



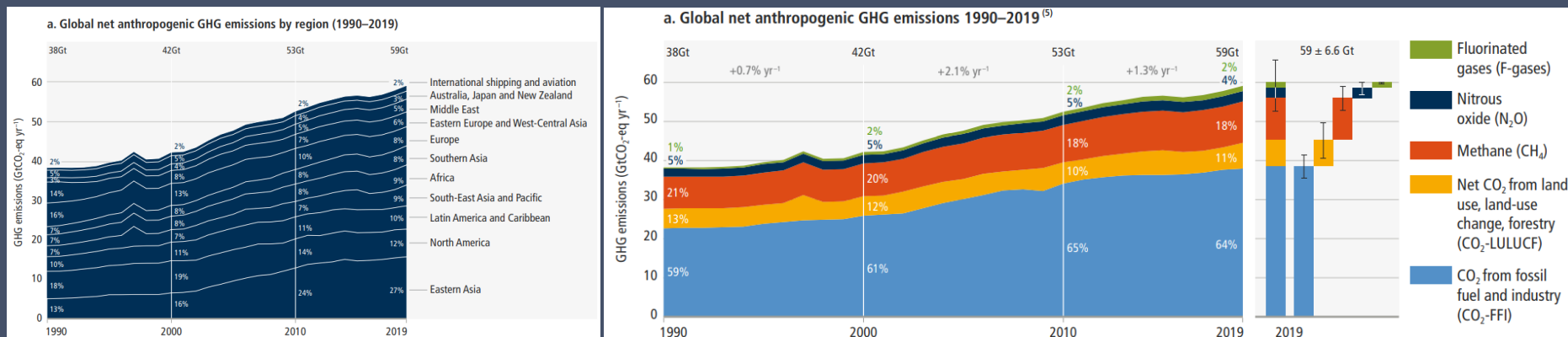
# UPM in energy transition

Tapio Korpeinen, CFO and Executive Vice President, UPM Energy

# GHG emissions – where are we and how big is the remaining budget?



Global net emissions in 2019: 59 GtCO<sub>2</sub>-eq, of which CO<sub>2</sub>-FFI: 38 GtCO<sub>2</sub> (FFI= Fossil fuels and industry)



## Remaining carbon budget

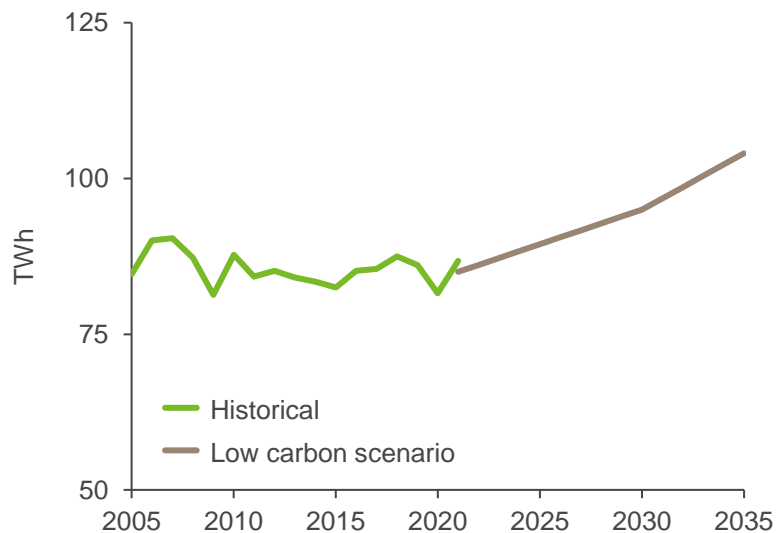
500 GtCO<sub>2</sub> to 1.5 degrees (50 % probability)

1150 GtCO<sub>2</sub> to 2 degrees (67 % probability)

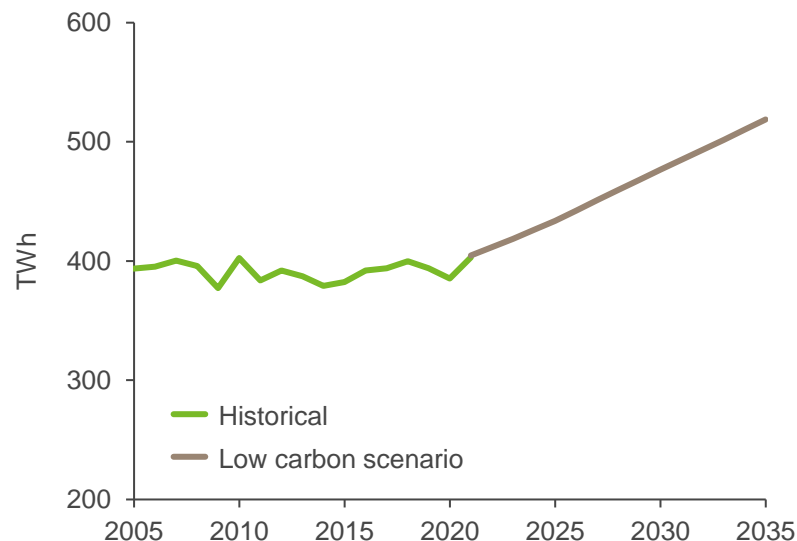
# Decarbonisation will require electrification: Nordic electricity demand expected to turn into an increasing trend



