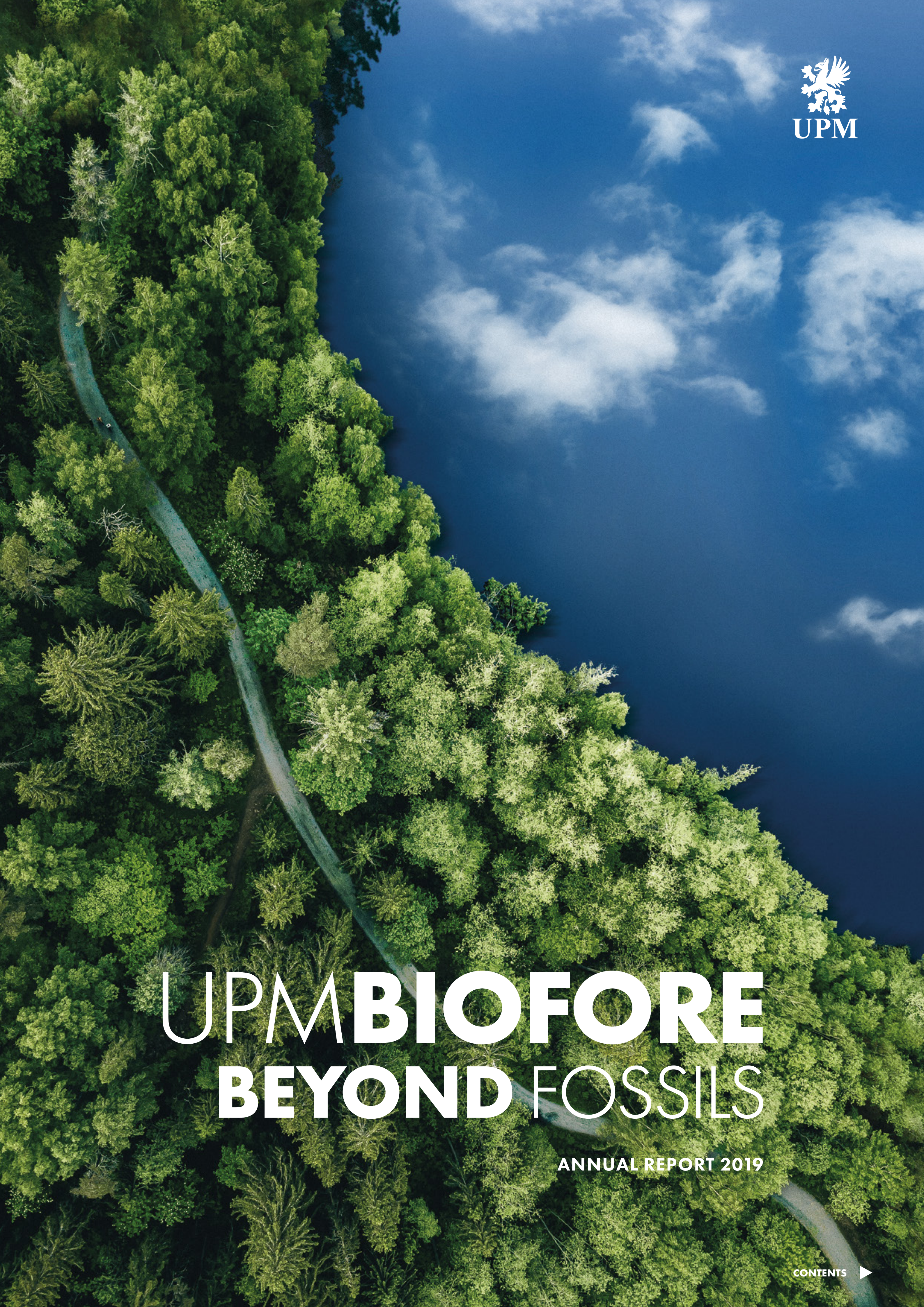

UPM

UPM BIOFORE BEYOND FOSSILS

ANNUAL REPORT 2019

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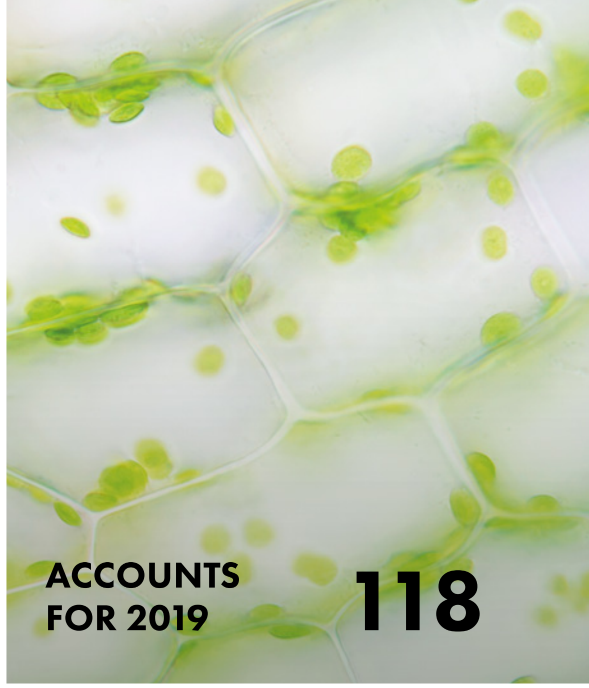


CONTENTS

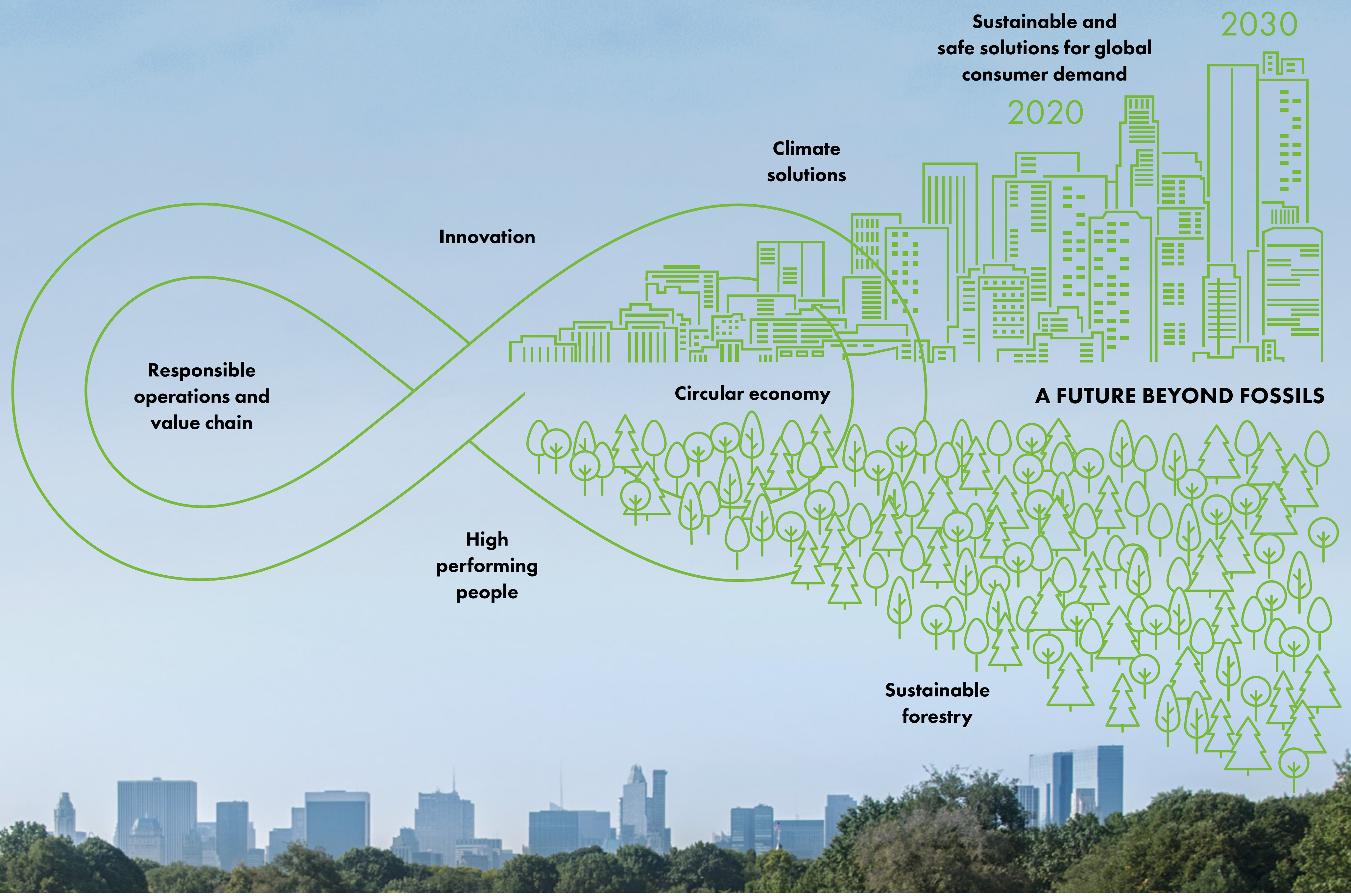
› UPM does not publish a separate environmental and corporate responsibility report but has integrated the contents into this annual report. Various highlights from the year 2019 can be found under the sections for each business area. To find out more about UPM's responsibility agenda, please visit upm.com/responsibility.

FUTURE BEYOND FOSSILS

is a key driver for UPM going forward

THE NEED FOR RESPONSIBLE CHOICES

Our innovations create value and business opportunities that go beyond fossils. We offer renewable, recyclable and low-impact alternatives to non-renewable materials.



We need sustainable choices
Population growth, urbanisation and rising living standards, particularly in emerging markets in Asia, create new consumer demand that stretches far into the future. Demographic change creates new needs. Digitalisation and e-commerce change consumer behaviour.

The demand for daily consumer goods and the need for packaging materials and labelling continue to increase. People also move more, use more energy and invest in lifestyle choices, all of which increases the demand for our products.

While consumer demand grows, natural resources are dwindling. Mitigating climate change and tackling other environmental challenges requires sustainable choices. The demand for responsibly produced renewable materials and products increases as a result of sustainable consumer choices and increasing regulation.

We offer sustainable and safe solutions and innovate for a future beyond fossils

Sustainable forestry preserves forests and increases carbon sinks
Sustainable forestry and land use respond to resource scarcity and climate change, while also creating the prerequisites for financial growth. A sustainably managed forest grows more, creates renewable raw materials, adapts better to climate change and is a more effective carbon sink in the long term. Sustainable forestry safeguards biodiversity, the good status of water bodies and the benefits of forests for humans.

Sustainable forest management requires investment and continuous development. This secures the economic value of forests and wood supply. The benefits are widely distributed across rural areas, balancing out regional disparities.

This is the foundation of a sustainable bioeconomy.

We ensure sustainable forestry and keep forests full of life

Responsible operations and a circular economy create a competitive advantage
A circular economy and resource efficiency offer solutions to climate change and the scarcity of natural resources. Many of the challenges we face could be solved entirely or in part if materials and products were recycled and used more efficiently. Globally, approximately 60% of the wood fibre used in the production of paper and boards is recycled. However, only some 18% of plastics and 20% of electronic waste is recycled.

Responsible business conduct and product design encompass the entire value chain, from sourcing raw materials to the recycling or disposal of end products. Renewable and recyclable products, and innovations based on these products, are an essential part of the bioeconomy, both now and in the future.

We use and reuse our resources efficiently and ensure responsible business conduct throughout our value chain

Mitigating climate change is urgent
The main cause of climate change is the use of fossil fuels. We must quickly reduce our usage and move to low-emission or zero-carbon energy sources. This requires a versatile energy portfolio that guarantees a sufficient supply of clean energy for society.

Forests play an important role in mitigating climate change, and sustainable forest management ensures that forests are adapting to the changing climate. Renewable wood and recyclable products reduce the world's dependency on fossil-based and other non-renewable raw materials.

We commit to UN's target to limit global temperature rise to 1.5°C

› Climate actions on page 86
› Sustainable forestry on page 88
› Circular economy on page 96
› Product stewardship on page 82
› Innovation on page 22 and 52

SUSTAINABLE AND SAFE SOLUTIONS

We respond to the growth in consumer demand with recyclable products that are made of responsibly sourced, renewable raw materials.

We actively develop new solutions for various needs and promote the sustainable use of renewable materials.

We strive to mitigate climate change and drive value creation through innovating novel products. We innovate climate-positive products and turn them into growing businesses.

Product design must cover the entire value chain, from raw material sourcing to end products, and their recycling or disposal. Renewable and recyclable products, and innovations based on these products, are an essential part of the bioeconomy, both now and in the future. Examples of how our safe and sustainable products offer alternatives to fossil materials are shown on the right.

- Our strategy on page 16
- Product stewardship on page 82
- Limitless opportunities of a bioeconomy on page 6
- Customer collaboration on page 84
- upm.com/responsibility

EXAMPLES OF OUR PRODUCTS THAT REPLACE FOSSIL-BASED MATERIALS

PACKAGING
Products made from pulp; UPM UniqueBarr™ barrier papers; UPM BioVerno renewable naphtha used in products such as milk cartons; UPM Fine paper

LABELLING
UPM Raflatac Forest Film™; UPM Raflatac Fossil-Free Adhesive; RAFNXT+ range; PCR (post-consumer recycled) film and paper label materials; fibre-based face papers and release liners

TRANSPORTATION
Low-emission UPM BioVerno diesel and naphtha; WISA plywood vehicle flooring in trailers

ELECTRIFICATION
Providing zero-carbon electricity to the market

CONSTRUCTION
UPM's sawn timber and WISA Plywood; UPM ProFi composite decking material; ash from biomass-based energy generation used in the cement industry and soil stabilisation

MANUFACTURING
WISA BioBond gluing technology; UPM BioPiva™ lignin in resins, adhesives, polymer blends and bio-plastics; green liquor dregs from pulp mills as a desulphuring agent at power plants; ash as raw material for paper filler production

MEDICATION AND MEDICAL RESEARCH
FibDex®, a wound care dressing made from nanofibrillar cellulose, and GrowDex®, a nanocellulose hydrogels for 3D cell culture for medical research

CONSUMER PRODUCTS
UPM Formi recyclable composite material

OUR ALTERNATIVES FOR FOSSIL-BASED MATERIALS

FIBRE PRODUCTS

We provide responsibly produced fibre-based products that are used in packaging, hygiene and tissue products, often replacing non-renewable raw materials. We use renewable wood fibre as the main raw material for our graphic papers, specialty packaging materials, labelling materials and biocomposite products.

Growth drivers
- Global demand growth of consumer goods
- Growth of e-commerce
- Population growth, increasing income levels
- Urbanisation and demographic change
- Environmental awareness
- Legislation
- Brands and product innovations

MOLECULAR BIOPRODUCTS

Biofuels and biochemicals offer new growth opportunities beyond our current product portfolio. The fuel and chemical markets are huge, but are mainly supplied by fossil raw materials, representing a quickly increasing demand for sustainable alternatives. UPM has excellent advantages in developing its biomolecule businesses: a competitive forest industry platform, sustainable feedstocks and land use, biomass processing technologies and intellectual property rights.

Growth drivers
- Climate change mitigation
- Sustainability
- Pressure to reduce greenhouse gas emissions and tailpipe emissions in transport
- Replacement of fossil raw materials with renewables

WOOD PRODUCTS

Most of our wood products are used in construction. Plywood and sawn timber are also used in furniture and parquet, packaging and vehicle floors, as well as being used as insulation in carriers used for liquefied natural gas. Wood products offer a solution that is healthy, safe and mitigates climate change. Our wood-based products retain the carbon bound in wood throughout their lifecycle.

Growth drivers
- Building and construction
- The role of renewable materials in construction
- Road transportation
- LNG carrier and terminal investments globally

LOW-EMISSION ENERGY

Our energy portfolio consists mostly of energy sources that do not cause fossil carbon dioxide emissions. We generate hydropower, nuclear power and biomass-based energy in the mills' combined heat and power plants. Energy efficiency means that energy consumption and emissions are continuously reduced.

Growth drivers
- Electrification – electricity everywhere
- Climate change mitigation
- Pressure to replace fossil fuels with renewables
- Regulating the electricity grid as weather-dependent generation increases
- Sustainable consumer choices

KEY PERFORMANCE INDICATORS

UPM BIOREFINING

UPM ENERGY

UPM RAFLATAC

UPM SPECIALTY PAPERS

UPM COMMUNICATION PAPERS

UPM PLYWOOD

TOP PERFORMANCE

Comparable EBIT, EUR
1,404m
–7%

Comparable ROE
11.2%
–1.7pp

STRONG CASH FLOW

Operating cash flow, EUR
1,847m
+39%

ATTRACTIVE DIVIDEND

Dividend (proposal), EUR
693m
+0%

INDUSTRY-LEADING BALANCE SHEET

Net debt, EUR
–453m

FOCUSED INVESTMENTS

Capital expenditure, EUR
378m
attractive returns with disciplined and effective investments

4/6
business areas achieved their financial targets

upm.com/investors

GLOBAL BUSINESSES – LOCAL PRESENCE

UPM's sales by market 2019
EUR 10,238 million

62% Europe

19% Asia

North America 13%

Rest of the world 6%

Active employees completed Code of Conduct training 96% *)
The UPM Code of Conduct lays the foundation for responsible business operations and continuous improvement.
+96pp

Employee engagement index 71% favourable
Engaged, high-performing people implement the Biofore strategy and drive short- and long-term success.
+0pp

Total recordable injury frequency 6.8
Ensuring a safe working environment for employees and everyone working for UPM.
+3%

Share of certified wood 82%
Forest certification is an excellent tool for ensuring sustainable forestry. Chain-of-Custody requirements ensure 100% supply from controlled sources.
+1pp

Supplier Code qualified supplier spend 84%
Transparent supplier requirements form the basis of responsible sourcing throughout the entire supply chain.
+1pp

Fossil CO_2 emissions (Scope 1 and 2) 5.8 million t
Creating climate solutions and working towards carbon neutrality.
–6%

*) New training for the updated Code of Conduct started in September 2019.

Presence		Countries
54	production plants in	12
18,700	employees in	46
12,500	customers in	120
100,700	shareholders in	32
24,000	b-to-b suppliers in	81

EVENTS IN 2019

JANUARY

9 UPM announces its participation in the international public tendering process in the port of Montevideo. In March, the National Ports Administration (ANP) awards UPM the concession in the port.

22 UPM is ranked 23rd in the list of 100 most sustainable corporations by the Corporate Knights, and also highlighted as a global leader on the CDP Forest A List

31 UPM Energy announces a refurbishment of the Kuusankoski hydropower plant in Finland

FEBRUARY

5 UPM Biofuels launches a collaborative project with international dairy corporation Arla, packaging company Elopak and chemical producer Dow to bring 40 million wood-based packages into supermarkets

15 Bernd Eikens is appointed Executive Vice President for UPM Biorefining as of 1 March 2019

MARCH

5 UPM begins transplanting rare and threatened wood-inhabiting fungi as part of a unique biodiversity project

APRIL

2 UPM Communication Papers announces plans to permanently close paper machine 10 at UPM Plattling, Germany. The paper machine was closed in July.

MAY

27 UPM launches FibDex®, a wound dressing created from wood-based nanofibrillar cellulose for the European market

JUNE

27 Jaakko Nikkilä is appointed Executive Vice President for UPM Specialty Papers as of 1 July 2019

JULY

23 UPM makes the USD 2.7 billion investment decision to construct a 2.1 million tonne greenfield eucalyptus pulp mill near Paso de los Toros in central Uruguay. UPM will also invest USD 350 million in port operations in Montevideo and local facilities, including a new residential area.

AUGUST

26 UPM, along with Bore Ltd and Wijnne Barends, affiliates of the Dutch Spliethoff Group, will design and build seven new LNG vessels for transporting pulp, paper and other products in Europe

SEPTEMBER

10 UPM announces plans to permanently close SC PM2 in Rauma, Finland and sell or close its Chapelle newsprint mill in France. UPM also announces plans to establish a new Business Services Hub in Wroclaw, Poland. The PM2 was closed in November.

The expansion of UPM Chudovo plywood mill is inaugurated

16 UPM maintains its industry-leader position in the Dow Jones European and World Sustainability Indices (DJSI)

23 The UN recognises UPM as one of the 36 Global Compact LEAD participants demonstrating world-class commitment to corporate responsibility

OCTOBER

24 UPM announces that President and CEO Jussi Pesonen will continue in his current position. He will not be available for re-election to UPM's Board of Directors.

UPM decides to invest in a combined heat and power (CHP) plant at its Nordland paper mill in Germany to strengthen its cost competitiveness and reduce its CO_2 emissions by 5%

NOVEMBER

20 UPM Raflatac opens a new label stock slitting and distribution terminal in Chelyabinsk, Russia

28 UPM joins 4evergreen, a new initiative by CEPI (the Confederation of European Paper Industries) to boost fibre-based packaging in a circular economy

BEYOND FOSSILS BECOMES REALITY

Good performance continued with record cash-flow. The year ended with an exceptionally strong financial position. Investments in Uruguay pulp mill and next generation biochemicals in Germany build company value and strengthen our position in climate change mitigation.

2019 was a milestone year in UPM's strategic transformation

The year 2019 was a milestone year in UPM's strategic transformation. The decision to build the second UPM pulp mill in Uruguay will result in a step change in scale of the pulp business and UPM's future earnings. Growth initiatives in biomolecular businesses made good progress and will open totally new markets for UPM with large growth potential for the future.

Our business performance continued at a good level despite the slowing economic growth. We were able to maintain stable margins throughout the year and achieved a record-strong cash flow. This was a good achievement given the erosion of our product prices during the second half of the year.

Our sales decreased by 2% and comparable EBIT fell by 7% in 2019. Our operating cash flow increased by more than half a billion euros to EUR 1,847 million and we finished the year with a record-low negative net debt of EUR -453 million.

I would like to sincerely thank all UPMers and our partners for making 2019 a success.

Future beyond fossils

Our strategic guidance remained unchanged: Our portfolio consists of six competitive businesses with strong market positions and performance. We grow businesses that are having long-term fundamentals for demand growth and high barriers to entry. Performance, growth, innovation and responsibility continue to be the four cornerstones we build on.

We have clearly defined the spearheads for our growth: high-value fibre, specialty packaging materials and molecular bioproducts will pave our way.

In the beginning of 2020 UPM committed to UN Business Ambition for 1.5°C. We have a unique opportunity to make a positive impact and contribute to limiting climate change. We innovate climate-positive products and turn them into growing businesses. We source from sustainably managed forests and reduce our emissions. Furthermore, we limit risks from climate mitigation policies and the physical impacts of the changing climate to our businesses and assets. All this is important for the long-term value of the company.

We believe that customers, investors and other stakeholders value responsible operations that keep risks under control and add to our business opportunities. During the year, UPM was invited as a UN Global Compact LEAD participant. We have received several top recognitions for its sustainability performance, including the global Dow Jones Sustainability Index, MSCI AAA rating and CDP Triple A listing.

Our objective is earnings growth. We will maintain our high standards when it comes to return requirements for any growth investments.

In addition to executing various low-risk, focused growth investments, we started implementing our transformative projects that provide us with unique opportunities for significant long-term earnings growth.

In UPM Biorefining, the implementation of the pulp mill project in Uruguay is making rapid progress. In UPM Biochemicals, we made the decision on the first industrial-scale biochemicals refinery in Germany in January 2020. Biochemicals has the potential to provide UPM with a significant growth platform for decades to come. In UPM Biofuels, we have completed the environmental impact assessment for a possible biofuels refinery in Finland.

Shareholder value at the core

Creating shareholder value is at the core of our strategy, and we believe that our Beyond fossils actions also benefit other stakeholders and society in the long term.

UPM's Board of Directors is proposing a dividend of EUR 1.30 (1.30) per share for 2019, representing 38% of operating cash flow per share. The proposal reflects UPM's exceptional financial position and confidence in future cash generation.

Over the next few years, we can allocate more capital to growing and transforming the company while simultaneously paying an attractive dividend to our shareholders and maintaining our strong balance sheet. We will also ensure that our employees have the competence, integrity and drive to make our strategy come true.

Global economic growth is expected to continue in 2020, albeit at a modest level. Growth is expected to be slow in Europe. The long-term outlook for our businesses is strong. It is driven by global consumer megatrends, more sustainable consumer choices and the need to reduce reliance on fossil resources. UPM is ready to grasp the limitless opportunities that bioeconomy offers for value creation and business growth.

We have many things to look forward to in 2020. We have exciting transformative projects either in progress or in planning, which will drive the company's future earnings and value. UPM's financial position is exceptionally strong, which enables us to make these opportunities real.

Jussi Pesonen
President and CEO

OUR STRATEGY

A new era of growth

UPM ANNUAL REPORT 2019

UPM STRATEGY – BEYOND FOSSILS

We create value by seizing the limitless potential of bioeconomy

Our portfolio consists of businesses with strong long-term fundamentals for demand growth and high barriers to entry

We build on four strategic cornerstones: performance, growth, innovation and responsibility

	SIGNIFICANCE	TARGET	OUR WAY
PERFORMANCE	• Top performance drives value creation and mitigates risks related to the business environment • Top performance enables investments in growth, innovation and responsibility	• Continuous improvement • Top performance in each business	• Operating model with separate business areas • High-performing people • Commercial excellence • Cost efficiency • Efficient use of assets and capital
GROWTH	• Our product markets offer significant growth potential, driven by global consumer megatrends • We are in a unique position to open new large markets by offering sustainable solutions to replace fossils	• Earnings growth • Attractive returns	• Focus areas for growth: high value fibre, specialty packaging materials and molecular bioproducts • Clear return targets • Focused growth projects and transformative projects for earnings growth • Talent attraction
INNOVATION	• Replacement of fossil-based materials with sustainable alternatives presents large opportunities for value creation • Developing products, services and processes is key to improving resource efficiency, sustainability and competitiveness	• Boost growth • Boost competitiveness	• New businesses, products and technologies with a focus on bioeconomy • Developing products, services and processes • Developing capabilities • Extensive partner network
RESPONSIBILITY	• Global consumers present a large and growing demand for sustainable and safe solutions • Responsible operations and value chain mitigate risks and create opportunities related to changes in consumer choices and regulations	• Provide solutions to global challenges, while creating value for our stakeholders • Competitive advantage	• Compliance • Responsible operations and value chain • Value-based leadership • Renewable, recyclable and safe products
PORTFOLIO	• Value creation is driven by performance within each business and synergies within the group • Long-term value creation is further driven by effective capital allocation and right choice of businesses	• Superior long-term shareholder returns	• Develop businesses with strong long-term fundamentals for demand growth and high barriers to entry • Disciplined and effective capital allocation and strong balance sheet • Capitalise on corporate benefits and synergies

Performance

TOP PERFORMANCE

UPM aims for continuous improvement in its financial performance through the right operating model, performance culture, continuous improvement programmes and effective capital allocation.

BUSINESS AREA RETURNS AND LONG-TERM TARGETS

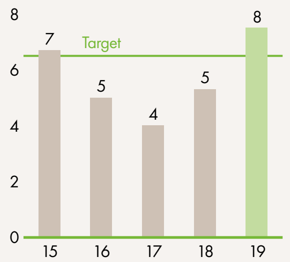
Comparable ROE

11.2%

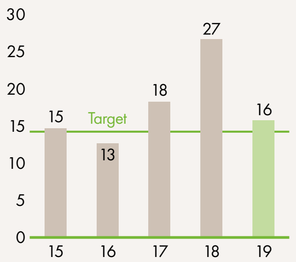
Comparable EBIT decrease in 2019

–7%

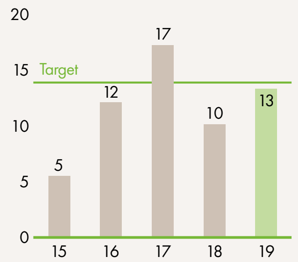
UPM Energy *)**
ROCE % *)



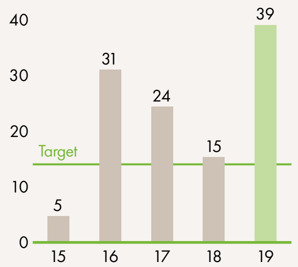
UPM Biorefining
ROCE % *)



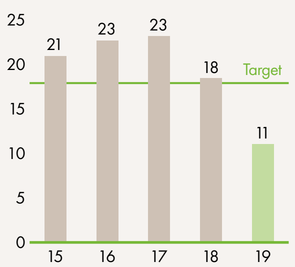
UPM Specialty Papers
ROCE % *)



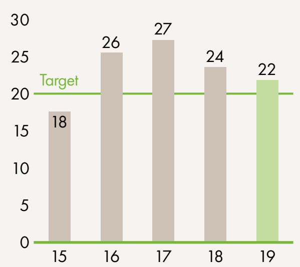
UPM Communication Papers
FCF/CE % **)



UPM Plywood
ROCE % *)



UPM Raflatac
ROCE % *)

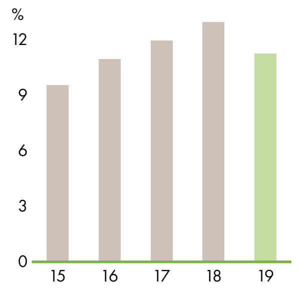


*) ROCE % = Return of capital employed excluding items affecting comparability.

**) Free cash flow after investing activities (investments and/or divestments) and restructuring costs.

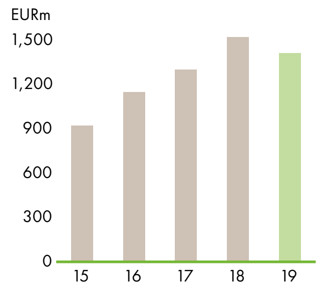
***) Shareholdings in UPM Energy valued at fair value.

Comparable ROE



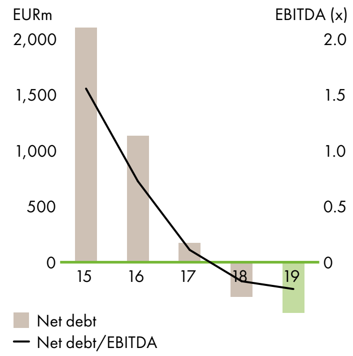
Target: 10%

Comparable EBIT



Target: EBIT growth

Net debt and leverage



Policy ≤2x

Continuous improvement

UPM aims for continuous improvement in its financial performance. At the group level, our target is to grow comparable EBIT over the long term. In 2019, comparable EBIT decreased by 7% to EUR 1,404 million (1,513 million) mainly due to decreased sales prices of UPM's products. In the past five years, comparable EBIT has grown by 62%.

The right operating model

UPM operates in the bio and forest industry value chain. Our businesses in various parts of the value chain operate as separate market-facing businesses, both in terms of customers and suppliers. Compared with the traditional vertically integrated operating model in our industry, our model gives several benefits:

- Transparency and accountability: target setting, incentives, commercial strategies and benchmarking
- Cost competitiveness: agility, efficiency and optimal sourcing
- Growth: wider opportunities for attractive growth investments

Business area targets

At the business area level, UPM is targeting top performance in the respective markets. We have also set long-term return targets (ROCE %, on the left) for the six business areas. The return targets apply over business and investment cycles. They have been set at a level that is both ambitious but also enables value-creating growth investments. In 2019, four out of six business areas met or exceeded the targeted returns.

Capturing corporate benefits

UPM builds on corporate synergies and benefits, thereby adding value to our businesses and stakeholders with:

- Competitive and sustainable wood sourcing, forestry and plantation operations
- Value-adding, efficient and responsible global functions
- Group-wide continuous improvement (Smart) programmes in commercial strategies, variable costs, working capital, site and maintenance costs, safety and environmental performance
- Technology development and intellectual property rights
- Global business platform
- Disciplined and effective capital allocation
- Compliance with applicable laws and regulations and corporate policies

Effective capital allocation

Capital allocation is key to attractive long-term returns, as well as developing the business portfolio in areas with the best long-term value creation potential. At UPM, capital allocation decisions take place at the corporate level.

We invest in sustainable businesses with strong long-term fundamentals for demand growth and a clear competitive advantage or high barriers to entry. With careful preparation, we aim to secure attractive returns that meet our targets both in the short and long term.

Over the past five years, UPM's investments have offered highly attractive returns. In addition, UPM's growing businesses have on average offered three times higher comparable EBIT margins than the mature graphic paper business over the same period.

Strong balance sheet and attractive ROE

An Investment Grade rating is an important element in our financing strategy. UPM's financial policy on leverage is based on a net debt/EBITDA ratio of 2 or less. At the end of 2019, the net debt/EBITDA ratio was –0.24.

UPM aims for a 10% return on equity. ROE also takes into account the financing, taxation and capital structure of the group. In 2019, the comparable ROE was 11.2%.

SIGNIFICANCE
- Top performance drives value creation and mitigates risks related to the business environment
- Top performance enables investments in growth, innovation and responsibility
- Effective capital allocation and the right choice of businesses enhance long-term value creation further

TARGETS
- Continuous improvement
- Top performance in each business area
- Growth in comparable EBIT
- Attractive returns
- Strong balance sheet

OUR WAY
- Operating model with separate business areas
- High-performing people
- Commercial excellence
- Cost efficiency
- Efficient use of assets and capital
- Capitalise on corporate benefits and synergies

> Spearheads for growth on page 20
> Creating shareholder value on page 30
> Our 2030 responsibility targets on page 60
> Accounts for 2019 on page 118

SPEARHEADS FOR GROWTH

We have selected three focus areas where we are seeking significant growth in the coming years.

High-value fibre — transformative growth project in Uruguay

Global consumer megatrends and the need to find more sustainable alternatives for fossil-based materials support demand growth for market pulp. The requirements for competitive greenfield pulp operations are difficult to meet, providing a sustainable competitive advantage.

Over the past few years, UPM Pulp has thrived through focused growth investments. it has increased production capacity by more than 500,000 tonnes at its existing four pulp mills.

In 2019, UPM decided to build a new world-class pulp mill in Uruguay, near the town of Paso de los Toros. The mill will have an annual capacity of 2.1 million tonnes of eucalyptus market pulp. The USD 2.7 billion investment will raise our pulp production capacity by more than 50% and significantly contribute to future earnings. The mill is scheduled to start up in the second half of 2022. In addition, UPM will invest in port operations in Montevideo and housing near the mill.

Molecular bioproducts – transformative new businesses

For years, UPM has been developing technologies to produce sustainable drop-in alternatives for fossil fuels and fossil-based chemicals. New large value-creation opportunities may open by decarbonising traffic and providing consumers with more sustainable products.

UPM Biofuels has successfully entered the market with its renewable diesel and naphtha UPM BioVerno. UPM Lappeenranta Biorefinery has proven its proprietary technology, product quality and sustainability, and has achieved commercial success. We are now exploring opportunities to scale up the business by studying a potential larger biorefinery in Finland, with a wider range of sustainable feedstocks.

UPM Biochemicals has been studying entering the market on a commercial scale. In 2019, we completed a basic engineering study of a potential biorefinery and assessed two alternative industrial parks in Germany. The investment decision was made in January 2020 (read more on the right).

Specialty packaging materials – focused growth projects and innovation

Global consumer megatrends are driving demand for appealing and functional, but at the same time sustainable and safe, labelling and packaging solutions.

We continue to grow in the attractive specialty paper and self-adhesive label materials segments. We focus on expanding their current production units and customer reach, and continuously developing their product portfolio. Our strong position and innovations in these technically demanding and fast-growing niche segments of the packaging value chain provide attractive growth opportunities.

In 2019, UPM rebuilt paper machine 2 at UPM Nordland, Germany from fine paper to specialty paper production. At the UPM Changshu mill in China, we installed a second supercalender on paper machine 3, expanding our release liner base paper capacity.

SIGNIFICANCE

- UPM's product markets offer significant growth potential, driven by global consumer megatrends
- UPM is in a unique position to open new large markets by offering sustainable solutions to replace fossils

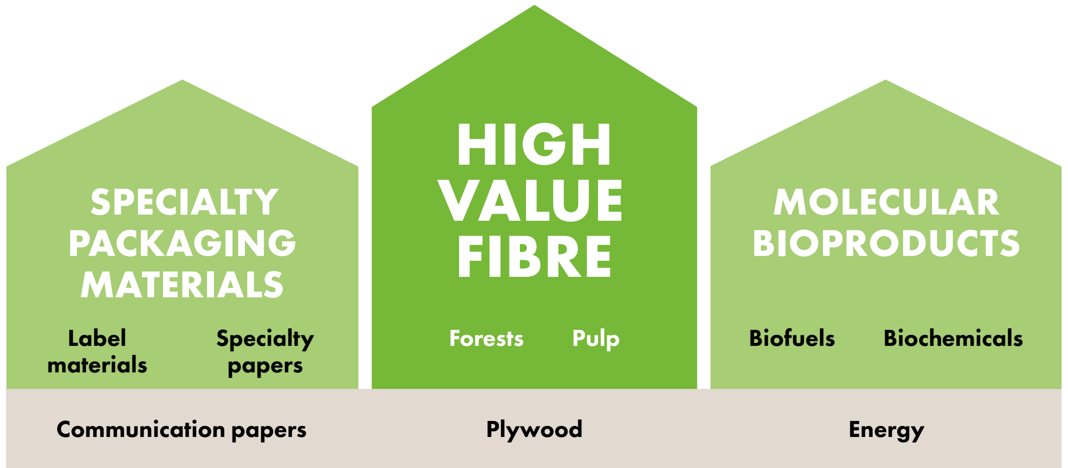
TARGETS

- Earnings growth
- Attractive returns

OUR WAY

- Focus areas for growth: high-value fibre, specialty packaging materials and molecular bioproducts
- Clear return targets
- Focused growth projects and transformative projects for earnings growth
- Talent attraction

› Uruguay pulp mill project on page 38 and upm.uy/growth
› Renewable biofuels and naphtha on page 52
› Biochemicals development on page 53



THE KEY FACTORS
the spearheads have in common are significant growth potential and UPM's competitive advantage based on deep knowhow and high barrier to entry.

UPM is investing also in UPM Plywood and UPM Energy, while maintaining consistently strong cash flow and earnings in UPM Communication Papers.

VALUE-CREATION OPPORTUNITIES IN THE COMING YEARS

	SPECIALTY PACKAGING MATERIALS	HIGH-VALUE FIBRE	MOLECULAR BIOPRODUCTS
UPM BUSINESSES	UPM Raflatac UPM Specialty Papers	UPM Pulp	UPM Biofuels UPM Biochemicals
STRONG LONG-TERM FUNDAMENTALS	Demand growth driven by global consumer megatrends	Demand growth driven by global consumer megatrends	Climate commitments and replacing fossil materials open large growing markets
SOLUTIONS	Sustainable and safe products for global consumer demand, e.g. labelling and packaging	Fibre-based products provide sustainable solutions for global consumer demand, e.g. tissue, hygiene, packaging, specialty	Unique solutions to decarbonise traffic and provide consumers with bio-based products
MARKET GROWTH	+4%	+3%	Strong growth potential
COMPETITIVE ADVANTAGE	Technically demanding segments, where UPM has a leading market position, expertise and innovation	Competitive greenfield pulp operations have high requirements (wood supply, location, infrastructure, capital)	Unique value chain position with sustainable feedstocks, the right technology and IPR
CURRENT PROJECTS OR PROSPECTS UNDER STUDY	Focused growth investments in Germany and China Product portfolio development	A new world-scale pulp mill in Uruguay, capacity of 2.1 million tonnes, investment of USD 2.7 billion	Exploring scaling up in biofuels: potential biorefinery in Finland Entering to wood-based biochemicals business by building a biorefinery in Germany

CASE

UPM CREATES A COMPLETELY NEW BUSINESS IN BIOCHEMICALS

UPM is taking the next transformative growth step and entering the biochemicals business by investing in a biorefinery in Leuna, Germany. The biorefinery will produce a range of 100% wood-based biochemicals that enable a switch from fossil raw materials to sustainable alternatives in various consumer-driven end-uses. The investment opens up totally new markets for UPM with large growth potential for the future.

UPM will invest EUR 550 million in an industrial scale biorefinery to convert solid wood into next-generation biochemicals: bio-monoethylene glycol (BioMEG) and lignin-based renewable functional fillers. In addition, the biorefinery will produce bio-monopropyleneglycol (BioMPG) and industrial sugars. The total annual capacity of the biorefinery will be 220,000 tonnes. The facility is scheduled to start up by the end of 2022.

The product range offers unique customer value and is expected to achieve a good cost position, comparable to the fossil-based alternatives. Once the facility is fully ramped up and optimised, it is expected to achieve the ROCE target of 14%.

We help our customers to make their businesses more sustainable. Currently the supply of biochemicals is very limited. Due to this, high-quality sustainable alternatives are priced at a premium in the markets.

The combination of sustainable wood supply, a unique technology concept, integration into existing infrastructure at Leuna and the proximity of customers will ensure competitiveness of operations. The safety and sustainability of the value chain will be based on our high standards.

Application areas for glycols include textiles, PET bottles, packaging, de-icing fluids, composites, pharma, cosmetics and detergents. The market supply is almost entirely based on fossil raw materials: oil, natural gas and coal. Lignin-based renewable functional fillers are used in various rubber applications as a sustainable alternative to carbon black and silica. Besides climate benefits they will provide additional benefits such as lighter weight and high purity.

Being the European centre for chemicals industry excellence and located in the middle of the markets, Germany provides an attractive location for the biorefinery. The region also offers good availability of sustainably sourced hardwood. Wood sourcing will be based on forest thinning and the residues from regional sawmills.

INNOVATING FOR GROWTH

Replacement of fossil materials with bio-based alternatives presents major opportunities for value creation. Developing products, services and processes is key to improving resource efficiency, sustainability and competitiveness.

We develop new technologies and innovate ways to expand our offering with renewable products and solutions that can replace fossil-based materials. Research and development, bioeconomy innovations and new technologies support this transformation and expand our business portfolio.

We are developing innovative and high-quality products from wood-based biomass. Wood fibre, biomolecules, residues and side streams are becoming increasingly important raw materials of the future.

Innovation and R&D programmes are essential in the development of new products and technologies. Research and development funding is primarily being used on studying new technologies and developing businesses and processes. A global network of research centres provides support for UPM's activities in R&D, both in new and existing businesses.

In 2019, UPM spent EUR 121 (106) million on research and development, making up 6.6% (7.6%) of UPM's operating cash flow. In addition to direct R&D expenditure of EUR 53 (52) million, the figure includes negative operating cash flow and capital expenditure in developing businesses, development of transformative business prospects and digitalisation projects and initiatives.

SIGNIFICANCE
- The increasing demand for renewable and recyclable materials as we search for alternatives to fossil-based raw materials and increase the efficiency of resource usage
- The growing consumption in emerging markets, requiring responsibly produced solutions
- Bioeconomy products offer sustainable solutions to the challenges of global megatrends, such as mitigating climate change

TARGETS
- Developing products and innovations that replace fossil-based solutions and create added value and growth
- Capturing the limitless opportunities of the bioeconomy

OUR WAY
- Strong expertise in forest biomass processing
- Responsibility and circular economy
- Resource efficiency, product stewardship and ecodesign across the entire value chain
- Technological development and intellectual property rights
- Partnerships and networking

Accelerating the development and scale-up of new bio-based businesses

Molecular bioproducts form one of UPM's three strategic focus areas for growth and are at the core of innovating for a future beyond fossils. We have successfully entered the biofuels business and built a profitable and sustainable business platform. Development is currently ongoing, with the aim of expanding the biofuels business and making a similar entry into the biochemicals business.

In 2019, we built Biofore Base, a new state-of-the-art R&D piloting plant and expanded R&D operations in Lappeenranta, Finland. It unites UPM's technologies, globally accumulated experience and expertise. Operations will range from strategic research to commercial scale-up that further strengthen UPM's expertise and enhance future capabilities. Biofore Base will also accelerate the development and commercialisation of bio-based solutions into viable industrial processes in a cost-efficient way.

To support UPM's new business development, the Biofore Base is designed with the scope to further expand on a global scale. In 2020, special focus will be on expanding into new value chains with new partners and research organisations.

337
UPM granted patents and patent validations in 2019

412
UPM patent filings and validations in 2019

- New sustainable alternatives on page 52
- Safe and sustainable products on page 8
- Climate actions on page 86
- Circular economy on page 96

Transition to low-emission economy provides opportunities

Our products offer a solution to mitigating climate change as they systematically replace fossil raw materials with bio-based renewable alternatives. The products store carbon for the entire duration of their lifecycle, also when recycled multiple times.

In 2019, we assessed risks and opportunities relating to climate change that would potentially affect our business. As part of the assessment, we created cost abatement curves for reducing CO_2 emissions from our operations. We also initiated a study with external partners to more accurately estimate the impact that our products have on the climate by substituting fossil-based or other competing alternatives, for example.

Sustainably managed forests form a cost-competitive carbon capture technology and we carried out research on both soil and forest carbon storages. We are also conducting research on other carbon capture technologies with external partners.

Reduce, reuse and recycle

We create circular economy solutions in the value chain of forest industry products. We see the residues and side streams as valuable raw materials, a source of energy and, thus, of real business opportunities. Our research into pulp and paper mill side streams is aimed at finding more efficient ways to utilise by-products such as sludge, ash, green liquor dregs and waste heat.

Green liquor dregs are one of the most challenging residues from pulp production, and we are currently developing several innovative processes for utilising this material in Finland and Uruguay. The More with Biofore in China research programme continued with several pilot trials to recycle effluent water back into the process, further reducing fresh water intake.

Solid patent portfolio creates value

The significance of the patents, trademarks and intellectual property rights protecting our innovations is even more pronounced in our new businesses. A solid patent portfolio boosts our competitive edge and also provides an excellent basis for value creation in the future. For example, wood-based biofuels, biochemicals and biomedicals are new business areas in which a lot of research and product development is carried out, both internally and with external partners.

Extensive partner network

Our close-knit global partner network is comprised of customers, universities, research organisations, suppliers and start-up companies. Collaboration speeds up the development and launch of new solutions, particularly for new businesses.

The partnership with European Joint Undertaking on Bio-Based Industries (BBI) focuses on bio-based products, the production of these and strengthening their competitiveness in Europe. As a shareholder in the Finnish CLIC Innovation Ltd, we aim for breakthrough solutions in the bioeconomy, circular economy and cleantech, as well as in smart energy systems. We are also a member of FinnCERES Ecosystem to collaborate on research into lignocellulose-based materials.

In 2019, UPM joined 4evergreen, a new initiative by CEPI (the Confederation of European Paper Industries). The aim is to boost fibre-based packaging in circular economy.

CASE

DEVELOPING A FULLY RENEWABLE BEVERAGE CARTON

About 20% of a typical paperboard beverage carton is made up of fossil-based plastic. The plastic barrier coating is used for holding the liquid and to prevent migration of air and flavours through the paperboard. There was a clear market need for a fully renewable beverage carton that provides a reduced carbon footprint and excellent product protection properties.

UPM Biofuels joined forces with Dow – one of the world-leading, innovative chemical companies, and Elopak – an international supplier of paper-based packaging solutions, to co-create a 100% renewable* beverage carton that is recyclable and responsibly sourced.

UPM BioVerno naphtha is made from a residue of the pulp production process, and it comes from responsibly managed forests. Using naphtha as raw material for the plastic coating in liquid cartons allows reducing the carbon footprint of the packaging. Every tonne of UPM's naphtha used for carton manufacturing reduces the need for fossil raw materials an equivalent amount.

The technical properties of the carton coating and cap correspond to fossil-based materials. Sustainability of the entire value chain is certified.

**On mass balance basis*

VALUE FROM RESPONSIBILITY

Creating value for society – both as a company and through our renewable and responsible solutions – is an integral part of our strategy. The bioeconomy offers new opportunities for value creation and business growth.

SIGNIFICANCE

- We are building a sustainable future by replacing non-renewable materials with renewable ones, using them more efficiently and creating new, responsible solutions
- Responsibility is an integral part of our strategy and our operations and is seen as a source of competitive advantage

TARGETS

- We lead the forest-based bioindustry into a sustainable, innovation-driven and exciting future beyond fossils
- We provide solutions to global challenges, while creating value for our stakeholders

OUR WAY

- We respect international agreements such as the UN Declaration of Human Rights, the ILO Declaration on Fundamental Principles and Rights at Work, and the OECD Guidelines for Multinational Enterprises
- Our Biofore strategy guides us in achieving our responsibility targets for 2030, and in contributing to the UN Sustainable Development Goals
- Our Code of Conduct and Supplier and Third-Party Code provide a foundation for responsible business conduct and continuous improvement
- Corporate responsibility is managed by the Board of Directors and the Group Executive Team, as well as by businesses and functions

We promote responsible business practices throughout our value chain and we actively seek sustainable solutions in co-operation with our customers, suppliers and other stakeholders. Responsibility is integrated into our Biofore strategy as a solid foundation for long-term value creation, with emphasis on the following methods of ensuring responsible business practices:

- Compliance
- Responsible operations and value chain
- Value-based leadership
- Renewable raw materials, recyclable and safe products

Compliance in all our activities

Decision making, management and operations are guided by our values and by the UPM Code of Conduct. Responsible business practices, complemented by credible and transparent reporting, are the basis for our responsible business conduct across the whole value chain.

In 2019, we renewed the UPM Code of Conduct and introduced a new training concept for all employees. By the end of the year, 96% had completed the training. The UPM Supplier and Third-Party Code was revised to reflect the changes in the Code of Conduct. It will be implemented in early 2020.

In 2019, UPM was named a Global Compact LEAD participant once again for its commitment to the UN Global Compact. We were one of only 36 global companies to receive this recognition, the only representative of the forestry industry, and the only company from Finland.

Responsible operations and value chain

Efficient operations not only reduce costs, but also minimise negative environmental impact. By managing our forests sustainably, we ensure the availability of wood, safeguard biodiversity and mitigate climate change. Our commitment to respecting human rights is a focal point of our responsible business practices.

Climate change remained high on the agenda. The Finnish Meteorological Institute (FMI) concluded a study in 2019, helping us predict the future long-term physical impacts of climate change on our business. A thorough analysis of transition scenarios was carried out internally.

In 2019, UPM's businesses continued to work on detailed roadmaps on how to reach our 2030 environmental targets, and on developing environmental reporting and sharing best practices. As a result, environmental deviations reduced from 26 to 20. As an example of mill developments, the UPM Kaukas paper and pulp mill significantly reduced its COD load and started to use recycled nutrients from nearby sources.

We made a big step towards transparent monitoring of biodiversity in our own forests in Finland. We developed new biodiversity indicators, which help us to quantify how to enhance biodiversity. Our target is to preserve and improve biodiversity in UPM's own forests in Finland.

Value-based leadership

Value-based and inspiring leadership ensures high performance and continuous professional development, a safe and healthy working environment, and the wellbeing of employees and contractors.

A diverse and inclusive working environment empowers people. Local commitment is crucial to this.

A new Enabling Performance approach was put into action in 2018 and was expanded to cover most salaried employees in 2019. The aim is to increase employee motivation and drive better results.

In 2019, we reviewed our Human Resources Rules and clarified our commitments to working conditions, labour practices and decent work, and employee's responsibilities. We also agreed on a salient human rights issue assessment procedure at the business area level, which complements the existing human rights due diligence at UPM. The procedure was piloted at UPM Raflatac.

Sustainable and safe solutions

Global consumers present a large and growing demand for sustainable and safe solutions. Renewable raw materials and recyclable products are the essence of a circular economy. With our approach to product stewardship, we aim to ensure that our solutions respond to global challenges and that our product communication is reliable and transparent.

The development of sustainable solutions continued in 2019. UPM Raflatac launched wash-off labelling materials with recycled content. UPM Plywood widened their range of fire-retardant products.

Also, our joint operations and partnerships strongly supported our innovations. UPM Raflatac and UPM Biofuels joined forces to develop solutions based on renewable naphtha, which is an ideal renewable component for replacing fossil-based raw materials with sustainably sourced renewable feedstock. UPM also created a new wound care dressing made from wood-based nanocellulose, in collaboration with researchers from the University of Helsinki and surgeons and nursing staff from the Helsinki Burn Centre.

- Sustainable and safe products on page 8
- Compliance on page 74
- Climate actions on page 86
- Sustainable forestry and land use on page 88
- Lifelong product stewardship on page 82
- More about responsibility throughout the Annual Report
- upm.com/responsibility
- sustainabledevelopment.un.org

CASE

COMPREHENSIVE STUDY ON SDGS

The UN Sustainability Development Goals (SDGs) are a set of 17 goals with 169 targets that strive to solve the most pressing global challenges by 2030. As a UN Global Compact LEAD Participant, we are strongly committed to supporting the SDGs. Our strategy guides us in achieving our ambitious responsibility targets for 2030, set in 2015, and our contributions to SDGs.

In 2019, we reviewed all 17 SDGs and their 169 targets against our Biofore strategy, our 2030 responsibility targets and stakeholder expectations. We chose the most relevant SDG targets based on where we can have the greatest impact, either by minimising our negative impacts or by increasing our positive impacts on people, societies and the environment.

After having analysed and evaluated the outcome with businesses, 12 targets for 6 SDGs were chosen as the focus of our work. The chosen SDGs are: SDG 6 (Clean water and sanitation), SDG 7 (Affordable and clean energy), SDG 8 (Decent work and economic growth), SDG 12 (Responsible consumption and production), SDG 13 (Climate action) and SDG 15 (Life on land).

We continuously monitor the progress of our contribution to SDGs and raise the bar when targets are reached ahead of schedule or when new or more ambitious targets are needed to meet the needs of the changing world.

MEGATRENDS DRIVE DEMAND FOR SUSTAINABLE AND SAFE SOLUTIONS

Our innovations create value and business opportunities beyond fossils. We offer renewable, recyclable and low-impact alternatives to non-renewable materials.

MEGATRENDS	SIGNIFICANCE TO UPM	OPPORTUNITIES FOR UPM	CHALLENGES FOR UPM
POPULATION GROWTH, URBANISATION, DEMOGRAPHIC CHANGE	• Global consumer demand is set to grow significantly by 2030 • Value creation by providing sustainable solutions for consumers • Reducing the use of non-renewable materials • Positive contribution to society	• Significant growth in global consumer demand • Growing need for sustainable and safe solutions • New business opportunities with ecodesign • Large business opportunities with bioeconomy, molecular bioproducts in chemical and fuel value chains in particular • Cost-efficient and responsible supply chains	• Fit of UPM's product mix and geographical presence to the future growth outlook • Unpredictable regulation and subsidies may distort markets • Uncertainties regarding global trade, protectionism, tariffs and sanctions • General economic development
RESOURCE SCARCITY AND ROLE OF RENEWABLES	• Customers and consumers are increasingly seeking renewable and recyclable solutions • Competitive forest industry platform and access to sustainable feedstock enable business success • Sustainable land use	• Growing demand for renewable and bio-degradable materials and low-emission energy • Competitive advantage from resource efficiency and new circular economy products • Healthy forests and safeguarded wood availability • Increased forest growth in Northern Europe, sustainable plantations • Sustainable land use and ecosystem services • Responsible water use and safeguard the natural water cycle in forests	• Changes in raw material costs and availability • Unpredictable regulation and subsidies may distort markets • Competition for renewable raw materials • Competition for land use • Threat of deforestation and biodiversity loss globally
CLIMATE CHANGE	• Forests and wood-based products have a unique role in climate change mitigation • Business opportunities by decarbonisation of traffic and energy • Transition to low-carbon economy	• Competitive advantages and growth opportunities with sustainability • Growing demand for alternatives to replace fossil materials • Prioritising use of low-emission and renewable energy • Strong demand growth for renewable fuels to decarbonise traffic • Circular economy • Forests as carbon sinks • Increased forest growth in Northern Europe and new plantations in Uruguay	• Unpredictable regulation and subsidies may distort markets • Cost of greenhouse gas emissions • Political instability • Increasingly common and more severe storms, floods and droughts, damage cause by insects • Unpredictable wood-harvesting conditions
DIGITALISATION	• Digital innovations to support value creation and growth • Customer focus • Transforming processes and technology	• Growing e-commerce drives growth in demand for labelling, packaging, pulp and transport • Increasing efficiency, productivity and change agility • Improved efficiency and decision-making through industrial Internet, big data, data analytics, forecasting, robotics and automation • Demand trends for different paper end uses and geographical areas • UPM's production platform with continuous optimisation opportunities	• Fit of UPM's product mix and geographical presence to future growth outlook • Declining graphic paper consumption • New forms of competition • Changing needs for skills and competencies • Cyber security
RESPONSIBILITY AND COMPLIANCE	• Responsible operations and value chain • Long-term business success, mitigating risks and capturing opportunities • High-performing people	• Regulation may drive markets for sustainable products • Product stewardship • Transparency as competitive advantage • Cost-efficient and responsible value chains • Engaged and diverse workforce, talent attraction • Sustainable returns and risk mitigation	• Unpredictable regulation and subsidies may distort markets • Reputation and financial risks in the event of non-compliance • Unpredictable changes in the operating environment • Uncertainties regarding global trade, protectionism, tariffs and sanctions

RISKS AND OPPORTUNITIES

The operating environment exposes UPM to a number of risks and opportunities. Many of them arise from general economic activity and global megatrends (see previous page). Execution of strategies exposes UPM and its business areas, functions and production plants to a number of risks and opportunities. No new emerging risks were identified in 2019.

PERFORMANCE

GROWTH

INNOVATION

RESPONSIBILITY

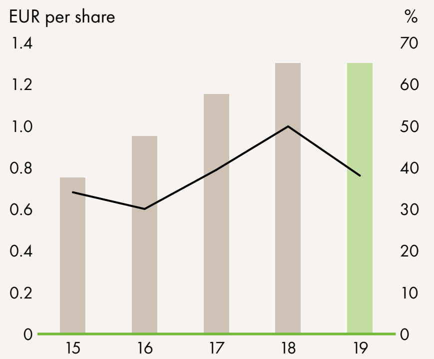
PORTFOLIO

	RISK DESCRIPTION	IMPACT	MANAGEMENT	OPPORTUNITY	STRATEGIC FOCUS AREAS INVOLVED
OPERATING ENVIRONMENT	Global economic cycles	Impacts the demand and sales prices of various UPM products and main input costs items, as well as currency exchange rates. UPM's main earnings sensitivities are presented on page 160.	Industry-leading balance sheet. Continuous improvement in competitiveness, resource efficiency and customer offering. Business portfolio development.	UPM's strong balance sheet, focus on competitiveness and responsible operations mitigate risks and may present strategic opportunities (incl. M&A) in an economic downturn.	Performance, Growth, Innovation, Responsibility, Portfolio
OPERATING ENVIRONMENT	Faster than expected decline in demand for graphic paper	Increased pressure on UPM's graphic paper deliveries and sales prices, scarcity of recycled fibre.	Continuous improvement in competitiveness. Focus on more attractive paper end-use segments. Adjust paper production capacity to profitable customer demand. Business portfolio development.	UPM's large paper production platform provides continuous optimisation opportunities. Reliable supplier of high quality products and customer service merits customer loyalty.	Performance, Innovation, Portfolio
OPERATING ENVIRONMENT	Overcapacity in some of UPM's products due to changes in demand or supply	Temporarily impacts sales prices and deliveries of the product in question.	Continuous improvement in competitiveness. Disciplined planning and selection of investments. Business portfolio development.	UPM's diverse business portfolio, focus on competitiveness and strong balance sheet mitigate risks and may present strategic opportunities (incl. M&A) in a cyclical downturn of a business.	Performance, Growth, Portfolio
OPERATING ENVIRONMENT	Significant moves in currency exchange rates relevant for UPM	Impacts UPM's earnings and cash flow directly and competitiveness indirectly. UPM's main currency exposures are presented on page 189.	Continuous hedging of net currency exposure. Hedging the balance sheet. Continuous improvement in competitiveness. Disciplined planning and selection of investments. Business portfolio development.	UPM's diverse business portfolio and geographical presence, focus on competitiveness and strong balance sheet mitigate risks and may present strategic opportunities in changing currency environment.	Performance, Growth, Portfolio
OPERATING ENVIRONMENT	Availability and price of major production inputs like wood, fibre, chemicals and water, potentially due to climate change. Availability and cost of logistics.	Increased cost of raw materials and logistics, potential delivery or production interruptions. UPM's cost structure is presented on page 160–161 and sensitivity to water prices on page 134.	Continuously improving resource efficiency and optimisation of supply chain. New technologies. Long-term supply contracts and relying on alternate suppliers. Selected ownership of forest land and long-term forest management contracts. Disciplined planning and selection of investments.	UPM's continuous improvement in resource efficiency and circular economy mitigate risks and offer competitive advantage.	Performance, Innovation, Responsibility, Portfolio
OPERATING ENVIRONMENT	International trade barriers, e.g. protectionist policies	Impacts trade flows and short-term market balances and may directly or indirectly impact sales prices and deliveries of UPM's products.	Monitoring through international trade associations. Compliance. Continuous improvement in competitiveness. Disciplined planning and selection of investments. Business portfolio development.	UPM's diverse business portfolio, geographical presence and responsible business practices mitigate risks and may present opportunities for optimisation in case of trade barriers in some products and locations.	Performance, Growth, Responsibility, Portfolio
OPERATING ENVIRONMENT	Changes in regulation, subsidies and taxation Transitional policies related to climate change Physical impacts of climate change	May distort markets for energy or wood raw material, for example. May change relative competitiveness of energy forms. May change relative competitiveness of countries. May create additional competition for wood raw material. Direct and indirect impacts of climate change. UPM's sensitivity to carbon pricing is presented on page 134.	Monitoring for early signals for regulation changes. Communicating clearly the impacts of such policies on employment and value creation. Compliance. Continuous improvement in competitiveness, materials and energy efficiency. Leading environmental performance. Innovation and selected investments in value added renewable products and energy. Business portfolio development. Sustainable forest management and UPM biodiversity programme. Disciplined planning and selection of investments. Preparedness to changing harvesting conditions e.g. wood inventories.	May drive market growth for sustainable products and energy, e.g. renewable fuels and chemicals. Resource efficiency, circular economy and renewability are important sources of competitive advantage. In electricity markets, hydropower is an important form of power generation. Increased wood growth in northern hemisphere.	Performance, Growth, Innovation, Responsibility, Portfolio
OPERATIONS AND STRATEGY	Continuous improvement in competitiveness	Weakening relative competitiveness impacts profitability and increases risks related to the external business environment (above).	Commercial strategies. Programmes for savings in variable and fixed costs. Culture and track record of continuous improvement in productivity and resource efficiency. Product and service development.	Increasing relative competitiveness improves profitability and mitigates risks related to the external business environment (above).	Performance, Innovation, Responsibility
OPERATIONS AND STRATEGY	Selection and execution of investment projects	Material cost overruns. Inopportune timing. Return on investment does not meet targets.	Disciplined selection, planning, project management and follow-up processes. Investing in projects with attractive returns and sustainable competitive advantage. Environmental and social impact assessments. Stakeholder engagement.	Carefully selected and implemented growth projects improve UPM's ROCE and grow its earnings. UPM's financial targets are presented on page 16.	Growth, Responsibility, Portfolio
OPERATIONS AND STRATEGY	Delays in OL3 nuclear plant project completion and start-up	Adverse impact on PVO's business and financial position, the fair value of UPM's energy holdings and the cost of energy sourced from OL3 when completed.	Ensuring that contractual obligations are met by both parties.	The investment provides a competitive, safe and CO_2 emission-free electricity supply for the long term.	Growth, Responsibility
OPERATIONS AND STRATEGY	Selection and execution of M&A	Cost of acquisition proves high and/or targets for strategic fit and integration are not met. Return on investment does not meet targets. Damage to reputation.	Disciplined acquisition preparation to ensure the strategic fit, right valuation and effective integration. Environmental and social impact assessments. Stakeholder engagement.	UPM's strong balance sheet and cash flow enable value-enhancing M&A when timing and opportunity are right. Societal value creation.	Growth, Responsibility, Portfolio
OPERATIONS AND STRATEGY	Developing and commercialising innovations and new businesses	Return on investment does not meet targets. Lost opportunity. Risks related to intelelctual property rights.	Disciplined selection, development and commercialisation processes for innovations. Collaboration and partnerships in R&D and commercialisation. Business model development. Careful preparation for market entry.	Existing products and services redesigned to bring more value. New value-added products to replace oil-based materials may be a significant source of value creation and growth for UPM.	Performance, Growth, Innovation, Responsibility
OPERATIONS AND STRATEGY	Compliance risks; competition law, anti-corruption, human rights, securities regulation, taxation	Damage to reputation. Loss of business. Fines and damages. May impact the value of the company.	Governance, compliance procedures, UPM Code of Conduct, UPM Supplier and Third Party Code, audits, whistleblowing channel, trainings.	Good governance mitigates risks and promotes best practices. High responsibility standards and transparency are a differentiating factor and create long term value.	Performance, Growth, Responsibility, Portfolio
OPERATIONS AND STRATEGY	Supply chain and third party reputation risks	Damage to reputation. Loss of business. Loss of competitive position. May impact the value of the company.	UPM Code of Conduct, UPM Supplier and Third Party Code, supplier audits, certification.	Good governance and responsible sourcing practices mitigate risks and provide competitive advantage.	Performance, Growth, Responsibility, Portfolio
OPERATIONS AND STRATEGY	Environmental risks; a leak or spill due to malfunction or human error	Damage to reputation. Sanctions. Direct costs to clean up and repair potential damages to production plant. Loss of production.	Best available techniques (BAT). Maintenance, internal control and reports. Certified environmental management systems (ISO 14001, EMAS).	Industry-leading environmental performance provides competitive advantage, including efficiency gains.	Performance, Growth, Innovation, Responsibility, Portfolio
OPERATIONS AND STRATEGY	Physical damage to people or property	Harm to employees or contractors and damage to reputation. Damage to assets or loss of production.	Loss prevention activities and systems, incl. One Safety tool. Emergency and business continuity procedures.	Leading health and safety performance strengthens the brand as an employer, as well as improving engagement, efficiency and productivity.	Performance, Responsibility
OPERATIONS AND STRATEGY	Ability to recruit and retain diversely skilled employees	Business planning and execution impaired, affecting long-term profitability and value creation.	Competence development. Incentive schemes. Workplace safety. Enabling performance, measuring and developing employee engagement. Value-based leadership and integrity.	Engaged high-performing and diverse people enable the implementation of the Biofore strategy as well as commercial success.	Performance, Growth, Innovation, Responsibility, Portfolio
OPERATIONS AND STRATEGY	Availability and security of information systems, malware	Interruptions in critical information systems cause a major interruption to UPM's business. Damage to reputation. Loss of business.	Technical, physical and process improvements to mitigate availability and security risks.	Sophisticated IT systems enable efficient operations, optimised performance as well as new customer services and data security.	Performance, Innovation, Responsibility

CREATING SHAREHOLDER VALUE

Our Biofore strategy is designed to generate attractive shareholder returns. Over the coming years we can allocate more capital to growing and transforming the company, while distributing an attractive dividend and maintaining a strong balance sheet.

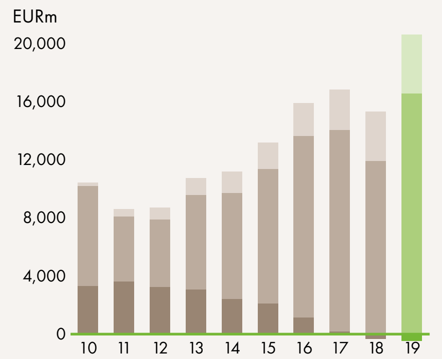
Cash flow-based dividend



— % of operating cash flow per share
*) 2019: Board's proposal

Policy: A dividend of 30–40% of the annual operating cash flow per share

Enterprise value and cumulative dividends



Net debt
Market capitalisation
Cumulative dividend

+40%
Share price 2019

Dividend proposal EUR
1.30
per share

Top performance
We aim for continuous improvement in our financial performance. Top performance enables investing in value-enhancing growth, innovation and responsibility and is a key to the long-term earnings growth. A strong cash flow underpins our ability to provide attractive dividends to our shareholders.

Value-enhancing growth
Consumer megatrends drive demand growth for most of our products. The increasing need for sustainable and safe solutions further supports this growth. We invest in growing our businesses with strong long-term fundamentals for profitability and growth, where we have a clear competitive advantage. This enables attractive returns for invested capital both in the short and longer term. We prioritise earnings growth over sales growth.

Innovating for a future beyond fossils
We innovate to supply consumers with more sustainable solutions. We protect our intellectual property. Innovations create new, attractive business opportunities with high added value and a unique competitive advantage.

Value from responsibility
We aim to capture the opportunities presented by the increase in responsible consumer choices and tightening regulation. Sustainable and safe solutions and responsible operations throughout the value chain help to mitigate risks.

Improving business portfolio
Increasing our share of sustainable growth businesses with a higher profit margin improves our long-term profitability and boosts the value of our shares. UPM's growth businesses have three times higher margins on average than the mature graphic paper business.

Industry-leading balance sheet
Our industry-leading balance sheet mitigates risks and enables us to accelerate the transformation of our company when the opportunity and timing are right.

Attractive dividends
We aim to pay an attractive dividend. Earnings growth enables increasing dividend in the long term. Our dividend policy is based on cash flow, targeting a dividend of 30–40% of the company's annual operating cash flow per share.

5-YEAR SHARE PERFORMANCE AND VALUATION MULTIPLES

	2019	2018	2017	2016	2015
Share price at 31 Dec, EUR	**30.91**	22.15	25.91	23.34	17.23
Comparable EPS, EUR	**2.07**	2.24	1.88	1.65	1.38
Dividend per share, EUR	**1.30*)**	1.30	1.15	0.95	0.75
Operating cash flow per share, EUR	**3.46**	2.49	2.92	3.16	2.22
Effective dividend yield, %	**4.2**	5.9	4.4	4.1	4.4
P/E ratio	**15.5**	7.9	14.2	14.1	10.0
P/BV ratio 1)	**1.64**	1.21	1.60	1.51	1.16
EV/EBITDA ratio 2)	**8.7**	6.3	8.6	8.7	8.4
Market capitalisation, EUR million	**16,485**	11,813	13,818	12,452	9,192

*) 2019: Board's proposal
1) P/BV ratio = Share price at 31 Dec./Equity per share
2) EV/EBITDA ratio = (Market capitalisation + Net debt)/EBITDA

INDUSTRY LEADER IN RESPONSIBILITY

Our consistent efforts on responsibility have received recognition from several third parties and have made us one of the industry leaders in various fields.

UN Global Compact LEAD: UPM has been recognised as a Global Compact LEAD company for demonstrating world-class commitment to corporate responsibility. We are one of 36 global companies, and the only forest-industry company and the only Finnish company, participating in the UN Global Compact LEAD.

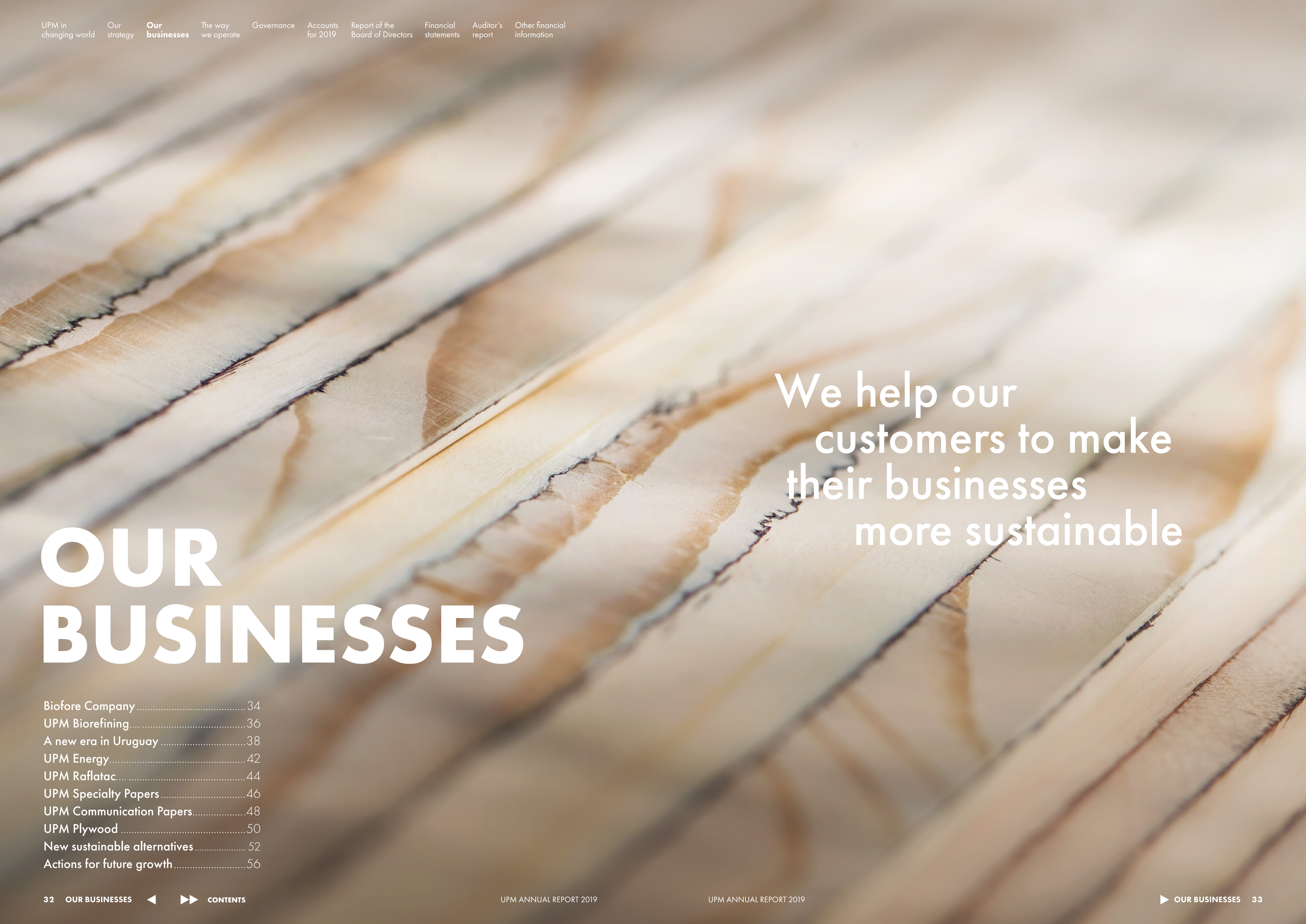
Dow Jones Sustainability Index: UPM has been listed as the industry leader in the forest and paper sector in the Dow Jones Sustainability World and Europe Indices (DJSI) for 2019–2020.

MSCI ESG ratings: UPM received a rating of AAA in the MSCI ESG Ratings assessment. MSCI ESG Research provides MSCI ESG ratings on global public companies, according to each company's exposure to industry-specific ESG risks and its ability to manage those risks relative to its peers.

CDP Programs: UPM was one of the only six Triple A List companies globally for its significant actions to mitigate climate risk, prevent deforestation and enhance water stewardship. UPM was featured on the A List for Climate, Forests and Water.

RobecoSAM's Sustainability Yearbook: UPM has been listed in the RobecoSAM's 2019 and 2020 Sustainability Yearbook with a Gold Class distinction. We are one of the top-scoring companies in our industry and received this recognition for our excellent sustainability performance.

Corporate Knights: UPM was ranked 23th in the Corporate Knights list of the world's 100 most sustainable corporations, and was the only company listed in the Paper and Forest Products category.



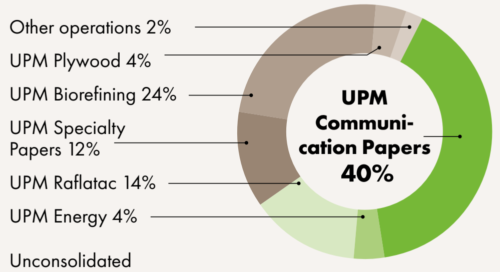
OUR BUSINESSES

We help our customers to make their businesses more sustainable

BIOFORE COMPANY

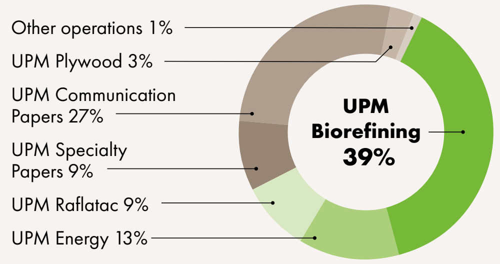
We lead the forest-based bioindustry into a sustainable, innovation-driven and exciting future beyond fossils. We deliver renewable and responsible solutions to the growing global consumer demand across six business areas. The competence, integrity and drive of our people make us unique.

Sales 2019
EUR 10,238 million

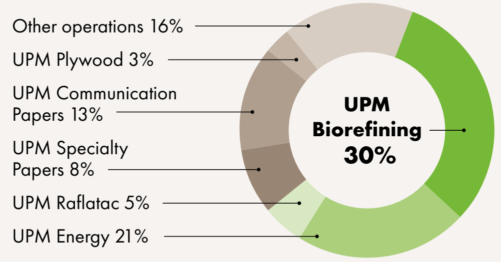


Unconsolidated

Comparable EBIT 2019
EUR 1,404 million



Capital employed 31 Dec 2019
EUR 11,474 million



UPM BIOREFINING

UPM Biorefining consists of pulp, timber and biofuels businesses. UPM Pulp offers a versatile range of responsibly-produced pulp grades suitable for a wide range of end uses such as tissue, speciality papers, graphic papers and board. UPM Timber offers certified sawn timber for construction, joinery and furniture. UPM Biofuels produces wood-based renewable diesel for all diesel engines and renewable naphtha that can be used as a biocomponent for gasoline or for replacing fossil raw materials in the petrochemical industry.

UPM ENERGY

UPM Energy creates value through cost-competitive, zero-carbon electricity generation and through physical and financial electricity trading, as well as energy optimisation services for industrial electricity consumers.

UPM RAFLATAC

UPM Raflatac offers innovative and sustainable labelling materials for branding and promotion, information and functional labelling in the food, beverage, personal care, pharmaceutical and retail segments, for example.

UPM SPECIALTY PAPERS

UPM Specialty Papers offers labelling materials and release liner base papers, flexible packaging papers as well as office and graphic papers for labelling, commercial siliconising, packaging, office use and printing.

UPM COMMUNICATION PAPERS

UPM Communication Papers offers an extensive product range of graphic papers for advertising and publishing as well as home and office uses.

UPM PLYWOOD

UPM Plywood offers high quality WISA® plywood and veneer products for construction, vehicle flooring, LNG shipbuilding, parquet manufacturing and other industrial applications.

OTHER OPERATIONS

UPM Forest secures competitive wood and biomass for UPM businesses and manages UPM-owned and privately-owned forests in North Europe. In addition, UPM offers forestry services to forest owners and forest investors. UPM Biochemicals, UPM Biomedicals and UPM Biocomposites business units are also included in Other operations.

WORLD CLASS COMPETITIVENESS

UPM combines the integrated production of pulp, timber and biofuels with a synergistic supply chain of wood raw materials.

Pulp is a versatile material meeting global demand for responsible and renewable products. Pulp mills generate renewable energy in their recovery boilers as well as useful side streams and residues used for biofuels, biochemicals and bioplastics. Crude tall oil, a residue of pulp production, is the raw material used for renewable UPM BioVerno diesel and naphtha.

UPM sells most of its sawn timber to industrial customers in the furniture, construction and packaging sectors. Wood chips, sawdust and other by-products are used for pulp, paper and energy production. (Read more below.)

The world class pulp mill investment

In July 2019, UPM decided to invest in the new world class pulp mill in Uruguay. The USD 2.7 billion investment in a 2.1 million tonnes eucalyptus pulp mill will raise our pulp production capacity by more than 50%. The mill is scheduled to start up in the second half of 2022.

During the past decade UPM has developed additional plantation areas in Uruguay. With a combination of competitive wood supply, scale, best available techniques and efficient logistics the mill is expected to reach a highly competitive cash cost level, approximately USD 280 per delivered tonne of pulp.

The business fundamentals for the investment are positive given the healthy long-term demand outlook of pulp, especially in Asia. The annual trend growth of global market pulp demand is estimated to be about 3%. (Read more on pages 38–39).

Focus on productivity

Productivity improvement was one of the main targets of UPM Biorefining in 2019. The organisational set-up was renewed to strengthen the strategic focus on the pulp and biofuels businesses, and further build long term competitiveness.

Our pulp mills made new production records and timber production continued to run at full capacity. Efficiency of all mills was improved. There has been specific focus on equipment lifecycle analysis and reliability centered maintenance (RCM) methodology. Digitalisation, data analytics and visualisation tools were developed to increase productivity.

As an integral part of the value chain, efforts to enhance wood supply continued in 2019. In Finland UPM sources wood from private landowners, company-owned forests and import markets. In Uruguay wood is sourced from sustainably managed local eucalyptus plantations that are owned by UPM and third-party landowners as part of the Fomento Programme.

Continuously improving environmental performance

We continued to improve the environmental performance in our pulp operations. Throughout the year only two deviations from our performance target levels took place – in comparison to eight in the previous year (read more about Clean run on page 93).

In Finland several measures were implemented at our three pulp mills to improve environmental performance.

In Uruguay, several improvements were carried out in effluent treatment units of the UPM Fray Bentos mill. Also modifications in the medium voltage network were implemented in order to improve reliability and response against contingencies in power supply.

In 2019, Uruguay River Executive Commission's (CARU) scientific committee made its 100th joint inspection with Uruguayan authorities at the mill. The inspections have been taking place every month for more than eight years. The results published by CARU are in line with those published by UPM and the Uruguayan authorities. The UPM Fray Bentos mill continues to be among the best in environmental performance.

UPM Timber together with Finnish sawmillers published an Environmental Product Declaration that makes it possible for customers, such as builders, to differentiate and calculate the environmental impacts of different building materials. UPM Timber achieved the zero solid waste to landfill target for the third consecutive year.

CASE

A BUILDING MATERIAL THAT STORES CARBON

Timber is the only building material to have a positive effect on the environment. The trees that UPM use for timber take 60 to 80 years to reach maturity. During all that time, they store carbon dioxide from the atmosphere. This continues far beyond timber processing – a wooden house binds up to 50 tonnes of CO_2 through its lifetime.

Yet timber's potential goes far beyond domestic homes – an office building with 16,000 m^2 of timber framing stores over 3,600 metric tonnes of CO_2. That is the equivalent of taking nearly 1,000 petrol cars off the road. Studies have even shown that constructing a high-rise building from wood may reduce the structure's carbon footprint by up to 75%.

Benefits reach those inside timber buildings, too. As a 'living' material, wood buffers against major fluctuations in humidity, to the point where mechanical ventilation can be redundant. Timber as a building material means creating a safe and healthy environment to thrive.

Nothing is left to waste in the production: chips and sawdust are used as raw materials for pulp while other by-products are burned to create energy. Sustainable forest management practices have helped forest growth double in Finland in the past 50 years.

"Responsibly produced pulp is one of the most sustainable materials – and it is everywhere.

OUR DIRECTION

- In Pulp: Provide the most versatile pulp range and advanced technical service. Maintain cost competitiveness through continuous operational improvement. Grow as a trusted and responsible pulp supplier.
- In Timber: Enhance profitability through efficient use of wood supply, integrated full production and focused commercial strategy. Streamlined business model to secure position in chosen key markets and end-use segments.

OUR STRENGTHS

- Versatile range of sustainably produced pulp grades for a wide range of end uses
- Modern and efficient mills in a business committed to growth
- Responsibility integrated into all operations from wood sourcing to logistics
- Competitive sawmills with a dedicated global sales and logistics network

KEY FIGURES	2019	2018
Sales, EURm	2,712	2,892
Comparable EBIT, EURm	544	847
Capital employed (average), EURm	3,469	3,180
Comparable ROCE, %	15.7	26.6
Personnel on 31 Dec.	2,739	2,636

Comparable EBIT decreased due to lower pulp sales prices. Delivery volumes were higher. Global chemical pulp demand continued to grow. Demand for advanced renewable diesel and naphtha remained strong. Demand growth for sawn timber continued albeit at lower levels.

A NEW ERA IN URUGUAY

UPM is embarking on a truly transformative investment by building a new pulp mill in Uruguay.

