

UPM Hürth

ENVIRONMENTAL AND SOCIETAL RESPONSIBILITY 2021



UPM Hürth

UPM Hürth (Rhein Papier GmbH) is located in the west of Cologne in the Hürth-Knapsack industrial zone. This central position between the agglomerations of Rhine-Main and Rhein-Ruhr provides short distances for raw material supplies, customer deliveries and waste management.

The mill was founded in 2001. UPM Hürth's PM 1 paper machine is producing high-quality newsprint and printing paper for advertising supplements since the start-up in 2002. Its raw material is sorted graphic recovered paper, e.g. newspapers, magazines, advertising supplements, catalogues and office paper. The mill's de-inking plant can process up to 400,000 tons of RCP per year.

Process effluents are pre-treated prior to entering the treatment plant in the neighbouring chemical industrial park. Waste is either energetically recovered or recycled. Thermal energy (steam) is delivered by the adjacent RWE power plant. Since the beginning of 2016 electrical power is drawn from the public grid.

The UPM Hürth mill focusses on safe ways of working, respect for the environment as well as high productivity and innovation for the benefit of its customers.





UPM Hürth Environmental and Societal Responsibility 2021 is a supplement to the Corporate Environmental and Societal Responsibility Statement of UPM's pulp and paper mills (available at www.upm.com) and provides millspecific environmental and societal performance data and trends for the year 2021. The annually updated mill supplements and the UPM Corporate Environmental and Societal Responsibility Statement together form the joint EMAS Statement of UPM Corporation. The next Updated UPM Corporate Environmental Statement and also this supplement will be published in 2023.

UPM delivers renewable and responsible solutions and innovate for a future beyond fossils across six business areas: UPM Fibres, UPM Energy, UPM Raflatac, UPM Specialty Papers, UPM Communication Papers and UPM Plywood. As the industry leader in responsibility, we are committed to the UN Business Ambition for 1.5°C and the science-based targets to mitigate climate change. We employ 17,000 people worldwide and our annual sales are approximately EUR 9.8 billion. Our shares are listed on Nasdaq Helsinki Ltd. UPM Biofore - Beyond fossils. www.upm.com



The mark of responsible forestry

For more information about FSC certification visit www.fsc.org





For more information about PEFC certification visit www.pefc.org



www.blauer-engel.de/uz14a



Review of the year 2021

Sustainability is deep-seated in UPM's company strategy "Beyond Fossils", spanning from ecologic and economic to social tasks. These have been taken in account in the mill's operative targets, which combine economic success with sustainable actions and respect for the interests of society, standing in multiple interrelations to the company. UPM Hürth's certifications according to international standards document this way of working.

Environmental Audits

During the reporting year several audits regarding environmental topics have taken place: Recertification audit according to EMAS, and internal audits reviewing FSC[®] und PEFC[™] standard and chemical management as a part of the OHS audit. District Council Department twice inspected the implementation of legislation and governance regarding CoVid-19 mitigation measures. There was an audit by DeHSt (german authority for emission trading) concerning correctness and quality of the mill's emission reports. The result is not yet available.

The tasks derived from the audits are a key for the continuous improvement process at UPM Hürth. Renewed applications for EU-Ecolabel and German "Blauer Engel" were done. Due to CoVid-19 the granting procedure was prolonged. Granting will be done in the beginning of 2022.

Resources

During the enduring pandemic situation not only the paper market changed strongly, but also the market for recovered paper. The well-established circular economy of the last decades was interrupted after the second lockdown. Orders from the advertising industry were missing and the corresponding paper was not available as collected stock later. Simultaneously demand from the packaging industry was rising quickly, resulting in high shares of cardboard in the household collection from which the grades needed for graphic paper production are sorted out. On top industrial paper waste from printing houses was not available as before. The resulting RCP scarcity made for a noticeable price increase, temporarily there was not enough raw material available for all German UPM paper mills. The results of the necessary shutdowns are described in the following passage.

Due to the external energy supply we can influence the corresponding key figures mainly by increasing energy efficiency. Optimizing steam consumption obtains highest priority: Steam is still delivered from the neighbouring power plant. In the current situation of energy supply for the mill CO_2 -footprint is higher from steam than from electrical power.