*Finnish electricity demand, TWh*



*Nordic electricity demand, TWh*



# Natural gas price high and volatile – Europe fears that Russian gas is not available during winter



## ***Emission allowance***

*EUA front year, €/tCO<sub>2</sub>*



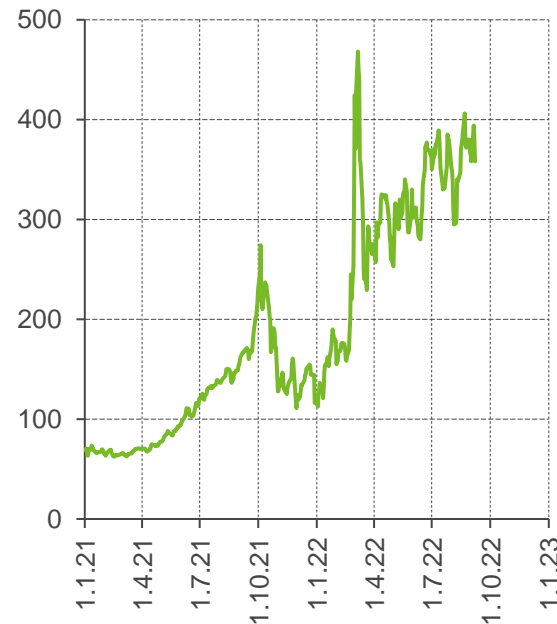
## ***Natural gas***

*TTF front month, EUR/MWh*

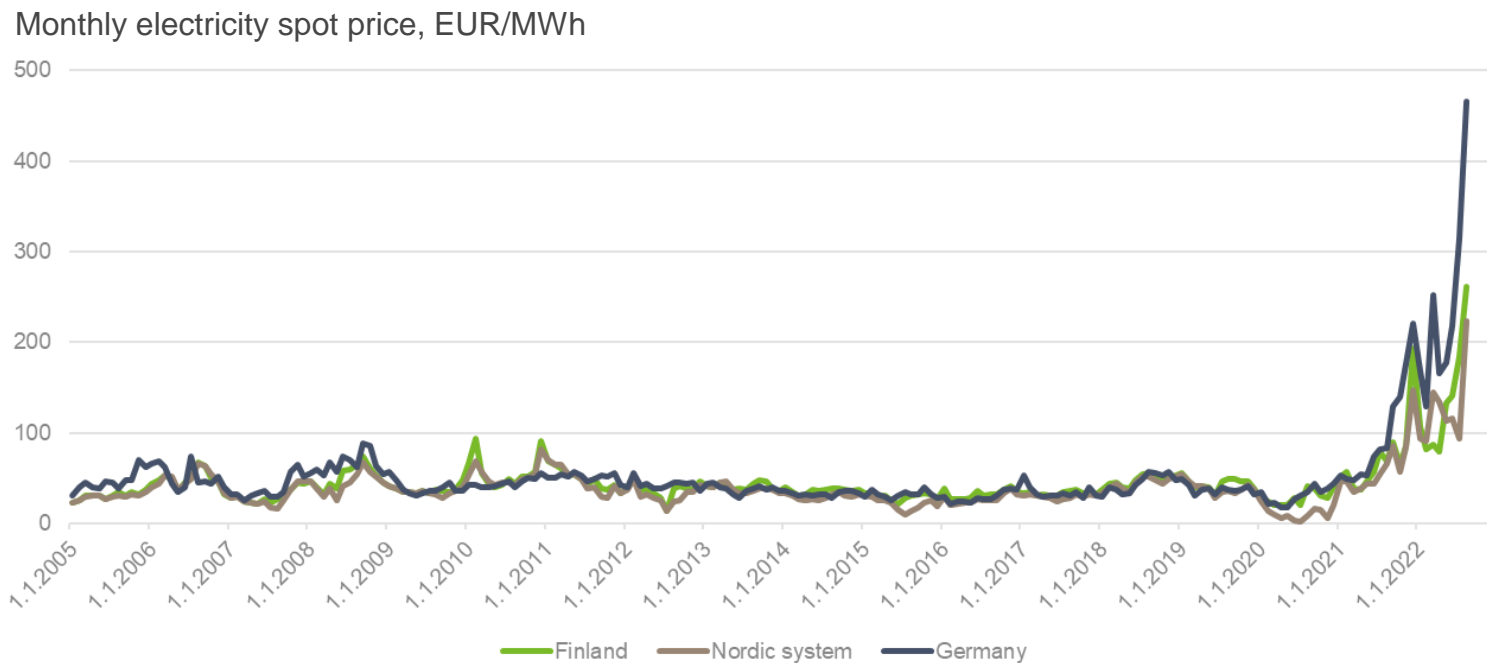


## ***Coal***

*API2 front month, USD/t*



# Monthly realized electricity prices Finland, Nordic system, Germany

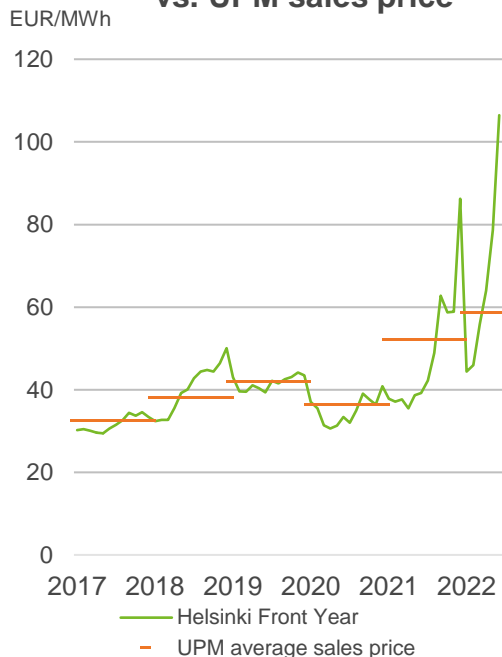




# Unprecedented moves in energy futures prices causes short-term cash flow volatility from energy hedges



## Market electricity prices vs. UPM sales price



Unprecedented rise in energy futures prices across the forward curve

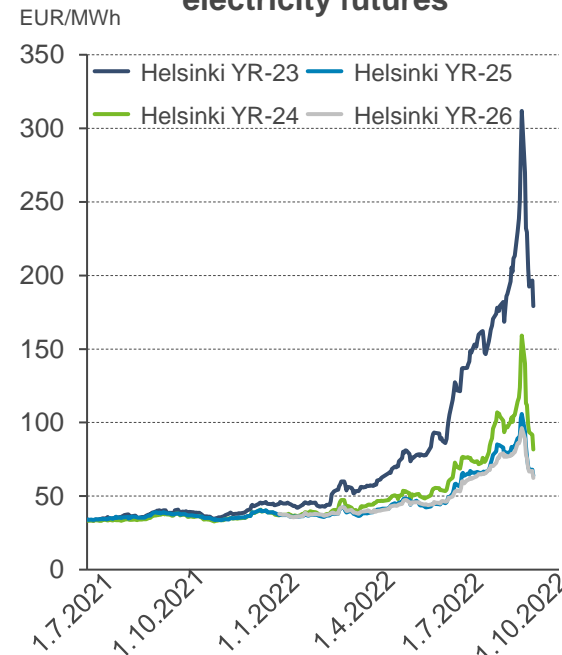
Cash outflow of energy hedges totalled EUR 1,101m in H1 2022

UPM's energy hedges are only for hedging the existing electricity generation and energy consumption

The cash outflow will later be offset by a similar cash inflow from the hedges or energy production