- In July UPM announced that it will invest USD 2.7 billion in a eucalyptus pulp mill near Paso de los Toros in central Uruguay
- The production capacity will be 2.1 million tonnes of eucalyptus pulp
- The new pulp mill is scheduled to start up in the second half of 2022
- UPM will also invest approximately USD 280 million in port operations in Montevideo and USD 70 million in local investments outside the mill fence, including a new residential area in the town
- When in operation, the mill will generate more than 110 MW of surplus renewable electricity

Significant step for UPM Pulp and UPM's future earnings
The mill is expected to be one of the most competitive pulp mills in the world, in terms of both costs, and the safety and environmental performance of its value chain. Competitive and sustainable wood supply, scale, best available techniques at the mill and efficient logistics are the key enablers for a successful pulp mill project.

For UPM, the investment represents a step change in future earnings. The low-cost position of the mill provides for attractive returns on investment in various market scenarios. The project has been carefully prepared to ensure long-term competitiveness and to minimise risks both in the project phase and during continuous operations.

The investment represents a step change in the scale of UPM's pulp business. UPM's pulp production capacity will increase by more than 50%. The growth will take place in the attractive and fast-growing eucalyptus pulp segment. UPM Pulp will become one of the most competitive suppliers of premium pulp in the world.

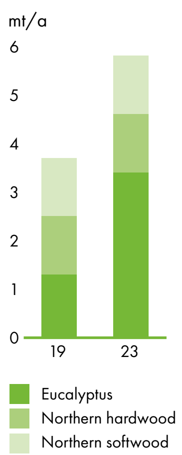
State-of-the-art mill design
The pulp mill has been designed as an efficient single-line operation. The machines, materials, automation levels and standards enable a high operating rate and maintainability as well as high energy output, ensuring excellent safety, leading environmental performance and low operating costs during the long lifecycle of the mill.

The mill is designed to fully meet strict Uruguayan environmental regulations as well as international standards and recommendations for modern mills, including the use of the latest, proven best available techniques (BAT). The mill's environmental performance will be verified with comprehensive and transparent monitoring. Furthermore, the safety and sustainability performance of the value chain from plantations to customer delivery is expected to be on an industry-leading level.

Competitive wood supply and efficient logistics
The eucalyptus availability for the mill is secured through plantations owned or leased by UPM as well as through wood-sourcing agreements with private partners. The plantations that UPM owns or leases in Uruguay cover 400,000 hectares. They will supply the UPM Fray Bentos mill and the new mill.

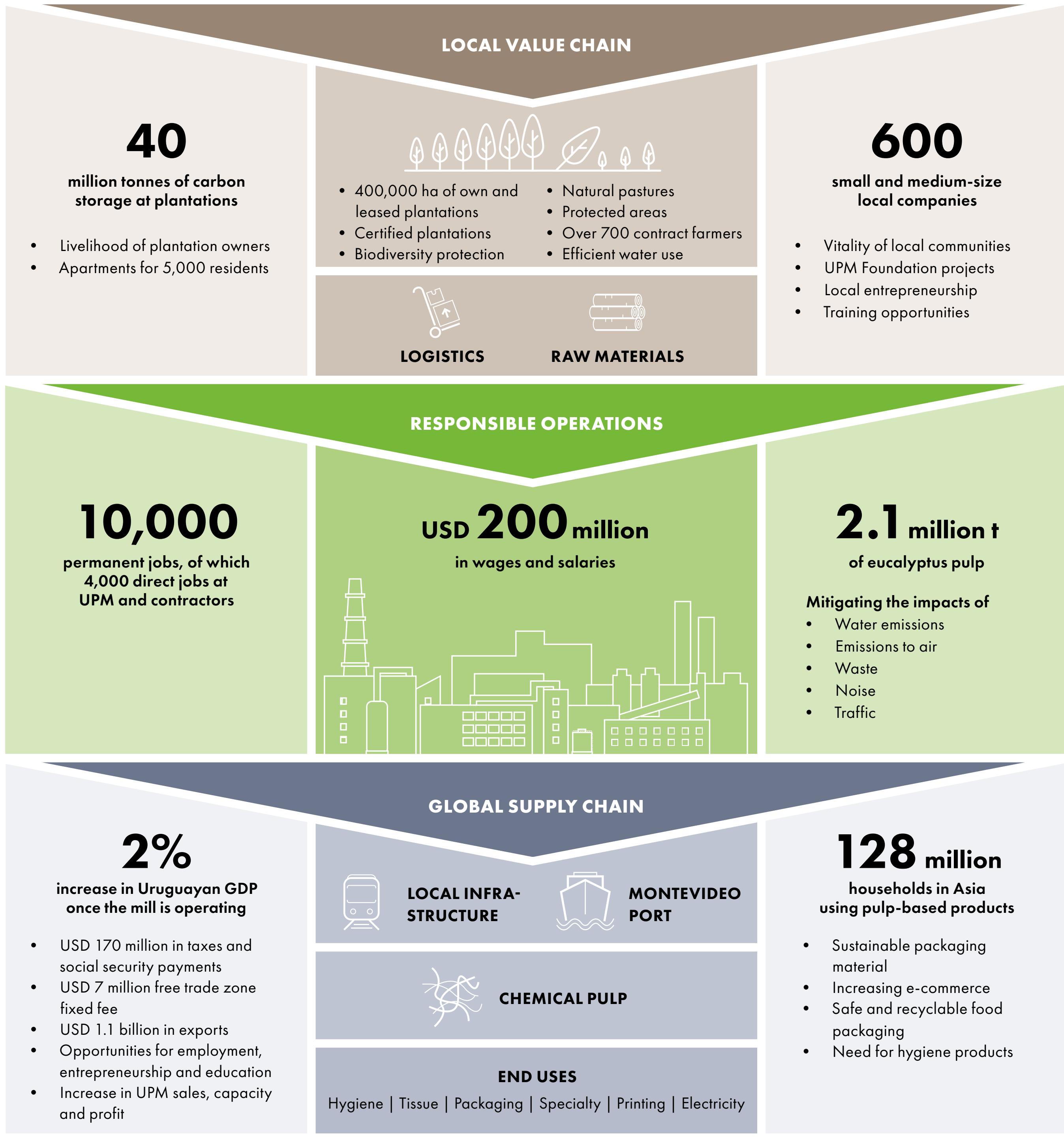
An efficient logistics chain will be secured by the agreed road improvements, extensive railway modernisation and port terminal construction. The Public-Private Partnership agreement between the government and the construction company for the construction of the central railway was signed in May 2019, and the financing of the construction consortium was finalised in October.

UPM's pulp capacity



UPM will build a deep-sea pulp terminal in Montevideo port. Direct rail access from the mill to a new deep-sea port terminal creates an efficient supply chain to world markets. The Montevideo deep-sea port also enables synergies in ocean logistics with UPM's existing Uruguayan operations.

IMPACTS OF THE NEW PULP MILL



Pulp for sustainable products for consumers around the world
Demand for pulp continues to grow driven by increased urbanisation and the growing purchasing power of the middle class, especially in developing economies. The growth will be strongest especially in China and the rest of the Asia-Pacific region. Pulp will be used for tissue papers, hygiene products, packaging board, labels and other specialty papers as well as printing and writing paper. Products made from pulp can be used to replace products made from non-renewable materials like plastics.

Spearheads for growth on page 20

DRIVING CLEANER TRAFFIC

UPM is producing renewable diesel and naphtha from wood-based residue at the UPM Lappeenranta Biorefinery, Finland. The biorefinery's processes transform crude tall oil, a residue of pulp making, into renewable diesel for road transport. UPM BioVerno drop-in diesel is a competitive and sustainable alternative to fossil fuels or first-generation biofuels. The process also generates renewable UPM BioVerno naphtha, which can be used either as a low-emission biocomponent for gasoline or as feedstock for replacing fossil raw materials in plastics and other chemical industry solutions.

By collaborating with other sustainability frontrunners, UPM has launched innovations such as a 100% wood-based, fully recyclable milk carton created in collaboration with Dow and Elopak. Another outcome of partnering is UPM Raflatac Forest Film™, a 100% wood-based label material made from UPM BioVerno naphtha.

In addition to renewable diesel and naphtha, the biorefinery produces wood-based chemicals. For example, UPM's turpentine can be used in the production of bio-based aroma chemicals for the fragrance industry. Another residue from the biorefinery, wood-based pitch, can be used to produce inks, bitumen for roads and roofs, or used as bioliquid.

UPM BioVerno renewable diesel produces over 80% lower greenhouse gas emissions during its lifecycle, compared with fossil diesel, and significantly reduces tailpipe emissions. Future demand for high quality, advanced biofuels is predicted to be strong, driven by climate change mitigation targets and stricter environmental standards. In 2019, for example, the Finnish Parliament approved a law to gradually increase the use of biofuels to 30% and advanced biofuels to 10% by 2030. This is a world-leading target for advanced biofuels. Other EU member states are setting similar targets.

Future plans for decarbonisation

In 2019, UPM continued to evaluate future opportunities to scale up the biofuels business with new types of technology and raw materials. UPM is planning a second biorefinery in Kotka, Finland, with a 500,000-tonne annual production of advanced biofuels for use in road transport, aviation and petrochemicals.

The potential new biorefinery would utilise several feedstocks, such as solid wood residues and residual oils. UPM Biofuels has also been developing a new climate positive farming concept by growing Brassica carinata as a secondary crop in Uruguay with local farmers. The annual cultivation area has reached 10,000 hectares, demonstrating that the system works on a commercial scale.

The carinata crop produces non-edible oil, a feedstock for biofuel and protein for animal feed. Brassica carinata not only reduces greenhouse gas emissions when converted into fuel, but also absorbs a large quantity of carbon dioxide and stores it in soil, when cultivated on existing farmland during underutilised periods of winter.

Unique sustainability certifications

UPM's biofuel production is certified for meeting the RSB (Roundtable on Sustaibale Biomaterials) and ISCC (International Sustainability and Carbon Certification) international sustainability standards. We have also taken a step further with our RSB low indirect land use change (ILUC) risk certification, to show that our products have minimal risk of causing indirect emissions. All our products satisfy the sustainability and traceability criteria of the EU Renewable Energy Directive, as well as the EU's chemicals legislation based on a regulation concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).

› UPM Raflatac Forest Film on page 44
› Developing a fully renewable beverage carton on page 23
› Biofuels development on page 52
› upmbiofuels.com

CASE

ON THE ROAD TO CLIMATE-POSITIVE FUELS

Transportation accounts for 25% of greenhouse gas emissions in Europe. In order to decarbonise the industry, it is important to increase energy efficiency, advance public transport and electric vehicles and replace fossils with renewables. One way to do this is by producing advanced biofuels from sustainable feedstocks. In the UPM – Climate Positive Fuels® concept we are not only replacing fossil fuels with renewables but also removing CO_2 from the atmosphere by storing carbon in soil.

Soil and plants bind atmospheric CO_2. Biosequestration of carbon has the additional benefit of increasing soil fertility, productivity and nutrient retention. Even a small increase in soil carbon stocks can have a huge impact on compensating for the increase of human-caused CO_2 emissions.

In Uruguay, UPM is developing a climate-positive farming system using Brassica carinata oilseed plant for the sustainable production of biofuels. Carinata sequesters carbon to the soil through its large root structure and aboveground biomass. The fuel derived from Carinata seed oil is considered climate positive.

UPM Biofuels received the RSB certificate for the cultivation of Carinata in 2019. It was also recognised with the world's first RSB low ILUC (Indirect Land Use Change) risk certification for Carinata oil, which shows that using UPM's Carinata oil from Uruguay has a low risk of generating indirect emissions elsewhere. UPM's efforts to create a sustainable chain from farm to biorefinery is a big step towards decarbonising the transport industry.

OUR DIRECTION

- Unique, sustainable, advanced biofuels and biomaterials in various markets and segments
- Opportunities for scaling up the biofuel business

OUR STRENGTHS

- Established producer of low-emission renewable diesel and naphtha
- Sustainable bio-based alternative to fossil feedstock in the petrochemical industry
- Certified with international sustainability standards ISCC and RSB

"Wood-based plastic coating for liquid cartons reduces the fossil materials used and the carbon footprint.

UPM Energy

MARKET-AGILE ENERGY

Decarbonisation, growth of renewables and electrification are driving the change in electricity markets.

The energy industry has a central role in making societies carbon neutral.

UPM Energy is well positioned to support the system in climate change mitigation. Our CO_2-emission-free hydro and nuclear generation in Finland account for 97% of the electricity we generate. Hydropower is valuable in securing balance for an increasingly volatile market, whereas nuclear power can provide a reliable base load for the system. The electricity produced is sold to Nord Pool, the Nordic power market. In addition to physical trading, UPM Energy also operates in the financial energy markets.

We also provide industrial electricity consumption and flexibility services to industrial consumers and other energy companies. Our deep understanding of industrial consumption, as well as efficient, low-emission electricity generation, give us a unique position in the marketplace.

Growth in CO_2-emission-free generation

UPM Energy is investing in power generation that is free from CO_2 emissions. The main, ongoing project is underway at Teollisuuden Voima (TVO), where its Olkiluoto 3 EPR-type nuclear power unit is scheduled to commence regular electricity production in March 2021. UPM's share of the new unit's capacity is approximately 500 MW through its holding in Pohjolan Voima.

In January, UPM Energy announced that it will increase the production capacity of its Kuusankoski hydropower plant through an extensive renovation and modernisation project from 2019–2022. The plant's average annual electricity production is estimated to increase from the current 180 GWh to 195 GWh. In addition to improved efficiency, modern hydropower technologies are also better for the environment.

Market-based solutions are driving changes in the energy market. The Nordic electricity market is increasingly tied with continental Europe. A strong CO_2 emission trading scheme should be the main tool for decarbonisation. This presents an attractive position for UPM Energy in the transforming energy markets.

Improving diversity of water systems

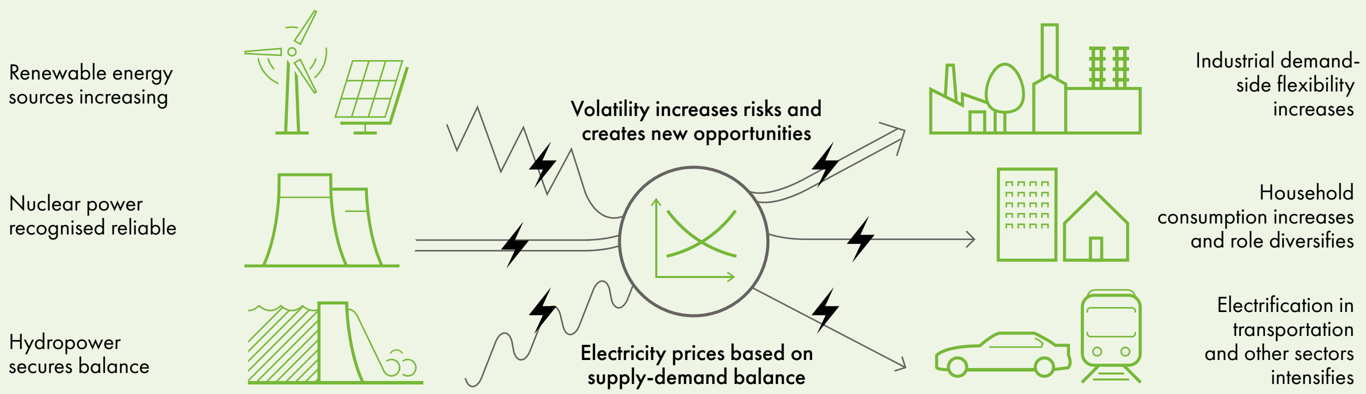
Hydropower plants can also have an adverse impact on aquatic ecosystems. These adverse effects are caused by the regulation of watercourses, the clearing of rivers and the building of dams. The impact is mainly alleviated by means of compensation in line with permit conditions, with the funds being used by authorities to transplant fish and promote research into restoring migratory fish stocks.

UPM supports the restoration of migrating fish stocks. Our migratory fish programme aims to dismantle migration barriers and test new ways to restore fish stocks all around Finland. The programme is based on collaboration with stakeholders. For example, the project funded construction of a breeding and growth area for the endangered Saimaa land-locked salmon in Kuurna of river Pielisjoki in Finland. The construction was completed in 2019.

CASE

THE NEW REALITY OF ELECTRICITY

The electricity markets are undergoing a transformation. As the share of intermittent renewable energy sources grows in the energy system, the volatility in the market also increases. This in turn requires increased balancing capabilities to ensure stability in the system.



OUR DIRECTION

- Profitable growth in zero-carbon electricity generation
- Solutions for industrial energy excellence
- Embracing the electrification of society

OUR STRENGTHS

- Competitive, zero-carbon electricity generation asset portfolio
- Strong track record in physical and financial electricity markets
- World-class expertise in the optimisation of industrial power consumption

KEY FIGURES	2019	2018
Sales, EURm	417	391
Comparable EBIT, EURm	185	123
Capital employed (average), EURm	2,454	2,346
Comparable ROCE, %	7.5	5.3
Personnel on 31 Dec.	68	63

Comparable EBIT increased due to higher electricity sales prices and lower costs for nuclear. The hydro situation improved in Finland.

> "We aim at expanding our zero-emission power generation.

LEADING IN SUSTAINABLE LABELLING

UPM Raflatac's strategic cornerstones for growth are improved customer reach, a wider product portfolio and winning operations. Sustainability with a 360° lifecycle approach is integrated into our strategy.

We are one of the leading suppliers of self-adhesive label materials operating in 40 countries and serving customers in over 120 countries. Our high-quality film and paper label materials for consumer product and industrial labelling are designed to combine economy, sustainability and optimised performance.

In 2019, we continued to improve our customer reach through commercial excellence development including the launch of our online customer portal MyRAFLATAC. We also opened a new service terminal in Chelyabinsk, Russia. We started a three-year productivity programme at our factories.

More sustainable and innovative choices

In 2019, we continued to respond to the growing need of more sustainable packaging solutions. This means utilising raw materials that are of sustainable origin or recycled and offering products that are resource-optimised. The solutions also enable packaging recyclability and reducing waste throughout the packaging lifecycle. UPM Raflatac Forest Film™ is the industry's first wood-based film material innovated in collaboration with UPM Biofuels using UPM BioVerno naphtha, a residue of pulp production. This innovative material answers brand owners' needs to replace fossil-based virgin materials with renewable ones — one tonne of fossil raw material can now be replaced with one tonne of renewable raw material (read more below). Another example of the collaboration is the UPM Raflatac Fossil-Free Adhesive made from the same renewable material.

UPM Raflatac RAFNXT+ range was the world's first label material verified by the Carbon Trust. Compared to UPM Raflatac's standard range, this paper label material helps companies to reduce their carbon footprint and mitigate climate change.

Our new wash-off labelling solutions responded to the growing demand to increase the reuse of glass and plastic bottles. We introduced new label materials with recycled content to contribute to a circular economy. We also expanded our product offering to support pharmaceutical companies in ensuring patient safety through secure and tamper-evident packaging.

Value from responsible operations

UPM's Biofore Site™ programme aims to enhance the culture of responsibility in our factories and terminals. It provides a platform for continuous improvement towards meeting UPM's 2030 responsibility targets. Reducing CO_2 emissions and water consumption and aiming for zero solid waste to landfill are common targets for all our production sites. We increased the use of renewable electricity at the UPM Mills River factory in the US. The factory is now our fourth factory powered by 100% renewable energy, which is a major step towards meeting our target. Five of our factories are now certified in accordance with ISO 22000 food safety standard.

In 2019, we responded to the market demand by launching a range of FSC™-certified paper face stocks for the Americas market. This supports our aim to supply products that are sustainable over their lifecycle.

We continued to expand our RafCycle® by UPM Raflatac service for turning waste into a resource. RafCycle now has 150 partners globally in 16 countries.

Towards a truly circular economy

UPM Raflatac is leading in sustainable labelling by partnering with key influencers in the forest and packaging value chain. We have signed the New Plastics Economy Global Commitment and CE 100 initiative led by the Ellen MacArthur Foundation. Our target is to promote a circular economy and to reduce unnecessary plastic packaging by innovating future-proof circular materials. The first Global Commitment progress report, which UPM Raflatac is part of as the only label material supplier, was published in October.

CASE

FINNISH WATER SOLD WITH PURITY

Founded in 2017, the Finnish company Vellamo sells premium natural mineral water in North America and Finland. The water bottles look like blocks of ice, reflecting the blue colour of a glacier. The high-quality, sustainable label is an integral part of the Vellamo water brand. The company recently started using the new UPM Raflatac Forest Film™ – a transparent labelling material originating from sustainably managed forests.

"The labels must be sustainable and meet all legal requirements. We also strive to recycle materials efficiently and manufacture the product itself rationally. Our goal is to achieve a carbon-neutrality for our materials, production and logistics. We are committed to avoid selling to areas without a recycling system," says Petteri Ahonen, CEO of Vellamo.

Demand for renewable packaging materials for consumer products is increasing rapidly. Forest Film is the first wood-based polypropylene labelling material on the market and has the same properties as traditional plastic labels. The raw material used for the label material is renewable UPM BioVerno naphtha produced at UPM's Lappeenranta Biorefinery. Renewable naphtha is a fossil-free raw material made from crude tall oil, a residue from pulp production.

Vellamo's company values and goals are similar to UPM Raflatac's. "Nature and its values are strongly represented in the Vellamo water bottle. Our use of completely recyclable packaging materials is a good example of combining smart solutions with great storytelling and design," Ahonen continues.

OUR DIRECTION

- Profitable organic growth, potentially complemented by acquisitions
- Expanding customer reach through commercial excellence
- Widening product portfolio, especially in high value-added and sustainable products and solutions
- Innovating in productivity

OUR STRENGTHS

- End-use-focused product offering
- Sustainability and product safety leadership
- Global delivery network and efficient supply chain
- Global scale in R&D and technical expertise
- Modern, strategically located production assets

KEY FIGURES	2019	2018
Sales, EURm	1,555	1,488
Comparable EBIT, EURm	126	126
Capital employed (average), EURm	579	535
Comparable ROCE, %	21.8	23.6
Personnel on 31 Dec.	3,181	3,244

Comparable EBIT remained unchanged. Higher sales prices and delivery volumes offset the negative impact of higher costs and unfavourable changes in currencies. Global demand growth for self-adhesive label materials continued, albeit at a slower pace.

"UPM Raflatac Forest Film is a transparent labelling material originating from sustainably managed forests.

UPM Specialty Papers

CREATING SUSTAINABLE ALTERNATIVES

UPM Specialty Papers offers high-quality papers for labelling, commercial siliconising, packaging, office use and printing. Growing Asia Pacific markets account for over 50% of UPM Specialty Papers sales.

Our strategy is to grow through innovative value-adding solutions. UPM's consistently high-quality papers enable high performance and efficiency in the value chain, while minimising environmental impact.

As the search for solutions for a circular economy grows, UPM's unique concept for release liner recycling allows value chain members to reach their sustainability targets and close the loop. Collected release liners are desiliconised and used to produce new release liner base papers.

Our fibre-based release liner base papers offer alternatives to non-renewable materials. In 2019, we expanded our product portfolio for tape and industrial applications and successfully launched a new logistics label product in APAC, which opens a new segment for us.

In flexible packaging papers, we are growing in select packaging end-uses. Our renewable and recyclable solutions address demand for sustainable packaging, replacing fossil-based materials. We are developing our barrier grades for new and more demanding applications, such as food packaging. In late 2019, we also introduced a portfolio of kraft papers.

In fine papers, we build our presence in Asia by leveraging our strong track record in sustainability. We have also broadened our offering through new innovations. We introduced a new office paper brand with the market's first wrap without a plastic-coating. In China, we continued to strengthen our own brands and to grow our presence in a major e-commerce platform.

Investments in long-term value creation

UPM rebuilt paper machine 2 at UPM Nordland in Germany from fine paper to specialty paper production. The ramp-up of the converted paper machine started in Q4.The planned capacity after the rebuild is 110,000 tonnes. The investment will improve the availability of our most recent innovations including UPM's unique concept for release liner recycling.

At UPM Changshu mill in China we expanded our release liner base paper capacity with an additional 40,000 tonnes. This additional capacity makes us well-positioned to support our customers' growth ambitions.

Sustainability as a competitive advantage

We help our customers make sustainability a competitive advantage through our products which are recognised for fulfilling high responsibility criteria.

In 2019, we were recognised with the FSC® Asia-Pacific Leadership Award for our work to promote FSC® forest certification in the region.

During the year, UPM Changshu mill achieved ISO 50001 Energy Management System certification, which is a voluntary standard to help us manage our energy efficiency. It was also the first year that we operated under China's ultra-low emission standard. UPM Changshu mill is used as a benchmark in environmental issues for other local companies. In late 2019, UPM Changshu mill was licensed to produce papers for food contact.

In UPM Tervasaari and UPM Jämsänkoski mills in Finland our focus continues in sustainable labelling and packaging solutions which are renewable and recyclable. In 2019, we joined 4evergreen which is a new initiative by CEPI, the Confederation of European Paper Industries. The initiative aims to boost the contribution of fibre-based packaging in a circular and sustainable economy. We also chair one of the working streams.

CASE

CHINA LEADS THE E-TAIL REVOLUTION

China's online shopping market, which is the world's largest and most innovative, offers a glimpse into the future of e-commerce globally. Internet shopping has transformed daily life in China. People shop whenever they want, wherever they are, and have it express-delivered at minimum cost. In 2019, over 63 billion packages were delivered across China by express delivery.

Lan Qing lives in Chongqing, a major city in Southwest China. She admits that online shopping is a major part of her life. She uses e-commerce platforms for buying food, clothes, daily necessities, travel packages, hotels, all kinds of tickets – in fact, for purchasing almost everything she needs.

"I don't really go out shopping anymore these days," she says with a laugh.

The e-commerce boom in China will create demand for label and packaging materials. Labels are needed to ensure efficiency in the logistics chain. To capture this opportunity, UPM Specialty Papers has developed a tailor-made release liner base paper specifically for this end-use.

The Chinese government recently issued new standards promoting the use of sustainable packaging materials, and consumers are showing a preference for sustainably packaged products. We believe that our sustainability credentials can create more value for our customers in this sizeable and growing market.

OUR DIRECTION

- Global leader in labelling materials
- The preferred partner for fine paper in Asia-Pacific
- Growth in select flexible packaging end-uses

OUR STRENGTHS

- Sustainable alternatives to non-renewable materials
- Value adding products and services
- Ease of doing business
- Trusted growth partner

KEY FIGURES	2019	2018
Sales, EURm	1,412	1,429
Comparable EBIT, EURm	120	90
Capital employed (average), EURm	904	889
Comparable ROCE, %	13.3	10.1
Personnel on 31 Dec.	1,992	2,000

Comparable EBIT increased due to lower input costs more than offsetting the negative impact of lower fine paper sales prices and unfavourable changes in currencies. Fixed costs decreased. Demand growth for label, release and packaging papers was healthy in 2019. After a slow start in the Asia-Pacific region, demand for fine paper was good.

"Our papers offer renewable and recyclable alternatives to non-renewable materials.

UPM Communication Papers

EFFICIENT AND COMMITTED

Our strategic focus is on safeguarding long-term competitiveness while evolving our business through targeted innovation, uncompromising performance and a strong commitment to reliability and quality.

The development of the demand for graphic papers has been weak, especially in Europe, due to slower economic growth in 2019. To ensure our long-term success, we continued to implement measures to adapt capacity to the profitable customer demand. We closed PM10 at UPM Plattling, Germany, in July and PM2 at UPM Rauma in November. We also announced plans to sell or close UPM Chapelle Darblay newsprint mill in France. UPM rebuilt PM2 at UPM Nordland in Germany from fine paper to specialty paper production. The ramp-up of the converted paper machine started in Q4.

Our work in fixed and variable cost management also continued. Through an optimal use of digital solutions, we improved efficiency throughout our operations.

Reducing the environmental footprint of our operations is a strategic cornerstone for making our business future-proof. We place strong emphasis on reducing CO_2 emissions, both for purchased and self-generated energy. In 2019, we made energy investment at Nordland and Hürth paper mills in Germany and entered into a wind power purchase agreement In Finland. (Read more below).

Committed to paper

We are committed to the graphic paper industry and are convinced that graphic papers will remain a reliable and trusted communication channel, even over the long-term. Print adds value to the wider media mix in terms of engagement and contact time with the content and communicates a sense of trustworthiness and quality. In our rapidly changing world, reading and literacy are fundamental to human development and a prerequisite for a full participation in today's fast-paced and culturally diverse society.

We stay on top of publishing trends and offer innovative solutions to ensure that our customers' needs can be met quickly and effectively.

Recycling intensified

We take a holistic approach to sustainability, focusing on raw material sourcing, production, our role in society and the value we generate for our stakeholders and customers.

We provide our customers with EU Ecolabel-certified products from all our European mills and offer the most comprehensive range of papers carrying the EU Ecolabel mark in the industry. Our mills also have PEFC™ and FSC® Chain of Custody certification to promote sustainable forestry.

Recycled fibre accounts for nearly one third of all fibre used in UPM's paper production, and we are the world's largest user of recovered paper in graphic paper production. In 2019, we continued our development work with UPM Raflatac and UPM's R&D to improve the recyclability of paper labels.

UPM aims to become a zero solid waste company by 2030. Together with on-site partner SMI, we have developed a new process for producing precipitated calcium carbonate from residue ash at UPM Schongau mill. This offers us a new way to use residue ash and save energy and is an example of our corporate culture of setting ambitious goals to build a sustainable future.

CASE

INVESTING TO REDUCE CO_2 EMISSIONS

UPM invests in Germany to reduce costs and emissions while increasing flexibility to participate in electricity markets. In Dörpen, we plan to build a natural gas-based combined heat and power (CHP) plant at the Nordland paper mill. This investment will reduce our annual CO_2 emissions by 5%. The plant, which is set to be connected to the grid in Q3 2022, supports Germany's move away from coal power and aligns with the government's goal of generating 65% of its electricity from renewable sources by 2030.

In Hürth, we partner with E.ON, one of Europe's largest energy companies, to build a biomass fired boiler providing steam for our paper mill. The plant is expected to go online in Q1 2022 and will also feed renewable energy into the grid. The investment makes our production process, which is already based on 100% recovered paper, even more sustainable.

These new plants will provide a stable and economically predictable supply of power and heat, increasing the competitiveness of our mills. By providing flexible generation capacity, the CHP plant at UPM Nordland will increase the overall stability of the grid and the integration of growing renewable power generation.

The wind power purchase agreement with German wind park development company wpd will help reduce UPM's CO_2 emissions by 5%.

The projects support UPM's target to reduce CO_2 emissions by 65% by 2030. They are also in line with energy policies in Germany, or Energiewende. As part of the transition to low-carbon and sustainable energy sources, coal- and nuclear-powered plants will be phased out.

OUR DIRECTION

- Maintain a profitable market position while actively managing capacity in line with market developments
- Increase operational efficiency and quality of our portfolio
- Drive digitalisation by focusing on optimisation and extending digital solutions to our customer interface
- Increase focus on sustainability and our footprint to secure future relevance of the paper business

OUR STRENGTHS

- Long-term commitment to paper and reliability of supply
- Broad portfolio and strong geographical presence
- High quality of products and services
- Extensive, thoroughly optimised production
- Responsible operations, strong ethical values and a fully traceable supply chain

KEY FIGURES	2019	2018
Sales, EURm	4,552	4,690
Comparable EBIT, EURm	383	267
Capital employed (average), EURm	1,647	1,602
Comparable ROCE, %	23.2	16.7
FCF/CE, %	39.0	15.3
Personnel on 31 Dec.	7,673	7,929

Comparable EBIT increased due to higher sales prices more than offsetting the negative impact of lower volumes. Variable and fixed costs were lower. Demand for graphic papers in Europe was 9% lower than in the previous year.

"

We focus on technology innovations that help minimise energy needs at the mills.

BUILDING COMPETITIVE ADVANTAGE

UPM Plywood's primary end uses are building and construction, vehicle flooring and liquefied natural gas (LNG) shipbuilding. Our strategy focuses on demanding high-end applications and on medium-range standard products.

In 2019, we finished our two-year growth investment at the UPM Chudovo mill in Russia. The mill's birch plywood production capacity increased by 45,000 to 155,000 cubic metres along with the expansion of the product portfolio. In addition, the investment improved the mill's environmental performance; the mill's wood efficiency was improved, a new bioheat boiler was built at the mill site and the water treatment facility is being renewed.

Delivering responsible solutions

Our products are long-lasting, carbon-storing and made from responsibly sourced wood.

Plywood is an optimal material for most end-uses thanks to its superior strength-to-weight-to-price ratio and its renewable raw material base. Building and construction is the main end use, and we lead in high- and medium-range standard products in Europe.

New innovative and sustainable plywood solutions are further strengthening our offerings. The role of lignin in resins also continues to grow. Since autumn 2017, lignin has been used as part of the WISA BioBond gluing technology in plywood production.

Road transport is expected to remain the major mode of freight transport in Europe. Growing e-commerce volumes are driving a growth in plywood demand in light vehicles. Our WISA birch plywood has a positive ecological impact on fuel consumption, given its excellent weight-to-strength ratio compared with other materials.

LNG use is growing globally. We are the leading supplier of birch plywood for large LNG carriers. The LNG plywood manufacturing process is strictly controlled. Certified WISA-Birch plywood is ideal for insulation in these vessels due to its strength and stability at –163°C.

Customer needs are driving the development of our operations and offerings. Our innovations are focusing on new sustainable and multi-functional products. In 2019, we continued our commercial strategy of identifying new end-use applications with our fire-retardant structural plywood for building and construction end uses.

Committed to lifecycle approach

WISA Plywood is made of wood that is renewable and stores carbon. All the wood used in our products come from known, responsibly managed forests in Finland, the Baltic countries and Russia.

Compared with other materials, such as aluminium, plastic and steel, plywood manufacturing consumes significantly less energy.

In 2019, we published Environmental Product Declarations for our WISA products to show a product's environmental impact throughout its whole lifecycle, from raw-material sourcing to disposal. These third-party-verified and internationally comparable declarations help building contractors and designers better understand the environmental impact of construction products and materials.

CASE

FIRE-RETARDANT PLYWOOD MAKES BUILDING EASIER

The fire safety of a building needs to be ensured already at the design stage. With WISA-SpruceFR, fire-retardant structures can be built using much simpler designs and less materials. The work of designers and builders becomes easier as fire protection is achieved with one structural product rather than complicated multi-layered structures. This also saves time and storage space.

WISA-Spruce[FR] meets the requirements of the most stringent fire-risk classification for wood materials, and it can be used in the same way as regular plywood. The fire-retardant treatment does not affect the technical properties of the plywood. Lightweight and durable spruce plywood is particularly well suited for use in load-bearing structures such as walls and floors. With an expanded range, fire-retardant plywood can now be used for all frame-construction end uses.

WISA-Spruce[FR] plywood is made from sustainably grown and sourced wood, and the fire-retardant treatment given to the plywood is not harmful to the environment. WISA plywood has third-party verified, internationally comparable Environmental Product Declarations (EPDs). These EPDs contain information on the product's environmental impact throughout its lifecycle, from the sourcing of raw materials to its disposal.

OUR DIRECTION

- Profitable growth through superior customer experience and operational excellence
- Strengthen market position by increasing value and service offerings

OUR STRENGTHS

- End-use, market and customer insight
- Leading reliability of supply, with consistent high quality
- Leading supplier in demanding end-use segments
- Strongest brand on the market: WISA®

KEY FIGURES	2019	2018
Sales, EURm	450	480
Comparable EBIT, EURm	36	52
Capital employed (average), EURm	329	283
Comparable ROCE, %	11.0	18.4
Personnel on 31 Dec.	2,467	2,502

Comparable EBIT decreased mainly due to lower delivery volumes. Market demand in Europe decelerated in 2019. Demand for spruce plywood and for birch plywood-related industrial applications was weakening.

> "Our new gluing technology replaces fossil-based phenol with bio-based lignin in our plywood production.

NEW SUSTAINABLE ALTERNATIVES

We develop new businesses, products and technologies with a focus on bioeconomy. We are continuing our development of biomolecular businesses and we launched new products over the course of 2019.

Developing biofuels and naphtha
UPM Biofuels successfully entered into the market with its UPM BioVerno renewable diesel and naphtha. UPM BioVerno drop-in diesel is a unique, competitive and sustainable alternative to fossil fuels and first-generation biofuels and is produced from crude tall oil, a residue of pulp production.

UPM's renewable naphtha can be used either as a low-emission biocomponent for gasoline or as feedstock for replacing fossil raw materials in plastics and other chemical industry solutions. In 2019, we launched a collaborative venture with Dow and Elopak to create a 100% wood-based, fully recyclable beverage carton. UPM Raflatac and UPM Biofuels collaborated and launched UPM Raflatac Forest Film™, the first wood-based polypropylene film label material on the market.

We are now exploring opportunities to scale up the business by studying a potential larger biorefinery in Kotka, Finland, with a wider range of sustainable feedstocks. The potential biorefinery would produce approximately 500,000 tonnes of unique, advanced fuels for use in road transportation, aviation and petrochemicals.

Research on raw materials is focused on making efficient use of different forest industry residues and by-products. Alternatives made from waste and residue-based raw materials that do not compete with food production are being tested.

UPM Biofuels is developing a new feedstock concept by cultivating Brassica carinata as a sequential crop in Uruguay. The carinata crop produces non-edible oil that is suitable for use as feedstock for biofuels and its by-product can also be used as protein for animal feed.

Biochemicals offer renewable alternatives
UPM Biochemicals offers and develops innovative, sustainable and competitive wood-based biochemicals. The product segments are glycols and lignin products. Strong growth is expected for the market in the coming years as biochemicals mainly replace chemicals made from fossil raw materials. UPM Biochemicals has been

CASE

NATURAL WOUND CARE

New wound care dressing made from a sustainable, wood-based raw material can speed-up healing and brings new convenience to patient care. FibDex® is the third biomedical product based on wood-based raw materials to be commercialised by UPM.

The dressing, made from nanofibrillar cellulose, provides a moist environment for optimal healing and absorbs fluids from the wound. FibDex is particularly suited to treating large wound areas. Just one dressing is required throughout the whole treatment. Based on the clinical trial results, FibDex was awarded the CE mark, as it fulfils the standards and legislative requirements set for medical devices.

As UPM's biomedical products are newcomers to the biomedical and clinical applications markets, it will take a lot of work to increase recognition of both the company and its products. UPM is currently looking for partners to distribute the products. UPM is aiming for global markets. In addition to Europe, the product can be sold in countries outside of the European Union which accept the European CE mark.

UPM has created the wound care product in collaboration with researchers from the University of Helsinki and surgeons and nursing staff from the Helsinki Burn Centre.

CONSISTENT STEPS IN DEVELOPING NEW BUSINESSES SINCE 2005

'05
- Exploring the use of wood plastic composites in the building industry

'06
- Strong increase of second-generation biodiesel development
- Developing products and processes based on new technologies

'07
- Production of UPM ProFi, composite material, begins in Lahti, Finland
- Testing of biomass gasification technology at pilot scale in the USA

'08
- New UPM Biorefinery Development Centre established in Lappeenranta, Finland
- Production of UPM ProFi expanded to Bruchsal, Germany
- Finnish Centre for Nanocellulosic Technologies established
- Developing new bioethanol and energy production concept using waste

'09
- Pilot testing of gasification technology in the USA completed
- Research on replacing fossil-based chemicals with biochemicals in UPM products
- Biofuel production technology development and nanocellulose research
- Developing new concept for the production of biomass-based bio oil for power generation

'10
- EIA for a biorefinery in Kuusankoski and Rauma, Finland and at Stracel, France
- EIA for a biorefinery begins in Lappeenranta, Finland
- Product development of UPM Formi, a new biocompiste material, begins

'11
- EIA for a biorefinery in Lappeenranta concluded
- Market launch of UPM Formi
- Pre-commercial production of cellulose nanofibrils starts at Otaniemi, Finland
- Piloting biofuels and biochemicals in Lappeenranta

'12
- Construction of UPM Lappeenranta Biorefinery begins
- Production of UPM Formi begins in Lahti, Finland
- Research of various biofuels production processes and raw materials
- Development of pilot- and plant-scale industrial applications for biofibrils

'13
- Comprehensive UPM BioVerno fleet tests begin
- UPM ProFi decking product portfolio expands
- UPM Biochemicals business unit established
- Developing and testing industrial biochemical applications
- Joint research projects with partners

'14
- Sales agreement for the distribution of UPM BioVerno diesel
- UPM's Biofore Concept Car premieres at the Geneva International Motor Show
- UPM BioPiva lignin material launched
- Developing technology to produce advanced biomass-based fuels with partners
- Increased focus on efficient use and reuse of side streams

'15
- Production begins at the UPM Lappeenranta Biorefinery
- Industrial concept development proceeds in biochemicals
- GrowDex®, a nanocellulose hydrogel for 3D cell culturing launched

'16
- Innovation unit at the Biomedicum research centre in Helsinki established
- Side stream efficiency research intensifies

'17
- Testing Brassica carinata sequential cropping concept in Uruguay
- New WISA BioBond lignin-based gluing technology introduced
- Basic engineering study on a potential industrial-scale biochemicals biorefinery in Germany starts
- UPM Lappeenranta Biorefinery at its design capacity
- UPM Sustainable Fibre Materials research project begins
- UPM Biomedicals unit established

'18
- EIA for possible Kotka Biorefinery, Finland
- Entering the bioplastics market with UPM BioVerno renewable naphtha
- New biocomposite material for 3D printing launched

'19
- Testing of industrial biochemicals applications
- GrowDex-T hydrogel with advanced features launched
- World's first wood-based polypropylene labelling material Forest Film launched
- New UPM ProFi products launched
- Collaborative project to bring 40 million wood-based beverage cartons into supermarkets launched in Finland
- Wood-based renewable functional filler concept for rubbers introduced
- FibDex®, a nanofibrillar cellulose wound dressing launched

'20
- Decision to enter to wood-based biochemicals business by building a biorefinery in Leuna, Germany.

> **Made from renewable and responsibly sourced wood fibres, UPM UniqueBarr™ is a non-plastic material for wrapping.**

actively developing and testing industrial applications to create industrial-scale mill concepts and meet the market demand.

In 2019, UPM completed the basic engineering studies on the potential biorefinery in Germany. The investment decision was made in January 2020. The industrial scale biorefinery will convert solid wood into next generation biochemicals: bio-monoethylene glycol (BioMEG) and lignin-based renewable functional fillers. The biorefinery will also produce bio-monopropylene glycol (BioMPG) and industrial sugars. End-use segments for glycols include textiles, PET-bottles, packaging, de-icing products, composites, cosmetics, pharma and detergents. Renewable functional fillers are used to substitute carbon black and silica. We introduced a wood-based renewable functional fillers concept to rubber market in 2019.

The biomedical product range is expanding

We work with global partners to develop new biomedical products and applications. GrowDex®, a nanocellulose hydrogel, is suitable for use in 3D cell culture and related applications, such as medical development and research. The product has been on the market since 2015. Growdex T hydrogel with advanced features, launched in 2019, is the latest addition to the Growdex product range.

In 2019, we launched FibDex®, a new wound care dressing made from nanofibrillar cellulose. It is the third biomedical product made from wood-based raw materials that UPM has commercialised. Based on clinical trial results, FibDex was awarded the CE mark as it fulfils the standards and legislative requirements set for medical devices.

Circular economy is the basis of growth for biocomposites

UPM Biocomposites offers smart and sustainable composite products for various uses in outdoor building material and consumer products. Our target is to increase the use of recycled materials in products. For example, UPM ProFi Piazza decking contains 75% recycled materials.

UPM Formi composite material, made from cellulose fibres and polymers, is suitable for use in both the industrial and consumer applications, from furniture to consumer electronics. It complies with the requirements set by the EU for reinforced plastics in relation to the circular economy and its carbon footprint is 30–60% smaller than traditional plastics. A new Formi EcoAce product range, launched in 2019, has significantly lower carbon footprint compared to virgin plastic solutions. UPM Formi became ISCC (International Sustainability and Carbon Certification) certified, which guarantees that the product meets environmental and social standards along the supply chain.

UPM Biocomposites has continued developing the new UPM Formi 3D biocomposite, which was launched in 2018. The focus has been on large-scale industrial 3D printing with end user applications that include casting moulds, concept models for architecture and prototypes for consumer products.

New solutions in specialty packaging

Made from renewable and responsibly sourced wood fibres, UPM UniqueBarr™ is a non-plastic material for wrapping. Without the plastic coating, the paper can be recycled with regular paper waste. Improved recyclability means a smaller carbon footprint thanks to prolonged material lifecycle and a reduction in landfill waste.

UPM's unique concept for release liner recycling allows value chain members to reach their sustainability targets. Collected release liners are desiliconised and used to produce new release liner base papers.

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› Forest Film on page 44
› Developing a fully renewable beverage carton on page 23
› upmbiofuels.com
› upmbiochemicals.com
› upmbiomedicals.com

CASE

BREAKTHROUGHS IN LIGNIN VALUE CHAIN

Completely bio-based lignin is a textbook example of the work being carried out to find functional alternatives to fossil-based materials. This wood-derived material is about to find its way into many industries and products over the next few years.

Almost a quarter of the dry mass of each tree is lignin, which is separated in the pulp production process and traditionally used as bioenergy through incineration. New, innovative uses of lignin, however, offer an effective way of reducing industries' dependency on fossil materials.

UPM is a pioneer in decades-long research on the utilisation of lignin in resins, adhesives, bioplastics and polyurethanes, for example. Further exciting applications can be awaited in the near future.

With our knowhow in lignin chemistry and quality management, we can ensure that our products are exactly suited for the end-use applications of our customers. We offer UPM BioPiva™ lignin products together with a customised technical solution all the way to industrial implementation. Since autumn 2017, lignin has been used as part of the WISA BioBond gluing technology in plywood production. Lignin is also supplied to many of the biggest resin producers worldwide.

ACTIONS FOR FUTURE GROWTH

The year 2019 was a milestone year in UPM's strategic transformation. At the same time, all our businesses continue developing product innovations beyond fossils.

BUSINESS AREA	STRATEGIC TARGETS	ACTIONS 2019	ACTIONS PLANNED FOR 2020 *)
GROUP AND ALL BUSINESSES	Continuous improvement of financial, social and environmental performance Maintain strong balance sheet and capability for future opportunities Developing Aiming Higher culture for business success Compliance with laws and regulation Mitigate risks and capture opportunities	Continuous improvement programmes Strong cash flow and balance sheet Disciplined and effective capital allocation A dialogue on developing inclusive leadership started Aiming Higher culture developed Enabling performance approach fostered Engaging safety culture and global health concept promoted UPM Code of Conduct updated and employees trained Counterparty risk management enhanced Internal climate change agenda, TCFD pledge signed, climate-related targets strengthened	Continuous improvement programmes Disciplined and effective capital allocation Continue diversity and inclusion work Strengthen engaging safety culture and global health concept Renew UPM Report Misconduct Channel Implementation and training of the revised UPM Supplier and Third Party Code Commitment to UN 1.5 degree pledge Study on climate related substitution and storage effects of our products
UPM BIOREFINING	Grow as trusted and responsible pulp producer Provide sustainable, advanced biofuels and biomaterials Enhance profitability through efficient wood supply, integrated full-production and focused commercial strategy	Decision on the new greenfield pulp mill in Uruguay New profitability level at UPM Lappeenranta Biorefinery, growth in bioplastics market Evaluation of future opportunities to scale up the biofuels business with new types of technology and raw materials Wood supply solutions to improve efficiency and reliability enhanced	Construction work on the pulp mill site and in Montevideo port Evaluation of growth opportunities and new sustainable feedstocks in biofuels continues
UPM ENERGY	Profitable growth in zero-carbon electricity generation Solutions for industrial energy excellence Embracing the electrification of society	Service offering development to industrial-scale electricity consumers continued Refurbishment of the Kuusankoski hydropower plant started Continued OL3 project, the commissioning tests of OL3 continued	Continue developing the service offering to industrial-scale electricity consumers Continue refurbishment of the Kuusankoski hydropower plant The commissioning tests of OL3 to continue
UPM RAFLATAC	Profitable organic growth, potentially complemented by acquisitions Expanding customer reach through commercial excellence Widening product portfolio, especially in high value-added and sustainable products and solutions Innovating in productivity	Investment in special label capacity in Tampere, Finland completed Opened a new terminal in Chelyabinsk, Russia Launched UPM Raflatac Forest Film™, the industry's first wood-based film material Launched UPM Raflatac RAFNXT+ range, the world's first label material verified by the Carbon Trust Introduction of new label materials with recycled content RafCycle® recycling solution continued its geographic expansion Three-year productivity programme started	Expand distribution coverage in attractive markets Capture growth opportunities and develop product portfolio and service offering Continuing to develop new concepts in sustainability and circular economy Continue three-year productivity programme
UPM SPECIALTY PAPERS	Global leader in labelling materials The preferred fine paper supplier in Asia-Pacific Growth in select flexible packaging end-uses	Launched new innovative release liner products Ramp-up of UPM Nordland PM2 release liner production in Germany Expansion at UPM Changshu in China completed New office paper brand with the markets' first non-plastic wrapping material New portfolio of packaging papers	Global growth in selected products Ramp-up of new capacity in China and Germany Continue strengthening our brands Continue to innovate alternatives for fossil-based materials Continuous improvement in environmental performance
UPM COMMUNICATION PAPERS	Maintain a profitable market position while actively managing capacity in line with market developments Increase operational efficiency and quality of our portfolio Drive digitalisation by focusing on optimisation and extending digital solutions to our customer interface Increase focus on sustainability and our footprint	Closed a total of 620,000 tonnes of graphic paper capacity in Germany and Finland Plan to sell or close UPM Chapelle mill in France Cost management and mill programmes continued Targeted growth in certain end-uses and segments Strengthen customer interface Investment in a CHP plant at UPM Nordland paper mill, Germany New process for producing precipitated calcium carbonate from residue ash at UPM Schongau mill developed	Continue cost efficiency improvement Continue strengthening our market role Capture opportunities in additional end-uses and segments Further explore digitalisation opportunities, focusing on customer interface Continue to reduce the environmental impact
UPM PLYWOOD	Profitable growth through superior customer experience and operational excellence Strengthen market position by increasing value and service offerings	Supply chain service model strengthened Growth investment at the UPM Chudovo mill in Russia completed Boiler replacement at UPM Joensuu completed and scarf-jointing line replacement project proceeded Leadership skills development and mapping of commercial competence development needs	Operational excellence Differentiation from competition with "Responsibility made easy" Further enhance effective raw material usage and agile supply chain capabilities
UPM FOREST	Secure competitive wood supply sustainably Ensure sustainable land use and forestry by increasing biodiversity and carbon sinks	Development of strategic forest assets Study availability and quality of competitive wood for UPM's growth projects Development of indicators and monitoring methods of biodiversity Development of forest carbon calculations	Development of strategic forest assets Ensure availability and quality of competitive wood for UPM's growth projects Enhance activity in private wood trade by promoting e-trade
UPM BIOCHEMICALS	Enter the wood-based biochemicals market	Completed the engineering study and continued a commercial assessment to verify attractiveness of the potential biochemicals refinery in Germany Testing of industrial biochemicals applications	Investment in a biorefinery to convert solid wood into next generation biochemicals at Leuna, Germany
UPM BIOMEDICALS	Further application development and piloting, product commercialisation	Launched new biomedical products: Growdex T hydrogel and FibDex, a nanofibrillar cellulose wound dressing	Continue to commercialise products and search collaboration opportunities
UPM BIOCOMPOSITES	Business creation and continued growth	Launched new UPM ProFi products Continue to commercialise UPM Formi and UPM Formi 3D	Continue to commercialise new UPM ProFi products New UPM Formi product range to be launched with 90% renewable fibre content

*) Not a complete list

THE WAY WE OPERATE

Sustainability is the only solid foundation for long-term value creation

OUR RESPONSIBILITY TARGETS FOR 2030

UPM's Biofore strategy guides us in achieving our responsibility targets for 2030 and our contributions to UN Sustainable Development Goals (SDGs).

Our responsibility focus areas are divided into economic, social and environmental responsibility. For each focus area, we determined the respective targets and key performance indicators. The focus areas, as well as the targets, are updated annually. The review is based on our annual materiality analysis, which identifies issues that either have a significant impact on our business performance or issues that influence the assessment and decisions made by our stakeholders.

Our 2019 responsibility target review focused on our contribution to climate change mitigation. As a result, we tightened our targets for fossil CO_2 emissions from our own combustion processes and from purchased electricity. We added a new target on indirect fossil CO_2 emissions, focusing on sourced materials and logistics. We also launched targets for ensuring climate-positive land use and a climate-positive product portfolio in the future.

Furthermore, we tightened the already-attained target for emissions of acidifying flue gases. Targets where we reached 100% fulfilment in 2019 have been removed. Certified environmental management systems, Chain-of-Custody coverage and availability of environmental product declarations are today part of our daily business practices.

Positive contribution to SDGs

Our responsibility targets contribute positively to SDGs. To strengthen our future efforts, we launched a new target: Development of new products and services with contribution to SDGs.

In 2019, we reviewed all 17 SDGs and their 169 targets against our operating environment. We chose the most relevant SDG targets based on where we can have the largest impact, either by minimising our negative impacts or by increasing the positive impacts. Others are also relevant to us, but to a lesser extent.

Goal 6:
Clean water and sanitation
(Target: 6.3)

Goal 7:
Affordable and clean energy
(Targets: 7.2 and 7.3)

Goal 8:
Decent work and economic growth
(Targets: 8.2, 8.5 and 8.8)

Goal 12:
Responsible consumption and production
(Targets: 12.2, 12.4 and 12.5)

Goal 13:
Climate action
(Target: 13.1)

Goal 15:
Life on land
(Targets: 15.2 and 15.5)

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› sustainabledevelopmentun.org

UPM RESPONSIBILITY FOCUS AREA	2030 TARGET	2030 FOLLOW-UP / 2019 RESULTS
ECONOMIC		
Profit Creating value to shareholders	• Comparable EBIT growth through focused top-line growth and margin expansion • Comparable ROE: 10% • Net debt/EBITDA: 2 times or less	• Comparable EBIT decreased by 7% to EUR 1,404 million (1,513 million) • Comparable ROE was 11.2% (12.9%) • Net debt/EBITDA was −0.24 times (−0.17)
Governance Ensuring accountability and compliance	• 100% coverage of participation to UPM Code of Conduct training (continuous)	• 96% (99%) of active employees completed the trainings for the updated Code of Conduct. Training started in September 2019.
Responsible sourcing Adding value through responsible business practices	• 80% of UPM spend qualified against UPM Supplier and Third Party Code (continuous) • 100% of UPM raw material spend qualified against UPM Supplier and Third Party Code by 2030 1) • Continuous supplier auditing based on systematic risk assessment practices • 30% reduction of CO_2 emissions from materials and logistics (scope 3) 2)	• 84% (83%) of supplier spend qualified against UPM Supplier and Third Party Code • 94% (94%) of raw material spend qualified against UPM Supplier and Third Party Code • 185 supplier audits were conducted based on identified risks. 300 contractor reviews were also carried out with focus on working conditions. • Target launched end of 2019
SOCIAL		
Diversity and inclusion Developing organisational culture and local conditions to ensure diverse and inclusive working environment for business success	• People feel that UPM values and promotes diversity. People are treated fairly in their work environment and can advance regardless of personal background or characteristics. 95% favourable in the Employee Engagement Survey Diversity and Inclusion index by 2030. • Diversity and inclusion initiative (continuous)	• Responses to the Employee Engagement Survey's Diversity and Inclusion index 70% (68%) favourable • UPM started a dialogue with key management teams on developing inclusive leadership
Continuous learning and development Ensuring high performance for business success and continuous professional development for future employability	• Goal setting discussions are held and development plans are created for employees, completion rate 100% by 2030 • Employees perceive good opportunities for learning and development at UPM, 80% favourable in Employee Engagement Survey by 2030	• 88% (89%) of employees had completed individual goal setting or annual discussion. 65% (61%) of employees had a development plan documented • Responses to Employee Engagement Survey's question regarding learning and development were 68% (66%) favourable
Responsible leadership Emphasising value-based and inspiring leadership and integrity. Continuous development of working environment	• Employee engagement and enablement indices with favourable score clearly above external high-performing norm by 2030	• Employee engagement index 71% (71%) favourable. This is 3 pp below the external high-performing norm. Employee enablement index 74% (72%) favourable. This is on par with the external high-performing norm
Working conditions Ensuring safe and healthy working environment and wellbeing of employees	• No fatalities or serious accidents in UPM operations • Continuous improvement in safety: Lost time accident frequency (LTAF) <1 and Total recordable injury frequency (TRIF) <2 levels permanently reached (including contractors) • All operations have certified OHS system by 2030 • Health Promotion Programme is in use at all UPM sites and businesses by 2030 • Absenteeism rate <2% in all organisations by 2030	• One fatal accident in 2019, three serious accidents • LTAF was 2.9 (2.7) for UPM workforce and 3.3 (2.9) including contractors, TRIF was 7.1 (6.9) for UPM workforce and 6.8 (6.6) including contractors • All production sites have an OHS management system in place. 49% of the sites have external certification of their OHS system. • A majority of the sites with Health Promotion initiatives • The absenteeism rate was 4.0% (3.9%)
Community involvement Ensuring local commitment	• Continuous development of strategic sustainability initiatives with leading NGOs • Continuous sharing of best practices of stakeholder initiatives • UPM's Biofore Share and Care programme brings significant added value	• UPM started co-operation with WWF Finland. Co-operation continued with Vida Silvestre and Osprey Foundation, for example. • Sharing of best practices ensured through well-established operational stakeholder forums, for example • Over 500 employees with over 3,000 hours volunteered in local communities
ENVIRONMENTAL		
Product stewardship Taking care of the entire lifecycle	• Climate-positive product portfolio (continuous) • Development of new products and services with contribution to the UN Sustainable Development Goals (continuous) • All applicable products eligible for ecolabelling by 2030	• Target launched end of 2019 • Target launched end of 2019 • 83% (85%) of UPM sales was eligible for ecolabelling
Waste Promoting material efficiency and circular economy – reduce, reuse and recycle	• No process waste sent to landfills or to incineration without energy recovery by 2030	• 89% (90%) of UPM's total process waste was recovered or recycled. The total amount of waste to landfills decreased by 2% compared to 2018.
Climate Creating climate solutions and working towards carbon neutrality	• Fossil CO_2 emissions from our own combustion and purchased electricity (Scope 1 and 2) reduced by 65% by 2030 3) • Maximise the business benefits of greenhouse gas claims (continuous) • Improve energy efficiency annually by 1% (continuous) • 70% share of renewable fuels (continuous) • Acidifying flue gases (NO_x/SO_2) reduced 20% by 2030 3)	• Fossil CO_2 emissions reduced by 15% compared to 2015 and 6% compared to 2018 • UPM sold greenhouse gas claims worth nearly 1.1 million CO_2 tonnes • Energy efficiency target was not achieved • Level of 70% (70%) reached in the use of renewable fuels • 12% reduction achieved since 2015 for the UPM average product
Water Using water responsibly	• Effluent load (COD) reduced by 40% by 2030 4) • Wastewater volume reduced by 30% by 2030 4) • 100% of nutrients used at effluent treatment from recycled sources by 2030 4)	• 31% reduction in effluent load achieved since 2008 for the UPM average product • 10% reduction in wastewater volume achieved since 2008 for the UPM average product • 31% of nutrients from recycled resources
Forests and biodiversity Ensuring sustainable land use and keeping forests full of life	• Climate-positive land use (continuous) • All fibre certified by 2030 5) • Positive impact on biodiversity (continuous): implementing biodiversity programme and developing monitoring system 6)	• Target launched end of 2019 • 82% (81%) of all wood used by UPM is sourced from certified forests • Indicators and methods to measure biodiversity were developed and monitoring started

1) Covers all UPM raw material spend including wood and wood-based biomass sourcing and excluding energy
2) From 2018 level
3) From 2015 level
4) From 2008 level, relevant for pulp and paper production
5) Forest management certification
6) Covers UPM own forests in Finland

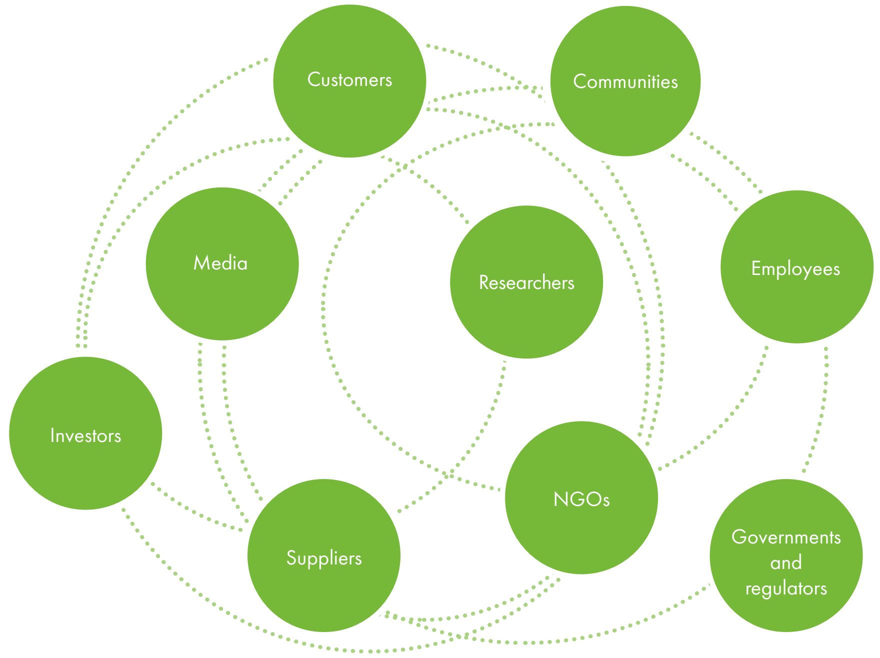
SIGNIFICANCE
- Stakeholder engagement provides UPM with predictability and a competitive advantage
- Continuous dialogue with stakeholders improves understanding of key risks, challenges and opportunities in the operating environment

TARGET
- We aim to understand stakeholders' needs for information and expectations for UPM and consider them in strategic development and decision-making processes

OUR WAY
- We engage in active dialogue with our stakeholders to discuss our operations and targets
- The UPM Code of Conduct sets the standards for responsible behaviour and collaboration
- Stakeholder engagement is measured by several indicators
- Stakeholder relations are coordinated globally at Group level, while businesses are responsible for continuous dialogue with customers and business partners as well as the local communities

VALUE FROM STAKEHOLDER ENGAGEMENT

Understanding the views and expectations of our stakeholders plays a crucial role in the success of our company and the acceptability of our operations. Active and open dialogue with our stakeholders provides valuable input for our development efforts.



OUR MOST IMPORTANT STAKEHOLDERS

Our Biofore strategy forms the foundation of our stakeholder dialogue. The key focus areas and activities vary locally and according to stakeholder needs.

The impact of UPM's operations extends from the local level to society at large. We aim to provide a balanced view of the economic, environmental and social aspects of our business activities.

Stakeholder feedback as a tool for development

Our goal is to provide our stakeholders with a clear picture of what our future course is, how we implement our Biofore strategy in practice, and how we create long-term value for our stakeholders. We disclose relevant and accurate information in accordance with market regulations to all participants in the market. During 2019, we arranged investor events, participated in industry conferences and met widely with investors in all our main markets in Europe, North America and Asia. As many of our stakeholders view UPM primarily as an economic operator, financial success, stability, good governance, future outlook and growth were key themes discussed.

Stakeholder mapping and the systematic gathering of feedback and views from different sources play an essential role in our stakeholder relations work. We analyse the feedback carefully to understand the expectations of our stakeholders and take them into consideration in our development work and decision-making. The level of stakeholder engagement is measured by several indicators, such as customer enquiries, contacts with the mills, investor relations, wood sourcing as well as number of job applications. As an example, we received more than 250 enquires or concerns from general public.

Every year, we conduct a materiality analysis that highlights the most important responsibility issues for us and our stakeholders. The analysis is based on several surveys, customer enquiries and feedback from an open web-based tool (page 65).

Climate change high on the policy agenda

Through public affairs work, UPM aims to foster the necessary prerequisites for its operations, particularly in Finland, Uruguay, Germany and China. Active influencing at the EU level is also important. UPM co-operates with a number of trade associations, the most important being the Finnish Forest Industries Federation (FFIF) and the Confederation of European Paper Industries (CEPI). As we enter new businesses, we also need to find new ways and forums for co-operation. UPM is a founding member of Leaders of Sustainable Biofuels (LSB), which is an EU association representing the producers and developers of sustainable biofuels with the aim of decarbonising traffic.

2019 was an exceptional year, with parliament elections both in Finland and the EU. We were active in discussions on the Finnish operating environment and the focus areas of the new government. In particular, we emphasised competitiveness, predictability, innovations and climate change solutions.

Sustainable forest management and the positive climate impact of forestry were high on our agenda in 2019. Discussions on forestry were carried out with environmental organisations, certification bodies, authorities and decision-makers. Climate impact of forests is linked to the policies on land use, land-use change and forestry (LULUCF). The regulation on LULUCF has been approved at EU level and

CASE

CONSISTENT STAKEHOLDER ENGAGEMENT IN URUGUAY

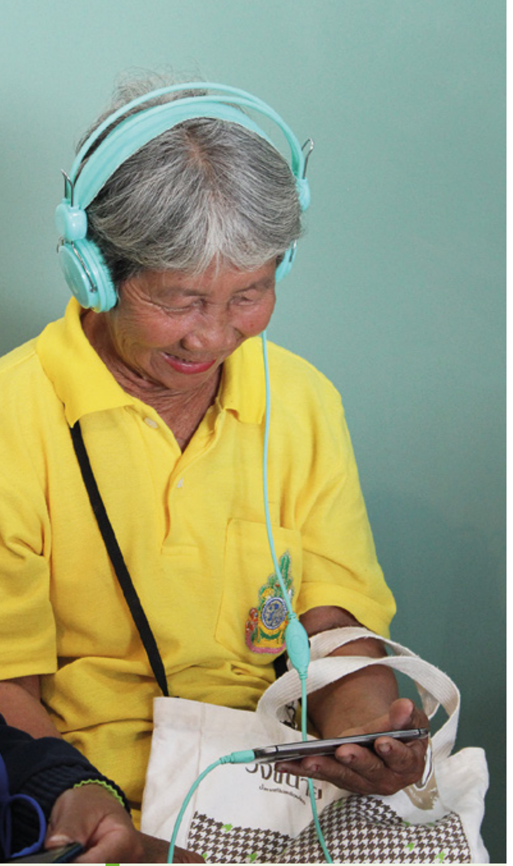
When UPM announced in 2016 that we were considering alternatives for long-term development in Uruguay, local stakeholder engagement gained new momentum. Throughout the planning phase, we have regularly met with numerous stakeholders. Authorities and decision-makers, local communities, UPM employees, potential employees, contractors, plantation owners, NGOs and the media have been informed about the company's plans and the dialogue has provided the company with valuable insights into local conditions and views.

Discussions, info sessions, mill visits and public hearings have been held both in Montevideo – the capital – and in Paso de los Toros, which is the location of the new mill site. Public hearings in Uruguay are part of the legal permitting process. They have been held for both the new mill and the export port to be built in Montevideo. The events provide an opportunity for open discussion and feedback to be expressed. Between 60–350 people have actively attended each of the hearings.

During the design phase, the environmental and socioeconomic impacts of the mill were carefully assessed in independent studies. The results were communicated openly at meetings and on the website. Public opinion has also been regularly surveyed since 2016 and the majority of Uruguayans have expressed their support for the project. Stakeholders have been particularly interested in employment and training opportunities.

Concerns were also raised regarding the environmental impact and possible social problems during the construction period. The development plan, created in co-operation with local authorities, enables the management of both environmental and social impacts. UPM's position in the free-trade zone has also been criticised.

During our 30 years in Uruguay, we have built up our stakeholder relations with local communities and parties in areas where we operate. Consistent and transparent communication is a prerequisite for success in this kind of large investment project.



CASE

ADDRESSING DECENT WORK IN THE TAPIOCA SUPPLY CHAIN

Tapioca starch is a raw material used in paper production extracted from the root of the cassava plant. As part of an extensive onsite survey, we interviewed more than 500 workers from a tapioca starch factory and farmers supplying tapioca in Thailand.

The results showed that most of the workers are satisfied with their working and living conditions, including access to clean water and electricity. Nevertheless, there are still major challenges in the supply chain and we are taking them seriously.

Even though our supplier has implemented a number of measures to improve safety, many factory workers have safety concerns. Working with machinery and the safety of chemicals were identified as the areas most in need of improvement. The factory has taken action after the survey. For the farmers, the greatest potential for improvement lies in ensuring that helping out at farms does not interfere with their children going to school.

The survey created good opportunities to discuss the importance of safety and the use of personal protective equipment at the factory, for example. The supplier is also committed to improving conditions at the farms and further assessing the conditions of young workers.

UPM has carried out regular and extensive audits in Thailand since 2014 and initiated discussion with various stakeholders. Our goal is to continuously improve the working conditions of factories and farmers in Thailand. The suppliers must be committed to our Supplier and Third Party Code.

in 2019 the member states had to submit their LULUCF plans to the EU Commission. UPM has highlighted the importance of sustainable forest management and manufacturing products from renewable raw materials that replace fossils, as an effective way to mitigate climate change.

UPM actively promotes cost-competitive and consistent implementation of climate change policies. The EU Emission Trading Scheme´s third trading period will end in 2020 and UPM has been engaged in the EU preparations for the new trading period starting in 2021. While the mechanism is still limited to cover only activities within the EU, it is necessary to have so called carbon leakage measures in place to ensure both efficiency in mitigating emissions and the competitiveness of industrial players in global competition.

Decarbonising traffic through renewable energy and biofuels policies continued. The update of the EU Renewable Energy Directive for 2021–2030 was approved in 2018. It sets an EU-wide target for renewable energy overall, and a sub-target for renewables in traffic by 2030. For UPM, it was very important to get recognition for advanced and residue-based biofuels with high GHG reduction. In 2019, we actively monitored the implementation of the EU-wide target in national legislation, especially in Finland, Sweden, Norway, the Netherlands, Germany and France.

World-class commitment to corporate responsibility

UPM continued active participation in the UN Global Compact's action platforms. In September, the UN recognised UPM as one of 36 Global Compact LEAD companies demonstrating world-class commitment to corporate responsibility. In 2019, UPM chaired the Global Compact Finland Network, bringing together all Finnish companies and organisations committed to the Global Compact.

We also continued our co-operation with different stakeholders on responsibility issues on a voluntary basis, around themes such as ecolabels, fish migration and nature conservation. UPM's two-year co-operation agreement with the Forest Stewardship Council FSC® has significantly increased the share of FSC® certified wood in Finland. As a member of FSC and working with PEFC (the Programme for the Endorsement of Forest Certification) Forest Management standard updates, UPM engaged in active dialogue with the management of FSC and PEFC International. In 2019, UPM continued its co-operation with WWF Finland and Birdlife Finland. Responsibility issues were also raised in customer enquiries, with product safety, ecolabels and the origin of raw materials emerging as key themes. Globally, we continued active co-operation with local permit authorities.

Emphasis on local communities and impacts

UPM's mills in Europe, China and Uruguay can be among the biggest employers and taxpayers in the locations in which they operate. In Uruguay, UPM started a major pulp mill investment project in 2019. Stakeholder engagement around the investment project has been active (see the previous page). All in all, UPM aims for engagement and open dialogue with local communities. For example, our Kymi and Kaukas mills have their own forums for local dialogue. In 2019, both mills organised open door days reaching thousands of visitors. UPM co-operates with local schools and academia, organising boot camps and visits for students, for example. In addition, it is crucial for us to have active dialogue with local forest owners, neighbours of harvesting sites and other individuals related to forest management.

Our EMAS (EU Eco-Management and Audit Scheme) statements cover societal impacts in addition to environmental performance, providing more detailed information on the local impacts of our pulp and paper mills. The EMAS statements also include information on co-operation with local stakeholders, such as sponsorship of local organisations or co-operation with educational institutions. Local statements complement UPM's corporate responsibility reporting. Mill-specific EMAS statements are compiled annually and published on the UPM website.

Biofore Share and Care programme continues

UPM's Biofore Share and Care programme demonstrates our dedication to responsibility through sponsorships,

UPM'S MATERIALITY ANALYSIS 2019

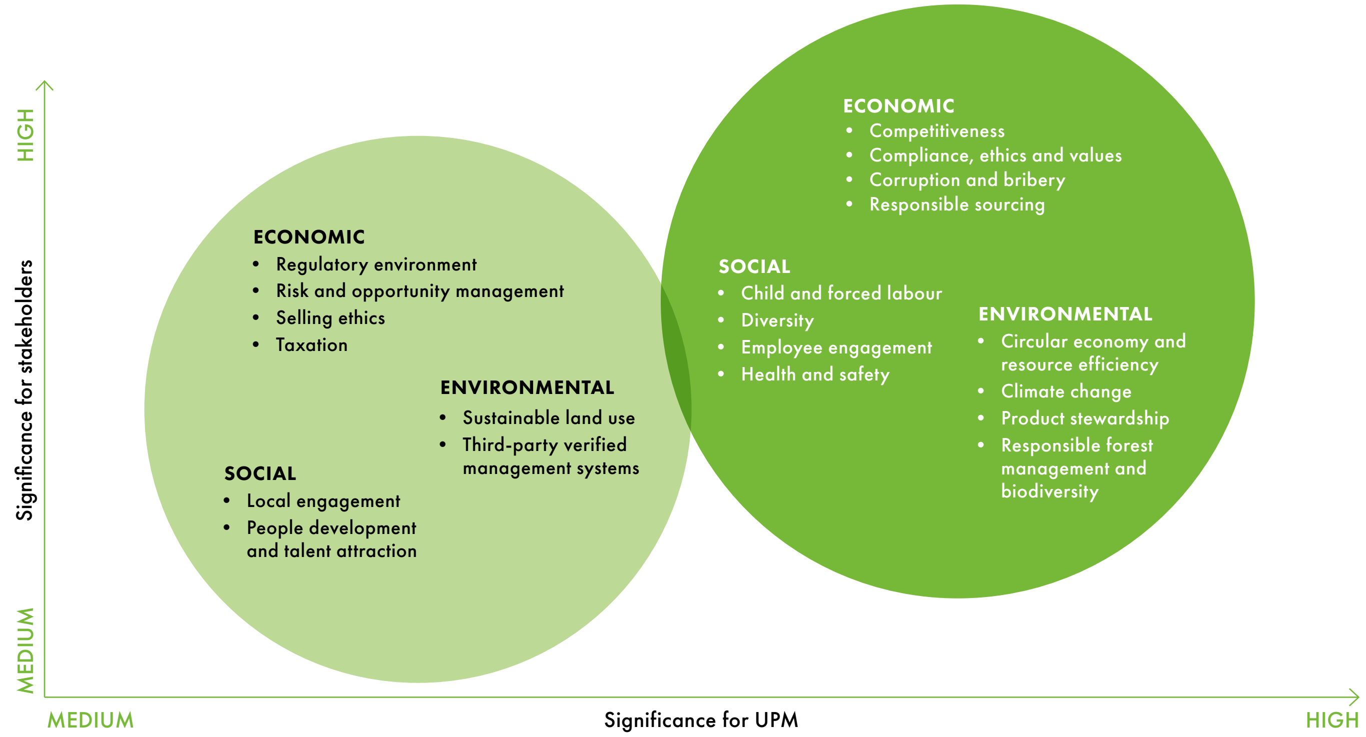
The materiality analysis of the company's responsibility issues covers topics that directly or indirectly influence the ability to create, maintain or acquire economic, environmental or social value for UPM, its stakeholders and society.

Analysis is carried out annually, based on follow-up of the interests and concerns of various stakeholder groups, including communities, employees, NGOs, customers, suppliers, government and regulators, investors, researchers and media.

All customer questions and stakeholder concerns received during the year are taken into consideration. Additionally, UPM conducts a specific stakeholder survey using a web-based tool that enables stakeholders to answer anonymously. In 2019, the survey also covered the relevance of UN Sustainable Development Goals (SDGs) for UPM.

Results of the survey are gathered and analysed by an independent third party and used to support UPM's wider evaluation. Most material economic, environmental and social responsibility topics identified in UPM's analysis are presented below. UPM's responsibility focus areas and targets (pages 60–61) reflect these material aspects. UPM does not distinguish between topics within the section and considers them all equally material.

PERFORMANCE GROWTH INNOVATION RESPONSIBILITY PORTFOLIO



donations and employee voluntary work. We share our resources with causes that respect sustainable development and work in line with our purpose and values. We direct support to four focus areas: reading and learning projects, responsible water initiatives, bio-innovations and community engagement. UPM does not financially support political parties or individual candidates.

Employee volunteering emphasises local commitment and impact. UPM's salaried employees can spend up to 8 hours per year on local volunteering work during their working hours. Over 500 employees with over 3,000 hours volunteered in local communities. UPMers have participated in several reading and learning projects in Finland, Uruguay, Germany, China and the US, for example. In addition, UPM spent approximately EUR 1.2 (1.2) million on local sponsorships aiming to support the vitality of UPM's production locations.

UPM's support for its Uruguayan UPM Foundation continued with a contribution of USD 400,000 (USD 400,000). The foundation supports and encourages training, entrepreneurship, employment, healthy living and entertainment in local communities in the Uruguayan countryside. EUR 474,000 (499,000) was donated to charities or other non-profit causes. UPM made donations to e.g. SOS-Children's Villages to improve the wellbeing of children and families, Finnish Forest Association to organise children's educational forestry trips, the Baltic Sea Action Group for nutrient recycling initiative and the Economic Information Office (TAT) to support the Yrityskylä learning environment. Wroclaw university of science and technology also received a donation to study properties of bio-based filmic materials for the use of food packaging.

OUR BUSINESSES ACTIVELY ENGAGE WITH STAKEHOLDERS

In addition to the group-wide focus areas, our businesses had their additional focus areas in stakeholder dialogue in 2019. Customer collaboration is presented on pages 84–85, employee activities on pages 68–71.

BUSINESS	COMMUNITIES	GOVERNMENTS AND REGULATORS	SUPPLIERS	NGOs	MEDIA
UPM PULP	In Finland summer jobs and recruitment events for students, open door events at the mills. In Uruguay Information sharing meetings on the new pulp mill project, and UPM Foundation activities. In both countries mill tours and excursions to explore sustainable forestry. Training programmes, employee volunteering and other initiatives within the Biofore Share and Care programme. Co-operation with universities, schools, NGOs and research institutes.	Uruguay: co-operation with the government and authorities related to the current forestry and pulp operations and the new pulp mill project. Finland: discussions on infrastructure.	Safety training with contractors. Co-operation with machine suppliers and logistic service providers.	Discussions on the new pulp mill project in Uruguay. Socio-economic and environmental impacts of the current operations and the new mill project. Co-operation with Vida Silvestre, Aves Uruguay, BioUruguay and America Solidaria, Ceprodih, Desem and Jóvenes Fuertes.	Focus on the decision to invest in a new pulp mill in Uruguay and the impacts of the mill. Information meetings, mill tours and trips to explore sustainable forestry.
UPM BIOFUELS	Co-operation with universities and research institutes, associations and certification bodies and auditors. Participation in seminars and conferences.	Discussions with Finnish and EU politicians and authorities on future biofuel policies.	Safety training with contractors. Continuous dialogue and supplier audits.	Co-operation with the Roundtable on Sustainable Biomaterials and Zero Emission Resource Organisation (Norway).	Visits to Lappeenranta Biorefinery, interviews and communications on mill events.
UPM TIMBER	Active participation in local events and projects. Co-operation with vocational colleges on apprenticeships and education. Forest owner visits at sawmills.	Co-operation and sawmill visits with local authorities on logistics, traffic and permits.	Induction and training for maintenance and logistics companies.		Interviews. Communications on the environmental impact of sawmills and sawn timber. Apprenticeship programmes at the Kaukas sawmill. Mill events and visits.
UPM ENERGY	Sponsorships of various energy-related student organisations.	Discussions with Finnish and EU politicians and authorities on energy policy development.	Collaboration related to maintenance of hydropower plants and facilities.		Promoting migrating fish programme and related projects.
UPM RAFLATAC	Partnership with the Packaging School at Clemson University in the USA. Local sponsorships, such as Icehearts in Finland and Scarborough Athletic FC in the UK. Volunteering work with Park Pals for Helsinki Gardens, Mummonkamari and local cleanup in Tampere, Mills River cleanup and Upward Elementary School cleanup in North Carolina.		Collaboration on the development of fossil-free labelling materials like Forest Film and fossil-free adhesive and labelling materials containing post-recycled content.	Collaboration with Ellen MacArthur Foundation on CE100 circular economy programme and The New Plastics Economy initiatives. Participation in the Sustainable Packaging Coalition. Partnership with WWF Poland on "Rivers for Life" and circular economy projects.	Engaging with key media regionally. Building global thought leadership in sustainability and innovations through blog posts, social media, events and exhibitions.
UPM SPECIALTY PAPERS	Environmental education and local Biofore Share and Care activities in Finland and China. In China, several projects to promote reading skills, such as "Green bookshelf" and "Mini Library". In Finland, local youth sports initiatives.	Co-operation with government departments on High-Tech Enterprise Status of UPM Changshu. Participation in government and industry associations programmes on environmental protection and industry standards. Joining Cepi's 4evergreen initiative to boost sustainable fibre-based packaging.	Supplier audits and training on compliance, UPM Supplier and Third Party Code, responsibility and safety.	2019 FSC® Asia-Pacific Leadership Award. Promoting sustainable forest products with WWF and FSC. Tree planting day with China Green Foundation.	Engaging with key media, mill visits and social media development.
UPM COMMUNICATION PAPERS	Partnership with Stiftung Lesen continued. Community engagement at mill locations through micro-sponsorships. Recruitment activities focused on apprentices and students. Partnering with Plant-for-the-Planet. UPM Blandin carbon offset project continued.	Discussions on the operating environment and competitiveness of the Finnish forest industry. Contribution to industry and government expert groups on energy, RCP and wood sourcing in Central Europe. Joint Jury work on environmental award with environmental ministry in Germany.	Joint forest days for customers. Joint exhibitions on forestry topics. Safety training with contractors. Continuous dialogue and development of sustainability related co-operation.	Chairmanship of the board of Biodiversity in Good Company. Member of B.A.U.M. environmental initiative. Joint Jury work on environmental award with NABU.	Mill visits and background meetings, active dialogue around various topics. Promoting sustainable advantages of paper. Initiating a paper campaign launched by the German paper association.
UPM PLYWOOD	Inauguration of UPM Chudovo plywood mill extension in Russia. Open doors event at UPM Pellos in Finland. Apprenticeship and summer worker programmes at the mills.	Collaboration with local authorities at mill sites. Promoting wood building and building code development.	Briefings on supplier compliance.		Working with local media on locally relevant stories, press releases regarding products, events and investments.
UPM FOREST	Local events on modern forestry methods and sustainable forestry. Dialogue on logging plans. Co-operation project with Centre for Economic Development, Transport and the Environment to remove migration barriers of fish continued. 1200 forest trips for Finnish 6th grade students.	Discussions with EU and Finnish politicians and authorities on forest and biomass policies. Discussion with Finnish authorities on sustainable forestry and active forest ownership promotion.	Supplier audits. Joint UPM Safety Team. Management training programme for contractors. Nature management training. Griffin e-learning environment.	Joint projects with WWF Finland, Osprey Foundation and North Karelian Ornithological Association. Meetings and forest visits. Continuous dialogue. FSC® standardisation work. A biodiversity target work started.	Press conferences and background discussions on new products and services and the wood market. Working with local media on locally relevant stories.
UPM BIOCHEMICALS	Co-operation with universities and research institutes in Finland and Central Europe. Development cooperation with start-ups, technology suppliers and SMEs.	Discussions with Finnish and German politicians and authorities about investments. Discussion with EU authorities on bio-based materials and policies.	Continuous dialogue and development of co-operation with key suppliers and service providers.		Interviews and presentations. Coverage on trade press, especially in Finland and Germany.
UPM BIOMEDICALS	Global co-operation with universities, pharma, hospitals and research institutes. Development co-operation with start-ups, technology suppliers and SMEs.	Discussion with EU authorities and advisory groups on bio-based materials and medical device requirements.	Continuous dialogue and development of co-operation with key suppliers and service providers. Supplier qualification and audits.		Interviews, coverage in trade press and scientific publications. Involvement and promotion of co-innovation projects supporting improvements in disease diagnosis and treatment.
UPM BIOCOMPOSITES	Technology development co-operation with universities. Participation in housing fairs and exhibitions. Closed material circulation in production.	Active participation in national and Europe-wide wood plastic composite standardisation development.	Supplier mapping and categorisation. Supplier qualifications and audits. Continuous dialogue with main suppliers.		Promotion of new products and solutions such as UPM ProFi Piazza and UPM Formi EcoAce.