Since in the end of 2020 a lower operating rate of the machine had to be assumed, we had defined a considerable reduction in speed for 2021. Due to the lack of RCP described we had to stop the machine several times in addition to the speed decrease. The reduced operation mode didn't have any negative impact on the result of the steam saving projects. For electrical power this was different, and we could not reach our targets on that score. Especially the technical difficulties in the fourth quarter with the resulting shut down times led to a negative overall result.

Although the switching off of facilities during shutdowns had been automatised as far as possible, electric energy is still consumed when the machine stands still (e.g. heating, ventilation, lighting).

The shutdowns also impacted specific values for water usage and wastewater amount. Tanks are emptied for cleaning and water is used for rinsing.

In all the system needs time after restart to reach optimal conditions, for example in temperature or concentration of additives.

Environmental Performance

Environmental reporting is done in a global data base. Incidents are categorized from 1 (insignificant) to 5 (serious impact on environment). As in the last years we did not have any incident with impacts outside the mill's premises (cat.3 or higher). Altogether there were four deviations in category Clean Run 2:

- Legionella measurement exceeded an internal value for action taking
- The measurements taken for this resulted in a big amount of biomass led to the adjacent power plant, causing foam in their process, but no deviation from limit values.
- A smouldering fire on the conveyor RCP warehouse
- A diesel forklift caught fire outside the building in front of the reject containers.

To counteract the frequent observations regarding small oil spills, a working group including personnel from shop floor and work preparation was established to sum up hydraulic leakages and work them off one after the other. We started with the winders. Here it is possible to plan work without machine standstills. In the following year focus will change towards the paper machine.

The water pipes in the administration building could not yet be released for drinking, because after the successful implementation of a chlorination the final measurement results are not yet available.

Input of additives could be brought back to a good level. The change of whiteness measuring to Y-value (brightness) has been implemented at all metering points and enables to run the dithionite plant without additional use of colourants. Part of the lower bleaching agent usage could be balanced by increase of fillers. Dithionite bleaching had to be started only late in the year and usage decreased remarkably.

Qualification of a recycling phosphoric acid had to be postponed, because the market did not provide any suitable product in 2021. The new biocide facility was installed. The modified biocide component is advantageous, because the product remains stable in the process for a longer time and the decomposition products can be metabolized as nutrients in the wastewater plant. Expansion of the facility to enable cleaning in the wastewater plant as legionella prevention is in preparation.

Environmental projects

In 2021 the following environmentally relevant projects were worked on:

- Planning for connection to the new GSH (Green Steam Hürth) biomass power plant has been finalized. First works as the laying of new pipes for condensate to RWE have already been done. The construction of the steam connection to GSH will be done between February and June 2022. Corner stone is the connection of a new steam pipeline from the biomass plant to the existing steam infrastructure. The start-up of the power plant is planned for the end of 2022.
- "Brightness measurement" project as a primary state to a fully automated regulation in stock preparation was implemented. Several spots in DIP plant were supplied with sensors, which regulate usage of peroxide and dithionite as well as the overflows of pre- and post- flotation depending on the measurements. In this way usage of chemistry can be adjusted directly to the actual brightness values, as well as the operating mode of the flotation to optimise material losses and sludge amounts. At the end of the year all measuring equipment was installed. After calibration the regulation can start working.
- Usage of a brighter filler and increase of filler amount for improvement of whiteness (and thus decreasing bleaching agent usage) and for raw material substitution has started successfully. A long-term trial beginning from first quarter 2022 is meant to establish the decrease of electrical power usage in the DIP by increasing filler. We also expect steam savings because of improved dewatering / drying properties. This needs to be quantified during the trial.
- A regulable reduction of the spray water pressure at ModulP depending on moisture content has been installed for steam saving. Less water input directly decreases steam usage by decreasing need of drying. At the same time desalted water is saved.
- For saving electrical power one stirring unit in the pulper "Poperoller" was switched off. The two units are now operated alternately.