Exceptional uncertainty and tightness in the energy markets indicate strong earnings potential of UPM Energy

## Helsinki area electricity futures



Source: NASDAQ OMX

6 | © UPM

# UPM Energy is an agile business area with good profits



Sales

526 M€

Capital Employed \*

2,579 M€

Electricity generation

8.5 TWh

Comparable EBIT

270 M€

Comparable ROCE

11.4 %

Personnel \*

72

Figures for 2021  
\*) on 31 Dec. 2021

# Spearheads for UPM Energy

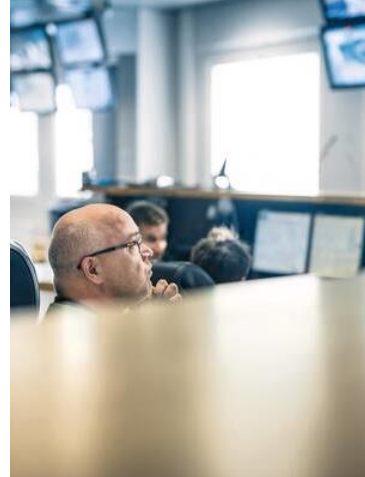
Maximise the  
value of 12 TWh  
clean portfolio



Accelerate  
digital  
integration



Continue to  
monetize service  
opportunities



Capture  
opportunities in  
energy transition

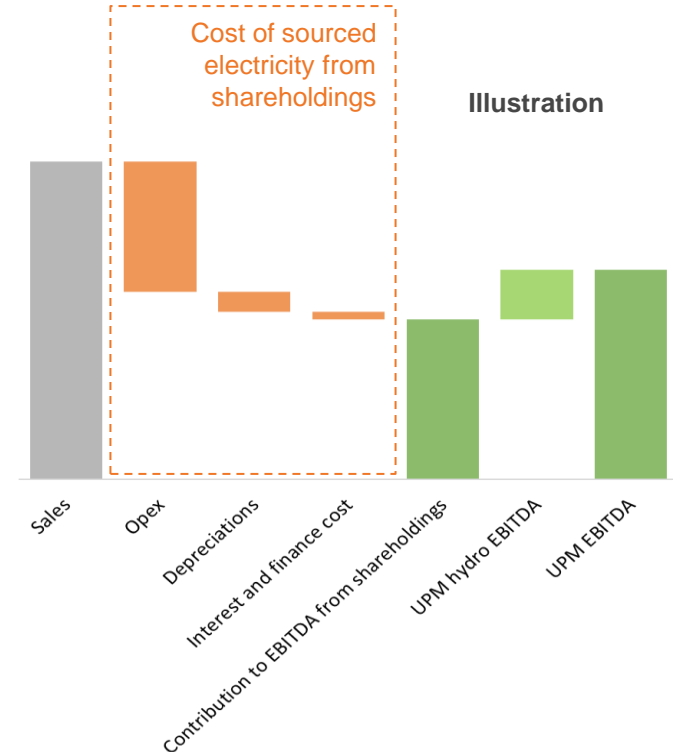




# Competitive electricity generation asset portfolio

UPM Energy's power generation	MW	EURm
Hydropower holdings	560	1092
Nuclear power OL1 and OL2	588	1,561
Nuclear power OL3 (PTO 12/2022)	494	499
Thermal power	154	1
UPM Energy's shareholdings in total, valued at fair value	1,796	3,152
UPM own hydropower assets	166	
UPM Energy's in total (incl. OL3)	1,962	
UPM Energy capital employed		3,276