ENABLING PEOPLE GROWTH

Our people and their capabilities, integrity and drive set UPM apart and drive our success. Our culture of Aiming Higher sets the tone for everything we do and encourages all UPMers to develop, as individuals and as a company. Our values –Trust and be trusted, Achieve together and Renew with courage – guide us along the way.

Full time **97%**	Part time **3%**
Women **21%**	Men **79%**
Permanent **88%**	Fixed term **12%**
Shop-floor **60%**	Salaried **40%**

Continuously aiming higher
Building a culture of Aiming Higher is essential to our success in today's rapidly changing world. While it sets our tone, our values remain the foundation of who we are. Our strengths are our accountability and performance-driven approach. In the future, we want to focus more on innovation and being more outward looking, as well as agility and co-operation across boundaries.

Our aim is to increase employee motivation to drive performance. We also want to better differentiate and reward high performance. As a result, we introduced the Enabling Performance approach, which encompasses frequent and forward-looking manager-employee discussions, agile goal setting and regular feedback from relevant stakeholders. The results have been good and according to the annual UPM Employee Engagement Survey (EES), all these aspects have improved from the previous year. In 2019, Enabling Performance has expanded to cover most salaried employees.

Engaging employees
We are committed to active employee participation and consultation, organised in accordance with international and national rules and regulations. We offer various forums to facilitate continuous dialogue between employees and business management, and there are new communication tools and channels that ease and enhance dialogue within and across teams.

UPM continues its cooperative body, the UPM European Forum, which focuses on issues related to our business environment and changes within the company. The forum organises regular meetings for employee representatives from business units operating in Europe. There are also cooperative bodies in UPM countries, operating based on country-specific rules, regulations and UPM practices. The aim is to promote employee participation and dialogue between UPM business areas and country management, and employee representatives and employees on a national level.

We continuously measure our progress, and the results illustrate successful development in engaging our people. The annual UPM Employee Engagement Survey (EES), which invites all employees across the company to evaluate distinct aspects of their working environment every year, has a high participation rate of 84% (84%). This indicates that UPMers are keen to improve their workplace. The survey shows that employee engagement has improved steadily over the last ten years, from 55% in 2010 to 71% in 2019.

Encouraging learning
In the changing and increasingly complex business environment, enhancing employees' capabilities and wellbeing is important for both business success and sustained employability. Ensuring high performance and continuous professional development is UPM's long-term goal. We are determined to be a responsible and attractive employer, now and in the future.

We encourage our employees to pursue professional growth and support them in developing their skills. We aim for all employees to have an individual development plan. In 2019, 65% of employees had such a plan.

UPM applies the 70-20-10 learning and development framework: 70% of the learning takes place on the job, 20% comes from sharing with and learning from colleagues, and 10% comes from off-the-job training. An increasingly popular learning method is digital learning. Digital learning content can be created and shared flexibly in UPM's learning platform. It is offered more and more to develop commercial and financial skills, compliance, safety, and manager onboarding, for example.

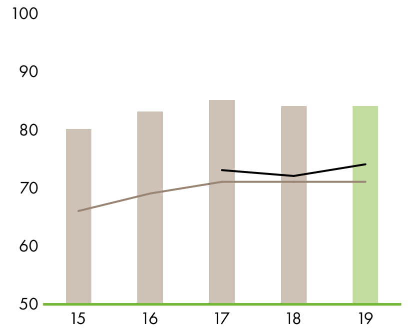
Enabling renewal through recruitment programmes
Our apprenticeship programmes are ways to ensure the required level of expertise for future employees. The programmes are typically targeted at shop-floor positions in production or maintenance. UPM conducts the programmes with regional vocational schools. In Finland and Germany, approximately 100 people join the programmes annually. Most of the graduated apprentices have continued to work at UPM.

Being the employer of choice has become crucial when recruiting new employees and especially younger professionals. We have organised several successful graduate programmes in recent years and will continue to do so annually. We continuously develop our employee experience using a design thinking approach. In 2019, the focus was on creating a smooth and engaging onboarding experience for people joining UPM.

Following our systematic employer branding work, our position among students and professionals has been recognised by external parties in Finland and China.

Leading by example
Achieving our ambitious targets requires the committed input of skilled people and teams, empowered by inspiring leaders.

Employee engagement and enablement index



2030 TARGETS
Engagement and enablement favourable responses above external high performance norm

71% achieved for engagement index. 3%-points below external norm.

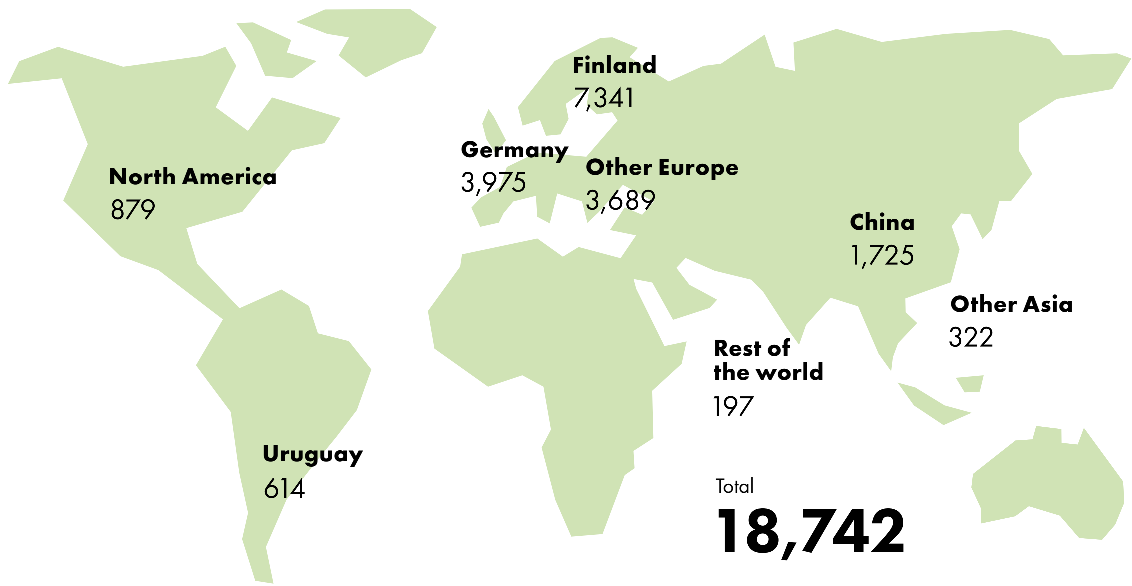
74% achieved for enablement index. On par with external norm.

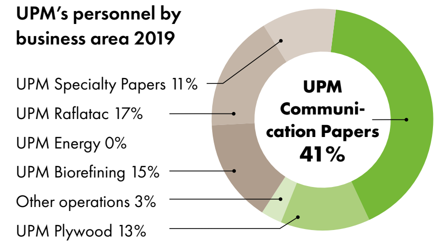
SIGNIFICANCE
- The capabilities, integrity and drive of our people make us unique

TARGETS
- Aim higher in performance
- Lead with passion
- Embrace the limitless opportunities
- Raise the bar in our safety performance

OUR WAY
- Lead according to UPM values and with integrity
- Develop an inclusive and diverse work environment
- Engage employees
- Enable performance with agile goal-setting and feedback
- Invest in the growth of our people and develop new competences
- Provide a safe and healthy working environment and foster the wellbeing of employees and contractors

OUR EMPLOYEES BY REGION





2030 TARGETS 95% favourable responses in the Diversity and inclusion index

70% favourable in Employee Engagement Survey 2019

UPM continuously invests in developing leadership capabilities and management teams. Our development programmes support our three corner-stones of leadership: leading oneself, leading people and leading business. Dealing with complexity, improving coaching capabilities and promoting inspiring leadership have been the key areas of development in recent years.

In 2019, leadership development focused on front-line and middle managers, as they lead most of our employees. UPM continued to foster a growth mindset and improve the skills needed to enable performance, such as conversation and feedback skills. By the end of 2019, approximately one fifth of UPM managers had completed the programme on achieving quality conversation skills and improved feedback.

Developing a diverse and inclusive work environment

We value diversity and strive for an inclusive culture. We respect the privacy of our employees and promote equal opportunities and objectivity in employment and career development. In addition to building a culture of Aiming Higher, we are committed to developing local conditions that ensure an inclusive and diverse working environment.

UPM PERSONNEL IN FIGURES	2019	2018	2017
Turnover %	9.2	8.9	9.2
Turnover % (voluntary)	4.0	4.1	3.9
Average age of personnel	44.3	44.0	44.5
People development			
Average training hours/ employee	12	12	13 [1]
OHS figures, UPM workforce			
Lost-time accident frequency	2.9	2.7	3.3
Total recordable injury frequency	7.1	6.9	8.2
Absenteeism % [2]	4.0	3.9	3.8
Number of occupational diseases [2]	6	6	17
OHS figures, contractors			
Lost-time accident frequency	4.2	3.3	7.0
Total recordable injury frequency	6.2	5.8	9.4

[1] Reflects active employees
[2] Reflects own employees

To further develop inclusive leadership and culture, UPM started a dialogue with management teams in 2019 and this work will continue in 2020. Approximately 600 people participated in the dialogue in autumn 2019.

We regularly review our diversity status. UPM management teams regularly conduct self-assessments that include diversity and inclusion. We welcome the talent of people with different competencies, backgrounds and experiences, as well as genders, ages and nationalities. This contributes to a richness of views, thereby improving decision-making and business success. Inclusive behaviour is integrated into UPM leadership development programmes and emphasised in UPM Code of Conduct training.

Rewarding and recognising high performance

UPM rewards and recognises high performance. Our approach to compensation consists of base salary, benefits and incentives, which are determined by UPM's global rules, local legislation, general agreements, local market practices, the level of the position and individual performance. Gender, age, ethnic origin and nationality play no role in determining salaries and wages.

Intangible recognition is included in the total reward portfolio, which means that UPM provides, for instance, a safe and healthy working environment, interesting and meaningful work and good leadership and career opportunities. UPM designed its reward policy to increase employee commitment to and motivation for high performance.

Each employee belongs to a unified annual Short-Term Incentive (STI) scheme. The STI scheme covers group and business-level targets, personal and team performance targets and individual performance evaluation, to differentiate and reward high performance.

The annual incentives paid in 2019 for the 2018 STI plan were EUR 61 million and the estimated amount of annual incentives for the 2019 STI plan is EUR 53 million. To recognise significant individual or team success, we have a separate Achievement Award system. It is designed to support UPM's high-performance culture and recognise individuals and teams for outstanding contribution, significant achievements and exceptional performance.

In addition to the Short-Term Incentive scheme, we provide two long-term incentive plans: Performance Share Plan (PSP) for senior executives and Deferred Bonus Plan (DBP) for other key employees. Launched annually, the plans cover approximately 400 employees.

Restructuring to ensure cost competitiveness

In restructuring situations, we follow local labour laws and work in close co-operation with various authorities and other external parties and take active measures exceeding mandatory obligations to promote retraining, re-employment and relocation within the company. We also offer different kinds of outplacement programmes.

UPM Communication Papers has taken action to ensure competitiveness and profitable paper production by closing paper machines and by taking other restructuring measures in 2019. The business area permanently closed paper machine 10 at UPM Plattling, Germany, and paper machine 2 in Rauma, Finland. These measures affected 155 employees in Germany and 179 employees in Finland. In addition, UPM announced its plan to sell or close its Chapelle newsprint mill in France by the end of Q2/2020. The plan will affect 236 employees.

In addition, other business areas and functions are taking action to ensure cost-competitiveness and UPM has established a new Business Services Hub into Wroclaw, Poland. In total, 168 positions in 11 locations are to be transferred to the new hub, which will be fully operational by the end of Q3/2020.

CASE

DIVERSITY BRINGS NEW PERSPECTIVES

People with different competences and backgrounds who are committed to UPM company values and culture contribute to higher team performance and help businesses succeed. They bring out new perspectives in decision-making and help to provide a wider understanding of various scenarios.

UPM started a dialogue on developing inclusive leadership in 2019. Workshops on diversity and inclusion have been carried out in management teams across UPM. Work will continue in 2020.

Workshops have shown that diversity is often simplified as a gender, nationality or age issue, but there are many invisible factors in each individual's background, such as work history, personal experiences, language and so on. A term repeated often in the workshops was "unconscious bias". There are stereotypes, prejudices and personal experiences that may be difficult to recognise, but which affect our decisions and behaviour.

However, diversity without inclusion will not improve performance in the way that is expected of diverse teams. Also, we cannot bring the best out of people and their potential without inclusive culture. If UPMers ensure that team members are encouraged to contribute to company development and ideas are listened to, diversity becomes a big asset.

STRENGTHENING OUR SAFETY CULTURE

Our proactive safety culture is based on our values, the UPM Code of Conduct and UPM Safety Rules.

In 2019, our OHS focus areas were contractor safety and the evaluation of the ISO 45001 occupational health and safety management system in all businesses. We have continued our work on the six life-saving standards and identification of the top risks, as well as OHS auditing. Annual safety audits are an integral part of our OHS management system. Cross-functional auditing provides valuable feedback about selected OHS processes and daily activities.

In 2019, we focused on further involving every employee in safety. New e-learnings on safe driving and travelling and the six UPM life-saving standards were launched. The UPM Safety Summit brought together over 90 business leaders to learn about the latest world-class safety solutions and the human factor. The event was dedicated to our shared commitment to a zero-accident mindset and creating new momentum in safety.

We actively use the global One Safety tool for proactively reporting safety incidents. All our employees and contractors are required to report all near-misses and to make safety and environmental observations.

One Safety tool supports us in achieving our targets and allows us to proactively share the insights gained from incidents across the company. The tool also supports effective safety steering and OHS risk management. The One Safety mobile application, which allows employees to report their observations immediately, was launched in 2019.

Promoting employees' health and wellbeing

We are working closely with employees and external occupational health organisations to support the wellbeing of our personnel. Our aim is to support the continuous improvement of employees' health, quality of life and ability to perform.

Wellbeing topics are covered in e-learning training sessions, which are highly applicable to both work life and free time.

Based on local need, we also launched several health and wellbeing initiatives at various UPM sites and in various businesses.

Having a zero-accident mindset

In 2019, UPM's lost-time accident frequency (LTAF: the number of lost-time work accidents per one million hours of work) was 2.9 (2.7). The total recordable injury frequency (TRIF) was 7.1 (6.9). The TRIF includes LTA cases as well as cases of modified duties and accidents requiring medical treatment. The frequency of accidents involving UPM's contractors was 4.2 (LTAF) and 6.2 (TRIF) in 2019.

Despite our efforts for continuous improvement, there was one fatal accident and three serious accidents in 2019. The accidents were thoroughly investigated and corrective actions were taken. Key learning points were also shared in order to prevent serious accidents in the future.

Our permanent target is to have zero accidents, with good safety performance recognised through company-wide safety awards. In 2019, the UPM Hürth paper mill in Germany received the UPM Safety Award for making long-term improvements.

In 2019, a total of

51,000

safety-related near-miss and safety observation reports were recorded

34,000

safety walks and discussions took place

CASE

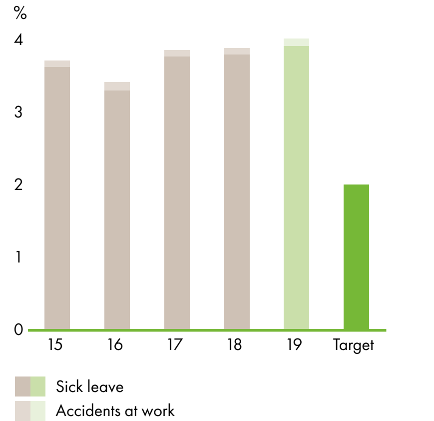
SETTING THE BAR TO ZERO ACCIDENTS

Top management from corporate and mills gathered together at the UPM Safety Summit in Augsburg to discuss safety. Although the number of lost-time accidents has significantly declined over the past few years, our ultimate goal is to prevent all serious accidents.

Safety and wellbeing have a direct impact on employee engagement and our business success. We have to pay more attention to our achievements and positive safety results.

Having an established safety culture is the primary concern. We are pushing for leadership that encourages people to act responsibly. When people feel that they can have an impact on issues, they are more engaged with maintaining safety.

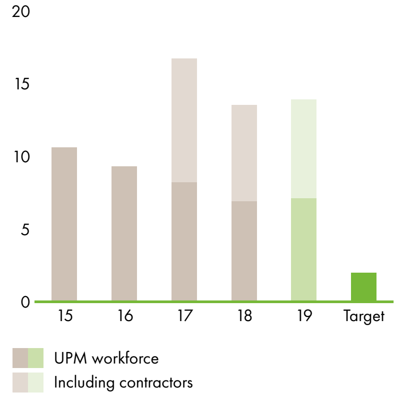
Absenteeism rate



2030 TARGETS Absenteeism rate below 2 for UPM employees

4.0 achieved for "% absence hours from theoretical working time"

Total recordable injury frequency (TRIF)



2030 TARGETS TRIF below 2 for UPM workforce and contractors (continuous)

6.8 achieved for "Total injuries per one million hours worked"

MAKING THE RIGHT CHOICES

We are committed to complying with the applicable laws and regulations, as well as our Code of Conduct, regardless of the location, situation or people involved. Our Code of Conduct and our values help us make the right choices and guide our work in the changing business environment. This builds the foundation for long-term success.

Our compliance system is embedded in our governance model and is designed to support company performance and a culture of integrity at all levels. We follow the development of this culture with the help of the Integrity Index, which is an average calculated on the basis of favourable responses to integrity-related questions in our annual Employee Engagement Survey (EES). These questions are:

1. I understand the UPM Code of Conduct and ethical standards.
2. If I had to report unethical behaviour or misconduct, I am confident that it would be handled effectively by UPM.
3. UPM operates in an ethical manner and in accordance with the UPM Code of Conduct.

Our integrity index figure in 2019 was 86% (86%).

The main emphasis of our compliance system is on preventive actions, which are based on the annual risk management cycle and risk assessments conducted for all businesses and operations. Our compliance system and actions within this system are demonstrated in the illustration on the right.

Actions to ensure compliance

We strive to ensure compliance with our values and commitments by training our employees, raising awareness through active communication and developing our risk management, monitoring and reporting processes.

OUR MAIN PRINCIPLES UNDER THE UPM CODE OF CONDUCT

- **We are** committed to integrity
- **We respect** people and human rights
- **We take care** of our environmental impact and product safety
- **We have** zero tolerance for corruption and bribery
- **We avoid** conflicts of interest
- **We comply** with competition law
- **We protect** our assets and information
- **We know** with whom we trade
- **We engage** with our stakeholders and society
- **We voice** our concerns

Our compliance team held several training sessions related to the launch of the updated Code of Conduct. One of these sessions was held at our Changshu paper mill in June.

SIGNIFICANCE

- Compliance is an integral part of responsibility, one of our strategic focus areas
- Compliance helps us to create sustainable business in the long term
- Compliance is an important asset in our decision making, management and operations

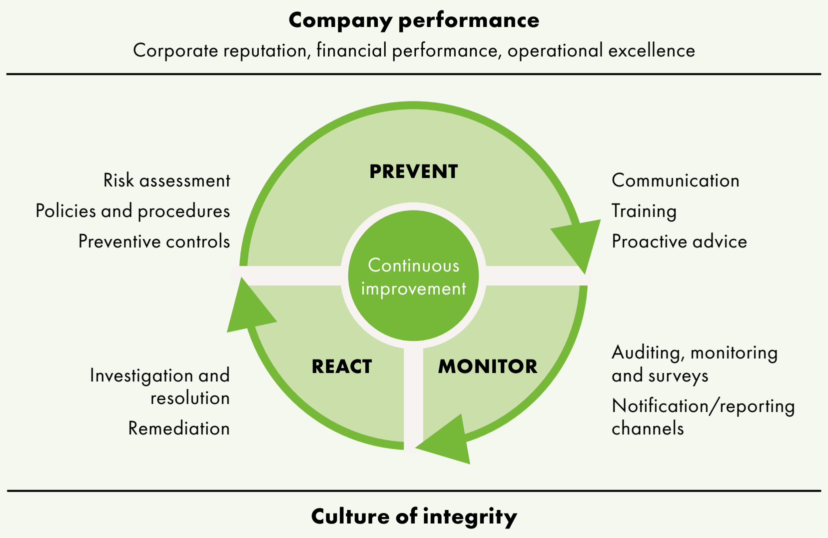
TARGETS

- Compliant operations and behaviour
- Engaging work environment where employees feel safe to voice their concerns
- Responsible value creation

OUR WAY

- We are all responsible for building a culture of integrity, with everything we do and every choice we make
- We do not compromise our standards of integrity under any circumstances
- Accountability for compliance extends down from the Board of Directors and senior management to all employees

UPM COMPLIANCE SYSTEM



Risk assessment

With the support of our compliance team, each business area, function and unit is responsible for identifying, measuring and managing compliance risks related to its own operations. The results of annual risk assessments and discussions are used to guide compliance activities and mitigation actions.

An example of our compliance team's mitigation actions is the counterparty risk management project, which was initially launched in 2017 and continued into 2019 with the implementation phase and launch in April. As a result of this project, we now have a new tool and improved processes for the management of risks relating to our numerous counterparties in different countries and continents. We want to know who we are trading with and to source even more responsibly. We also want to be able to manage uncertainties relating to trade sanctions more effectively. The new tool supports us in preventive decision making with automatic screening and alert functionalities and provides us with improved tracking and documentation trails.

Policies and procedures

The UPM Code of Conduct was updated during the year to ensure that it covers all major compliance risk areas and continues to reflect our transformed business operations, evolving business environment and stakeholder expectations. The updated Code of Conduct was approved by the Board in April. It now includes a new section on

19

the number of languages in which the UPM Code of Conduct is available on theUPM Intranet and on the corporate website upm.com/governance

86%

Integrity index based on Employee Engagement Survey results

Code of Conduct training

2030 TARGETS

100% coverage of participation in UPM Code of Conduct training (continuous)

96% of active employees completed the new UPM Code of Conduct training since September 2019

conflicts of interest and places more emphasis on the importance of safety, non-harassment and speak-up culture.

Following the Board's approval of the updated Code of Conduct, the Group Executive Team approved updates to several rules given under the Code of Conduct, including Anti-Corruption Rules, Supplier and Third Party Code and Confidentiality Rules.

Training and communication

Our compliance trainings are supported by active communication. As our employees' awareness of what is expected from them is a prerequisite for compliance, we continued to allocate further resources to this.

In 2019, the launch of the updated Code of Conduct was followed by extensive communication and training efforts to enhance our employees' awareness and understanding of its contents. These efforts included launching mandatory e-learning for all employees (read more on the right), with targeted trainings for salaried and shop floor employees, preparation of materials for manager training and team discussions, as well as the launch of the Code of Conduct mobile application called UPM Code App. In addition, a printed copy of the updated Code of Conduct was distributed to all employees. Tailored version of the Code of Conduct with the most relevant contents was distributed to employees in the production environment.

The Code of Conduct e-learning is complemented by other compliance training, including face-to-face training with specific target groups, who are defined based on risk assessments. Our e-learning modules are available under the same HR platform and easily accessible to our employees. Thanks to this platform, we are able to manage our training effectively through automated reminders and escalation processes, and we can also easily produce training reports. Available compliance e-learnings with the completion rates at year-end are listed in the table below.

Monitoring

Our group company risk matrix, which is based on country risk and complexity and theextent of our operations in each country, forms the basis for monitoring activities aimed at ensuring compliance at all levels of the organisation. Our compliance team has a three-year monitoring plan for its compliance reviews that is based on this matrix. The reviews to be performed each year are agreed with the businesses during the annual risk assessment process and coordinated with Internal Audit. The compliance review findings and recommendations are reported to the Audit Committee of the Board of Directors and businesses, and implementation of these recommendations is executed in collaboration with said businesses.

In 2019, the compliance team conducted compliance reviews in group companies located in eight different countries in South America, Africa, Asia and Europe.

Reporting

It is an important part of our culture of integrity that employees feel comfortable to voice any concerns they have and can trust UPM to take the appropriate action. If we are worried about anything, we must speak up and take action.

The UPM Report Misconduct channel is available on the corporate website for all stakeholders and on the UPM intranet for our employees. Stakeholders and employees may use this channel to report to our Head of Internal Audit, Chief Compliance Officer and Security Director any complaints or concerns they have in relation to violations of the UPM Code of Conduct, any policies or rules thereunder or any applicable laws or regulations. Our employees can also report any suspected or observed breach or misconduct to either their managers or a representative of UPM Legal, HR or Internal Audit functions. We do not tolerate retaliation against any person who, in good faith, reports suspected misconduct or participates in an investigation to resolve suspected misconduct.

The table on the previous page summarises the number of cases reported either through the Report Misconduct channel or directly to Internal Audit. Two cases related to discrimination. Five cases led to disciplinary action, including warnings and terminations of employment.

> upm.com/compliance

COMPLIANCE TRAINING FOR SPECIFIC TARGET GROUPS IN 2019	COMPLETION RATES AS OF 31 DECEMBER 2019	SIZE OF TARGET GROUP
Code of Conduct e-learning *)	96	18,300
Personal data protection e-learning	99	7,300
Anti-corruption e-learning	99	7,300
Competition law e-learning	99	3,300
Confidentiality e-learning	99	7,300
Insider Policy e-learning	99	370

*) Training for the updated Code of Conduct started in September 2019.

REPORTED CASES UNDER REPORT MISCONDUCT CHANNEL		
UPM Code of Conduct section	**2019**	**2018**
Our commitment on integrity	1	1
Our people and operations		
Respect people and human rights	20	20
Taking care of the environmental impact and product safety	2	2
Business Integrity		
Zero-tolerance of corruption and bribery	3	0
Avoid conflicts of interest	1	8
Compliance with competition laws	1	0
Protect assets and information	2	2
Our Stakeholders		
Know with whom you trade	1	0
Total	**31**	**32**

COMPLIANCE MONITORING

REGULAR DISCUSSIONS WITH MANAGEMENT, monitoring significant projects, training rate monitoring, implementation of risk mitigation plan

REGULAR COMPLIANCE REVIEWS based on group company risk matrix

UPM BUSINESS AREAS AND OTHER OPERATIONS

REGULAR DISCUSSIONS WITH EMPLOYEES, third party due diligence and risk monitoring, reports through UPM Report Misconduct channel, EES and other employee surveys

CASE

GAMIFICATION BRINGS CODE OF CONDUCT TO LIFE

The Code of Conduct, updated in 2019, is a compass for us, guiding our conduct and actions and helping us to make the right decisions at work. All employees were required to take the mandatory Code of Conduct e-learning. To make the e-learning more relevant and engaging, a gamification design approach was taken.

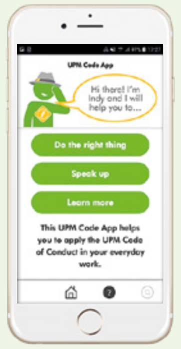
In the e-learning training, our employees are given real-life situations that could happen to anyone and asked what they would do in a similar situation. The story spans one day, from the breakfast table to returning home from work, and the e-learner is one of its characters.

If your colleague's posts on social media share too much information, what do you do? If your colleague is harassing your teammate, do you confront him? If your colleague suggests her partner for a job at UPM, how do you react? The characters involved in the scenarios gain or lose points based on the answers given.

The e-learners are given multiple answers to choose from in each situation and, by design, the answers aren't clear-cut – there can be more than one right answer. This way, the e-learning training imitates real life: you do not always immediately know the right choice but have to consider the situation from different angles.

The gamification of the e-learning has proven successful. According to feedback, the Code of Conduct is more meaningful. E-learning is a game, but the message comes through clearly.

Making the content and spirit of the Code of Conduct more relatable to us and helping us see how it can guide us in our everyday work builds a culture of integrity in everything we do and every choice we make.



UPMers can now easily check the right thing to do with the UPM Code App. The application provides easy access to the Code of Conduct, checklists on different situations and guidelines on how to make the right decisions. It is also a quick way to access the UPM Misconduct Channel to voice concerns.

OUR VALUE CREATION GENERATES TAX REVENUE

SIGNIFICANCE

- Our good financial performance also generates higher tax revenue
- We are strongly committed to continuously improving our economic and social performance
- Our businesses play a leading role in contributing to societal development through the tax revenue they generate

OUR WAY

- Based on the standards of the UPM Code of Conduct, the UPM Tax Policy describes the main principles and guidelines of UPM taxation
- Taxes are paid in accordance with local tax laws and regulations of the country in question
- We pay corporate income taxes in the countries where added value is created and profit is generated

UPM's effective tax rate in 2019 was 17.9% (18.6%) and cash tax rate 13.5% (13.7%). The corresponding corporate income taxes reported in 2019 were EUR 234 million (EUR 342 million), and corporate income taxes paid in 2019 were EUR 176 million (EUR 252 million). In addition to taxes on income, UPM's various production inputs and outputs are also subject to taxation, which is either paid by UPM (e.g. energy taxes and property taxes such as taxes on real estate) or collected by UPM (e.g. VAT, payroll taxes and social security contributions).

In the table below, we report the corporate income taxes paid and property taxes in main countries. Based on UPM's corporate and operational structure, UPM reports and pays its corporate income taxes mainly in countries where production activity takes place and innovations are developed. UPM follows the arm's length principle in related party transactions.

In accordance with UPM's Tax Policy, the locations of its companies are driven by commercial rationale and business reasoning. UPM does not have any investments in production or service operations in jurisdictions defined by the Council of the European Union as non-cooperative jurisdictions for tax purposes or in any similar secrecy jurisdictions. A list of UPM subsidiaries and joint operations and their country of incorporation can be found on page 198–199.

In Finland, UPM has significant production operations across all its six business areas, as well as research and development operations. Accordingly, UPM is one of the major taxpayers in Finland. In 2019, UPM's corporate income taxes in Finland are estimated to be EUR 137 million (EUR 200 million), of which subsidiaries report and pay approximately EUR 94 million (EUR 80 million). The remaining figure of approximately EUR 43 million (EUR 120 million) is reported and paid by UPM-Kymmene Corporation.

In Uruguay, the government has granted many free trade zone permits for domestic and foreign investments. The Uruguay government has granted UPM's pulp mill a permit to operate in a free trade zone, whereby taxes in Uruguay consist mainly of property tax and annual tax-like charges paid to the government for the development of the zone. The new pulp mill under construction in Uruguay will also be located in a similar free trade zone.

In China, regarding fine paper production, UPM qualifies as a high-tech enterprise with a reduced corporate income tax rate of 15%. UPM also pays withholding taxes on dividends in China. In those countries where UPM's companies are using tax losses from previous years to offset the tax liability of the year in question, such as Germany, no or only limited corporate income taxes are paid.

CORPORATE INCOME TAXES PAID AND PROPERTY TAXES BY COUNTRY

EURm	2019	2018
Finland	**150**	215
Germany	**17**	13
Uruguay	**15**	13
China	**7**	17
United Kingdom	**6**	5
France	**5**	5
Russia	**3**	5
Estonia	**2**	4
Other	**6**	6
Group total	**211**	283

DIRECT ECONOMIC VALUE GENERATED AND DISTRIBUTED BY UPM IN 2019 (EUR MILLION)

Direct economic value created		Economic value distributed	
		Operating costs	–7,314
Sales	10,238	Employee wages and benefits	–1,214
Income from sale of assets	14	Payments to providers of loans	–49
Income from financial investments	4	Dividend distribution	–693
Other income	93	Corporate income taxes paid and property taxes	–211
		Donations	–0
Total	**10,349**		**–9,481**
Economic value retained 868			

UPM's economic impact is significant in the surrounding communities. The company's operations contribute to local, regional and national economies by generating economic benefits for different stakeholder groups. The related direct monetary flows indicate the extent of added value globally.

Tax compliance

UPM Tax Policy is supported by internal instructions, benchmark analysis of best practices and related internal controls. Tax matters are managed by UPM's tax function, which is complemented by third-party tax services to comply with local tax reporting, filing and other requirements.

The Audit Committee of the Board of Directors is responsible for the supervision of tax risk management as part of UPM's risk management processes. UPM's internal control and risk management operations review tax risks regularly and update the control framework together with the tax function. More thorough review of the tax practices of customers and suppliers is a part of UPM's counterparty risk management processes. UPM aims to co-operate transparently and proactively with tax authorities, and values dialogue with other important stakeholders concerning taxation. In Finland, UPM co-operates with the Finnish Large Taxpayers' Office.

Energy taxation at various levels of the value chain

Taxation of end products

In addition to taxes on income, UPM's various production inputs and outputs are subject to taxation.

Energy taxation is especially relevant to UPM in various countries. This refers to excise tax on liquid fuels, as well as electricity and some other fuels. Energy taxation is subject to detailed regulation at country and EU levels.

The majority of UPM's electricity production is hydropower or combined heat and power (CHP) production at mill sites, where most of the fuels used in energy production are from renewable sources. The electricity produced by UPM is subject to electricity taxation, regardless of which sources are used.

Renewable UPM BioVerno diesel and naphtha, which are produced from crude tall oil, a residue of the pulp production, are also subject to energy taxation. The energy tax rates for transport fuels from renewable and sustainable sources, like UPM BioVerno, are lower than those of fossil fuels.

Taxation of raw materials and other inputs

UPM is also a significant energy consumer, especially for paper production. Most of the energy used in the production processes is subject to energy taxes, although there are various tax rates and exemptions depending on the type of use.

UPM pays a significant amount of energy tax on fuels as part of logistics costs, especially for road transportation.

Compensation for paid energy taxes for global cost-competitiveness

Within the EU, energy taxation laws allow member states to compensate for the taxes paid or apply lower tax rates for energy-intensive industrial production or other activities. Many of the main countries in which UPM has production facilities, for example Finland and Germany, offer such tax relief because the level of energy taxation has increased significantly in recent years.

In Finland, electricity is taxed at a lower rate when used in industrial production, at 6.9 EUR/MWh, while the tax rate for other-than-industrial use is 22.4 EUR/MWh. Energy-intensive industries also receive a retroactive refund of energy taxes paid based on a separate application, if the amount exceeds a threshold dependent on the company's added value. For UPM, this retroactive refund paid in 2019 (for energy taxes paid in 2018) amounted to approximately 74% of paid energy taxes. This is on the same level as a typical refund rate for companies operating in the manufacture of paper and paper products according to a report published by VTT Technical Research Centre of Finland.

It is possible to apply for a similar retroactive energy tax refund in Austria, while in the UK and France, relief is granted upfront in the form of lower tax rates for energy-intensive industrial users fulfilling specific requirements. In Germany, there are energy tax relief schemes that companies can apply for in advance; some are available retroactively if the company meets various eligibility criteria.

UPM benefits from certain subsidy schemes or feed-in tariffs related to renewable energy production, such as EEG (Erneuerbare Energien Gesetz) compensation for energy-intensive industries in Germany and operating aid for wood fuel power plants in Finland.

› UPM's assets and capital expenditure by country page 158
› UPM's Tax Policy is available on upm.com/governance

RESPONSIBLE SOURCING

A cost-effective supply chain is a significant part of our value creation. The long-term development together with our suppliers guarantees a well-functioning and responsible supply chain.

UPM buys products, materials and services from over 24,000 b-to-b suppliers globally. Our sourcing network includes suppliers from start-up companies to international corporations. In addition, UPM buys wood from some 18,000 private forest owners.

The main sourcing categories are fibre, chemicals, other raw materials, indirect purchases, logistics and energy. Long-term reliable deliveries, product and service quality, financial stability of suppliers, social and environmental responsibility, and product safety are taken into consideration when selecting suppliers.

Cost-efficiency and continuous development

The aim of co-operation between UPM and its suppliers is to ensure compliance, competitiveness and systematic performance. A common goal is to guarantee that suppliers can provide responsibly produced, cost-competitive and innovative materials and services globally – in all market situations.

The supply chain's long-term development work has continued in several projects with suppliers. In terms of digital solutions, UPM decided to use a single platform to standardise and simplify sourcing processes, such as demand planning, tendering, contracting and purchase transactions. The aim is to improve process efficiency and transparency as well as to integrate suppliers transparently to business processes. The solution will be put into operation in 2020.

Suppliers are bound by the same rules

We are committed to responsible sourcing practices in our Code of Conduct. All the minimum requirements for suppliers are defined in the UPM Supplier and Third Party Code. In 2019, the UPM Supplier and Third Party Code was revised in line with the updated UPM Code of Conduct.

We require suppliers to promote the same requirements in their own supply chains. In 2019, 84% (83%) of UPM total spend was qualified against the UPM Supplier and Third Party Code.

All contractors working at our production facilities must comply with UPM's safety requirements. Various additional requirements are applied to wood, chemicals, pulp, packaging materials and logistics.

All our wood, pulp and recovered paper suppliers are continuously evaluated in regard to environmental issues, social responsibility and their involvement in the local community. These raw materials are either FSC® and PEFC™ certified or comply with the FSC Controlled Wood standard or Due Diligence requirements for PEFC.

A prominent user of wood and recovered paper

We are both a major forest owner and a purchaser of wood. We source all wood assortments to ensure optimal utilisation of this valuable raw material. In 2019, we purchased 27.5 (27.6) million cubic metres of wood worldwide.

We are also the world's leading user of recovered paper for the production of graphic paper. In 2019, we used approximately 2.3 (2.5) million tonnes of recovered paper. Recycled fibre is approximately 30% of all fibre raw materials used in UPM's paper production.

The origin of wood is monitored

All the wood used is legally logged and comes from sustainably managed forests. We don't use wood harvested from tropical rainforests or accept wood from plantations that have been established by destroying natural forests. We don't accept wood from regions that do not respect the rights of indigenous peoples. All of our wood supplies are covered by third-party-verified, FSC® and PEFC™ certified chains of custody.

We also verify that the wood supplied to our mills is compliant with the EU Timber Regulation, the US Lacey Act and other regional requirements.

Continuous improvement with raw material suppliers

UPM buys approximately 1.6 million tonnes of chemical pulp from external suppliers. We set further requirements to pulp suppliers for environmental performance, social responsibility, forestry, wood sourcing and reporting.

Collecting and analysing environmental- and social responsibility-related data for our pulp and chemical suppliers is an integral part of our supplier risk and performance management. We create development plans together with the suppliers based on these analyses. We also monitor the performance of our other raw material suppliers through various surveys.

Know your supplier

UPM carries out supplier risk assessments. The responsibility-related risks are determined by the country of origin, sourced material and complexity of supply chain. Based on the risk assessment, selected suppliers' activities are evaluated in more detail through annual surveys, supplier audits and joint development plans. Last year, UPM's own trained auditors and external auditors carried out 185 audits, based on identified risks, including human rights, social and environmental topics.

If any non-conformities are discovered, the supplier is required to take corrective measures. We monitor the implementation of these measures and provide support for improving the suppliers' operations if needed. However, some contracts may have to be discontinued due to insufficient measures or the seriousness of UPM's findings.

In relation to CO_2 emissions and water-related risks caused by supply chains, the focus is on monitoring pulp suppliers' CO_2 emissions and water consumption.

An effective third-party management plays an essential role in securing business continuity and compliance. In 2019, UPM enhanced its supplier screening and risk mitigation. A new counterparty risk management tool offers better visibility into counterparty-related risks through automated screening and support businesses in ethical and preventive decision-making.

Global co-operation in sustainability

In 2019, UPM continued its co-operation with Together for Sustainability (TfS), a chemical industry initiative that promotes and improves practices within the supply chains of its members. TfS membership also gave UPM access to EcoVadis assessments and TfS member audit reports. The co-operation improves transparency and the efficiency of our assessments and audits. In 2019, we conducted over 400 environmental and social risk assessments with EcoVadis and initiated first TfS audits. In 2020, we will increase the number of supplier audits and EcoVadis assessments.

Responsible sourcing is also an important theme in the UN Global Compact. We are an active member within the Action Platform, promoting decent work in global supply chains.

Addressing decent work in the tapioca supply chain on page 65.

SIGNIFICANCE

- An effective supply chain guarantees our competitiveness and the availability of commodities required for production in all market situations

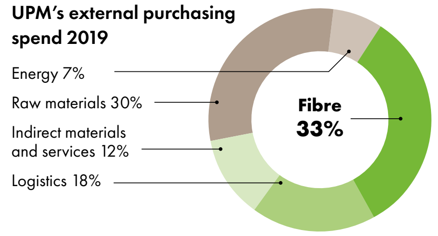
TARGETS

- We are a reliable and future-oriented partner
- We create business value through proactive and collaborative supplier management
- We set clear requirements and expectations for our suppliers
- We focus on cost leadership, innovation, continuous development and proactive risk management

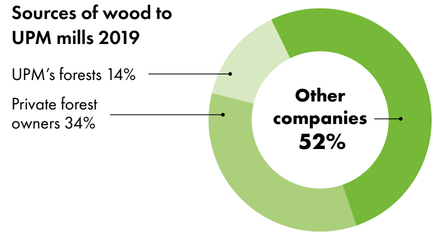
OUR WAY

- Focus on long-term, co-operative relationships and promoting methods for responsible sourcing
- Monitoring our suppliers' performance continuously and developing processes together with our key suppliers
- Having responsible practices in the supply chain creates long-term value for us and our stakeholders
- The UPM Supplier and Third Party Code sets transparent requirements for the entire supply chain
- Focus on 2030 responsibility targets

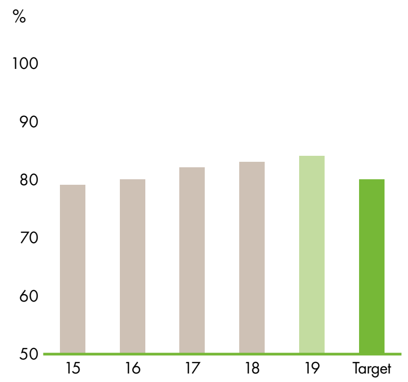
UPM's external purchasing spend 2019



Sources of wood to UPM mills 2019



Supplier code qualified supplier spend



2030 TARGETS 80% of total supplier spend qualified against UPM Supplier and Third Party Code (continuous)

8 DECENT WORK AND ECONOMIC GROWTH 12 RESPONSIBLE CONSUMPTION AND PRODUCTION

84% achieved

LIFELONG PRODUCT STEWARDSHIP

As the population grows and consumption increases, renewable raw materials and recycling must increasingly be used to replace fossil materials and other non-renewable natural resources. This is an opportunity for both UPM and its customers.

- PULP AND BIOFUEL BASED MATERIALS
- LABEL MATERIALS
- WOOD MATERIALS
- OFFICE PAPERS
- SPECIALTY PAPERS
- ELECTRICITY

SIGNIFICANCE

- Global megatrends are driving demand for sustainable and safe solutions
- Renewable wood and recyclable products reduce the world's dependency on fossil-based and other non-renewable raw materials

TARGETS

- Innovating renewable and responsible solutions for a future beyond fossils
- Taking care of the entire life cycle
- Creating value for customers

OUR WAY

- Recyclable products made from renewable and biodegradable raw materials
- Strong commitment to long-term customer relationships
- Co-operating across the value chain
- Ecodesign approach, which includes circular-economy thinking
- Using the Restricted Substances List and improved chemical management to enhance product safety
- Open and transparent communication about products
- Focus on 2030 responsibility targets

Product stewardship must cover the entire value chain, from the sourcing of raw materials to the end products and their recycling or disposal. Bio-based and recyclable products, as well as innovations based on these, are an essential part of the bioeconomy. Open and transparent communication about products, supported by ecolabels, certificates and product declarations increases consumer awareness.

Mitigating climate change and creating value for society

UPM products help to mitigate climate change by replacing fossil-based products with bio-based renewable alternatives. Carbon bound from the atmosphere remains in our products over its lifetime, even if they're recycled several times. Sustainable management of forests and plantations — the main sources of our raw materials — allows them to continue functioning as carbon sinks.

UPM also actively develops solutions based on the circular-economy model, in which materials circulate and products generate added value. Our target is to provide solutions that improve our customers' business processes — creating mutual benefit and societal value. Biomedical products, as well as our pharmaceutical and healthcare labelling solutions, are examples of where we create direct societal value. UPM's Rafcycle® programme for label-paper waste and the recycling of recovered graphic paper are examples of the added value created by a circular economy.

Continuous dialogue and collaboration with customers

UPM's businesses offer a variety of products and services. Each business has its own customer-management process and way of interacting with customers. A comprehensive understanding of each market, knowledge of the end uses of products and an appreciation of the needs of our customers all underpin our approach to customer relationship management.

Our dialogue with customers is continuous. We are also engaged in various development projects with our customers. Many of these projects are linked to product development and supply-chain efficiency.

Our businesses conduct regular customer-satisfaction surveys. Based on these results, overall satisfaction with UPM as a supplier is 86% (86%). These surveys also help us to define our areas for development. Product safety, forest certification, resource efficiency and recyclability are some of the most important factors for our customers. Climate actions and mitigating climate change have become increasingly important topics.

The ecodesign approach

Ecodesign is integrated into our product development in all businesses. We are committed to minimising the environmental impact of our use of materials and our manufacturing processes across the entire value chain and whole product lifecycle. We're also developing a way to integrate UN Sustainable Development Goals into our product development process.

Life cycle assessments (LCAs) are an important part of the ecodesign tool box. We use LCAs to provide reliable, documented information on the environmental impacts of our materials and production processes. The results are also used for UPM Raflatac's Label Life service, UPM Plywood's Environmental Product Declarations and to calculate the carbon footprint of pulp and paper products, biofuels or naphtha.

Product safety

Since its launch in 2010, the UPM Restricted Substances List has been our main tool for communicating product safety requirements to our chemical and raw-material suppliers, as well as our customers. Since 2018, we have participated in a Pulp & Paper Value Chain Information System development project with several chemical suppliers. The aim is to increase transparency in the supply chain and accelerate the exchange of information.

The ISO 9001 quality and ISO 22000 food safety management systems provide a framework for continuously improving our performance. All UPM production sites are ISO 9001-certified. All of our pulp mills, and the European UPM Raflatac and UPM Specialty Papers sites have a certified ISO 22000 food safety management system. In 2019, the UPM Changshu paper mill was licensed to produce papers for food contact. This means we can offer a number of products that are designed and produced to meet food packaging requirements.

Ecolabels and product declarations

UPM's product declarations provide customers with transparent information about products and the supply chain.

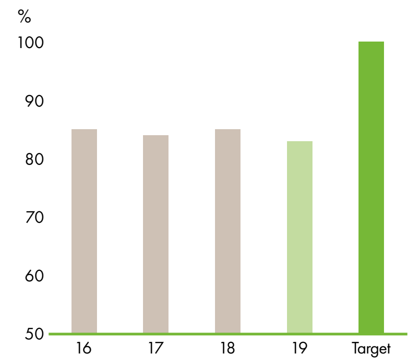
Product profiles, such as Paper Profile or UPM Pulp's Environmental Product Declarations, provide information on raw materials, emissions and other environmental features. Product safety profiles show how products comply with relevant product and chemical regulations. Wood-origin statements provide information on the species and country of origin of the wood.

Ecolabels help customers make responsible choices. UPM is the world's largest producer of EU ecolabelled graphic papers. The EU Ecolabel is available for all UPM graphic papers in Europe. In 2019, UPM renewed its EU Ecolabel application and received certification in accordance with the tightened EU Ecolabel criteria.

We also give our customers the opportunity to use well-known local ecolabels, such as the German Blue Angel or the Nordic Ecolabel. All UPM businesses have FSC® and PEFC™ chain of custody certification. In 2019, UPM Raflatac's label-grade RAFNXT+ was the world's first label material verified by the Carbon Trust to help mitigate climate change. The range uses less raw materials, energy and water, and generates less waste during its life cycle, compared to standard labels. This results in a concrete positive impact on the climate.

› Sustainable and safe products on page 8
› Circular economy on page 96
› upm.com/responsibility

Products eligible for ecolabelling



2030 TARGETS

100% of applicable products eligible for ecolabelling

83% achieved

ACTIVE CUSTOMER COLLABORATION

We serve the global market with a comprehensive product range of responsibly produced renewable products for everyday use.

BUSINESS	PRODUCT RANGE	CUSTOMER INDUSTRIES	COLLABORATION ACTIONS IN 2019	IMPORTANT CORPORATE RESPONSIBILITY TOPICS	MAJOR CHANGES IN CUSTOMER INDUSTRIES
UPM PULP	Softwood, birch and eucalyptus pulp	Tissue, specialty, graphic papers and packaging	• Joint projects on technical, logistics and sustainability topics • UPM Pulp Schools providing sustainability and technical services and training • Strengthening production, sales and customer service with R&D • Strengthening service concept with new tools like RFID tagging of pulp deliveries	• Safety culture at mills and product safety • Forest certification, origin of wood, sustainable forestry, climate change • Environmental performance of pulp mills including emissions, water usage and solid waste • Urgency to find alternatives for plastics, EU and national regulations	• Growth of tissue and packaging board production • Continued decline of printing and writing paper industry in mature markets • Stricter environmental legislation in China resulting in limitations on recovered paper imports, for example • Increased demand for wood-based solutions to replace plastics
UPM BIOFUELS	Wood-based renewable diesel for transport and renewable naphtha for transport and petrochemicals	Fuel distributors and the transportation, oil and petrochemicals industries	• Sales of UPM BioVerno naphtha stabilised for the production of sustainable plastics in Europe • Joint development projects with customers • Expanding the target markets • Strengthening sales and technical product support • Customer focus throughout the organisation	• Reducing greenhouse gas emissions and exhaust emissions • Biofuel-specific sustainability certification (ISCC and RSB) • Social and traceability criteria for targets set by the EU Renewable Energy Directive • Safety and product safety	• Global increase of advanced biofuel volumes and demand • Wood, waste- and residue-based biofuels and biomaterials are favoured by both customers and legislation • Growing demand for sustainable feedstock alternatives
UPM TIMBER	Standard and special sawn timber	Joinery, packaging, furniture, distribution and construction industries	• Further focus on strategic markets and market-specific weighting • Customer categorisation and customer-specific account plans • Optimisation of raw material quality and usage • Delivery accuracy • Excellent service throughout the supply chain	• Chain of custody, origin of wood, forest certification, sustainable forest management • Safety	• Growing importance of Eastern Europe as a production area • Instability and financial challenges in Middle Eastern and North African markets
UPM ENERGY	Electricity and related services	Nordic market and industrial consumers	• Enhanced service portfolio	• Zero-carbon electricity production • Active grid balance management • Fish migration	• Structural changes in the Nordic electricity market • Increased volatility of the electricity market due to intermittent weather-dependent production capacity • Climate change mitigation through decarbonisation
UPM RAFLATAC	Self-adhesive paper and film label stock	Label printers, converters, packers, brand owners in food, beverage, home and personal care, pharmaceutical, retail, logistics, durables, tyres and A4 segments	• Expanding customer sales & service reach through excellent commercial functions and digital customer portal: MyRAFLATAC • Sustainable product development and offering via our Smart Choice and Smart Circle solutions • Collaboration in leading packaging forums like the Ellen MacArthur Foundation (CE100 and New Plastics Economy Global Commitment), the Sustainable Packaging Coalition and the Association of Plastic Recyclers. • Joint projects with customers and brand owners e.g. tailored LCA calculations via our Label Life service	• Product safety, Life cycle assessment, ecodesign and bio-based components • Waste management • Recyclability and recycled content (PCR) • Forest certification • Climate change	• E-commerce increasing label use for packaging and logistics • Increase in automated product labelling and identification • Retailer and distributor network development • Increased need for sustainable label products and solutions • Legislation: Increasing mandatory product information
UPM SPECIALTY PAPERS	Labelling materials, release liner base papers, flexible packaging papers, office and graphic papers	Paper converters, merchants, distributors, retailers, printers, publishers, label stock manufacturers and commercial siliconisers	• Ongoing development work on supply chain performance and service • Product development projects with customers and value chain members • Sustainability services and training • Supporting copypaper merchants with marketing materials and initiatives • Joined Cepi's 4evergreen initiative to boost fibre-based packaging	• Renewable and recyclable raw materials • Forest certification, origin of wood • Product safety • Resource efficiency • Compliance with laws and regulations	• Increased consumer demand for renewable and recyclable solutions • Increased share of e-commerce • Technology development; for example, increase in automated product labelling and identification • Increase in the number of personal printers in APAC
UPM COMMUNICATION PAPERS	Graphic papers for various end uses	Newspaper and magazine publishers, retailers, print shops, catalogue, directory and book publishers, office, envelope and home suppliers, merchants, brokers, advertising	• Joint product development initiatives • Engaging with the international magazine publishing industry through strategic partnerships with FIPP and VDZ organisations • Comprehensive sustainability agenda with clear goals, focusing on raw material sourcing, production, role in society and value generation for stakeholders	• Safety culture • Supplier social responsibility and safety performance • Forest certification, ecolabels • Resource efficiency and CO_2-footprint reduction	• Digitalisation • Consolidation • Process streamlining • Efficiency increases through automation
UPM PLYWOOD	Plywood and veneer products	Construction, vehicle flooring, LNG shipbuilding and parquet industries, as well as other industrial applications	• Active customer satisfaction and relationship management • Introduction of extended capabilities and offering of UPM Chudovo mill • Introduction of new functional products for construction use	• Safety culture • Forest certification and chain of custody • Product safety • Focus on climate actions, resource efficiency	• Lack of visibility for demand development increases uncertainty • Increased need for services, stocks and short lead time • Increasing demand for online services • Increased environmental awareness drives LNG demand
UPM FOREST	Wood and wood-based biomass (logs, pulpwood, chips, forest residues etc.), full forestry service offering	All UPM businesses using wood or wood-based biomass, forest owners	• Focus on creating unique customer experience for forest owners • Development of forestry service offering • Enhanced digital solutions to improve customer service	• Sustainable forestry, forest certification • Income and employment for people living in rural areas, employment of entrepreneurs	• Increasing wood demand and competition due to pulp mill investments in Finland
UPM BIOCHEMICALS	Lignin products, glycols and industrial sugars development pipeline	Resins and adhesive industry, bio-plastics and plastic compounds	• Joint development projects on technical and sustainability issues • Close collaboration to develop tailormade solutions for specific production conditions and product requirements	• Forest certification, lifecycle analysis, ecodesign and bio-based materials • Sustainable alternatives to fossil-based materials • Safety	• Growing customer demand for renewable and sustainable materials • Strong attention on recyclability of plastics
UPM BIOMEDICALS	Wood-based products for biomedical applications	Academic, biotech, pharma, research hospitals and CROs (contract research organisations)	• Joint development projects on new applications and product development • Digital marketing development • Customer and stakeholder training • Co-marketing projects with industrial partners	• Animal-free in-vitro medical research • Products for healthcare improvement	• Growing customer preference for renewable and sustainable materials • New technologies for more relevant human science
UPM BIOCOMPOSITES	UPM ProFi decking products and UPM Formi granules	Distributors of building products in Europe, contract manufacturers for large-scale consumer brands	• Joint development projects with customers on technical and design issues • Customer and stakeholder training • Digital marketing development • Demand chain understanding	• Sustainable alternatives to fossil-based plastic materials • Recycling plastics and label production side streams	• Trend to find renewable alternatives to fossil-based polymers • Trend to increase the content of recycled materials in products

COMMITTED TO CLIMATE ACTIONS

Our Biofore strategy drives the transition to a low-carbon economy. Forests, wood-based products and low-carbon energy have a unique role, both in mitigating the effects of climate change and in our strategy.

Committed to limit global temperature rise to 1.5°C
We committed to the UN's Business Ambition for 1.5°C pledge to pursue science-based measures to limit global temperature rise to 1.5°C. UPM is uniquely positioned to reach carbon neutrality by climate-positive land use, reduced emissions and climate-positive products.

We have made a systematic global review of our opportunities for reducing emissions using existing technologies. We have also analysed the financial impact of each carbon action. Based on this assessment we committed to reduce our CO_2 emissions from fuels and purchased electricity by 65% from the 2015 level by 2030.

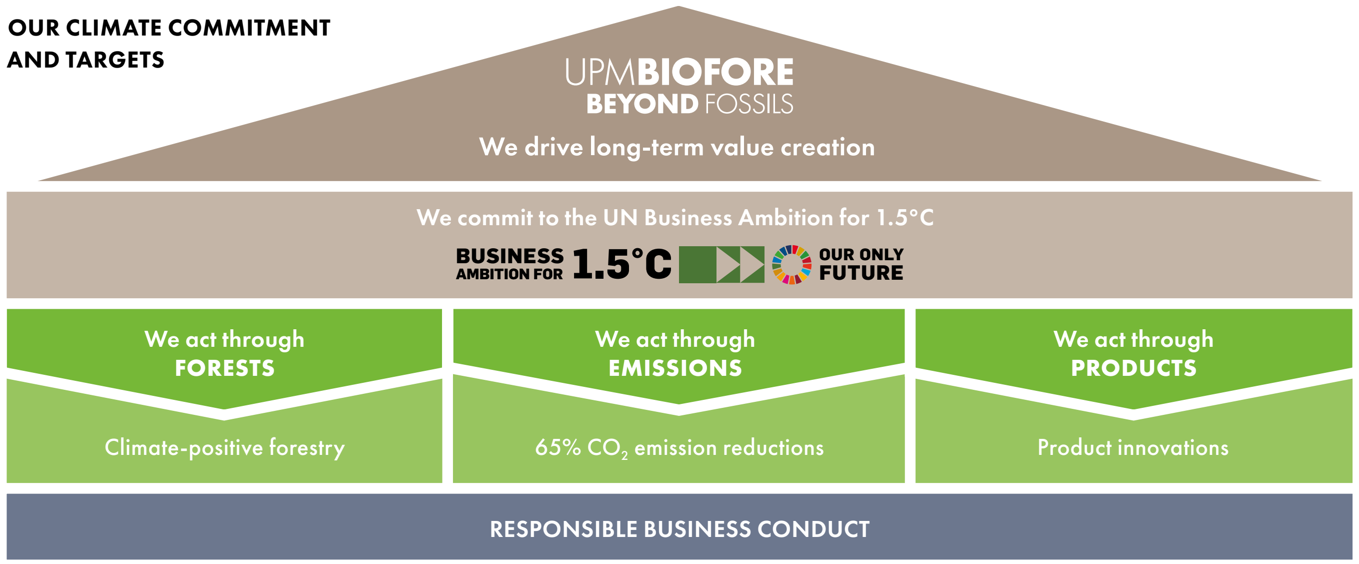
Climate-related science is developing quickly and we want to take an active role by seeking scientific partners to collaborate with in order to gain credible data and approaches.

In 2020, we will begin a study on climate-related substitution and carbon storage effects of our products. CDP recognised UPM as one of the only six Triple A List companies globally for its significant actions to mitigate climate risk.

Management of climate-change-related issues
We placed more emphasis on managing climate-change-related issues in 2019. Our climate action project, established in 2017, was strengthened by the appointment of a full-time project manager. The findings of the project, including scenario analyses, will be used in business planning to mitigate risks and capture benefits.

To increase transparency in climate-related reporting and management, we signed the pledge of the TCFD (Task Force on Climate-related Financial Disclosure) and developed our reporting according to this framework (read more 135).

OUR CLIMATE COMMITMENT AND TARGETS



Based on the scenario work and the outcome of the project, we revised our climate-related targets to better address the aspects that were identified as relevant in mitigating the effects on climate change.

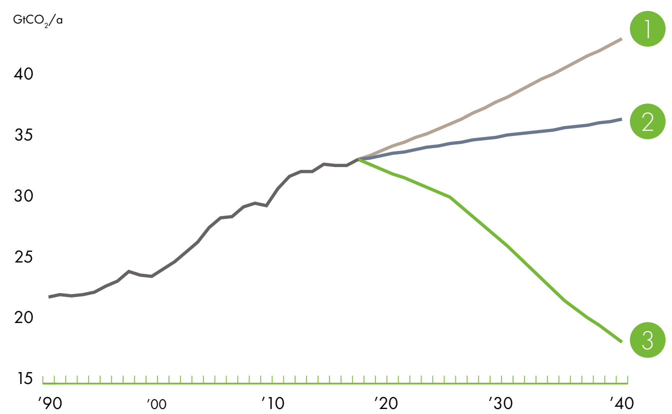
Knowing the risks
As well as taking action to mitigate the impacts of climate change, it is crucial to understand how a company's businesses, operations and assets could be affected by the physical impacts of climate change and by the transition aspects such as policies, regulation, technologies and market behaviour. We must understand the risks and opportunities in order to take actions that help us adapt for possible future scenarios.

In 2019, UPM engaged with the Finnish Meteorological Institute (FMI) to study the physical impacts of climate change in UPM's main areas of operations. We looked at three scenarios, representing low, medium and high CO_2 emissions and other greenhouse gases. As part of the climate project, all UPM businesses studied transition impacts for the same three scenarios. The price of energy and carbon, development of energy markets, availability of raw materials and regulation, as well as market and consumer behaviour, were key considerations.

- Sustainable forestry on next page
- Reducing energy use and emissions to air on page 90
- Sustainable and safe products on page 8
- Risks and opportunities on pages 28 and 129–131
- upm.com/responsibility

THREE EMISSION SCENARIOS

UPM's selected three global emission scenarios to illustrate portraits of the future contingent on CO_2 emission levels in 2040. They are based on forecasts issued by the International Energy Agency (IEA).



Sources: UPM and IEA

1 **Global CO_2 emissions increase, temperature rise of more than 3°C**
Conclusions: In the high-emission scenario, physical impacts dominate

2 **Combined emissions increase, albeit slowly, temperature rise of 3°C**
3 **Temperature rise remains below 2°C**

Conclusions: In the low- and medium-emission scenarios the transition impacts play a bigger role. UPM is well positioned, as our business portfolio allows for flexibility regarding recognised risks and opportunities.

SIGNIFICANCE
- Climate change is a major challenge and require action
- The transition to a low-carbon economy and the physical impacts of climate change bring both risks and opportunities
- The global climate agreement aims to keep the average global temperature rise at a level that does not threaten nature or society
- Forests, which function as carbon sinks, and wood-based products have a unique role in mitigating the effects of climate change, whilst the use of fossil fuels must be reduced

TARGET
- Create climate solutions and innovate for a future beyond fossils, whilst aiding in limiting the global temperature rise to 1.5°C

OUR WAY
- Ensure wood supply comes from sustainably managed forests and ensure a positive impact on land use
- Efficient use and increasing share of renewable and low-emission energy
- Renewable and recyclable products, materials and solutions that replace fossil-based ones
- Focus on 2030 responsibility targets

CASE

PHYSICAL IMPACTS UNDER CLOSE MONITORING

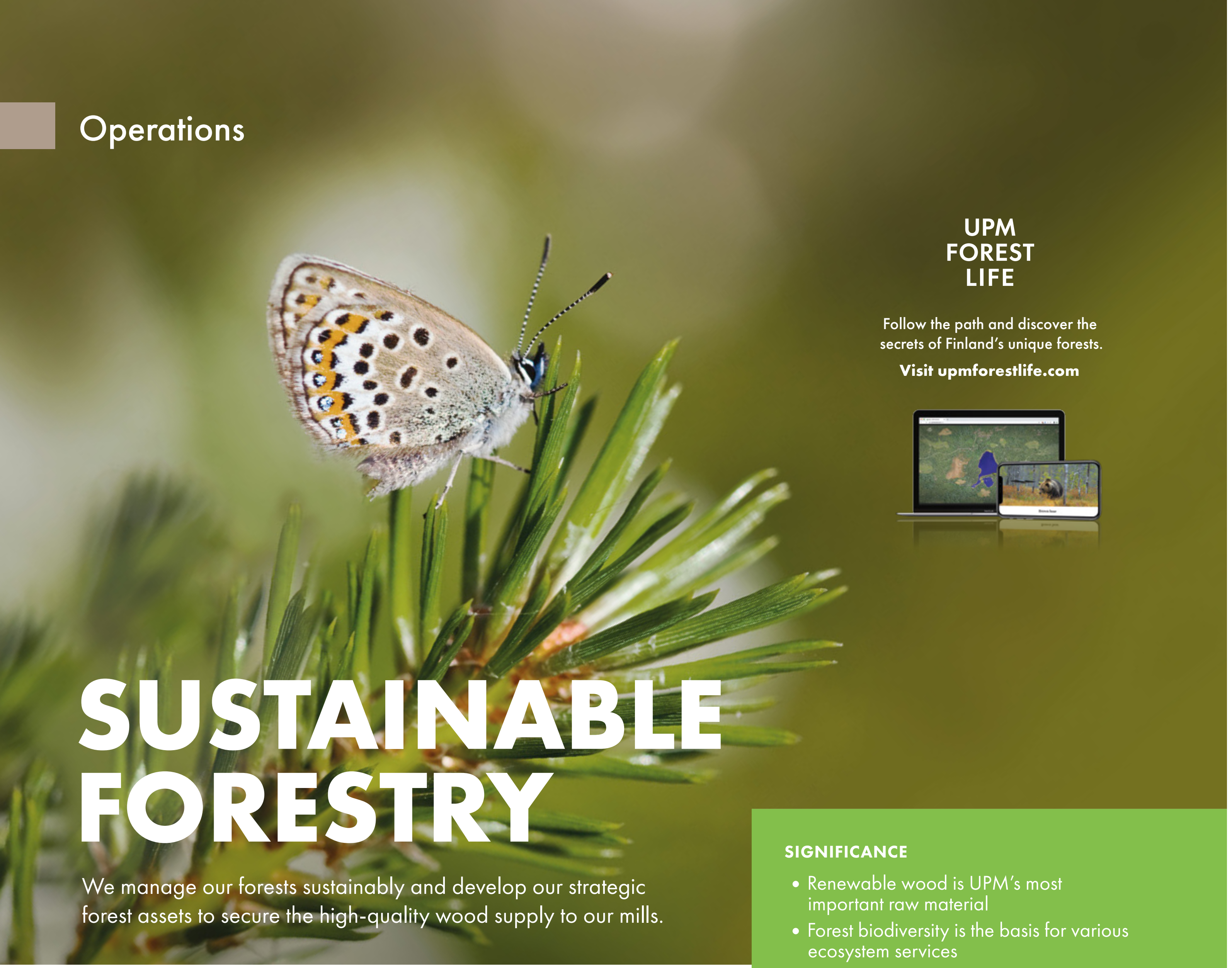
The Finnish Meteorological Institute (FMI) has issued a report helping UPM to predict the future physical long-term impacts of climate change on its business in Finland, Uruguay, Southern Germany and Eastern China. The Institute incorporated three alternative emission scenarios in the report. The biggest risks in the company's business are related to more frequent and severe extreme weather conditions such as heavy rainfall, storms and drought.

Climate change will have the biggest physical impact on UPM's business environment in Finland, where temperatures are expected to rise more significantly and rapidly than the world average. The average temperature may rise between 1°C and 6°C in winter and between 1°C and 4°C in summer.

"Forest growth will likely accelerate as the growing season will be longer and the amount of carbon dioxide in the atmosphere will increase. However, weather extremes will intensify, which presents new risks," explains Ari Venäläinen, Senior Research Scientist at the FMI.

The Finnish Meteorological Institute estimates that the impacts of climate change will be less significant in the other three countries where UPM operates. In Uruguay, the annual average temperature may rise between 0.9°C and 1.8°C, but this would not significantly affect forest growth.

In Eastern China, the annual average temperature may rise by between 1.6°C and 2.7°C. The FMI predicts that the biggest related risk would be the flooding of the River Yangtze due to a potential increase in rainfall. In Southern Germany, the annual average temperature could rise between 1.6°C and 2.7°C by 2050, depending on the eventual emission scenario. The increase of droughts and forest fires due to higher temperatures constitute the biggest risks for forestry.



UPM FOREST LIFE

Follow the path and discover the secrets of Finland's unique forests.

Visit upmforestlife.com

SUSTAINABLE FORESTRY

We manage our forests sustainably and develop our strategic forest assets to secure the high-quality wood supply to our mills.

Finland and Uruguay are the most important countries for UPM's wood sourcing. In both countries, the forest sector is significant for the national economy, and there is clear land ownership. Responsible land use ensures the long-term economic value of forests and mitigates climate change.

At the end of 2019, UPM owned 510,000 hectares of forest land in Finland, and 76,000 hectares of forest land in the United States. In Uruguay, the company owns 263,000 hectares of plantation land.

Forest land owned by UPM houses nearly 46,000 protected sites, with a total area of 142,000 hectares. We are also responsible for managing approximately 1.3 million hectares of forest and plantation land owned by private forest owners.

UPM owns modern nurseries in Finland and in Uruguay. High-quality seedlings provide the foundation for good tree growth and for services that best meet the needs of forest customers. In 2019, we increased our seedling production volumes. Our Finnish nursery improved the conditions for deciduous tree production, promoting both wood production and biodiversity, as well as climate change mitigation and adaptation.

Focus on mitigating climate change and forest biodiversity

We are committed to climate-positive forestry. Sustainably managed forests are more resilient to changes in the climate. We ensure that we always grow more forests than we harvest, and we work to improve our forests' growth and ability to absorb more carbon. In the future, we will also annually report the carbon sink levels of our forests, and the reporting system will be developed further.

In 2019, UPM continued to implement its work aimed at positive impact on biodiversity in company forests in Finland. This biodiversity programme is implemented through biodiversity guidelines for operational forestry work, forest protection and co-operation with stakeholders. Developing indicators and monitoring methods were the focus area.

SIGNIFICANCE

- Renewable wood is UPM's most important raw material
- Forest biodiversity is the basis for various ecosystem services
- Forests and wood-based products play a unique role in climate change mitigation
- Forests are part of the water cycle
- Forests support the wellbeing of local communities

TARGETS

- Ensure sustainable land use and maintain and enhance biodiversity
- Secure forest ecosystem services
- Climate-positive forestry

OUR WAY

- Third-party-verified and credible certification systems for all of our own forests
- Third-party-verified and certified chain of custody systems to ensure 100% wood traceability
- Commitment not to use wood from tropical rainforests or from forest plantations that have been established by converting natural forests
- No operations in areas where the rights of indigenous peoples are endangered
- No plantation operations in water-stressed areas
- Strong stakeholder engagement
- Focus on 2030 responsibility targets

In Uruguay, UPM has systematically developed methods for maintaining biodiversity in its eucalyptus plantations. More than one third of the land is left unplanted, so it consists of grasslands, native forests, wetlands, waterways and ecological corridors.

Wood supply from controlled sources

The growing need for food production and for wood as a resource causes deforestation. This is especially so in the world's tropical regions and is an important area of concern for the entire forest industry.

We recognise this challenge. We are taking action in our own operations and by actively participating in international co-operation networks. UPM's wood sourcing and forestry operations do not cause deforestation.

Forest certification is based on standards that have been defined in an open stakeholder process. Our compliance with these standards is monitored by an independent third party.

All UPM-owned forests are certified. To promote the certification of privately owned forests in Finland, UPM has established the FSC® group certification scheme. In 2019, UPM's Finnish FSC group certification scheme covered approximately 504,000 hectares of forest. 82% (81%) of wood consumed in our mills was sourced from certified forests in 2019, and all wood sourced by UPM is FSC Controlled Wood and from PEFC Controlled Sources.

CDP recognised UPM as one of the only six Triple A List companies globally for its significant actions to mitigate climate risk and prevent deforestation.

Engaging with stakeholders

UPM has a long tradition of working together with expert stakeholders on several development projects. In 2019, we partnered with Aves Uruguay and Vida Silvestre in Uruguay, and with the Osprey Foundation in Finland.

In Finland, we started transplanting threatened wood-inhabiting fungi in co-operation with Natural Resources Institute Finland and the University of Helsinki. The target is to accelerate the reintroduction of species inhabiting deadwood to forests. We also co-operated with BirdLife in a project where we developed artificial nest network for raptor species. Another project was the EU-funded Beetles Life project which aims to protect specific threatened beetle species in forest ecosystem. Co-operation with Helsinki University and with the University of Eastern Finland on forestry research continued.

UPM continued to participate in forest-related stakeholder forums, including roundtable process coordinated by the Finnish government, FSC Boreal Network and the WWF New Generation Plantation Platform. These forums bring together forest and environmental organisations, forest owners and representatives from industry, research and public administration, with the common goal of identifying and developing responsible forestry practices.

› Climate actions on page 86
› upm.com/responsibility/forests

CASE

A NEW TARGET OF CLIMATE-POSITIVE LAND USE

Climate-positive land use is UPM's latest responsibility target. This means that the company-owned forests will maintain the carbon sink effect and thus contribute to the mitigation of climate change. Natural Resources Institute Finland calculated the carbon balance of the company forests in Finland and Uruguay for 2019. The carbon sink of UPM's forests in Finland amounted to 1.3 million tonnes of CO_2 as an annual average during the last five years.

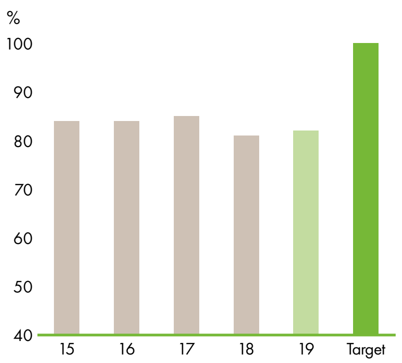
UPM's climate target related to land use is regularly monitored by calculating and reporting the carbon balance. At the same time, methods for measuring greenhouse gases caused by land use are being developed in collaboration with researchers.

UPM has started to provide forest owners with a forest regeneration service to replace clear-felling. Reforestation, which maintains the varied age structure of the forest, is suitable for certain sites. Certain peatland sites can also be suitable for this practice — and they can provide more affordable solutions for improving the carbon balance and climate than clear-felling. High-quality seedlings produced in the company's own nurseries and timely work in the forests contribute to climate-positive forest management.

UPM's decision to invest in a new pulp mill in Uruguay has increased the plantation area. This increase has resulted in a temporary increase in the size of the carbon sink, which will level off as the mill starts production. The carbon storage of soil and trees will be maintained in the future.

100% Wood supply from controlled sources

Certified fibre share



2030 TARGETS — 100% certified fibre by 2030

82% achieved

UPM FORESTS AND PLANTATIONS

	2008	2019
Forest and plantation land, own and leased (1,000 ha)	1,012	**991**
Forest growth (million m³)	4.3	**8.9**
Wood harvested from UPM forests and plantations (million m³)	2.2	**3.7**
Value of forests and plantations, including land (EURm)	1,270	**2,688**

Forest area distribution

REDUCING ENERGY USE AND EMISSIONS TO AIR

We constantly look for new solutions to minimise our environmental impact by selecting optimised energy sources and generation methods, and by improving energy efficiency.

We favour the use of renewable and other carbon-neutral energy sources. Biomass-based fuels account for 70% (70%) of our fuel usage.

As the use of weather-dependent energy sources increases around the world, the need for balancing power within energy systems will also grow. In Finland, UPM has significant assets in hydropower — the most effective and sustainable method of producing balancing power.

Paper and pulp mills, which use electricity and heat in their production processes, account for the majority of UPM's total energy consumption. Most of this energy is used in the manufacture of mechanical pulp, for pumping and for paper and pulp drying.

We generate steam and electricity through combined heat and power (CHP) plants at all of our pulp mills, and at almost all of our paper mills. At some mills, all or part of this energy is produced by external or co-owned power plants.

Continuous improvement in energy efficiency

We are always looking for ways to improve energy efficiency across our operations, with audits, innovations and internal campaigns. However, in 2019 we did not reach our annual target of increasing energy efficiency by 1%.

As a result of the energy-saving investments we carried out in 2019, UPM reduced its energy costs by EUR 1.2 (3.2) million, avoided emitting 12,800 (23,000) tonnes of CO_2 and achieved a 41,000 (95,000) MWh reduction in energy consumption. The annual savings were EUR 1.4 (4.1) million, 15,600 (28,000) tonnes of CO_2 and 49,000 (118,000) MWh.

Reducing emissions to air

In 2019, we tightened our 2030 targets for reducing emissions of fossil CO_2 and acidifying flue gases. For acidifying flue gases, the earlier 2030 target was already reached. For fossil CO_2 emissions, we wanted to be significantly more ambitious to comply with the UN's 1.5°C pledge.

Continuous improvement and investments will help us to reach the new targets. In line with this, we finalised some investments and programmes in 2019, whilst others are proceeding and more were announced.

The research programme More with Biofore in China continued. The UPM Changshu paper mill has already achieved a 2% improvement in its energy efficiency.

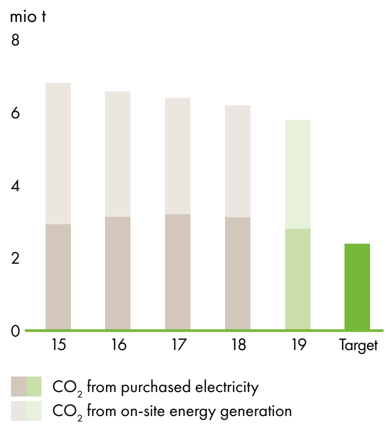
In Russia, UPM Plywood completed its expansion at the Chudovo plywood mill. The new 19 MW biomass boiler uses wood-based by-products from plywood production, such as bark, chips and dust. It increases the mill's material efficiency and reduces fossil fuel consumption.

In Finland, UPM Energy is currently refurbishing the Kuusankoski hydropower plant through an extensive renovation and modernisation project, lasting from 2019–2022. TVO's Olkiluoto 3 EPR-type nuclear power plant unit is scheduled to commence regular electricity production in March 2021.

In Germany, UPM announced its investment in a natural gas-based CHP plant at UPM Nordland paper mill. After completion, the plant will reduce UPM's fossil CO_2 emissions by 5%. In Hürth, we partner with E.ON to build a biomass fired boiler providing steam for the paper mill, replacing the current fossil-fuel-based steam supply.

> 2030 responsibility targets on page 60
> Climate actions on page 86
> UPM Energy on page 42
> UPM Communication Papers on page 48

Fossil CO_2 emissions



2030 TARGETS — 65% reduction from 2015 level

15% reduction achieved for UPM's total CO_2 emissions (scope 1 and 2)

2030 TARGETS — 20% reduction of acidifying flue gases from 2015 level

12% achieved for the UPM average product

SIGNIFICANCE

- Energy generation is the main source of air emissions
- Fossil fuels are the largest contributor to climate change
- UPM is a significant producer and user of energy

TARGETS

- Significantly cut fossil CO_2 emissions from production and increase energy efficiency
- Minimise acidifying flue gases (NO_x and SO_2) emissions by efficient purification

OUR WAY

- Committed to continuous improvements in energy efficiency and to an increased share of renewable and low-emission energy
- Use of Best Available Techniques (BAT)
- Focus on meeting our 2030 responsibility targets

CASE

NEW TARGET, NEW AMBITION

After already achieving our target for nitrogen oxide (NOx) and sulphur dioxide (SO_2) emissions in 2018, we have revised our reduction target for acidifying flue gases and have widened the scope to include all UPM production, and not just pulp and paper mills.

The continuous efforts to improve energy generation processes and investing in advanced flue gas purification technology are what have enabled us to achieve the earlier goal so soon. Along with our new reduction target, we also aim to ensure that the positive development of our CO_2 emissions from fossil fuels do not have a negative impact on acidification.

In terms of logistics, we have entered into a long-term charter agreement with the Dutch company, Spliethoff Group. This company will design and build seven vessels, which we will use for sustainable sea transportation in Europe. These vessels will be fuelled with liquid natural gas (LNG), meaning a significant reduction in NOx (approx. 85%), SO_2 (approx. 99%) and CO_2 (approx. 25%) emissions in comparison to the more commonly used marine gas oil.

CAPACITY TO GENERATE POWER THROUGH OWN POWER PLANTS AND SHAREHOLDINGS

	Nominal MW
Hydropower	732
Nuclear power	588
Thermal power	137
UPM Energy in total	**1,457**
Mill site combined heat and power (CHP)	1,398
Mill site hydropower	7
Mill site power generation in total	**1,405**
Total UPM	**2,862**

ELECTRICITY GENERATION THROUGH OWN POWER PLANTS AND SHAREHOLDINGS

TWh	2019	2018
Mill CHP	5.7	5.6
Hydropower	2.8	2.9
Nuclear power	4.9	4.7
Thermal power	0.2	0.6
Total	**13.6**	**13.8**

FUELS USED FOR HEAT GENERATION

TWh	2019	2018
Black liquor	19.4	19.2
Bark and other biomass	7.6	8.3
Heat recovered from TMP production	1.3	1.5
Renewable fuels total	**28.3**	**29.0**
Peat	1.1	1.0
Purchased heat	1.3	0.4
Natural gas	7.1	7.1
Oil	0.6	0.6
Coal	2.8	2.8
Total	**41.2**	**40.9**

IMPROVING RESOURCE EFFICIENCY

We are using materials, water and energy in a responsible and efficient manner, and aim to continuously reduce our environmental impact.

SIGNIFICANCE

- Global megatrends such as population growth lead to resource scarcity and competition for natural resources
- Resource efficiency eases the pressure on resources and the environment and brings competitive advantages

TARGETS

- Continuous improvement of efficiency
- Excellent environmental performance
- Accountability and compliance
- Minimising negative impacts of operations

OUR WAY

- Certified management systems
- UPM's Clean Run programme
- Use of Best Available Techniques (BAT)
- Credible and transparent reporting
- Focus on 2030 responsibility targets

100% Production sites with certified environmental management system

2,900 Preventive environmental observations and near-misses reported

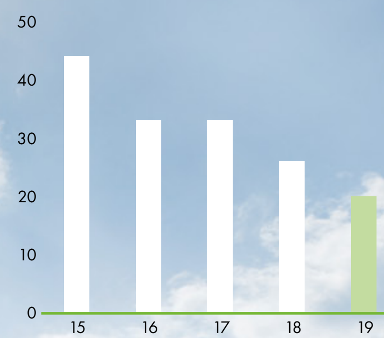
Management systems are supporting our continuous improvement process and resource efficiency efforts. Since 2018, all of our production sites have a certified ISO 14001 environmental management system. And almost all of our production sites and wood-sourcing operations have integrated management systems for environmental protection, quality management and occupational health and safety in accordance with ISO 14001, ISO 9001 and OHSAS 18001 standards.

To improve energy efficiency, many of our mills have energy management systems certified under ISO 50001 or the Finnish ETJ+ system.

All European pulp and paper mills, as well as the UPM Fray Bentos pulp mill in Uruguay and the UPM Changshu paper mill in China, adhere to the EU's Eco-Management and Audit Scheme (EMAS).

In 2019, all UPM business areas updated their plans for achieving our 2030 environmental targets regarding water, waste and air. This guarantees continuous improvement efforts towards our common targets.

The number of environmental deviations at UPM production sites



Investments in environmental performance

We invest in maintenance and process improvements in order to continually optimise the environmental performance of our production. In 2019, environmental investments totalled EUR 17 (16) million. The single largest investment was at Jämsä River Mills, where an urea feeding system was installed to two boilers to reduce NO_x emissions. UPM's environmental costs, which are mainly attributable to effluent treatment and waste management, totalled EUR 123 (121) million, including depreciation.

Minor environmental non-conformances

No major environmental incidents occurred at our production plants in 2019 and no significant fines were paid as a result of non-conformances. However, a total of 20 (26) temporary deviations from permit limits or environmental limits set by UPM occurred at the mills over the course of the year. Most deviations were related to minor contraventions of air- and water-emission limits (6 and 12, respectively). UPM immediately reported any deviations to the authorities and, where relevant, to local stakeholders. Appropriate measures were taken to normalise the situation and prevent similar occurrences.