- Possibilities to adjust machine operating mode to energetic aspects are analysed in the framework of a master thesis. For all significant energy users (SEU), which cause at least 3% of electricity usage, all influencing factors were described and a measurement for these was installed. A correlation table provides information about the significance of each influencing factor on the energy usage of the particular SEU. Influence of changes of single factors on the energy usage of the SEU can be simulated. The thesis shall be finalized in 2022 and an optimised operation scenario with target figures for each SEU regarding different parameters (production speed, basis weight) will be defined.
- The project "recirculation of seal water to the water circle" continued: Sealing water is collected at several pumps and gets back into the process instead of going into the wastewater drain. Hose piping from the pumps to a collecting tank was installed, from this tank the water is lead back into the system.
- A new way of thermal recovery for sludge has been established. In the neighbouring RWE Goldenberg power plant the possibility of co-incineration for damaged timber and paper sludges has been established to improve the CO₂-footprint of their energy production. Since September we run test deliveries. If all sludge from the mill can be burnt there, this would mean saving of 720.000 truck kilometres every year – a lot of CO₂ and a huge relief for regional traffic.

Amendments of law and compliance

All amendments of law and changes in jurisdiction are taken into consideration. This is done via the index of legal provisions delivered by Uniconsult, information letters from the German Paper Association (Verband der Deutschen Papierindustrie VDP) and from the Employer's Liability Insurance Association (BGRCI), as well as from UPM networking and the participation in paper industry association's professional bodies.

All regulations from German legislation regarding CoVid-19 and their changes during the year have been implemented. All postulations of TRGS 500 for the use of sodium bleaching liquor have been fulfilled.

Contacts to the authorities were necessary due to two events of fire and for inspections of the implementation of CoVid-19 regulations. These took place in cooperation and understanding.

After the measurements following the new regulations in BImSchG about formaldehyde authorities agreed to suspend regular measurements because of insignificance. Measurements must only be repeated if process or chemistry are changed noticeably.

General regulations regarding compliance are framed by UPM group. All employees were trained according to their authority to decide.

Guido H. Clemens, Manager Technology & Environment

Armin Schmidt, General Manager

UPM Hürth Contribution to UN Sustainable Development Goals in 2021*



Waste

All production waste is

100% thermally exploited or



Air

Since 2005 carbon dioxide emission has been reduced by





Water

recycled.

Since 2005 specific water usage has been deduced by





Energy

Specific energy consumption has been decreased by

25%

since 2005.



Safety

Until the end of 2021 the mill has worked



without accident.



Certified fibre

Hürth raw material is



recovered paper and certified according PEFC[™] oder FSC[®] Chain of Custody.



Fossil CO₂ emissions for steam are reported by our energy supplier RWE/ Kraftwerk Goldenberg, those for electrical power in the UPM global environmental report by supplier Lechwerke.

The change of sourcing electrical power in 2019 has resulted in a remarkable decrease in CO_2 emissions related to paper production at Hürth. Besides sourcing actions UPM Hürth can only indirectly influence energy related emissions by increasing the energy efficiency of its production. The related targets are followed up constantly, the most important tools being optimisation of heat recovery and the paper machine's operation mode.

Energy company GSH is building a new biomass power plant on former UPM Hürth mill ground. The new power plant will deliver nearly CO_2 neutral steam to the mill. This will significantly decrease the CO_2 footprint of paper production at Hürth and make production at Hürth almost climate neutral.





UPM Hürth uses 100% recovered paper as a raw material. Most of the waste generated in the process consists of fibres not suitable for recycling, printing ink and mineral residues (deinking sludge). The second important waste type is material like plastic foil, inlays and CDs (rejects). These two kinds of waste account for almost 99% of the waste generated.

Due to the shortage of recovered paper grades of high quality it has been necessary to accept lower qualities for the process which partly had a negative impact on specific usage values and the yield.

For several years sludge has not only been used for heat exploitation in power plants but has been recycled in two different ways: Some sludge is used by brick manufactures as a porosity additive: During stoving of bricks the fibre fraction is burned and leads to small holes in the brick which improve the isolation capacity of the walls built from it. The ashes remain as high-quality filler in the brick. A specialized facility that combines thermal and material recycling produces a special cement by burning the organic parts of the sludge.