UPM Energy sources electricity from part owned energy companies at full cost (cost-price principle, mankala principle)



# Olkiluoto 3 EPR – significant growth step for UPM Energy and Finland's largest climate action



OL3 will increase UPM Energy's carbon free electricity generation by nearly 50%

Reliable CO<sub>2</sub>-free baseload energy to support the electrification of the society

Unique and safe solution for final disposal of spent fuel

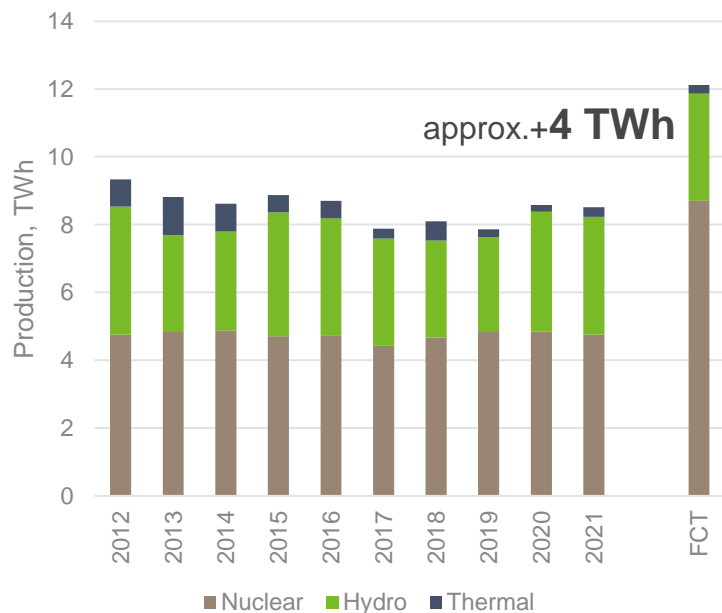
Finland's electricity self-sufficiency significantly improved, carbon neutral generation to about 90%



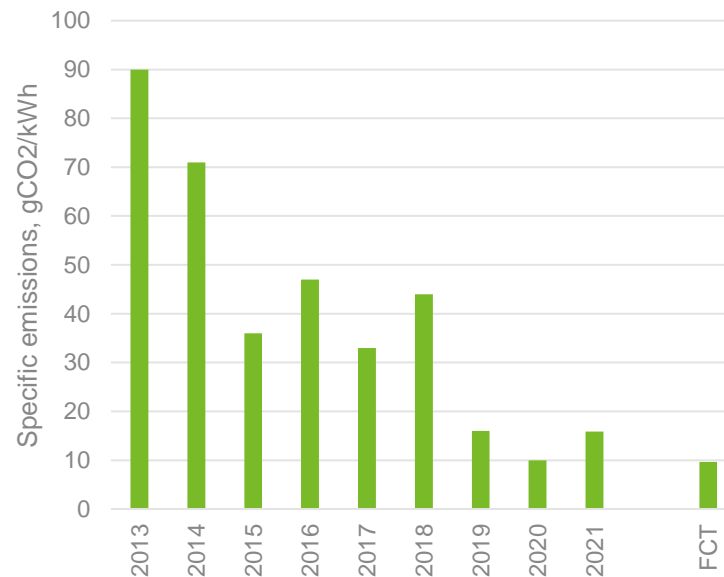
# UPM Energy's zero carbon production volumes to increase with OL3, emissions already close to zero



UPM Energy's power production, TWh



UPM Energy's specific emissions, gCO<sub>2</sub>/kWh



# Requirements for net-zero CO<sub>2</sub> energy systems

Reduction in overall fossil fuel use

Minimal use of unabated fossil fuels, and use of CCS in the remaining fossil fuel system

Electricity systems that emit no net CO<sub>2</sub>

Electrification of the energy system

Sustainable biofuels, low-emissions hydrogen, and synthetic fuels and chemicals in applications difficult to electrify