All sites systematically follow up any deviations, proactively report observations and near misses, carry out walks and discussions, and compile detailed risk assessments. Since 2016, UPM has used a global One Safety reporting tool for the management and reporting of both safety and environment-related operations.

› Environmental performance on page 136 (Report of the Board of Directors) and at upm.com/responsibility
› Responsible water use on page 94
› Reducing energy use and emissions to air on page 90

CASE

OUR LONG-TERM CLEAN RUN PROGRAMME SUPPORTS CONTINUOUS IMPROVEMENT

We launched the company-wide Clean Run programme in 2012 to improve our environmental performance. In the past eight years the progress has been excellent; environmental awareness has significantly improved and the number of deviations from the programme has decreased from 93 in 2013 to 20 in 2019. Compared to 2018, the number decreased by a fifth. The severity of deviations has also decreased. In spite of the results, there is still room for improvement, as our ultimate goal is zero deviations.

Internal processes, such as audits, environmental walks and reporting of results play an important role in this progress. In 2019, we carried out approximately 40 internal Clean Run audits at our production sites and terminals, organised 1,900 environmental walks and reported 1,940 observations and 960 near misses.

The Clean Run programme has developed from reporting and best-practice-sharing to a holistic process to manage environmental issues. Certified environmental management systems are in place at production sites, and the Clean Run programme helps to bring environmental issues to the forefront of everyday work. We are continuing to develop the programme, with the aim of creating a stronger link to achieving our 2030 environmental targets.

RESPONSIBLE WATER USE

Water has a crucial role in our business from sustainable forestry to production. It is also an important source of renewable energy.

As a signatory of the UN Global Compact's CEO Water Mandate, we follow recognised principles in water stewardship. We aim to use water in a way that is environmentally sustainable, socially equitable and economically beneficial.

UPM signed the WBCSD's WASH Pledge for Access to Safe Water, Sanitation and Hygiene back in 2014. Today, we are globally compliant with the standards of the WASH Pledge. CDP recognised UPM as one of the only six Triple A List companies globally for its significant actions to enhance water stewardship.

Continuous improvement in water management

The water we need for our pulp and paper production processes is circulated and re-used as much as possible. Only a small proportion eventually leaves the process as effluent and needs to be replaced with fresh water. Using less water also means using less electricity, fewer chemicals and less thermal energy.

All of our pulp and paper mills' effluents are cleaned in both mechanical and biological effluent treatment processes. We operate a global water specialist network to share best practices and get the best possible treatment results.

In 2019, we continued testing several potential sources of recycled nutrients and mapping opportunities for co-operation across all UPM sites. From the beginning of 2019, approximately one third of the nutrients used by UPM Kaukas mill's biological water treatment plant have been replaced by Kekkilä Recycling composting plant's side stream. Testing will continue in 2020 at several mills in Finland and Germany.

As far as water reduction and effluent load are concerned, all sites have been preparing a road map for reaching 2030 targets, and some actions are already being implemented. For example, UPM Kaukas paper mill improved the quality and quantity of clear filtrates after employing an additional disc filter, which has reduced the volume of fresh water used and wastewater produced by 20%.

At UPM Changshu, the More with Biofore in China programme continued with several pilot trials to reduce fresh water intake by recycling and reusing effluent water. In 2019, we finalised the technical specifications for recycling effluent water and explored opportunities for partners in the surrounding area to use part of the effluent after its purification. New membrane technology for cleaning paper machine process water has been in operation since autumn 2019, with promising results.

In Uruguay, several improvements were carried out in effluent treatment units of the UPM Fray Bentos mill, including the installation of a fibre filter in pulp bleaching area to reduce product losses into the wastewater streams.

UPM continued to explore new ways of working, new technologies and new partnerships with potential chemical and machinery suppliers. Some of these technologies have been piloted during 2019 and this work will continue in 2020.

Collaboration with stakeholders

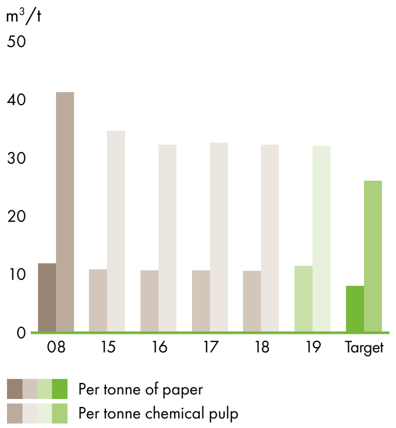
UPM's responsible water use highlights the importance of water resources and good water management all over the world. For example, UPM Raflatac collaborates with WWF Poland in the Rivers for Life project. In Finland, UPM actively co-operates with the Baltic Sea Action Group to find new sources of recycled nutrients. This collaboration promotes our 2030 responsibility target to use only recycled nutrients in our wastewater treatment plants.

Minimising the impact of hydropower facilities

UPM has been a hydropower producer for over one hundred years, and UPM Energy is the second-largest electricity producer in Finland. While hydropower is a cost-effective, renewable and CO_2-free way to generate electricity, it can also have an adverse impact on watercourses and their surroundings. In order to minimise these impacts, we work closely with authorities and other stakeholders.

› upm.com/responsibility
› UPM Energy on page 42
› Circular economy on page 96

Process wastewater volumes



2030 TARGETS 30% reduction from 2008 level

10% reduction achieved for the UPM average product

2030 TARGETS 40% reduction in effluent load (COD) from 2008 level

31% reduction achieved for the UPM average product

SIGNIFICANCE
- Water resources around the world are scarce and each watershed is unique
- Forests play a crucial role in the water cycle
- Water is an essential resource in pulp and paper production

TARGETS
- Use water responsibly
- Minimise the negative impact of our operations on water resources

OUR WAY
- Operations in areas with sufficient water resources
- Efficient water use with appropriate recycling techniques
- Treatment of used water according to the BAT (Best Available Techniques)
- When possible, water is returned to its original watershed
- Co-operation with local stakeholders to minimise negative impacts and ensure the availability of water for everyone
- Focus on 2030 responsibility targets

CASE

MITIGATING WATER SCARCITY RISKS

In 2019, we updated our water risk assessment by using the Water Risk Filter, an online tool developed by the WWF and the German finance institution DEG. The assessment confirmed that none of our most water-intensive mills (20 pulp and paper mills) are located in areas with a high or very high risk of water scarcity.

The assessment, however, pointed out a certain level of risk at four of these mills, where we had a close look at possible impacts and risk-reduction measures.

The UPM Changshu paper mill near Shanghai takes water from the Yangtze River. Even though the mill has already reduced its water consumption by 60% per tonne of paper over the last ten years, there is still potential for improvement, and this is currently being explored.

UPM Nordland paper mill uses groundwater as a water source. The mill consumes less water than any other UPM paper mill and also invested in its wastewater treatment plant in 2018, in order to replace part of its water withdrawal with treated wastewater. Today, approximately 20% of the effluent volume is reused, and the aim is to increase the use of purified wastewater to 25% in 2020.

The water withdrawal from the river Seine for UPM Chapelle Darblay and from the river Isar for UPM Plattling is insignificant compared with the typical flow of these rivers.

Reduction in the volume of process wastewater, and thus also reduction in water withdrawal, is one of UPM's 2030 responsibility targets and a continuous improvement target at all mills.

CIRCULAR ECONOMY

Many of our products are made from side streams, residues and waste. We actively develop new solutions in order to accelerate the transition to a circular economy, in response to climate change and resource scarcity.

Recycling is a part of a circular economy

We have developed innovative ways to reduce and recover waste and to use side streams. Examples of our efforts to promote a circular economy include the following:

Making use of our side streams and by-products

- UPM BioVerno renewable diesel and naphtha are produced from crude tall oil, a residue from chemical pulp production.
- Lignin, a by-product of pulp production, is used in WISA BioBond gluing technology, replacing fossil phenol used in plywood manufacturing.
- Ash from biomass-based energy generation is used in a wide variety of applications, in soil stabilisation and cement industry, or internally to replace caustic soda or as raw material for paper filler production, for example.

SIGNIFICANCE

- Circular economy addresses two key global challenges: resource scarcity and climate change
- There is growing demand and competition for raw materials
- A circular economy ensures materials are used more efficiently and creates a competitive advantage

TARGET

- Promote the efficient use of all material streams and the implementation of circular economy – reduce, reuse and recycle

OUR WAY

- Circular economy thinking
- Cross-industry collaboration
- Reuse materials and products several times, and create value through smart solutions
- Recycle and reuse production waste and utilise by-products
- Focus on 2030 responsibility targets

› Limitless opportunities of a bioeconomy on page 6
› Sustainable and safe products on page 8
› Climate actions on page 86
› Innovating for growth on page 22 and 52

Making use of recovered materials

- UPM is the world's largest consumer of recovered paper for the production of its graphic papers. In 2019, the company used 2.3 million tonnes of recovered paper. This means that approximately 30% of the fibre raw materials used in UPM's paper production are from recycled sources.
- UPM ProFi biocomposite utilises the cellulose fibres and plastic polymers generated as manufacturing surplus from self-adhesive label material production. In 2019, 33% of plastic polymers used in UPM ProFi were made from recycled materials, and this percentage is set to increase.
- Collected release liners are desiliconised in a unique process and used to produce new release liner base papers by UPM Specialty Papers.
- There is a steady increase in the use of recycled nutrients at UPM's effluent treatment plants (read more on the right).

Enhancing recycling

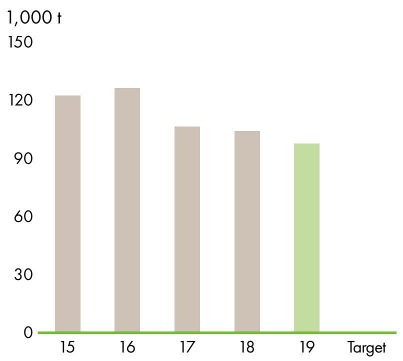
- UPM Raflatac collects label waste from its 150 customers and partners based in 16 countries, and recycles it using a variety of RafCycle® recycling solutions, including UPM ProFi and glassine liner with recycled content.
- UPM Raflatac has developed a range of innovative solutions to promote a circular plastics economy, including thin film materials, wash-off adhesives and label materials containing recycled content.
- Our state-of-the-art Materials Recovery Facility at UPM Shotton sorts collected household materials into re-usable waste fractions, including recovered paper that is utilised in our own paper production.

Our zero solid process waste to landfill target

By 2030, UPM will not deposit any process waste at landfill sites, and no process waste will be incinerated without recovering the energy. On average in 2019, 89% (90%) of our process waste was recycled or recovered, and 62% of our production sites have already achieved 100% share of utilisation. We share best practices, research results and ideas throughout UPM. Green liquor dregs are one of the most challenging residues from pulp production, and we are currently developing several innovative processes for utilising this material in Finland and Uruguay.

Overall, ash originating from bioenergy production makes up the largest proportion of our solid waste, 93% of which is recycled into a variety of applications. Most organic production residues, such as bark, wood residues and fibre-containing solids from deinking and effluent treatment, are used to generate energy for mill sites. The fibrous residues that are not incinerated are utilised in areas such as brick manufacturing, earthworks or as soil improvement materials (read more on the right).

Process waste to landfills



2030 TARGETS

No process waste to landfills or to incineration without energy recovery

89% recycling or recovery achieved for our total process waste

CASE

FROM THE BOTTOM OF A SOAKING POND TO A COMMERCIAL SOIL CONDITIONER

UPM Plywood together with ProAgria and the Natural Resources Institute Finland, Luke in Southern Savonia, have developed a new organic soil conditioner that can be used to improve the growth conditions of arable land. The soil conditioner is made of impure bark which is generated during the soaking of logs at the bottom of the soaking pond at UPM Plywood in Pellos, Finland. UPM has been seeking sustainable use for impure bark for a long time.

The bark and soil materials have been used in field tests as they are and as different mixtures containing crushed impure bark and bottom ash from the Järvi-Suomen Voima power plant and the calcareous slag, a side stream from the Voikoski gas plant. There was nothing out of the ordinary in terms of crop yield or quality. However, in the long term, adding organic material improved the soil's nutrient retention capacity and looseness.

Using bark waste as a soil conditioner can also boost carbon absorption in agricultural areas, which is one way to mitigate the effects of climate change. In addition, an essential benefit is that growth of the roots of plants and crops above ground increases as the nutrient content and quality of the soil improves.

The first batch of the product was launched in summer 2019. It is suitable for field farming and landscaping and it has been approved by the Finnish Food Authority.

SIDESTREAM FROM KEKKILÄ'S COMPOST AS NUTRIENT AT WASTEWATER TREATMENT PLANT

UPM's goal is to use only recycled nutrients such as nitrogen and phosphorus in its biological wastewater treatment by 2030. The industrial production of nitrogen requires a lot of energy, while phosphorus is a depleting resource and would be put to better use in fertilisers, for example.

In 2019, UPM Kaukas in Lappeenranta, Finland took a significant step towards this goal by utilising all reject water from the Kekkilä Recycling composting facility in Joutseno. This sidestream replaces approximately 3.7 tonnes of nitrogen each month, and thus reduces the load going to the municipal wastewater treatment plant. The idea of utilising Kekkilä's sidestream as nutrient was presented in 2018. After a brief laboratory testing – which yielded excellent results – there was an industrial-scale trial run before taking the nutrient into continuous use.

The recycled nutrient, sourced from only 15 kilometres from the mill, replaced approximately one third of the nutrients used at UPM Kaukas in 2019.

SUMMARY OF OUR SOCIETAL IMPACTS

Our activities and products have impacts on society. Understanding these impacts is a prerequisite to develop our operations. The evaluation covers our value creation from economic, social and environmental perspective.

Indirect inputs and outputs provide a more comprehensive picture of the value chain. Together with the direct inputs and outputs they form the basis for impact evaluation.

INDIRECT UPSTREAM

Number of b-to-b suppliers	**24,000**
Forest owners in Finland supplying wood to UPM	**18,000**
Supplier and Third Party Code qualified supplier spend	**84%**
Certified wood	**82%**
Percentage of wood origin known	**100%**
Seedlings planted	**50 million**
UPM forests available for free recreation use	**586,000 ha**
Ecosystem services	**EUR 440m**
Fossil CO_2 emissions (scope 2 & 3 upstream)	**6.4m t**
Water intensive production sites located in water abundant areas	**100%**
Restricted chemical substances in UPM screening	**6,000**
New hires	**2,300**

DIRECT UPSTREAM

RAW MATERIALS	
Wood	**27.5m m³**
Recovered paper	**2.3m t**
Minerals	**2.1m t**
Market pulp	**1.7m t**
Purchased paper for converting	**0.5m t**
Plastics, adhesives, resins, films	**0.2m t**
Co-mingled domestic waste	**0.2m t**
Costs, raw materials	**EUR 4.5 billion**
WATER UPTAKE	
Surface water	**416m m³**
Ground water	**19m m³**
Communal water	**4m m³**
ENERGY	
Renewable fuels	**27,000 GWh**
Fossil fuels	**11,600 GWh**
Purchased electricity and heat	**13,000 GWh**

UPM

54 production sites in 12 countries

991,000 ha forests and plantations

18,700 employees

Approx. 100,700 shareholders

Capital employed EUR 11,474m

Net debt EUR −453m

Market cap EUR 16,485m

DIRECT DOWNSTREAM

PRODUCTS	
Paper	**8.2m t**
Chemical pulp	**3.7m t**
Converting materials	**0.6m t**
Plywood and veneer	**0.8m m³**
Sawn timber	**1.7m m³**
Electricity and heat	**11,000 GWh**
By-products	**1.0m t**
Sales	**EUR 10,238m**
Comparable EBIT	**EUR 1,404m**
Comparable ROE	**11.2%**
Dividend distribution	**EUR 693m**
Employee wages and benefits	**EUR 1,214m**
Corporate income taxes paid and property taxes	**EUR 211m**
Payments to providers of loans	**EUR 49m**
Granted patents and patents validations	**337**
PEOPLE	
Employee engagement index	**71% favourable**
Training hours per employee	**12**
Total recordable injury frequency incl. contractors	**6.8**
Lost-time accident frequency incl.contractors	**3.3**

EMISSIONS TO AIR	
Nitrogen oxides	**8,500 t**
Sulphur dioxide	**1,100 t**
Particulates	**710 t**
VOC t	**660 t**
Fossil CO_2 emissions (scope 1)	**3.0m t**
EMISSIONS TO WATER	
Process wastewater	**210m m³**
Cooling water	**190m m³**
Biological oxygen demand (7days) t	**7,300 t**
Chemical oxygen demand	**60,300 t**
Adsorbable organic halogens	**280 t**
SOLID PROCESS WASTE	
To landfills	**99,800 dry t**
To temporary storage	**13,300 dry t**
To incineration without energy recovery	**1,500 dry t**
Hazardous waste for special treatment	**5,100 t**

INDIRECT DOWNSTREAM

Number of customers	**12,500**
People using UPM products	**over 220 million**
Value of products eligible for ecolabelling	**EUR 8.4 billion**
Virgin materials replaced	**3.3m t**
Carbon stored in UPM products	**18m t**
Fossil CO_2 emissions (scope 3 downstream)	**3.2m t**
Biofore Share and Care donations and sponsorships	**EUR 2.1m distributed to 285 groups**

OUTCOME & IMPACTS

- Purchase power of workforce and share-holders EUR 1.9b
- Multiplicative effects of value added EUR 3.0b
- Increasing knowledge and quality of life through our products
- Enhanced business practices in the value chain
- Vitality and prosperity for sphere of influence
- Health impact on employees and contractors
- Employee skills enhanced
- Climate change mitigation through UPM's climate actions
- Impact valuation of net carbon binding of UPM forests EUR 13m*
- Impact valuation of GHG emissions EUR −190m*
- Biodiversity enhanced
- Impact valuation of recreational use of UPM forests EUR 80m
- Impact valuation of ash used as raw material EUR 18m*
- Impact valuation of landfilled waste EUR −14m*

Impact evaluation is a continuous process for UPM. In 2017, UPM initiated a pilot study to assess the monetary value of certain impacts. This study provided us with examples shown on the right (*). In 2018, UPM piloted a new approach for net impact analysis.

OUR GOVERNANCE

Responsible business conduct is a basis for everything we do

The Board members visited Uruguay in March 2019. From left to right: Veli-Matti Reinikkala, Piia-Noora Kauppi, Kim Wahl, Jussi Pesonen, Björn Wahlroos, Berndt Brunow, Ari Puheloinen, Marjan Oudeman, Markus Skrabb, Tapio Korpeinen, Henrik Ehrnrooth, Kari Ståhlberg and Juha Mäkelä.

SIGNIFICANT DECISIONS

We also aim higher in our governance. Our decision making, management and operations are guided by our values and our Code of Conduct. Our governance structure supports good management, responsible business operations and compliance at all levels, with clear responsibilities and reporting lines.

UPM-Kymmene Corporation (UPM or the company) complies with all recommendations of the Finnish Corporate Governance Code (CG Code) for listed companies issued by the Finnish Securities Market Association. In accordance with the CG Code, we have published our Corporate Governance Statement (CG Statement) for the financial year 2019. It is available on the corporate website at upm.com/governance. We refer to the CG Statement for information on:

- Our governance structure and management system
- Duties and responsibilities of the Board of Directors and its committees
- Duties and responsibilities of our management bodies and
- Our management and control procedures related to internal control, risk management, internal audit, insider administration and related party transactions.

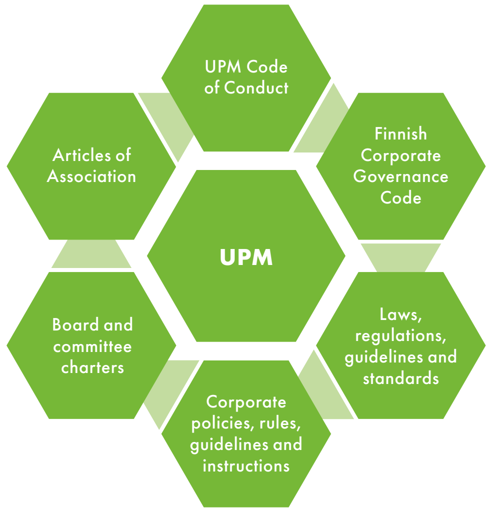
General meeting of shareholders

Our Annual General Meeting (AGM) took place in Helsinki, Finland on 4 April 2019. A total of 3,561 (2018: 3,386) shareholders were present or represented at the meeting, representing 50.2% of the company's registered shares and votes. We were pleased to see a record number of shareholders present or represented at the meeting.

The AGM adopted the company's Financial Statements and decided to distribute a dividend of EUR 1.30 (2017: EUR 1.15) per share and discharged the members of the Board of Directors and the President and CEO from liability for the financial year 2018. The dividends, totalling EUR 693 million, were paid on 17 April 2019 to shareholders who were registered in our shareholders' register on 8 April 2019. The year 2018 marked the fifth consecutive year of increased dividend (read more on page 31). For the year 2019, the Board of Directors has proposed a dividend of EUR 1.30 per share.

Information on other decisions taken at the AGM can be found later in this section and on the corporate website at upm.com/agm2019. The AGM approved all Board proposals and all decisions were taken without voting.

Our AGM 2020 will be held on 31 March at Finlandia Hall in Helsinki. Instructions for shareholders wishing to attend the meeting are available on the corporate website at upm.com/agm2020.



Governance framework

The illustration on the left summarises the basic regulatory framework for our governance.

Several changes took place within the governance framework during the year:

- The UPM Code of Conduct was updated
- The Finnish Corporate Governance Code was amended and came into force on 1 January 2020
- The board and committee charters were updated
- The UPM Approval Policy was updated
- The UPM Insider Policy was revised
- The Anti-Corruption Rules were updated
- The Confidentiality Rules were updated
- The Supplier and Third-Party Code was updated
- The Rules for Financial Information Recipients were approved
- The Rules for Global Legal Entity Governance were approved

CASE

UPM BOARD IN URUGUAY

In July 2019, the UPM Board of Directors made its biggest investment decision ever when it decided that the company would construct a 2.1-million tonne greenfield eucalyptus pulp mill in central Uruguay. Developing and securing competitive fundamentals for such a major investment and mitigating any significant risks associated with the project or the long-term operations requires careful planning and preparation. The Board has been monitoring the preparations and reviewing the status and the feasibility of this project since 2016.

In addition to the mill, the total investment of USD 3 billion also includes a pulp terminal in the port of Montevideo and investments in local facilities, such as a new residential area in Paso de los Toros, where the mill will be constructed. The mill is scheduled to begin production in the second half of 2022.

The Board members visited Uruguay in March 2019 as part of the Board's preparation for the investment decision. During their three-day stay, they took a tour at the intended mill site and visited the port of Montevideo. They also received local experts' extensive reviews on several topics, including Uruguayan cultural and historical background, economics and political agenda as well as UPM's exposure to and mitigation of short- and long-term risks.

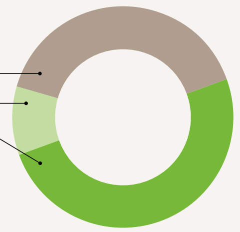
The relevant areas for the preparation of an investment were also covered, from wood supply and environmental permits to inbound roads and outbound logistics. The importance and impact of this investment to Uruguayan society became clearly visible during this visit.

› Uruguay pulp mill investment on page 38–39 and upm.uy/growth

Board of Directors

Board diversity – gender

Board diversity – age



The Board carries the main responsibility for the governance of the company, with the focus on overseeing the long-term value creation of UPM. To fulfil its role effectively, the Board:

- Sets the company's strategic objectives
- Reviews and approves financial and other plans relevant to the achievement of these objectives and
- Reviews the management's performance in terms of meeting these objectives.

The Board's other main responsibilities relate to the integrity of the company's financial reporting, the effectiveness of internal control and risk management systems, and the appointment, remuneration and succession planning of the company's senior management.

Board composition

The Nomination and Governance Committee proposed to the AGM 2019 that all incumbent directors be re-elected to the Board. This proposal was based on the committee's careful and thorough consideration of the Board's performance, effectiveness, independence, diversity and balance of relevant director attributes in relation to the requirements set by the company's strategic direction and evolving operations.

As proposed by the Nomination and Governance Committee, the AGM re-elected all ten incumbent directors to UPM's Board of Directors for a one-year term. The shareholders were asked to elect a single slate of directors as this is, unlike in many other countries, a market practice in Finland. The Nomination and Governance Committee also believes that this practice helps to ensure that the Board works effectively as a whole and comprises sufficiently diverse members with varied experience and versatile areas of expertise that mutually complement each other. The composition of the Board is presented in the table below. The directors' term will end upon closing of the AGM 2020.

Board diversity

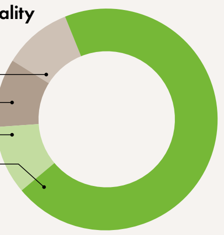
The Board diversity aspects are defined in the Diversity Policy of the Board and include relevant professional experience and education, gender, age, nationality and length of tenure. This policy is available at www.upm.com/governance. Information on the directors' professional backgrounds and other significant commitments is available on pages 112–113 of this report. Information on the other aspects of Board diversity is available in the pie charts above. More information on UPM Board diversity, related objectives and results obtained is available in our CG Statement 2019.

Director independence

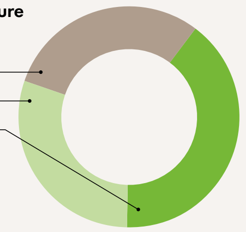
The Board of Directors evaluates the independence of its members both annually and – with the assistance of the Board's Nomination and Governance Committee – on an ongoing basis. The directors' independence is assessed based on the independence criteria of the Finnish CG Code. The majority of directors shall be independent of the company, and at least two directors of this majority shall be independent of any significant shareholders.

Evaluation of director candidates' independence is an important factor when the Nomination and Governance Committee prepares its annual proposal for the composition of the Board. The committee assesses directors' independence on a continuous basis and reviews a report on any changes in the directors' professional engagements and other commitments in every meeting to ensure compliance with the independence criteria. The committee also assesses how such changes may affect the directors' availability for Board work, and reports to the Board the outcome of such assessments. In particular, the committee assesses directors' positions in other publicly listed companies to ensure that the directors adhere to the best practices related to overboarding. According to the committee's assessments, the changes that took place in 2019 had no effect on the directors' independence and had mainly positive effects on their availability for Board work. The directors' commitment and availability for Board work is evidenced by the directors' high attendance at Board and committee meetings (see the table on the next page).

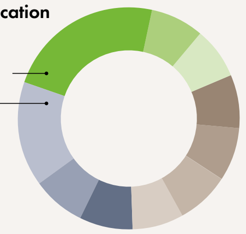
Board diversity – nationality



Board diversity – tenure



Board diversity – education



RELEVANT PROFESSIONAL EXPERIENCE

- Financial expertise
- Relevant industry knowledge
- International experience
- Risk management experience
- Governance and leadership experience
- Experience in the planning and implementation of company strategies

According to the evaluation carried out by the Board with the assistance of the Nomination and Governance Committee, all Board members are independent of the company's significant shareholders, as the company has no controlling shareholder and none of the company's shareholders has announced a holding of 10% or more of the company's shares or votes attached thereto. The Board has also assessed that all non-executive directors are independent of the company, including Berndt Brunow, Veli-Matti Reinikkala and Björn Wahlroos, who have been non-executive directors of the company for more than ten consecutive years. Based on the Board's overall evaluation of these directors' independence, their independence is not compromised due to their long service history, and no other factors or circumstances have been identified that could impair their independence. As the President and CEO of the company, Jussi Pesonen is not independent of the company.

Board work in 2019

The Board held 11 meetings in 2019. There is no minimum meeting attendance requirement for Board members. Instead, Board members are expected to attend all meetings unless there is a valid reason for not attending. The average attendance of the Board members at the Board meetings was 96.4% (2018: 100%) and at the committee meetings 97.8% (2018: 92.9%). The personal attendance rates of each Board member are presented in the table below. In connection to its meetings, the Board also held non-executive sessions and non-executive sessions with the auditor.

Strategic focus areas in 2019

In line with its main duties and responsibilities, the Board reviewed and approved updated strategic plans during its strategy session in May. The main focus areas of the UPM Biofore strategy continue to be performance, growth, innovation, responsibility and portfolio development. This strategy is enhanced by the brand promise: Beyond Fossils (read more on pages 14–31). An essential part of the Board's annual strategy work is to review and assess strategic and operational risks and opportunities. These risks and opportunities and their impact on operations and strategy are described on pages 28–29.

In 2019, the Board continued to focus its strategic review on the Uruguay

BOARD COMPOSITION IN 2019

DIRECTOR	DIRECTOR SINCE	NO. OF TERMS	AGE (AT THE END OF 2019)	INDEPENDENCE OF THE COMPANY	NON-EXECUTIVE / EXECUTIVE DIRECTOR
Björn Wahlroos (Chair)	2008	12	67	Independent	NED
Berndt Brunow (Deputy Chair)	2002	18	69	Independent	NED
Henrik Ehrnrooth	2015	5	50	Independent	NED
Piia-Noora Kauppi	2013	7	44	Independent	NED
Marjan Oudeman	2018	2	61	Independent	NED
Jussi Pesonen *)	2007	13	59	Non-independent	ED
Ari Puheloinen	2014	6	68	Independent	NED
Veli-Matti Reinikkala	2007	13	62	Independent	NED
Suzanne Thoma *)	2015	5	57	Independent	NED
Kim Wahl	2012	8	59	Independent	NED

*) Not available for re-election at the AGM 2020.

ATTENDANCE AT BOARD AND COMMITTEE MEETINGS 2019

DIRECTOR	ATTENDANCE/ NO. OF BOARD MEETINGS	ATTENDANCE %	ATTENDANCE/NO. OF COMMITTEE MEETINGS	ATTENDANCE %	AVERAGE ATTENDANCE %
Björn Wahlroos (Board and NGC Chair)	11/11	100	5/5	100	100
Berndt Brunow (Deputy Chair, NGC member)	11/11	100	5/5	100	100
Henrik Ehrnrooth (RC member)	10/11	90.9	4/5	80	87.5
Piia-Noora Kauppi (AC Chair)	11/11	100	5/5	100	100
Marjan Oudeman (AC member)	11/11	100	5/5	100	100
Jussi Pesonen	11/11	100	–	–	100
Ari Puheloinen (NGC member)	11/11	100	5/5	100	100
Veli-Matti Reinikkala (RC Chair)	11/11	100	5/5	100	100
Suzanne Thoma (RC member)	9/11	81.8	5/5	100	87.5
Kim Wahl (AC member)	10/11	90.9	5/5	100	93.8

NGC – Nomination and Governance Committee, RC – Remuneration Committee, AC – Audit Committee

platform development project. The Board has been closely reviewing the status and the feasibility of this project since 2016 and has conducted several status reviews, including risk assessments, in its meetings since then. The preparation work related to this project became more intense during the year, with the main focus being in the achievement of the readiness for the final investment decision by the Board. Prior to this decision, the Board visited Uruguay in the spring and also held one of its meetings there (read more on page 103). On 23 July 2019, the company then announced that it will construct a 2.1 million tonne greenfield eucalyptus pulp mill near Paso de los Toros in central Uruguay. This major strategic investment decision will grow the company's current pulp capacity by more than 50%, resulting in a step change in the scale of UPM's pulp business as well as in UPM's future earnings. Read more on this strategic investment on pages 38–39 and on the corporate website at upm.uy/en/growth.

Strategic focus areas in 2020

In 2020, the Board will continue to closely monitor the progress of the various streams of the pulp mill construction project including the mill, port, logistics, housing and railway streams as well as the development of the ongoing infrastructure initiatives by the Government of Uruguay.

The Board will also follow strategic business opportunities relating to the company's biochemicals and biofuels businesses. Read more on the company's biochemicals and biofuels businesses on pages 21 and 40 of this report.

The third nuclear power plant unit in Olkiluoto has been a matter of concern for the Board throughout the seriously delayed construction project, as the Company is involved in this project on the basis of its energy shareholdings (read more on these holdings and on this project on pages 130 and 171. As the construction project is approaching completion and production is expected to start in March 2021, Olkiluoto 3 will be one of the Board's focus areas this year as well.

Board evaluation

The Board conducts an annual evaluation of its performance and working methods, including an evaluation of the performance and working methods of its committees. In addition, the committees evaluate their performance and working methods on an annual basis. The Nomination and Governance Committee assists the Board in the annual evaluation and in the review of its results and takes these results into consideration when preparing the Board's proposal for the composition of the Board to the Annual General Meeting.

In 2019, the evaluation was conducted as a self-assessment and its results were reviewed and discussed at the Board meeting in December. Directors evaluated the performance of the Board and of the committees in relation to their duties and responsibilities, Board and committee composition and structure, Board culture, effectiveness of Board and committee meetings, individual director performance, and performance of the Chair of the Board. The overall results of the 2019 self-evaluation survey were highly favourable and indicated that the Board, Chair of the Board and the Board committees are functioning very effectively.

Board committees

The Board has three committees that assist in preparing matters to be decided by the Board:

- The Audit Committee,
- The Remuneration Committee and
- The Nomination and Governance Committee.

The committees also assist the Board in its oversight and monitoring responsibilities. The Board is always responsible for the performance of any duties assigned to the committees.

The Nomination and Governance Committee assisted the Board in reviewing the composition, qualification criteria and duties of the Board committees, and made a proposal to the Board for the appointment of committee members and chairs. The members appointed to the Board committees in the Board's constitutive meeting on 4 April 2019 are shown in the table above. Neither the President and CEO nor other company executives may be members of any Board committees.

The written committee charters approved by the Board of Directors set forth the purposes, composition, operations and duties of each committee, as well as the qualifications required for committee membership. The charters were amended in 2019 to reflect the changes in the regulatory environment and are available on the corporate website. Each committee is responsible for performing the duties assigned to it in its charter.

The committees hold their meetings prior to Board meetings in order to prepare matters to be decided by the Board. In the Board meeting following the committee meetings, the Committee Chairs report to the Board on the matters discussed and the actions taken by the committees. Furthermore, minutes of committee meetings are recorded and submitted to the Board members for reference. All committee meeting materials are available to the Board members before and after the meetings.

COMMITTEE MEMBERS 2019

AUDIT COMMITTEE
Piia-Noora Kauppi (Chair)
Marjan Oudeman
Kim Wahl

REMUNERATION COMMITTEE
Veli-Matti Reinikkala (Chair)
Henrik Ehrnrooth
Suzanne Thoma

NOMINATION AND GOVERNANCE COMMITTEE
Björn Wahlroos (Chair)
Berndt Brunow
Ari Puheloinen

Committee work in 2019

The importance and extent of the work of the committees has increased in recent years and will further increase following the continuous changes in the regulatory framework and the company's business environment. This is also reflected in the amendments made to the committee charters and in the topics and matters the committees were involved with in addition to their regular duties during the year.

Audit Committee

The Audit Committee is responsible for overseeing of the company's financial reporting processes and financial reporting, internal control, internal audit and risk management, and for monitoring the company's audit and compliance procedures. In 2019, the committee held five meetings. In addition to its regular duties, the committee reviewed, among others, the following topics in these meetings:

- Update of UPM Code of Conduct (approved by the Board in April)
- Financial matters and approval limits related to the pulp mill construction project in Uruguay
- Non-financial matters including anti-corruption and anti-bribery, labour practices, safety and human rights, responsible sourcing, environmental matters and product safety
- Update of UPM Approval Policy (approved by the Board in October)
- IT compliance, cybersecurity and data privacy
- Taxation
- Lease accounting
- Accounting of forest sales
- Amendments to the committee charter (approved by the Board in December)

The lead audit partner attended all committee meetings and reported to the committee on the interim procedures and findings as well as quarterly audit and non-audit fees and services. The committees' standard procedures include also quarterly sessions with the internal auditor, with the lead audit partner, with the management and among the committee members.

The Audit Committee has prepared the Board's proposal to the AGM 2020 for the election and remuneration of the auditor. In this context, the committee evaluated the qualifications and independence of the auditor, as well as the audit-related and non-audit-related services provided by the auditor. The evaluation included an assessment of the effectiveness of the audit process, the quality of the audit, the performance of the lead auditor and the audit team, and the co-operation with the auditor's international audit network. As a result of this evaluation, the committee recommended to the Board the re-election of PricewaterhouseCoopers Oy as the company's auditor and the Board concurred with this proposal and has made a corresponding proposal to the AGM 2020.

According to Pricewaterhouse-Coopers Oy, Authorised Public Accountant Mikko Nieminen would continue as the lead audit partner.

CASE

JAAKKO NIKKILÄ KNOWS SPECIALTY PAPERS

Jaakko Nikkilä assumed the role of Executive Vice President for UPM Specialty Papers and member of Group Executive Team in the beginning of July. He started his UPM career in 1995 at Tervasaari specialty paper mill as development engineer and production manager. He also worked in the mill's technical customer service. The mill's two label base paper machines became familiar already then.

From Tervasaari, the work took him to Asia. Nikkilä was responsible for specialty paper sales in Asia Pacific. Prior to his current position, Jaakko Nikkilä was leading UPM Specialty Papers' European and North American operations. He and his family lived for several years in Hong Kong and Shanghai.

"Hong Kong was a great experience. All our label papers came from Finland at that time. Our goal was to expand our business so that building of a specialty paper machine in China would become feasible. Ten years later, paper machine 3 started up at the UPM Changshu mill. I consider it one of our team's greatest accomplishments in recent years," he notes.

There have also been challenges along the way, such as increasing global competition, at times unstable global economy and constantly changing market conditions. Yet Nikkilä sees that global megatrends provide favorable long-term opportunities for UPM Specialty Papers. "Our strategy is clear, and we have great opportunities for profitable business growth based on our global customer reach, recent investments and exciting product development initiatives."

Remuneration Committee

Duties and responsibilities of the Remuneration Committee are related to the preparation of the company's remuneration principles and practices and to the remuneration and succession planning of the President and CEO as well as other senior executives. In 2019, the committee held five meetings. In addition to its regular duties, the committee was involved, among others, with the following topics in these meetings:

- Implementation of the amended EU Shareholders' Rights Directive
- Preparation of remuneration policy for governing bodies
- Amendments to the terms and conditions of the company's short- and long-term incentive schemes
- Amendments to the committee charter (approved by the Board in December)

In accordance with the Remuneration Committee's amended charter, the Remuneration Committee assists the Board in preparing the remuneration policy for the governing bodies and reviews its appropriateness at least annually. In addition, the committee assists the Board in preparing the remuneration report on an annual basis and presents both the policy and the report to shareholders at the general meeting.

The Remuneration Policy will be presented to shareholders at the AGM 2020 for the first time. The Remuneration Committee will prepare a remuneration report for the financial year 2020 to be presented to shareholders at the AGM 2021 (read more on page 110).

Nomination and Governance Committee

The Nomination and Governance Committee is responsible for the composition, diversity and remuneration of the Board of Directors and for corporate governance. When needed, the committee also identifies individuals who are qualified to serve as the President and CEO. In 2019, the committee held five meetings. In addition to its regular duties, the committee reviewed, among others, the following topics during the year:

- Update of UPM Code of Conduct (approved by the Board in April)
- Board training (arranged in 2019)
- Succession planning and continuance of the President and CEO's Service Agreement (approved by the Board in October, more information on the next page)
- Implementation of the amended EU Shareholders' Rights Directive
- Preparation of remuneration policy for governing bodies
- Amendments to the Board and committee charters (approved by the Board in December)

In 2019, the Nomination and Governance Committee began its annual review of the composition of the Board in May by discussing, among others, UPM's overall needs for the Board's stewardship in terms of the company's strategic agenda, development stage and relevant emerging trends. In this context, the committee also considered the Board's potential development needs and the succession planning of its members. The Committee concluded that search efforts would be started to find candidates who could meaningfully contribute to the Board's competences, diversity and overall renewal and decided to retain an executive search firm to assist in screening appropriate candidates.

As a result of these search efforts, the Nomination and Governance Committee has proposed that Emma FitzGerald and Martin à Porta be elected as new members of the Board at the AGM 2020. Of the incumbent directors Suzanne Thoma and Jussi Pesonen will not be available for re-election. The Nomination and Governance Committee's proposal on the composition of the Board in 2020 and the Board's assessment of the director nominees' independence is available on the corporate website at upm.com/agm2020.

Executive management

Jussi Pesonen has been the President and Chief Executive Officer of UPM-Kymmene Corporation since January 2004. According to his service agreement, Jussi Pesonen was entitled to retire in November 2020 at the age of 60. At the request of the company's Board of Directors, he will continue as the President and CEO (stock exchange release on 24 October 2019).

Jussi Pesonen has also been a member of the company's Board of Directors since March 2007. He has informed the Board that he will not be available for re-election to UPM's Board of Directors in the Annual General Meeting of 2020 (stock exchange release on 24 October 2019).

The President and CEO manages and oversees the company's day-to-day business operations. In practice, the President and CEO chairs the Group Executive Team, Strategy Team and Business Area Boards and makes decisions on matters that are relevant to the company's daily business operations at the meetings of these management bodies. The compositions of these management bodies are presented in the table below.

Management responsibilities

Members of the Group Executive Team have primary responsibility for the business areas and global functions that they lead. These areas of responsibility are shown in the illustration below.

The composition of the Group Executive Team changed during the year as Bernd Eikens, Executive Vice President of UPM Specialty Papers, was appointed Executive Vice President of UPM Biorefining as of 1 March and Jaakko Nikkilä his successor as Executive Vice President of UPM Specialty Papers as of 1 July (read more on the left).

COMPOSITION OF MANAGEMENT BODIES

GROUP EXECUTIVE TEAM	BUSINESS AREA BOARDS	STRATEGY TEAM
President and CEO (Ch.)	President and CEO (Ch.)	President and CEO (Ch.)
CFO	CFO	CFO
General Counsel	General Counsel	General Counsel
Business area EVPs	Business area EVP	EVP Strategy
EVPs of global functions	EVPs of global functions	EVP Technology

› Read more on our management system in the CG Statement 2019 and at upm.com/governance.
› Members of the Group Executive Team, including information on the executives' biographical details, professional and educational backgrounds, other significant commitments and shareholdings in the company, are presented on pages 114–115 of this report.

RESPONSIBILITY AREAS OF THE MEMBERS OF THE GROUP EXECUTIVE TEAM

PRESIDENT AND CEO JUSSI PESONEN

CFO 1)	Tapio Korpeinen	Bernd Eikens	**UPM Biorefining**
General Counsel	Juha Mäkelä	Tapio Korpeinen	**UPM Energy**
Strategy	Kari Ståhlberg	Antti Jääskeläinen	**UPM Raflatac**
Technology 2)	Jyrki Ovaska	Jaakko Nikkilä	**UPM Specialty Papers**
Human Resources	Riitta Savonlahti	Winfried Schaur	**UPM Communication Papers**
Stakeholder Relations 3)	Pirkko Harrela	Mika Sillanpää	**UPM Plywood**

1) Incl. Finance & Control, Treasury, IR, IT, Sourcing and Real Estate (incl. Finnish forest assets)
2) Incl. Investment Management, R&D, new business development (biochemicals, biocomposites)
3) Incl. Communications & Brand, Responsibility, Public & Media Relations

Remuneration

In accordance with the CG Code, we have published our Remuneration Statement for the financial year 2019 and this statement is available on the corporate website at upm.com/governance. The Remuneration Statement has been prepared in accordance with the requirements set out in the CG Code issued in 2015, which are still applicable for the financial year 2019. For the financial year 2020, we will prepare a remuneration report in accordance with the requirements of the CG Code applicable as of 1 January 2020.

The Board of Directors' Remuneration Committee and Nomination and Governance Committee have prepared the Remuneration Policy for the governing bodies (i.e. the Board of Directors and the President and CEO) and this policy will be presented at the AGM 2020. The policy sets out the framework for the remuneration of the company's governing bodies and it is available on the corporate website at upm.com/agm2020.

Our Remuneration Statement for the financial year 2019 is a comprehensive description of the company's remuneration principles and practices with regard to the members of the Board of Directors, the President and CEO, and members of the Group Executive Team. Information on the company's short- and long-term incentive schemes and plans as well as on the terms and conditions of the aforementioned executives' service agreements is available in this statement. Please see also pages 163–165 of this report. In this section, we provide information on the directors' and executives' actual remuneration in 2019. This information is also available in the Remuneration Statement.

Remuneration of the Board of Directors

In accordance with the Nomination and Governance Committee's proposal, the AGM 2019 resolved that the remuneration of the members of the Board of Directors remain unchanged. No changes have taken place in the directors' remuneration since 2017. In terms of directors' remuneration in 2020, the Nomination and Governance Committee has proposed that the remuneration remain the same.

The approved annual fees and each director's total remuneration including the number of shares purchased to each director are presented in the tables below. No annual fees were paid to the President and CEO for his role as a member of the Board.

Board members did not receive any other financial benefits for their Board or committee membership in addition to the annual base and committee fees. Shares purchased for the Board members in 2019 may not be transferred for two years from the purchase date (29 April 2019) or until the membership of the respective Board member ends, whichever occurs first.

It has long been customary at UPM to remunerate Board members in both shares and cash. Board members are encouraged to own company shares on a long-term basis and most of them have substantial holdings, indicating a close alignment of Board members' interests with those of shareholders.

Remuneration of executive management

Remuneration at UPM is designed to encourage our values-based behaviour, promote the achievement of ambitious strategic targets and pay for performance accordingly.

The aim of the company's management remuneration is to promote the company's long-term financial success, competitiveness and favourable development of shareholder value. Remuneration comprises fixed and variable components. These components are shown in the table on the right.

The variable components are linked to pre-determined and measurable performance and results criteria, and maximum levels have been set for their payment. The payable amounts of incentives are linked to the executive's position and achievement of annually set performance measures and targets.

The company has the right to reclaim any paid or due variable remuneration under certain circumstances, such as violation of law or other legal obligation, or violation of the UPM Code of Conduct or other company policies. Overall circumstances will be considered before exercising this right.

The company also has the right to cancel, recover or restate any paid or due variable remuneration in the event that financial or other calculations are found to be incorrect.

Salaries, benefits and incentives paid to the President and CEO and members of the Group Executive Team in 2019 are shown in the tables on the right.

In 2019, costs under the Finnish statutory pension scheme for the President and CEO amounted to EUR 465,000 (2018: EUR 471,000). Payments under the voluntary pension plan amounted to EUR 1,459,000 (2018: EUR 923,000).

In 2019, costs under the Finnish and German statutory pension schemes for GET members (excluding the President and CEO) amounted to EUR 924,000 (2018: EUR 988,000). Payments under the voluntary pension plan amounted to EUR 947,000 (2018: EUR 880,000).

BOARD REMUNERATION AND PAYMENT MECHANISM

ANNUAL BASE FEE (EUR)	2019	2018	PAYMENT MECHANISM
Chair	190,000	190,000	• Approx. 40% in company shares, rest in cash to cover taxes • Two-year lock-up period
Deputy Chair	135,000	135,000	
Members	110,000	110,000	

COMMITTEE FEES AND PAYMENT MECHANISM

ANNUAL COMMITTEE FEES 2018–2019 (EUR)	CHAIR	MEMBERS	PAYMENT MECHANISM
Audit Committee	35,000	15,000	Cash
Remuneration Committee	20,000	10,000	
Nomination and Governance Committee	20,000	10,000	

BOARD REMUNERATION IN 2019

DIRECTOR	ANNUAL BASE FEE (EUR)	40% FOR SHARES (EUR)	60% IN CASH (EUR)	ANNUAL COMMITTEE FEE	TOTAL REMUNERATION (EUR)	NO. OF PURCHASED SHARES	UPM SHARES 31 DEC. 2019
Björn Wahlroos	190,000	76,000	114,000	20,000	210,000	2,911	265,194
Berndt Brunow	135,000	54,000	81,000	10,000	145,000	2,068	312,533
Henrik Ehrnrooth	110,000	44,000	66,000	10,000	120,000	1,685	9,506
Piia-Noora Kauppi	110,000	44,000	66,000	35,000	145,000	1,685	19,391
Marjan Oudeman	110,000	44,000	66,000	15,000	125,000	1,685	3,155
Jussi Pesonen	–	–	–	–	–	–	466,472
Ari Puheloinen	110,000	44,000	66,000	10,000	120,000	1,685	11,531
Veli-Matti Reinikkala	110,000	44,000	66,000	20,000	130,000	1,685	44,327
Suzanne Thoma	110,000	44,000	66,000	10,000	120,000	1,685	9,506
Kim Wahl	110,000	44,000	66,000	15,000	125,000	1,685	21,305
Total	**1,095,000**	**438,000**	**657,000**	**145,000**	**1,240,000**	**16,774**	**1,162,920**

Auditor and audit fees

At the AGM 2019, PricewaterhouseCoopers Oy, a firm of Authorised Public Accountants, was re-elected as the company's statutory auditor for a one-year term, with Authorised Public Accountant Mikko Nieminen as the lead audit partner. Mr Nieminen has held this position since 4 April 2019. Mr Nieminen is the CEO of PwC Finland and acts as the lead audit partner in Kesko Corporation as well.

The latest tendering process for auditing services was carried out in 2013. The last year that PricewaterhouseCoopers Oy can act as the company's auditor is 2023.

The AGM further resolved that the audit fee would be paid against invoices approved by the Board of Directors' Audit Committee. The amounts paid to the auditor, as approved by the Audit Committee, are shown in the table on the right.

COMPONENTS OF MANAGEMENT REMUNERATION

COMPONENT	PAYABLE IN	BASIS OF PAYMENT	TIME OF PAYMENT
Base salary	Cash	Service agreement/ Executive contract	Monthly
Fringe benefits	For example, company car and phone	Service agreement/ Executive contract	Monthly
Short-term incentives	Cash	Short-Term Incentive Plan	Annually
Long-term incentives	Shares	Performance Share Plan	Annually following a three-year earning period

REMUNERATION OF THE PRESIDENT AND CEO IN 2019

SALARIES AND BENEFITS (EUR 1,000)	2019	2018
Salary	1,096	1,094
Short-term incentives	1,426	1,416
Share rewards	3,025	2,966
Benefits	29	31
Total	**5,576**	**5,507**
Income tax withholding *)	2,791	2,739

*) Income taxes withheld from salaries and benefits and remitted to tax authorities by UPM.

REMUNERATION OF THE GROUP EXECUTIVE TEAM IN 2019 (EXCLUDING THE PRESIDENT AND CEO)

SALARIES AND BENEFITS (EUR 1,000)	2019	2018
Salaries	4,242	3,971
Short-term incentives	1,779	2,387
Share rewards	9,421	9,014
Benefits	123	131
Total	**15,565**	**15,502**

AUDITOR'S FEES

EUR MILLION	2019	2018	2017
Audit fee	3.1	2.4	2.3
Audit-related services	0.2	0.0	0.1
Tax services	0.5	0.3	0.3
Other services	0.2	0.5	0.5
Total	**4.0**	**3.2**	**3.2**

Board of Directors

Björn Wahlroos

Chair of the Board
- Chair and member since 2008
- Chair of the Nomination and Governance Committee
- Independent of the company and significant shareholders
- Born 1952, Finnish citizen
- Ph.D. (Econ.)
- UPM shares 265,194

President and CEO of Sampo plc 2001–2009. Chair of the Board of Mandatum Bank plc 1998–2000, CEO and Vice Chair of the Board of Mandatum & Co Ltd 1992–1997. Executive Vice President and member of the Executive Committee of the Union Bank of Finland 1989–1992.

Chair of the Board of Sampo plc. Board member of the Finnish Business and Policy Forum EVA and the Research Institute of the Finnish Economy ETLA. Board member of Mannerheim Foundation.

Berndt Brunow

Deputy Chair of the Board
- Member since 2002, Deputy Chair since 2005
- Member of the Nomination and Governance Committee
- Independent of the company and significant shareholders
- Born 1950, Finnish citizen
- B.Sc. (Econ.)
- UPM shares 312,533

President and CEO of Oy Karl Fazer Ab 2002–2007. President and CEO of Sanitec Corporation 2000–2002. Prior to this, over 20 years of experience in executive positions at Finnpap and UPM Group.

Chair of the Board of Oy Karl Fazer Ab. Board member of Hartwall Capital Oy Ab.

Henrik Ehrnrooth

Member since 2015
- Member of the Remuneration Committee
- Independent of the company and significant shareholders
- Born 1969, Finnish citizen
- M.Sc. (Econ.)
- UPM shares 9,506

President and CEO of KONE Corporation since 2014 and KONE Corporation's Chief Financial Officer and Executive Board member 2009–2014. Earlier worked for Goldman Sachs International 1998–2009, most recently as a Managing Director in the Investment Banking Division. Prior to this, various positions at UBS Limited 1994–1998.

Member of the Foundation Board of the International Institute for Management Development (IMD, Switzerland) and member of the European Round Table for Industry (ERT).

Piia-Noora Kauppi

Member since 2013
- Chair of the Audit Committee
- Independent of the company and significant shareholders
- Born 1975, Finnish citizen
- LL.M.
- UPM shares 19,391

Managing Director of Finance Finland (FFI) since 2009. Member of the European Parliament and member of various parliamentary committees 1999–2008, Head of the Finnish Delegation in the EPP-ED Group 2004–2008. Legal advisor for the Parliamentary Group of the National Coalition Party Kokoomus 1997–1999.

Chair of the Board of the SOS-Children's Villages Foundation. Board member of the Finnish Financial Ombudsman Bureau. Member of the Supervisory Board of Helsinki Deaconess Institute and Helsinki School of Economics Support Foundation. Member of the EBF Executive Committee.

Marjan Oudeman

Member since 2018
- Member of the Audit Committee
- Independent of the company and significant shareholders
- Born 1958, Dutch citizen
- LL.M., MBA
- UPM shares 3,155

President of the Executive Board of Utrecht University 2013–2017. Executive Committee member of AkzoNobel NV, responsible for HR and organisational development 2011–2013. Executive Director of Strip Products Division and Executive Committee member in Tata Steel Europe (previously Corus Group Plc.) 2007–2010. Managing Director positions in Corus Group Plc. 2000–2007, latest Executive Director responsible for Corus Strip Products business and CEO of Corus Nederland BV. Various positions in Hoogovens Group NV 1982–1999, latest Managing Director of Hoogovens Packaging Steel business.

Board member of SHV Holdings NV, Solvay SA, Aalberts Industries NV and Novolipetsk Steel PJSC. Supervisory Board member of Het Rijksmuseum.

Jussi Pesonen

Member since 2007
- Independent of significant shareholders, non-independent of the company
- Born 1960, Finnish citizen
- M.Sc. (Eng.)
- UPM shares 466,472

President and CEO of UPM-Kymmene Corporation since 2004. COO of UPM Paper Divisions and Deputy to the President and CEO 2001–2004. Several management positions in UPM Paper Divisions 1987–2001.

Chair of the Board of the Finland Chamber of Commerce and ICC Finland. Deputy Chair of the Board of the Finnish Forest Industries Federation (FFIF). Board member of the Confederation of European Paper Industries (CEPI) and East Office of Finnish Industries Oy.

Ari Puheloinen

Member since 2014
- Member of the Nomination and Governance Committee
- Independent of the company and significant shareholders
- Born 1951, Finnish citizen
- General Staff Officer, General (ret.)
- UPM shares 11,531

Commander of the Finnish Defence Forces 2009–2014. Chief of Finnish Defence Command 2007–2009 and Commander of the Eastern Command 2004–2007. Deputy Chief of Operations of the Finnish Defence Staff 2000–2003 and Brigade Commander 1999–2000. Principal Secretary of the Defence Council 1997–1999. Assistant Defence Attaché in Moscow 1986–1990.

Board member of Patria Plc.

Veli-Matti Reinikkala

Member since 2007
- Chair of the Remuneration Committee
- Independent of the company and significant shareholders
- Born 1957, Finnish citizen
- eMBA
- UPM shares 44,327

President of ABB Region Europe during 2015 and member of the Group Executive Committee of ABB Ltd 2006–2015. President of ABB Process Automation Division 2006–2014 and Business Area Manager for ABB Process Automation 2005. Automation Technologies Division Manager in ABB China 2003–2004. ABB Drives & Power Electronics, Business Area Manager 2002 and Manager for ABB Drives 1996–2001. CFO of ABB Industry Oy 1994–1996. Prior to 1994, various positions in paper and packaging companies in Finland.

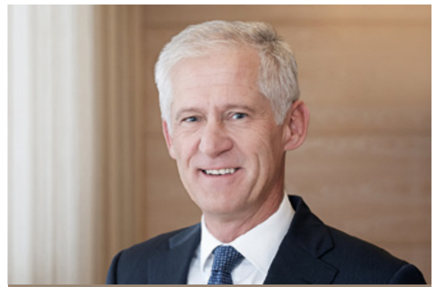
Chair of the Board of Cramo Plc and Board member of Fortum Corporation.

Suzanne Thoma

Member since 2015
- Member of the Remuneration Committee
- Independent of the company and significant shareholders
- Born 1962, Swiss citizen
- Ph.D. and M.Sc. (Chem. Eng.)
- BA (Business Admin.)
- UPM shares 9,506

Chief Executive Officer of BKW Ltd. since 2013. Head of BKW Group's Networks Business Unit 2010–2012. Head of WICOR Group's Automotive Division 2007–2009. Chief Executive Officer of Rolic Technologies Ltd 2002–2007. Various positions at Ciba Specialty Chemicals Corp. (former Ciba-Geigy) 1990–2002.

Board member of Schaffner Holding AG and Beckers Group.



Kim Wahl

Member since 2012
- Member of the Audit Committee
- Independent of the company and significant shareholders
- Born 1960, Norwegian citizen
- MBA (Harvard)
- BA (Business Econ.)
- UPM shares 21,305

Chair of the Board of Strømstangen AS since 2009. Deputy Chair and Cofounder of the European private equity firm IK Investment Partners 1989–2009. Associate, Corporate Finance, Goldman, Sachs & Co. 1987–1989.

Board member of DNB Bank ASA. Chair of the Board of Voxtra AS and Voxtra Foundation.

Group Executive Team


Jussi Pesonen

- President and CEO
- M.Sc. (Eng.)
- Born 1960, Finnish citizen
- Member of the Group Executive Team since 2001, employed by UPM Group since 1987
- UPM shares 466,472

President and CEO of UPM-Kymmene Corporation since 2004. COO of UPM Paper Divisions and Deputy to the President and CEO 2001–2004. Several management positions in UPM Paper Divisions 1987–2001.

Chair of the Board of the Finland Chamber of Commerce and ICC Finland. Deputy Chair of the Board of the Finnish Forest Industries Federation (FFIF). Board member of UPM-Kymmene Corporation, the Confederation of European Paper Industries (CEPI) and the East Office of Finnish Industries Oy.


Tapio Korpeinen

- Chief Financial Officer, Executive Vice President, UPM Energy
- M.Sc. (Tech.), MBA
- Born 1963, Finnish citizen
- Member of the Group Executive Team since 2008, employed by UPM Group since 2005
- UPM shares 168,013

CFO since 2010. President, Energy and Pulp Business Group 2008–2010. Vice President, Corporate Development and Senior Vice President, Strategy, UPM 2005–2008. Several management positions at Jaakko Pöyry Consulting in Finland and North America 1991–1998 and 1999–2005. A.T. Kearney in Finland 1998–1999 and McKinsey & Company in Sweden 1988–1990.

Chair of the Board of Pohjolan Voima Oy. Vice Chair of the Board of Kemijoki Oy. Board member of Teollisuuden Voima Oyj. Supervisory Board member of Varma Mutual Pension Insurance Company.


Bernd Eikens

- Executive Vice President, UPM Biorefining
- Ph.D. (Eng.)
- Born 1965, German citizen
- Member of the Group Executive Team since 2013, employed by UPM Group since 1998
- UPM shares 84,785

Executive Vice President, UPM Specialty Papers 2016–2019. Executive Vice President, UPM Paper ENA 2013–2016. Senior Vice President, Supply Chain, Paper Business Group 2008–2013. President, UPM-Kymmene Inc. North America 2005–2008. Several management positions at UPM Nordland Papier 1998–2005. Senior Process Engineer, International Paper Co. 1996–1998.

Supervisory Board member of Johann Bunte Bauunternehmung GmbH & Co. KG. Advisory Board member of Meyer Turku Oy.


Jyrki Ovaska

- Executive Vice President, Technology
- M.Sc. (Eng.)
- Born 1958, Finnish citizen
- Member of the Group Executive Team since 2002, employed by UPM Group since 1984
- UPM shares 99,054

President, Paper Business Group 2008–2013. President, Magazine Paper Division 2004–2008. President, Fine and Speciality Papers Division 2002–2003. Several management positions at United Paper Mills Ltd and UPM Group in the Printing Papers Division 1984–2001.

Vice Chair of the Board of CLIC Innovation Oy. Member of the Business Finland Advisory Board for Bioeconomy and Cleantech. Member of the Finnish Research and Innovation Council 2016–2019.


Pirkko Harrela

- Executive Vice President, Stakeholder Relations
- M.A.
- Born 1960, Finnish citizen
- Member of the Group Executive Team since 2004, employed by UPM Group since 1985
- UPM shares 92,264

Executive Vice President, Corporate Communications 2004–2013. Vice President, Corporate Communications of UPM 2003. Several positions in Communications in Finnpap and UPM Paper Division 1985–2002.

Board member of the Finnish Forest Industries Federation (FFIF). Member of S-Group's CSR and Sustainability Advisory Group. Member of the Board of Trustees in WWF Finland. Board member of Deutsch-Finnische Handelskammer, Satalinna Foundation and UPM-Kymmene Cultural Foundation. Member of the Board of Governors of the Association for Finnish Work.


Antti Jääskeläinen

- Executive Vice President, UPM Raflatac
- M.Sc. (Eng.), M.Sc. (Econ.), MBA
- Born 1972, Finnish citizen
- Member of the Group Executive Team since 2016, employed by UPM Group since 2014
- UPM shares 23,700

Senior Vice President, EMEIA, UPM Raflatac 2014–2016. Senior Vice President, Head of Global Operations, Amer Sports 2012–2014. Chief Development Officer, member of the Group Executive Board, Amer Sports 2009–2014. Several management positions at Stora Enso in Finland, Sweden and the UK 2004–2009. Engagement Manager & Associate, McKinsey & Company 2002–2004. Business Operations Manager, Nokia Networks in Finland and Italy 1998–2001. Financial Analyst, Enso Group 1997–1998.


Juha Mäkelä

- General Counsel
- LL.M.
- Born 1962, Finnish citizen
- Member of the Group Executive Team since 2008, employed by UPM Group since 2005
- UPM shares 73,894

Group General Counsel since 2005. Positions as legal counsel and senior legal counsel in KONE Corporation 1997–2004. Several positions in law firms 1991–1996.

Supervisory Board member of Kemijoki Oy.


Jaakko Nikkilä

- Executive Vice President, UPM Specialty Papers
- M.Sc. (Eng.), eMBA
- Born 1967, Finnish citizen
- Member of the Group Executive Team since July 2019, employed by UPM Group since 1995
- UPM shares 2,172

Senior Vice President, UPM Specialty Papers ENA 2018–2019. Vice President, APAC Sales, UPM Fine and Specialty Papers, China 2012–2017. Vice President, Converters, Paper Business Group, Finland 2011–2012. Area Sales Director, APAC Converters, Paper Business Group, Hong Kong 2005–2011. Production manager, Fine and Specialty Papers 2001–2005. Technical customer service manager, Fine and Specialty Papers 1995–2000. Analyst, Jaakko Pöyry Consulting 1993–1995.


Riitta Savonlahti

- Executive Vice President, Human Resources
- M.Sc. (Econ.)
- Born 1964, Finnish citizen
- Member of the Group Executive Team since 2004, employed by UPM Group since 2004
- UPM shares 26,781

Senior Vice President, Human Resources at Elcoteq Network Corporation 2001–2004. Senior Vice President, Human Resources at Raisio Group 2000–2001. Human Resources Manager at Nokia Mobile Phones, Salo Operations 1995–2000. Human Resources positions at ABB 1990–1994.

Supervisory Board member of Ilmarinen Mutual Pension Insurance Company. Board member of Scandic Hotels Group AB and Chair of the Compensation Committee. Member of Labour Markets Committee of the Finnish Forest Industries Federation (FFIF). Member of Work, Education and Skills Committee of the Finland Chamber of Commerce.


Winfried Schaur

- Executive Vice President, UPM Communication Papers
- Dipl. Ing. (FH)
- Born 1965, German citizen
- Member of the Group Executive Team since 2016, employed by UPM Group since 2001
- UPM shares 50,292

Senior Vice President, Newspaper Publishing, UPM Paper ENA 2013–2016. Several leadership positions in the UPM paper business 2001–2013. Project Manager, Investments, Haindl Papier GmbH 1993–2001. Project Engineer, Hoerbiger Automotive 1991–1992.

Chair of the Board of the German Pulp and Paper Association (VDP). Vice Chair of the Board of the Bavarian Industry Association (vbw). Board member of the Confederation of European Paper Industries (CEPI) and the Federation of German Industries (BDI).


Mika Sillanpää

- Executive Vice President, UPM Plywood
- M.Sc. (Eng.)
- Born 1958, Finnish citizen
- Member of the Group Executive Team since 2013, employed by UPM Group since 1985
- UPM shares 52,719

Vice President, Sourcing, UPM Raflatac Group 2008–2013. Senior Vice President, Strategic Development, UPM Raflatac Group 2003–2008. Vice President, UPM Raflatac Europe 2001–2003. Several management positions at UPM Raflatac in Finland and in France 1985–2000.

Board member of the Federation of the Finnish Woodworking Industries.


Kari Ståhlberg

- Executive Vice President, Strategy
- M.Sc. (Eng.)
- Born 1971, Finnish citizen
- Member of the Group Executive Team since 2013, employed by UPM Group since 2007
- UPM shares 41,971

Senior Vice President, Corporate Strategy 2010–2013. Director, M&A, UPM-Kymmene Corporation 2007–2010. Investment Manager at Finnish Industry Investment Ltd 2006–2007. M&A Advisor at JP Capital International Limited in the UK 2000–2006. Management Consultant at Jaakko Pöyry Consulting Oy 1998–2000.

Vice Chair of the Board of Steveco Oy.

COMMUNICATION ON PROGRESS

This is our **Communication on Progress** in implementing the principles of the **United Nations Global Compact** and supporting broader UN goals.

We welcome feedback on its contents.

UPM'S CORPORATE RESPONSIBILITY REPORTING IN ACCORDANCE WITH GRI STANDARDS AND AA 1000

UPM follows the Global Reporting Initiative's (GRI) Sustainability Reporting Standards in its corporate responsibility reporting. The reporting has been prepared in accordance with the GRI Standards: Core option.

Our GRI index document shows where the disclosures of material topics and general disclosures are addressed in the Annual Report, on UPM's webpage or in the GRI index document itself. It also includes information on omissions, additional explanations and disclosures on the management approach. The document is available on the UPM webpage upm.com/responsibility.

UPM is also committed to the principles of inclusivity, materiality and responsiveness as defined in the AA 1000 AccountAbility Principles Standard (2008).

The English version of the corporate responsibility information for 2019 has been assured by an independent third party, PricewaterhouseCoopers Oy (see the Independent Assurance Report below) and identified in the GRI content index. Congruence between the English and Finnish version has been checked.

AA1000
Licensed Assurance Provider
000-29

INDEPENDENT PRACTITIONER'S ASSURANCE REPORT

To the Management of UPM-Kymmene Corporation

We have been engaged by the Management of UPM-Kymmene Corporation (hereinafter also "the Company") to perform a limited assurance engagement on selected corporate responsibility information for the reporting period 1 January to 31 December 2019, disclosed in UPM-Kymmene Corporation's Annual Report 2019 and on its website in section "Responsibility" (hereinafter "the CR Reporting"). The assured information is indicated in the Company's GRI Content Index 2019 on the Company's website.

Furthermore, the assurance engagement has covered UPM-Kymmene Corporation's adherence to the AA1000 AccountAbility Principles with moderate (limited) level of assurance.

Management's responsibility

The Management of UPM-Kymmene Corporation is responsible for preparing the CR Reporting in accordance with the Reporting criteria as set out in the Company's reporting instructions and the GRI Standards Sustainability Reporting Guidelines of the Global Reporting Initiative. The Management of UPM-Kymmene Corporation is also responsible for such internal control as the management determines is necessary to enable the preparation of CR Reporting that is free from material misstatement, whether due to fraud or error.

The Management of UPM-Kymmene Corporation is also responsible for the Company's adherence to the AA1000 AccountAbility Principles of inclusivity, materiality and responsiveness as set out in AccountAbility's AA1000 AccountAbility Principles Standard 2008.

Practitioner's responsibility

Our responsibility is to express a limited assurance conclusion on the CR Reporting and on the Company's adherence to the AA1000 AccountAbility Principles based on the procedures we have performed and the evidence we have obtained. We conducted our limited assurance engagement in accordance with the International Standard on Assurance Engagements (ISAE) 3000 (Revised) "Assurance Engagements Other than Audits or Reviews of Historical Financial Information". That Standard requires that we plan and perform the engagement to obtain limited assurance about whether the CR Reporting is free from material misstatement.

In addition, we have conducted our work in accordance with the AA1000 Assurance Standard 2008. For conducting a Type 2 assurance engagement as agreed with the Company, the AA1000AS (2008) requires planning and performing of the assurance engagement to obtain moderate (limited) assurance on whether any matters come to our attention that cause us to believe that UPM-Kymmene Corporation does not adhere, in all material respects, to the AA1000 AccountAbility Principles and that the CR Reporting is not reliable, in all material respects, based on the Reporting criteria.

In a limited assurance engagement the evidence-gathering procedures are more limited than for a reasonable assurance engagement, and therefore less assurance is obtained than in a reasonable assurance engagement. An assurance engagement involves performing procedures to obtain evidence about the amounts and other disclosures in the CR Reporting, and about the Company's adherence to the AA1000 AccountAbility Principles. The procedures selected depend on the practitioner's judgement, including an assessment of the risks of material misstatement of the CR Reporting and an assessment of the risks of the Company's material nonadherence to the AA1000 AccountAbility Principles.

Our work consisted of, amongst others, the following procedures:

- Interviewing senior management of the Company.
- Interviewing employees from various organisational levels of the Company with regards to materiality, stakeholder expectations, meeting of those expectations, as well as stakeholder engagement.
- Assessing stakeholder inclusivity and responsiveness based on the Company's documentation and internal communication.
- Assessing the Company's defined material corporate responsibility topics as well as assessing the CR Reporting based on these topics.
- Visiting the Company's Head Office as well as two sites in Finland.
- Interviewing employees responsible for collecting and reporting the information presented in the CR Reporting at the group level as well as at the site level.
- Assessing how group employees apply the reporting instructions and procedures of the Company.
- Testing the accuracy and completeness of the information from original documents and systems on a sample basis.
- Testing the consolidation of information and performing recalculations on a sample basis.

Limited assurance conclusion

Based on the procedures we have performed and the evidence we have obtained, nothing has come to our attention that causes us to believe that UPM-Kymmene Corporation's CR Reporting for the reporting period ended 31 December 2019 is not properly prepared, in all material respects, in accordance with the Reporting criteria, or that the CR Reporting is not reliable, in all material respects, based on the Reporting criteria.

Furthermore nothing has come to our attention that causes us to believe that UPM-Kymmene Corporation does not adhere, in all material respects, to the AA1000 AccountAbility Principles.

When reading our assurance report, the inherent limitations to the accuracy and completeness of sustainability information should be taken into consideration.

Our assurance report has been prepared in accordance with the terms of our engagement. We do not accept, or assume responsibility to anyone else, except to UPM-Kymmene Corporation for our work, for this report, or for the conclusions that we have reached.

Observations and recommendations

Based on the procedures we have performed and the evidence we have obtained, we provide the following observations and recommendations in relation to UPM-Kymmene Corporation's adherence to the AA1000 AccountAbility Principles. These observations and recommendations do not affect the conclusions presented earlier.

Regarding Inclusivity: UPM-Kymmene Corporation has processes in place for stakeholder inclusivity and engagement. Stakeholder Relations coordinates stakeholder engagement at the group level, while businesses are responsible for local activity. We recommend that the Company continues inclusive dialogue across different stakeholder groups to meet stakeholder expectations also in the changing markets.

Regarding Materiality: UPM-Kymmene Corporation has a systematic process in place to evaluate and determine the materiality of corporate responsibility topics. Materiality analysis is updated annually. We recommend that the Company continues to further develop proactive dialogue with its stakeholders to determine and evaluate material topics.

Regarding Responsiveness: UPM-Kymmene Corporation has processes in place for responding to stakeholder needs. We recommend that the Company continues developing a systematic approach both to obtaining and acting on stakeholder feedback.

Practitioner's independence, qualifications and quality control

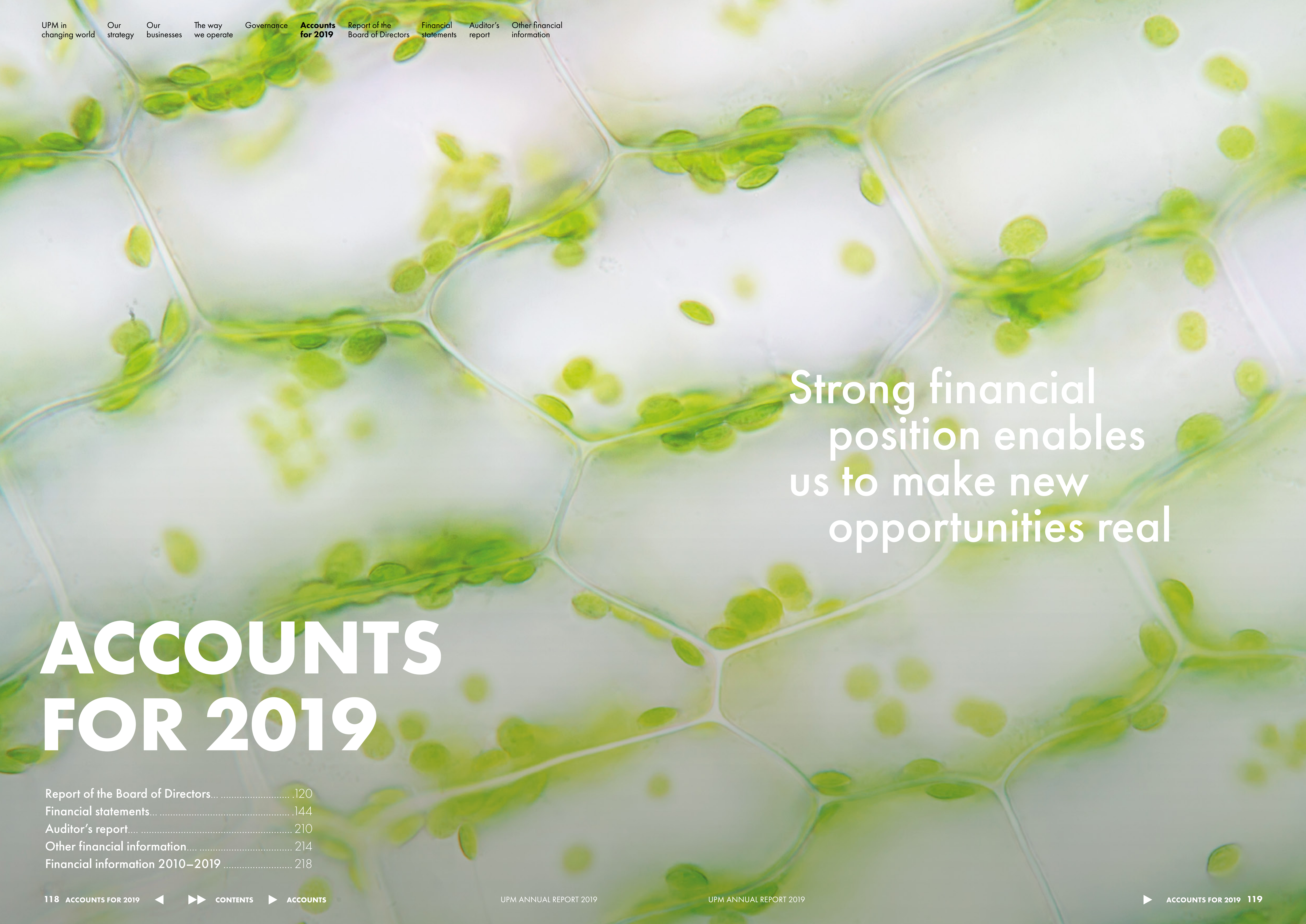
We have complied with the independence and other ethical requirements of the Code of Ethics for Professional Accountants issued by the International Ethics Standards Board for Accountants, which is founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behaviour.

Our multi-disciplinary team of corporate responsibility and assurance specialists possesses the requisite skills and experience within financial and non-financial assurance, corporate responsibility strategy and management, social and environmental issues, as well as the relevant industry knowledge, to undertake this assurance engagement.

PricewaterhouseCoopers Oy applies International Standard on Quality Control 1 and accordingly maintains a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

Helsinki 17 February 2020
PricewaterhouseCoopers Oy

Sirpa Juutinen	Jussi Nokkala
Partner	Director
Sustainability & Climate Change	Sustainability & Climate Change



Strong financial position enables us to make new opportunities real

ACCOUNTS FOR 2019

Report of the Board of Directors

UPM introduction and business model

UPM leads the forest-based bioindustry into a sustainable and innovation-driven future across six business areas:
UPM Biorefining, UPM Energy, UPM Raflatac, UPM Specialty Papers, UPM Communication Papers and UPM Plywood. These business areas are competitive, with strong market positions.

UPM provides sustainable and safe solutions to the growing global consumer demand. Products are made from renewable materials and are recyclable.

UPM group creates value to its stakeholders by operating separate businesses with a focus on:

- Competitive and sustainable wood sourcing, forestry and plantation operations
- Value adding, efficient and responsible global functions
- Continuous improvement (Smart) programmes
- Technology and intellectual property rights
- A global platform to build on
- Disciplined and effective capital allocation
- Compliance with applicable laws and regulations, UPM Code of Conduct and corporate policies

Clear roles and responsibilities

Group	Businesses	Outcomes
Portfolio strategy	Business area strategies	Top performance
Capital allocation	Commercial excellence	Competitive advantage
Business targets	Operational excellence	Value creation
Code of Conduct	Cost efficiency measures	Stakeholder and societal value
Responsibility targets	Focused growth project	License to operate
	Innovation	

Each business area is responsible for executing its own strategy and achieving targets. Group direction and support from global functions enable the businesses to capture benefits from UPM's brand, scale and integration, while navigating the complex operating environment. Capital allocation decisions take place at the group level.

Corporate responsibility is an integral part of all of our operations and a source of competitive advantage. UPM is committed to continuous improvement in financial, social and environmental performance. UPM promotes responsible practices throughout the value chain and is active in finding sustainable solutions, in co-operation with its customers, suppliers and partners.

Market environment in 2019

The global economic growth experienced a synchronised slowdown in 2019. This was impacted by trade tensions particularly between the US and China, prolonged political uncertainties and a sharp decline in global manufacturing activity. Global real GDP growth is estimated to have decreased to 2.6% in 2019, its lowest percentage since the global financial crisis.

In Europe, economic growth is estimated to have slowed to around 1.4%. Growth slowed the most in manufacturing-intensive economies such as Germany. However, employment held up well and inflation continued to remain at about 1%. The Brexit process was a continuous source of uncertainty, the UK's departure from the EU was repeatedly delayed, finally being set for January 2020.

The 2.3% US economic growth rate in 2019 reflected lower industrial confidence and a weaker outlook for investment and exports, impacted by the trade war. Private consumption was supported by strong consumer confidence, high employment and lower interest rates.

In China, economic growth slowed to 6.2%. China's imports declined, export growth was weaker, and investment activity remained modest. The slower growth in China and the effects of the geopolitical tensions on global value chains also impacted growth in emerging Asia.

While trying to find solutions to avoid any further weakening of the global economy and escalation of the trade tensions between the US and China, the world's leaders also collaborated to address the global climate change. Climate policy concerns were discussed with increasing frequency. Progress in coordinated global policy response remained modest.

The US dollar strengthened slightly against most other currencies during 2019. Overall, impact from changing currencies to UPM's businesses was relatively small during 2019.

Overall inflation remained low in 2019. The commodity cycle shifted downwards. Oil prices were volatile and driven by crude output and price disruptions due to geopolitical tensions. UPM's input costs stabilised after the significant increase seen in 2018 and started decreasing during the year 2019. Fibre and energy costs were lower in comparison with the previous year.

Market demand for UPM's products was influenced by slower global economic growth. Nevertheless, demand continued to grow for most of UPM's businesses in 2019, albeit at a modest pace. Sales prices started the year on generally good levels, but in many products decreased over the course of the year.

Global demand growth for chemical pulp continued in 2019, although uncertainties in the global economy and above-average producer inventory levels impacted global market pulp shipments during the year. Pulp prices decreased throughout the year from the record levels in 2018, to marginal producers' cash cost levels.

Demand for advanced renewable diesel and naphtha continued to be strong, driven by climate change mitigation targets, stricter environmental standards and sustainability. In 2019, the Finnish Parliament approved a law that sets a gradually increasing 30% biofuel use target for 2030. Furthermore, the law introduced a world-leading advanced biofuel use target of 10% for 2030.

Finland's electricity consumption fell, mainly due to the milder weather at the beginning and near the end of 2019. Nordic hydrological balance improved, getting closer to normal levels in H2 of 2019 after a weak H1. Electricity sales prices in Finland were lower.

Global demand growth for self-adhesive label materials continued in 2019, although at a slower pace than in the previous year. Demand growth for label, release and packaging papers was healthy. Demand was driven by e-commerce growth and private consumption. After a slow start in the Asia-Pacific region, demand for office paper in 2019 was good, and market prices in China increased.

In Europe, demand for graphic paper grades was 9% lower than in the previous year. The decline in demand was driven by lower economic growth and a decline in advertising spend. However, prices increased for all paper grades in the beginning of the year and started to decrease in the second half of the year.

Market demand for plywood in Europe slowed down in 2019. Demand for spruce plywood and birch plywood-related industrial applications became weaker. Competition remained intense in the birch-trading business. Demand continued to grow for construction-driven sawn timber, albeit at lower level. Uncertainties in the global economy and destocking in the value chain continued to impact market prices.

Key figures

	2019	2018	2017
Sales, EURm	10,238	10,483	10,010
Comparable EBITDA, EURm [1]	1,851	1,868	1,677
% of sales [1]	18.1	17.8	16.8
Operating profit, EURm	1,344	1,895	1,259
Comparable EBIT, EURm	1,404	1,513	1,292
% of sales	13.7	14.4	12.9
Profit before tax, EURm	1,307	1,839	1,186
Comparable profit before tax, EURm	1,367	1,457	1,218
Profit for the period, EURm	1,073	1,496	974
Comparable profit for the period, EURm	1,119	1,194	1,004
Earnings per share (EPS), EUR	1.99	2.80	1.82
Comparable EPS, EUR	2.07	2.24	1.88
Return on equity (ROE), %	10.7	16.2	11.5
Comparable ROE, %	11.2	12.9	11.9
Return on capital employed (ROCE), %	12.3	18.4	12.5
Comparable ROCE, %	12.8	14.6	12.8
Operating cash flow, EURm [1]	1,847	1,330	1,460
Operating cash flow per share, EUR [1]	3.46	2.49	2.74
Equity per share at the end of period, EUR	18.87	18.36	16.24
Capital employed at the end of period, EURm	11,474	10,575	9,777
Net debt, EURm	-453	-311	174
Net debt to EBITDA [1]	-0.24	-0.17	0.10
Personnel at the end of period	18,742	18,978	19,111

[1] 2018 comparative figures have been restated due to accounting policy change of forest renewal costs. *» Refer Note 1.5 Changes in accounting policies.*

» Refer Other financial information Alternative performance measures for definitions of key figures.

Adoption of IFRS 16 Leases

UPM adopted the IFRS 16 Leases standard on 1 January 2019 without restating prior years. The change in lease accounting has resulted in a reduction in operating costs (and therefore an increase in EBITDA), higher depreciation expenses and positive impact on operating profit. In addition, interest expenses have increased slightly. Cash generation was not impacted by the adoption of the standard. However, operating cash flow is positively impacted by it, given that a large part of the payments in relation to leases is now reported as financing cash flow (lease liability repayments).