The amounts processed in this facility have been systematically reduced in 2021 since a possibility for local thermal recovery became available. This saves 165 km of truck distance for every load and the corresponding CO₂ emissions.

The specific amounts of sludge could be slightly reduced by optimisation of operation mode.

Specific reject amount remains on a high level. This is due to the change of the RCP grades offered in the market. Rejects are thermally exploited in power plants.

No waste is brought to a landfill.

Hazardous waste is handled by a licensed contractor for disposal and is disposed off according to governmental regulations.



Specific Energy Consumption (MWh/t) in % compared to 2005



compared to 2005

Spec. RCP usage per tonne in % against 2005

100

80

60

40

20

0

05 13 14 15 16 17 18 19 20 21

05 13 14 15 16 17 18 19 20 21

Rejects,

specific Data in %

Sludge, specific Data in % compared to 2005



Waste recycling 2021







The water for the production process comes from a deep well and is recirculated to keep consumption on a low level. The well water has a low temperature and is first used for cooling, and then for the production process. Here it runs several cycles of usage in the different water cycles of paper machine and de-inking plant. After pre-treatment in the mill it is directed to the water treatment plant in the adjacent chemical industrial park.

The limits set by the authorities (450 m³/h and max. 30°C) were not exceeded. The decrease of temperature in PM water cycle since 2015 has effectively prevented passing the temperature limit. There also were no violations of limits by the chemistry park's waste water plant.

The consistent usage of the water from the PM cycle in the DIP cycles and for dilution of additives has led to a continuous reduction of the fresh water need for the paper production over the years.

Due to the stable machine run in the first quarters and the saving actions imple-

mented specific process water usage could be reduced again by 0.5 liters per ton.

Projects for water savings are described in "Review of the Year 2021.





Specific Waste Water Amount

Organisational structure and emergency organisation



Authorized representatives have been appointed for production facilities and minor facilities relevant for environment.

Statutory representatives advise the General Manager and the departments about fire protection, waste, dangerous goods, radiation protection and rail traffic on mill grounds. There also are representatives for the management systems quality and environment ("QUMB") and for energy, OHS and data security.

For emergencies of all kind – e.g. fire, accidents or environmental incidents – detailed emergency plans are defined. Specifications for the whole process from the alarm system and immediate actions until the wrap-up help to minimize the possible outcomes of the emergency case. At the shift coordinator's office there are checklists and detailed flow charts for different cases. For major incidents a crisis team is defined that decides about the necessary actions and cares for implementation.

In 2021 all employees were trained regarding fire protection and emergency management.

Societal responsibility

Nowadays sustainable business management is not restricted to environment friendly ways of production but is extended to many other business areas as compliance, human resources management, OHS or the contributions to societal life outside of the company itself. The bigger part of these tasks is managed by the UPM Group for its companies, but the individual business units have their own share in it, too.

Coping with CoVid-19 Situation

Covid-19 pandemic caused the necessity of extensive technical and organizational actions which have been summarized in a pandemic protection concept for the mill already in 2021. The crisis team continuously observes the current legal situation and adjusts mill procedures accordingly.

During the year under report the focus of the regulations was organization of routine self-test of the employees and the implementation of "3-G-Rule" at work (entry to the mill only when vaccinated, recovered or tested regarding CoVid-19). These measures came along with intensive communication and the necessary training.

In addition to dispensing medical masks, also for private use, and two self-tests per week to everyone who agreed to testing, we offered vaccinations at the company physician's office, complemented by a poster campaign. At the end of the year the quota of fully vaccinated people at the mill was about 95%.

Occupational Health and Safety

Safety first. This imperative is valid for every work in the mill and under all circumstances. A management system for OHS is the basis of our daily work and gives everyone his roll and his responsibilities – from the General Manager to the superiors and the operators at the machine.

Main pillars of the system are the UPM Safety Standards, the superior's safety walks which ensure the proper ways of working and the employee's safety observations. Especially the latter are important – on one hand to review rules and facilities for safe working, on the other hand to derive preventive measures against accidents, just as by the analyses of accidents or near misses. In 2020 we could register more than 500 such observations in spite of short time work and mobile working from home.