Energy conservation and efficiency

Flexible and integrated energy systems



# UPM and hydrogen – growth opportunities in large-scale green hydrogen solutions

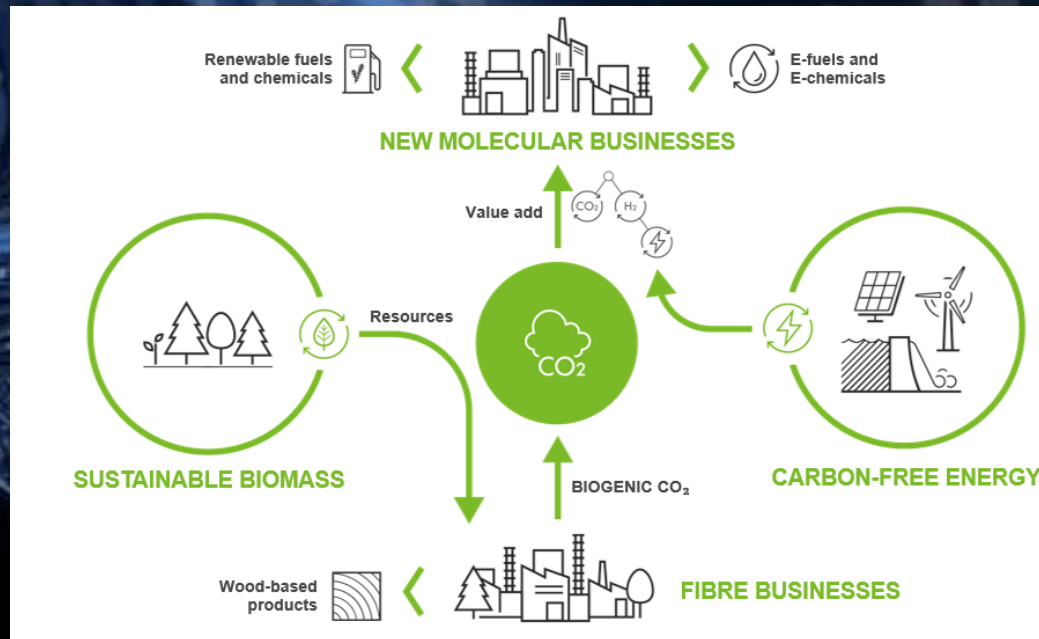


**Decarbonisation will require synthetic fuels** and new low-emission electricity generation

- demand for e-fuels will be driven by regulation and EU's target to decrease dependency on Russian fossil fuels

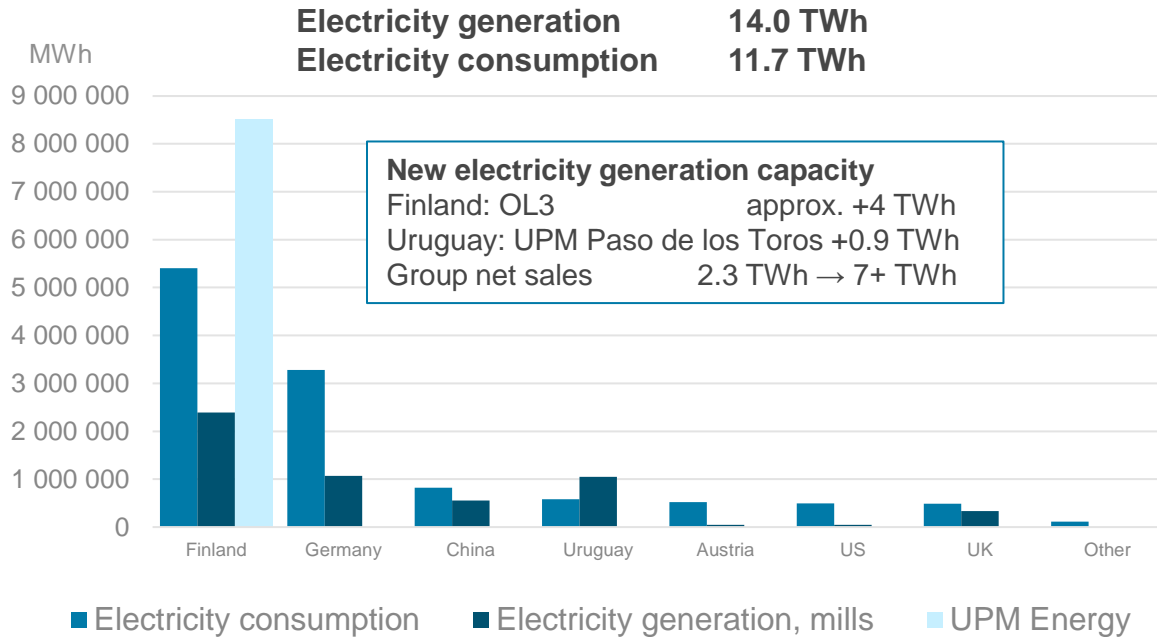
**UPM has competitive advantage**

- experience and in-depth knowledge on energy markets
- decarbonisation and energy optimization tools and skills
- experience on biorefinery operations
- available biogenic CO<sub>2</sub> needed in the production of some e-fuels