As a consequence of the adoption of IFRS 16, 2019 operating costs have been EUR 83 million lower (driving the increase in EBITDA by the same amount), depreciation expenses have been EUR 65 million higher and interest expenses have been EUR 12 million higher. The increase in leased assets on 1 January 2019 was EUR 493 million and the increase in financial debt amounted to EUR 491 million. Leased assets are not included in the measure of Capital expenditure.

Results

2019 compared with 2018

In 2019, sales were EUR 10,238 million, 2% lower than the EUR 10,483 million for 2018. The decrease in sales was mainly due to lower pulp sales prices and lower deliveries of graphic papers. Sales grew in UPM Raflatac and UPM Energy, and decreased in UPM Biorefining, UPM Communication Papers, UPM Plywood and UPM Specialty Papers.

Comparable EBIT decreased by 7% to EUR 1,404 million, 13.7% of sales (1,513 million, 14.4%).

Development in sales prices and variable costs differed between businesses. At the group level, the negative impact of lower sales prices was larger than the positive impact of lower variable costs.

Fixed costs decreased by EUR 65 million. Without the adoption of the IFRS 16 Leases standard fixed costs would have been EUR 57 million higher (i.e. decreased by EUR 8 million).

Delivery volumes decreased in UPM Communication Papers and UPM Plywood, remained unchanged in UPM Specialty Papers and grew in UPM Biorefining, UPM Raflatac and UPM Energy.

Depreciation, excluding items affecting comparability, totalled EUR 477 million (422 million) including depreciation of leased assets totalling EUR 72 million (7 million). The change in the fair value of forest assets net of wood harvested, excluding items affecting comparability, was EUR 26 million (63 million).

Operating profit was EUR 1,344 million (1,895 million). Items affecting comparability in operating profit totalled EUR -60 million in the period (382 million). This included EUR 58 million of restructuring charges in UPM Communication Papers and EUR 4 million in UPM Raflatac.

Net interest and other finance income and costs were EUR -38 million (-60 million). The exchange rate and fair value gains and losses were EUR 0 million (3 million). Income taxes were EUR 234 million (342 million).

Profit for 2019 was EUR 1,073 million (1,496 million), and comparable profit was EUR 1,119 million (1,194 million).

Financing and cash flow

In 2019 cash flow from operating activities before capital expenditure and financing totalled EUR 1,847 million (1,330 million). Working capital decreased by EUR 276 million during the period (increased by 209 million).

A dividend of EUR 1.30 per share (totalling EUR 693 million) was paid on 17 April 2019 in respect of the 2018 financial year.

Net debt decreased to EUR -453 million at the end of 2019 (-311 million). The gearing ratio as of 31 December 2019 was -4% (-3%). The net debt to EBITDA ratio, based on the latest 12 months' EBITDA, was -0.24 at the end of the period (-0.17).

On 31 December 2019 UPM's cash funds and unused committed credit facilities totalled EUR 1.5 billion.

Capital expenditure

In 2019, capital expenditure totalled EUR 378 million, 3.7% of sales (303 million, 2.9% of sales). Capital expenditure does not include additions to leased assets.

In 2020, UPM's total capital expenditure, excluding investments in shares and potential transformative prospects, is expected to be about EUR 1,200 million. This includes estimated capital expenditure of approximately EUR 900 million (USD 1,000 million) in Uruguay for the pulp mill, port operations and local investments outside the mill fence.

In April 2017 UPM announced plans to strengthen its position in the label market and invest approximately EUR 6 million in capacity for special labels in Tampere, Finland. A new special label product line has been built, focusing on small series production runs. In addition, internal logistics have been strengthened. The new product line was completed in January 2019.

In October 2017 UPM announced plans to expand its Chudovo plywood mill in Russia. The project has raised the mill's production capacity by 45,000 cubic metres, to 155,000 cubic metres, while also broadening the mill's product portfolio. In addition to the growth in production capacity, a new bio-heat boiler has been built at the mill site. The total investment is EUR 50 million and was completed at the end of Q3 2019.

In April 2018 UPM announced that it would rebuild Paper Machine 2 at its Nordland mill in Dörpen, Germany, and convert it from fine paper to glassine paper production. The machine will be equipped with new finishing equipment and will start producing glassine paper in Q1 2020. The planned capacity after the rebuild is 110,000 tonnes per year. The total investment in Nordland is EUR 124 million.

In April 2018 UPM announced plans to increase release liner base paper capacity at the UPM Changshu mill in China. Installing a second supercalender on paper machine 3 will create an additional capacity of more than 40,000 tonnes of glassine paper per year. The investment was completed in Q4 2019. The total investment in Changshu is EUR 34 million.

In January 2019 UPM announced that it would invest in the refurbishment of the Kuusankoski hydropower plant in Finland. The average annual production of the Kuusankoski plant is expected to increase from the current 180 GWh to 195 GWh. The investment will be completed by the end of 2022.

In July 2019 UPM announced that it would invest USD 2,7 billion in a 2,1 million tonne greenfield eucalyptus pulp mill near Paso de los Toros in central Uruguay. Additionally, UPM will invest approximately USD 280 million in port operations in Montevideo and USD 70 million in local investments outside the mill fence, including a new residential area in Paso de los Toros. The mill is scheduled to start up in the second half of 2022.

In October 2019 UPM announced that it would invest EUR 95 million in a Combined-Heat-Power (CHP) plant at the UPM Nordland paper mill in Germany. The plant is planned to go on grid in Q3 2022. The annual cost savings of more than EUR 10 million will start as of 2023. The investment is estimated to decrease UPM's CO_2-footprint by 300 000 tonnes.

Personnel

In 2019, UPM had an average of 19,185 employees (19,271). At the beginning of the year the number of employees was 18,978 and at the end of 2019 it was 18,742.

Further information about personnel is available in **» Our People** *section in UPM Annual report 2019.*

Uruguay pulp mill investment

On 23 July UPM announced that it would invest USD 2.7 billion in a 2.1 million tonne greenfield eucalyptus pulp mill near Paso de los Toros in central Uruguay. Additionally, UPM will invest approximately USD 280 million in port operations in Montevideo and USD 70 million in local investments outside the mill fence, including a new residential area in Paso de los Toros. The mill is scheduled to start up in the second half of 2022.

The investment will grow UPM's current pulp capacity by more than 50%, resulting in a step change in the scale of UPM's pulp business as well as in UPM's future earnings.

With a combination of competitive wood supply, scale, best available techniques and efficient logistics the mill is expected to reach a highly competitive cash cost level of approximately USD 280 per delivered tonne of pulp. This figure includes the variable and fixed costs of plantation operations, wood sourcing, mill operations and logistics delivered to the main markets. Furthermore, the safety and sustainability performance of the value chain from plantations to customer delivery is expected to be on an industry leading level.

Competitive wood supply

Eucalyptus availability for the mill is secured through UPM's own and leased plantations as well as through wood sourcing agreements with private partners. The plantations that UPM owns and leases in Uruguay cover 405,000 hectares. They will supply the current UPM Fray Bentos mill and the new mill near Paso de los Toros.

State of the art mill design

The pulp mill has been designed as an efficient single-line operation. The machines, materials, level of automation and standards enable a high operating rate and maintainability as well as high energy output, ensuring excellent safety, high environmental performance and low operating costs during the long lifecycle of the mill.

The mill is designed to fully meet the strict Uruguayan environmental regulations as well as international standards and recommendations for modern mills, including the use of latest and best available proven technology (BAT). The mill's environmental performance will be verified with comprehensive and transparent monitoring.

The mill's initial annual production capacity is 2.1 million tonnes, and the environmental permits enable further capacity potential. When in operation, the mill generates more than 110 MW surplus of renewable electricity.

Efficient logistics set-up

An efficient logistics chain will be secured by the agreed road improvements, extensive railway modernisation and port terminal construction.

The Public-Private-Partnership agreement between the government and the construction company for the construction of the central railway was signed in May 2019. Initial works on the central railway have been started and the financing of the construction consortium is finalised.

UPM has decided on the construction of a deep-sea pulp terminal in Montevideo port with an investment of approximately USD 280 million. Direct rail access from the mill to a modern deep-sea port terminal creates an efficient supply chain to world markets. The Montevideo deep-sea port also enables synergies in ocean logistics with UPM's existing Uruguay operations.

UPM has entered into a port terminal concession and plans to enter rail logistic services agreements both being under IFRS 16 Leases. The total amount of such lease payments is expected to be USD 200 million.

Significant impact on the Uruguayan economy

Based on independent socioeconomic impact studies, the mill is estimated to increase Uruguay's gross national product by about 2% and the annual value of Uruguay's exports by approximately 12% after completion.

In the most intensive construction phase, more than 6,000 people will be working on the site. When completed, approximately 10,000 permanent jobs are estimated to be created in the Uruguayan economy whereof approximately 4,000 would involve direct employment by UPM and its subcontractors. About 600 companies are estimated to be working in the value chain.

The mill will be located in one of Uruguay's many free trade zones and pay a fixed annual tax of USD 7 million per annum. The mill's value chain is expected to contribute USD 170 million in annual taxes and social security payments and contribute USD 200 million in wages and salaries annually.

Project schedule and capital outflow

The mill is expected to start up in the second half of 2022. The project is proceeding within the planned schedule. Preparations at the mill site are proceeding with earth works, fencing, lighting and road works. At the pulp terminal in Montevideo port the first phase of dredging is completed, and the back filling of the area has started.

The main part of the total capital expenditure of USD 3 billion will take place in 2020–2022. UPM will hold 91% ownership of the project and a local long-term partner which has also been involved in UPM Fray Bentos, owns 9%. UPM's investment will be mainly financed by operating cash flow complemented by regular group financing activities.

Biochemicals business development

UPM formed UPM Biochemicals in 2013 by combining its biochemical-related business initiatives. UPM Biochemicals offers and develops innovative, sustainable and competitive wood-based biochemicals. The product segments are biochemicals and lignin products. Development is at the pre-commercial phase, with UPM actively developing and testing industrial applications to create industrial-scale mill concepts.

In October 2017 UPM announced that it was evaluating the potential of building a biorefinery in Germany. Basic engineering of the potential biorefinery has been completed. The company is assessing two alternative industrial parks in Germany, in Frankfurt and in Leuna, to select the optimal set-up for the potential facility. The commercial studies also need to be concluded before UPM's regular process of analysing and preparing an investment decision commences.

OL3 power plant project

Teollisuuden Voima Oyj (TVO) is in the process of constructing a third nuclear power plant unit, OL3 EPR, at the Olkiluoto site (OL3). UPM participates in OL3 through its shareholding in Pohjolan Voima Oyj (PVO), which is the majority shareholder in TVO. UPM's indirect share of OL3 is approximately 31%. The OL3 plant supplier, a consortium consisting of AREVA GmbH, AREVA NP SAS and Siemens AG (the Supplier), is constructing OL3 as a turnkey project.

The start of regular electricity production, originally scheduled for April 2009, has been revised several times by the Supplier. As announced by TVO in December 2019, TVO received from Supplier information, regular electricity generation at OL3 would commence in March 2021.

According to Supplier, nuclear fuel will be loaded into the reactor in June 2020 and the first connection to the grid will take place in November 2020. According to the commissioning program, the unit will produce 1–3 terawatt hours with varying power levels during the test program, which will begin from the connection to the grid and will end to the beginning of regular electricity production.

When completed, OL3 will supply electricity to its shareholders on a cost-price principle (Mankala-principle) which is widely applied in the Finnish energy industry. Under the Mankala-principle electricity and/or heat is supplied to the shareholders in proportion to their ownership and each shareholder is, pursuant to the specific stipulations of the respective articles of association, severally responsible for its respective share of the production costs of the energy company concerned. OL3 will increase UPM Energy's electricity generation capacity significantly. The new power plant unit is expected to be highly efficient and meet the highest safety standards. Its power generation will be CO_2 -free and Olkiluoto will have a secure solution for the final disposal of used fuel.

Events during the year 2019

On 9 January UPM announced its participation in the international public tendering process in the port of Montevideo organised by the National Ports Administration (ANP) of Uruguay.

In March, ANP awarded UPM the concession in the port. The scope of the concession is the construction and operation of a port terminal specialised in the storage and shipping of pulp, chemicals and other inputs related to pulp production with a capacity to handle approximately 2 million tonnes of pulp annually. The tenure of the concession is to be 50 years.

On 31 January UPM announced that it would invest in the refurbishment of the Kuusankoski hydropower plant in Finland. The average annual production of the Kuusankoski plant is expected to increase from the current 180 GWh to 195 GWh. The investment will be completed by the end of 2022.

On 24 June UPM announced the decision to permanently close paper machine 10 at UPM Plattling, Germany, reducing the annual capacity of coated mechanical paper in Europe by approximately 155,000 tonnes. The paper machine was permanently closed in July 2019 and the number of persons affected is 155. UPM recognised restructuring charges of EUR 25 million as items affecting comparability in its 2019 results. The expected annual cost saving is approximately EUR 17 million.

On 17 July TVO announced it had received an updated schedule for the commissioning of the OL3 EPR plant unit from the Supplier. According to the received information, the regular electricity generation at the OL3 plant unit would start in July 2020.

On 23 July UPM announced that it would invest USD 2.7 billion in a 2.1 million tonne greenfield eucalyptus pulp mill near Paso de los Toros in central Uruguay. Additionally, UPM will invest approximately USD 280 million in port operations in Montevideo and USD 70 million in local investments outside the mill fence, including a new residential area in Paso de los Toros. The mill is scheduled to start up in the second half of 2022.

On 10 September UPM announced that it plans to permanently close SC paper machine 2 in Rauma, Finland and sell its Chapelle newsprint mill in Grand-Couronne, France, reducing the annual capacity of SC paper by 265,000 tonnes and newsprint by 240,000 tonnes. In addition, UPM announced that it plans to establish a new Business Services Hub in Wroclaw, Poland. In total 168 positions in 11 different locations would be affected. The hub is planned to be in full operation by the end of Q3 2020.

The employee consultation processes of paper machine 2 at UPM Rauma were completed on 5 November and the paper machine was permanently closed on 6 November. The number of personnel affected at UPM Rauma is 179. Related to the closure of Rauma PM2, UPM recognised restructuring charges of EUR 27 million, of which EUR 12 million as write-offs, as items affecting comparability in its 2019 results.

On 28 January 2020 UPM announced that it has started the employee consultation processes for the potential closure of UPM Chapelle newsprint mill in Grand-Couronne, France. These consultations are estimated to be concluded by end of Q2 2020. It is estimated that 236 people will be affected by the plan at UPM Chapelle. UPM will continue the sales process of the mill throughout the consultation process.

On 24 October UPM announced that it would invest EUR 95 million in a Combined-Heat-Power (CHP) plant at UPM Nordland paper mill in Germany. The plant is planned to go on grid in Q3 2022.

On 19 December TVO announced that it had received an updated schedule for the commissioning of the OL3 EPR plant unit from the Supplier. According to the received information, OL3 EPR plant will be connected to the grid in November 2020 and the regular electricity generation at the OL3 plant unit will start in March 2021.

Events after the balance sheet date

On 27 January multiple Finnish labor unions started extensive three week labor actions in the Finnish forest industry. Consequently, production on all of UPM's Finnish pulp and paper mills, label stock mill as well as plywood and sawmills has stopped. UPM has prepared for the labor actions and strives to fulfill customer orders either from stocks or from the mills operating outside Finland.

On 27 January, UPM announced the commitment to the United Nations Global Compact's Business Ambition for 1.5°C, joining leading companies in a promise to pursue science-based measures to limit global temperature rise to 1.5°C. UPM will strive to mitigate climate change and drive value creation through innovating novel products, committing to a 65% CO_2 emission reduction from the 2015 levels by 2030 and by practicing sustainable forestry.

On 28 January 2020 UPM announced that it has started the employee consultation processes for the potential closure of UPM Chapelle newsprint mill in Grand-Couronne, France. These consultations are estimated to be concluded by end of Q2 2020. UPM will continue the sales process of the mill throughout the consultation process.

Outlook for 2020

Global economic growth is expected to continue in 2020, albeit at a modest level. Growth is expected to be slow in Europe. Potential intensification or easing of trade tensions between major economic areas cause uncertainty to the business environment. These issues may impact UPM's product and raw material markets in 2020.

In 2020, robust demand is expected to continue for most UPM businesses, whereas demand decline is expected to continue for UPM Communication Papers.

In the beginning of the year 2020, paper prices are expected to decrease moderately, compared with Q4 2019. Pulp prices are starting the year 2020 at a low level, after the decreases that took place throughout the year 2019.

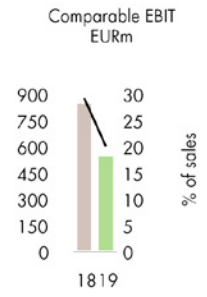
UPM will continue its actions to reduce fixed and variable costs. In 2020, the intensifying phase of UPM's transformative growth projects is expected to add project-related costs to the fixed costs.

UPM's comparable EBIT in H1 2020 is expected to be significantly lower than in H1 2019, due to lower sales prices, partly offset by decreases in variable costs. Comparable EBIT is expected to recover in H2 2020.

Business area reviews

UPM Biorefining

UPM Biorefining consists of pulp, timber and biofuels businesses. UPM Pulp offers a versatile range of responsibly-produced pulp grades suitable for a wide range of end uses such as tissue, specia-lty papers, graphic papers and board. UPM Timber offers certified sawn timber for construction, joinery and furniture. UPM Biofuels produces wood-based renewable diesel for all diesel engines and bio-based naphtha that can be used as a biocomponent for petrol or for replacing fossil raw materials in the petrochemical industry. UPM has three pulp mills in Finland and one mill and plantation operations in Uruguay. UPM operates four sawmills and one biorefinery in Finland.



	2019	2018
Sales, EURm	2,712	2,892
Comparable EBITDA, EURm [1]	724	1,011
% of sales	26.7	35.0
Change in fair value of forest assets and wood harvested, EURm [1]	-11	-12
Share of results of associates and joint ventures, EURm	2	2
Depreciation, amortisation and impairment charges, EURm	-171	-155
Operating profit, EURm	544	847
% of sales	20.1	29.3
Items affecting comparability in operating profit, EURm	–	–
Comparable EBIT, EURm	544	847
% of sales	20.1	29.3
Capital employed (average), EURm	3,469	3,180
Comparable ROCE, %	15.7	26.6
Pulp deliveries, 1,000 t	3,715	3,468

[1] 2018 comparative figures have been restated due to accounting policy change of forest renewal costs. » Refer Note 1.5 *Changes in accounting policies*, of the consolidated financial statements 2019.

2019 compared with 2018

Comparable EBIT for UPM Biorefining decreased due to lower pulp sales prices. Delivery volumes were higher.

The average price in euro for UPM's pulp deliveries decreased by 16%.

Market environment

Global chemical pulp demand continued to grow in 2019. Uncertainties in the global economy and above average pulp inventory levels continued to impact global market pulp shipments.

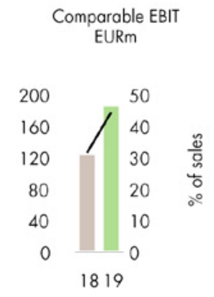
In 2019, the average European market price in euro was 11% lower for NBSK and 13% lower for BHKP compared to the previous year. In China the average market price in US dollars was 28% lower for NBSK and 26% lower for BHKP compared to the previous year.

Demand for advanced renewable diesel and naphtha remained strong.

Demand growth for sawn timber continued in 2019 albeit at lower levels. Uncertainties in the global economy and destocking in the value chain continued to impact market prices.

UPM Energy

UPM Energy creates value through cost-competitive, zero-carbon electricity generation and through physical and financial electricity trading as well as energy optimisation services for industrial electricity consumers. UPM Energy is the second largest electricity producer in Finland. UPM's power generation capacity consists of hydropower, nuclear power and condensing power.



	2019	2018
Sales, EURm	417	391
Comparable EBITDA, EURm	195	132
% of sales	46.7	33.7
Depreciation, amortisation and impairment charges, EURm	-9	-9
Operating profit, EURm	184	114
% of sales	44.2	29.2
Items affecting comparability in operating profit, EURm [1]	-1	-9
Comparable EBIT, EURm	185	123
% of sales	44.4	31.5
Capital employed (average), EURm	2,454	2,346
Comparable ROCE, %	7.5	5.3
Electricity deliveries, GWh	8,619	8,608

[1] In 2019 and 2018, items affecting comparability relate to restructuring of ownership in Meri-Pori power plant.

2019 compared with 2018

Comparable EBIT for UPM Energy increased due to higher electricity sales prices and lower costs for nuclear.

UPM's average electricity sales price increased by 10% to EUR 41.9/MWh (38.1/MWh).

Market environment

The Nordic hydrological balance improved close to normal levels in H2 2019 after weak a H1 2019. In Finland, hydrological balance remained weak until the end of Q3 2019 and improved significantly in Q4 due to heavy rains and mild weather.

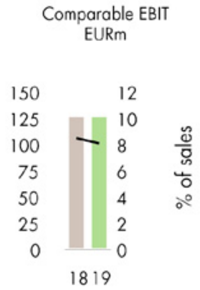
Coal prices in Q4 2019 decreased compared to the same period in the previous year.

The CO_2 emission allowance price of EUR 24.6/tonne at the end of Q4 2019 was slightly lower than in Q4 2018 (EUR 25.0/tonne).

The average Finnish area spot price on the Nordic electricity exchange in 2019 was EUR 44.0/MWh, 6% lower than in 2018 (46.8/MWh).

UPM Raflatac

UPM Raflatac offers innovative and sustainable labelling materials for branding and promotion, information and functional labelling in the food, beverage, personal care, pharmaceutical and retail segments, for example. UPM Raflatac is the second-largest producer of self-adhesive label materials worldwide.



	2019	2018
Sales	1,555	1,488
Comparable EBITDA, EURm	166	156
% of sales	10.7	10.5
Depreciation, amortisation and impairment charges, EURm	-40	-30
Operating profit, EURm	124	126
% of sales	8.0	8.5
Items affecting comparability in operating profit, EURm [1]	-2	—
Comparable EBIT, EURm	126	126
% of sales	8.1	8.5
Capital employed (average), EURm	579	535
Comparable ROCE, %	21.8	23.6

[1] 2019, items affecting comparability include EUR 2 million gain on sale of non-current assets and EUR 4 million of restructuring charges.

2019 compared with 2018

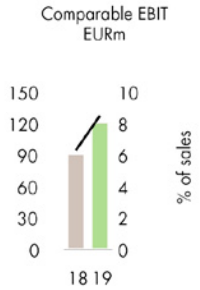
Comparable EBIT for UPM Raflatac remained unchanged. Higher sales prices and delivery volumes offset the negative impact of higher costs and unfavourable changes in currencies.

Market environment

Global demand growth for self-adhesive label materials continued in 2019, albeit at a slower pace.

UPM Specialty Papers

UPM Specialty Papers offers labelling materials and release line base papers, flexible packaging papers as well as office and graphic papers for labelling, commercial siliconising, packaging and printing. The operations consist of the UPM Changshu and UPM Tervasaari mills in China and Finland, as well as label and packaging papers production lines at the UPM Jämsänkoski mill in Finland. The main customers are label stock manufacturers, paper converters, merchants and distributors and packaging customers.



	2019	2018
Sales	1,412	1,429
Comparable EBITDA, EURm	194	167
% of sales	13.7	11.7
Depreciation, amortisation and impairment charges, EURm	-74	-77
Operating profit, EURm	120	90
% of sales	8.5	6.3
Items affecting comparability in operating profit, EURm	—	—
Comparable EBIT, EURm	120	90
% of sales	8.5	6.3
Capital employed (average), EURm	904	889
Comparable ROCE, %	13.3	10.1
Paper deliveries, 1000 t	1,552	1,554

2019 compared with 2018

Comparable EBIT for UPM Specialty Papers increased due to lower input costs more than offsetting the negative impact of lower fine paper sales prices and unfavourable changes in currencies. Fixed costs decreased.

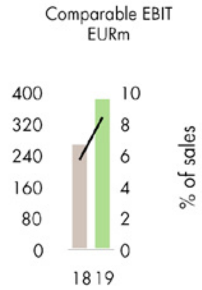
Market environment

After a slow start in the Asia-Pacific region, fine paper demand was good during 2019. China fine paper market prices increased during 2019.

Label, release and packaging paper demand growth was healthy in 2019 but sales prices were lower.

UPM Communication Papers

UPM Communication Papers offers an extensive product range of graphic papers for advertising and publishing as well as home and office uses. The business has extensive low-cost operations consisting of 15 efficient paper mills in Europe and the United States, a global sales network and an efficient logistic system. The main customers are publishers, cataloguers, retailers, printers and merchants.



	2019	2018
Sales	4,552	4,690
Comparable EBITDA, EURm	513	381
% of sales	11.3	8.1
Share of results of associated companies and joint ventures, EURm	1	2
Depreciation, amortisation and impairment charges, EURm	-145	-116
Operating profit, EURm	324	312
% of sales	7.1	6.7
Items affecting comparability in operating profit, EURm [1]	-58	46
Comparable EBIT, EURm	383	267
% of sales	8.4	5.7
Capital employed (average), EURm	1,647	1,602
Comparable ROCE, %	23.2	16.7
Paper deliveries, 1000 t	6,774	7,442

[1] In 2019, items affecting comparability include EUR 15 million restructuring charges and EUR 12 million impairment charges related to closure of paper machine 2 at UPM Rauma mill, Finland, and EUR 24 million restructuring charges and EUR 1 million impairment charges related to closure of paper machine 10 at UPM Plattling mill, Germany. Additionally, EUR 6 million relate to prior capacity closures and establishment of new Business Service Hub in Wroclaw, Poland. In 2018, items affecting comparability include EUR 30 million capital gain relating to sale of hydropower assets located in Schongau and Ettringen mill sites in Germany, EUR 18 million income relating to reversal of unused restructuring provisions in Finland and Germany, EUR 1 million loss relating to sale of Myllykoski mill site in Finland and EUR 1 million expense relating to prior capacity closures.

2019 compared with 2018

Comparable EBIT for UPM Communication Papers increased due to higher sales prices more than offsetting the negative impact of lower volumes. Variable and fixed costs were lower.

The average price in euro for UPM's paper deliveries increased by 6%.

Market environment

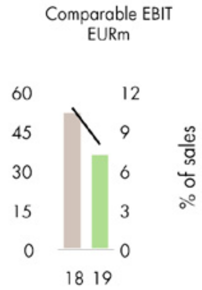
In 2019, demand for graphic papers in Europe was 9% lower than in the previous year. Newsprint demand decreased by 9%, magazine paper by 10% and fine paper by 7%.

Publication paper prices in Europe were 6% higher and fine paper prices 2% higher than in 2018.

Demand for magazine papers in North America decreased by 14% compared to 2018. The average price in US dollars for magazine papers increased by 5% compared to 2018.

UPM Plywood

UPM Plywood offers high quality WISA plywood and veneer products, for construction, vehicle flooring, LNG shipbuilding, parquet manufacturing and other industrial applications. Production facilities are located in Finland, Estonia and Russia.



	2019	2018
Sales	450	480
Comparable EBITDA, EURm	61	75
% of sales	13.5	15.6
Depreciation, amortisation and impairment charges, EURm	-25	-23
Operating profit, EURm	36	52
% of sales	8.0	10.8
Items affecting comparability in operating profit, EURm	—	—
Comparable EBIT, EURm	36	52
% of sales	8.0	10.8
Capital employed (average), EURm	329	283
Comparable ROCE, %	11.0	18.4
Plywood deliveries, 1,000 m3	739	791

2019 compared with 2018

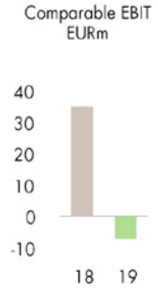
Comparable EBIT for UPM Plywood decreased mainly due to lower delivery volumes.

Market environment

Market demand in Europe decelerated in 2019. Demand for spruce plywood and for birch plywood-related industrial applications was weakening. Competition remained intense in the birch-trading business.

Other operations

UPM Forest secures competitive wood and biomass for UPM businesses and manages UPM-owned and privately-owned forests in North Europe. In addition, UPM offers forestry services to forest owners and forest investors. UPM Biochemicals, UPM Biomedicals and UPM Biocomposites business units and group services are also included in Other operations.



	2019	2018
Sales, EURm	264	326
Comparable EBITDA, EURm [1]	-18	-28
Change in fair value of forest assets and wood harvested, EURm [1]	38	419
Share of results of associated companies and joint ventures, EURm	–	2
Depreciation, amortisation and impairment charges, EURm	-27	-13
Operating profit, EURm	-10	380
Items affecting comparability in operating profit, EURm [2]	-4	345
Comparable EBIT, EURm	-7	35
Capital employed (average), EURm	1,824	1,392
Comparable ROCE, %	-0.4	2.5

1) 2018 comparative figures have been restated due to accounting policy change of forest renewal costs. » Refer Note 1.5 *Changes in accounting policies*, of the consolidated financial statements 2019.

2) In 2019, items affecting comparability of EUR 2 million relate to restructuring charges and EUR 2 million to capital loss on sale of Voikkaa mill site in Finland. In 2018, items affecting comparability of EUR 345 million relates to increase in the fair value of the forest assets in Finland, mainly due to higher forest growth estimates.

2019 compared with 2018

Comparable EBIT for other operations decreased. The change in the fair value of forest assets net of wood harvested was EUR 38 million (419 million). The increase in the fair value of forest assets was EUR 88 million (471 million). In 2018, this included EUR 345 million increase in the fair value of forest assets in Finland. The cost of wood harvested from UPM forests was EUR 51 million (52 million).

Board of Directors and the Group Executive Team

At the Annual General Meeting held on 4 April 2019, the number of members of the Board of Directors was confirmed as 10, and Berndt Brunow, Henrik Ehrnrooth, Piia-Noora Kauppi, Marjan Oudeman, Jussi Pesonen, Ari Puheloinen, Veli-Matti Reinikkala, Suzanne Thoma, Kim Wahl and Björn Wahlroos were re-elected to the Board. The directors' term of office will end upon the closure of the next AGM.

Björn Wahlroos was re-elected as Chair, and Berndt Brunow as Deputy Chair of the Board of Directors of UPM-Kymmene Corporation at the Board of Directors' constitutive meeting that took place following the Annual General Meeting.

In addition, the Board of Directors elected the chairs and other members to the Board committees from among its members. Piia-Noora Kauppi was re-elected to chair the Audit Committee, and Marjan Oudeman and Kim Wahl were re-elected as other committee members. Veli-Matti Reinikkala was re-elected to chair the Remuneration Committee, and Henrik Ehrnrooth and Suzanne Thoma were re-elected as other committee members. Björn Wahlroos was re-elected to chair the Nomination and Governance Committee, and Berndt Brunow and Ari Puheloinen were re-elected as other committee members.

Shares held by the Board of Directors and the Group Executive Team

At the end of the year, the members of the Board of Directors including the President and CEO owned a total of 1,162,920 (1,098,533) UPM-Kymmene Corporation shares. These represent 0.22% (0.21%) of the shares and 0.22% (0.21%) of the voting rights. At the end of the year, President and CEO Jussi Pesonen owned 466,472 shares. At the end of the year, the other members of the Group Executive Team owned a total of 710,645 shares.

» Refer Note 3.2 Key management personnel, of the consolidated financial statements 2019 for further information on remuneration and shares held by the members of the Board and the President and CEO and remuneration of the members of Group Executive Team.

Litigation

» Refer Note 9.2 Litigation, of the consolidated financial statements 2019 for information on legal proceedings.

Risk

Risk management

UPM regards risk management as a systematic and proactive means to analyse and manage opportunities and threats related to its business operations. This also includes risks that can be avoided through careful planning and evaluation of future projects and business environments.

Risk management is an integral part of UPM's management system as risk taking is a normal part of business operations. While executing strategies, UPM and its business areas, functions and manufacturing units are exposed to a number of risk and opportunities. Each business area, function and unit is responsible for identifying, measuring and managing of risks related to its own operations, and for reporting on risk exposures, risk management activities and results to its own management team and to the Risk Management function.

The Risk Management Committee, chaired by the CFO, is responsible for recommending risk tolerances and profile to the President and CEO and the Strategy Team. The Strategy Team is responsible for aligning risk management priorities, business and risk management strategies and policies.

The Board of Directors, assisted by the Audit Committee, monitors and assesses the effectiveness of the company's risk management systems and oversees the assessment and management of risks related to the company's strategy and operations. The Audit Committee oversees that risk management activities are aligned with the Risk Management Policy, and that risk assessments are used to guide internal audit activities.

UPM seeks to transfer insurable risks through insurance arrangements for any risks that exceed the defined tolerance.

UPM strives to ensure compliance with the UPM Code of Conduct and other corporate policies. To enhance compliance and mitigate risks, UPM performs risk assessments, training and monitoring at regular intervals.

UPM has developed and implemented a comprehensive internal control system that covers business and financial reporting processes. Internal control is aimed at ensuring that the company's operations are efficient and reliable, and in compliance with statutory requirements, and that the company's financial reporting is accurate and reliable, and reflects operational results. Internal control pertaining to financial reporting is described in the Corporate Governance Statement available in the corporate website.

The main risk factors that can materially affect the company's business, financial results and non-financial performance are set out below. They have been classified as strategic risks, operational risks, financial risks and hazard risks. Risks may also arise from legal proceedings incidental to UPM's operations.

Strategic risks

TYPE OF RISK	RISK DESCRIPTION
Competition, markets, customers and products	Energy, pulp, timber, paper, label, plywood and biofuels markets are cyclical and highly competitive. In all of these markets, the price level is determined as a combination of demand and supply, and shocks to either demand (decrease/ increase in end-use demand, change in customer preferences, etc.) or supply (e.g. new production capacity entering the market or old capacity being closed) may impact both the volume and price level. Also competitor behaviour influences the market price development. UPM's performance is also impacted by the performance of substitute or alternative products. Most notably, the demand in graphical papers in the mature markets is forecasted to continue to decline, due to the shift away from print media to digital media. Similarly, several raw materials used by UPM have competing end uses. Consumers' environmental awareness has also increased, and depending on the product area this may have either a positive or negative impact on the consumption of UPM's products and may impose further requirements for those products. UPM sells a proportion of its products to several major customers. The largest customer in terms of sales represented approximately 3% of UPM's sales in 2019, and the ten largest customers represented approximately 15% of such sales.
M&A and changes in the business portfolio	UPM's strategic direction is to grow in businesses with strong long-term fundamentals and sustainable competitive advantage. This may result in acquisitions of new businesses or divestments of existing businesses. Participation in M&A involves risks relating to successful implementation of a divestment and the ability to integrate and manage acquired operations and personnel successfully, as well as to achieve the economic targets set for an acquisition/ divestment.
Regulatory changes	UPM is exposed to a wide range of laws and regulations globally. The performance of UPM's businesses, for example the biofuels business, the paper businesses and the energy business, are to a high degree dependent on the current regulatory framework, and changes in regulation, direct and indirect taxation or subsidies would have a direct impact on the performance of UPM and its relative competitiveness. In addition, regulation may structurally restrict or exacerbate UPM's ability to compete for raw material.
Political and economical risks	UPM has significant production locations in Finland, Germany, the UK, France, Poland and the US. In these countries, the slow development of the individual economies and/ or of Europe as a whole may influence adversely UPM's performance. Furthermore, policies (on European and/ or national level) that hamper economic growth or lower the competitiveness of UPM (for example through adverse regulation or increase in direct or indirect taxation) may have an adverse impact on UPM's performance. In the developed countries, the unpredictability of regulation may lead to an increasing uncertainty and risk level when investing in or operating in these countries. UPM has significant production operations also in a number of developing economies, such as China, Uruguay and Russia. In the emerging market countries, the lack of transparency and predictability of the political, economic and legal systems may lead to an increasing uncertainty and risk level when investing in, or operating in these countries. These uncertainties may materialise as unfavourable taxation treatment, trade restrictions, inflation, currency fluctuations and nationalisation of assets.
Climate change	Climate change exposes UPM to variety of risks, that can be considered strategic, operational, hazard or financial. Strategic risks are related to competition, markets, customers, products and regulation. For example, unpredictable regulation and subsidies may distort raw material and final product markets, and costs of greenhouse gas emissions may influence UPM's financial performance. However, transition to low-carbon economy should bring business opportunities to UPM's renewable and recyclable products. Operational risks can be related to supply chain, availability and price of major inputs. Climate change may also cause operational or hazard risk related to exceptional weather events such as more severe storms, floods and draughts resulting in e.g. unpredictable wood harvesting conditions and hydro power availability. Climate change may also contribute to financial risks such as electricity price.
Shareholdings	Teollisuuden Voima Oyj (TVO) is in the process of constructing a third nuclear power plant unit, OL3 EPR, at the Olkiluoto site (OL3). UPM participates in OL3 through its shareholding in Pohjolan Voima Oyj (PVO), which is the majority shareholder in TVO. UPM's indirect share of OL3 is approximately 31%. The OL3 plant supplier, a consortium consisting of AREVA GmbH, AREVA NP SAS and Siemens AG (the Supplier), is constructing OL3 as a turnkey project. The consortium companies have under the plant contract joint and several liability for the contractual obligations. Originally the commercial electricity production of the OL3 was scheduled to start in April 2009. However, the completion of the project has been delayed. Supplier has updated the schedule for the commissioning of OL3 several times. As announced by TVO in December 2019, according to the information received from Supplier, regular electricity generation at the plant unit will commence in March 2021. In March 2018 TVO announced it had signed a comprehensive settlement agreement with the Supplier and Areva Group parent company, Areva SA, a company wholly owned by the French State. The settlement agreement concerns the completion of the OL3 project and related disputes and entered into force in late March. According to TVO, pursuant to the settlement agreement TVO and Supplier jointly withdrew the pending arbitration proceedings under the International Chamber of Commerce (ICC) rules with respect to costs and losses incurred in relation to delays in the construction of the OL3 project. In July 2018 TVO announced that in June 2018 the ICC tribunal had confirmed the arbitration settlement by a consent award, and the arbitration proceedings had been terminated. The parties also withdrew the pending appeals in the General Court of the European Union. According to TVO the settlement agreement stipulates as follows: To provide and maintain adequate and competent technical and human resources for the completion of the OL3 project, Areva will source the necessary additional resources from Framatome S.A.S., whose majority owner is EDF. The supplier consortium companies undertake that the funds dedicated to the completion of the OL3 project will be adequate and will cover all applicable guarantee periods, including setting up a trust mechanism funded by Areva companies to secure the financing of the costs of completion of the OL3 project. The turnkey principle of the OL3 plant contract and the joint and several liability of the supplier consortium companies remain in full force. The agreement also noted Supplier's schedule at the time the agreement was signed, according to which regular electricity production in the unit would have commenced in May 2019. The ICC arbitration concerning the costs and losses caused by the delay of the OL3 project is settled by financial compensation of EUR 450 million to be paid to TVO in two installments by Supplier. The parties withdraw all on-going legal actions related to OL3, including the ICC Arbitration and appeals in the General Court of the European Union. The supplier consortium companies are entitled to receive an incentive payment, in a maximum amount of EUR 150 million, upon timely completion of the OL3 project. In the event that the supplier consortium companies fail to complete the OL3 project by the end of 2019, the supplier consortium companies will pay a penalty to TVO for such delay in an amount which will depend on the actual time of completion of the OL3 project and may not exceed EUR 400 million. Further delays to the OL3 project could have an adverse impact on PVO's business and financial position, the fair value of UPM's energy shareholdings in PVO and/ or the cost of energy sourced from OL3 when completed. It is possible that the cost of energy sourced from OL3 at the time when it starts regular electricity production will be higher than the market price of electricity at that time.

Operational risks

TYPE OF RISK	RISK DESCRIPTION
Earnings uncertainty	The main short-term uncertainties in UPM's earnings relate to sales prices and delivery volumes of the group's products, as well as to changes in the main input cost items and exchange rates. Most of these items are dependent on general economic developments. There are significant uncertainties related to the global economic growth. Economists continue to expect modest GDP growth in 2020. Trade tensions between China and the US, and other economic areas, the undefined nature of Brexit and political uncertainties in several other countries cause uncertainty to the global economy. There are uncertainties regarding the growth outlook in developing economies, including China, which may significantly influence the overall global economy and many of UPM's product markets in particular. Uncertainties related to trade tariffs and other possible protectionist policies add to the risks. China accounted for 9.9% of UPM's sales in 2019. The UK has decided to leave the EU, and this is scheduled to take place at the end of January 2020. However, the nature of the relationship after an 11 month transition period remains undefined. This represents uncertainty and risks related to economic growth, especially in the UK and the EU. The EU is the most significant market for UPM, representing 57.6% of the company's sales in 2019. The UK accounted for 6.5% of UPM's sales. Changes to the monetary policies of major central banks may significantly impact various currencies that directly or indirectly affect UPM.
Supply chain management, availability and price of major inputs	UPM's business operations depend on a large number of suppliers and contractors. Majority of UPM's need of wood is covered by suppliers. Other production inputs, such as chemicals, fillers and recovered paper, are obtained from suppliers. Disruptions in the supply of key inputs would impact upon manufacturing operations, for example, by interrupting or resulting in the downscaling of production or a change in the product mix. They could also cause price increases for critical inputs or shifts in the availability and price of wood. It is also uncertain how the EU energy policies may impact upon the availability and costs of fibre and energy.
Project execution	Investment projects in UPM's businesses such as energy, pulp, paper or biofuels are often large and take one or more years to complete. UPM has experience in such projects in various businesses and locations around the world, and applies vigorous planning, project management and follow-up processes. Participation in large projects involves risks such as cost overruns or delays, as well as non-achievement of the economic targets set for the investment. Currently, UPM's largest ongoing investment project is the construction of a new world-class pulp mill in Uruguay, including the related other investments (port, Free Trade Zone infra and housing). Particular to this project is its size, complexity with a number of interconnected sub-projects as well as the level of co-operation with authorities e.g. in permitting, and other partners. The project implementation risks are managed using implementation risk framework, which has been developed during project preparation phase.
Partnerships	UPM currently works together with many partners without control over strategic direction and operational output. The highly competitive market situation and, for example, new developments in biofuels, bioenergy or biochemicals are likely to increase the importance of partnerships in the search for higher efficiency or new products and businesses. Partnerships, however, may create risks to the profitability, for example, through changes occurring within the partner entity or changes in how the partnership operates.
Ability to recruit and retain diversely skilled employees	UPM's success requires a skilled workforce and diversity in thinking. UPM is continuously developing its leadership culture, evaluating its recruitment, compensation policies and career development opportunities and taking measures to attract and retain diversely skilled personnel, thereby seeking to avoid shortages of appropriately competent and diverse personnel in the future.
Availability and security of information systems	UPM's production and business operations depend on the availability of supporting information system and network services. Unplanned interruptions in critical information system services can potentially cause a major damage in UPM's businesses. UPM has implemented numerous administrative and technical improvements to mitigate the availability and security risks and to reduce the service interruption related recovery time to acceptable level.
Risks related to noncompliance in own operations and supply chain	Breach of applicable laws and regulations or corporate policies by UPM employees may lead to legal processes or serious reputational damages impacting the value of the company. The UPM Code of Conduct sets the standards of responsible behaviour. These standards apply to every UPM employee. The Code covers topics relating to legal compliance and disclosure, anti-corruption, competition law, HR practices, human rights, responsible sourcing and environmental matters. UPM's environmental performance and social responsibility play a significant role in UPM's ability to operate and influence the long-term success of its businesses. UPM strives to ensure that employees are aware of the legal requirements, the Code and corporate policies by regular trainings and communication. The company maintains a Report Misconduct channel on its website. Non-compliance in the supply chain may also lead to legal processes or serious reputational damages impacting the value of the company. The UPM Supplier and Third Party Code defines the minimum level of performance that UPM requires from its suppliers and third party intermediaries. UPM performs due diligence on third party intermediaries and carries out regular audits in its supply chain.
Technology related claims and disputes	Molecular bioproducts form one of UPM's three strategic focus areas for growth. Initiatives within this strategic focus area are technology intensive and require increasing investments in such technologies either through internal development or through third party licenses or technological partnerships. As a result, evaluating the rights related to the technologies UPM use or intend to use is increasingly challenging, and the risks regarding IPR claims and disputes relating to technological partnerships are assessed to increase. The use of these technologies may also result in increased licensing costs for UPM, restrictions on UPM's ability to use certain technologies and/ or costly and time-consuming litigation.

Financial risks

Financial risks are described in consolidated financial statements 2019.

TYPE OF RISK	CONSOLIDATED FINANCIAL STATEMENT NOTE
Credit risk	4.6 Working capital
Liquidity and refinancing risk	5.1 Capital management
Interest rate risk	6.1 Financial risk management
Foreign exchange risk	6.1 Financial risk management
Electricity price risk	6.1 Financial risk management

Hazard risks

TYPE OF RISK	
Accident, natural event and site security	UPM operates a significant number of manufacturing facilities globally, mostly UPM owned, and is also the largest private owner of forest land in Finland. UPM also owns a significant plantations area in Uruguay. UPM is exposed to risks in areas such as occupational health and safety, environment, fire, natural events and site security. These risks are managed through established management procedures and loss prevention programmes. UPM's insurance programme also provides coverage for insurable hazard risks, subject to insurance terms and conditions.

Non-financial information

Global megatrends represent many long-term opportunities and challenges for UPM towards 2030 and beyond. They are also driving demand for sustainable solutions and responsible business practices.

To steer its responsibility activities, UPM has established a set of responsibility focus areas with targets and key performance indicators. They are reviewed every year based on a materiality analysis (page 65). The focus areas cover economic, social and environmental responsibility. Economic responsibility at UPM covers economic performance, good governance and compliance, as well as responsible sourcing. Social responsibility focuses on respecting human rights, occupational health and safety and UPM's role as a responsible employer. Environmental responsibility includes sustainable products, the climate and use of forests, as well as water use and waste reduction. Mitigation of and adaptation to climate change is becoming more important all the time, and it is relevant for UPM throughout the whole value chain: land use, production and products. Product stewardship is a key element of UPM's responsibility practices.

UPM's Biofore strategy guides the company in achieving its responsibility targets for 2030 and in contributing to the Sustainable Development Goals (SDG) of the 2030 Agenda for Sustainable Development published by the UN. In 2019, UPM reviewed its selection of most material SDGs in a comprehensive evaluation and several workshops.

Based on international frameworks and commitments

UPM respects international human rights agreements and agreements concerning labour rights, including the UN Declaration of Human Rights, the ILO Declaration on Fundamental Principles and Rights at Work, and the OECD Guidelines for Multinational Enterprises.

Since 2003, UPM is a signatory of the UN Global Compact initiative, whose ten universal principles are derived from international agreements in the areas of human rights, labour standards, the environment and anti-corruption. And since 2016, UPM has the LEAD participant status for its commitment to the UN Global Compact. In 2019, UPM was one of only 36 global companies to receive this recognition, and the only representative of the forest industry and Finland.

Regarding climate change UPM committed to the Science Based Targets (SBT) initiative in 2017 and received validation of the targets in 2019. To further strengthen group approach, UPM committed to the UN's Business Ambition for the 1,5°C pledge.

UPM follows the Finnish Corporate Governance Code issued by the Securities Market Association and complies with all of its recommendations.

UPM Code of Conduct and other corporate policies

UPM's decision making, management and operations are guided by UPM values and the UPM Code of Conduct. Legal compliance and responsible practices are the foundation of all of UPM's businesses and create long-term value for both UPM and its stakeholders. The UPM Code of Conduct emphasises UPM's commitment to business integrity and responsible business operations, manifesting the company's guiding principles.

The UPM Code of Conduct is complemented by more detailed policies approved by the Board of Directors and rules approved by the Group Executive Team, business areas or global functions. These policies and rules cover such topics as treasury, taxes, disclosures, insider matters, anti-corruption, competition law, confidentiality, contract management, human resources, the environment, forestry, information security and data protection, and safety.

UPM requires its suppliers, third party intermediaries and joint venture partners to apply the same principles as in the UPM Code of Conduct and to fulfil criteria concerning social and environmental responsibility. These requirements are defined in the UPM Supplier and Third Party Code.

The UPM Code of Conduct has been updated during 2019. The launch of the updated Code of Conduct was followed by extensive communication and training efforts to enhance our employees' awareness and understanding of its contents.

Roles of the group management and functions in leading non-financial matters

The Board of Directors, with the assistance of the Audit Committee, is responsible for monitoring compliance with applicable legal and regulatory requirements and with the UPM Code of Conduct and other corporate policies. In addition, the Audit Committee oversees procedures for treatment of complaints and concerns received by the company, anonymous or otherwise. As part of the committee's compliance review, the committee is provided with a quarterly report by the company's Chief Compliance Officer, and a report of submissions under the company's Report Misconduct channel by the Head of Internal Audit.

In line with its main duties and responsibilities, the Board reviewed and approved updated strategic plans during its strategy session in May 2019. The main focus areas of the UPM Biofore strategy continue to be performance, growth, innovation, responsibility and portfolio development. This strategy is enhanced by the brand promise: Beyond Fossils (read more on pages 16–17). An essential part of the Board's annual strategy work is to review and assess strategic and operational risks and opportunities (see UPM Governance Statement 2019). These risks and opportunities and their impact on operations and strategy are described on pages 28–29.

The Group Executive Team, headed by the President and CEO, is in charge of the management of corporate responsibility, determining courses of action and guiding development work. In practice, corporate responsibility efforts take place in businesses and functions, and in the Group's Responsibility team, which co-ordinates the projects carried out by businesses and functions.

The management of climate change related issues was further strengthened in 2019 with specific topics, such as UPM's resilience in different climate scenarios, reported directly to the Strategy Team. Generally, in the high-emission scenario, physical impacts dominate, and in low- and medium-emission scenarios the transition impacts play a bigger role. In low- and medium-emission scenarios, UPM is well positioned as our business portfolio allows for flexibility regarding recognised risks and opportunities. Based on the scenario work and the outcome of the project, climate-related targets were revised (see pages 86–87).

UPM Legal Function and its Compliance team manage legal compliance programmes and arrange related training at regular intervals for specific target groups, which have been defined based on risk assessments. UPM Sourcing organisations follow clearly defined selection and follow-up processes when evaluating suppliers. Strategic fit, service range, product performance, quality, price and sustainability are the key factors when selecting and evaluating suppliers.

While executing strategies, UPM and its business areas, functions and production units are exposed to a number of financial and non-financial risks and opportunities. Each business area, function and unit is responsible for identifying, measuring and managing risks related to its own operations, and for reporting on risk exposures, risk management activities and results to its own management team and to the Risk Management Function.

Management of non-financial matters

UPM's responsibility thinking starts with anticipating, mitigating and managing risks, and extends to creating a competitive advantage and long-term value.

UPM continually strives to reduce its risk exposure and improve its performance by using tools such as certified management systems. The majority of UPM's production sites, as well as its forestry operations, are covered by quality, environmental and health and safety systems, which are certified in accordance with the ISO 9001, ISO 14001 and OHSAS 18001 standards, respectively. All European pulp and paper mills, as well as the UPM Fray Bentos pulp mill in Uruguay and the UPM Changshu paper mill in China, also adhere to the EU's ecomanagement and audit scheme (EMAS). Many of the sites also have energy management systems certified under ISO 50001 or the Finnish ETJ+ system, and food safety management systems certified under ISO 22000.

Should stakeholders have any concerns or suspect misconduct, they are encouraged to contact UPM or to use the UPM Report Misconduct channel. This channel is available on UPM's intranet for UPM employees, and also on the corporate website for the company's external stakeholders. In 2019, 31 (32) cases were reported either through the UPM Report Misconduct channel or directly to internal audit. Five cases led to disciplinary action including warnings and terminations of employment.

Reporting framework used

UPM uses the GRI Standards reporting guidelines published by the Global Reporting Initiative to measure and report on corporate responsibility at group level. UPM's corporate responsibility reporting has been compiled in accordance with the GRI Standards: Core option.

Committed to anti-corruption

The UPM Code of Conduct underlines the company's zero tolerance attitude towards corruption and bribery in any form. UPM Anti-Corruption Rules explain prohibited conduct and expected ethical behaviour in further detail.

UPM performs anti-corruption risk assessment on a regular basis. The annual risk-assessment process includes a top-down risk discussion with the management of each business area. All UPM group entities are also assessed on the basis of country risk and complexity of operations. UPM operates globally and has significant manufacturing operations in several emerging market countries. Such operations require a number of permits and other licenses from the relevant authorities. Some of the countries where UPM operates are perceived as highly corrupt or corrupt according to Transparency International. In these countries, there is an increased risk of corruption, for example in relation to interaction with government officials and in the use of intermediaries when applying for permits and licences requiring governmental approval.

Due diligence of suppliers and third parties with whom UPM does business is an essential part of UPM's anti-corruption compliance programme. UPM requires that due diligence is performed before entering into or renewing any contract with a third party that meets specified criteria. UPM requires anti-bribery contract terms to be included in agreements with such third parties outlining the third party's commitment to compliance with applicable anti-bribery laws and UPM's right to audit the third party to verify compliance with these terms. The company also has corresponding due diligence procedures for joint ventures, including mergers and acquisitions.

The company's anti-corruption training covers all white-collar employees. In 2019, the company updated its Code of Conduct and organised approximately 40 training workshops in 14 countries. UPM also implemented its initiative, launched in 2017, to further enhance due diligence procedures through automated screening solutions and performed risk-based compliance reviews in selected jurisdictions and operations.

Respect for human rights

UPM is committed to respecting human rights. UPM has assessed all its operations and activity and has identified the potential human rights issues and impacts. When considering both the severity and likelihood of these potential issues and impacts, UPM considers the salient human rights issues in the company's sphere of influence to be environmental pollution, occupational health and safety (OHS), working conditions, protection of children, and forced labour.

In 2019, UPM reviewed its Human Resources Rules and clarified its commitments to working conditions, labour practises and decent work, and employee's responsibilities. Furthermore, UPM agreed on a salient human rights issue assessment practise on a business area level, which complements the existing human rights due diligence at UPM. The practise was piloted at UPM Raflatac.

Responsible sourcing

UPM requires its suppliers, third-party intermediaries and joint venture partners to apply the same principles as in the UPM Code of Conduct including commitment to anti-corruption, environmental and social responsibility, safe products, human rights and occupational health and safety practices.

Transparent supplier requirements are the basis for responsible sourcing. These supplier requirements are defined in the UPM Supplier and Third Party Code (available on the corporate website). A number of additional requirements are in place for the sourcing of wood, chemicals, pulp and packaging materials, as well as for safety and logistics. All contractors working on site go through UPM's safety requirements and a web-based safety induction training.

UPM carries out supplier risk assessments. The responsibility-related risks are determined by the country of origin, sourced material or service, and complexity of supply chain. Based on the risk assessment, selected suppliers' activities are evaluated in more detail through annual surveys, supplier audits and joint development plans.

In 2019, the UPM Supplier and Third Party Code was updated in line with the revised UPM Code of Conduct. UPM also enhanced its supplier screening and risk mitigation. A new counterparty risk management tool offers better visibility into counterparty-related risks through automated screening and support businesses in ethical and preventive decision-making.

UPM continued its cooperation with Together for Sustainability (TfS), a chemical industry initiative that promotes and improves sustainability practices within the supply chains. TfS membership also gave UPM access to EcoVadis assessments and TfS member sustainability audit reports. In 2019, UPM conducted over 400 environmental and social risk assessments with EcoVadis and initiated first TfS audits.

Social and employee-related matters

UPM's responsibility focus areas in social and employee-related matters are: learning and development, responsible leadership, diversity and working conditions.

UPM promotes active employee participation and consultation, organised in accordance with international and national rules and regulations. UPM aims to empower and engage employees at all levels through responsible leadership. UPM encourages its employees to pursue professional growth and supports them in learning skills and developing them further.

UPM respects the privacy of employees and promotes equal opportunities and objectivity in employment and career development. All UPM employees are treated as individuals regardless of gender, age, ethnic origin, nationality, etc.

UPM promotes employees' health and wellbeing. Safety is an essential part of UPM's activities and business management system. Equal safety requirements are applied to all employees, visitors and contractors working at UPM's premises.

In its People Strategy, UPM focused on leadership and creating safe, inclusive & diverse working environment, as well as aiming higher in performance and ensuring growth of our people. In 2019, UPM continued the enabling performance approach by creating feedback culture, setting goals in an agile manner and having better one-to-one conversations. Development programs to support skills of asking and giving feedback, high quality conversations and coaching have been continued. UPM has started a dialogue on diversity and inclusion in its key management teams during 2019.

The proactive safety of employees and contractors has remained an important focus area. UPM key business and operations leaders gathered to a discuss how to leading safety and raise the bar.

Product stewardship

Majority of UPM's products are made from renewable raw materials and are recyclable. Product stewardship covers the entire lifecycle of all UPM products from the development phase to the end-use and beyond.

Ecodesign and product safety measures, such as UPM's Restricted Substance List, ensure that impacts on products and the environment are considered and minimised. UPM provides product declarations to provide customers with easy access to information concerning the responsibility of products and the supply chain.

UPM is the world's largest producer of EU ecolabelled newsprint, graphic and office papers. All the European sites of UPM Raflatac and UPM Specialty Papers' mills and our pulp mills have implemented ISO 22000 food management systems and the respective products are designed and produced to meet food packaging requirements.

In 2019, UPM participated in a Pulp & Paper Value Chain Information System development project with several chemical suppliers. The aim is to enhance transparency in the supply chain and speed up the exchange of information.

Environment and climate change

UPM's responsibility focus areas in environmental matters are forests and biodiversity, climate, water-use and waste. UPM uses raw materials, water, energy and other resources in a responsible manner and continuously improves its energy, resource and cost efficiency.

UPM is committed to sustainable forestry, and the company uses third-party-verified FSC® and PEFC™ chain of custody certification to ensure that the wood it procures is legally sourced from sustainably managed forests. All UPM owned forests are certified. Sustainable forest management and land use play a key role both in mitigating and adapting to climate change.

In 2019, UPM continued to implement its work aimed at positive impact on biodiversity in company forests in Finland. This biodiversity programme is implemented through biodiversity guidelines for operational forestry work, forest protection and cooperation with stakeholders. The development of indicators and monitoring methods have been key in 2019.

UPM favours the use of renewable and other carbon-neutral energy sources. Biomass-based fuels make up 70% (70%) of fuels used by UPM worldwide. If UPM needed to buy certificates to cover its whole direct fossil CO_2 emissions, and if the price of CO_2 certificates were to rise by EUR 5 per tonne, it would mean additional costs of approximately EUR 14 million annually.

All of UPM's largest production plants are located in areas where there is sufficient water available. The water used by UPM plants comes from rivers, lakes or groundwater resources. UPM uses water responsibly in terms of the company's water consumption and effluent quality. If the price of raw water were to increase by EUR 0.01 per cubic metre, it would mean additional water costs of approximately EUR 4 million annually.

UPM has developed innovative ways to reduce its own waste and to recycle waste or residues with new products such as UPM BioVerno, UPM's renewable diesel and naphtha, as well as UPM ProFi composite, which partly utilises waste from the production of selfadhesive label materials. Furthermore, residues are used in external products, e.g. ash is used in applications ranging from landscaping to road building. Regulatory changes can have an impact on the options for waste or residue use, thus causing higher costs for alternative solutions.

In 2019, UPM's environmental investments totalled EUR 17 million (16 million). The single largest investment was at UPM Jämsä River Mills, where a urea feeding system was installed to two boilers to reduce NOx emissions. UPM's environmental costs, which were mainly attributable to effluent treatment and waste management, totalled EUR 123 million (124 million), including depreciation.

There has been a significant decrease in the number of environmental non-conformances since UPM's internal Clean Run programme was launched in 2012. No major environmental incidents occurred at UPM production plants in 2019. However, a total of 20 (26) temporary deviations from permit limits or limits set by UPM occurred over the course of the year. Approximately 2,900 (2,600) preventive environmental observations and near misses were reported in 2019. The goal of the Clean Run programme and the related reporting is to improve environmental performance and awareness and to share best practices.

In 2019, UPM's environmental performance improved compared to 2018 with a 2% reduction of waste sent to landfills. Our fossil CO_2 emissions (scopes 1 and 2) summed up to 5.8 million tonnes in 2019, which is a decrease of 6% compared to 2018.

UPM climate related disclosures according to TCFD (Task Force on Climate-related Financial Disclosures) is integrated to this report as follows:

REQUIREMENTS	PAGE
GOVERNANCE	
a) The role of the Board in overseeing climate-related issues	Page 132, paragraph "Roles of the group management and functions in leading non-financial matters"
b) The role of management in assessing and managing climate-related issues	Page 132, paragraph "Roles of the group management and functions in leading non-financial matters"
STRATEGY	
a) The climate related risks and opportunities over the short, medium and long term	Pages 129–130, paragraph "Risk management" and table "Strategic risks" Pages 26–29, chapters "Megatrends", "Risks and opportunities"
b) The impact of climate-related risks and opportunities on business, strategy and financial planning	Pages 26–29, chapters "Megatrends", "Risks and opportunities" Page 130, table "Strategic risks"
c) The resilience of strategy, taking into consideration climate-related scenarios	Page 134, paragraph "Environment and climate change" Pages 86–87, chapter "Committed to climate actions"
RISK MANAGEMENT	
a) Processes for identifying climate-related risks	Page 129, paragraph "Risk management" Page 132, paragraph "Roles of the group management and functions in leading non-financial matters"
b) Processes for managing climate-related risks	Page 129, paragraph "Risk management" Page 132, paragraph "Roles of the group management and functions in leading non-financial matters"
c) How processes for identifying, assessing, and managing climate-related risks are integrated into overall risk management	Page 129, paragraph "Risk management" Pages 105–107, chapter "Governance"
METRICS AND TARGETS	
a) Metrics used to assess climate-related risks and opportunities	Pages 10–11, "Key performance indicators"
b) Scope 1, Scope 2 and Scope 3 emissions, and related risks	Page 134, paragraph "Environment and climate change" Page 220, graph "Sources of UPM's greenhouse gas emissions"
c) Targets used to manage climate-related risks and opportunities and performance against targets	Page 136, table "Material non-financial topics and key performance indicators" Pages 60–61, table "UPM Responsibility targets"

Material non-financial topics and key performance indicators

TOPIC	MANAGEMENT	KEY PERFORMANCE INDICATOR	2019 RESULTS
Governance/ Anti- Corruption	Corruption related risks are identified and assessed in connection with the company's risk management process. These risks are managed and mitigated by training, communication, due diligence procedures, audits and practical guidelines specifically targeted at anticorruption and anti-bribery. UPM Code of Conduct training is mandatory to all employees and anti-bribery training to all salaried employees.	100% coverage of participating in UPM Code of Conduct training (continuous)	96% (99%) of active employees completed training for the revised UPM Code of Conduct. Training started in September 2019.
Human rights	UPM is committed to respecting human rights based on its Code of Conduct. UPM has a process for assessing human rights at UPM site level, including community relations and local sourcing, as well as for risk assessments and audits for suppliers.	Continuous supplier auditing based on systematic risk assessment practices	185 supplier audits were conducted based on identified risks, including human rights, social and environmental topics. In addition, about 300 contractor reviews with focus on working conditions were carried out.
Responsible sourcing	UPM requires its suppliers, third party intermediaries and joint venture partners to apply the same principles as in the UPM Code of Conduct. These supplier requirements are defined in the UPM Supplier and Third Party Code.	80% of total supplier spend qualified against UPM Supplier and Third Party Code (continuous)	84% (83%) of supplier spend qualified against UPM Supplier and Third Party Code.
Responsible leadership	UPM continuously develops leadership capabilities, management teams and working environments. UPM measures work environments, team work and leadership with an annual engagement survey and has a leadership development programme portfolio that supports self leadership, leading people and leading businesses. Programmes cover topics such as inspiring leadership, coaching, conversation and feedback skills, innovations and leading complexity.	Employee engagement and enablement indices overall favourable score above external high performing norm by 2030	Employee engagement index 71% (71%) favourable. This is 3%-points below the external high performing norm. Employee enablement index 74% (72%) favourable. This is on par with the external high performing norm.
Learning and development	UPM has a systematic process for goal setting and creating development plans for all employees globally to ensure high performance and continuous professional development.	Goal setting discussions are held and development plans created for employees, completion rate 100% by 2030	88% (89%) of employees had completed individual goal settings or annual discussions. 65% (61%) had a development plan documented.
Safe working conditions	UPM has a comprehensive safety management system which promotes a proactive and engaging safety culture. UPM uses means such as safety audits and reporting on safety related near-misses and safety observations.	No fatalities or serious accidents in UPM operations Total recordable injury frequency (TRIF) <2 levels permanently reached including contractors	One fatal accident and three serious accidents TRIF was 7.1 (6.9) for UPM workforce and 6.8 (6.6) including contractors.
Diversity	UPM wants to develop organisational culture and local conditions to ensure an inclusive and diverse working environment. UPM has committed to, and promotes, diversity and inclusion in its policies. UPM reviews the diversity status of all its businesses and functions regularly. The composition of UPM key management teams and inclusiveness is discussed and development actions planned and implemented.	95% favourable in the Employee Engagement Survey's Diversity and Inclusion index by 2030	Responses to the Employee Engagement Survey's Diversity and Inclusion index 70% (68%) favourable
Product stewardship	Ecolabels help customers make responsible choices and provide stakeholders with important information. Thirdparty verified environmental certificates and labels tell customers about the environmental performance of our products.	All applicable products eligible for ecolabelling by 2030	83% (85%) of UPM sales were eligible for ecolabelling.
Climate	UPM favours the use of renewable and other carbonneutral energy sources and strives to continuously improve its energy efficiency across all its operations. Strengthened targets for scope 1 and 2 to be in line with the commitment to Science Based Targets and 1.5° pledge.	Fossil CO_2 emissions from its own combustion and purchased electricity (Scope 1 and 2) reduced by 65% by 2030 (compared to 2015)	Fossil CO_2 emissions reduced by 15% compared to 2015
Water	UPM's goal is to minimise the impact of its operations on water resources, safeguard the natural water cycle in forests, and maintain the functioning of aquatic ecosystems.	Wastewater volume reduced by 30% by 2030 (compared to 2008)	10% reduction in wastewater volume achieved since 2008 for the UPM average product.
Waste	Circular economy means both financial and environmental efficiency. UPM aims to reuse materials and products, reduce the amount of solid waste and increase recycling and recovery in its operations.	No process waste sent to landfills or to incineration without energy recovery by 2030	89% (90%) of all UPM's process waste was recovered and recycled. The total amount of waste to landfills decreased by 2% compared to 2018.
Forest	UPM is committed to sustainable forestry and uses thirdparty verified chains-of-custody to ensure that wood is legally sourced from sustainably managed forests.	All fibre certified by 2030	82% (81%) of all wood used by UPM is sourced from certified forests.

*Material risks and their management is described on pages 129–131 of the Report of Board of Directors and in the Annual Report on pages 28–29. Information on the company's risk management system is available on the corporate website in the governance section and in the Corporate Governance Statement 2019, which is also available as a separate report on the corporate website **upm.com/governance.** More information about performance related non-financial topics is available in the general section of the Annual Report and on the UPM website **upm.com.***

Research and development

Innovations for growth and competitiveness

Innovation and R&D programmes are essential in the development of new products and technologies. Research and development funding is primarily being used on studying new technologies and developing businesses and processes. A global network of research centres provides support for UPM's activities in R&D, both in new and existing businesses.

In 2019, UPM spent EUR 121 (106) million on research and development, making up 6.6% (7.6%) of UPM's operating cash flow. In addition to direct R&D expenditure of EUR 53 (52) million, the figure includes negative operating cash flow and capital expenditure in developing businesses, development of transformative business prospects and digitalisation projects and initiatives.

Accelerating the development and scale-up of new bio-based businesses

Molecular bioproducts form one of UPM's three strategic focus areas for growth and are at the core of innovating for a future beyond fossils. UPM has successfully entered the biofuels business and built a profitable and sustainable business platform. Development is currently ongoing, with the aim of expanding the biofuels business and making a similar entry into the biochemicals business.

In 2019, UPM built Biofore Base, a new state-of-the-art R&D piloting plant and expanded R&D operations in Lappeenranta, Finland. It unites UPM's technologies, globally accumulated experience and expertise. Operations will range from strategic research to commercial scale-up that further strengthen UPM's expertise and enhance future capabilities. Biofore Base will also accelerate the development and commercialisation of bio-based solutions into viable industrial processes in a cost-efficient way.

To support UPM's new business development, the Biofore Base is designed with the scope to further expand on a global scale. In 2020, special focus will be on expanding into new value chains with new partners and research organisations.

Transition to low-emission economy provides opportunities

UPM products offer a solution to mitigating climate change as they systematically replace fossil raw materials with bio-based renewable alternatives. The products store carbon for the entire duration of their lifecycle, also when recycled multiple times.

In 2019, UPM assessed risks and opportunities relating to climate change that would potentially affect the business. As part of the assessment, cost abatement curves were created for reducing CO_2 emissions from our operations. UPM also initiated a study with external partners to more accurately estimate the impact that products have on the climate by substituting fossil-based or other competing alternatives, for example.

Sustainably managed forests form a cost-competitive carbon capture technology and UPM carried out research on both soil and forest carbon storages. UPM is also conducting research on other carbon capture technologies with external partners.

Reduce, reuse and recycle

UPM creates circular economy solutions in the value chain of forest industry products. Residues and side streams are seen as valuable raw materials, a source of energy and, thus, of real business opportunities. Research into pulp and paper mill side streams is aimed at finding more efficient ways to utilise by-products such as sludge, ash, green liquor dregs and waste heat.

Green liquor dregs are one of the most challenging residues from pulp production, and UPM is currently developing several innovative processes for utilising this material in Finland and Uruguay. The More with Biofore in China research programme continued with several pilot trials to recycle effluent water back into the process, further reducing fresh water intake.

Solid patent portfolio creates value

The significance of the patents, trademarks and intellectual property rights protecting UPM innovations is even more pronounced in the new businesses. A solid patent portfolio boosts the competitive edge and also provides an excellent basis for value creation in the future. For example, wood-based biofuels, biochemicals and biomedicals are new business areas in which a lot of research and product development is carried out, both internally and with external partners.

Extensive partner network

UPM´s close-knit global partner network is comprised of customers, universities, research organisations, suppliers and start-up companies. Collaboration speeds up the development and launch of new solutions, particularly for new businesses.

The partnership with European Joint Undertaking on Bio-Based Industries (BBI) focuses on bio-based products, the production of these and strengthening their competitiveness in Europe. As a shareholder in the Finnish CLIC Innovation Ltd, UPM aims for breakthrough solutions in the bioeconomy, circular economy and cleantech, as well as in smart energy systems. UPM is also a member of FinnCERES Ecosystem to collaborate on research into lignocellulose-based materials.

In 2019, UPM joined 4evergreen, a new initiative by Cepi (the Confederation of European Paper Industries). The aim is to boost fibre-based packaging in a circular and sustainable economy.

Developing biofuels and naphtha

UPM Biofuels successfully entered into the market with its UPM BioVerno renewable diesel and naphtha. UPM BioVerno drop-in diesel is a unique, competitive and sustainable alternative to fossil fuels and first-generation biofuels and is produced from crude tall oil, a residue of pulp production.

UPM's renewable naphtha can be used either as a low-emission biocomponent for gasoline or as feedstock for replacing fossil raw materials in plastics and other chemical industry solutions. In 2019, a collaborative venture with Dow and Elopak was launched to create a 100% wood-based, fully recyclable beverage carton. UPM Raflatac and UPM Biofuels collaborated and launched UPM Raflatac Forest Film™, the first wood-based polypropylene film label material on the market.

UPM is now exploring opportunities to scale up the business by studying a potential larger biorefinery in Kotka, Finland, with a wider range of sustainable feedstocks. The potential biorefinery would produce approximately 500,000 tonnes of unique, advanced fuels for use in road transportation, aviation, shipping and petrochemicals.

Research on raw materials is focused on making efficient use of different forest industry residues and by-products. Alternatives made from waste and residue-based raw materials that do not compete with food production are being tested.

UPM Biofuels is developing a new feedstock concept by cultivating Brassica carinata as a sequential crop in Uruguay. The carinata crop produces non-edible oil that is suitable for use as feedstock for biofuels and its by-product can also be used as protein for animal feed.

Biochemicals offer renewable alternatives

UPM Biochemicals offers and develops innovative, sustainable and competitive wood-based biochemicals. These are segmented into glycol and lignin products. Strong growth is expected for the market in the coming years as biochemicals mainly replace chemicals made from fossil raw materials. UPM Biochemicals is actively developing and testing industrial applications to create industrial-scale mill concepts and meet the market demand.

In 2019, basic engineering studies on the potential biorefinery in Germany were completed. The investment decision was made in January 2020. The industrial scale biorefinery will convert solid wood into next generation biochemicals: bio-monoethylene glycol (BioMEG) and lignin-based renewable functional fillers. The biorefinery will also produce bio-monopropylene glycol (BioMPG) and industrial sugars. End-use segments include textiles, PET-bottles, packaging, de-icing products, composites, resins and fillers. UPM introduced a wood-based renewable functional fillers concept to rubber market in 2019.

The biomedical product range is expanding

UPM works with global partners to develop new biomedical products and applications. GrowDex®, a nanocellulose hydrogel, is suitable for use in 3D cell culturing and related applications, such as medical development and research. The product has been on the market since 2017. GrowDex -T hydrogel with advanced features, launched in 2019, is the latest addition to the GrowDex product range.

In 2019, UPM launched FibDex®, a new wound care dressing made from nanofibrillar cellulose. It is the third biomedical product made from wood-based raw materials that UPM has commercialised. Based on clinical trial results, FibDex was awarded the CE mark as it fulfils the standards and legislative requirements set for medical devices.

Circular economy is the basis of growth for biocomposites

UPM Biocomposites offers smart and sustainable composite products for various uses in outdoor building material and consumer products. Target is to increase the use of recycled materials in products. For example, UPM ProFi Piazza decking contains 75% recycled materials.

UPM Formi composite material, made from cellulose fibres and polymers, is suitable for use in both the industrial and consumer applications, from furniture to consumer electronics. It complies with the requirements set by the EU for reinforced plastics in relation to the circular economy and its carbon footprint is 30–60% smaller than traditional plastics. A new Formi EcoAce product range, launched in 2019, has signification lower carbon footprint compared to virgin plastic solutions. UPM Formi became ISCC (International Sustainability and Carbon Certification) certified, which guarantees that the product meets environmental and social standards along the supply chain.

UPM Biocomposites has continued developing the new UPM Formi 3D biocomposite, which was launched in 2018. The focus has been on large-scale industrial 3D printing with end user applications that include casting moulds, concept models for architecture and prototypes for consumer products.

New solutions in specialty packaging

Made from renewable and responsibly sourced wood fibres, UPM UniqueBarr™ is a non-plastic material for wrapping. Without the plastic coating, the paper can be recycled with regular paper waste. Improved recyclability means a smaller carbon footprint thanks to prolonged material lifecycle and a reduction in landfill waste.

UPM unique concept for release liner recycling allows value chain members to reach their sustainability targets. Collected release liners are desiliconised and used to produce new release liner base papers.

R&D's role in different businesses

BUSINESS AREA	DESCRIPTION
UPM Biorefining UPM Pulp	In 2019, the focus was on Quality to Trust based on the work carried out into understanding the effects that wood raw material, pulp production processes and pulp quality have on a customer's ability to achieve high production efficiency and good product quality. As part of the technical customer service process, Pulp R&D teams worked seamlessly with Uruguay and Finland operation teams and, with customers, were involved in several added-value and needs-based projects. Systematic improvements to product quality and production cost efficiency and reductions in solid waste amounts were successful thanks to the work of UPM's researchers and development experts, both in Research Centres and at mills. Work into reaching the target of having zero solid waste before 2030 by using waste streams from pulp mills were successfully tested and evaluated. In supporting UPM's growth strategy, special effort was put into finding the right concept when building the new state-of-the-art mill in Uruguay, which is set to be ready by the end of 2022.
UPM Biofuels	Collaboration and product development across the whole value chain allowed UPM Biofuels to enter the petrochemicals market with UPM BioVerno naphtha as a raw material for bioplastics. The first application is a wood-based plastic coating for liquid cartons that reduces both the fossil raw materials used and the carbon footprint. Operational efficiency at UPM's Lappeenranta Biorefinery was improved by means of targeted development projects during this turnaround. Piloting, research and process development continued at the UPM Biorefinery Development Center (BRDC), where UPM's biofuels development started 10 years ago. In sustainability development, UPM Biofuels came a step closer to gaining the world's first Roundtable of Sustainable Biomaterials (RSB) low indirect land use change (ILUC) risk certification for crude tall oil-the feedstock used for UPM BioVerno renewable fuels production-and for UPM's cultivation of the Brassica carinata oil crop in Uruguay. RSB is one of the world's most trusted, valued and peer-reviewed standards for biomaterials. UPM Biofuels completed the Environmental Impact Assessment for a potential new Kotka Biorefinery in Finland. UPM is also studying and testing the use of several new feedstocks that fulfil sustainability criteria, such as wood residues and cultivation of Brassica carinata as possible raw materials for this Kotka Biorefinery.
UPM Energy	The focus was on improving the cost-competitiveness and environmental performance of hydropower production assets and on developing competencies and business operations related to the optimisation of industrial energy consumption and demand-side flexibility. UPM Energy participated in several research programmes and undertook development work with the aim of improving UPM's power generation and consumption operations in a changing electricity market.
UPM Raflatac	Research centres at four sites (Finland, Poland, China, USA) support the product range expansion of paper, film and special products in global self-adhesive labelling business operations. Cost efficiency and product customisation requirements for various end-use segments were taken into account during the customer and market-orientated development phase. Product safety and sustainable alternatives, i.e. Forest Film and RAFNXT+, increased their role alongside these requirements. Continuous quality improvement still remains an essential part of product and process development. Together with UPM Communication Papers and UPM's central European Research Centre, UPM Raflatac developed a new type of adhesive, promising considerable improvements in the recyclability of paper labels.
UPM Specialty Papers	R&D and product development initiatives aim to enable high performance and efficiency in the value chain and to develop fibre-based alternatives for non-renewable materials. These initiatives also support growth targets by driving the innovation of products for new applications. R&D centres in Finland and China work in close co-operation with local production, customer service and global business operations. In 2019 several new base paper grades were introduced for release liners, including a product portfolio for tapes and industrial applications and a tailor-made solution for logistics labels. At the end of 2019, UPM Specialty Papers also introduced a family of kraft products for the packaging segment. Moving forward, the focus for product development is to develop sustainable packaging papers for increasingly demanding end-uses. UPM Specialty Papers continues to develop release liner base papers to further improve efficiency and minimise the environmental impact of the value chain. UPM Specialty Papers also works to enhance the sustainability and efficiency of operations. The More with Biofore in China research programme at the Changshu mill met key targets, including obtaining ISO 50001 Energy Management System certification and improving energy efficiency. It was also the first year that the Changshu mill has operated under China's ultra-low emission standard, one of the strictest in the world. In order to meet these emission requirements, UPM Specialty Papers has invested approximately EUR 13 million to comprehensively upgrade the existing desulphurisation, denitrification and dust removal systems. Several rounds of water recycling trials have been completed with promising results; water consumption will be further reduced once the upgrades are completed.
UPM Communication Papers	Development in UPM Communication Papers' product offering focused on key target segments and their needs, as well as extending the approach to address new and profitable end uses. R&D centres in Lappeenranta, Finland, and in Augsburg, Germany, focused on investigating new fibre concepts for various paper grades. Together with UPM Raflatac and UPM's central European Research Centre, UPM Communication Papers developed a new type of adhesive, promising considerable improvements in the recyclability of paper labels. In the area of energy, the focus was on technological innovations that help minimise energy needs at the production sites. Efficiency was increased through own-process development, asset optimisation and digitalised maintenance concepts. Contributions from the R&D teams were valuable in helping meet the 2030 targets in the areas of energy, water consumption, effluent treatment and resource efficiency.
UPM Plywood	UPM Plywood product management and development provides competitive products within selected end-use areas in tight collaboration with our customers, superior technical expertise and support for customers, and support for the commercialisation of newly developed products and applications. One example of new functional products is WISA®-SpruceFR, a fire-retardant plywood panel that enables designers and architects to design simpler structures that meet building code requirements in relation to fire properties, saving both material costs and construction time.

Information on shares

Shares

UPM has one class of shares. Each share entitles the holder to one vote at the General Meeting of UPM.

On 31 December 2019, the total number of UPM shares was 533,735,699. Through the issuance authorisation described below, the number of shares may increase to a maximum of 558,735,699. On 31 December 2019, UPM held 411,653 treasury shares, representing approximately 0.08% of the total number of UPM shares and voting rights. There are no specific terms related to the shares.

In 2019, UPM shares worth a total of EUR 9,695 million (9,980 million) were traded on the NASDAQ Helsinki stock exchange. This is estimated to represent more than 50% of all trading volume in UPM shares. The highest listing was EUR 31.49 in December and the lowest was EUR 21.10 in July.

In the beginning of the year the company's ADSs were traded on the US over-the-counter (OTC) market under a Level 1-sponsored American Depositary Receipt programme. This American Depositary Receipt programme terminated on 30 August 2019.

Authorisations held by the Board of Directors

The Annual General Meeting held on 4 April 2019 authorised the Board of Directors to decide on the repurchase of a maximum of 50,000,000 of the Company's own shares. The authorisation will be valid for 18 months from the date of the AGM resolution.

The Annual General Meeting held on 4 April 2019 authorised the Board of Directors to decide on the issuance of new shares, the transfer of treasury shares and the issuance of special rights entitling to shares in proportion to the shareholders' existing holdings in the Company, or in a directed share issue, deviating from the shareholder's pre-emptive subscription right. The Board of Directors may also decide on a share issue without payment to the Company itself. The aggregate maximum number of new shares that may be issued and treasury shares that may be transferred is 25,000,000, including the number of shares that can be received on the basis of the special rights. The authorisation will be valid for 18 months from the date of the AGM resolution.

Aside from the above, the Board of Directors has no current authorisation to issue shares, convertible bonds or share options.

Changes in number of shares

	2019	2018	2017	2016	2015
Number of shares 1 January	533,735,699	533,735,699	533,735,699	533,735,699	533,735,699
Number of shares at 31 December	533,735,699	533,735,699	533,735,699	533,735,699	533,735,699

Major shareholders at 31 December 2019

	NUMBER OF SHARES	HOLDING %
Varma Mutual Pension Insurance Company	10,085,370	1.89
Ilmarinen Mutual Pension Insurance Company	8,715,000	1.63
ELO Mutual Pension Insurance Company	3,660,262	0.69
The State Pension Fund	3,500,000	0.66
The Society of Swedish Literature in Finland	2,877,070	0.54
Swiss National Bank	2,439,163	0.46
Kymin Osakeyhtiön 100-vuotissäätiö	1,696,360	0.32
Mandatum Life Insurance Company	1,603,717	0.30
The Social Insurance Institution of Finland / Pension Liability Fund	1,603,690	0.30
OP-Suomi Investment Fund	1,533,747	0.29
Nominees & registered foreign owners	368,905,523	69.12
Others	127,115,797	23.82
Total	533,735,699	100.00

Shareholders by category at 31 December, %

	2019	2018	2017	2016	2015
Companies	2.3	2.1	2.1	2.2	2.3
Financial institutions and insurance companies	3.0	2.9	2.4	3.1	3.4
Public bodies	5.7	6.8	5.1	5.8	6.0
Non-profit organisations	4.6	4.4	4.8	4.8	5.0
Households	15.2	15.0	15.1	15.3	15.8
Non-Finnish nationals	69.1	68.7	70.5	68.8	67.5
Total	100.0	100.0	100.0	100.0	100.0

Share distribution at 31 December 2019

SIZE OF SHAREHOLDINGS	NUMBER OF SHARES	% OF SHAREHOLDERS	NUMBER OF SHARES, MILLION	% OF SHARES
1 – 100	33,641	33.40	1.7	0.3
101 – 1,000	50,267	49.90	20.0	3.7
1,001 – 10,000	15,479	15.37	41.8	7.8
10,001 – 100,000	1,222	1.21	30.1	5.6
100,001 –	127	0.13	76.5	14.3
Total	100,736	100.00	170.1	31.9
Nominee-registered			363.6	68.1
Not registered as book entry units			–	0.0
Total			533.7	100.0

Under the provisions of the Securities Markets Act, changes in holdings must be disclosed when the holding reaches, exceeds or falls below 5, 10, 15, 20, 25, 30, 50 or 66.7 (2/3) per cent of the voting rights or the number of shares of the company. The stock exchange releases on notifications of changes in holdings pursuant to Chapter 9, Section 5 of the Securities Market Act are available in UPM website ***upm.com/investors***.

