

# Pulp mills and biomass plants in Germany



Germany has [five pulp mills](#), as well as a large number of paper mills, with the latter using waste paper for around 60% of its production. They [also use pulp from eucalyptus plantations in Brazil and Uruguay](#), as well as pulp from virgin wood from Germany and elsewhere in Europe.

[According to the German Environment Agency \(Umweltbundesamt\)](#), the pulp and paper industry is amongst the country's five most energy intensive sectors. In 2022, it was responsible for almost 13 million tonnes of CO<sub>2</sub> emissions from fossil fuel burning.

[2023 industry figures](#) showed that fossil fuels (mostly coal) generated 23 TWh of primary energy used in German pulp and paper mills, while 12 TWh came from biomass (excluding 0.29 TWh from biogas and 3.3 TWh from Refuse Derived Fuel, i.e. mixed waste that includes plastic). The remainder (5.3 TWh of heat and 7.9 TWh of electricity) is purchased externally and will therefore also include fossil fuels and some biomass energy.

According to the same industry report, biomass burned by the industry in 2023 consisted of 4.4 million tonnes of 'waste liquor', i.e. pulp mill sludges, 415,334 tonnes of bark, 698,482 tonnes of pulp mill fibre residues (i.e. rejects from pulp production), and 287,6000 tonnes of other residues. In addition, 333,966 of other, unspecified, biomass were purchased and burned, which could include roundwood.

Germany is gradually phasing out its coal burning, with many coal plants due to shut down by 2030 and the last ones by 2038. There is a high chance that operators will simply switch from burning coal and other fossil fuels to burning wood, with no benefit to the climate at all. Essity has already announced such a plan in Mannheim and, in December 2024, Koehler Group completed a coal-to-biomass conversion at its paper mill in Oberkirch. The example of Hürth described below is indicative of what the implications of this will be for forests.

Furthermore, at least two pulp and paper companies are expanding into wider biomass energy markets, beyond supplying process energy and selling some additional electricity to the grid. These are [Mercer International, which has built a 150,000 tonne capacity wood pellet plant](#), and Koehler Group, which operates five biomass cogeneration plants that don't supply the company's paper mills. Koehler Group has also recently acquired two wood and biomass logistics and trading companies, one in Germany, the other in France.

# E.on's new biomass plant at UPM paper mill in Hürth

The amount of primary woody biomass burned to provide energy for paper production *increased significantly in January 2024*, after E.on commissioned a biomass cogeneration plant on the outskirts of Cologne to provide heat and power for an adjacent UPM paper mill in Hürth and to export electricity to the grid.

The plant is designed to burn 45 tonnes of wood an hour all year round, equivalent to 360,000 tonnes of wood a year<sup>1</sup> This new biomass plant **represents a 107% increase** in the total amount of wood other than pulp mill residues burned to supply energy for the entire pulp and paper industry in Germany. Even more alarming, roundwood accounts for the majority of the biomass burned in Hürth, according to **information**

**disclosed by the operators** to the government's registry of power plants. Ironically, UPM's paper mill in Hürth fully relies on recycled paper and the company **prides itself on its efficiency**. Yet, in order to turn recycled paper into paper for printing newspapers, UPM relies on hundreds of thousands of tonnes of wood being burned, most of it from whole trees.

<sup>1</sup> If the plant operates for 8,000 hours a year, which is generally assumed to be the maximum number of hours for heat and power plants, allowing for routine maintenance.

## Overview of biomass use by pulp mill operators in Germany

### Essity

Essity is a multinational company with its headquarters in Sweden, which produces health and hygiene products, from paper tissues and sanitary pads to wound care materials. It was founded as a spin-off from SCA, a Swedish company that features extensively in the chapter about Sweden in this report.

Essity operates an integrated pulp and paper mill in Mannheim, a city in Baden-Württemberg, using mostly

wood but also some wheat straw. The plant has a biomass boiler with a **net electrical capacity of 28.45 MW**. Pulp mill residues provide two-thirds of the energy, with the **remaining third consisting of forest wood from the region**. In 2022, Essity announced plans for a new biomass cogeneration plant to replace fossil gas boilers. They stated that this would burn wood purchased mostly from the region.

UPM Hürth pulp mill. *Ocrho/Wikimedia Commons*





## ***Mercer International***

Mercer International is an international pulp and paper and wood products company with its headquarters in Canada.