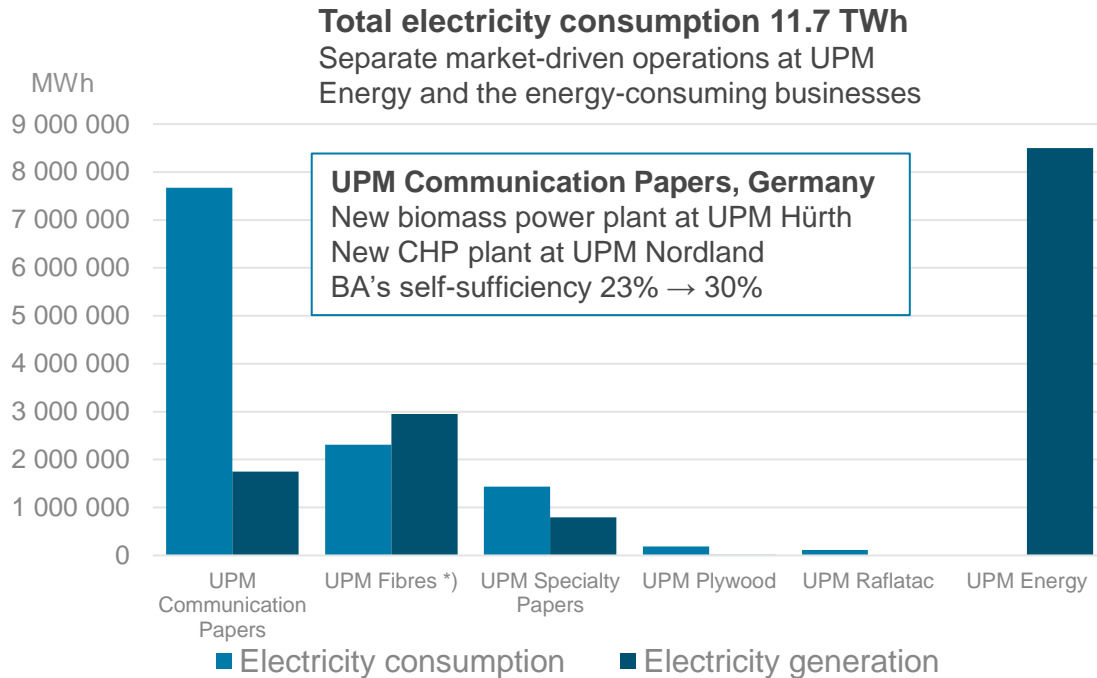




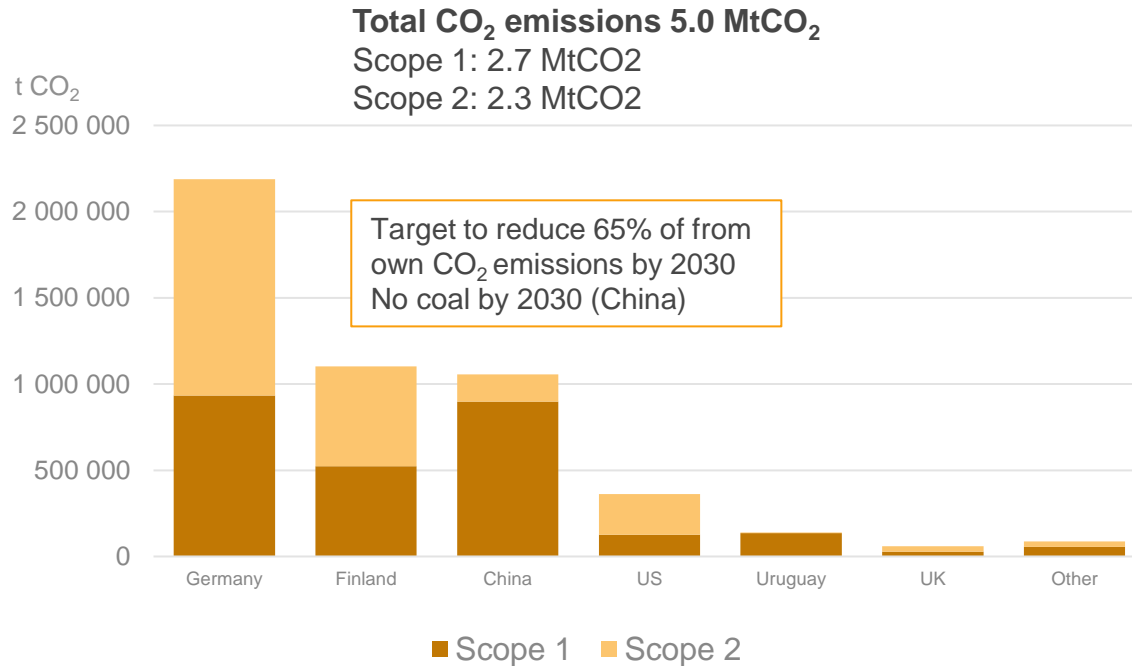
# UPM's electricity consumption and generation by country