Adjusted share related indicators

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Earnings per share (EPS), EUR	1.99	2.80	1.82	1.65	1.72	0.96	0.63	-2.14	0.88	1.08
Comparable EPS, EUR	2.07	2.24	1.88	1.65	1.38	1.20	0.91	0.74	0.93	0.99
Equity per share, EUR	18.87	18.36	16.24	15.43	14.89	14.02	14.08	14.18	14.22	13.64
Dividend per share, EUR [1]	1.30	1.30	1.15	0.95	0.75	0.70	0.60	0.60	0.60	0.55
Dividend to earnings ratio, %	65.4	46.4	63.0	57.6	43.6	72.9	95.2	neg.	68.2	50.9
Dividend to operating cash flow, %	38	52	42	30	34	30	43	30	30	29
Effective dividend yield, %	4.2	5.9	4.4	4.1	4.4	5.1	4.9	6.8	7.1	4.2
P/E ratio	15.5	7.9	14.2	14.1	10.0	14.2	19.5	neg.	9.7	12.2
Operating cash flow per share, EUR	3.46	2.49	2.74	3.16	2.22	2.33	1.39	1.98	1.99	1.89
Dividend distribution, EURm [1]	693	693	613	507	400	373	317	317	315	286
Share price at 31 Dec., EUR	30.91	22.15	25.91	23.34	17.23	13.62	12.28	8.81	8.51	13.22
Lowest quotation, EUR	21.10	21.69	20.82	13.71	13.19	10.07	7.30	7.82	7.34	7.37
Highest quotation, EUR	31.49	34.70	26.69	23.41	19.26	13.99	13.02	10.98	15.73	13.57
Average quotation for the period, EUR	25.73	28.86	23.89	17.51	16.37	12.26	9.42	9.21	11.17	10.43
Market capitalisation, EURm	16,485	11,813	13,818	12,452	9,192	7,266	6,497	4,633	4,466	6,874
Shares traded, EURm [2]	9,695	9,980	8,460	6,749	7,469	6,233	5,308	5,534	8,835	8,243
Shares traded (1,000)	376,801	345,822	354,053	385,355	456,168	508,318	563,382	600,968	790,967	790,490
Shares traded, % of all shares	70.7	64.8	66.4	72.2	85.5	95.6	106.7	114.4	151.5	152.0
Number of shares, average (1,000)	533,324	533,324	533,415	533,505	533,505	531,574	527,818	525,434	521,965	519,970
Number of shares at the end of period (1,000)	533,736	533,736	533,736	533,736	533,736	533,736	529,302	526,124	524,973	519,970
of which treasury shares (1,000)	412	412	412	231	231	231	231	231	211	–

[1] 2019 proposal
[2] Trading on the Nasdaq Helsinki Main Market. Treasury shares bought by the company are included in shares traded.

The definitions of share related indicators are described below

SHARE RELATED INDICATORS	DEFINITION
Earnings per share (EPS), EUR	Profit for the period attributable to owners of the parent company divided by adjusted average number of shares during the period excluding treasury shares.
Comparable EPS, EUR	Earnings per share calculated in accordance with IFRS excluding items affecting comparability and their tax impact.
Equity per share, EUR	Equity attributable to the owners of the parent company in relation to the adjusted number of shares at the end of period.
Dividend per share, EUR	Dividend distribution divided by adjusted number of shares at the end of period.
Dividend to earnings ratio, %	Dividend per share as a percentage of earnings per share.
Dividend to operating cash flow, %	Dividend per share as a percentage of operating cash flow per share.
Effective dividend yield, %	Adjusted dividend per share as a percentage of adjusted share price at 31.12.
P/E ratio	Adjusted share price in relation to the earnings per share.
Operating cash flow per share, EUR	Operating cash flow divided by adjusted average number of shares during the period excluding treasury shares.
Market capitalisation, EURm	Total number of shares (excluding those held as treasury shares) multiplied by the share price at the end of period.
Adjusted share price at the end of period	Share price at the end of period in relation to share issue coefficient.
Adjusted average share price	Total value of shares traded in relation to adjusted number of shares traded during the period.

Board of Directors' proposal for the distribution of profit

The Board of Directors proposes to the Annual General Meeting of UPM-Kymmene Corporation to be held on 31 March 2020 that a dividend of EUR 1.30 per share be paid based on the balance sheet to be adopted for the financial year ending 31 December 2019 and that the remaining portion of the distributable funds be retained in the Company's unrestricted shareholders' equity.

The dividend will be paid to a shareholder who is registered in the Company's shareholders' register held by Euroclear Finland Ltd on the dividend record date of 2 April 2020. The Board of Directors proposes that the dividend be paid on 16 April 2020.

On the date of the dividend proposal, 30 January 2020,the Company's registered number of shares is 533,735,699. The aforementioned number of shares includes 411,653 treasury shares which are not entitled to dividend. As a result, the proposed dividend would total EUR 693.3 million.

On 31 December 2019, the distributable funds of the parent company were EUR 3,968,806,884.13 including EUR 756,182,443.15 profit for the period. No material changes have taken place in respect of the Company's financial position after the balance sheet date. In the opinion of the Board of Directors, the proposed distribution of profits does not risk the solvency of the Company.

Signatures of the annual accounts and the report of the Board of Directors for the year 2019

Helsinki, 30 January 2020

Björn Wahlroos
Chair

Berndt Brunow

Henrik Ehrnrooth

Piia-Noora Kauppi

Marjan Oudeman

Jussi Pesonen
President and CEO

Ari Puheloinen

Veli-Matti Reinikkala

Suzanne Thoma

Kim Wahl

Financial Statements 2019

Consolidated financial statements, IFRS

Consolidated income statement

EURm	NOTE	2019	RESTATED *) 2018
Sales	2.1, 2.2	10,238	10,483
Other operating income	2.3	97	87
Costs and expenses *)	2.3	-8,531	-8,665
Change in fair value of forest assets and wood harvested *)	4.2	26	407
Share of results of associated companies and joint ventures		3	6
Depreciation, amortisation and impairment charges	2.3, 4.1, 4.4	-490	-422
Operating profit		1,344	1,895
Exchange rate and fair value gains and losses	5.4	—	3
Interest and other finance costs, net	5.4	-38	-60
Profit before tax		1,307	1,839
Income taxes	7.1	-234	-342
Profit for the period		1,073	1,496
Attributable to:			
Owners of the parent company		1,061	1,495
Non-controlling interests	8.1	12	1
		1,073	1,496
Earnings per share for profit attributable to owners of the parent company			
Basic earnings per share, EUR	2.4	1.99	2.80
Diluted earnings per share, EUR	2.4	1.99	2.80

*) Accounting policy change of forest renewal costs

Consolidated statement of comprehensive income

EURm	NOTE	2019	2018
Profit for the period		1,073	1,496
Other comprehensive income for the period, net of tax			
Items that will not be reclassified to income statement:			
Actuarial gains and losses on defined benefit plans		-58	—
Changes in fair value of energy shareholdings		-13	183
Items that may be reclassified subsequently to income statement:			
Translation differences		67	62
Net investment hedge		-6	-14
Cash flow hedges		-50	13
Other comprehensive income for the period, net of tax	7.2	-58	243
Total comprehensive income for the period		1,014	1,739
Attributable to:			
Owners of the parent company		987	1,738
Non-controlling interests		27	1
		1,014	1,739

The notes are integral part of these consolidated financial statements.

Consolidated balance sheet

EURm	NOTE	2019	2018
ASSETS			
Goodwill	4.4	238	236
Other intangible assets	4.4	326	295
Property, plant and equipment	4.1	4,083	4,186
Leased assets	5.2	590	—
Forest assets	4.2	2,097	1,945
Energy shareholdings	4.3	2,145	2,159
Other non-current financial assets	5.3	170	178
Deferred tax assets	7.2	395	397
Net retirement benefit assets	3.4	38	38
Investments in associates and joint ventures		33	32
Other non-current assets		23	34
Non-current assets		10,140	9,501
Inventories	4.6	1,367	1,642
Trade and other receivables	4.6, 5.3	1,576	1,833
Other current financial assets	5.3	59	107
Income tax receivables		26	24
Cash and cash equivalents	5.1, 5.3	1,536	888
Current assets		4,565	4,496
Assets classified as held for sale	8.4	18	—
Assets		14,722	13,996

EURm	NOTE	2019	2018
EQUITY AND LIABILITIES			
Share capital	5.5	890	890
Treasury shares		-2	-2
Translation reserve		278	232
Other reserves	5.5	1,711	1,778
Reserve for invested non-restricted equity	5.5	1,273	1,273
Retained earnings		5,912	5,623
Equity attributable to owners of the parent company		10,062	9,792
Non-controlling interests	8.1	113	5
Equity		10,175	9,797
Deferred tax liabilities	7.2	549	535
Net retirement benefit liabilities	3.4	759	679
Provisions	4.5	144	126
Non-current debt	5.2, 5.3	1,195	753
Other non-current financial liabilities	5.3	83	101
Non-current liabilities		2,730	2,194
Current debt	5.2, 5.3	104	25
Trade and other payables	4.6, 5.3	1,654	1,881
Other current financial liabilities	5.3	33	78
Income tax payables		27	22
Current liabilities		1,818	2,005
Liabilities		4,548	4,199
Equity and liabilities		14,722	13,996

The notes are integral part of these consolidated financial statements.

Consolidated statement of changes in equity

EURm	SHARE CAPITAL	TREASURY SHARES	TRANSLATION RESERVE	OTHER RESERVES	RESERVE FOR INVESTED NON-RESTRICTED EQUITY	RETAINED EARNINGS	EQUITY ATTRIBUTABLE TO OWNERS OF THE PARENT COMPANY	NON-CONTROLLING INTERESTS	TOTAL EQUITY
Value at 31 December 2018	890	-2	232	1,778	1,273	5,623	9,792	5	9,797
Impact of adoption of IFRS 16 [1]	—	—	—	—	—	-6	-6	—	-6
Value at 1 January 2019	890	-2	232	1,778	1,273	5,617	9,786	5	9,791
Profit for the period	—	—	—	—	—	1,061	1,061	12	1,073
Translation differences	—	—	53	—	—	—	53	15	67
Cash flow hedges - reclassified to income statement, net of tax	—	—	—	5	—	—	5	—	5
Cash flow hedges - change in fair value, net of tax	—	—	—	-54	—	—	-54	—	-54
Net investment hedge, net of tax	—	—	-6	—	—	—	-6	—	-6
Energy shareholdings - changes in fair value, net of tax	—	—	—	-13	—	1	-13	—	-13
Actuarial gains and losses on defined benefit plans, net of tax	—	—	—	—	—	-58	-58	—	-58
Total comprehensive income for the period	—	—	47	-63	—	1,004	987	27	1,014
Share-based payments, net of tax	—	—	—	-3	—	-8	-12	—	-12
Dividend distribution	—	—	—	—	—	-693	-693	—	-693
Changes in non-controlling interests	—	—	—	—	—	-7	-7	81	75
Total transactions with owners for the period	—	—	—	-3	—	-709	-712	81	-631
Total equity at 31 December 2019	890	-2	278	1,711	1,273	5,912	10,062	113	10,175
Value at 1 January 2018	890	-2	184	1,590	1,273	4,750	8,684	4	8,687
Profit for the period	—	—	—	—	—	1,495	1,495	1	1,496
Translation differences	—	—	61	—	—	—	61	—	62
Cash flow hedges - reclassified to income statement, net of tax	—	—	—	-13	—	—	-13	—	-13
Cash flow hedges - change in fair value, net of tax	—	—	—	26	—	—	26	—	26
Net investment hedge, net of tax	—	—	-14	—	—	—	-14	—	-14
Energy shareholdings - changes in fair value, net of tax	—	—	—	183	—	—	183	—	183
Actuarial gains and losses on defined benefit plans, net of tax	—	—	—	—	—	—	—	—	—
Total comprehensive income for the period	—	—	48	196	—	1,494	1,738	1	1,739
Share-based payments, net of tax	—	—	—	-8	—	-7	-16	—	-16
Dividend distribution	—	—	—	—	—	-613	-613	—	-613
Total transactions with owners for the period	—	—	—	-8	—	-621	-629	—	-629
Total equity at 31 December 2018	890	-2	232	1,778	1,273	5,623	9,792	5	9,797

[1] More information on changes in group's accounting policies is presented in *» Note 1.5 Changes in accounting policies.*

» Refer Note 5.5 Share capital and reserves, for further information.

Consolidated cash flow statement

EURm	2019	RESTATED *) 2018
Cash flows from operating activities		
Profit for the period	1,073	1,496
Adjustments [1]	719	301
Interest received	2	2
Interest paid	-29	-15
Dividends received	2	2
Other financial items, net	-20	-20
Income taxes paid [3]	-176	-228
Change in working capital [2]	276	-209
Operating cash flow	1,847	1,330
Cash flows from investing activities		
Capital expenditure	-359	-303
Additions to forest assets	-44	-49
Proceeds from sale of property, plant and equipment and intangible assets, net of tax	13	32
Proceeds from sale of forest assets, net of tax	2	110
Proceeds from disposal of energy shareholdings	1	1
Net cash flows from net investment hedges	-29	16
Change in other non-current assets	1	-4
Investing cash flow	-415	-199
Cash flows from financing activities		
Proceeds from non-current debt	13	0
Payments of non-current debt **)	-6	-324
Lease repayments **)	-82	-7
Change in current liabilities	-7	4
Net cash flows from derivatives	11	0
Dividends paid	-693	-613
Contributions by non-controlling interests	21	—
Other financing cash flow	-39	-19
Financing cash flow	-783	-959
Change in cash and cash equivalents	649	172
Cash and cash equivalents at beginning of period	888	716
Exchange rate effect on cash and cash equivalents	-1	0
Change in cash and cash equivalents	649	172
Cash and cash equivalents at end of period	1,536	888

*) Accounting policy change of forest renewal costs.
**) Repayments of finance leases under IAS 17 have been reclassified from Payments of non-current debt to Lease repayments.

[1] **Adjustments**

EURm	2019	2018
Change in fair value of forest assets and wood harvested	-26	-407
Share of results of associated companies and joint ventures	-3	-6
Depreciation, amortisation and impairment charges	490	422
Capital gains and losses on sale of non-current assets	-1	-47
Financial income and expenses	37	56
Income taxes	234	342
Utilised provisions	-29	-35
Non-cash changes in provisions	43	-21
Other adjustments	-25	-4
Total	719	301

[2] **Change in working capital**

EURm	2019	2018
Inventories	282	-317
Receivables included in working capital	270	-50
Liabilities included in working capital	-276	158
Total	276	-209

[3] Total income taxes paid in 2019 amounted to EUR 176 million (252 million).

Notes to the consolidated financial statements

The notes to the consolidated financial statements are grouped into sections based on their nature. The notes contain the relevant financial information as well as a description of accounting policy and key estimates and judgements applied for the topics of the individual notes. All amounts are shown in millions of euros unless otherwise stated.

Items marked with this symbol describe the accounting principle applied by UPM to the specific financial statement area.

Items marked with this symbol indicate that the accounting area involves estimates and judgement which are described separately.

Risks related disclosures, whether they are financial, actuarial, credit or counterparty in nature, can be found in sections marked with this symbol.

1. Basis for reporting

1.1 Corporate information

UPM-Kymmene Corporation ("the parent company" or "the company") together with its consolidated subsidiaries ("UPM" or "the group") is a global forest-based bioindustry group. UPM large product range covers pulp, graphic and specialty papers, selfadhesive labels, wood-based renewable diesel, electricity as well as plywood and timber products.

UPM-Kymmene Corporation is a Finnish limited liability company, domiciled in Helsinki in the Republic of Finland. The address of the company's registered office is Alvar Aallon katu 1, 00100 Helsinki, where a copy of the consolidated financial statements can be obtained.

The parent company's shares are publicly traded on the Nasdaq Helsinki Main Market.

These group consolidated financial statements were authorised for issue by the Board of Directors on 30 January 2020. According to the Finnish Companies Act, the General Meeting of Shareholders is entitled to decide on the adoption of the company's financial statements.

1.2 Basis of preparation

UPM's consolidated financial statements are prepared in accordance with International Financial Reporting Standards as adopted by the European Union (IFRS as adopted by the EU) and IFRIC Interpretations.

The consolidated financial statements have been prepared under the historical cost convention, except for forest assets, energy shareholdings and certain other financial assets and financial liabilities, defined benefit plan assets and obligations and share-based payment arrangements which are measured at fair value.

The consolidated financial statements are presented in millions of euros, which is the functional and presentation currency of the parent company. Items included in the financial statements of each group subsidiary are measured using the currency of the primary economic environment in which the subsidiary operates ("the functional currency").

The amounts within parentheses refer to the preceding year, 2018.

Figures presented in these financial statements are rounded and therefore the sum of individual figures might deviate from the presented total figure.

Accounting policies

The accounting policies applied to the consolidated financial statements as a whole are described in this section, while the remaining accounting policies are described in the notes to which they relate as UPM aims to provide enhanced understanding of each financial statement area. Further, to provide a better understanding, the accounting choices made within the framework of the prevailing IFRS are described together with the policy.

Key estimates and judgements

In the process of applying the group's accounting policies, management has made a number of judgements and applied estimates of future events that affect the reported amounts of assets and liabilities, the disclosure of contingent assets and liabilities at the date of the financial statements, and the reported amounts of revenues and expenses during the reporting periods. Although these estimates are based on management's best knowledge, actual results and timing may ultimately differ from previously made estimates. Key estimates and judgement which are material to the reported results and financial position are presented in the following notes.

KEY ESTIMATES AND JUDGEMENTS	NOTE
Valuation of forest assets	4.2 Forest assets
Fair value determination of energy shareholdings	4.3 Energy shareholdings
Impairment of property, plant and equipment	4.1 Property, plant and equipment
Impairment of goodwill and other intangible assets	4.4 Goodwill and other intangible assets
Pension and other post-employment benefits	3.4 Retirement benefit obligations
Income taxes	7. Income tax
Environmental provisions	4.5 Provisions
Legal contingencies	9.2 Litigation

Financial risks

UPM is exposed to a variety of financial risks as a result of its business activities including currency risk, interest rate risk, commodity price risk, credit risk, capital risk and liquidity risk. Risk management related to financial activities is carried out by UPM's central treasury department, Treasury and Risk Management, under policies approved by the Board of Directors. Financial risks are described in the relevant notes as described below.

FINANCIAL RISK	NOTE
Credit risk	4.6 Working capital
Liquidity and refinancing risk	5.1 Capital management
Interest rate risk	6.1 Financial risk management
Foreign exchange risk	6.1 Financial risk management
Electricity price risk	6.1 Financial risk management
Financial counterparty risk	6.2 Derivatives and hedge accounting

1.3 Consolidation principles

Subsidiaries

UPM's consolidated financial statements include the financial statements of the parent company, UPM-Kymmene Corporation, and subsidiaries controlled by UPM. All group entities apply consistently UPM's accounting policies. All intercompany transactions, receivables, liabilities and unrealised profits, as well as intragroup profit distributions, are eliminated. Unrealised losses are also eliminated unless the transaction provides evidence of an impairment of the transferred asset.

Joint operations

UPM's share in joint operations is recognised in the consolidated balance sheet through recognition of the group's own assets and liabilities and revenues and expenses in the arrangement together with UPM's proportionate share in the joint assets, liabilities and joint income and expenses. The proportionate share of realised and unrealised gains and losses arising from intragroup transactions between UPM and its joint operations is eliminated.

Associates and joint ventures

Associates are entities over which the group has significant influence. Joint ventures are joint arrangements where the group has joint control with other parties and the parties have rights to the arrangement's net assets.

Interests in associates and joint ventures are accounted for using the equity method of accounting and are initially recognised at cost.

Associates and joint ventures follow the group accounting policies for consolidation purpose.

Non-controlling interests

The profit or loss attributable to owners of the parent company and non-controlling interests is presented on the face of the income statement. Non-controlling interests are presented in the consolidated balance sheet within equity, separately from equity attributable to owners of the parent company.

Transactions with non-controlling interests are treated as transactions with equity owners of the group. For purchases from non-controlling interests, the difference between consideration paid and the acquired share of the carrying value of the subsidiary's net assets is recorded in equity. Gains or losses of disposals to non-controlling interests are also recorded in equity, net of transaction costs.

1.4 Foreign currency translation

Foreign currency transactions are translated into the functional currency using the exchange rate prevailing at the date of transaction. Foreign exchange gains and losses resulting from the settlement of such transactions and from the translation at year-end exchange rates of monetary assets and liabilities denominated in foreign currencies are recognised in the income statement, except when recognised in other comprehensive income as qualifying cash flow hedges and qualifying net investment hedges.

UPM records foreign exchange differences relating to ordinary business operations within the appropriate line items above operating profit and those relating to financial items are presented separately as a net amount in finance costs.

Income and expenses of subsidiaries that have a functional currency different from euro are translated into euros at quarterly average exchange rates. Assets and liabilities of subsidiaries are translated at the closing rate at the balance sheet date. All resulting translation differences are recognised as a separate component in other comprehensive income. On consolidation, exchange differences arising from the translation of net investment in foreign operations and other currency instruments designated as hedges of such investments, are recognised in other comprehensive income. When a foreign entity is partially disposed of, sold or liquidated, translation differences accrued in equity are recognised in the income statement as part of the gain or loss on sale/liquidation.

1.5 Changes in accounting policies

IFRS 16 Leases

The group as a lessee

On 1 January 2019, UPM has changed its accounting policy regarding recognition, measurement, presentation and disclosure of leases. As a result, UPM as a lessee has recognised most of leases on the balance sheet and there is no distinction between operating and finance leases anymore.

Leases of property, plant and equipment where UPM, as a lessee, obtains substantially all of the economic benefits from the use of the identified asset and where UPM has the right to direct the use of the identified asset, are classified as leases.

The group recognises a leased asset and a lease liability at the lease commencement date, except for short-term leases. Short-term leases are leases where the duration of the lease term is 12 months or less. In case the contract includes a purchase option, it is not a short-term lease. UPM recognises lease payments of short-term leases as an expense on straight-line basis over the lease term.

The lease term of the different contracts is determined as the non-cancellable period taking into consideration the options to extend and terminate if it is reasonably certain that the group will exercise the extension option or will not exercise the termination option. If the contract is for an indefinite period of time and the group and the lessor both have a right to terminate the contract within a short notice period (12 months or less) without a significant penalty, the contract is considered to be a short-term and the lease payments are expensed in the income statement on a straight-line basis over the lease term.

Leased asset comprises the initial lease liability, initial direct costs and the obligations to refurbish the asset, less any incentives granted by the lessors. The leased asset is subsequently valued at cost less accumulated depreciation and impairment losses. Remeasurement takes place in case lease liability is remeasured and change in cash flows is based on contract terms that have been included in the original contract. The leased asset is depreciated over the shorter of the asset's useful life and the lease term.

The lease liability is recognised at the commencement date and measured at the present value of the lease payments to be paid during the lease term. The group uses, as a basis, discount rate implicit in the lease and if that rate cannot be readily determined, UPM uses incremental borrowing rate which comprises of currency and lease period based reference rate and specific credit spread. Lease payments can include fixed payments, variable payments that depend on an index or rate and extension option payments or purchase options if it is reasonably certain that the group will exercise them. The lease liability is subsequently measured at amortised cost using the effective interest rate method and remeasured (with corresponding adjustment to the related leased asset) when there is a change in future lease payments due to renegotiation, changes of an index or rate or reassessment of options.

The group has elected to separate non-lease components such as service components and other variable components and account them for as expenses, if they can be separated from the leased asset. However, the group does not separate non-lease components from the lease contracts of company cars.

The group does not apply portfolio approach of leases with similar characteristics.

The group as a lessor

At inception of a lease contract, the group makes an assessment whether the lease is a finance lease or an operating lease. If the lease transfers substantially all of the risks and rewards incidental to ownership of the asset, it is considered to be a finance lease; if not, the lease is considered to be an operating lease. The group has only a minor amount of operating lease contracts, whereby the lease payments are recognised on a straight-line basis over the term of the lease.

Implementation of IFRS 16

The group has adopted the IFRS 16 standard using the modified retrospective application method without restatement of comparatives. Under IFRS 16, a right-of-use asset (i.e. leased assets), representing the right to use the underlying asset, and a lease liability, representing the obligation to make lease payments, is recognised on the balance sheet.

As part of the transition, leased assets of EUR 493 million and lease liabilities of EUR 491 million were recognised at the date of initial application on 1 January 2019. The most significant lease contracts recognised on the balance sheet consists of land areas, power plants and real estate. Leased assets are not included in the measure of Capital expenditure.

UPM estimated the remaining lease term as of 1 January 2019 and measured its lease liability at the present value of the remaining lease payments discounted using incremental borrowing rate at the date of application 1 January 2019. Lease payments relating to an optional renewal period in the lease liability were included only if it was reasonably certain that the group will exercise that option. The group applied IAS 36 Impairment of Assets to assess the leased assets for impairment at the date of initial application and consequently recognised an adjustment, net of tax, to the opening balance of retained earnings.

UPM applied short-term leases exemption consistently upon transition and subsequently for all asset classes.

For transition purposes UPM did not reassess previous decisions about existing contracts whether they are or contain a lease. Additionally, the group did not identify initial direct costs of leases previously classified as operating leases. At the date of initial application, the group did not apply practical exemption to account leases with the remaining term less than 12 months as short-term leases.

The Group has elected to separate lease and non-lease components for all asset classes except for company cars.

Upon transition, UPM did not make any adjustments to existing finance lease balances which have been accounted for in accordance with IAS 17. Subsequently, the group accounts for the leased asset and lease liability in accordance with the general requirements of IFRS 16.

The change in lease accounting has resulted in a reduction in operating costs (and therefore an increase in EBITDA), higher depreciation expenses and positive impact on operating profit. In addition, interest expenses have increased slightly. Cash generation was not impacted by the adoption of the standard. However, operating cash flow is positively impacted by it, given that a large part of the payments in relation to leases is now reported as financing cash flow (lease liability repayments).

The impact of the initial application of IFRS 16 by each balance sheet line item is described below. The balance sheet impact includes also the reclassification of finance leases recognised in accordance with IAS 17 at 31 December 2018 to leased assets and lease liability. In addition, certain long-term land use contracts were reclassified from intangible rights to leased assets. The corresponding lease liabilities have been settled in previous periods. Operating lease prepayments reported in trade and other receivables at 31.12.2018 were reclassified to leased assets.

Adjustments of opening balances

EURm	31 DEC 2018	IMPACT OF IFRS 16	1 JAN 2019
ASSETS			
Goodwill	236	—	236
Other intangible assets	295	–17	279
Property, plant and equipment	4,186	–71	4,114
Leased assets	—	581	581
Forest assets	1,945	—	1,945
Energy shareholdings	2,159	—	2,159
Other non-current financial assets	178	—	178
Deferred tax assets	397	—	397
Net retirement benefit assets	38	—	38
Investments in associates and joint ventures	32	—	32
Other non-current assets	34	—	34
Non-current assets	9,501	493	9,994
Inventories	1,642	—	1,642
Trade and other receivables	1,833	-8	1,825
Other current financial assets	107	—	107
Income tax receivables	24	—	24
Cash and cash equivalents	888	—	888
Current assets	4,496	-8	4,488
Assets	13,996	485	14,482
EQUITY AND LIABILITIES			
Share capital	890	—	890
Treasury shares	–2	—	–2
Translation reserve	232	—	232
Other reserves	1,778	—	1,778
Reserve for invested non-restricted equity	1,273	—	1,273
Retained earnings	5,623	-6	5,617
Equity attributable to owners of the parent company	9,792	-6	9,786
Non-controlling interests	5	—	5
Equity	9,797	-6	9,791
Deferred tax liabilities	535	—	535
Net retirement benefit liabilities	679	—	679
Provisions	126	—	126
Non-current debt	753	422	1,175
Other non-current financial liabilities	101	—	101
Non-current liabilities	2,194	422	2,616
Current debt	25	69	94
Trade and other payables	1,881	—	1,881
Other current financial liabilities	78	—	78
Income tax payables	22	—	22
Current liabilities	2,005	69	2,074
Liabilities	4,199	491	4,690
Equity and liabilities	13,996	485	14,482

The following reconciliation to opening balance for the lease liabilities as of 1 January 2019 is based upon the operating lease commitments as of 31 December 2018.

EURm	
Operating lease commitments 31.12.2018	554
Recognition exemption for short-term leases	–7
Reasonably certain extension or termination options	53
Non-lease components (service components)	–27
Other	2
Gross lease liabilities at 1.1.2019	575
Discounting [1]	–84
Lease liability 1.1.2019	491
Present value of finance lease liabilities 31.12.2018	98
Total lease liabilities 1.1.2019	589

[1] The lease liabilities were discounted at incremental borrowing date as of 1.1.2019. The weighted-average incremental borrowing rate was 1.4%.

IFRIC 23 Uncertainty over income tax treatments

IFRIC 23 explains how to recognise and measure deferred and current income tax assets and liabilities where there is uncertainty over a tax treatment. The interpretation is effective for annual reporting periods beginning on or after 1 January 2019. The group is subject to income taxes in numerous jurisdictions and the calculation of the group's tax expense and income tax liabilities involves a degree of estimation and judgement. Tax balances reflect the current understanding and interpretation of existing tax laws and the latest information available about the positions expected to be taken by tax authorities. Tax matters at UPM are managed by UPM's own tax function, which is complemented by third-party tax services in order to comply with local tax reporting, filings and other duties. Management periodically evaluates positions taken in tax returns with respect of situations in which applicable tax regulation is subject to interpretation and adjusts income tax liabilities where appropriate using the most likely amount expected to be paid. The group applied IFRIC 23 retrospectively without adjusting comparative information. At the end of 2018, the group has reviewed its uncertain tax positions and concluded that there are appropriate tax liabilities recognised for periods which are open for reviews and audits by tax authorities. Thus, the adoption of IFRIC 23 on 1 January 2019 did not have any impact on the group's financial statement on transition.

Accounting policy change of forest renewal costs

On 1 January 2019, UPM has changed its accounting policy relating to forest assets by capitalising forestry renewal costs on the balance sheet during the growth cycle and reclassifying forest assets-related cash flows from operating cash flow to investing cash flow. Previously UPM has recognised forestry renewal costs in income statement and reported forest assets-related cash flows, including forest renewal costs, forest asset purchases and sales, in operating cash flow. UPM has consistently increased the weight of the Southern hemisphere plantations in its forest asset portfolio, where the growth cycle is significantly shorter and significance of forestry renewal cost substantially higher compared to the Northern hemisphere.

Majority of UPM's forest renewal costs are related to Southern hemisphere plantations. Thus, the change of accounting policy results in more relevant information on group's financial performance and cash flows.

The change has an impact on the following key figures in UPM group, UPM Biorefining and Other operations: EBITDA, EBITDA margin, operating and investing cash flows, operating cash flow per share and net debt to EBITDA ratio. Operating profit, comparable EBIT and balance sheet are not affected. The comparative years have been restated according to the new reporting principles.

Impact on consolidated income statement, cash flow statement and key figures

2018	AS PUBLISHED	RESTATED	IMPACT
Costs and expenses	-8,710	-8,665	45
Change in fair value of forest assets and wood harvested	452	407	-45
Comparable EBITDA, EURm	1,823	1,868	45
% of sales	17.4	17.8	0.4
Operating cash flow, EURm	1,391	1,330	-60
Operating cash flow per share, EUR	2.61	2.49	-0.11
Investing cash flow, EURm	-260	-199	60
Net debt to EBITDA (last 12 m.)	-0.17	-0.17	0

Phase 1 amendments IFRS 9 and IFRS 7 for IBOR reform

The group has elected to early adopt the Amendments to IFRS 9 and IFRS 7 Interest Rate Benchmark Reform issued in September 2019. In accordance with the transition provision, the amendments have been adopted retrospectively to hedging relationships that existed at the start of the reporting period or where designated thereafter.

The amendments provide temporary relief from applying specific hedge accounting requirements to hedging relationships directly affected by IBOR reform. The reliefs have the effect that IBOR reform should not generally cause hedge accounting to terminate. However, any hedge ineffectiveness should continue to be recorded in the income statement. Furthermore, the amendments set out triggers for when the reliefs will end, which include the uncertainty arising from interests rate benchmark reform no longer being present.

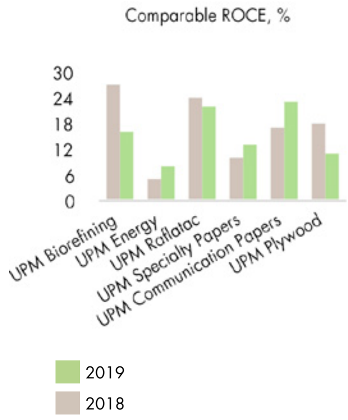
The Group's risk exposure that is directly affected by the IBOR reform is fair value hedge accounting of long-term fixed-rate debt for changes in fair value attributable to USD LIBOR which is the current benchmark interest rate. Group currently has only few contracts which reference USD LIBOR and extend beyond 2021. Group Treasury oversees the Group's IBOR transition and follows changes to ISDA and other market guidelines on effects of these changes to UPM's contracts. In fair value hedging relationships, fair value for both the hedged item and hedging instrument is calculated with identical rate. Therefore no ineffectiveness is expected.

2. Business performance

Sales	Comparable EBIT	Comparable ROE
EUR **10,238 m**	EUR **1,404 m**	**11.2 %**
(EUR 10,483m)	(EUR 1,513m)	(12.9 %)

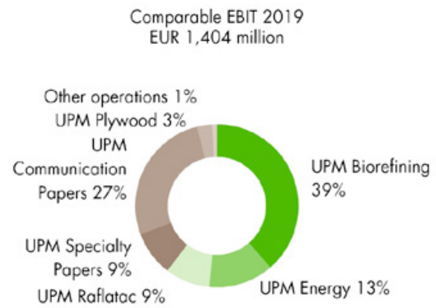
2.1 Business areas

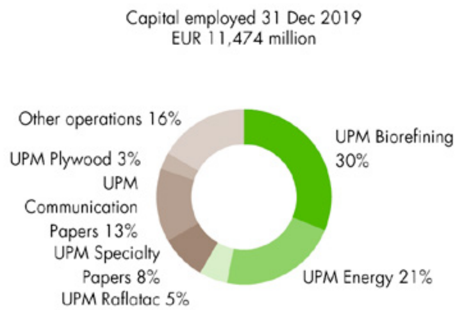
UPM business portfolio consist of six competitive businesses with strong market positions. UPM reports financial information for the following business areas (segments): UPM Biorefining, UPM Energy, UPM Raflatac, UPM Specialty Papers, UPM Communication Papers, UPM Plywood and Other operations. UPM has production plants in 12 countries. The group's most important markets are Europe, North America and Asia.



Accounting policies

UPM business areas are reported consistently with the internal reporting provided to UPM's President and CEO who is responsible for allocating resources and assessing performance of the business areas. Internal reporting is prepared under the same basis as the consolidated accounts, except for a joint operation, Madison Paper Industries (MPI) which is consolidated as a subsidiary in the UPM Communication Papers reporting. Costs, revenues, assets and liabilities are allocated to business areas on a consistent basis. The sales transactions between business areas are based on market prices, and they are eliminated on consolidation.





The group disaggregates its external sales by business areas, because UPM business areas are reported consistently with the internal reporting provided to UPM's President and CEO who is responsible for allocating resources and assessing performance of the business areas. The goods and services included in sales revenue of each business area are presented in below table:

BUSINESS AREA	DESCRIPTION AND PRODUCTS
UPM Biorefining	UPM Biorefining consists of UPM Pulp, UPM Biofuels and UPM Timber business units. UPM Pulp has three pulp mills in Finland, one pulp mill and plantation operations in Uruguay. UPM Pulp serves the global market with a comprehensive assortment of sustainably produced eucalyptus, birch and softwood pulp grades for a variety of tissue, specialty paper, board, printing and writing paper and other applications. UPM Biofuels has one biorefinery in Finland. UPM Biofuels products include wood-based renewable diesel for transport and renewable naphtha for transport and for bioplastics. UPM Timber has four saw mills in Finland. UPM Timber products include certified sawn timber from Nordic pine and spruce to joinery, packaging, distribution and construction industries.
UPM Energy	UPM Energy assets consists of hydro power assets in Finland and shareholdings in energy companies. UPM Energy is the second largest electricity producer in Finland. UPM Energy operations include electricity generation, and operations in both physical electricity and financial portfolio management. UPM Energy sells low emission electricity to NordPool electricity market.
UPM Raflatac	UPM Raflatac is one of the world's leading producers of self-adhesive label materials. UPM Raflatac supplies high-quality film and paper label stock for consumer product and industrial labelling. Customers include label printers and brand owners.
UPM Communication Papers	UPM Communication Papers is the world's leading producer of graphic papers. UPM Communication Papers customers include newspaper publishers, telephone directory publishers, cataloguers, retailers, magazine publishers, printers, merchants, office supply distributors, office equipment manufacturers and envelope manufacturers.
UPM Plywood	UPM Plywood manufactures high-quality plywood and veneer products mainly for construction and transport industries and thermo-formable wood material for the form pressing industry. Production facilities are located in Finland, Estonia and Russia.
UPM Specialty Papers	UPM Specialty Papers produces office papers to Asian markets and labelling and packaging materials to global markets. High performance papers are manufactured in China and Finland.
Other operations	Other operations include UPM Forest, UPM Biocomposites, UPM Biochemicals business units and group services. UPM Forest sells wood and wood-based biomass (logs, pulpwood, chips, forest residues) to other UPM Business Areas as well as third party customers. In addition it provides forest expertise and contracting services to woodland and forestry owners. UPM Biocomposites combines cellulose fibres and polymers into UPM ProFi decking products and UPM Formi granules. UPM Biochemicals produces wood-based lignin products for industrial use and cell culture hydrogel products for biomedical applications.

Key performance indicators and financial targets

UPM aims to grow its comparable EBIT over the long term. The group has a portfolio of five businesses that operate on growing markets and one business that faces declining demand. All of UPM businesses are competitive and have strong market positions. Financial target setting, follow up and allocation of resources in the group's performance management process is mainly based on the business area comparable EBIT and comparable ROCE.

UPM presents comparable performance measures to reflect the underlying business performance and to enhance comparability from period to period. However the comparable performance measures used by management should not be considered in isolation as a substitute for measures of performance in accordance with IFRS. Business area information including description of items affecting comparability is presented below.

Business area information for the year ended 31 December 2019

EURm, OR AS INDICATED	UPM BIORE-FINING	UPM ENERGY	UPM RAFLATAC	UPM SPECIALTY PAPERS	UPM COM PAPERS	UPM PLYWOOD	OTHER OPERATIONS	ELIMINATIONS AND RECONCI-LIATIONS [2]	GROUP
External sales	2,096	180	1,555	1,203	4,516	427	258	4	10,238
Internal sales	617	237	—	209	36	24	6	-1,129	—
Total sales	2,712	417	1,555	1,412	4,552	450	264	-1,125	10,238
Comparable EBIT	544	185	126	120	383	36	-7	17	1,404
Items affecting comparability in operating profit	—	-1	-2	—	-58	—	-4	5	-60
Operating profit	544	184	124	120	324	36	-10	21	1,344
Finance costs, net									-37
Income taxes									-234
Profit for the period									1,073
Operating assets [1]	3,638	2,481	703	1,124	2,026	351	2,159	-362	12,121
Deferred tax assets									395
Other non-operating assets									87
Other financial assets									2,119
Total assets									14,722
Operating liabilities [1]	246	28	169	200	525	31	277	-338	1,139
Deferred tax liabilities									549
Other liabilities									930
Other financial liabilities									1,930
Total liabilities									4,548
Other items									
Change in fair value of forest assets and wood harvested	-11	—	—	—	—	—	38	—	26
Share of results of associates and joint ventures	2	—	—	—	1	—	—	—	3
Depreciation and amortisation	-171	-9	-40	-73	-132	-25	-27	—	-476
Impairment charges	—	—	—	—	-13	—	—	—	-13
Capital employed, 31 December	3,392	2,453	534	924	1,501	320	1,881	468	11,474
Average capital employed	3,469	2,454	579	904	1,647	329	1,824	-182	11,024
Capital expenditure	133	6	13	115	47	29	35	—	378
Capital expenditure, excluding acquisitions and shares	133	6	13	115	47	29	35	—	378
Comparable ROCE, %	15.7	7.5	21.8	13.3	23.2	11.0	-0.4	—	12.8
Personnel, 31 December	2,739	68	3,181	1,992	7,673	2,467	622	—	18,742

[1] Business area's operating assets include goodwill, other intangible assets, property, plant and equipment, forest assets, energy shareholdings, investments in associates and joint ventures, inventories and trade receivables. Operating liabilities include trade payables and advances received.

[2] Eliminations and reconciliations include the elimination of internal sales and internal inventory margin and the changes in fair value of unrealised cash flow and commodity hedges that are not allocated to segments.

» Refer Other financial information on Alternative performance measures, for definitions of key figures and reconciliation to measures presented in the consolidated income statement and balance sheet prepared in accordance with IFRS.

Business area information for the year ended 31 December 2018

EURm, OR AS INDICATED	UPM BIO-REFINING	UPM ENERGY	UPM RAFLATAC	UPM SPECIALTY PAPERS	UPM COM PAPERS	UPM PLYWOOD	OTHER OPERATIONS	ELIMINATIONS AND RECONCI-LIATIONS [2]	GROUP
External sales	2,223	109	1,488	1,213	4,664	458	321	7	10,483
Internal sales	669	282	—	216	26	22	6	-1,220	—
Total sales	2,892	391	1,488	1,429	4,690	480	326	-1,214	10,483
Comparable EBIT	847	123	126	90	267	52	35	-26	1,513
Items affecting comparability in operating profit	—	-9	—	—	46	—	345	1	382
Operating profit	847	114	126	90	312	52	380	-25	1,895
Finance costs, net									-56
Income taxes									-342
Profit for the period									1,496
Operating assets [1]	3,540	2,506	701	1,158	2,228	353	1,847	-362	11,970
Deferred tax assets									397
Other non-operating assets									97
Other financial assets									1,532
Total assets									13,996
Operating liabilities [1]	288	45	172	265	624	51	183	-310	1,318
Deferred tax liabilities									535
Other liabilities									826
Other financial liabilities									1,520
Total liabilities									4,199
Other items									
Change in fair value of forest assets and wood harvested	-12	—	—	—	—	—	419	—	407
Share of results of associates and joint ventures	2	—	—	—	2	—	2	—	6
Depreciation and amortisation	-155	-9	-30	-77	-116	-23	-13	—	-423
Impairment charges	—	—	—	—	—	—	—	—	—
Capital employed, 31 December	3,252	2,460	529	892	1,604	302	1,665	-130	10,575
Average capital employed	3,180	2,346	535	889	1,602	283	1,392	-51	10,176
Capital expenditure	77	1	24	85	46	52	18	—	303
Capital expenditure, excluding acquisitions and shares	77	1	24	85	46	52	18	—	303
Comparable ROCE, %	26.6	5.3	23.6	10.1	16.7	18.4	2.5	—	14.6
Personnel, 31 December	2,636	63	3,244	2,000	7,929	2,502	604	—	18,978

[1] Business area's operating assets include goodwill, other intangible assets, property, plant and equipment, forest assets, energy shareholdings, investments in associates and joint ventures, inventories and trade receivables. Operating liabilities include trade payables and advances received.

[2] Eliminations and reconciliations include the elimination of internal sales and the changes in fair value of unrealised cash flow and commodity hedges that are not allocated to segments.

» Refer Other financial information on Alternative performance measures, for definitions of key figures and reconciliation to measures presented in the consolidated income statement and balance sheet prepared in accordance with IFRS.

Items affecting comparability

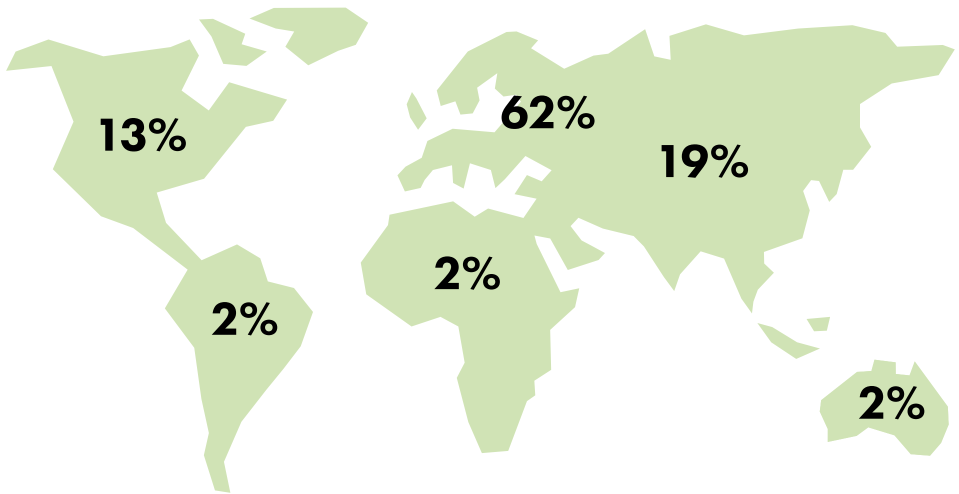
EURm	2019	2018
In operating profit		
Impairment charges	-13	–
Restructuring charges	-52	9
Change in fair value of unrealised cash flow and commodity hedges	5	–
Capital gains and losses on sale of non-current assets	–	29
Fair value changes of forest assets resulting from changes in estimates	–	345
Total	-60	382
Total in profit before tax	-60	382
In income taxes		
Taxes related to items affecting comparability	14	-80
Total	14	-80
Total in profit for the period	-46	302

Certain non-operational or non-cash valuation transactions with significant income statement impact are considered as items affecting comparability and reported separately to reflect the underlying business performance and to enhance comparability from period to period.

In 2019, items affecting comparability in operating profit include EUR 15 million restructuring charges and EUR 12 million impairment charges related to closure of paper machine 2 at UPM Rauma mill, Finland, and EUR 24 million restructuring charges and EUR 1 million impairment charges related to closure of paper machine 10 at UPM Plattling mill, Germany. Additionally, restructuring charges reported as items affecting comparability include prior capacity closures in UPM Communication Papers as well as restructuring costs related to establishment of a new Business Services Hub in Wroclaw, Poland.

In 2018, items affecting comparability in operating profit include fair value change of forest assets in Finland amounting to EUR 345 million, resulting mainly from higher forest growth estimates. In addition, the group has adjusted its long-term wood price estimates slightly. Capital gains affecting the comparability comprise of a gain of EUR 30 million relating to sale of UPM Communication Papers' hydropower facilities in Schongau and Ettringen, Germany. Restructuring charges reported as items affecting comparability include reversals of previous years' restructuring provisions, amounting to EUR 18 million for UPM Communication Papers and EUR 9 million charges in UPM Energy regarding restructuring of ownership in MeriPori power plant.

Sales by destination



Total assets and capital expenditure by country

	Assets		Capital expenditure	
EURm	2019	2018	2019	2018
Finland	9,217	8,900	135	131
Germany	1,144	987	94	59
United States	385	406	6	3
United Kingdom	155	152	5	5
China	782	784	35	34
France	67	59	1	1
Uruguay	2,099	1,820	70	17
Other EU countries	341	333	8	9
Other European countries	185	150	24	40
Rest of world	348	406	1	5
Total	14,722	13,996	378	303

Sales by country

EURm	2019	2018
Finland	894	916
Germany	1,580	1,688
United States	1,213	1,158
United Kingdom	665	664
China	1,042	1,186
France	387	395
Uruguay	25	57
Other EU countries	2,372	2,380
Other European countries	476	461
Rest of world	1,584	1,577
Total	10,238	10,483

2.2 Sales

UPM generates revenue mainly from the sale of goods, i.e. several types of products.

The majority of UPM's revenue comes from sales of graphic and specialty papers to publishers, retailers, printing houses, merchants and distributors, converters and label stock manufacturers; sales of self-adhesive label materials to label printers and brand owners and sales of pulp products to tissue, board, specialty and graphic paper producers. The revenue comprises also sales of energy, biofuels, sawn timber and plywood products and a very limited amount of services not related to sale of goods.

UPM sells a proportion of its products to several major customers. The largest customer in terms of sales represented approximately 3% of UPM's sales in 2019 and 2018, and the ten largest customers represented approximately 15% of such sales.

The group disaggregates its external sales by business area, because this depicts how the nature, amount, timing and uncertainty of revenue and cash flows are affected by economic factors. Sales by UPM business areas are reported consistently with the internal reporting provided to UPM's President and CEO who is responsible for allocating resources and assessing performance of the business areas. The goods and services included in sales revenue of each business area are presented in below tables.

» Refer Note 2.1 Business areas for information on UPM products.

Sales by business area

EURm	2019	2018	CHANGE
UPM Biorefining	2,712	2,892	-6 %
UPM Energy	417	391	7 %
UPM Raflatac	1,555	1,488	5 %
UPM Specialty Papers	1,412	1,429	-1 %
UPM Communication Papers	4,552	4,690	-3 %
UPM Plywood	450	480	-6 %
Other operations	264	326	-19 %
Eliminations	-1,125	-1,214	–
Total	10,238	10,483	-2 %

External sales by major products

BUSINESS AREA	BUSINESS	2019	2018
EUR million			
UPM Biorefining	UPM Pulp, UPM Biofuels, UPM Timber	2,096	2,223
UPM Energy	UPM Energy	180	109
UPM Raflatac	UPM Raflatac	1,555	1,488
UPM Specialty Papers	UPM Specialty Papers	1,203	1,213
UPM Communication Papers	UPM Communication Papers	4,516	4,664
UPM Plywood	UPM Plywood	427	458
Other operations	UPM Forest, UPM Biochemicals, UPM Biomedicals, UPM Biocomposites	258	321
Eliminations and reconciliations		4	7
Total		10,238	10,483

BUSINESS	PRODUCT RANGE
UPM Pulp	Softwood, birch and eucalyptus pulp
UPM Biofuels	Wood-based renewable diesel for transport and renewable naphtha for transport and petrochemicals
UPM Timber	Standard and special sawn timber
UPM Energy	Electricity and related services
UPM Raflatac	Self-adhesive paper and film label stock
UPM Specialty Papers	Labelling materials, release base papers, flexible packaging materials, office papers, graphic papers
UPM Communication Papers	Graphic papers for various end uses
UPM Plywood	Plywood and veneer products
UPM Forest	Wood and wood-based biomass (logs, pulpwood, chips, forest residues etc.), full forestry service offering
UPM Biochemicals	Lignin products for industrial use
UPM Biomedicals	Wood-based products for biomedical applications
UPM Biocomposites	UPM ProFi decking products and UPM Formi granules

Effect of a 10% change in prices on operating profit for the year

EURm	2019	2018
Papers in UPM Communication Papers	441	458
Fine and specialty papers in UPM Specialty Papers	119	120
Label materials in UPM Raflatac	155	149
Plywood	41	45
Sawn timber	36	33
Chemical pulp (net effect)	63	57

The biggest factor affecting UPM's financial results is the sales price of paper. A change in the volume delivered has less than half of the effect of the same percentage change in sale prices.

§ *Accounting policies*

Sales of goods
UPM's performance obligation in the contracts with customers consists of providing the goods specified in the contracts. Revenue from UPM's product sales is recognised when performance obligation is satisfied, which takes place at point in time when control of the good has been transferred to the customer. In UPM's customer contracts the transfer of control and thus timing of revenue recognition is largely dependent on delivery terms. Group terms of delivery are based on Incoterms 2010, the official rules for interpretation of trade terms issued by the International Chamber of Commerce. Major part of the sales contracts is on delivery terms basis, whereby delivery is not a promised service to the customer, as the control of a good does not transfer to the customer before shipment. Revenue and the corresponding receivable are recorded at the point in time when the product is delivered to the destination point for terms designated Delivered Duty Paid ("DDP") or Delivered at Place ("DAP"). For sales transactions designated free of carriage (FCA), revenue is recorded at the time of shipment. For sales transactions designated as Carriage paid to (CPT) or Carriage and Insurance Paid to (CIP), the portion of revenue relating to goods is recorded at the time of loading and the portion of revenue relating to delivery services over time when the service has been performed.

UPM sells energy to NordPool electricity market. Revenue is recognised when electricity is transmissed over time.

Sales of services
UPM provides forest expertise and contracting services to woodland and forestry owners and freight services (free space on group's vessels sold as freight services). Revenues from services are recorded over time when the service has been performed. Sales of services is very limited and thus the group does not report it separately.

Revenue recognition
The group recognises revenue as an amount equal to the price specified in the customer contract net of any sales taxes, cash flow hedging results of sales in foreign currency, hedges of energy sales and variable consideration, when applicable. Variable consideration is defined as any variability that may occur between the sales price and the amount UPM expects to receive. The variable consideration includes mainly cash discounts and volume rebates that encourage the customer to take specific volumes in a given timescale. In addition, the group gives the customers the right for purchase price refund in case the products do not meet the quality as specified in the agreement. The amount of variable consideration is recognised as a refund liability when some of the amount received is expected to be refunded to the customer. Customer rebates payable to customers in relation to sales made until the end of the reporting period and expected quality claims are estimated using the expected value method, and revenue is only recognised to the extent that it is highly probable that a significant reversal will not occur. A refund liability is included in trade and other payables.

Receivables are recognised when the goods are delivered, and the consideration is unconditional except for the passage of time. For most of UPM's customer contracts the period between the transfer of goods or services to customers and the receipt of payment is less than 12 months. For these contracts the group has elected to use the practical expedient not to adjust revenue for the effect of financing components.

Advance payments received from customers are recognised as contract liability. UPM does not have any contract assets arising from contracts with customers.

» Refer Note 4.6 Working capital for information on contract liabilities and refund liabilities.

2.3 Operating expenses and other operating income

Operating expenses
Operating expenses excluding forest assets fair value change, wood harvested and share of results of associates and joint ventures are presented below.

EURm	2019	2018
Costs and expenses		
Raw materials, consumables and goods	5,515	5,682
Employee costs [1]	1,214	1,194
Other operating costs and expenses [2]	918	899
Delivery costs and other external charges	884	891
Total	8,531	8,665

1) *» Refer Note 3 Employee rewards, for further information.*

2) Distribution of other operating costs and expense

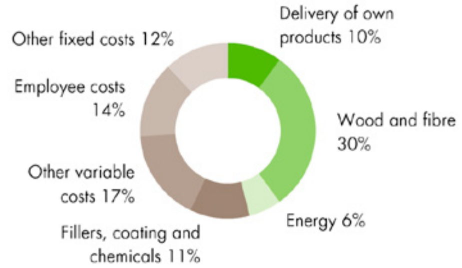
EURm	2019	2018
Rents and lease expenses [1]	16	44
Emission expenses [2]	8	-7
Losses on sale of non-current assets	3	2
Credit losses	12	9
Maintenance and other operating expenses [3]	879	850
Total	918	899

1) Rents and lease expenses have decreased in 2019 due to adoption of IFRS 16 Leases standard. *» Refer Note 5.2. Net Debt, for further information*

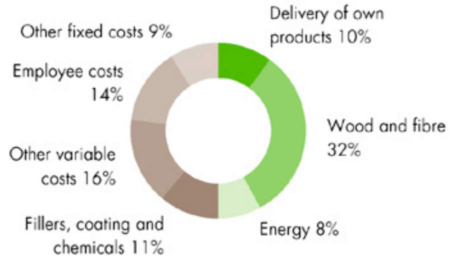
2) Emission expenses include gains on sales of emission rights EUR 14 (22) million.

3) Other operating expenses include, among others, energy as well as expenses related to services and group's administration.

Cost structure 2019
EUR 8,531 million



Cost structure 2018
EUR 8,665 million



Auditor's fees

EURm	2019	2018
Audit fee	3.1	2.4
Audit related services	0.2	—
Tax services	0.5	0.3
Other services	0.2	0.5
Total	4.0	3.2

In 2019, auditor's fees include EUR 0.1 (0.0) million related to audit services, EUR 0.2 (0.3) million related tax services and EUR 0.2 (0.5) million related to other services paid to PwC Oy.

Research and development costs
The research and development costs included in operating expenses were EUR 53 million (52 million) in 2019. The focus was on new technologies and developing businesses.

Government grants
In 2019, government grants recognised as deduction of operating expenses totalled to EUR 4 million (5 million) of which EUR 2 million (4 million) relates to Finland. In addition, the group received emission rights from governments amounting to EUR 62 million (34 million) of which EUR 33 million (20 million) relates to Finland, EUR 19 million (10 million) to Germany, EUR 3 million (1 million) to Austria and EUR 0 million (1 million) to UK.

Other operating income

EURm	2019	2018
Gains on sale of non-current assets	4	49
Rental income	13	14
Emission rights received	62	34
Derivatives, non-qualifying hedges	1	-11
Exchange rate gains and losses	3	-10
Other	13	12
Total	97	87

In 2018, gains on sale relating to sale of non-current assets includes EUR 30 million income relating to sale of hydropower facilities in Germany and EUR 17 million income relating to sale of land areas in Finland.

Emission rights
The group has recognised EUR 62 million (34 million) of income in Other operating income and EUR 8 million of expense (7 million income) under Other operating costs and expenses relating to CO_2 emissions. The liability to cover the obligation to return emission rights amounted to EUR 18 million (14 million) and is recognised in provisions. The emission rights recognised in intangible assets are specified below:

EURm	2019	2018
Carrying value, at 1 January	45	44
Emission rights received and purchased	67	33
Deliveries and disposals	-33	-31
Impairment	—	—
Carrying value, at 31 December	80	45
Accumulated costs	81	47
Accumulated impairments	-1	-1
Carrying value, at 31 December	80	45

§ *Accounting policies*

Research and development costs
Research and development costs are expensed as incurred, except for certain development costs, which are capitalised as they generate future economic benefits, and UPM can the measure the cost reliably. Capitalised development costs are amortised on a systematic basis over their expected useful lives, usually not exceeding five years.

Government grants
Government grants are recognised at fair value where there is a reasonable assurance that the grant will be received and the group will comply with the attached conditions. Government grants relating to the purchase of property, plant and equipment are deducted from the acquisition cost of the asset and accordingly directly reduce the annual depreciation of the underlying asset. Other government grants are recognised in the income statement in the period necessary to match them with the costs they are intended to compensate.

Other operating income
Other operating income mainly includes gains on the disposal of non-current assets and rental income. Further, other operating income includes foreign exchange gains and losses in respect of UPM's normal business activities. Gains and losses on derivatives not qualifying hedge accounting are also recognised in other operating income.

Emission rights
The group participates in the European Emissions Trading Scheme aimed at reducing greenhouse gas emissions. Emission rights received from governments free of charge to emit a fixed tonnage of carbon dioxide in a fixed period of time give rise to an intangible asset for the emission rights, a government grant and a liability for the obligation to deliver emission rights equal to the emissions that have been made during the compliance period.

Emission rights are initially recognised as intangible assets based on market value at the date of initial recognition. Emission rights are not amortised. If the market price of emissions rights at the balance sheet date is less than the recognised costs, any surplus emission rights that are not required to cover actual and estimated emissions during the financial year, are impaired to the market price.

Government grants are recognised as deferred income in the balance sheet at the same time as emission rights and are recognised in other operating income in the income statement, systematically, over the compliance period to which the corresponding emission rights relate.

The liability to deliver emission rights is recognised based on actual emissions. The emissions realised are expensed under other operating costs and expenses in the income statement and presented as a provision in the balance sheet. The liability is settled using emission rights on hand, measured at the carrying amount of those emission rights. Emission rights and associated provisions are derecognised when disposed. Any profit or loss represents the costs of purchasing additional rights to cover excess emissions, the sale of unused rights in the case realised emission are under emission rights received free of charge or the impairment of unused emission rights.

2.4 Earnings per share and dividend

According to UPM dividend policy, the company aims to pay an attractive dividend amounting to 30–40% of the group annual operating cash flow per share.

The dividend paid in 2019 were EUR 693 million (EUR 1.30 per share) which is 52% of the operating cash flow per share and in 2018 EUR 613 million (EUR 1.15 per share). The Board of Directors proposes to the Annual General Meeting that a dividend of EUR 693 million, EUR 1.30 per share, will be paid in respect of 2019. The proposed dividend represents 38% of UPM's operating cash flow per share for the year 2019.

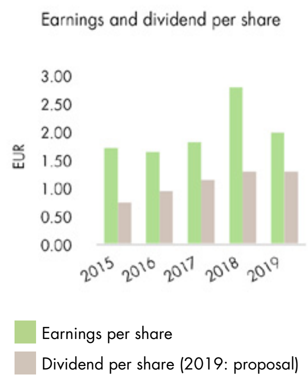
Earnings per share

EURm	2019	2018
Profit attributable to owners of the parent company, EURm	1,061	1,495
Weighted average no. of shares (1,000)	533,324	533,324
Basic earnings per share, EUR	1.99	2.80
Diluted earnings per share, EUR	1.99	2.80

§ *Accounting policies*

Earnings per share
Earnings per share (EPS) is the amount of profit for the period attributable to each ordinary share. The basic earnings per share are computed using the weighted average number of shares outstanding during the period. Diluted earnings per share are computed using the weighted average number of shares outstanding during the period plus the dilutive effect of share options. The group did not have share-option schemes at the end of 2019 and 2018.

Dividend
Dividend distribution to the owners of the parent company is recognised as a liability in the group's consolidated financial statements in the period in which the dividends are approved by the parent company's shareholders.



3. Employee rewards

3.1 Employee costs

EURm	2019	2018
Salaries and fees	964	936
Share-based payments	14	13
Pension and other post-employment benefits, defined benefit plans	25	29
Pension costs, defined contribution plans	105	105
Other indirect employee costs [1]	107	110
Total	1,214	1,194

[1] Other indirect employee expenses primarily include other statutory social expenses, excluding pension expenses.

3.2 Key management personnel

The Annual General Meeting 2019 resolved that the remuneration of the members of the Board of Directors remain unchanged. No changes have taken place in the directors' remuneration since 2017.

In 2019 and 2018, the Chair of the Board of Directors received an annual base fee of EUR 190,000, the Deputy Chair of the Board EUR 135,000 and other members of the Board EUR 110,000. The annual base fee was paid in company shares and cash so that approximately 40% of the fee was paid in the company shares to be purchased on the Board members' behalf, and the rest in cash. The company paid any costs and transfer tax related to the purchase of the company shares.

The Chair of Audit Committee received annual committee fee of EUR 35,000 and Chair of Remuneration Committee as well as Chair of Nomination and Governance Committee EUR 20,000. The members of Audit Committee received annual committee fee of EUR 15,000 and members of other committees EUR 10,000. The annual committee fees were paid in cash.

No annual fees were paid to the President and CEO for his role as a member of the Board.

In 2019, 2,911 (2,539) company shares were purchased to the Chair, 2,068 (1,804) to the Deputy Chair and 1,685 (1,470) to other members of the Board.

Shareholdings (no. of shares) and fees of the Board of Directors

	Shareholdings 31 December		Annual base fee (EUR 1,000)		Annual committee fee (EUR 1,000)	
	2019	2018	2019	2018	2019	2018
Board members						
Björn Wahlroos, Chair	265,194	262,283	190	190	20	20
Berndt Brunow, Deputy Chair	312,533	310,465	135	135	10	10
Henrik Ehrnrooth	9,506	7,821	110	110	10	10
Piia-Noora Kauppi	19,391	17,706	110	110	35	35
Marjan Oudeman	3,155	1,470	110	110	15	15
Jussi Pesonen, President and CEO	466,472	418,859	–	–	–	–
Ari Puheloinen	11,531	9,846	110	110	10	10
Veli-Matti Reinikkala	44,327	42,642	110	110	20	20
Suzanne Thoma	9,506	7,821	110	110	10	10
Kim Wahl	21,305	19,620	110	110	15	15
Total	1,162,920	1,098,533	1,095	1,095	145	145

Salaries and benefits of the President and CEO and the Group Executive Team

	President and CEO Jussi Pesonen		Other members of Group Executive Team [1]	
EUR 1,000	2019	2018	2019	2018
Salaries	1,096	1,094	4,242	3,971
Short-term incentives	1,426	1,416	1,779	2,387
Share rewards	3,025	2,966	9,421	9,014
Benefits	29	31	123	131
Total	5,576	5,507	15,565	15,502

[1] 11 members in 2019 and 2018.

In 2019, costs under the Finnish statutory pension scheme for the President and CEO amounted to EUR 465,000 (471,000) and payments under the voluntary pension plan amounted to EUR 1,459,000 (923,000).

In 2019, costs under the Finnish and German statutory pension schemes for Group Executive Team (GET) members (excluding the President and CEO) amounted to EUR 924,000 (988,000) and payments under the voluntary pension plan amounted to EUR 947,000 (880,000).

The remuneration of the President and CEO and other members of the Group Executive Team consists of the base salary and benefits, short-term incentives and long-term share-based incentives.

In 2019 and 2018, the short-term incentive plan for the President and CEO and other members of the Group Executive Team was linked to the achievement of the predetermined financial targets of the group or business area as well as individual targets. The maximum incentives amount to a total of 100% of the annual base salary to the Business Area Executives and to a total of 70% of annual base salary to the other members of the Group Executive Team. For the President and CEO, the maximum annual incentive amounts to 150% of the annual base salary.

The expenses recognised in income statement in respect of share-based payments for the Group Executive Team were EUR 3.4 million (3.0 million).

According to the service agreement, the President and CEO was entitled to retire in November 2020 at the age of 60. At the request of the company's Board of Directors, the President and CEO will continue as the President and CEO until further notice. The President and CEO has a voluntary pension benefit in addition to the Finnish statutory pension scheme. The President and CEO's voluntary pension benefit is arranged through a defined benefit plan. Under the defined benefit plan, the target pension is 60% of the average indexed earnings from the last ten full calendar years of employment calculated according to the Finnish statutory pension scheme. The expenses of the President and CEO's defined benefit pension plan in 2019 were EUR 1.0 million (0.9 million). The plan assets amounted to EUR 14.9 million (11.5 million) and the obligation amounted to EUR 15.0 million (11.7 million).

The retirement age of other members of the Group Executive Team is 63. Other Group Executive Team members are under defined contribution plans.

Should the company or the President and CEO give notice of termination of the service agreement, no severance pay will be paid in addition to the salary for the 12-month notice period. For GET members, the period for severance pay is 12 months, in addition to the six months' salary for the notice period, unless notice is given for reasons that are solely attributable to the executive. Should a GET member give notice of termination to the company, no severance pay will be paid in addition to the salary for the notice period.

If there is a change of control in the company, the President and CEO may terminate his service agreement within three months and each GET member within one month from closing the takeover and shall receive compensation equivalent to 24 months' base salary.

3.3 Share-based payments

UPM offers rewards and recognition with an emphasis on high performance. All UPM's employees belong to a unified annual Short Term Incentive (STI) scheme. In addition, UPM has two long-term incentive schemes: the Performance Share Plan (PSP) for senior executives and the Deferred Bonus Plan (DBP) for other key employees.

Performance Share Plan

The Performance Share Plan (PSP) is targeted at the President and CEO and other Group Executive Team (GET) members as well as other selected members of the management. Under the ongoing plans UPM shares are awarded based on total shareholder return during a three-year earning period. The earned shares are delivered after the earning period has ended. Total shareholder return takes into account share price appreciation and paid dividends.

PERFORMANCE SHARE PLANS	PSP 2016–2018	PSP 2017–2019	PSP 2018–2020	PSP 2019–2021
No. of participants at 31 December 2019	22	21	27	30
Actual achievement	100%	100%	—	—
Max no. of shares to be delivered [1]				
to the President and CEO	112,500	92,500	84,100	94,072
to other members of GET	319,500	275,500	264,400	313,600
to other selected members of management	240,500	169,000	181,000	236,850
Total max no. of shares to be delivered	672,500	537,000	529,500	644,522
Share delivery (year)	2019	2020	2021	2022
Earning criteria (weighting)	Total shareholder return (100%)	Total shareholder return (100%)	Total shareholder return (100%)	Total shareholder return (100%)

[1] For PSP 2016–2018 and PSP 2017–2019, the gross number of shares actually earned.

Deferred Bonus Plan

The Deferred Bonus Plan (DBP) is targeted at other selected key employees and it consists of annually commencing plans. Each plan consists of a one-year earning period and a two-year restriction period. UPM shares are awarded based on achievement of group or group and business area EBITDA targets. Prior to share delivery, the share rewards earned are adjusted with dividends and other capital distributions, if any, paid to all shareholders during the restriction period.

DEFERRED BONUS PLANS	DBP 2016	DBP 2017	DBP 2018	DBP 2019
No. of participants (at grant)	340	360	370	390
No. of participants (at 31 December 2019)	303	304	330	367
Max no. of shares to be delivered (at grant)	770,000	525,000	450,000	460,000
Estimated no. of shares to be delivered at 31 December 2019 [1]	350,261	291,340	294,665	165,711
Share delivery (year)	2019	2020	2021	2022
Earning criteria	Group/Business Area EBITDA	Group/Business Area EBITDA	Group/Business Area EBITDA	Group/Business Area EBITDA

[1] For DBP 2016 and DBP 2017, the gross number of shares actually earned

The indicated actuals and estimates of the share rewards under the Performance Share Plan and the Deferred Bonus Plan represent the gross amount of the rewards of which the applicable taxes will be deducted before the shares are delivered to the participants.

§ *Accounting policies*

The group's long-term share incentive plans are recognised as equity-settled or cash-settled share-based payment transactions depending on the settlement. The group classifies the transactions with net settlement features for tax obligations as equity-settled in its entirety. Shares are valued using the market rate on the grant date. The settlement is a combination of shares and cash. The group may obtain the necessary shares by using its treasury shares or may purchase shares from the market. PSP and DBP share deliveries are executed by using already existing shares and the plans, therefore, have no dilutive effect.

3.4 Retirement benefit obligations

The group operates various pension schemes in accordance with local conditions and practices in the countries of operations. Retirement benefits are employee benefits that are payable usually after the termination of employment, such as pensions and post-employment medical care.

The pension plans are generally funded through payments to insurance companies or to trustee-administered funds or foundations and classified as defined contribution plans or defined benefit plans.

Defined benefit assets and liabilities recognised in the balance sheet are presented below:

	2019					2018				
EURm	FINLAND	UK	GERMANY	OTHER COUNTRIES	TOTAL	FINLAND	UK	GERMANY	OTHER COUNTRIES	TOTAL
Present value of funded obligations	542	509	39	19	1,108	481	451	33	17	982
Fair value of plan assets	-579	-491	-3	-20	-1,092	-518	-417	-3	-18	-956
Deficit (+)/surplus (-)	-37	17	37	-1	16	-38	34	31	-1	26
Present value of unfunded obligations	—	—	596	79	675	—	—	512	75	587
Net defined benefit liability (+)/asset (-)	-37	17	633	78	691	-38	34	542	74	612
Net retirement benefit asset in the balance sheet	-38	—	—	—	-38	-38	—	—	—	-38
Net retirement benefit liability in the balance sheet [1]	2	17	633	78	729	—	34	542	74	650

[1] Net retirement benefit liability in the balance sheet includes other long-term employee benefits of EUR 30 million (29 million) in 2019.

About 95% of the group's defined benefit arrangements exist in Finland, in the UK and in Germany. The group has defined benefit obligations also in Austria, Holland, France, Canada and in the US. Approximately a quarter of UPM's employees are active members of defined benefit arrangement plans.

Finland

In Finland employers are obliged to insure their employees for statutory benefits, as determined in Employee's Pension Act (TyEL). TyEL provides the employee with insurance protection for old age, disability and death. The benefits can be insured with an insurance company or the employer can establish a fund or a foundation to manage the statutory benefits.

Approximately 82% (82%) of group´s Finnish employees are insured with an insurance company and these arrangements qualify as defined contribution plans. Approximately 18% (18%) of employees are insured with TyEL foundation (UPM Sellutehtaiden eläkesäätiö). The TyEL foundation is administered by the representatives of both the employer and the employees. The foundation has named an authorised representative to take care of its regular operations. The plan is supervised by Financial Supervisory Authority. The foundation is classified as a defined benefit plan for the benefits that must be funded nationally and is the most significant defined benefit pension plan in Finland for UPM.

UK

In the UK, the group operates a legacy defined benefit scheme providing benefits that are linked to the salary level near retirement age or an earlier date of leaving service. The scheme is closed both for new members and future accrual for old members. Part of the scheme is a defined contribution plan and is open to all current employees. The UK pension scheme operates under a single trust which is independent from the group.

Germany

In Germany employees within defined benefit arrangements are entitled to annual pensions on retirement based on their service and final salary. All significant defined benefit plans are closed for new employees.

Present value of obligation and fair value of plan assets

	Pension and other post-employment benefits 2019			Pension and other post-employment benefits 2018		
EURm	PRESENT VALUE OF OBLIGATION	FAIR VALUE OF PLAN ASSETS	NET DEFINED BENEFIT LIABILITY/ (ASSET)	PRESENT VALUE OF OBLIGATION	FAIR VALUE OF PLAN ASSETS	NET DEFINED BENEFIT LIABILITY/ (ASSET)
Carrying value, at 1 January	1,569	-956	612	1,651	-1,028	623
Current service cost	13	–	13	14	–	14
Past service cost	–	–	–	4	–	4
Interest expense (+) income (–)	34	-22	12	31	-20	11
Total included in employee costs (Note 3.1)	47	-22	25	49	-20	29
Actuarial gains and losses arising from changes in demographic assumptions	–	–	–	-5	–	-5
Actuarial gains and losses arising from changes in financial assumptions	228	–	228	-90	–	-90
Actuarial gains and losses arising from experience adjustments	-16	–	-16	35	–	35
Return on plan assets, excluding amounts included in interest expense (+) income (–)	–	-130	-130	–	60	60
Total remeasurement gains (–) and losses (+) included in other comprehensive income	211	-130	81	-59	60	1
Benefits paid	-67	67	–	-68	68	–
Contributions by the employer	–	-30	-30	–	-40	-40
Translation differences	24	-21	3	-4	4	-1
Carrying value, at 31 December	1,784	-1,092	691	1,569	-956	612

Actuarial risks

Defined benefit plans typically expose the group to the following actuarial risks:

Investment risk (asset volatility)

The group is exposed to changes of assets' values especially in the investments of the foundations and schemes in Finland and in the UK. The asset values of these arrangements constitute 98% of total asset values in defined benefit plans within group.

Interest risk

Discount rates used in calculations are based on high-quality corporate bond yield curves in currency in which the benefits are paid. A decrease in the discount rate would increase the plan liabilities. The maturities of yields are reflecting the durations of the underlying obligations. The weighted average duration of group's defined benefit obligation is 18 years (16 years) at the end of 2019.

Inflation risk

In the Finnish plan, the inflation risk is not significant as changes in the inflation assumption are mainly covered by the TyEL pooling system. In the UK, the pensions in payment are tied to Retail Price Index whilst being tied to Consumer Price Index during deferment. An increase of 0.5% in indexes will increase the liabilities by some EUR 39 million. In Germany the pensions have to be adjusted in accordance with the Consumer Price Index.

Salary risk

The present value of the net retirement benefit assets and liabilities is calculated by reference to the expected future salaries of plan participants. An increase in the salary of the plan participants would increase the plan liabilities. In Finland, the salary risk is minor as well as in the UK, where the changes in salary levels have no impact on the funding position as all defined benefit arrangements in the UK are closed to future accrual. In Germany, an increase of 0.5% in expected future salaries would increase the obligation by EUR 23 million.

Life expectancy

Adjustments in mortality assumption have an impact on group's defined benefit obligation. An increase in life expectancy by one year will increase the obligation in Finland by EUR 22 million, in the UK by EUR 23 million and in Germany by EUR 31 million.

Key estimates and judgements

Several actuarial assumptions are used in calculating the expense and liability related to the defined benefit plans. Statistical information used may differ materially from actual results due to, among others, changing market and economic conditions, or changes in service period of plan participants. Significant differences in actual experience or significant changes in assumptions may affect the future amounts of the defined benefit obligation and future expense.

Actuarial assumptions

The weighted average principal assumptions used in the valuations of the defined benefit obligations are detailed below:

	FINLAND		UK		GERMANY		OTHER COUNTRIES	
	2019	2018	2019	2018	2019	2018	2019	2018
Discount rate %	0.74	1.79	2.05	3.00	0.93	1.88	1.23	2.07
Inflation rate %	1.31	1.69	3.00	3.40	1.70	1.70	1.70	1.86
Rate of salary increase %	1.31	1.69	n/a	n/a	2.50	2.50	2.44	2.53
Rate of pension increase %	0.53	0.65	2.95	3.25	1.70	1.70	0.95	0.95
Expected average remaining working years of participants	13.2	13.9	17.4	16.5	8.9	9.3	10.5	9.4

EURm	0.5% INCREASE		0.5% DECREASE	
	2019	2018	2019	2018
Discount rate %	-148	-121	167	137
Rate of salary increase %	26	20	-19	-16
Rate of pension increase %	93	67	-84	-64
Life expectancy +1 year	78	57	n/a	n/a

A negative change indicates a decrease in the defined benefit obligation.
A positive change indicates an increase in the defined benefit obligation.

Sensitivity analysis of defined benefit obligations

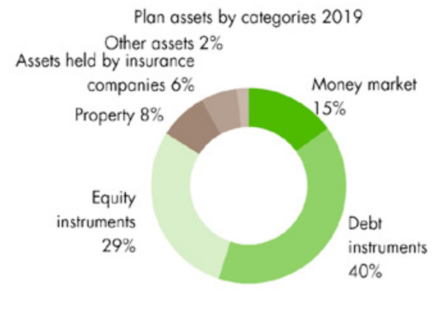
The sensitivity analysis shows the effect of the change in assumption. The analysis assume that all other assumptions remain unchanged. The projected unit credit method has been applied when calculating the obligation as well as these sensitivities.

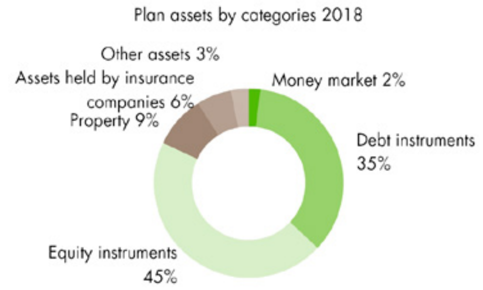
Plan assets by categories at 31 December

EURm	2019		2018	
	Quoted	Unquoted	Quoted	Unquoted
Money market	33	126	18	–
Debt instruments	353	83	307	27
Equity instruments	266	51	439	–
Property	23	68	39	46
Assets held by insurance companies	–	62	–	54
Other assets	–	27	–	26
Total	675	417	802	154

In 2019 plan assets include the company's ordinary shares with a fair value of EUR 2 million (1 million).

In 2020 contributions of EUR 38 million are expected to be paid to group's defined benefit plans. In 2019 contributions of EUR 30 million were paid to group's defined benefit plans.





Accounting policies

Defined benefit pension plans
Plan benefits depend on salary and length of service. The defined benefit obligations are calculated annually by independent actuaries using the projected unit credit method. The present value of the defined benefit obligation is determined by discounting the estimated future cash outflows using interest rates of high-quality corporate bonds that are denominated in the currency in which the benefits will be paid and that have terms to maturity approximating the term of the related pension liability. The liability recognised in the balance sheet in respect of defined benefit pension plans is the present value of the defined benefit obligation at the balance sheet date less the fair value of plan assets. The cost of providing pensions is charged to the income statement as employee costs so as to spread the cost over the service lives of employees. Changes in actuarial assumptions and actuarial gains and losses arising from experience adjustments are charged or credited in other comprehensive income in the period in which they arise. Past service costs and gains or losses on settlement are recognised immediately in income when they occur.

Defined contribution plans
For defined contribution plans, contributions are paid to pension insurance companies. Once the contributions have been paid, there are no further payment obligations. Contributions to defined contribution plans are charged to the income statement in the period to which the contributions relate.

Other post-employment obligations
Some group companies provide post-employment medical and other benefits to their retirees. The entitlement to healthcare benefits is usually conditional on the employee remaining in service up to retirement age and the completion of a minimum service period. The expected costs of these benefits are accrued over the period of employment, using an accounting methodology similar to that for defined benefit pension plans. Valuations of these obligations are carried out by independent qualified actuaries.

4. Capital employed

UPM's capital employed primarily relates to its production facilities and both forest and energy assets. UPM aims to capture growth opportunities in its existing business portfolio and invest in projects with attractive and sustainable returns.

Capital employed

	2019	2018
Property, plant and equipment	4,083	4,186
Leased assets	590	—
Forest assets	2,097	1,945
Energy shareholdings	2,145	2,159
Goodwill and other intangible assets	564	531
Operating working capital	1,451	1,800
Provisions	-144	-126
Net retirement benefit assets and liabilities	-721	-640
Cash and cash equivalents	1,536	888
Other assets and liabilities	7	-29
Net deferred tax assets and liabilities	-153	-138
Assets classified as held for sale	18	—
Total	11,474	10,575

4.1 Property, plant and equipment

EURm	LAND AND WATER AREAS	BUILDINGS	MACHINERY AND EQUIPMENT	OTHER TANGIBLE ASSETS	CONSTRUC-TION IN PROGRESS	TOTAL
2019						
Accumulated costs	796	3,522	13,579	870	235	19,002
Accumulated depreciation and impairments	-35	-2,574	-11,574	-737	—	-14,919
Carrying value, at 31 December	761	948	2,006	134	235	4,083
Reclassifications to leased assets (IFRS 16) 1 Jan 2019	—	-1	-70	—	—	-71
Carrying value, at 1 January	740	992	2,096	127	159	4,115
Additions	14	7	10	3	316	351
Disposals	—	-5	-1	—	—	-6
Depreciation	—	-72	-303	-17	—	-392
Impairment	—	-1	-12	—	—	-13
Reclassifications	—	22	205	20	-246	—
Reclassifications to assets held for sale	-3	-2	-6	—	—	-11
Translation differences	10	8	15	1	6	40
Carrying value, at 31 December	761	948	2,006	134	235	4,083
2018						
Accumulated costs	775	3,599	14,227	878	159	19,638
Accumulated depreciation and impairments	-35	-2,606	-12,060	-751	—	-15,452
Carrying value, at 31 December	740	992	2,167	127	159	4,186
Carrying value, at 1 January	724	1,044	2,295	130	88	4,281
Additions	7	—	10	-1	270	286
Disposals	-13	—	-1	—	—	-15
Depreciation	—	-74	-317	-17	—	-408
Reclassifications	1	15	168	14	-198	—
Translation differences	22	7	12	1	-1	41
Carrying value, at 31 December	740	992	2,167	127	159	4,186

Capital expenditure
Capital expenditure, excluding acquisitions and shares, amounted to EUR 378 million (303 million) in 2019.

In January 2019 UPM announced that it would invest in the refurbishment of the Kuusankoski hydropower plant in Finland. The average annual production of the Kuusankoski plant is expected to increase from the current 180 GWh to 195 GWh. The investment will be completed by the end of 2022.

In July 2019 UPM announced that it would invest USD 2.7 billion in a 2.1 million tonne greenfield eucalyptus pulp mill near Paso de los Toros in central Uruguay. Additionally, UPM will invest approximately USD 280 million in port operations in Montevideo and USD 70 million in local investments outside the mill fence, including a new residential area in Paso de los Toros. The mill is scheduled to start up in the second half of 2022.

In October 2019 UPM announced that it would invest EUR 95 million in a Combined-Heat-Power (CHP) plant at the UPM Nordland paper mill in Germany. The plant is planned to go on grid in Q3 2022. The annual cost savings of more than EUR 10 million will start as of 2023. The investment is estimated to decrease UPM's CO_2-footprint by 300,000 tonnes.