In February of the year reported unfortunately an accident at work occurred, when an employee slipped during untightening a roll and broke his hand.

EXPENSES FOR WORKPLACE HEALTH PROMOTION 2021	EUR
Support sports club	13,106
Free mineral water	3,996
Shutdown beverages	2,481
Weekly fruit basket*	0
Health Day*	0
Individual protection or screen glasses/ear protection	3,297
Medical Service	13,152
EXPENSES FOR PREVENTION MEASURES COVID-19 PANDEMIC SITUATION	EUR
Face masks for personnel	2,260
Disinfectants and dispenser	138
CO ₂ measurement device	49,286
Sum	87,717

* stopped during Covid crisis due to hygienic standards

Accidents at work with 24 hours or more lost working time





Safety training: Rescue from confined spaces



The daily newspaper in school

We think it is important to support our employees in a healthy way of life. We do this in several ways: free mineral water and other beverages during shutdowns, offer of vaccinations and an allowance for physical activity are ongoing examples. In 2021 we offered a schooling regarding "Good Sleep" for our personnel.

Biofore Share & Care Programme

Building and maintaining good relations with local communities close to our operations and supporting the vitality of these communities are essential for us and for our business success. One way of engaging with society is through sponsorships and donations.

UPM's Biofore Share and Care programme reflects our commitment to building a sustainable, innovation-driven future by sharing our expertise and assets for causes we care about. The focus areas are: Reading & learning, engaging with communities, responsible water use and boosting bio-innovations.

UPM's support can take different forms in different projects. It can be a cash contribution to support community projects, membership of community-related organisations, donations of products or materials. employee volunteering or fundraising. Local sponsorship is targeted on chosen projects and aims at longterm involvement in the community where UPM operates.

Regional Engagement

The Hürth mill sponsors daily regional newspapers to three schools at Hürth with the intention to give young people the opportunity to get a deeper insight to the facts instead of just believing "fake news". We also support nearby nurseries and elementary schools with paper donations for drawing.

After the disastrous flood which hit the "Rhein-Erft-Kreis", which affected UPM Hürth only indirectly, UPM Group has supported the district with a generous donation. The mill spontaneously gave out material to help affected employees, e.g. pumps, hoses and shovels.

In December UPM Hürth took part in a tree-planting event with 100 trees. Leversbach community had called for it, after larger areas had to be uprooted because of drought and bark-beetle attack. Black walnut, European chestnut, red oak and Turkish hazel were chosen as trees that can stand longer drought periods.



Material for employees affected by the flood

Environmental parameters

The figures related to production as well as raw material and energy consumption are published as aggregated figures on group level in the UPM Corporate Environmental and Societal Responsibility Statement.

		2019	2020	2021
Production capacity		330,000 t	330,000 t	330,000 t
Raw materials	Recovered paper			
	Additives	See UPM Corpo	rate Environmental a	nd Societal
Energy	Fossil fuel	Responsibility Sto	atement for more info	ormation
	Purchased power			
Emission to air	Carbon dioxide, CO ₂ (fossil) ¹⁾	64,907 t	57,441 t	63,167 t
	Nitrogen oxide, NO _x ²¹⁾	31.6 t	27.32 t	21.08 t
	Sulphur dioxide, SO ₂ ¹⁾	19.75 t	19.13 t	11.37 t
	Particulate	1.52 t	0.68 t	1 00.0
	Carbon monoxide, CO ¹⁾	2.2 t	2.7 t	2.24 t
Water intake	Process Water	2,099,624 m ³	1,716,603 m ³	1,731,386 m ³
Waste water discharge to external effluent treatment	Effluent Volume from Process	1,772,152 m ³	1,404,942 m ³	1,378,910 m ³
	COD	1,696 t	1,758 t	1,709 t
	Phosphorus	1.488 t	1.614 t	1.894 t
	AOX	0.328 t	0.272 t	0.286 t
Non-hazardous waste	Waste to recycling, energy recovery, and or composting			
	– White Pulp	4,857 t	729 t	0 t
	– Sludges	97,633 t	84,311 t	86,585 t
	– De-inking residues, non fibrous	6,046 t	5,289 t	5,624 t
	– Bark and wood waste	39 t	26 t	30 t
	– Metals	328 t	247 t	377 t
	Waste to incineration without energy recovery			
	– Domestic Waste	38 t	33 t	32,7
	- Others	132 t	136 t	132 t
Hazardous waste		37.3 t ²⁾	19.97 t ²⁾	19.83 t ²⁾
Land use	Total use of land	12.75 ha	10.58 ha	10.58 ha
	Total sealed area	8.45 ha	8.45 ha	8.45 ha
	Total nature-oriented area on site	4.3 ha	1.73 ha	1.73 ha
	Not defined		0.4 ha	0.4 ha