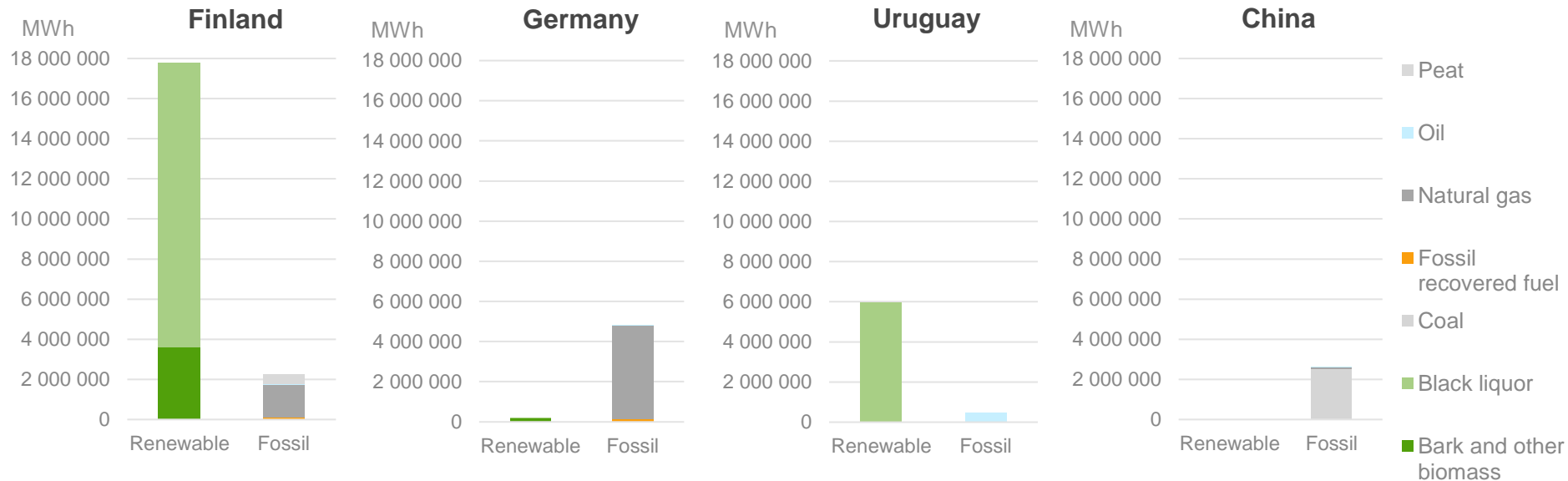
# UPM's electricity consumption and generation by business areas



# UPM's CO<sub>2</sub> emissions by country



# UPM's fuels consumption in Finland, Germany, Uruguay and China – 70% renewable fuels



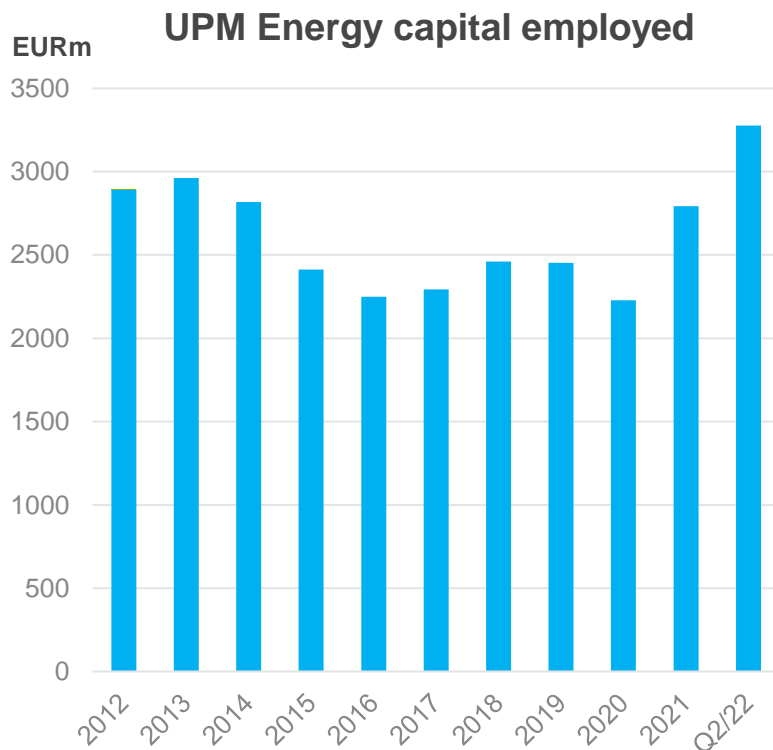


# Assets and valuation

Tapio Korpeinen, CFO and Executive Vice President, UPM Energy



# UPM Energy's assets are competitive, CO<sub>2</sub>-free and increasingly valuable



## Hydropower

- Flexible generation, crucial to balance the volatile system
- Renewable, CO<sub>2</sub>-free
- Value EUR 1.3bn

## Nuclear power

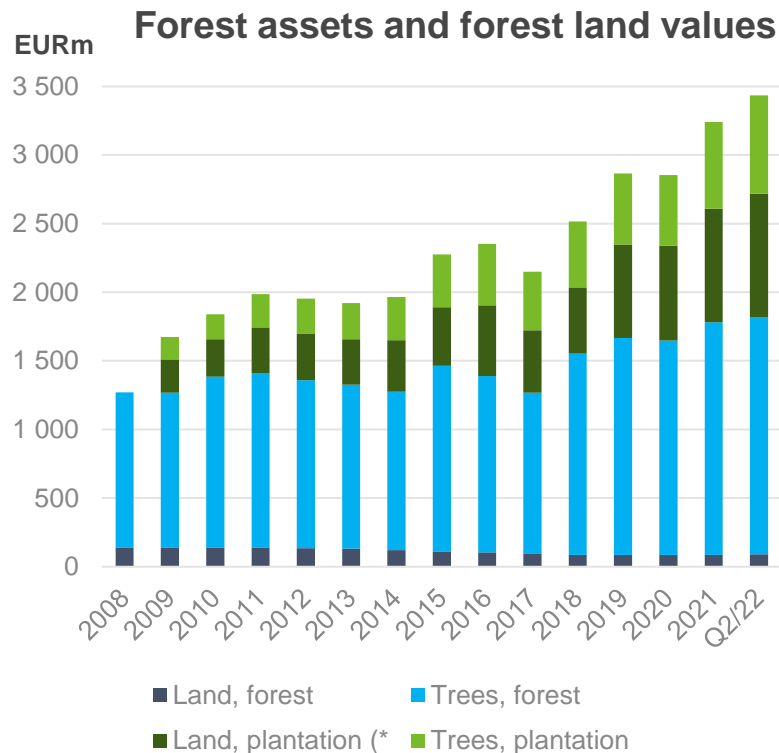
- Reliable baseload generation
- CO<sub>2</sub>-free
- Unique and safe solution for final disposal of spent fuel
- Value EUR 2.0bn