In April 2018 UPM announced that it would rebuild Paper Machine 2 at its Nordland mill in Dörpen, Germany, and convert it from fine paper to glassine paper production. The machine will be equipped with new finishing equipment and will start producing glassine paper in Q1 2020. The planned capacity after the rebuild is 110,000 tonnes per year. The total investment in Nordland is EUR 124 million.

In April 2018 UPM announced plans to increase release liner base paper capacity at the UPM Changshu mill in China. Installing a second supercalender on paper machine 3 will create an additional capacity of more than 40,000 tonnes of glassine paper per year. The investment was completed in Q4 2019. The total investment in Changshu is EUR 34 million.

In October 2017 UPM announced plans to expand its Chudovo plywood mill in Russia. The project has raised the mill's production capacity by 45,000 cubic metres to 155,000 cubic metres, while also broadening the mill's product portfolio. In addition to the growth in production capacity, a new bio-heat boiler has been built at the mill site. The total investment is EUR 50 million and was completed at the end of Q3 2019.

Capitalised borrowing costs
In 2019, the borrowing costs capitalised as part of non-current assets amounted to EUR 4 million (2 million). Amortisation of capitalised borrowing costs was EUR 3 million (3 million) and the average interest rate used 7.19% (7.92%), which represents the average costs to finance the projects. In 2019, capitalised borrowing costs were mainly related to the expansion of Chudovo plywood mill.

Major capital commitments at 31 December

EURm	2019	2018
CHP power plant / Germany	95	—
New pulp mill / Uruguay	2,684	—
Renovation and modernisation / Kuusankoski hydro power plant	19	—
Paper machine conversion / Nordland paper mill	15	81
Capacity increase / Changshu paper mill	4	25
Capacity increase / Chudovo plywood mill	1	8

Impairment losses
In June 2019, UPM announced the decision to permanently close paper machine 10 at UPM Plattling, Germany, reducing the annual capacity of coated mechanical paper in Europe by approximately 155,000 tonnes. With the closure of the paper machine, UPM recognised impairment charges of EUR 1 million in Communication Business area.

In September 2019, UPM announced that it plans to permanently close SC paper machine 2 in Rauma, Finland, reducing the annual capacity of SC paper by 265,000 tonnes. EUR 12 million impairment charges were recognised related to the closure of paper machine at UPM Rauma mill in Communication Papers business area.

In 2018, no impairment charges were recognised.

Accounting policies

Property, plant and equipment
Property, plant and equipment is stated at historical cost. Costs of assets of acquired in business combinations are determined at fair value at the acquisition date. Depreciation is calculated on a straightline basis and the carrying value is adjusted for impairment charges, if any. The carrying value of property, plant and equipment on the balance sheet represents the cost less accumulated depreciation and any impairment charges.

Borrowing costs incurred for the construction of any qualifying assets are capitalised during the period of time required to complete and prepare the asset for its intended use. Other borrowing costs are expensed.

Major renovations are capitalised and depreciated over the useful lives of the related asset. Ordinary expenses for repairs and maintenance are expensed as incurred.

Gains and losses on disposals are determined by comparing the disposal proceeds with the carrying amount and are included in other operating income and other operating expenses, respectively.

ASSESSED USEFUL LIVES	NUMBER OF YEARS
Land, not subject to depreciation	-
Buildings	20–50
Power plants	20–30
Heavy machinery	15–20
Light machinery	10–15
Equipment	5

Impairment testing
Carrying values of individual items included in property, plant and equipment are reviewed at each closing date to determine whether there is any indication of impairment. The carrying value is written down immediately to the asset's recoverable amount if the carrying value exceeds the estimated recoverable amount. Assets that have an indefinite useful life are not subject to amortisation and are tested annually for impairment. The recoverable amount is determined as the higher of an asset's fair value less costs to sell and its value in use. Value in use is determined by discounting future cash flows expected to be generated by the asset. For the purposes of assessing impairment, assets are grouped at the lowest levels for which there are separately identifiable cash flows (cash-generating units).

Non-financial assets, other than goodwill, that have suffered impairment are reviewed for possible reversal of the impairment at each reporting date. Where an impairment loss is subsequently reversed, the carrying amount of the asset is increased to the revised estimate of its recoverable amount, but the increased carrying amount will not exceed the carrying amount that would have been determined had no impairment loss been recognised for the asset in prior years.

Key estimates and judgements

The estimations of useful lives, residual value as well as depreciation and amortisation methods require significant management judgement and are reviewed annually. Management makes estimates on the future cash flows expected to result from the use of the asset and its eventual disposal. While management believes that estimates of future cash flows are reasonable, different assumptions regarding such cash flows could materially affect valuations.

The long useful lives of assets, changes in estimated future sales prices of products, changes in product costs and changes in the discount rates used could lead to significant impairment charges.

Estimates are also made in an acquisition when determining the fair values and remaining useful lives of acquired intangible and tangible assets.

4.2 Forest assets

UPM is both a major forest owner and a purchaser of wood. The value of forest assets, i.e. standing trees, amounted to EUR 2,097 million (1,945 million) at the end of 2019. UPM's own and leased forest land areas are summarised in below table.

1,000 ha	FOREST LAND	PRODUCTIVE FOREST LAND	FORESTED LAND
Finland	510	430	426
Uruguay	263	158	150
Uruguay, leased land	142	112	105
United States	76	56	56
Total	991	756	737

At the end of 2019, carrying value of own forest land amounted to EUR 591 million (EUR 569 million) and leased forest land EUR 176 million (EUR 0 million). The change in lease accounting in 2019 has resulted in recognition of leased forest land in the balance sheet. Own land is stated at cost whereas leased land is valued at cost less accumulated depreciation.

Forest assets

EURm	2019	2018
Carrying value, at 1 January	1,945	1,600
Additions	119	51
Disposals	-1	-59
Wood harvested	-101	-101
Net change in fair value	125	433
Translation differences	10	21
Carrying value, at 31 December	2,097	1,945

Change in fair value, change due to harvesting and gains or losses on sale of forest assets are recognised in the income statement as a net amount amounting to EUR 26 million (407 million) in 2019. In 2018, the fair value of forest assets in Finland was increased by EUR 345 million mainly due to higher forest growth estimates. In addition, the company adjusted its long-term wood price estimates slightly.

Accounting policies

The group divides all its forest assets for accounting purposes into growing forests, which are recognised as forest assets at fair value less costs to sell, and land. Own land is stated at cost whereas leased land is valued at cost less accumulated depreciation.

Any changes in the fair value of the growing forests are recognised in the operating profit in the income statement. The fair value is calculated on the basis of discounted future expected cash flows as there is a lack of a liquid market. The fair value of forest assets is a level 3 measure in terms of the fair value measurement hierarchy.

On 1 January 2019, UPM has changed its accounting policy relating to forest assets by capitalising forestry renewal costs on the balance sheet during the growth cycle and reclassifying forest assets-related cash flows from operating cash flow to investing cash flow. Before the change UPM has recognised forestry renewal costs in income statement and reported forest assets-related cash flows, including forest renewal costs, forest asset purchases and sales, in operating cash flow.

» Refer Note 1.5 Changes in accounting policies, for further information.

Key estimates and judgements

Fair valuation
The valuation process of forest assets is complex and requires management estimates and judgement on assumptions that have a significant impact on the valuation of the group's forest assets.

Main factors used in the fair valuation of forest assets are estimates for growth and wood harvested, stumpage prices and discount rates. Stumpage price forecasts are based on the current prices adjusted by the management's estimates for the full remaining productive lives of the trees, up to 100 years for forests in Finland and in the US and up to 10 years for plantations in Uruguay. The cash flows are adjusted by selling costs and costs related to future risks. Felling revenues and maintenance costs are estimated on the basis of actual costs and prices, taking into account the group's projection of future price and costs development. In addition, calculations take into account future forest growth and environmental restrictions.

The pre-tax discount rate used to determine the fair value of the Finnish forests in 2019 was 7.0% (7.0%) and for Uruguayan plantations 9.9% (9.9%). A decrease (increase) of one percentage point in discount rate would increase (decrease) the fair value of forest assets by approximately EUR 260 million (260 million).

4.3 Energy shareholdings

UPM is both a significant purchaser and producer of energy. The majority of electrical and thermal energy is consumed at the group's pulp and paper production. The production is mainly carried out by energy companies in which UPM has energy shareholdings. Energy shareholdings are unlisted equity investments. UPM does not have control or joint control of or significant influence in the said energy companies.

The value of energy shareholdings amounted to EUR 2,145 million (2,159 million) at the end of 2019. These energy companies supply energy or both energy and heat to their shareholders on a cost-price principle (Mankala-principle) which is widely applied in the Finnish energy industry. Under the Mankala-principle energy and/or heat is supplied to the shareholders in proportion to their ownership and each shareholder is, pursuant to the specific stipulations of the respective articles of association, severally responsible for its respective share of the production costs of the energy company concerned.

	Number of shares	Group holding %	Carrying value, EURm	
			2019	2018
Pohjolan Voima Oyj, A series	8,176,191	61.24	360	340
Pohjolan Voima Oyj, B series	4,140,132	58.11	1,191	1,185
Pohjolan Voima Oyj, B2 series	2,869,819	51.22	188	226
Kemijoki Oy	179,189	7.33	290	290
Länsi-Suomen Voima Oy	10,220	51.10	111	110
Other	–	–	7	7
Carrying value, at 31 December			2,145	2,159

PVO's share capital is divided into different series of shares. The B and B2 series relate to PVO's shareholdings in Teollisuuden Voima Oyj (TVO). UPM has no direct shareholdings in TVO. TVO operates two nuclear power plants (Olkiluoto 1 and Olkiluoto 2) and is constructing one new nuclear power plant in Olkiluoto (Olkiluoto 3), Finland. The operation of a nuclear power plant is governed by international, European Union and local nuclear regulatory regimes. Pursuant to the Finnish Nuclear Liability Act, the operator of a nuclear facility has a strict third-party liability in relation to nuclear accidents. Shareholders of power companies that own and operate nuclear power plants are not subject to the liability under the Nuclear Liability Act. In Finland, the future costs of conditioning, storage and final disposal of spent fuel, management of low and intermediate level radioactive waste as well as nuclear power plant decommissioning are provided for by a state established fund (the Finnish State Nuclear Waste Management Fund). The contributions to the Fund are intended to be sufficient to cover estimated future costs. These contributions have been taken into consideration in the fair value of the related energy shareholdings.

Energy shareholdings

EURm	2019	2018
Carrying value, at 1 January	2,159	1,974
Disposals	-1	-1
Changes in fair value recognised in other comprehensive income	-13	185
Carrying value, at 31 December	2,145	2,159

Accounting policies

The group has made an irrevocable election to designate its energy shareholdings as equity instruments where changes in fair value are recognised through OCI. The shareholdings are not held for trading as the group has an intention to hold the investments for the long term. Purchases of energy shareholdings are initially and subsequently measured at fair value through other comprehensive income, net of tax if applicable, with only dividend income recognised through profit and loss. Initial fair value is acquisition cost including transaction costs. Upon disposal of the investment, the accumulated fair value changes in equity are not recycled to the income statement but instead, are reclassified from the fair value reserve to retained earnings.

The fair value of energy shareholdings is a level 3 measure in the fair value measurement hierarchy.

Key estimates and judgements

Fair valuation and sensitivity

Valuation of energy shareholdings requires management's assumptions and estimates of a number of factors that may differ from the actual outcome which could lead to significant adjustment to the carrying amount of the asset. Fair value is determined on a discounted cash flow basis and the main factors impacting the future cash flows include future electricity prices, price trends and discount rates.

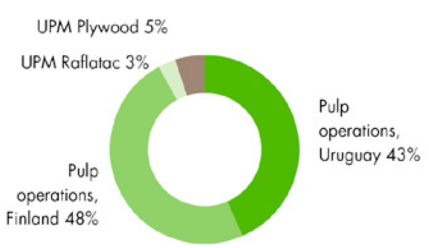
The electricity price estimate is based on a simulation of the Finnish area electricity price. A change of 5% in the electricity price used in the model would change the total value of the assets by EUR 350 million. The discount rate of 5.52% used in the valuation model is determined using the weighted average cost of capital method. A change of 0.5% in the discount rate would change the estimated fair value of the assets by approximately EUR 280 million.

Other uncertainties and risk factors in the value of the assets relate to start-up schedule of the fixed price turn-key Olkiluoto 3 EPR nuclear power plant project. UPM's indirect share of the capacity of Olkiluoto 3 EPR is approximately 31%, through its PVO B2 shares. Changes in regulatory environment or taxation could also have an impact on the value of the energy generating assets.

4.4 Goodwill and other intangible assets

The group's goodwill mainly relates to pulp operations in Finland and Uruguay belonging to UPM Biorefining business area.

Goodwill by business area 2019



Goodwill

EURm	2019	2018
Carrying value, at 1 January	236	231
Translation differences	2	5
Carrying value, at 31 December	238	236

Goodwill by business area

EURm	2019	2018
Pulp operations Uruguay	101	99
Pulp operations Finland	115	115
UPM Raflatac	7	7
UPM Plywood	13	13
Other operations	1	1
Total	238	236

Other intangible assets

EURm	INTANGIBLE RIGHTS	SOFTWARE AND OTHER INTANGIBLE ASSETS	TOTAL
2019			
Accumulated costs	485	637	1,122
Accumulated amortisation and impairments	-286	-590	-876
Carrying value, at 31 December	199	47	246
Reclassifications to leased assets (IFRS 16) 1 Jan 2019	-16	-1	-17
Carrying value, at 1 January	201	32	233
Additions	3	23	26
Amortisation	-5	-8	-13
Carrying value, at 31 December	199	47	246
Emission rights, carrying value [1]			80
Carrying value including emission rights, at 31 December			326
2018			
Accumulated costs	518	634	1,152
Accumulated amortisation and impairments	-301	-601	-902
Carrying value, at 31 December	217	33	250
Carrying value, at 1 January	217	33	250
Additions	4	10	15
Amortisation	-4	-11	-15
Carrying value, at 31 December	217	33	250
Emission rights, carrying value [1]			45
Carrying value including emission rights, at 31 December			295

[1] » Refer Note 2.3 Operating expenses and other operating income, for further information on emission rights.

Impairment testing

Impairment tests for goodwill and water rights with indefinite life were carried out in the fourth quarter 2019. The values of water rights were tested based on expected future cash flows of each separate hydro power plant. Water rights of hydropower plants belonging to UPM Energy and reported in intangible rights amounted EUR 189 million at the end of 2019 and 2018.

Goodwill impairment tests were carried out for pulp operations in Finland and Uruguay, belonging to UPM Biorefining business area, UPM Raflatac business area and UPM Plywood business area.

The 2019 impairment tests did not result in a recognition of any impairment.

The basis for valuation and key assumptions used in goodwill impairment testing are summarised in below table:

CASH GENERATING UNIT	BASIS OF VALUATION	PERIOD OF FORECAST	PRE-TAX DISCOUNT RATE	KEY ASSUMPTIONS
Pulp operations Finland	Value in use	10 years + terminal value	7.72 % (2018: 9.25 %)	Pulp price, wood costs
Pulp operations Uruguay	Value in use	10 years + terminal value	8.10 % (2018: 9.87 %)	Pulp price, wood costs
UPM Raflatac	Value in use	10 years + terminal value	6.78 % (2018: 7.83 %)	Product prices, cost development
UPM Plywood	Value in use	10 years + terminal value	10.14 % (2018: 10.93 %)	Product prices, cost development

Sensitivity analyses

The sensitivity analyses of goodwill impairment tests indicate that no reasonable change in key assumptions would result in recognition of impairment loss against goodwill. In pulp operations the recoverable amount is most sensitive to pulp sales prices and the cost of wood raw material.

As at 31 December 2019, for pulp operations Finland, a decrease of more than 16% in pulp prices would result in recognition of impairment loss against goodwill. For pulp operations Uruguay, a decrease of more than 11% in pulp prices would result in recognition of impairment loss against goodwill and a decrease of more than 13% in pulp prices would result in a write-down of the entire goodwill. The group believes that no reasonable change in wood cost would cause the aggregate carrying amount to exceed the recoverable amount.

Key estimates and judgements

The group's assessment of the carrying value of goodwill and indefinite life assets requires significant judgement.

While management believes that estimates of future cash flows are reasonable, different assumptions are subject to change as a result of changing economic and operational conditions. Actual cash flows could therefore vary from estimated discounted future cash flows and could result in changes in the recognition of impairment charges in future periods.

Future cash flows

The review of recoverable amount for goodwill and indefinite life assets is based on a calculation of value in use, using management projections of future cash flows. The most important assessments and assumptions needed in calculations are forecasts for future growth rates for the business in question, product prices, cost development and the discount rates applied. The group is using ten-year forecasts in calculations as the nature of the group's business is long-term, due to its capital intensity, and is exposed to cyclical changes. In estimates of product prices and cost development, forecasts prepared by management for the next three years and estimates made for the following seven years are taken into consideration. In addition, consideration is given to the investment decisions made by the group as well as the profitability programmes that the group has implemented and the views of knowledgeable industry experts on the long-term development of demand and prices. In the projection of cash flows UPM uses EBITDA adjusted with cash flows not captured within EBITDA, including working capital movements and capital expenditures.

Discount rate

The discount rate is estimated using the weighted average cost of capital (WACC) on the calculation date adjusted for risks specific to the business in question. The adjusted after-tax discount rate is translated to a pre-tax rate for each cash generating unit (CGU) based on the specific tax rate applicable to where the CGU operates.

Accounting policies

Goodwill

Goodwill arises in connection with business combinations where the consideration transferred exceeds the fair value of the acquired net assets. Goodwill is recognised at cost less accumulated impairment and is an intangible asset with an indefinite useful life. Goodwill is allocated to the cash generating units that are expected to benefit from the synergies from the business combination.

Intangible rights

Intangible rights include water rights of hydropower plants, patents, licences, intellectual property and similar rights. Water rights are deemed to have an indefinite useful life as the company has a contractual right to exploit water resources in the energy production of power plants.

The values of water rights are tested annually for impairment based on expected future cash flows of each separate hydropower plant. Other intangible rights are recognised at cost less accumulated amortisation and impairment. Amortisation is calculated using the straight-line method over their estimated useful lives ranging from 5 to 10 years.

Software and other intangible assets

Research expenditure is recognised as an expense as incurred. Costs incurred in acquiring software that will contribute to future period financial benefit are capitalised to software and systems. Other intangible assets are recognised at cost less accumulated amortisation and impairment. Amortisation is calculated using the straight-line method over their estimated useful lives ranging from 3 to 5 years.

Impairment testing

Goodwill and other intangible assets that are deemed to have an indefinite life are tested at least annually for impairment. For goodwill impairment testing purposes the group identifies its cash-generating units (CGUs), which is the smallest identifiable group of assets that generate cash inflows largely independent of the cash inflows of other assets or other groups of assets. Each CGU is no larger than a business area. The carrying amount for the CGU includes goodwill, non-current assets and working capital. If the balance sheet carrying amount of the CGU unit exceeds its recoverable amount, an impairment loss is recognised. Impairment loss is allocated first to reduce the carrying amount of any goodwill allocated to the unit and then to other assets of the unit. An impairment loss recognised for goodwill is not reversed in a subsequent period.

Other intangible assets with indefinite useful lives are impaired if the recoverable amount of the asset is less than the carrying amount. The carrying amount of the asset is then reduced to the recoverable amount which is the higher of the asset's net selling price and its value in use.

4.5 Provisions

EURm	RESTRUCTURING	TERMINATION	ENVIRONMENTAL	EMISSIONS	OTHER	TOTAL
2019						
Provisions at 1 January	22	24	20	14	46	126
Provisions made during the year	11	33	—	22	6	72
Provisions utilised during the year	-3	-19	-1	-18	-7	-47
Unused provisions reversed	—	-2	—	—	-4	-7
Reclassifications	—	—	—	—	—	—
Translation differences	—	—	—	—	—	—
Provisions at 31 December	30	36	20	18	41	144
Non-current						81
Current						62
Total						144
2018						
Provisions at 1 January	42	52	20	9	53	177
Provisions made during the year	1	5	1	16	1	22
Provisions utilised during the year	-8	-20	-1	-10	-7	-46
Unused provisions reversed	-13	-10	—	—	-2	-25
Reclassifications	-1	-3	—	—	—	-3
Translation differences	—	—	—	—	—	1
Provisions at 31 December	22	24	20	14	46	126
Non-current						95
Current						31
Total						126

UPM has undergone several restructurings in recent years including mill closures and profit improvement programs. Restructuring provisions recognised include various restructuring activities including dismantling costs. Termination provisions include severance payments, unemployment compensations or other arrangements for employees leaving the company. In Finland termination provisions include also unemployment arrangements and disability pensions. Unemployment provisions in Finland are recognised 2–3 years before the granting and settlement of the compensation.

At 31 December 2019 and 2018, restructuring and termination provisions relate to capacity closures and optimisation of operations in UPM Communication Papers business area. UPM has closed paper machine 10 at UPM Plattling in Germany and SC paper machine 2 in Rauma in 2019. The total termination and restructuring provisions related to these actions amounted to EUR 33 million in 2019.

In 2018, EUR 18 million prior years' restructuring and termination provisions were reversed as unused.

The group recognises provisions for normal environmental remediation costs expected to be incurred in a future period upon a removal of non-current assets and restoring industrial landfills where a legal or constructive obligation exists.

Other provisions are mainly attributable to onerous contracts and will be incurred over a period longer than one year.

Provisions for emissions include liability to cover the obligation to return emission rights. The group possesses emission rights amounting to EUR 80 million (45 million) as intangible assets.

*» **Refer Note 2.3** Operating expenses and other operating income, for further information on emission rights.*

Accounting policies

A provision is recognised when a present legal or constructive obligation exists as a result of a past event and it is probable that an outflow of resources will be required to settle the obligation and the amount can be reliably estimated. Provisions are split between amounts expected to be settled within 12 months of the balance sheet date (current) and amounts expected to be settled later (non-current).

Restructuring and termination provisions

A restructuring provisions is recognised when a detailed plan for the implementation of the measures is complete and when the plan has been communicated to those who are affected. Employee termination provisions are recognised when the group has communicated the plan to the employees.

Environmental provisions

Environmental expenditures that relate to an existing condition caused by past operations that do not contribute to future earnings are expensed. The recognition of environmental provisions is based on current interpretations of environmental laws and regulations. Such provisions are recognised when the group has an obligation to dismantle and remove a facility or an item of plant and to restore the site on which it is located. The amount recognised is the present value of the estimated future expenditure determined in accordance with local conditions and requirements. A corresponding item of property, plant and equipment of an amount equivalent to the provision is also recognised and subsequently depreciated as part of the asset. Provisions do not include any third-party recoveries.

Emission provisions
Emission obligations are recognised in provisions based on realised emissions. The provision is measured at the carrying amounts of the corresponding emission rights held, which are recognised as intangible assets. In case of deficit in emission rights, the shortage is valued at the market value at the balance sheet date.

Key estimates and judgements

Environmental provisions
The estimates used in determining the provisions are based on the expenses incurred for similar activities in the current reporting period taking into account the effect of inflation, cost-base development and discounting. Because actual outflows can differ from estimates due to changes in laws, regulations, public expectations, technology, prices and conditions, and can take place many years in the future, the carrying amounts of provisions are regularly reviewed and adjusted to take into account of any such changes. The discount rate applied is reviewed annually.

The group aims to operate in compliance with regulations related to the treatment of waste water, air emissions and landfill sites. However, expected events during production processes and waste treatment could cause material losses and additional costs in the group's operations.

Legal contingencies
Management judgement is required in measurement and recognition of provisions related to pending litigation. Provisions are recorded when the group has a present legal or constructive obligation as a result of past event, an unfavourable outcome is probable and the amount of loss can be reasonably estimated. Due to inherent uncertain nature of litigation, the actual losses may differ significantly from the originally estimated provision.

» Refer Note 9.2 Litigation for details of legal contingencies.

4.6 Working capital

The group defines operating working capital as inventories, trade receivables, trade payables and advances received which are presented separately below. The performance obligations related to advances received are typically fulfilled within 12 months of receipt of the advance.

UPM is focusing on working capital efficiency and targeting a sustainable and permanent reduction in operating working capital.

Operating working capital

EURm	2019	2018
Inventories	1,367	1,642
Trade receivables	1,222	1,476
Trade payables	-1,130	-1,310
Advances received	-8	-7
Total	1,451	1,800

Inventories

EURm	2019	2018
Raw materials and consumables	682	822
Work in progress	9	10
Finished products and goods	658	777
Advance payments	18	33
Total	1,367	1,642

Trade and other receivables

EURm	2019	2018
Trade receivables		
Trade receivables	1,253	1,502
Loss allowance provision	-31	-26
Total trade receivables	1,222	1,476
Prepayments and accrued income		
Personnel expenses	2	4
Interest income	—	1
Energy and other excise taxes	52	54
Other items	106	77
Total prepayments and accrued income	159	135
Other receivables		
VAT and other indirect taxes receivable	144	181
Other receivables	51	41
Total other receivables	195	222
Total	1,576	1,833

	2019			2018		
EURm	TRADE RECEIVABLES	LOSS ALLOWANCE PROVISION	TRADE RECEIVABLES, NET OF PROVISION	TRADE RECEIVABLES	LOSS ALLOWANCE PROVISION	TRADE RECEIVABLES, NET OF PROVISION
Undue	1,128	-3	1,125	1,325	-5	1,320
Past due up to 30 days	79	-1	79	116	-1	115
Past due 31–90 days	13	-2	11	32	-1	30
Past due over 90 days	33	-26	8	30	-20	10
Total	1,253	-31	1,222	1,502	-26	1,476

Trade and other payables

EURm	2019	2018
Accrued expenses and deferred income		
Personnel expenses	188	196
Interest expenses	7	6
Indirect taxes	4	4
Customer rebates	124	129
Customer claims	7	7
Other items	88	82
Total accrued expenses and deferred income	417	425
Advances received	8	7
Trade payables	1,130	1,310
Other current liabilities	98	139
Total	1,654	1,881

Operational credit risk

Operational credit risk is defined as the risk where UPM is not able to collect the payments for its receivables. The group has a credit policy in place and the exposure to credit risk is monitored on an ongoing basis. Outstanding trade receivables, days of sales outstanding (DSO) and overdue trade receivables are followed on monthly basis. Potential concentrations of credit risk with respect to trade and other receivables are limited due to the large number and the geographic dispersion of customers. Customer credit limits are established and monitored, and ongoing evaluations of their financial condition is performed. The group has trade credit insurances to protect accounts receivables from significant credit losses. In certain market areas, including Asia and Northern Africa, measures to reduce credit risks include letters of credit, prepayments and bank guarantees. Maximum exposure to credit risk, without taking into account any credit enhancements, is the carrying amount of trade and other receivables.

UPM does not have significant concentration of customer credit risk. The ten largest customers accounted for approximately 15% (18%) of the trade receivables as at 31 December 2019 – i.e., approximately EUR 179 million (269 million).

In 2019, trade receivables amounting to EUR 8 million (7 million) were subject to permanent write-off and the loss was recognised under other costs and expenses. In accordance with the group's accounting policy, trade receivables are permanently written off when there is no reasonable expectation of recovery.

Accounting policies

Inventories
Inventories are stated at the lower of cost and net realisable value. Cost is determined by the method most appropriate to the particular nature of inventory, the first-in, first-out (FIFO) or weighted average cost. The cost of finished goods and work in progress comprises raw materials, direct labour, other direct costs and related production overheads (based on normal operating capacity) but excludes borrowing costs. Net realisable value is the estimated selling price in the ordinary course of business, less the costs of completion and selling expenses. If the net realisable value is lower than cost, a valuation allowance is established for inventory obsolescence.

Trade receivables
Trade receivables arising from selling goods and services in the normal course of business are recognised initially at transaction price and subsequently at amortised cost less loss allowance provision. No element of financing is deemed present as the sales are made with a credit term of 14–60 days, which is consistent with market practice.

The group applies the IFRS 9 simplified approach to measuring expected credit losses which uses a lifetime expected loss allowance for all trade receivables. The group has recognised two types of provisions for trade receivables – a general provision for lifetime expected credit losses and a provision for specified individual trade receivables, both of which are charged to the income statement. The group uses a provision matrix for estimating lifetime expected credit losses where trade receivables are segregated by businesses. The provision matrix is based on historical observed default rates, adjusted by forward looking information. It takes into account trade credit insurances, payment profile of customers and the factor that as debts get older they are more likely not to be paid. Additionally, the group recognises a provision individually for outstanding trade receivables where specific debtor information is available. In these cases there must be objective evidence that the group will not be able to collect all amounts due according to the original terms of the receivables.

Trade receivables are permanently written off when there is no reasonable expectation of recovery. The customer entering into bankruptcy or liquidation proceedings or finalising such proceedings, or entering into debt-restructuring are considered indicators that the trade receivables are no longer expected to be recovered. Subsequent recoveries of amounts previously written off are credited to the income statement. The carrying amount of trade receivables approximates to their fair value due to the short-term nature of the receivables.

Trade and other payables
Trade payables arise from purchase of inventories, fixed assets and goods and services in the ordinary course of business from UPM's suppliers. Trade and other payables are classified as current liabilities if they are due to be settled within the normal operating cycle of the business or within 12 months from the balance sheet date. Trade payables are recognised initially at fair value and subsequently at amortised cost using the effective interest method. The carrying amount of trade payables approximates to their fair value due to the short-term nature of the payables.

The group is recognising refund liability for expected volume and other discounts arising from contracts with customers. Customer rebates include mainly volume discounts and are recognised as equal to an amount which is most likely to be paid to the customer. The carrying amount of expected customer rebates is updated at each reporting date, using the latest forecast data available.

Customer claims relating to quality complaints are accounted for as revenue related refund liability. Expected customer claims are estimated based on historical data and the amount of refund liability is updated at each reporting date.

Advances received are recognised as contract liability until the performance obligation is fulfilled.

5. Capital structure

UPM has a strong cash flow and industry-leading balance sheet that mitigates risks and enables value-enhancing strategic actions.

Net debt	Free cash flow
EUR **-453 m**	EUR **1,432 m**
(EUR -311 m)	(EUR 1,131 m)

5.1 Capital management

UPM's objective for managing capital comprising of net debt and total equity is to ensure maintenance of flexible capital structure to enable the ability to operate in capital markets and maintain optimal returns to shareholders. The group manages its financing activities, debt portfolio and financial resources via various policies that are designed to ensure optimum financing arrangements minimising simultaneously financial expenses and refinancing risk and optimising liquidity. Borrowing activities are centralised to the parent to the extent possible and cash resources are distributed within the group by the central treasury department.

UPM targets a net debt to EBITDA ratio of approximately 2 times or less.

UPM's capital

EURm	2019	2018
Equity attributable to owners of the parent company	10,062	9,792
Non-controlling interest	113	5
Total equity	10,175	9,797
Non-current debt	1,195	753
Current debt	104	25
Total debt	1,299	778
Total capitalisation	11,474	10,575
Total debt	1,299	778
Less: Interest-bearing financial assets	1,752	1,089
Net debt	-453	-311
Gearing ratio, % [1]	-4	-3
Net debt to EBITDA [1]	-0.24	-0.17

[1] *Refer* *» Other financial information* *on Alternative performance measures.*

Liquidity and refinancing risk

UPM seeks to maintain adequate liquidity under all circumstances by means of efficient cash management and restricting financial investments to investment types that can readily be converted into cash. Adequate liquidity is maintained by keeping sufficient amount of unused committed credit lines or cash as a reserve.

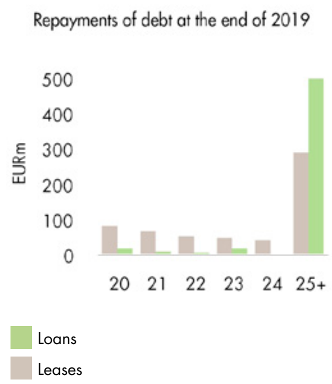
Refinancing risks are minimised by ensuring a balanced loan portfolio maturing schedule and sufficiently long maturities. The average loan maturity at 31 December 2019 was 7.5 years (8.0 years).

Liquidity and refinancing

EURm	2019	2018
Cash at bank	977	784
Cash equivalents	559	104
Committed credit lines	7	7
of which used	-4	-5
Loan commitments	-47	-47
Used uncommitted credit lines	-2	-9
Long-term loan repayment cash flow [1]	-99	-13
Liquidity	1,391	821

[1] Total debt increased in 2019 as a result of the implementation of IFRS 16 Leases 1 January 2019.

Cash and cash equivalents comprise cash in hand, deposits held at banks and with original maturities of three months or less. Bank overdrafts are included in used uncommitted credit lines and presented within current debt in the balance sheet. In 2019, no impairment and no expected credit losses were recognised in profit or loss for loan receivables or cash and cash equivalents.



Maturity table of debt at the end of 2019

EURm	2020	2021	2022	2023	2024	2025+	TOTAL
Bonds	—	—	—	—	—	334	334
Loans from financial institutions	16	10	6	18	1	1	53
Lease liabilities [1]	83	68	53	49	43	290	586
Other loans	1	1	1	1	1	174	179
Current loans	2	—	—	—	—	—	2
Principal payments	102	79	60	68	45	799	1,154
Interest payments	45	43	42	41	40	168	379

[1] Value of lease liabilities increased due to the implementation of the new standard IFRS 16 Leases

The difference between the above nominal values and carrying value of total debt arise from fair value adjustments increasing carrying value by EUR 152 million and other non-cash adjustments decreasing carrying value by EUR 9 million.

Maturity table of debt at the end of 2018

EURm	2019	2020	2021	2022	2023	2024+	TOTAL
Bonds	—	—	—	—	—	328	328
Loans from financial institutions	4	13	8	3	15	2	44
Lease liabilities	7	49	5	5	4	27	98
Other loans	1	4	1	1	1	169	176
Current loans	9	—	—	—	—	—	9
Principal payments	22	66	13	9	20	525	654
Interest payments	36	32	32	32	32	137	302

The difference between the above nominal values and carrying value of total debt arise from fair value adjustments increasing carrying value by EUR 133 million and other non-cash adjustments decreasing carrying value by EUR 10 million.

Maturity table of derivatives included in net debt and guarantees at the end of 2019

EURm	2020	2021	2022	2023	2024	2025+	TOTAL
Net settled interest rate swaps							
Net inflow	14	15	15	15	14	40	112
Net outflow	—	—	—	—	—	—	-1
Gross settled derivatives							
Gross currency swaps							
Total inflow	7	7	7	7	7	204	239
Total outflow	-1	-1	-1	-1	-2	-175	-181
Forward foreign exchange contracts							
Total inflow	325	—	—	—	—	—	325
Total outflow	-326	—	—	—	—	—	-326
Guarantees	2	—	—	—	—	—	2

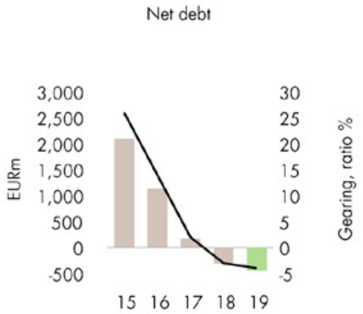
Maturity table of derivatives included in net debt and guarantees at the end of 2018

EURm	2019	2020	2021	2022	2023	2024+	TOTAL
Net settled interest rate swaps							
Net inflow	11	11	11	11	11	40	95
Net outflow	-2	—	—	—	—	—	-2
Gross settled derivatives							
Gross currency swaps							
Total inflow	10	7	7	7	7	205	242
Total outflow	-1	-1	-2	-2	-3	-187	-195
Forward foreign exchange contracts							
Total inflow	409	—	—	—	—	—	409
Total outflow	-410	—	—	—	—	—	-410
Guarantees	2	—	—	—	—	—	2

5.2 Net debt

Net debt is defined as the total of current and non-current debt less cash and cash equivalents and interest-bearing current and non-current financial assets. In 2019, the group reduced net debt by EUR 142 million. Net debt totalled EUR -453 million (-311 million) at the end of 2019.

UPM has adopted IFRS 16 Leases standard on 1 January 2019 without restating prior years. The change in lease accounting policy has resulted in an increase in net debt by EUR 491 million on 1 January 2019.



Net debt

EURm	2019	2018
Bonds	431	405
Loans from financial institutions	35	39
Lease liabilities	504	90
Other loans	225	219
Non-current debt	1,195	753
Repayments of non-current debt	17	6
Repayments of lease liabilities	83	7
Derivatives	3	3
Other liabilities	2	9
Current debt	104	25
Total debt	1,299	778
Loan receivables	7	7
Derivatives	154	134
Other receivables	19	31
Non-current interest-bearing assets	180	171
Loan receivables	8	8
Derivatives	8	4
Other receivables	20	18
Cash and cash equivalents	1,536	888
Current interest-bearing assets	1,571	918
Total interest-bearing assets	1,752	1,089
Net debt	-453	-311

Accounting policies

Debt

Debt comprising of bonds, bank and pension loans, lease liabilities and other loans is recognised initially at fair value, net of transaction costs and subsequently measured at amortised cost using the effective interest method. Any difference between proceeds (net of transaction costs) and the redemption value is recognised in the income statement over the estimated life of the borrowing. UPM classifies debt as non-current unless due for settlement within a year. Most of the debt is hedged in a fair value hedge relationship as described in **» Note 6.1** *Financial risk management.*

Change in net debt 2019

	Reported in financing activities in cash flow statement						
EURm	NON-CURRENT LOANS INCL. REPAYMENTS	LEASE LIABILITIES	CURRENT LOANS	NET DERIVATIVES	OTHER FINANCIAL ASSETS	CASH AND CASH EQUIVALENTS	NET DEBT
Carrying value, at 31 December 2018	669	98	9	-135	-64	-888	-311
Impact of adoption of IFRS 16	—	491	—	—	—	—	491
Carrying value, at 1 January 2019	669	588	9	-135	-64	-888	179
Change in net debt, cash							
Proceeds from non-current debt	13	—	—	—	—	—	13
Payments of non-current debt	-6	—	—	—	—	—	-6
Lease repayments		-82					-82
Change in current liabilities	—	—	-7	—	—	—	-7
Net cash flows from derivatives	—	—	—	11	—	—	11
Change in other financial assets in operating cash flow	—	—	—	—	6	—	6
Change in other financial assets in investing cash flow	—	—	—	—	5	—	5
Change in cash and cash equivalents	—	—	—	—	—	-649	-649
	7	-82	-7	11	10	-649	-710
Change in net debt, non-cash							
New contracts and subsequent additions	—	76	—	—	—	—	76
Fair value gains and losses	20	—	—	-35	—	—	-15
Exchange gains and losses	12	5	—	—	-1	1	17
Effective interest rate adjustment	1	—	—	—	—	—	1
	32	81	—	-35	-1	1	78
Carrying value, at 31 December 2019	708	586	2	-159	-54	-1,536	-453

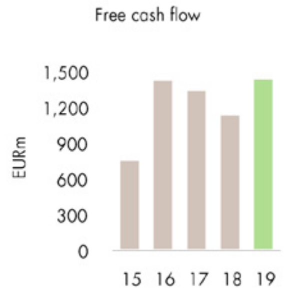
Change in net debt 2018

	Reported in financing activities in cash flow statement						
EURm	NON-CURRENT LOANS INCL. REPAYMENTS	LEASE LIABILITIES	CURRENT LOANS	NET DERIVATIVES	OTHER FINANCIAL ASSETS	CASH AND CASH EQUIVALENTS	NET DEBT
Carrying value, at 1 January	991	105	5	-143	-68	-716	174
Change in net debt, cash							
Payments of non-current debt	-324	—	—	—	—	—	-324
Lease repayments	—	-7	—	—	—	—	-7
Change in current liabilities	—	—	4	—	—	—	4
Change in other financial assets in operating cash flow	—	—	—	—	7	—	7
Change in other financial assets in investing cash flow	—	—	—	—	-3	—	-3
Change in cash and cash equivalents	—	—	—	—	—	-172	-172
	-324	-7	4	—	4	-172	-495
Change in net debt, non-cash							
Fair value gains and losses	-19	—	—	8	—	—	-10
Exchange gains and losses	19	1	—	—	—	—	20
Effective interest rate adjustment	1	—	—	—	—	—	1
	1	1	—	8	—	—	10
Carrying value, at 31 December	669	98	9	-135	-64	-888	-311

Free cash flow

Free cash flow is primarily a liquidity measure. It is an important indicator of UPM's overall operational performance as it reflects the cash generated from operations after investing activities.

EURm	2019	2018
Operating cash flow	1,847	1,330
Investing cash flow	-415	-199
Free cash flow	1,432	1,131
Dividends paid	-693	-613
Contributions by non-controlling interests	21	—
Other financing cash flow	-39	-19
Change in other financial assets in operating cash flow	-6	-7
Change in other financial assets in investing cash flow	-5	3
Change in net debt, cash	-711	-495
Change in net debt, non-cash	78	10
Impact of adoption of IFRS 16	491	—
Change in net debt	-142	-485
Opening net debt	-311	174
Closing net debt	-453	-311



Bonds

FIXED RATE PERIOD	INTEREST RATE, %	CURRENCY	NOMINAL VALUE ISSUED, MILLION	CARRYING VALUE 2019 EURm	CARRYING VALUE 2018 EURm
1997–2027	7.450	USD	375	431	405
Value, at 31 December				431	405
Current portion				—	—
Non-current portion				431	405

Leases

UPM has adopted IFRS 16 Leases standard on 1 of January 2019 without restating prior years.

Leases of property, plant and equipment where UPM, as a lessee, obtains substantially all of the economic benefits from the use of the identified asset and where UPM has the right to direct the use of the identified asset, are classified as leases. Approximately 30 % of leased assets recognised on the balance sheet consists of land areas in Uruguay. The group uses the leased land areas for eucalyptus plantations. Approximately 32 % of the leased assets on the balance sheet consist of five power plants. UPM uses the energy generated by these plants for its own production. In addition, the group has leased one waste water treatment plant as well as several warehouses, terminals, offices, railcars and vessels. UPM also leases some production machinery and equipment like forklifts and vehicles that are insignificant to the total leased assets portfolio.

In 2019, the total cash outflow for leased assets was EUR 82 million. The expenses related to short-term leases recognised in the income statement in 2019 amounted to EUR 9 million. The group had no significant variable lease payments in 2019.

The lease commitments for leases not commenced at year-end totals approximately EUR 100 million and these relate to long-term charter agreements.

In 2018, UPM had three power plant lease agreements classified as finance leases as well as one finance lease arrangement over the usage of a waste water treatment plant. In addition, the group had certain production assets and buildings under long term finance lease arrangements.

Changes in leased assets 2019

	LAND AREAS	BUILDINGS	MACHINERY AND EQUIPMENT	OTHER LEASED ASSETS	TOTAL
Carrying value, at 1 January	174	283	108	16	581
New contracts and subsequent additions	44	11	17	3	75
Reassessments and disposals	1	—	—	—	1
Depreciations	-10	-32	-22	-7	-72
Translation differences	3	1	1	—	5
Carrying value, at 31 December	212	262	104	12	590

Leased assets 2018 included in property, plant and equipment and intangible assets

EURm	2018
Accumulated costs	153
Accumulated depreciation	-66
Carrying value, at 31 December	88

Future minimum lease payments 2018

	Finance leases	Operating leases
EURm	2018	2018
Within 1 year	8	90
Between 1 and 5 years	66	226
Later than 5 years	28	238
Total	102	554
Of which interests	-5	—
Present value of future minimum lease payments	98	—

§ Accounting policies

Leases 2019

In 2019, the group has changed its accounting policy for leases where the group is the lessee. The new and old accounting policy are described below and the impact of the change is described in *» Note 1.5 Changes in accounting policies.*

The group as a lessee

UPM assesses whether a contract is or contains a lease at inception of the contract. This assessment involves the exercise of judgment about whether it depends on a specified asset, whether UPM obtains substantially all the economic benefits from the use of that asset, and whether UPM has the right to direct the use of the asset.

The group recognises a leased asset and a lease liability at the lease commencement date, except for short-term leases. UPM applies this to all asset classes. Short-term leases are leases that, at the commencement date, have a lease term of 12 months or less. A lease that contains a purchase option is not a short-term lease. UPM recognises lease payments of short-term leases as an expense on a straight-line basis over the lease term.

The lease term is determined as the non- cancellable period of the lease taking into consideration the options to extend and terminate if it is reasonably certain that the group will exercise the extension option or will not exercise the termination option. If the contract is for an indefinite period of time and the group and the lessor both have a right to terminate the contract within a short notice period (12 months or less) without a significant economic penalties and termination cash payments, the contract is considered to be a short-term.

The lease liability is recognised at the commencement date and measured at the present value of the lease payments to be paid during the lease term. The group uses, as a basis, discount rate implicit in the lease and if that rate cannot be readily determined, UPM uses incremental borrowing rate which comprises of currency and lease term-based reference rate and specific credit spread as well as other specific terms and conditions of a lease. Lease payments can include fixed payments, variable payments that depend on an index or rate and extension option payments or purchase options if it is reasonably certain that the group will exercise them. The lease liability is subsequently measured at amortised cost using the effective interest rate method and remeasured (with corresponding adjustment to the related leased asset) when there is a change in future lease payments due to renegotiation, changes of an index or rate or reassessment of options.

Leased asset comprises the initial lease liability, initial direct costs and the obligations to refurbish the asset, less any incentives granted by the lessors. The leased asset is subsequently valued at cost less accumulated depreciation and impairment losses. Remeasurement takes place in case lease liability is remeasured and change in cash flows is based on contract terms that have been included in the original contract. The leased asset is depreciated over the shorter of the asset's useful life and the lease term. The leased asset is subject to testing for impairment if there is an indicator for impairment, as for own assets.

The group has elected to separate non-lease components such as service components and other variable components and account them for as expenses, if they can be separated from the leased asset. However, the group does not separate non-lease components from the lease contracts of company cars.

The group does not apply portfolio approach of leases with similar characteristics.

Leased assets are presented in the balance sheet as a separate financial statement line item. Lease liabilities are presented as part of non-current debt and current debt line items in the balance sheet. Lease liabilities are part of net debt calculation of the group. Short-term lease payments are reported as rents and lease expenses. Variable lease payments are recognised within the operating costs and expenses based on the nature of the payment. The interest expense on the lease liability is recognised as a component of finance costs in income statement. In cash flow statement, payments for the principal portion of the lease liability are recognised as financing cash flow while payments for interest portion of lease liability, short-term leases, and variable amounts not included in the measurement of the lease liability, are classified within operating cash-flow.

The group as a lessor

At inception of a lease contract, the group makes an assessment whether the lease is a finance lease or an operating lease. If the lease transfers substantially all of the risks and rewards incidental to ownership of the asset, it is considered to be a finance lease; if not, the lease is considered to be an operating lease. The group has only a minor amount of operating lease contracts, whereby the lease payments are recognised on a straight-line basis over the term of the lease.

Leases 2018

Leases of property, plant and equipment where the group, as a lessee, has substantially all the risks and rewards of ownership are classified as finance leases. Finance leases are recognised as assets and liabilities in the balance sheet at the commencement of lease term at the lower of the fair value of the leased property and the present value of the minimum lease payments.

Each finance lease payment is allocated between the liability and finance charges. The corresponding rental obligations, net of finance charges, are included in other non-current debt. The interest element of the finance cost is charged to the income statement over the lease period so as to produce a constant periodic rate of interest on the remaining balance of the liability for each period. Property, plant and equipment acquired under finance leases are depreciated over the shorter of the asset's useful life and the lease term.

Leases where the lessor retains substantially all the risks and rewards of ownership are classified as operating leases. Payments made as a lessee under operating leases are charged to the income statement on a straight-line basis over the period of the lease.

5.3 Financial assets and liabilities by category

Financial assets and liabilities recognised in the balance sheet include cash and cash equivalents, loans and other financial receivables, investments in securities, trade receivables, trade payables, loans, bank overdrafts and derivatives.

Classification of financial assets into different measurement categories depends on the contractual cash flow characteristics and the business model for managing the financial asset. The measurement category of each financial asset is determined at inception. Financial assets and liabilities are offset and the net amount reported in the balance sheet when there is a legally enforceable right in all circumstances to offset the recognised amounts and there is an intention to settle on a net basis or realise the asset and settle the liability simultaneously.

Financial assets and liabilities by category at the end of 2019

EURm	FAIR VALUE THROUGH PROFIT AND LOSS	EQUITY INSTRUMENTS AT FAIR VALUE THROUGH OCI	DERIVATIVES UNDER HEDGE ACCOUNTING	FINANCIAL ASSETS AND LIABILITIES AT AMORTISED COST	TOTAL
Energy shareholdings	–	2,145	–	–	2,145
Other non-current financial assets					
Loans and receivables	–	–	–	15	15
Derivatives	–	–	155	–	155
	–	–	155	15	170
Trade and other receivables	–	–	–	1,576	1,576
Other current financial assets					
Loans and receivables	–	–	–	8	8
Derivatives	17	–	34	–	51
	17	–	34	8	59
Cash and cash equivalents	–	–	–	1,536	1,536
Total financial assets	17	2,145	189	3,135	5,487
Non-current debt					
Interest-bearing liabilities	–	–	–	1,195	1,195
	–	–	–	1,195	1,195
Other non-current financial liabilities					
Other liabilities [1]	–	–	–	83	83
Derivatives	–	–	–	–	–
	–	–	–	83	83
Current debt					
Interest-bearing liabilities	–	–	–	101	101
Derivatives	3	–	–	–	3
	3	–	–	101	104
Trade and other payables	–	–	–	1,654	1,654
Other current financial liabilities					
Derivatives	4	–	28	–	33
	4	–	28	–	33
Total financial liabilities	7	–	28	3,033	3,069

[1] Consists mainly of non-current advances received and a put liability that is not estimated to mature within 12 months.

Financial assets and liabilities by category at the end of 2018

EURm	FAIR VALUE THROUGH PROFIT AND LOSS	EQUITY INSTRUMENTS AT FAIR VALUE THROUGH OCI	DERIVATIVES UNDER HEDGE ACCOUNTING	FINANCIAL ASSETS AND LIABILITIES AT AMORTISED COST	TOTAL
Energy shareholdings	–	2,159	–	–	2,159
Other non-current financial assets					
Loans and receivables	–	–	–	15	15
Derivatives	–	–	163	–	163
	–	–	163	15	178
Trade and other receivables	–	–	–	1,833	1,833
Other current financial assets					
Loans and receivables	–	–	–	8	8
Derivatives	16	–	83	–	99
	16	–	83	8	107
Cash and cash equivalents	–	–	–	888	888
Total financial assets	16	2,159	246	2,745	5,166
Non-current debt					
Loans	–	–	–	753	753
	–	–	–	753	753
Other non-current financial liabilities					
Other liabilities [1]	–	–	–	100	100
Derivatives	–	–	1	–	1
	–	–	1	100	101
Current debt					
Loans	–	–	–	22	22
Derivatives	3	–	–	–	3
	3	–	–	22	25
Trade and other payables	–	–	–	1,881	1,881
Other current financial liabilities					
Derivatives	8	–	70	–	78
	8	–	70	–	78
Total financial liabilities	10	–	71	2,756	2,838

[1] Consists mainly of non-current advances received and a put liability that is not estimated to mature within 12 months.

The carrying amounts of financial assets and financial liabilities except for non-current loans approximate their fair value. The fair value of non-current loans amounted to EUR 1,186 million (750 million) at the end of 2019. For quoted bonds, the fair values are based on the quoted market value as of 31 December.

At the end of 2019, all bonds were quoted. For other non-current borrowings fair values are estimated using the expected contractual future payments discounted at market interest rates and are categorised within level 2 of the fair value hierarchy.

» Refer Note 5.2 Net debt, for further information on net debt and bonds.

Fair value measurement hierarchy for financial assets and liabilities

EURm	2019				2018			
	Level 1	Level 2	Level 3	Total	Level 1	Level 2	Level 3	Total
Financial assets								
Derivatives, non-qualifying hedges	–	17	–	17	–	16	–	16
Derivatives under hedge accounting	23	166	–	189	106	140	–	246
Energy shareholdings	–	–	2,145	2,145	–	–	2,159	2,159
Total	23	183	2,145	2,351	106	156	2,159	2,421
Financial liabilities								
Derivatives, non-qualifying hedges	–	7	–	7	–	10	–	10
Derivatives under hedge accounting	7	22	–	28	15	56	–	71
Total	7	29	–	36	15	66	–	81

There have been no transfers between levels in 2019 and 2018.

Accounting policies

Fair value through profit or loss
This category includes derivatives that don't qualify hedge accounting. They are measured at fair value and any gains or losses from subsequent measurement are recognised in the income statement.

Equity instruments at fair value through other comprehensive income
This category includes mainly UPM's energy shareholdings. These assets are measured at fair value through other comprehensive income.

Financial assets at amortised cost
This category comprises loan receivables with fixed or determinable payments that are not quoted in an active market, as well as trade and other receivables, and cash and cash equivalents. They are included in non-current assets unless they mature within 12 months of the balance sheet date. Cash and cash equivalents are always classified as current assets. Loan receivables that have a fixed maturity are measured at amortised cost using the effective interest method. Loan receivables without fixed maturity date are measured at amortised cost. As soon as a loan receivables or cash and cash equivalents are originated or purchased, a loss allowance for 12-month expected credit losses are recognised in profit or loss. If credit risk increases significantly, full lifetime expected credit losses are recognised in profit or loss. In the comparison period, loan receivables were impaired if the carrying amount exceeded the estimated recoverable amount. The credit loss model applied to trade receivables is described in » **Note 4.6** *Working capital.*

Derivatives under hedge accounting
All derivatives are initially and continuously recognised at fair value in the balance sheet. Gains and losses on remeasurement of derivatives used for hedging purposes are recognised in accordance with the accounting principles described in » **Note 6.2** *Derivatives and hedge accounting.*

Financial liabilities measured at amortised cost
This category includes debt, trade payables and other financial liabilities. » **Refer Note 5.2** *Net debt, for further information.*

The different levels of fair value hierarchy used in fair value estimation are defined as follows:

Fair values under level 1
Quoted prices (unadjusted) traded in active markets for identical assets or liabilities. Derivatives include futures and commodity forwards traded in exchange.

Fair values under level 2
Observable inputs are used as basis for fair value calculations either directly (prices) or indirectly (derived from prices). If all significant inputs required to fair value an instrument are observable, the instrument is included in level 2. Derivatives, level 2 include OTC derivatives like forward foreign exchange contracts, foreign currency options, interest and currency swaps and commodity swaps.

Specific valuation techniques used to value financial instruments at level 2 include the following methods:

Interest forward rate agreements (FRA) are fair valued based on quoted market rates on the balance sheet date. Forward foreign exchange contracts are fair valued based on the contract forward rates at the balance sheet date. Foreign currency options are fair valued based on quoted market rates and market volatility rates on the balance sheet date by using the Black&Scholes option valuation model. Interest and currency swap instruments are fair valued as present value of the estimated future cash flows based on observable yield curves. Commodity swaps are fair valued based on forward curve quotations received from service providers.

An embedded derivative that is by nature a foreign currency forward contract is valuated at market forward exchange rates and is included in level 2. Embedded derivatives are monitored by the group and the fair value changes are reported in other operating income in the income statement.

Fair values under level 3
Financial assets or liabilities of which fair values are not based on observable market data (that is, unobservable inputs) are classified under level 3. This category include UPM's energy shareholdings and forest assets. Fair valuations are performed at least quarterly by respective business areas or functions. Fair valuations are reviewed by the group finance management and overseen by the Audit Committee. » **Refer Note 4.3** *Energy shareholdings* and » **Note 4.2** *Forest assets.*

5.4 Financial income and expenses

EURm	2019	2018
Exchange rate gains and losses		
Derivatives	15	7
Exchange gains and losses on financial liabilities measured at amortised costs	-11	-20
Exchange gains and losses on financial assets measured at amortised costs	-5	14
Other exchange rate gains and losses	1	1
	-1	2
Fair value changes		
Fair value gains and losses on derivatives designated as fair value hedges	21	-15
Fair value adjustment of debt attributable to interest rate risk	-20	19
Fair value adjustment of firm commitments attributable to foreign exchange risk	—	-2
	1	1
Total	—	3
Interest and other finance costs, net		
Interest expense on lease liabilities	-13	-1
Interest expense on other financial liabilities measured at amortised cost	-32	-43
Interest income on derivatives	16	22
Interest income on loans and receivables	2	2
Other financial expenses, net	-11	-40
	-38	-60
Total	-37	-56

Net gains and losses on derivatives included in the operating profit

EURm	2019	2018
Cash flow hedges reclassified from hedging reserve	-6	16
Non-qualifying hedges	1	-11
Total	-4	5

Foreign exchange gains and losses in the operating profit excluding non-qualifying hedges

EURm	2019	2018
Sales	-51	19
Other operating income	3	-10
Total	-48	9

5.5 Share capital and reserves

The company has one series of shares and each share carries one vote. There are no specific terms related to the shares. At 31 December 2019, the number of the company's shares was 533,735,699. The shares do not have any nominal counter value. The shares are included within the book entry system for securities.

Share capital

	2019	2018
Number of shares (1,000)	533,736	533,736
Share capital, EURm	890	890

Treasury shares

At 31 December 2019, the company held 411,653 (411,653) of its own shares, 0.08% (0.08%) of the total number of shares.

Reserves

EURm	2019	2018
Fair value reserve	1,632	1,646
Hedging reserve	55	104
Share-based payments reserve	24	28
Total other reserves	**1,711**	**1,778**
Reserve for invested non-restricted equity	1,273	1,273
Translation reserve	278	232
Total reserves	**3,263**	**3,282**

Fair value reserve

This reserve represents the cumulative net change in the fair value of investments in equity securities comprising mainly of the fair value change of the energy shareholdings. Amounts are recycled only within equity upon the disposal of the asset.

Hedging reserve

This reserve comprises the cumulative net change in the fair value of the effective portion of cash flow hedging instruments related to hedged transactions that have not yet occurred and the cost of hedging when recognised in OCI. Amounts are recognised in profit or loss when the associated hedged transactions affect profit or loss or as part of the acquisition cost of property, plant and equipment. There were no reclassifications from the cash flow hedge reserve to profit or loss during the period resulting from inefficiency.

Share-based payments reserve

The share-based payments reserve is used to recognise the fair value of the share incentive plans, Performance Share Plan and Deferred Bonus Plan, over their vesting period.

Reserve for invested non-restricted equity

Reserve for invested non-restricted equity includes, under the Companies' Act, the exercise value of shareholders' investments in the company unless otherwise decided by the company.

Translation reserve

This reserve includes the foreign currency differences arising from the translation of foreign operations, and the effective result of transactions that hedge the group's net investments in foreign operations. There were no reclassifications from the translation reserve to profit or loss during the period resulting from inefficiency of net investment hedges.

Accounting policies

Transaction costs directly relating to the issue of new shares or share options are recognised, net of tax, in equity as a reduction in the proceeds. Where any group company purchases the parent company's shares (treasury shares), the consideration paid, including any directly attributable incremental costs (net of tax), is deducted from equity attributable to the owners of the parent company until the shares are cancelled or reissued. Where such shares are subsequently reissued, any consideration received, net of any directly attributable incremental transaction costs and the related income tax effects, is included in equity attributable to the owners of the parent company.

Hedging reserve

EURm	CURRENCY CASH FLOW HEDGES	ELECTRICITY PURCHASE AND SALES HEDGES	COST OF HEDGING	TAX	TOTAL
2019					
Hedging reserve, at 1 January	-19	154	-5	-26	104
Amounts reclassified to profit and loss	38	-46	13	-1	5
Change in fair value of hedging instruments recognised in OCI	-24	-30	-14	14	-54
Hedging reserve, at 31 December	-4	78	-6	-14	55

EURm	CURRENCY CASH FLOW HEDGES	ELECTRICITY PURCHASE AND SALES HEDGES	COST OF HEDGING	TAX	TOTAL
2018					
Hedging reserve, at 1 January	38	76	—	-23	91
Amounts reclassified to profit and loss	-23	3	4	3	-13
Change in fair value of hedging instruments recognised in OCI	-34	75	-9	-6	25
Hedging reserve, at 31 December	-19	154	-5	-26	104

6. Risk management

6.1 Financial risk management

The objective of financial risk management is to protect the group from unfavourable changes in financial markets and thus help to secure profitability. The objectives and limits for financing activities are defined in the Group Treasury Policy approved by the Board of Directors. In financial risk management various financial instruments are used within the limits specified in the Group Treasury Policy. Only such instruments which market value and risk profile can be continuously and reliably monitored are used for this purpose.

Financing services are provided to the group entities and financial risk management carried out by the central treasury department, Treasury and Risk Management.

Foreign exchange risk

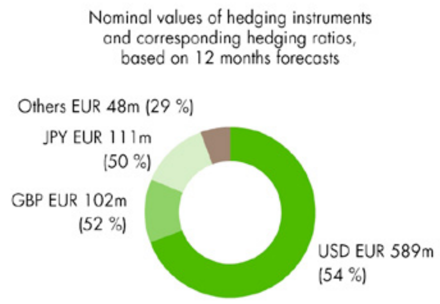
The group is exposed to foreign exchange risk arising from various currency exposures, primarily with respect to USD, GBP and JPY. Foreign exchange risk arises from contracted and expected commercial future payment flows (transaction exposure), from changes in value of recognised assets and liabilities denominated in foreign currency and from changes in the value of assets and liabilities in foreign subsidiaries (translation exposure). The objective of foreign exchange risk management is to limit the uncertainty created by changes in foreign exchange rates on the future value of cash flows earnings and in the group's balance sheet. Changing exchange rates can also have indirect effects, such as change in relative competitiveness between currency regions.

Transaction exposure

The group hedges transaction exposure related to highly probable future commercial foreign currency cash flows on a rolling basis over the next 12-month period based on forecasts by the respective business areas. Transaction risk arises from the changes in currency rates of highly probable transactions, which are expected to take place in currencies other than the functional currency of the entity. The group's policy is to hedge an average of 50% of its estimated net risk currency cash flow. Some highly probable cash flows have been hedged for longer than 12 months ahead while deviating from the risk neutral hedging level at the same time. At 31 December 2019, 51% (52%) of the forecast 12-month currency flow was hedged.

The group enters into external forward contracts, which are designated at group level as hedges of foreign exchange risk of specific future foreign currency flows. Cash flow hedge accounting is applied when possible. If hedge accounting is not possible, fair value changes of the hedging instrument are recognised through profit and loss immediately.

At the end of 2019, UPM's estimated net risk currency flow for the next 12 months was EUR 1,673 million (1,999 million).



The average weighted hedging rate by currency against EUR were USD 1.15, GBP 0.89 and JPY 122.5.

Translation exposure

The group has several currency denominated assets and liabilities on its balance sheet such as foreign currency bonds, loans and deposits, group internal loans and cash in other currencies than functional currencies. The aim is to fully hedge this balance sheet exposure. The group might, however, within the limits set in the group Treasury Policy have unhedged balance sheet exposures.

At 31 December 2019 the unhedged balance sheet exposures in net of interest-bearing assets and liabilities amounted to EUR 14 million (21 million). Hedge accounting is not applied and all fair value changes of hedging instruments are recognised through profit and loss immediately.

The group has also accounts receivable and payable balances denominated in foreign currencies. The aim is to fully hedge the net exposure in main currencies. The nominal values of the hedging instruments in net of accounts payable and receivable hedging were EUR 433 million (530 million). Hedge accounting is not applied and all fair value changes of hedging instruments are recognised through profit and loss immediately.

The group has net investments in foreign subsidiaries that are subject to foreign currency translation differences. The exchange rate differences arising from translation of foreign subsidiaries are accumulated as a separate component of equity in the translation reserve relate mainly to USD, CNY and GBP. Currency exposure arising from the net investment in foreign subsidiaries is generally not hedged. However, at 31 December 2019, part of the foreign exchange risk associated with the net investments in Uruguay, China and Singapore were hedged and net investment hedge accounting has been applied. The average weighted hedging rate of these hedges against EUR were Uruguay USD 1.13, China CNY 8.04 and Singapore USD 1.13

Derivatives used for hedging translation risks are external forward contracts, cross currency swaps and currency options.

12 months net risk currency flow

EURm	2019	2018
USD	1,089	1,045
JPY	221	170
GBP	195	342
Others	168	442
Total	**1,673**	**1,999**

Foreign exchange risk sensitivity

The following table illustrates the effect to profit before tax due to recognised balance sheet items in foreign currency and the effect to equity arising mainly from foreign currency forwards used to hedge foreign currency flows.

	Profit before tax		Equity	
EURm	**2019**	**2018**	**2019**	**2018**
EUR strengthens by 10%				
USD	–	1	61	64
GBP	–	–	10	17
JPY	-1	-1	11	9
EUR weakens by 10%				
USD	–	-1	-61	-64
GBP	–	–	-10	-17
JPY	1	1	-11	-9

The following assumptions were made when calculating the sensitivity to changes in the foreign exchange risk:

- Major part of non-derivative financial instruments (such as cash and cash equivalents, trade receivables, debt and trade payables) are either directly denominated in the functional currency or are transferred to the functional currency through the use of derivatives i.e. the balance sheet position is close to zero. Exchange rate fluctuations have therefore minor or no effects on profit or loss.
- The position includes foreign currency forward contracts that are part of the effective cash flow hedge having an effect on equity.
- The position includes also foreign currency forward contracts that are not part of the effective cash flow hedge having an effect on profit.
- The position excludes foreign currency denominated future cash flows and effects of translation exposure and related hedges

Interest rate risk

The interest-bearing liabilities and assets expose the group to interest rate risk, namely repricing and fair value interest rate risk caused by interest rate movements. According to the Group Treasury Policy the interest rate exposure is defined as the difference in interest rate sensitivity between assets and liabilities compared to a benchmark portfolio with a 6-month duration. The total interest rate exposure is a net debt portfolio which includes all interest bearing assets and liabilities and derivatives that are used to hedge the aforementioned balance sheet items. The policy sets risk limits and allowed deviation from target net debt duration level. The group uses interest rate derivatives, such as interest rate swaps, interest rate futures and crosscurrency swaps, to change net debt duration.

The table below shows the nominal value of interest rate position exposed to interest rate risk in each significant currency. The position includes all cash balances, interest bearing assets and liabilities and currency derivatives used to hedge these items. The positive/negative position indicates a net liability/asset position by currency and that the group is exposed to repricing and/or fair value interest rate risk by interest rate movements in that currency. Table excludes leasing transactions.

Nominal values of the group's net debt by currency including derivatives

EURbn	2019	2018
EUR	-1.0	-0.4
USD	0.3	0.2
GBP	-0.1	-0.1
Others	-0.1	–
Total	-1.0	-0.3

Most of the interest rate derivatives hedging interest on long-term debt meet the requirement of fair value hedge accounting.

Interest rate sensitivity

The following table illustrates the effect to profit before tax mainly as a result of higher/lower interest expense on floating rate debt and the effect to equity as a result of a decrease/increase in the fair value of derivatives designated as cash flow hedges of floating rate debt.

	Profit before tax		Equity	
EURm	**2019**	**2018**	**2019**	**2018**
Interest rate of net debt 100 basis points higher	-6	-5	–	–
Interest rate of net debt 100 basis points lower	6	5	–	–

The following assumptions were made when calculating the sensitivity to changes in interest rates:

- The variation of interest rate is assumed to be 100 basis points parallel shift in applicable interest rate curves.
- In the case of fair value hedges designated for hedging interest rate risk, the changes in the fair values of the hedged items and the hedging instruments attributable to the interest rate movements balance out almost completely in the income statement in the same period. However, the possible ineffectiveness has an effect on the profit of the year.
- Cash balances are excluded.
- Leasing transaction are excluded.
- Fixed rate debt that is measured at amortised cost and is not designated to fair value hedge relationship is not subject to interest rate risk sensitivity.
- In case of variable to fixed interest rate swaps which are included in cash flow hedge accounting, fair value changes of hedging swaps are booked to equity.
- Floating rate debt that are measured at amortised cost and not designated as hedged items are included in interest rate sensitivity analysis.
- Changes in the market interest rate of interest rate derivatives (interest rate futures, swaps and cross currency swaps) that are not designated as hedging instruments in hedge accounting affect the financial income or expenses (net gains or losses from remeasurement of the financial assets and liabilities to fair value) and are therefore included in the income-related sensitivity analysis.

Electricity price risk

UPM is hedging both sales of power production and power purchases consumed at daily business. The group's sensitivity to electricity market price is dependent on the electricity production and consumption levels and the hedging levels. The inherent price risks arise from the daily sales and purchases of electricity from the power market with spot prices, and the hedging objective is to reduce the earnings volatility that arises from electricity prices.

UPM considers system (SYS) and electricity price area differential (EPAD) products perfect hedges for corresponding electricity price risk components in Finland. The components of electricity price risk in the Nordic power market are hedged by entering into System and EPAD electricity derivative contracts, mostly Nasdaq Commodities forwards, futures and options. System and EPAD prices are considered as separately identifiable and reliably measurable risk components in electricity sales and purchase contracts as well as in the hedging instruments, as a quoted price is available. Fair value changes of designated system and EPAD derivatives are offsetting electricity sales and purchase price changes. The share of SYS component covers approximately 80–90% and the share of EPAD component covers 10–20% of the changes in electricity sales and purchase prices.

The electricity price risk in the Central European power market is hedged by entering into European electricity exchange futures. Products used for hedging hedge the entire price risk for the underlying price area.

The time frame hedged has historically been approximately rolling 5 years. Hedging level has been typically higher for the nearest years and lower for the latter years. Hedging level for a certain year has historically varied between 0–80%. UPM constantly updates its electricity sales and consumption forecasts. The targeted hedging level is calculated based on the most recent available information about the sales and consumption of electricity.

The group applies cash flow hedge accounting for the hedging relationships when it hedges its electricity price risk. In addition to hedging, the group is also trading electricity forwards and futures. As well as hedging, proprietary trading risks are monitored on a daily basis. Value-At-Risk levels are set to limit the maximum risk at any given time. Cumulative maximum loss is limited by stop-loss limits.

Electricity derivatives price sensitivity

Sensitivity analysis for financial electricity derivatives is based on position at the end of financial year. Sensitivities change over time as the overall hedging and trading positions change. Underlying physical positions are not included in the sensitivity analysis. Sensitivity analysis is calculated separately for the hedge accounted and non-hedge accounted volumes. In the analysis it is assumed that forward quotation in Nasdaq Commodities and EEX would change EUR 5/ MWh throughout the period UPM has derivatives. EUR 5/ MWh price sensitivity is estimated from historical market price movements in Nasdaq and EEX markets.

EURm	EFFECT	2019	2018
+/– EUR 5/MWh in electricity forward quotations			
Effect on profit before tax	+/-	3.8	–
Effect on equity	+/-	11.2	27.2

6.2 Derivatives and hedge accounting

The group uses financial derivatives to manage currency, interest rate and commodity price risks.

» **Refer Note 6.1** *Financial risk management.*

Accounting policies

All derivatives are initially and continuously recognised at fair value in the balance sheet. The fair value gain or loss is recognised through the income statement or other comprehensive income depending on whether the derivative is designated as a hedging instrument, and on the nature of the item being hedged. Certain derivatives are designated at inception either hedges of the fair value of recognised assets or liabilities or a firm commitment (fair value hedge), hedges of highly probable forecasted transactions (cash flow hedge), or hedges of net investments in foreign subsidiaries with other than the EUR as their functional currency (net investment hedge). Derivative fair values on the balance sheet are classified as non-current when the remaining maturity is more than 12 months and as current when the remaining maturity is less than 12 months.

For hedge accounting purposes, UPM documents the relationship between the hedging instruments and hedged items, as well as the risk management objective and strategy for undertaking various hedge transactions at the inception date. This process includes linking all derivatives designated as hedges to specific assets and liabilities or to specific firm commitments or forecast transactions. The group also documents its assessment, both at the hedge inception and on an on-going basis, as to whether the hedge is highly effective in offsetting changes in fair values or cash flows of the hedged items.

Certain derivatives, while considered to be economical hedges for UPM's financial risk management purposes, do not qualify for hedge accounting. Such derivatives are recognised at fair value through the income statement in other operating income or under financial items.

Cash flow hedges

The effective portion of changes in the fair value of derivatives that are designated and qualify as cash flow hedges is recognised in other comprehensive income. Cost of hedging, meaning forward points of derivative forward contracts accounted as cash flow hedges, is recognised as a part of the hedging reserve. Amounts deferred in equity are transferred to the income statement and classified as income or expense in the same period as that in which the hedged item affects the income statement (for example, when the forecast external sale to the group that is hedged takes place).

When the forecasted transaction that is hedged results in the recognition of a fixed asset, gains and losses previously deferred in equity are transferred from equity and included in the initial measurement of the acquisition cost and depreciated over the useful lives of the assets.

When a hedging instrument expires or is sold, or when a hedge no longer meets hedge accounting criteria, any cumulative gain or loss existing in equity at that time remains in equity and is recognised when the committed or forecasted transaction is ultimately recognised in the income statement. However, if a forecasted transaction is no longer expected to occur, the cumulative gain or loss that was reported in equity is immediately recognised to the income statement.

In currency cash flow hedging, the hedging instrument is made in the same currency as the hedged item and hence the fair value change of the hedging instrument are expected to effectively offset the fair value changes generated by the hedged items. Thereby the hedge ratio between the instrument and the cash flow is 1:1. Ineffectiveness may arise in the highly unlikely case that the forecasted cash flows are no longer expected to occur. There are no other significant sources of ineffectiveness that can reasonably be expected to take place.

Ineffectiveness in electricity price hedges may arise in the highly unlikely case that the forecasted cash flows are no longer expected to occur. Ineffectiveness may also arise in case EPAD prices remained negative for a longer period of time, but considering historical price development UPM considers this scenario to be highly unlikely.

Hedges of net investments in foreign subsidiaries

The fair value changes of forward exchange contracts used in hedging net investments that reflect the change in spot exchange rates are recognised in other comprehensive income within translation reserve. Any gain or loss relating to the interest portion of forward exchange contracts is recognised immediately in the income statement under financial items. Gains and losses accumulated in equity are included in the income statement when the foreign operation is partially disposed of or sold.

The hedging instrument is always made in the same currency as the hedged investment, hence the hedge ratio in net investment hedging is 1:1. For hedging of net investments, ineffectiveness may only arise in the highly unlikely situation where the hedged item is disposed or sold during the duration of the hedging instrument.

Fair value hedges

The group applies fair value hedge accounting for hedging fixed interest risk on debt. Changes in the fair value of derivatives that are designated and qualify as fair value hedges and that are prospectively highly effective are recorded in the income statement under financial items, along with any changes in the fair value of the hedged asset or liabilities that are attributable to the hedged risk. The carrying amounts of hedged items and the fair values of hedging instruments are included in interest-bearing assets or liabilities.

Derivatives that are designated and qualify as fair value hedges mature at the same time as hedged items. If the hedge no longer meets the criteria for hedge accounting, the adjustment to the carrying amount of a hedged item for which the effective interest method is used is amortised to profit or loss over the expected period to maturity.

Ineffectiveness in fair value hedge of fixed interest risk may arise in case of early redemption of such debt, which is hedged under fair value hedge accounting. The group has not recognised other significant sources of ineffectiveness that can reasonably be expected to take place.

The group applies fair value hedge accounting also for hedging firm commitment of a purchase in foreign currency. The currency changes of the hedging instrument are recorded through profit and loss in financial items, until they are recognised as a part of the acquisition cost of a fixed asset.

Financial counterparty risk

The financial instruments the group has agreed with banks and financial institutions contain an element of risk of the counterparties being unable to meet their obligations. According to the Group Treasury Policy derivative instruments and investments of cash funds may be made only with counterparties meeting certain creditworthiness criteria. The group minimises counterparty risk also by using a number of major banks and financial institutions. Creditworthiness of counterparties is constantly monitored by Treasury and Risk Management.

Net fair values of derivatives

EURm	Positive fair values 2019	Negative fair values 2019	Net fair values 2019	Positive fair values 2018	Negative fair values 2018	Net fair values 2018
Foreign exchange risk						
Forward foreign exchange contracts						
Cash flow hedges	11	-21	-10	6	-30	-24
Net investment hedge	1	-1	—	—	-26	-26
Non-qualifying hedges	6	-7	-1	9	-9	—
Cross currency swaps						
Non-qualifying hedges	7	—	7	2	—	2
Derivatives hedging foreign exchange risk	25	-29	-4	17	-65	-49
Interest rate risk						
Interest rate swaps						
Fair value hedges	103	—	103	83	—	83
Non-qualifying hedges	1	—	1	1	-1	—
Cross currency swaps						
Fair value hedges	51	—	51	50	—	50
Non-qualifying hedges	—	—	—	3	—	3
Derivatives hedging interest risk	156	—	156	138	-1	137
Commodity risk						
Electricity sales						
Cash flow hedges	1	-5	-4	2	-12	-10
Electricity purchase						
Cash flow hedges	23	-2	21	104	-2	102
Other commodities						
Non-qualifying hedges	2	—	2	1	—	1
Derivatives hedging commodity risk	26	-7	19	107	-14	93
Total	206	-36	170	262	-81	181

No derivatives are subject to offsetting in the group's financial statements. All derivatives are under ISDA or similar master netting agreement.

Notional amounts of derivatives

EURm	2019	2018
Interest rate forward contracts	1,729	1,129
Interest rate swaps	334	753
Forward foreign exchange contracts	2,491	2,524
Currency options	24	52
Cross currency swaps	172	167
Commodity contracts	913	1,189

Cash collaterals pledged for derivative contracts totalled EUR 20 million of which EUR 19 million relate to commodity contracts and EUR 1 million to interest rate forward contracts.

Net fair values of derivatives calculated by counterparty

EURm	POSITIVE FAIR VALUES	NEGATIVE FAIR VALUES	NET FAIR VALUES
2019	188	-17	171
2018	245	-64	181

Timing of nominal amounts of derivatives 2019

EURm	Within 1 year	Between 1–5 years	Later than 5 years	Total
		2019		
Foreign exchange risk				
Forward foreign exchange contracts				
Cash flow hedges	1,459	–	–	1,459
Net investment hedge	298	–	–	298
Non-qualifying hedges	724	10	–	734
Currency options				
Non-qualifying hedges	24	–	–	24
Cross currency swaps				
Non-qualifying hedges	–	–	172	172
Interest rate risk				
Interest rate swaps				
Fair value hedges	–	–	334	334
Non-qualifying hedges	–	–	–	–
Cross currency swaps				
Fair value hedges	–	–	172	172
Interest rate futures				
Non-qualifying hedges	1,729	–	–	1,729
Commodity risk				
Electricity sales				
Cash flow hedges	217	174	–	390
Non-qualifying hedges	–	35	–	35
Electricity purchase				
Cash flow hedges	210	227	–	437
Other commodities				
Non-qualifying hedges	48	–	–	48

Timing of nominal amounts of derivatives 2018

EURm	Within 1 year	Between 1–5 years	Later than 5 years	Total
		2018		
Foreign exchange risk				
Forward foreign exchange contracts				
Cash flow hedges	1,249	–	–	1,249
Net investment hedge	443	–	–	443
Non-qualifying hedges	810	22	–	832
Currency options				
Non-qualifying hedges	52	–	–	52
Cross currency swaps				
Non-qualifying hedges	–	–	167	167
Interest rate risk				
Interest rate swaps				
Fair value hedges	–	–	328	328
Non-qualifying hedges	425	–	–	425
Cross currency swaps				
Fair value hedges	–	–	167	167
Interest rate futures				
Non-qualifying hedges	1,129	–	–	1,129
Commodity risk				
Electricity sales				
Cash flow hedges	286	157	–	443
Electricity purchase				
Cash flow hedges	294	368	–	662
Other commodities				
Non-qualifying hedges	84	–	–	84

The nominals of cross currency swaps are included in both foreign exchange risk and interest rate risk.

Effect of IBOR reform and significant assumptions

The Group's risk exposure that is directly affected by the IBOR reform is fair value hedge accounting of long-term fixed-rate debt for changes in fair value attributable to USD LIBOR which is the current benchmark interest rate. Group currently has only few contracts which reference USD LIBOR and extend beyond 2021. Group Treasury oversees the Group's IBOR transition and follows changes to ISDA and other market guidelines on effects of these changes to UPM's contracts. In fair value hedging relationships, fair value for both the hedged item and hedging instrument is calculated with identical rate. Therefore no ineffectiveness is expected.

7. Income tax

7.1 Tax on profit for the year

Income tax

In 2019, tax on profit for the year amounted to EUR 234 million (342 million). The effective tax rate was 17.9% (18.6%). In 2019 and 2018, the effective tax rate was affected by the income not subject to tax from subsidiaries operating in tax free zone. In addition, effective tax rate was affected by German tax rate that is higher than in Finland.

In 2019, accrued and paid withholding taxes relating to dividend payments of subsidiaries amounted to EUR 2 million (EUR 1 million). Change in recoverability of deferred tax assets includes EUR 15 million tax income related to reassessment of deferred tax assets in Germany.

Income tax

EURm	2019	2018
Current tax expense	181	243
Change in deferred taxes	53	99
Total	234	342

Tax rate reconciliation

EURm	2019	2018
Profit before tax	1,307	1,839
Computed tax at Finnish statutory rate of 20%	261	368
Difference between Finnish and foreign rates	16	30
Tax-exempt income	-34	-63
Non-deductible expenses	9	8
Withholding taxes	2	1
Tax loss with no tax benefit	3	6
Results of associates	–	-1
Change in tax legislation	1	4
Change in recoverability of deferred tax assets	-12	-3
Utilisation of previously unrecognised tax losses	-10	-8
Other items	-1	–
Total income taxes	234	342
Effective tax rate, %	17.9%	18.6%

Accounting policies

The group's income tax expense comprises current tax and deferred tax. Current tax is calculated on the taxable result for the period based on the tax rules prevailing in the countries where the group operates and includes tax adjustments for previous periods and withholding taxes deducted at source on intra-group transactions. Tax expense is recognised in the income statement, unless it relates to items that have been recognised in equity or as part of other comprehensive income. In these instances, the related tax expense is also recognised in equity or other comprehensive income, respectively.

Key estimates and judgements

The group is subject to income taxes in numerous jurisdictions and the calculation of the group's tax expense and income tax liabilities involves a degree of estimation and judgement. Tax balances reflect a current understanding and interpretation of existing tax laws. Management periodically evaluates positions taken in tax returns with respect of situations in which applicable tax regulation is subject to interpretation and adjusts income tax liabilities where appropriate.

7.2 Deferred tax

EURm	2019	2018	2017
Deferred tax assets			
Intangible assets and property, plant and equipment	77	76	90
Inventories	45	62	41
Retirement benefit liabilities and provisions	148	121	135
Other temporary differences	103	24	19
Tax losses and tax credits carried forward	180	198	222
Offset against liabilities	-157	-83	-84
Total	395	397	423
Deferred tax liabilities			
Intangible assets and property, plant and equipment	-249	-181	-186
Forest assets	-364	-329	-244
Retirement benefit assets	-7	-7	-16
Other temporary differences	-86	-101	-95
Offset against assets	157	83	84
Total	-549	-535	-458
Net deferred tax assets (liabilities)	-153	-138	-36

Deferred income tax assets and liabilities are offset when there is a legally enforceable right to offset current tax assets against current tax liabilities and when the deferred income taxes relate to the same fiscal authority.

Movements in deferred tax assets and liabilities

EURm	2019	2018
Carrying value, at 1 January	-138	-36
Charged to income statement	-53	-99
Charged to other comprehensive income	38	-2
Exchange rate adjustments	—	-1
Net deferred tax assets (liabilities)	-153	-138

Tax charge to other comprehensive income

	Before tax	Tax	After tax	Before tax	Tax	After tax
EURm	2019			2018		
Actuarial gains and losses on defined benefit plans	-81	24	-58	-1	—	—
Energy shareholdings	-13	—	-13	186	-3	183
Translation differences	67	—	67	62	—	62
Cash flow hedges	-63	12	-50	16	-3	13
Net investment hedges	-8	2	-6	-17	3	-14
Total	-97	38	-58	246	-2	243

Key estimates and judgements

Recognised deferred tax assets
The recognition of deferred tax assets requires management judgement as to whether it is probable that such balances will be utilised and/or reversed in the foreseeable future. At 31 December 2019, net operating loss carry-forwards for which the group has recognised a deferred tax asset amounted to EUR 616 million (672 million), of which EUR 502 million (567 million) was attributable to German subsidiaries. In Germany net operating loss carry-forwards do not expire. In other countries net operating loss carry-forwards expire at various dates and in varying amounts. Based on profit forecasts, it is probable that there will be sufficient future taxable profits available against which the tax losses can be utilised.