In Germany, Mercer operates two pulp mills, one in Arneburg in Saxony-Anhalt, the other in Rosenthal am Rennsteig in Thuringia. In 2021, the environmental NGO ROBINWOOD [staged a protest outside the pulp mill in Arneburg](#), protesting against wasteful use of whole trees for pulp and paper production as well as wasteful energy use. However, as far as bioenergy use is concerned, the company has [advised NGOs and the media](#) that they only use pulp mill residues, and there is no evidence to the contrary, even though the recovery boilers in Arneburg have a [combined net electric capacity of 140 MW](#) and export some of that electricity to the grid.

However, as well as operating the two pulp mills, [Mercer International acquired a large sawmill](#), wood

processing plant and pellet mill in Torgau, Saxony, from a German company in 2022. The pellet mill produces up to 150,000 tonnes of wood pellets a year. The site [includes biomass boilers](#) with a combined net capacity of 11 MW electricity and 55 MW heat, with part of the electricity exported to the grid. It burns bark as well as woodchip.

Finally, the company operates a large sawmill in Saalburg-Ebersdorf, with an [adjacent 13 MW electricity and 50 MW heat capacity biomass boiler](#) which burns sawmill residues as well as arboricultural residues, a term which includes trees cut down for road building or other developments.

According to information published in an industry magazine, Mercer also [burns woodchip from forest wood](#) in its biomass boilers (excluding those linked to its pulp mills).

## Sappi

Sappi is a multinational pulp and paper company with its headquarters in South Africa. It operates two integrated pulp and paper mills in Germany: one in Alfeld, Lower Saxony, the other in Ehingen (Donau) in Baden-Württemberg. A third mill, in Stockstadt am Main in Bavaria, is [currently being decommissioned](#) and is therefore not included in this report.

Sappi's Alfeld mill [burns mostly black liquor](#) in its biomass boiler and [generates additional energy from burning fossil gas](#).

In the Ehingen mill, [77% of the fuel burned is biomass](#), including black liquor, bark and wood residues from the pulp mill, as well as some biogas. There is no evidence of Sappi using forest wood or sawmill residues for energy generation in Germany.



## Koehler Group diversifies into burning wood for energy generation

*Koehler Group is a German company founded in 1807 to produce paper. In 2012, the company [founded Koehler Renewable Energy](#) as a fully-owned subsidiary. It invests in biomass cogeneration plants, onshore wind, solar PV and hydro power.*

Koehler Group operates biomass plants at two of its paper mills: one in Kehl, the other in Oberkirch, both in Baden-Württemberg. Furthermore, Koehler Renewable Energy operates five stand-alone biomass cogeneration plants. Four of them are not associated with paper production, and one supplies energy to a paper mill operated by a different company.

As well as burning wood for energy, Koehler Group [acquired the majority of shares](#) in the wood and biomass logistics and trading company Zollikofer Group in 2021. In August 2024, Zollikofer Group then bought up a similar French company, SAS REKO Energie Bois (REKO).

With regards to the waste wood burning in Oberkirch and possibly Wiesmoor, the following information is important: In Germany, 83% of all waste wood is burned for energy, whereas in Italy, 82% of waste wood is recycled, mostly to make panelboard. The overcapacity of waste-wood burning energy plants has caused panelboard producers to rely far more heavily on using whole trees from the forest instead of waste wood. Waste wood burning thus contributes to the over-exploitation of forests in Germany.

Location	Net electrical capacity (MW)	Thermal capacity (MW)	Biomass burned	Other information
Brunsbüttel, Schleswig-Holstein	4.9	31.7	100,000 t woodchip, including from arboricultural residues	
Dollbergen, Lower Saxony	8.62	38	120,000 t woodchips from forest wood and arboricultural residues	Heat sold to Avista Oil (lubricants from waste fossil fuel oil)
Elsfleth, Lower Saxony	5.48	26	90,000 t virgin wood	Heat and electricity sold to Omni Park paper mill
Goch, North-Rhine Westphalia	8.5	28	90,000 t virgin wood	Heat sold to food processing company
Greiz, Thuringia	1.7	16.7	20,000 t wood dust from forestry industry residues	Steam and electricity for paper mill. Lignite plant converted to wood 2023.
Kehl	11.6	61.7	150,000 t waste wood grades 1-4	Heat and power for paper mill, some power exported to grid
Oberkirch <sup>2</sup>	12.9	44	Woodchips, 'green waste', mill residues <sup>3</sup>	Heat and power for paper mill, some power to be exported to grid
Wiesmoor, Lower Saxony	2.4	13.4	50,000 t woodchips, likely waste wood	Heat sold for greenhouses

**Table 1:** Biomass power stations burning woody biomass associated with Koehler Group.

<sup>2</sup> Note that this boiler will start burning biomass during 2024. It is currently being converted from coal to biomass.

<sup>3</sup> Unlike pulp mills, paper mills do not produce significant quantities of residues.

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