# Developing our forest assets

UPM forests and plantations	2008	2021	Area distribution	
Forest and plantation land (own and leased) (1,000 ha)	1,012	1,057	8%	7% US
Forest growth (million m <sup>3</sup> )	4.3	8.8	90%	49% Finland
Wood sourced from UPM forests and plantations (million m <sup>3</sup> )	2.2	3.6		44% Uruguay
Value of forests and plantations, including land (EURm)	1,270	3,241		
			2008	2021

Investing in strategic forest assets in Uruguay  
 Releasing capital from forests far from our mills  
 Productivity with active management and nurseries  
 Strong commitment to sustainability

# Active forest strategy – UPM's forest assets are increasingly productive and valuable



## Uruguay plantations

“fast turnover, low inventory”

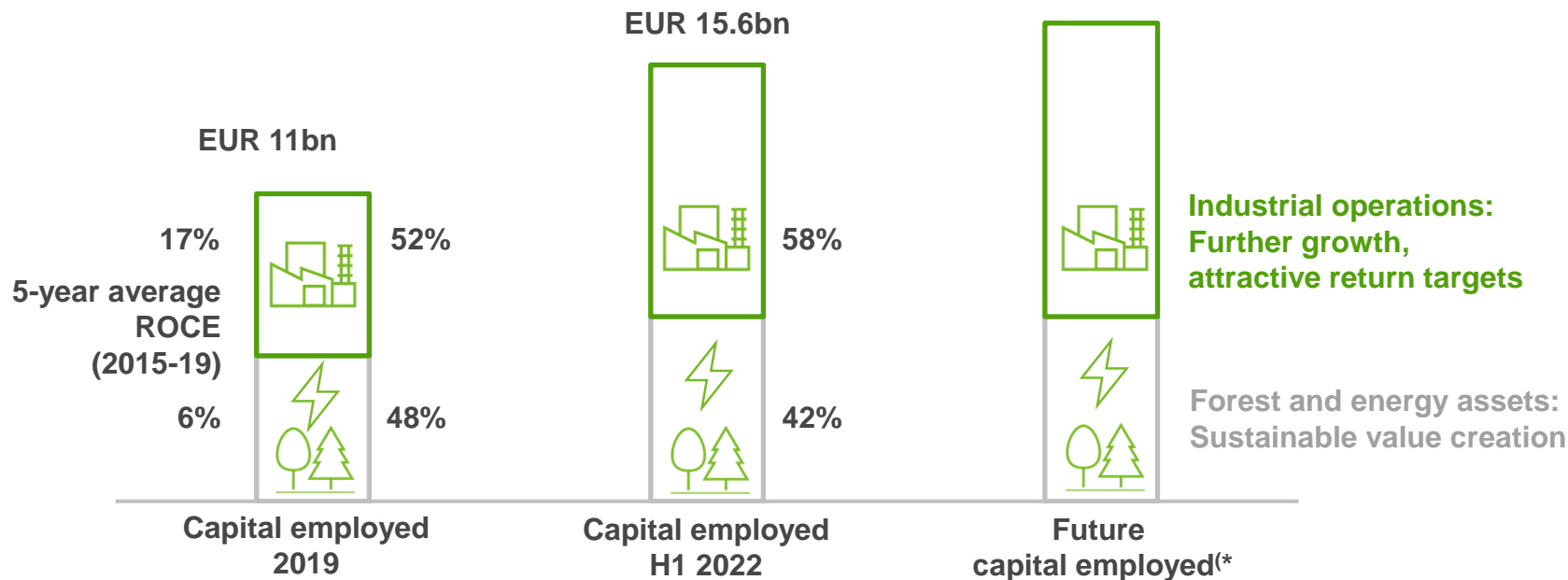
- Value EUR 1.6bn
- Continuous productivity improvement (pulp tonnes/ha)
- Investing in strategic forest assets

## Finland and other northern forests

“slow turnover, high inventory”

- Value EUR 1.8bn (+43% since 2008, EUR/ha +140% since 2008)
- Decreased area (-42% since 2008), focusing on forests close to mills
- Improved growth (m<sup>3</sup>/ha)
- Trend price (EUR/m<sup>3</sup>)

# Ongoing growth investments have increased UPM capital employed – significant earnings potential as they ramp up



\*) This is an illustration, not a forecast

UPM **BIOFORE**  
**BEYOND** FOSSILS