The assumptions regarding future realisation of tax benefits, and therefore the recognition of deferred tax assets, may change due to future operating performance of the group, as well as other factors, some of which are outside of the control of the group.

Unrecognised deferred tax assets and liabilities
The net operating loss carry-forwards for which no deferred tax is recognised due to uncertainty of their utilisation amounted to EUR 819 million (804 million) in 2019. These net operating loss carry-forwards are mainly attributable to certain German and French subsidiaries and do not expire. In addition, the group has not recognised deferred tax assets on loss carry-forwards amounting to EUR 439 (410 million) which relate to closed Miramichi paper mill in Canada. These loss carry-forwards expire at different times by the end of 2029.

The group has not recognised deferred tax liability in respect of undistributed earnings of non-Finnish subsidiaries to the extent that it is probable that the temporary differences will not reverse in the foreseeable future. In addition, the group has not recognised deferred tax liability for the undistributed earnings of Finnish subsidiaries and associates as such earnings can be distributed without any tax consequences.

Accounting policies

Deferred tax is calculated based on temporary differences between the carrying amounts and the taxable values of assets and liabilities and for tax loss carry-forwards to the extent that it is probable that these can be utilised against future taxable profits.

Deferred income tax is determined using tax rates (and laws) that have been enacted or substantially enacted by the balance sheet date and are expected to apply when the related deferred income tax asset is realised or the deferred income tax liability is settled.

Deferred income tax is provided on temporary differences arising on investments in subsidiaries, associates and joint ventures, except where the timing of the reversal of the temporary difference is controlled by the group and it is probable that the temporary difference will not reverse in the foreseeable future. Deferred tax assets and liabilities are recognised net where there is a legal right to set-off and an intention to settle on a net basis.

8. Group structure

8.1 Business acquisitions and disposals

In 2019, UPM made a minor sale of its joint venture, EURO WASTE a.s. In 2018 no business disposals were made.

In 2019, no business acquisitions were made. In 2018, UPM made a minor business acquisition by acquiring the assets of Converters Express in the United States.

Transactions with non-controlling interests
In September 2019, the new shareholders' agreements of Tile Forestal S.A., CUECAR S.A., Tebetur S.A. and Blanvira S.A. were signed reducing UPM's continuing interest in these companies to 91%. The proceeds of EUR 3 million were received from non-controlling interest in cash being the proportionate share of the carrying amount of the net assets of these subsidiaries.

In addition, the terms and conditions of UPM S.A. shareholders' agreement were amended resulting in recognition of 9% non-controlling interest amounting to EUR 63 million and derecognition of financial liability amounting to EUR 56 million. The difference amounting to EUR 7 million was recognised in equity as transactions with non-controlling interest. Prior to the amendment of the agreement the group accounted the portion belonging to non-controlling interests at the present value of the redemption amount within financial liability due to put option over non-controlling interests.

The assets, liabilities, income and expenses of subsidiaries with non-controlling interests are consolidated line by line into the UPM consolidated financial statements. The proportion of the profit for the period, as well as the accumulated share of total equity belonging to non-controlling interests are presented separately in the consolidated income statement and consolidated balance sheet.

Accounting policies

UPM consolidates acquired entities at the acquisition date which is when it gains control using the acquisition method. Consideration transferred is determined as the fair value of the assets transferred, the liabilities incurred and equity instruments issued including the fair value of a contingent consideration. Acquisition related transaction costs are expensed as incurred. Identifiable assets acquired and liabilities and contingent liabilities assumed are measured initially at their fair values at the acquisition date. The group measures any non-controlling interest in the acquiree either at fair value or at the non-controlling interest's proportionate share of the acquiree's net assets.

The excess of the consideration transferred, the amount of any non-controlling interest in the acquiree and the acquisition-date fair value of any previous equity interest in the acquiree over the fair value of the identifiable net assets of the subsidiary acquired is recorded as goodwill.

8.2 Principal subsidiaries and joint operations

SUBSIDIARIES	COUNTRY OF INCORPORATION	HOLDING % 2019	HOLDING % 2018
Blandin Paper Company	US	100.00	100.00
Forestal Oriental S.A.	UY	100.00	100.00
Gebr. Lang GmbH Papierfabrik	DE	100.00	100.00
LLC UPM Ukraine	UA	100.00	100.00
Nordland Papier GmbH	DE	100.00	100.00
NorService GmbH	DE	100.00	100.00
nortrans Speditionsgesellschaft mbH	DE	100.00	100.00
OOO UPM-Kymmene	RU	100.00	100.00
OOO UPM-Kymmene Chudovo	RU	100.00	100.00
PT UPM Raflatac Indonesia	ID	100.00	100.00
Rhein Papier GmbH	DE	100.00	100.00
Steyrermühl Sägewerksgesellschaft m.b.H. Nfg KG	AT	100.00	100.00
UPM (China) Co., Ltd	CN	100.00	100.00
UPM (Vietnam) Ltd	VN	100.00	100.00
UPM AG	CH	100.00	100.00
UPM AS	EE	100.00	100.00
UPM Asia Pacific Pte. Ltd	SG	100.00	100.00
UPM Biofuels S.A.	UY	100.00	100.00
UPM Communication Papers Oy	FI	100.00	100.00
UPM Energy Oy	FI	100.00	100.00
UPM France S.A.S.	FR	100.00	100.00
UPM GmbH	DE	100.00	100.00
UPM Manufatura e Comércio de Produtos Florestais Ltda	BR	100.00	100.00
UPM Plywood Oy	FI	100.00	100.00
UPM Pulp Sales Oy	FI	100.00	100.00
UPM Raflatac (China) Co., Ltd.	CN	100.00	100.00
UPM Raflatac (S) Pte Ltd	SG	100.00	100.00
UPM Raflatac (UK) Limited	GB	100.00	100.00
UPM Raflatac Chile SpA	CL	100.00	100.00
UPM Raflatac Co., Ltd	TH	100.00	100.00
UPM Raflatac Iberica S.A.	ES	100.00	100.00
UPM Raflatac Inc.	US	100.00	100.00
UPM Raflatac Mexico S.A. de C.V.	MX	100.00	100.00
UPM Raflatac NZ Limited	NZ	100.00	100.00
UPM Raflatac Oy	FI	100.00	100.00
UPM Raflatac Pty Ltd	AU	100.00	100.00
UPM Raflatac s.r.l.	AR	100.00	100.00
UPM Raflatac SAS	FR	100.00	100.00
UPM Raflatac Sdn. Bhd.	MY	100.00	100.00
UPM Raflatac South Africa (Pty) Ltd	ZA	100.00	100.00
UPM Raflatac Sp.z.o.o.	PL	100.00	100.00
UPM S.A.	UY	91.00	91.00
UPM Sales GmbH	DE	100.00	100.00
UPM Sales Oy	FI	100.00	100.00
UPM Silvesta Oy	FI	100.00	100.00
UPM Specialty Papers Oy	FI	100.00	100.00
UPM Sähkönsiirto Oy	FI	100.00	100.00
UPM-Kymmene (Korea) Ltd	KR	100.00	100.00
UPM-Kymmene (UK) Ltd	GB	100.00	100.00
UPM-Kymmene AB	SE	100.00	100.00
UPM-Kymmene Austria GmbH	AT	100.00	100.00
UPM-Kymmene B.V.	NL	100.00	100.00
UPM-Kymmene Inc.	US	100.00	100.00
UPM-Kymmene India Private Limited	IN	100.00	100.00
UPM-Kymmene Japan K.K.	JP	100.00	100.00
UPM-Kymmene Kagit Urunleri Sanayi ve Ticaret Ltd. Sti.	TR	100.00	100.00
UPM-Kymmene Otepää OÜ	EE	100.00	100.00
UPM-Kymmene S.A.	ES	100.00	100.00
UPM-Kymmene Seven Seas Oy	FI	100.00	100.00
UPM-Kymmene S.r.l.	IT	100.00	100.00
Werla Insurance Company Ltd	MT	100.00	100.00

The table includes subsidiaries with sales exceeding EUR 2 million in 2019.

JOINT OPERATIONS	COUNTRY OF INCORPORATION	HOLDING % 2019	HOLDING % 2018
Oy Alholmens Kraft Ab (Pohjolan Voima Oyj, G series)	FI	27.88	27.88
EEVG Entsorgungs- und Energieverwertungsgesellschaft m.b.H.	AT	50.00	50.00
Järvi-Suomen Voima Oy	FI	50.00	50.00
Kainuun Voima Oy	FI	50.00	50.00
Kaukaan Voima Oy (Pohjolan Voima Oyj, G9 series)	FI	54.00	54.00
Kymin Voima Oy (Pohjolan Voima Oyj, G2 series)	FI	76.00	76.00
Madison Paper Industries	US	50.00	50.00
Rauman Biovoima Oy (Pohjolan Voima Oyj, G4 series)	FI	71.95	71.95

8.3 Related party transactions

The Board of Directors and the Group Executive Team

There have not been any material transactions between UPM and its members of the Board of Directors or the Group Executive Team (key management personnel) or persons closely associated with these members or organisations in which these individuals have control or significant influence. There are no loans granted to any members of the Board of Directors or the Group Executive Team at 31 December 2019 and 2018.

For information concerning shares held by members of the Board of Directors as well as remuneration to members of the Board of Directors and the Group Executive Team are disclosed in **» Note 3.2.** *Key management personnel.*

Associates and joint ventures

In Finland, the group organises its producer's responsibility of recovered paper collection through Encore Ympäristöpalvelut Oy (until 1.1.2019 by name Paperinkeräys Oy). Austria Papier Recycling GmbH purchases recovered paper in Austria and L.C.I s.r.l. in Italy. ASD Altpapier Sortierung Dachau GmbH is a German recovered paper sorting company. The purchases from those four companies represented approximately 93% (89%) of total recovered paper purchase amount from associates and joint ventures.

Transactions with associates and joint ventures are presented in the table below. The group has no individually material associates or joint ventures.

EURm	2019	2018
Dividends received	2	2
Purchases of raw materials and services	73	87
Loan receivables	5	6
Trade and other receivables	1	1
Trade and other payables	6	9

Subsidiaries and joint operations

» Refer Note 8.2 *Principal subsidiaries and joint operations.*

Pension Funds

In Finland, the group has the pension foundation, UPM Sellutehtaiden eläkesäätiö, which is a separate legal entity. Pensions for about 18% (18%) of the group's Finnish employees are arranged through the Foundation.

In 2019, the contributions paid by UPM to the Foundation amounted to EUR 20 million (23 million). The Foundation manages and invests the contributions paid to the plan. The fair value of the Foundation's assets at 31 December 2019 was EUR 537 million (470 million), of which 50% was in the form of equity instruments, 42% in the form of debt instruments and 8% was invested in property and money market.

In the UK, the single UPM Pension Scheme operates under a Trust which is independent from the group. The Trust consists of various defined benefit sections, all of which are closed to future accrual and one common defined contribution section which is open to all UPM employees in the UK. The group made contributions of EUR 8 million (8 million) to the defined benefit sections of the Scheme in 2019. The fair value of the UK defined benefit fund assets at 31 December 2019 was EUR 491 million (417 million), of which 10% was invested in equity instruments, 43% in debt instruments, 42% in property and money market and 5% in other investments.

8.4 Assets held for sale

Assets classified as held for sale EUR 18 million relate to UPM Chapelle paper mill assets located in France. In September UPM announced that it plans to sell its Chapelle newsprint mill in Grand-Couronne, France.

No assets were classified as held for sale at the end of 2018.

Accounting policies

Non-current assets (or disposal groups) are classified as assets held for sale and stated at the lower of carrying amount and fair value less costs to sell, if UPM will recover their carrying amount through a sale transaction which is considered highly probable. Non-current assets classified as held for sale, or included within a disposal group that is classified as held for sale, are not depreciated after the classification.

9. Unrecognised items

9.1 Commitments and contingencies

In the normal course of business, UPM enters into various agreements providing financial or performance assurance to third parties. The maximum amounts of future payments for which UPM is liable is disclosed in the table below under "Other commitments". Property under mortgages given as collateral for own commitments include property, plant and equipment, industrial estates and forest land.

EURm	2019	2018
On own behalf		
Mortgages	1	1
On behalf of others		
Guarantees	2	2
Other own commitments		
Leasing commitments for the next 12 months in accordance with IFRS 16 [1]	6	90
Leasing commitments for subsequent periods [1]	—	464
Other commitments	104	92
Total	113	649

[1] Leasing commitments have decreased as a result of the adoption of IFRS 16 Leases 1 January 2019.

The lease commitments for leases not commenced at year end totals approximately EUR 100 million and these relate to long-term charter agreements.

9.2 Litigation

Contingent liabilities
The group is defendant or plaintiff in a number of legal proceedings incidental to its operations. These lawsuits primarily involve claims arising from commercial law issues.

Group companies
In 2012, UPM commenced arbitration proceedings against Metsäliitto Cooperative and Metsä Board Corporation due to their breaches of UPM's tag-along right under the shareholders' agreement concerning Metsä Fibre Oy in connection with the sale of shares in Metsä Fibre to Itochu Corporation. UPM claimed jointly from Metsäliitto and Metsä Board a capital amount of EUR 58.5 million. Metsäliitto and Metsä Board had sold a 24.9% holding in Metsä Fibre to Itochu Corporation for EUR 472 million. In connection with the transaction with Itochu, Metsäliitto had exercised a call option to purchase UPM's remaining 11% shareholding in Metsä Fibre for EUR 150 million. The arbitral tribunal rendered its final decision (arbitral award) in February 2014 and ordered Metsäliitto and Metsä Board to pay UPM the capital amount of EUR 58.5 million and penalty interest and compensate UPM for its legal fees. As a result, UPM recorded an income of EUR 67 million as item affecting comparability in Q1 2014.

In May 2014 Metsäliitto and Metsä Board commenced litigation proceedings in the Helsinki District Court challenging the arbitral award and requesting the District Court to set aside the arbitral award or to declare it null and void. In June 2015 the District Court rejected the actions by Metsäliitto and Metsä Board and following an appeal the Helsinki Court of Appeal rejected the actions by Metsäliitto and Metsä Board in October 2016. Metsäliitto and Metsä Board filed a request for leave of appeal with the Supreme Court.

In March 2019 the Supreme Court rendered its decision denying Metsäliitto and Metsä Board leave to appeal as a result of which the judgement of the Court of Appeal remains final.

9.3 Events after the balance sheet date

On 27 January multiple Finnish labor unions started extensive three week labor actions in the Finnish forest industry. Consequently, production on all of UPM's Finnish pulp and paper mills, label stock mill as well as plywood and sawmills has stopped. UPM has prepared for the labor actions and strives to fulfill customer orders either from stocks or from the mills operating outside Finland.

On 27 January, UPM announced the commitment to the United Nations Global Compact's Business Ambition for 1.5°C, joining leading companies in a promise to pursue science-based measures to limit global temperature rise to 1.5°C. UPM will strive to mitigate climate change and drive value creation through innovating novel products, committing to a 65% CO_2 emission reduction from the 2015 levels by 2030 and by practicing sustainable forestry.

On 28 January UPM announced that it has started the employee consultation processes for the potential closure of UPM Chapelle newsprint mill in Grand-Couronne, France. These consultations are estimated to be concluded by end of Q2 2020. UPM will continue the sales process of the mill throughout the consultation process.

10. Other notes

10.1 Forthcoming new standards, amendments and accounting policy changes

Certain new accounting standards and interpretations have been published that are not mandatory for 31 December 2019 reporting periods. The group early adopted Phase 1 amendments IFRS 9 and IFRS 7 for IBOR reform. *» Refer Note 1.5 Changes in accounting policies for further information.*

Other standards are not expected to have a material impact on the group in the current or future reporting periods and on foreseeable future transactions and have not been early adopted.

Parent company accounts

(Finnish Accounting Standards, FAS)

Income statement

EURm	NOTE	2019	2018
Sales	1	2,318	2,484
Change in inventories of finished goods and work in progress		-2	—
Production for own use		5	4
Other operating income	2	18	154
Materials and services	3	-1,510	-1,494
Personnel expenses	4	-250	-242
Depreciation, amortisation and impairment charges	5	-111	-117
Other operating expenses	6	-192	-200
Operating profit		277	588
Financial income and expenses	7	516	312
Profit before closing entries and tax		793	900
Closing entries	8	6	3
Income taxes	9	-43	-122
Profit for the period		756	780

Balance sheet

EURm	NOTE	2019	2018
ASSETS			
Intangible assets	10	45	36
Tangible assets	11	1,599	1,646
Holdings in group companies	12	3,077	4,136
Holdings in participating interest companies	12	5	5
Other shares and holdings	12	3	3
Receivables from group companies	12	864	646
Receivables from participating interest companies	12	4	4
Other non-current receivables	12	7	7
Non-current assets		5,603	6,482
Inventories	13	206	267
Trade receivables	14	27	30
Receivables from group companies	14	944	1,180
Receivables from participating interest companies	14	8	5
Other current receivables	14	52	75
Cash and cash equivalents		1,382	770
Current assets		2,619	2,327
Assets		8,223	8,809

EURm	NOTE	2019	2018
EQUITY AND LIABILITIES			
Share capital	15	890	890
Revaluation reserve	15	142	142
Reserve for invested non-restricted equity	15	1,273	1,273
Retained earnings	15	1,940	1,853
Profit for the period	15	756	780
Equity		5,000	4,938
Accumulated depreciation difference		440	446
Provisions	16	49	101
Bonds	17	334	328
Payables to group companies	17	115	385
Other non-current liabilities	17	172	167
Non-current liabilities		621	879
Advances received	18	1	—
Trade payables	18	241	267
Payables from group companies	18	1,703	1,919
Payables from participating interest companies	18	—	1
Other current liabilities	18	168	258
Current liabilities		2,112	2,445
Liabilities		2,733	3,324
Equity and liabilities		8,223	8,809

Cash flow statement

EURm	2019	2018
Cash flows from operating activities		
Profit before closing entries and tax	793	900
Financial income and expenses	-516	-312
Adjustments to operating profit [1]	59	13
Change in working capital [2]	266	-238
Interest received	47	39
Interest paid	-31	-25
Dividends received	534	328
Other financial items	-61	17
Income taxes paid	-45	-103
Operating cash flow	1,046	618
Cash flows from investing activities		
Investments in tangible and intangible assets	-83	-79
Investments in shares and holdings	-197	-14
Proceeds from sale of intangible and tangible assets	12	131
Proceeds from disposal of shares and holdings	1,257	243
Change in other non-current receivables	-217	49
Investing cash flow	773	329
Cash flows from financing activities		
Payments of non-current liabilities	-270	-269
Change in current liabilities	-238	118
Dividends paid	-693	-613
Group contributions, net	-6	-2
Financing cash flow	-1,207	-765
Change in cash and cash equivalents	612	182
Cash and cash equivalents at beginning of period	770	589
Change in cash and cash equivalents	612	182
Cash and cash equivalents at end of period	1,382	770

[1] Adjustments to operating profit

EURm	2019	2018
Depreciation, amortisation and impairment charges	111	117
Capital gains and losses on sale of non-current assets	-2	-141
Change in provisions	-50	37
Total	59	13

[2] Change in working capital

EURm	2019	2018
Inventories	60	-124
Current receivables	260	-184
Current non-interest-bearing liabilities	-54	69
Total	266	-238

Notes to the parent company financial statements

Accounting policies

The financial statements of the parent company are prepared in accordance with Finnish Accounting Standards, FAS. The main differences in accounting policies of the group and the parent company relate to the measurement of financial derivatives and forest assets and recognition of defined benefit obligations, lease agreements and deferred income taxes. The financial statements are presented in millions of euros and rounded and therefore the sum of individual figures might deviate from the presented total figure.

1. Sales

Sales by business area

EURm	2019	2018
UPM Biorefining	1,876	2,005
Other operations	442	479
Total	2,318	2,484

Sales by destination

EURm	2019	2018
Finland	2,275	2,432
Other EU countries	22	27
Other countries	21	25
Total	2,318	2,484

2. Other operating income

EURm	2019	2018
Gains on sale of non-current assets	5	140
Rental income	10	12
Other	3	2
Total	18	154

3. Materials and services

EURm	2019	2018
Raw materials and consumables	1,460	1,599
Change in inventories	45	-109
Delivery costs and other external charges	5	5
Total	1,510	1,494

4. Personnel expenses

EURm	2019	2018
Salaries and fees of the President and CEO, and members of the Board of Directors [1]	7	7
Other salaries and fees	206	194
Pension costs	31	35
Other indirect employee costs	7	7
Total	250	242

[1] » Refer Note 3.2 *Key management personnel*

Personnel

	2019	2018
Total on average	3,070	2,990

5. Depreciation, amortisation and impairment charges

EURm	2019	2018
Intangible rights	2	2
Other intangible assets	6	8
Buildings	19	20
Machinery and equipment	80	83
Other tangible assets	3	4
Total	111	117

6. Other operating expenses

EURm	2019	2018
Rents and lease expenses	13	7
Losses on sale of non-current assets	3	1
Maintenance expenses	84	95
Other operating expenses [1]	92	97
Total	192	200

[1] The research and development costs in operating expenses were EUR 24 million (21 million) and auditor's fee EUR 1.4 million (0.7 million). In personnel expenses the research and development costs were EUR 16 million (16 million).

7. Financial income and expenses

EURm	2019	2018
Income on non-current assets		
Dividend income from group companies	534	328
Interest income from group companies	6	6
	540	334
Other interest and financial income		
Other interest income from group companies	40	32
Other interest income from other companies	1	—
Other financial income from group companies	—	13
Other financial income from other companies	—	2
	41	47
Value adjustments	—	2
Interest and other financial expenses		
Interest expenses to group companies	-13	-12
Interest expenses to other companies	-16	-13
Other financial expenses to group companies	-3	—
Other financial expenses to other companies	-32	-46
	-65	-71
Total	516	312

8. Closing entries

EURm	2019	2018
Change in accumulated depreciation difference	-6	-9
Group contributions granted	—	6
Total	-6	-3

9. Income taxes

EURm	2019	2018
Tax expense for the period	43	122
Total	43	122

Deferred tax assets and liabilities [1]

EURm	2019	2018
Deferred tax assets		
Provisions	10	20
Share-based payments	2	2
Total	13	23
Deferred tax liabilities		
Accumulated depreciation difference	88	89
Revaluations of land areas	60	60
Total	148	149

[1] The parent company has not recognised deferred tax assets and liabilities in the balance sheet. Deferred tax assets and liabilities are calculated based on temporary differences between the carrying and taxable values of assets and liabilities.

10. Intangible assets

EURm	INTANGIBLE RIGHTS	OTHER INTANGIBLE ASSETS	ADVANCE PAYMENTS	TOTAL
2019				
Accumulated costs	18	248	27	293
Accumulated amortisation and impairments	-12	-236	—	-248
Carrying value, at 31 December	5	13	27	45
Carrying value, at 1 January	5	17	14	36
Additions	2	2	19	23
Disposals	—	—	-6	-6
Amortisation	-2	-6	—	-8
Carrying value, at 31 December	5	13	27	45
2018				
Accumulated costs	16	249	14	279
Accumulated amortisation and impairments	-11	-232	—	-243
Carrying value, at 31 December	5	17	14	36
Carrying value, at 1 January	5	23	8	35
Additions	2	1	12	15
Disposals	—	—	-5	-5
Amortisation	-2	-8	—	-10
Reclassifications	—	1	-1	—
Carrying value, at 31 December	5	17	14	36

11. Tangible assets

EURm	LAND AND WATER AREAS	BUILDINGS	MACHINERY AND EQUIPMENT	OTHER TANGIBLE ASSETS	ADVANCE PAYMENTS AND CONSTRUCTION IN PROGRESS	TOTAL
2019						
Accumulated costs	421	611	2,200	143	22	3,398
Accumulated amortisation and impairments	—	-381	-1,600	-118	—	-2,099
Revaluations	300	—	—	—	—	300
Carrying value, at 31 December	721	230	601	25	22	1,599
Carrying value, at 1 January	720	244	645	25	11	1,646
Additions	2	7	28	3	20	59
Disposals	-1	-3	—	—	—	-4
Depreciations	—	-19	-80	-3	—	-102
Reclassifications	—	1	8	—	-9	—
Carrying value, at 31 December	721	230	601	25	22	1,599
2018						
Accumulated costs	420	623	2,166	142	11	3,363
Accumulated amortisation and impairments	—	-379	-1,520	-117	—	-2,017
Revaluations	300	—	—	—	—	300
Carrying value, at 31 December	720	244	645	25	11	1,646
Carrying value, at 1 January	757	256	668	26	19	1,726
Additions	1	6	45	2	10	64
Disposals	-14	—	—	—	—	-14
Depreciations	—	-20	-83	-4	—	-107
Reclassifications	—	2	16	1	-18	—
Changes in revaluations	-23	—	—	—	—	-23
Carrying value, at 31 December	720	244	645	25	11	1,646

12. Other non-current assets

EURm	HOLDINGS IN GROUP COMPANIES	HOLDINGS IN PARTICIPATING INTEREST COMPANIES	OTHER SHARES AND HOLDINGS	RECEIVABLES FROM GROUP COMPANIES	RECEIVABLES FROM PARTICIPATING INTEREST COMPANIES	OTHER NON-CURRENT RECEIVABLES	TOTAL
2019							
Accumulated costs	4,492	5	3	864	4	7	5,375
Accumulated value adjustments	-1,415	—	—	—	—	—	-1,415
Carrying value, at 31 December	3,077	5	3	864	4	7	3,960
Carrying value, at 1 January	4,136	5	3	646	4	7	4,801
Additions	197	—	—	234	—	—	431
Disposals	-1,256	—	—	-16	—	—	-1,272
Carrying value, at 31 December	3,077	5	3	864	4	7	3,960
2018							
Accumulated costs	5,551	5	3	646	4	7	6,216
Accumulated value adjustments	-1,415	—	—	—	—	—	-1,415
Carrying value, at 31 December	4,136	5	3	646	4	7	4,801
Carrying value, at 1 January	4,363	5	4	699	4	7	5,080
Additions	14	—	—	8	—	—	22
Disposals	-243	—	—	-61	—	—	-304
Value adjustments [1]	2	—	—	—	—	—	2
Carrying value, at 31 December	4,136	5	3	646	4	7	4,801

[1] Value adjustments are recognised under financial items.

13. Inventories

EURm	2019	2018
Raw materials and consumables	165	210
Finished products and goods	25	27
Advance payments	16	29
Carrying value, at 31 December	206	267

14. Current receivables

EURm	TOTAL	RECEIVABLES FROM GROUP COMPANIES	RECEIVABLES FROM PARTICIPATING INTEREST COMPANIES
2019			
Trade receivables	405	371	8
Loan receivables [1]	570	570	—
Prepayments and accrued income	31	1	—
Other current receivables	25	2	—
Carrying value, at 31 December	1,031	944	8
2018			
Trade receivables	564	529	5
Loan receivables [1]	650	650	—
Prepayments and accrued income	30	1	—
Other current receivables	46	—	—
Carrying value, at 31 December	1,290	1,180	5

[1] There were no loans granted to the company's President and CEO and members of the Board of Directors at 31 December 2019 and 2018.

EURm	2019	2018
Prepayments and accrued income		
Energy taxes	7	6
Personnel expenses	—	1
Interest income	6	10
Exchange gains and losses	10	7
Income taxes	5	4
Other items	2	3
Carrying value, at 31 December	31	30

15. Equity

EURm	SHARE CAPITAL	REVALUATION RESERVE	RESERVE FOR INVESTED NON-RESTRICTED EQUITY	RETAINED EARNINGS	PROFIT/LOSS FOR THE PERIOD	TOTAL SHAREHOLDER'S EQUITY
2019						
Carrying value, at 1 January	890	142	1,273	1,853	780	4,938
Transfer of profit from previous year	—	—	—	780	-780	—
Profit for period	—	—	—	—	756	756
Dividend distribution	—	—	—	-693	—	-693
Carrying value, at 31 December	890	142	1,273	1,940	756	5,000
2018						
Carrying value, at 1 January	890	165	1,273	1,608	859	4,794
Transfer of profit from previous year	—	—	—	859	-859	—
Profit for period	—	—	—	—	780	780
Dividend distribution	—	—	—	-613	—	-613
Changes in revaluations	—	-23	—	—	—	-23
Carrying value, at 31 December	890	142	1,273	1,853	780	4,938

EURm	2019	2018
Distributable funds		
Reserve for invested non-restricted equity	1,273	1,273
Retained earnings from previous years	1,940	1,853
Profit for the period	756	780
Total distributable funds at 31 December	3,969	3,906

16. Provisions

EURm	RESTRUCTURING	TERMINATION	ENVIRONMENTAL	OTHER [1]	TOTAL
2019					
Provisions at 1 January	3	4	8	85	101
Provisions made during the year	—	1	—	—	1
Provisions utilised during the year	—	-3	—	-50	-53
Carrying value, at 31 December	3	3	8	35	49
2018					
Provisions at 1 January	3	5	9	49	65
Provisions made during the year	—	—	—	37	37
Provisions utilised during the year	—	-1	—	—	-1
Carrying value, at 31 December	3	4	8	85	101

[1] Other provisions are attributable to onerous contracts and fair value losses of financial derivatives. At the end of 2019 the fair value loss in other provisions of EUR 7 million (11 million) was attributable to one group internal cross currency swap with nominal value of EUR 76 million (85 million) and maturity in 2027. Changes in provisions are recognised in sales, materials, personnel or other operating expenses or financial expenses.

17. Non-current liabilities

EURm	2019	2018
Bonds	334	328
Payables to group companies	115	385
Other non-current liabilities	172	167
Carrying value, at 31 December	621	879

Maturity in 2025 (in 2024) or later

EURm	2019	2018
Bonds	334	328
Other non-current liabilities	172	167
Total	506	494

Bonds

FIXED RATE PERIOD	INTEREST RATE, %	CURRENCY	NOMINAL VALUE ISSUED, MILLION	CARRYING VALUE 2019 EURm	CARRYING VALUE 2018 EURm
1997–2027	7.450	USD	375	334	328
Carrying value, at 31 December				334	328
Non-current portion				334	328

18. Current liabilities

EURm	TOTAL	PAYABLES TO GROUP COMPANIES	PAYABLES TO PARTICIPATING INTEREST COMPANIES
2019			
Advances received	1	—	—
Trade payables	293	51	—
Accrued expenses and deferred income	102	15	—
Other current liabilities	1,717	1,636	—
Carrying value, at 31 December	2,112	1,703	—
2018			
Trade payables	324	56	1
Accrued expenses and deferred income	137	18	—
Other current liabilities	1,984	1,844	—
Carrying value, at 31 December	2,444	1,919	1

EURm	2019	2018
Accrued expenses and deferred income		
Personnel expenses	78	77
Interest expenses	3	7
Exchange gains and losses	21	51
Other items	—	1
Carrying value, at 31 December	102	137

19. Commitments

EURm	2019	2018
Mortgages		
As security against own debt	1	1
Guarantees		
Guarantees for loans on behalf of Group companies	13	1
Other guarantees on behalf of Group companies	67	37
Other commitments		
Leasing commitments, due within 12 months	34	33
Leasing commitments, due after 12 months	64	81
Other commitments	62	77
Total	240	229

Pension commitments of the President and CEO and the members of the Group Executive Team

» Refer Note 3.2 Key management personnel.

Related party transactions

» Refer Note 8.3 Related party transactions.

Derivatives

All financial derivative contracts of the group are made by the parent company. All contracts are made with external counterparties except for one cross currency swap used in managing foreign currency risk of the group internal assets. Hedge accounting is not applied. The fair value losses of financial derivatives are recognised through the income statement and presented as a provision in the balance sheet.

Financial risks, fair values and maturities of the group external derivatives are disclosed in » Note 6.1 Financial risk management and in » Note 6.2 Derivatives and hedge accounting.

Auditor's report

(Translation of the Finnish Original)

To the Annual General Meeting of UPM-Kymmene Corporation

Report on the Audit of the Financial Statements

Opinion

In our opinion,
- the consolidated financial statements give a true and fair view of the group's financial position and financial performance and cash flows in accordance with International Financial Reporting Standards (IFRS) as adopted by the EU
- the financial statements give a true and fair view of the parent company's financial performance and financial position in accordance with the laws and regulations governing the preparation of the financial statements in Finland and comply with statutory requirements.

Our opinion is consistent with the additional report to the Audit Committee.

What we have audited

We have audited the financial statements of UPM-Kymmene Corporation (business identity code: 1041090-0) for the year ended 31 December 2019. The financial statements comprise:
- the consolidated balance sheet, income statement, statement of comprehensive income, statement of changes in equity, statement of cash flows and notes, including a summary of significant accounting policies
- the parent company's balance sheet, income statement, statement of cash flows and notes.

Basis for opinion

We conducted our audit in accordance with good auditing practice in Finland. Our responsibilities under good auditing practice are further described in the *» Auditor's Responsibilities for the Audit of the Financial Statements* section of our report.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Independence

We are independent of the parent company and of the group companies in accordance with the ethical requirements that are applicable in Finland and are relevant to our audit, and we have fulfilled our other ethical responsibilities in accordance with these requirements.

To the best of our knowledge and belief, the non-audit services that we have provided to the parent company and to the group companies are in accordance with the applicable law and regulations in Finland and we have not provided non-audit services that are prohibited under Article 5(1) of Regulation (EU) No 537/2014.

Our audit approach

OVERVIEW	
Materiality	Overall group materiality: EUR 60 million, which represents approximately 5% of the average of the profit before tax for the last three years.
Group scoping	The group audit scope encompassed all significant group companies, as well as a number of smaller group companies in Europe, Asia, North America and South America covering the vast majority of revenue, assets and liabilities.
Key audit matters	Valuation of forest assets Valuation of energy shareholdings Recoverability of deferred tax assets

As part of designing our audit, we determined materiality and assessed the risks of material misstatement in the financial statements. In particular, we considered where management made subjective judgements; for example, in respect of significant accounting estimates that involved making assumptions and considering future events that are inherently uncertain.

Materiality

The scope of our audit was influenced by our application of materiality. An audit is designed to obtain reasonable assurance whether the financial statements are free from material misstatement. Misstatements may arise due to fraud or error. They are considered material if individually or in aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of the financial statements.

Based on our professional judgement, we determined certain quantitative thresholds for materiality, including the overall group materiality for the consolidated financial statements as set out in the table below. These, together with qualitative considerations, helped us to determine the scope of our audit and the nature, timing and extent of our audit procedures and to evaluate the effect of misstatements on the financial statements as a whole.

MATERIALITY	
Overall group materiality	EUR 60 million (previous year EUR 60 million)
How we determined it	Approximately 5% of the average of the profit before tax for the last three years.
Rationale for the materiality benchmark applied	We chose profit before taxes as the benchmark because, in our view, it is the benchmark against which the performance of the Group is commonly measured by users, and is a generally accepted benchmark. We chose approximately 5%, which is within the range of acceptable quantitative materiality thresholds in auditing standards.

How we tailored our group audit scope

We tailored the scope of our audit, taking into account the structure of the UPM-Kymmene Group, the accounting processes and controls, and the industry in which the group operates.

We determined the type of work that needed to be performed at group companies by us, as the group engagement team, or by auditors from other PwC network firms operating under our instruction. Audits were performed in group companies which were considered significant either because of their individual financial significance or due to their specific nature, covering the majority of revenue, assets and liabilities of the group. Selected specified procedures as well as analytical procedures were performed to cover the remaining group companies.

Key audit matters

Key audit matters are those matters that, in our professional judgment, were of most significance in our audit of the financial statements of the current period. These matters were addressed in the context of our audit of the financial statements as a whole, and in forming our opinion thereon, and we do not provide a separate opinion on these matters.

As in all of our audits, we also addressed the risk of management override of internal controls, including among other matters consideration of whether there was evidence of bias that represented a risk of material misstatement due to fraud.

KEY AUDIT MATTER IN THE AUDIT OF THE GROUP	HOW OUR AUDIT ADDRESSED THE KEY AUDIT MATTER
Valuation of forest assets *» Refer Note 4.2 in the consolidated financial statements for the related disclosures.* The group owns and leases total of 991 thousand hectares of forests and plantations in Finland, the United States and Uruguay valued at EUR 2 097 million at 31 December 2019. Forest assets are measured at fair value less cost to sell. The fair value is calculated on the basis of discounted future expected cash flows as there is a lack of a liquid market. Young saplings and land are valued at cost. Main factors used in the valuation are estimates for growth and wood harvested, stumpage prices and discount rates. We focused on this area as the amounts are material, the valuation process is complex and judgmental and is based on assumptions that are affected by expected future market or economic conditions.	In testing the valuation of forest assets, in conjunction with our valuation specialists we: • Assessed the methodologies adopted by management for the valuation; • Tested the mathematical accuracy of the model used for valuation; • Assessed the discount rates applied in the valuation; • Assessed the other key valuation assumptions; and, • Validated key inputs and data used in valuation model such as stumpage price, trend price forecast, tree growth assumptions, consumer price index and inflation.
Valuation of energy shareholdings *» Refer Note 4.3 in the consolidated financial statements for the related disclosures.* The energy shareholdings amounted to EUR 2 145 million at 31 December 2019. The energy shareholdings are unlisted equity investments in energy companies and are valued at fair value through other comprehensive income, net of tax if applicable. The fair value is determined on a discounted cash flow basis. The main factors impacting the future cash flows include future electricity prices, price trends, discount rates and the start-up schedule of the nuclear power plant unit Olkiluoto 3. We focused on this area as the amounts are material, the valuation process is complex and judgmental and is based on assumptions that are affected by expected future market or economic conditions.	In testing the valuation of the energy shareholdings, in conjunction with our valuation specialists we: • Assessed the methodology adopted by management for the valuation; • Tested the mathematical accuracy of the model used for valuation; • Assessed the future electricity prices and price trends; • Assessed the discount rate applied in the valuation; • Validated the Olkiluoto 3 nuclear power plant unit start-up schedule against the most recent available information; • Validated key inputs and data used in valuation model such as production costs and volumes, UPM's ownership percentages, inflation, tax rate and net debt.
Recoverability of deferred tax assets *» Refer Note 7.2 in the consolidated financial statements for the related disclosures.* The Group has recognised deferred tax assets of EUR 182 million on net operating loss carry-forwards, of which most relates to German subsidiaries. In Germany the net operating loss carry-forwards do not expire. We focused on this area because the recognition of deferred tax assets relies on the significant application of judgement by the Management in respect of assessing the probability and sufficiency of future taxable profits.	We assessed whether historical profitability in German subsidiaries support the recognition of the deferred tax asset. Despite recent history of profits for the German tax group we also assessed whether the Management's forecasts of future profitability support the recoverability of deferred tax assets.
We have no key audit matters to report with respect to our audit of the parent company financial statements.	
There are no significant risks of material misstatement referred to in Article 10(2c) of Regulation (EU) No 537/2014 with respect to the consolidated financial statements or the parent company financial statements.	

Responsibilities of the Board of Directors and the Managing Director for the Financial Statements

The Board of Directors and the Managing Director are responsible for the preparation of consolidated financial statements that give a true and fair view in accordance with International Financial Reporting Standards (IFRS) as adopted by the EU, and of financial statements that give a true and fair view in accordance with the laws and regulations governing the preparation of financial statements in Finland and comply with statutory requirements. The Board of Directors and the Managing Director are also responsible for such internal control as they determine is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, the Board of Directors and the Managing Director are responsible for assessing the parent company's and the group's ability to continue as a going concern, disclosing, as applicable, matters relating to going concern and using the going concern basis of accounting. The financial statements are prepared using the going concern basis of accounting unless there is an intention to liquidate the parent company or the group or to cease operations, or there is no realistic alternative but to do so.

Auditor's Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with good auditing practice will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

As part of an audit in accordance with good auditing practice, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the parent company's or the group's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of the Board of Directors' and the Managing Director's use of the going concern basis of accounting and based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the parent company's or the group's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the parent company or the group to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events so that the financial statements give a true and fair view.
- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the group to express an opinion on the consolidated financial statements. We are responsible for the direction, supervision and performance of the group audit. We remain solely responsible for our audit opinion.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

We also provide those charged with governance with a statement that we have complied with relevant ethical requirements regarding independence, and to communicate with them all relationships and other matters that may reasonably be thought to bear on our independence, and where applicable, related safeguards.

From the matters communicated with those charged with governance, we determine those matters that were of most significance in the audit of the financial statements of the current period and are therefore the key audit matters. We describe these matters in our auditor's report unless law or regulation precludes public disclosure about the matter or when, in extremely rare circumstances, we determine that a matter should not be communicated in our report because the adverse consequences of doing so would reasonably be expected to outweigh the public interest benefits of such communication.

Other reporting requirements

Appointment

We have been acting as auditors appointed by the annual general meeting since 30 April 1996. Our appointment represents a total period of uninterrupted engagement of 24 years. The Company arranged the latest audit tendering process in 2013. Authorised Public Accountant (KHT) Mikko Nieminen has acted as the responsible auditor since 4 April 2019, representing a total uninterrupted period of one year.

Other information

The Board of Directors and the Managing Director are responsible for the other information. The other information comprises the report of the Board of Directors and the information included in the Annual Report, but does not include the financial statements and our auditor's report thereon. We have obtained the report of the Board of Directors prior to the date of this auditor's report and the Annual Report is expected to be made available to us after that date.

Our opinion on the financial statements does not cover the other information.

In connection with our audit of the financial statements, our responsibility is to read the other information identified above and, in doing so, consider whether the other information is materially inconsistent with the financial statements or our knowledge obtained in the audit, or otherwise appears to be materially misstated. With respect to the report of the Board of Directors, our responsibility also includes considering whether the report of the Board of Directors has been prepared in accordance with the applicable laws and regulations.

In our opinion
- the information in the report of the Board of Directors is consistent with the information in the financial statements
- the report of the Board of Directors has been prepared in accordance with the applicable laws and regulations.

If, based on the work we have performed on the other information that we obtained prior to the date of this auditor's report, we conclude that there is a material misstatement of this other information, we are required to report that fact. We have nothing to report in this regard.

Other Statements

We support the proposal that the financial statements are adopted. The proposal by the Board of Directors regarding the distribution of profits is in compliance with the Limited Liability Companies Act. We support that the Members of the Board of Directors and the Managing Director of the parent company should be discharged from liability for the financial period audited by us.

Helsinki 14 February 2020

PricewaterhouseCoopers Oy
Authorised Public Accountants

Mikko Nieminen
Authorised Public Accountant (KHT)

Other financial information

Alternative performance measures

UPM presents certain performance measures of historical performance, financial position and cash flows, which in accordance with the "Alternative Performance Measures" guidance issued by the European Securities and Markets Authority (ESMA) are not accounting measures defined or specified in IFRS and are therefore considered as alternative performance measures. These alternative performance measures are described below:

ALTERNATIVE PERFORMANCE MEASURE	DEFINITION
Operating profit	Profit before income tax expense, finance expenses and finance income and net gains on sale of energy shareholdings as presented on the face of the IFRS income statement. Gains on sale of energy shareholdings are not recorded to the income statement from 2018 onwards.
Comparable EBIT	Operating profit adjusted for items affecting comparability.
Comparable EBITDA	Operating profit before depreciation, amortisation and impairments, change in fair value of forest assets and wood harvested, share of results of associates and joint ventures and items affecting comparability.
Comparable profit before tax	Profit before income tax expense excluding items affecting comparability.
Comparable profit for the period	Profit for the period excluding items affecting comparability and their tax impact.
Comparable EPS, EUR	Earnings per share calculated in accordance with IFRS excluding items affecting comparability and their tax impact.
Net debt	Total of current and non-current debt less cash and cash equivalents and interest-bearing current and non-current financial assets.
Items affecting comparability	Certain non-operational or non-cash valuation transactions with significant income statement impact are considered as items affecting comparability, if they arise from asset impairments, restructuring measures, asset sales, fair value changes of forest assets resulting from changes in valuation parameters or estimates or changes in legislation or legal proceedings. In addition, the changes in fair value of unrealised cash flow and commodity hedges are classified as items affecting comparability. Numerical threshold for items to be considered as significant in UPM's business areas UPM Biorefining, UPM Specialty Papers and UPM Communication Papers is determined as one cent (EUR 0.01) after tax per share or more. In other business areas, the impact is considered to be significant if the item exceeds EUR 1 million before tax.
Free cash flow	Cash generated from operations after cash used for investing activities.
Return on equity (ROE), %	Profit for the period as a percentage of average equity.
Comparable ROE, %	Return on equity (ROE) excluding items affecting comparability.
Return on capital employed (ROCE), %	Profit before taxes, interest expenses and other financial expenses as a percentage of average capital employed.
Comparable ROCE, %	Return on capital employed (ROCE) excluding items affecting comparability.
Capital employed	Group total equity and total debt.
Business area's comparable ROCE, %	Business area's operating profit adjusted for items affecting comparability as a percentage of business area's average capital employed.
Business area's capital employed	Business area's operating assets less its operating liabilities. Operating assets include goodwill, other intangible assets, property, plant and equipment, forest assets, energy shareholdings, investments in associates and joint-ventures, inventories and trade receivables. Operating liabilities include trade payables and advances received.
Capital expenditure	Capitalised investments in property, plant and equipment, intangible assets including goodwill arising from business combinations, energy shareholdings and other shares, associates and joint ventures.
Capital expenditure excluding acquisitions and shares	Capital expenditure excluding investments in shares and participations.
Operating cash flow per share, EUR	Operating cash flow divided by adjusted average number of shares during the period excluding treasury shares.
Gearing ratio, %	Net debt as a percentage of total equity
Net debt to EBITDA	Net debt divided by EBITDA
Equity to assets ratio, %	Equity expressed as a percentage of total assets less advances received.

Reconciliation of key figures to IFRS

EURm, OR AS INDICATED	Q4/19	Q3/19	Q2/19	Q1/19	Q4/18	Q3/18	Q2/18	Q1/18	Q1-Q4/19	Q1-Q4/18
Items affecting comparability										
Impairment charges	-1	-11	-1	—	—	—	—	—	-13	—
Restructuring charges	—	-18	-28	-5	-10	—	18	—	-52	9
Change in fair value of unrealised cash flow and commodity hedges	-6	1	6	4	6	-3	-2	—	5	—
Capital gains and losses on sale of non-current assets	—	2	-2	—	—	—	-2	30	—	29
Fair value changes of forest assets resulting from changes in estimates	—	—	—	—	345	—	—	—	—	345
Total items affecting comparability in operating profit	-7	-26	-26	-1	340	-3	15	30	-60	382
Taxes relating to items affecting comparability	10	5	-1	—	-68	1	-3	-9	14	-80
Items affecting comparability, total	2	-21	-26	-1	272	-2	11	21	-46	302
Comparable EBITDA										
Operating profit	336	316	319	373	744	417	349	385	1,344	1,895
Depreciation, amortisation and impairment charges excluding items affecting comparability	120	119	118	120	105	105	106	106	477	422
Change in fair value of forest assets and wood harvested excluding items affecting comparability	-19	-5	3	-5	-35	-27	3	-3	-26	-63
Share of results of associates and joint ventures	-1	-1	-1	-1	-1	-2	-1	-2	-3	-6
Items affecting comparability in operating profit	7	26	26	1	-340	3	-15	-30	60	-382
Comparable EBITDA	442	455	466	488	473	497	442	456	1,851	1,868
% of sales	18.1	18.2	17.9	18.1	17.3	18.7	17.1	18.2	18.1	17.8
Comparable EBIT										
Operating profit	336	316	319	373	744	417	349	385	1,344	1,895
Items affecting comparability in operating profit	7	26	26	1	-340	3	-15	-30	60	-382
Comparable EBIT	343	342	345	374	404	420	334	355	1,404	1,513
% of sales	14.0	13.7	13.2	13.9	14.8	15.9	12.9	14.1	13.7	14.4
Comparable profit before tax										
Profit before tax	324	319	300	364	731	401	337	371	1,307	1,839
Items affecting comparability in operating profit	7	26	26	1	-340	3	-15	-30	60	-382
Comparable profit before tax	331	345	325	366	390	404	322	341	1,367	1,457
Comparable ROCE, %										
Comparable profit before tax	331	345	325	366	390	404	322	341	1,367	1,457
Interest expenses and other financial expenses	14	10	11	8	7	9	8	9	44	33
	346	355	337	374	397	413	330	350	1,411	1,490
Capital employed, average	11,323	10,996	11,069	10,946	10,259	9,817	9,712	9,755	11,024	10,176
Comparable ROCE, %	12.2	12.9	12.2	13.7	15.5	16.8	13.6	14.3	12.8	14.6
Comparable profit for the period										
Profit for the period	263	260	245	304	591	328	269	309	1,073	1,496
Items affecting comparability, total	-2	21	26	1	-272	2	-11	-21	46	-302
Comparable profit for the period	261	281	271	305	319	330	258	288	1,119	1,194
Comparable EPS, EUR										
Comparable profit for the period	261	281	271	305	319	330	258	288	1,119	1,194
Profit attributable to non-controlling interest	2	-14	—	—	2	-2	—	-1	-12	-1
	263	267	271	305	321	328	258	287	1,106	1,193
Average number of shares basic (1,000)	533,324	533,324	533,324	533,324	533,324	533,324	533,324	533,324	533,324	533,324
Comparable EPS, EUR	0.49	0.50	0.51	0.57	0.60	0.61	0.48	0.54	2.07	2.24
Comparable ROE, %										
Comparable profit for the period	261	281	271	305	319	330	258	288	1,119	1,194
Total equity, average	10,015	9,706	9,804	9,924	9,491	8,959	8,856	8,821	9,986	9,230
Comparable ROE, %	10.4	11.6	11.1	12.3	13.4	14.6	11.6	13.0	11.2	12.9

Quarterly key figures are unaudited.

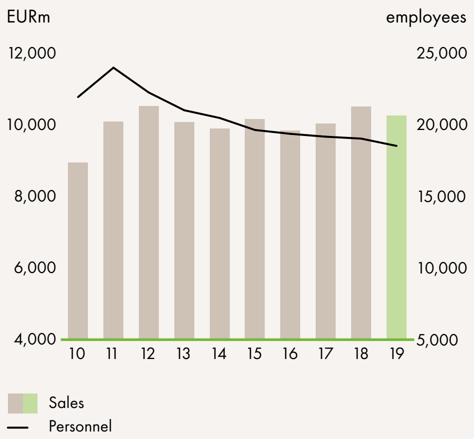
Financial information 2010–2019

EURm, OR AS INDICATED	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
Income statement										
Sales	10,238	10,483	10,010	9,812	10,138	9,868	10,054	10,492	10,068	8,924
Comparable EBITDA [1]	1,851	1,868	1,677	1,560	1,350	1,306	1,161	1,325	1,383	1,343
% of sales	18.1	17.8	16.8	15.9	13.3	13.2	11.5	12.6	13.7	15.0
Operating profit	1,344	1,895	1,259	1,135	1,142	674	548	-1,318	459	755
% of sales	13.1	18.1	12.6	11.6	11.3	6.8	5.5	-12.6	4.6	8.5
Comparable EBIT	1,404	1,513	1,292	1,143	916	866	683	556	682	731
% of sales	13.7	14.4	12.9	11.6	9.0	8.8	6.8	5.3	6.8	8.2
Profit before tax	1,307	1,839	1,186	1,080	1,075	667	475	-1,271	417	635
% of sales	12.8	17.5	11.9	11.0	10.6	6.8	4.7	-12.1	4.1	7.1
Comparable profit before tax	1,367	1,457	1,218	1,089	849	793	610	471	573	611
% of sales	13.4	13.9	12.2	11.1	8.4	8.0	6.1	4.5	5.7	6.8
Profit for the period	1,073	1,496	974	880	916	512	335	-1,122	457	561
% of sales	10.5	14.3	9.7	9.0	9.0	5.2	3.3	-10.7	4.5	6.3
Comparable profit for the period	1,119	1,194	1,004	879	734	638	479	390	487	516
% of sales	10.9	11.4	10.0	9.0	7.2	6.5	4.8	3.7	4.8	5.8
Balance sheet										
Non-current assets	10,140	9,501	9,144	9,715	10,259	10,269	10,487	11,066	11,412	10,557
Inventories	1,367	1,642	1,311	1,346	1,376	1,356	1,327	1,388	1,429	1,299
Other current assets	3,215	2,853	2,612	2,850	2,558	2,570	2,785	2,489	2,548	1,956
Total assets	14,722	13,996	13,067	13,911	14,193	14,195	14,599	14,943	15,389	13,812
Total equity	10,175	9,797	8,663	8,237	7,944	7,480	7,455	7,461	7,477	7,109
Non-current liabilities	2,730	2,194	2,254	3,364	4,328	4,717	5,019	5,430	5,320	4,922
Current liabilities	1,818	2,005	2,150	2,309	1,921	1,998	2,125	2,052	2,588	1,781
Total equity and liabilities	14,722	13,996	13,067	13,911	14,193	14,195	14,599	14,943	15,389	13,812
Capital employed at year end	11,474	10,575	9,777	10,657	11,010	10,944	11,583	11,603	12,110	11,087
Capital expenditure	378	303	329	325	520	411	362	357	1,179	257
% of sales	3.7	2.9	3.3	3.3	5.1	4.2	3.6	3.4	11.7	2.9
Capital expenditure excluding acquisitions and shares	378	303	303	325	486	375	329	347	340	252
% of sales	3.7	2.9	3.0	3.3	4.8	3.8	3.3	3.3	3.4	2.8
Cash flow and net debt										
Operating cash flow	1,847	1,330	1,460	1,686	1,185	1,241	735	1,040	1,041	982
Free cash flow	1,432	1,131	1,336	1,424	750	994	438	968	910	787
Net debt	-453	-311	174	1,131	2,100	2,401	3,040	3,210	3,592	3,286
Key figures										
Return on capital employed (ROCE), %	12.3	18.4	12.5	10.5	10.3	6.5	4.8	neg.	4.4	6.6
Comparable ROCE, %	12.8	14.6	12.8	10.6	8.3	7.6	6.0	4.2	5.2	6.4
Return on equity (ROE), %	10.7	16.2	11.5	10.9	11.9	6.9	4.5	neg.	6.3	8.2
Comparable ROE, %	11.2	12.9	11.9	10.9	9.5	8.5	6.4	4.2	6.7	7.5
Gearing ratio, %	-4	-3	2	14	26	32	41	43	48	46
Net debt to EBITDA	-0.24	-0.17	0.10	0.73	1.56	1.84	2.62	2.42	2.60	2.45
Equity to assets ratio, %	69.2	70.1	66.6	59.4	56.1	52.7	51.1	50.0	48.6	51.5
Personnel										
Personnel at year end	18,742	18,978	19,111	19,310	19,578	20,414	20,950	22,180	23,909	21,869
Deliveries										
Pulp (1,000 t)	3,715	3,468	3,595	3,419	3,224	3,287	3,163	3,128	2,992	2,919
Electricity (GWh)	8,619	8,608	8,127	8,782	8,966	8,721	8,925	9,486	8,911	9,426
Papers, total (1,000 t)	8,326	8,996	9,430	9,613	9,771	10,028	10,288	10,871	10,615	9,914
Plywood (1,000 m3)	739	791	811	764	740	731	737	679	656	638
Sawn timber (1,000 m3)	1,741	1,719	1,728	1,751	1,731	1,609	1,661	1,696	1,683	1,729

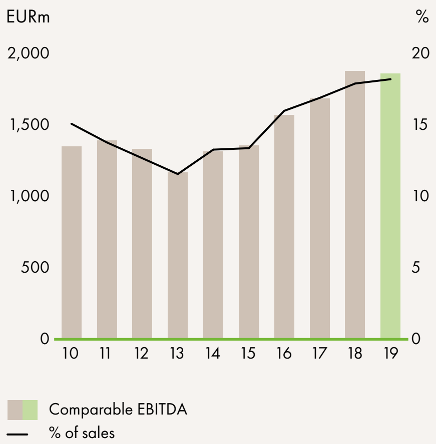
[1] EBITDA 2010–2011 includes change in fair value of unrealised cash flow and commodity hedges.

FINANCIAL INFORMATION 2010–2019

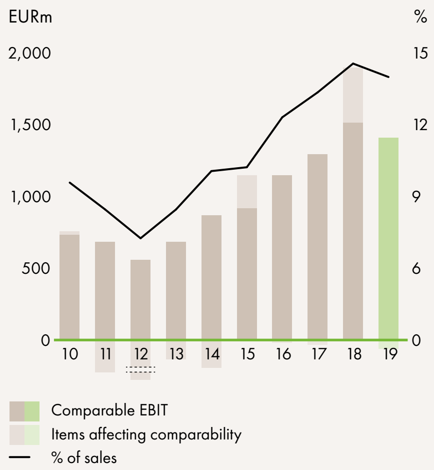
Sales and personnel



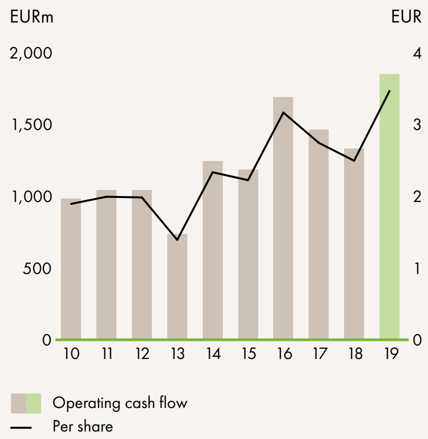
Comparable EBITDA



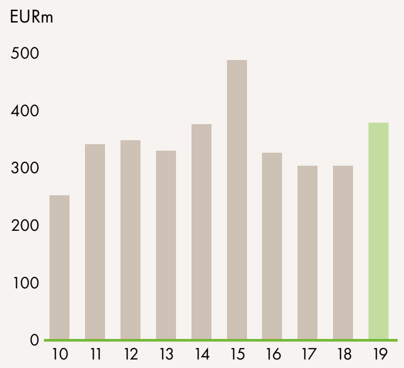
Comparable EBIT



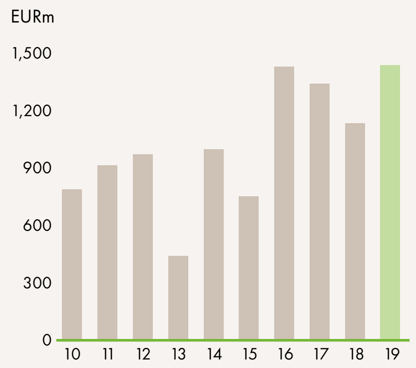
Operating cash flow



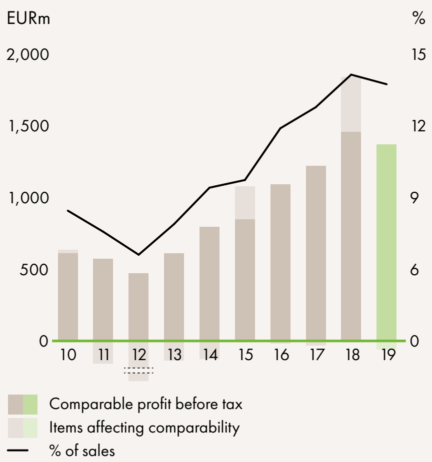
Capital expenditure excluding acquisitions and shares



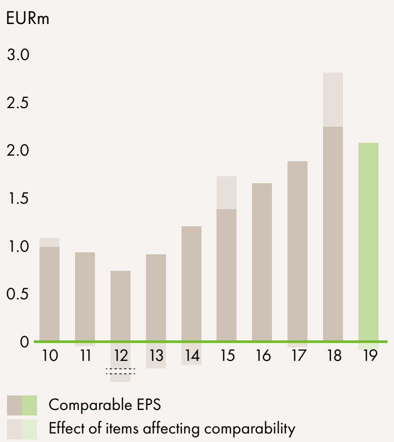
Free cash flow



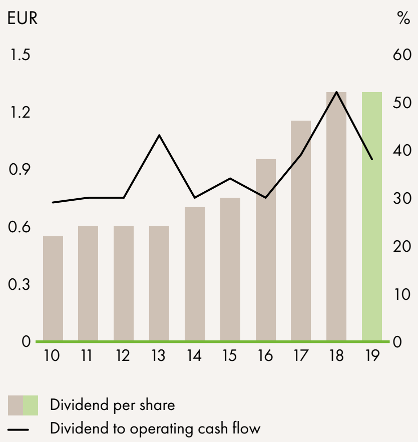
Comparable profit before tax



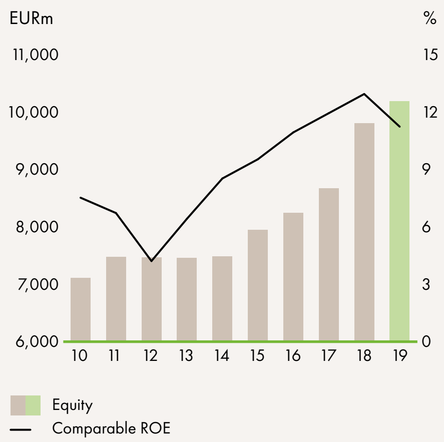
Comparable earnings per share



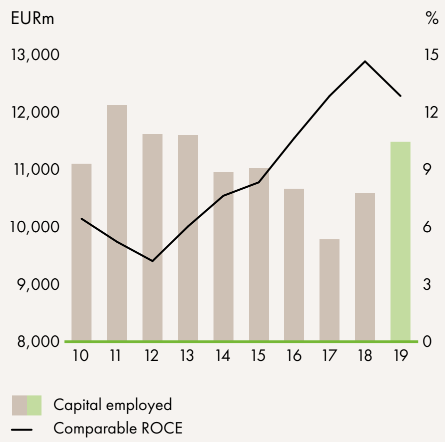
Dividend per share



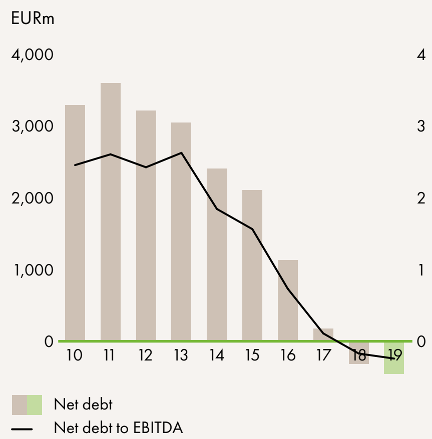
Equity and comparable ROE



Capital employed and comparable ROCE



Net debt and net debt to EBITDA

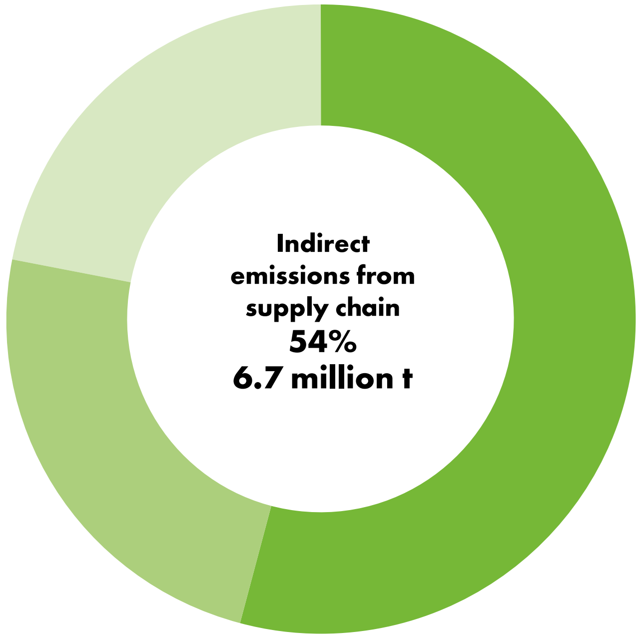


In 2016 UPM has relabeled the previously referenced “excluding special items” non-GAAP financial measures with “comparable” performance measures. Corresponding 2014 and 2015 group measures have been revised accordingly.

MORE ON RESPONSIBILITY

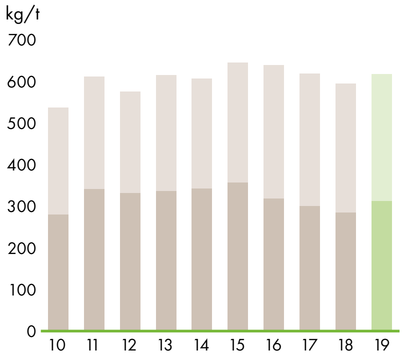
Sources of UPM's fossil carbon dioxide emissions 2019

On-site energy generation 24%, 3.0 million t
Indirect emissions from purchased electricity 22%, 2.8 million t



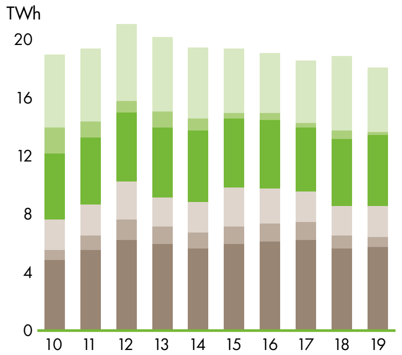
According to the calculation 46% of the direct and indirect fossil carbon dioxide (CO_2) emissions are related to UPM's energy use, but raw materials, transportation and processing of sold products also have a significant impact. CO_2 emissions related to energy use reduced by 6% in 2019. More details are available at upm.com/responsibility.

UPM's fossil carbon dioxide emissions per tonne of paper



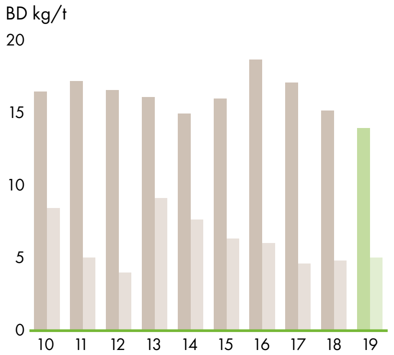
CO_2 from purchased electricity per tonne of paper
CO_2 from on-site energy generation per tonne of paper

Electricity sourcing



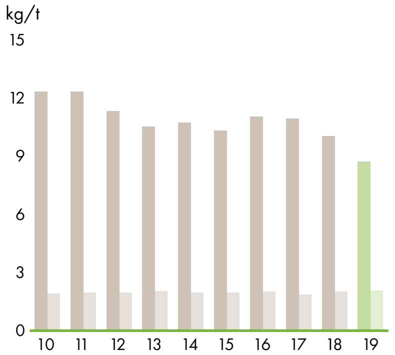
Market purchase
Condensing, shareholdings
Nuclear, shareholdings
Hydro, shareholdings
Hydro
CHP

Solid waste to landfills and to incineration w/o energy recovery per tonne of product



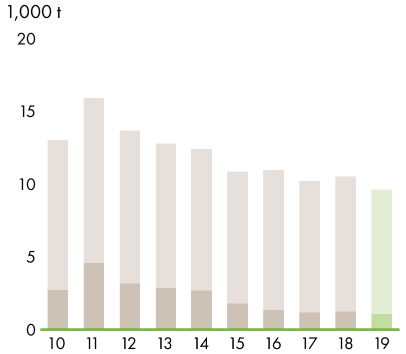
Per tonne of chemical pulp
Per tonne of paper

UPM's COD load per tonne of product



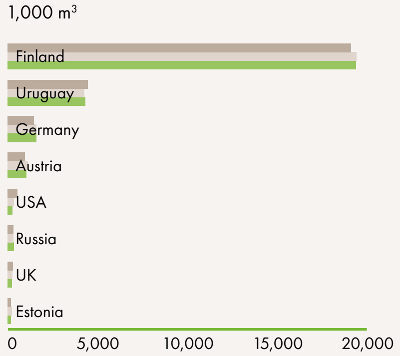
Per tonne of chemical pulp
Per tonne of paper

UPM's acidifying flue gases



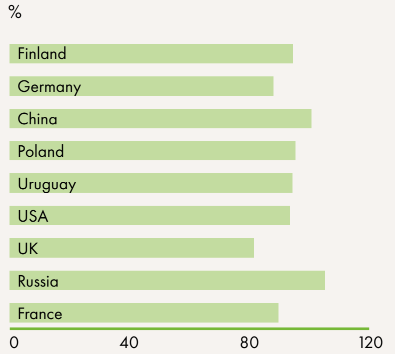
Total SO_2
Total NO_x

Wood deliveries to UPM mills



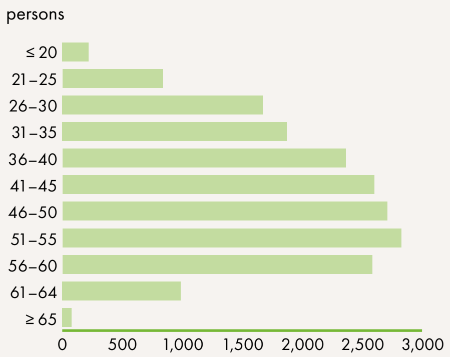
2017
2018
2019

Ratio of female to male salaries weighted basic salary 2019

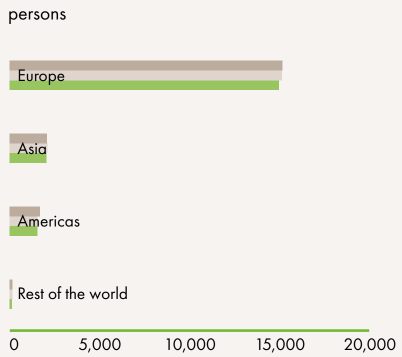


The ratio is calculated by comparing weighted average of basic salaries of women to men on the same job grade, for the nine biggest countries in terms of salaried employees. These countries cover 89% of UPM's total number of salaried employees.

Age structure of UPM employees 2019

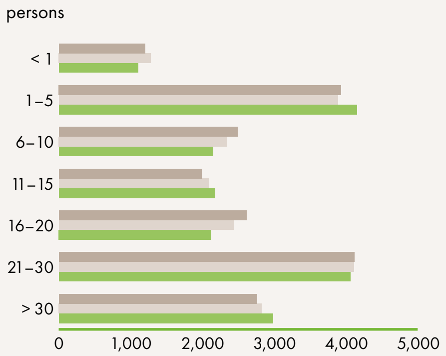


UPM employees by region



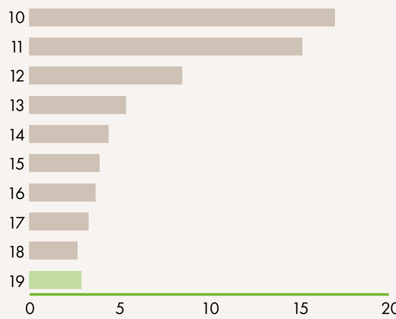
2017
2018
2019

Employees' years of service with UPM



2017
2018
2019

Lost-time accident frequency, UPM workforce



COMPETITIVE BUSINESSES, STRONG MARKET POSITIONS

Our 18,700 people work in 46 countries across six continents. With head office in Finland, our most important markets are in Europe, Asia and North America.

UPM BIOREFINING

- A versatile range of chemical pulp for many growing end uses with annual production capacity of 3.7 million tonnes produced in Finland and in Uruguay
- Annual capacities in tonnes by mills:
  UPM Fray Bentos 1.3 million;
  UPM Pietarsaari 800,000;
  UPM Kaukas 770,000 and
  UPM Kymi 870,000 tonnes
- 405,000 ha of own and leased plantations in Uruguay
- Certified sawn timber with annual capacity of 1.5 million cubic metres, produced at four sawmills in Finland
- Wood-based renewable diesel and naphtha with the annual capacity of 130,000 tonnes produced in Finland

Pulp mills
Finland: UPM Kaukas (Lappeenranta), UPM Kymi (Kouvola) and UPM Pietarsaari

Uruguay: UPM Fray Bentos, UPM Paso de los Toros (completed in 2022) and sustainable eucalyptus plantations

Sawmills
Finland: UPM Alholma (Pietarsaari), UPM Kaukas (Lappeenranta), UPM Korkeakoski (Juupajoki) and UPM Seikku (Pori)

Biorefinery
Finland: UPM Lappeenranta Biorefinery (Lappeenranta)

Market position

#8 Pulp globally

UPM ENERGY

- Cost competitive low-emission electricity generation in Finland consisting of hydro, nuclear and thermal power
- The total electricity generation capacity is 1,457 MW, including UPM's own hydropower plants and shareholdings in other energy companies
- Market agility and optimisation services for industrial consumers
- Largest shareholdings:
  – 47.69% of Pohjolan Voima Oy (PVO), which is a majority shareholder (58.5%) in Teollisuuden Voima Oyj (TVO)
  – 19% of Kemijoki Oy's hydropower shares

Hydropower plants:
Finland: Harjavalta, Kallioinen (Sotkamo), Kaltimo (Joensuu), Katerma (Kuhmo), Keltti (Kouvola), Kuusankoski (Kouvola), Tyrvää (Sastamala), Voikkaa (Kouvola) and Äetsä

Market position

#2 in Finland

UPM RAFLATAC

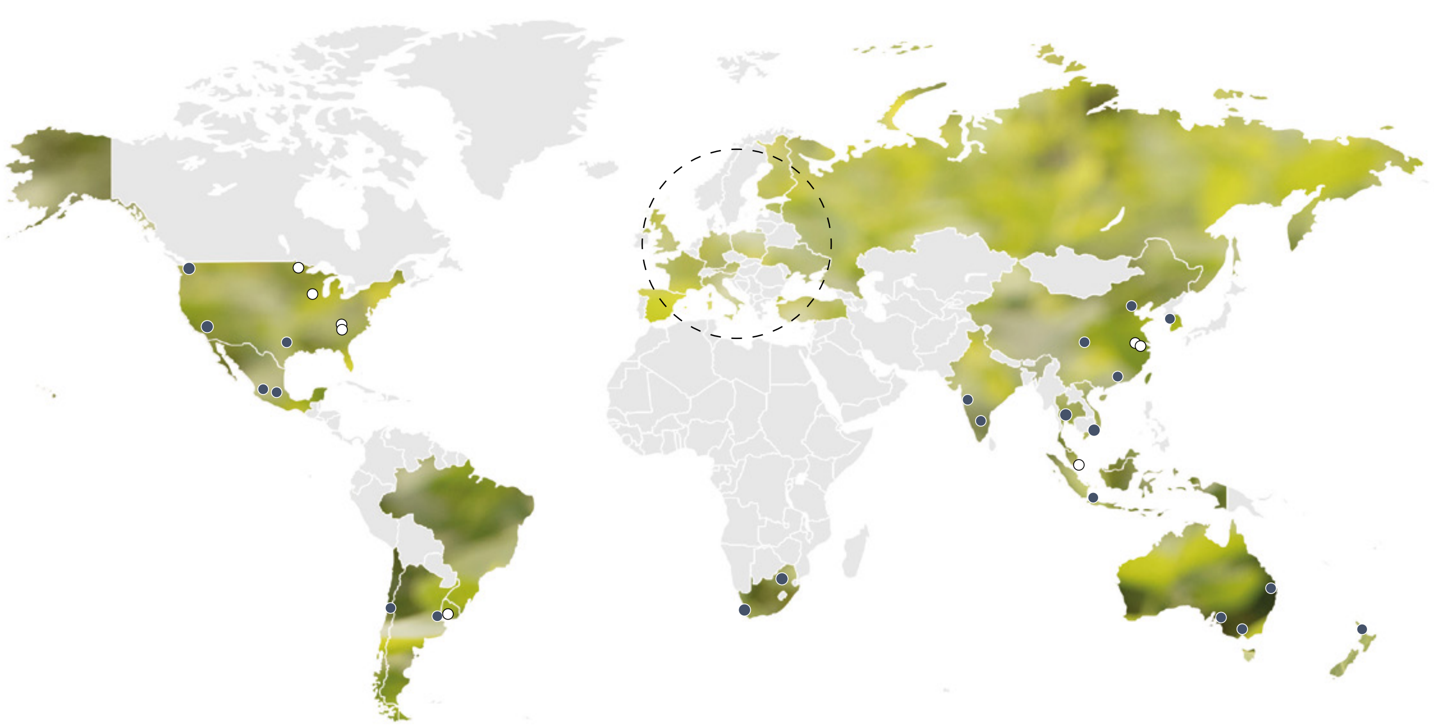
- Self-adhesive label materials for product and information labelling
- 10 factories and 29 slitting and distribution terminals in all continents

Labelstock factories
China: Changshu
Finland: Tampere
France: Nancy
Malaysia: Johor
Poland: Kobierzyce (Wroclaw) and Nowa Wieś (Wroclaw)
United Kingdom: Scarborough
USA: Mills River, NC; Fletcher, NC and Dixon, IL

Slitting and distribution terminals
Argentina: Buenos Aires
Australia: Adelaide, Brisbane and Melbourne
Chile: Santiago
China: Chengdu, Guangzhou and Tianjin
India: Bangalore and Navi Mumbai
Indonesia: Jakarta
Italy: Osnago
México: Ciudad de México and Guadalajara
New Zealand: Auckland
Russia: Moscow, St Petersburg and Chelyabinsk
South Africa: Cape Town and Johannesburg
South Korea: Seoul
Spain: Barcelona
Thailand: Bangkok
Turkey: Istanbul
Ukraine: Kiev
USA: Dallas, TX, Ontario, CA and Seattle, WA
Vietnam: Binh Thang Ward Di An District

Market position

#2 globally



UPM SPECIALTY PAPERS

- Labelling materials, release liner base papers, flexible packaging papers, office and graphic papers
- Total annual production capacity of 2.0 million tonnes

Paper mills
China: UPM Changshu
Germany: UPM Nordland Papier (Dörpen)
Finland: UPM Jämsänkoski (Jämsä) and UPM Tervasaari (Valkeakoski)

Market position

#1 Labelling materials and release liner base papers globally

#1 High-quality office paper segment in China

UPM COMMUNICATION PAPERS

- Magazine paper, newsprint and fine papers for a wide range of end uses
- Annual paper production capacity of 7.3 million tonnes, manufactured in 15 paper mills
- Capacities: Annual production capacity of 3.5 million tonnes of magazine papers, 2.0 million tonnes of newsprint and 1.8 million tonnes of fine papers
- The combined heat and power (CHP) plants operating on paper mill sites included in the business area

Paper mills
Austria: UPM Steyrermühl

Finland: UPM Jämsä River Mills (Jämsänkoski and Kaipola), UPM Kaukas (Lappeenranta), UPM Kymi (Kouvola) and UPM Rauma

France: UPM Chapelle Darblay (Grand-Couronne)

Germany: UPM Augsburg, UPM Ettringen, UPM Hürth, UPM Nordland Papier (Dörpen), UPM Plattling and UPM Schongau

United Kingdom: UPM Caledonian Paper (Irvine), UPM Shotton Paper

USA: UPM Blandin (Grand Rapids, MN)

Market position

#1 in Europe

UPM PLYWOOD

- Plywood and veneer products mainly for construction, vehicle flooring and LNG shipbuilding as well as other manufacturing industries
- Production capacity: approximately one million cubic metres
- Production in 9 mills in Finland, Estonia and Russia

Plywood mills
Estonia: UPM Otepää

Finland: UPM Joensuu, UPM Jyväskylä, UPM Pellos (3 mills, Ristiina, Mikkeli) and UPM Savonlinna

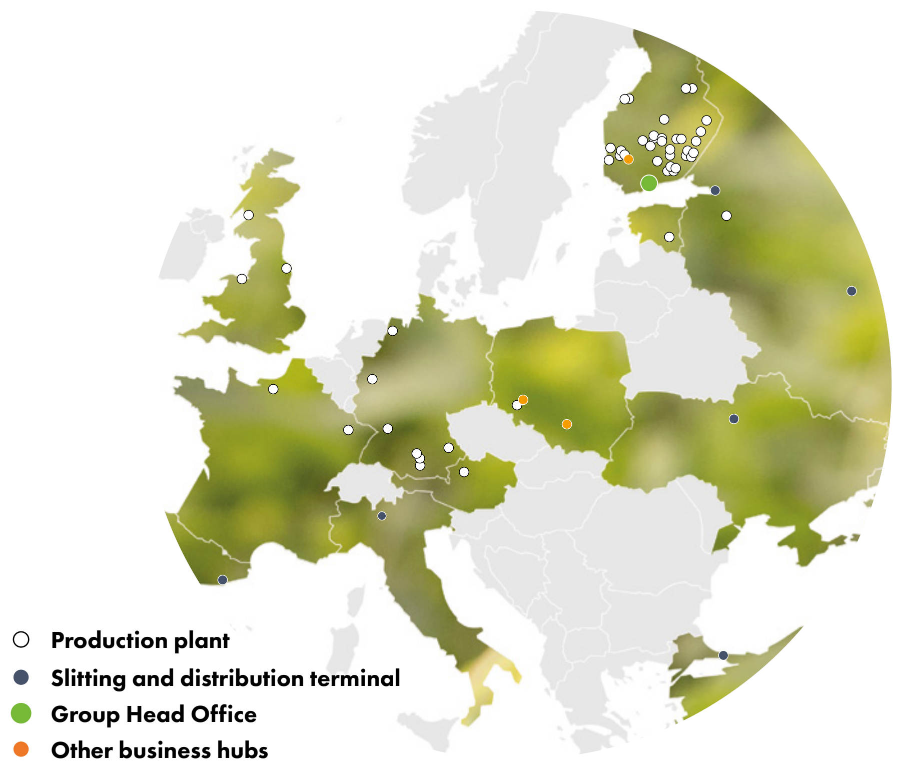
Russia: UPM Chudovo

Veneer mill
Finland: UPM Kalso (Vuohijärvi, Kouvola)

Market position

#1 High and mid segments in EMEA

#1 LNG plywood globally



OTHER OPERATIONS

- UPM Forest: Purchasing wood and biomass in 14 countries, 510,000 ha of own forest land in Finland and 76,000 ha in the USA, offering forestry services to private forest owners in Finland
- UPM Biochemicals: Lignin products, development of glycols, Finland and Germany
- UPM Biomedicals: Wood-based products for biomedical applications
- UPM Biocomposites producing UPM ProFi outdoor products and UPM Formi composite material for injection moulding and extrusion

Biochemicals
Finland: Biofore Base research centre, Lappeenranta
Germany: Biochemicals biorefinery, Leuna (completed in 2022)

Biomedicals innovation unit
Finland: Biomedicum research and educational centre, Helsinki

Biocomposites mills
Finland: UPM Lahti
Germany: UPM Bruchsal (Karlsruhe)

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CONTENTS

UPM IN CHANGING WORLD

OUR STRATEGY

OUR BUSINESSES

THE WAY WE OPERATE

OUR GOVERNANCE

ACCOUNTS FOR 2019

ANNUAL GENERAL MEETING

UPM-Kymmene Corporation will hold its Annual General Meeting on

Tuesday 31 March 2020 at 14:00 (EET)
Finlandia Hall, Mannerheimintie 13e
00100 Helsinki, Finland

Instructions for those wishing to attend are given in the notice to the meeting, which is available on the company's website at **upm.com/agm2020.**

DIVIDEND

The Board of Directors proposes to the Annual General Meeting that a dividend of EUR 1.30 per share be paid for the 2019 financial year. The dividend will be paid to the shareholders who are registered in the company's shareholders' register held by Euroclear Finland Ltd on the dividend record date 2 April 2020. The Board of Directors proposes that the dividend be paid on 16 April 2020.

FINANCIAL REPORTS IN 2020

UPM will publish the financial reports in 2020 as follows:

- UPM Interim Report for January–March (Q1) on 23 April 2020
- UPM Half Year Financial Report for January–June (Q1–Q2) on 23 July 2020
- UPM Interim Report for January–September (Q1–Q3) on 27 October 2020

EU Ecolabel: FI/11/001

Made of paper awarded the EU Ecolabel reg.nr. FI/11/001.

upm.com

Cover: UPM Finesse premium silk, 250 g/m^2.
Accounts: UPM Fine, 90 g/m^2. Other pages: UPM Finesse silk, 135 g/m^2.
Printed on papers granted the EU Ecolabel FI/11/001. Printer: PunaMusta Oy 2020/2