Values for carbon dioxide resulting from heat consumption. For information about electrical power see UPM Corporate Environmental Statement.
Bone dry tons



Performance against targets in 2021

TARGET	ACHIEVEMENT	COMMENTS
Engineering and implementation of GSH power plant connection	yes	Engineering done, work proceeding as scheduled
electrical power usage ≤ 0.850 MWh/t	no	reached 0.874 MWh/t, see review 2021
steam usage ≤ 0.780 MWh/t	yes	reached 0.773 MWh/t, Modul P project
water usage ≤ 7.2 m³/t	yes	reached: 6.8 m ³ . Modul P, seal water projects
Clean Run Kat. ≥ 3 = zero	yes	reached: zero

Targets for 2022

TARGET	DEADLINE	RESPONSIBLE
Engineering and implementation of GSH power plant connection	31.12.2022	Implementation of steam and condensate connection Manager Energy
electrical power usage ≤ 0.835 MWh/t	31.12.2022	Optimized operation mode after analysis of significant energy consuming facilities, filler project Manager Energy/Manager Production
steam usage ≤ 0.760 MWh/t	31.12.2022	Optimized operation mode after analysis of significant energy consuming facilities, filler project Manager Energy/Manager Production
water usage ≤ 6.7 m³/t	31.12.2022	Stable operation mode without too many shutdowns, checking ideas from employee suggestion system, implementation of promising ideas, sticky audit for optimisation of water circles. Manager Technology, Environment, Quality
Clean Run cat. ≥ 3 = Zero	31.12.2022	Continue encouragement for environmental observations and handling those, methodical inspection, environmental action day Manager Technology, Environment, Quality



Environmental verifier's declaration on verification and revalidation activities

Environmental verifier Astrid Günther (DE-V-0357), acting for TÜV NORD CERT Umweltgutachter GmbH, licensed for the scope NACE Code 17.12 (papermaking), declares to have verified whether the site UPM Hürth/Rhein Papier GmbH, Bertramsjagdweg 12, 50354 Hurth, Germany as indicated in the updated UPM Corporate Environmental and Societal Responsibility Statement 2021 of the mentioned site (registration no. FI-000058), meets all requirements of Regulation (EC) No 1221/2009 of the European Parliament and of the Council of 25 November 2009 as amended by Regulation (EU) 2017/1505 and Regulation (EU) 2018/2026 of the comission on the voluntary participation by organisations in a Community Eco-Management and Audit Scheme (EMAS).

By signing this declaration, I declare that:

- the verification and validation has been carried out in full compliance with the requirements of Regulation (EC) No 1221/2009,
- the outcome of the verification and validation confirms that there is no evidence of non-compliance with applicable legal requirements relating to the environment,
- the data and information of the updated Environmental Statement 2021 of UPM Hürth/Rhein Papier GmbH, reflect a reliable, credible

and correct image of all the activities of UPM Hürth/Rhein Papier GmbH, within the scope mentioned in the updated Environmental Statement 2021.

This document is not equivalent to EMAS registration. EMAS registration can only be granted by a Competent Body under Regulation (EC) No 1221/2009. This document shall not be used as a stand-alone piece of public communication.

Essen, April 7, 2022

Astrid Günther

Environmental verifier DE-V-0357 TÜV NORD CERT Umweltgutachter GmbH

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