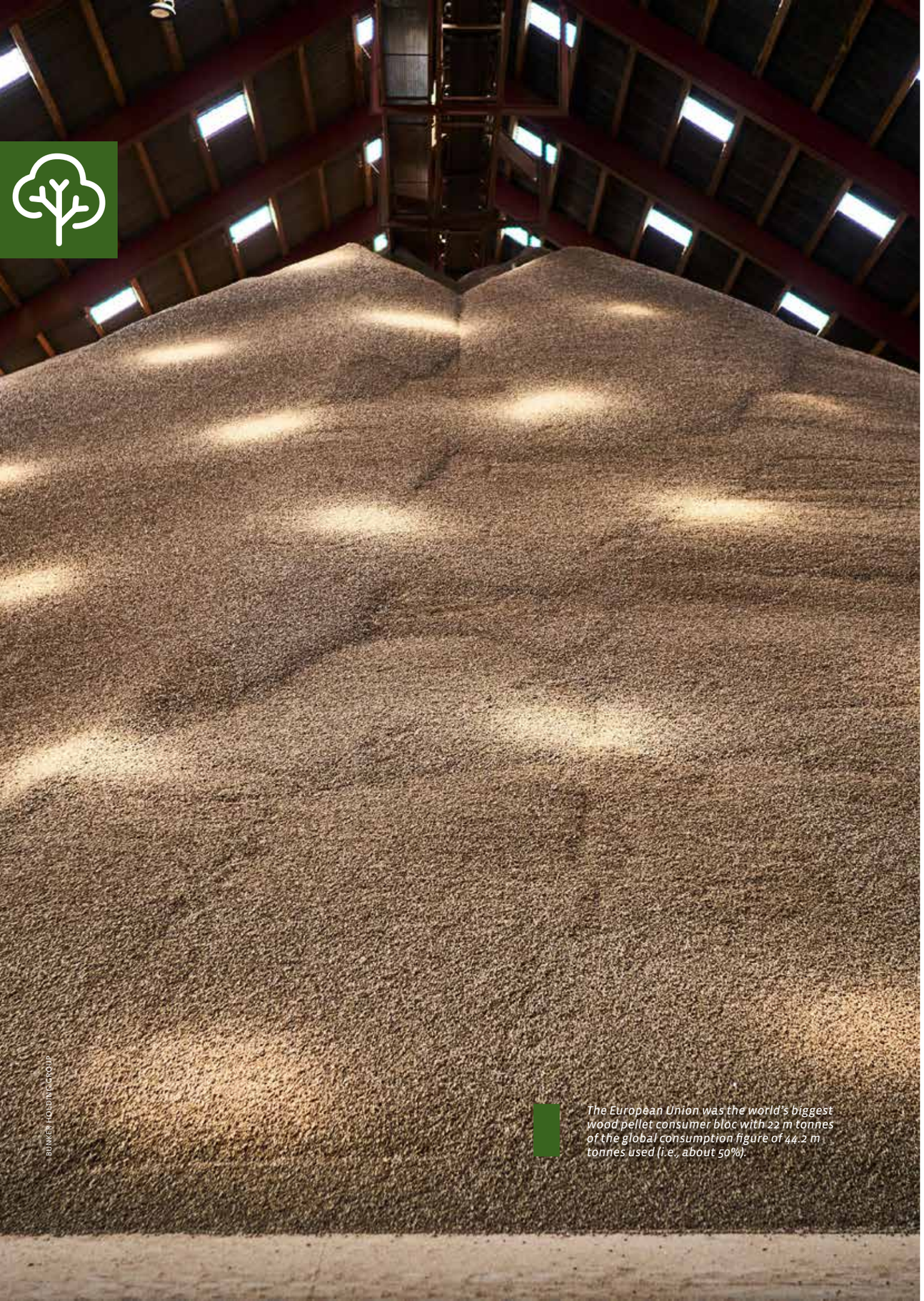


BUNKER HOLDING GROUP

The European Union was the world's biggest wood pellet consumer bloc with 22 m tonnes of the global consumption figure of 44.2 m tonnes used (i.e., about 50%).

-4.8%

The decrease of inland consumption from solid biofuels in the EU27 between 2022 and 2023

SOLID BIOFUELS BAROMETER 2024

A study carried out by EurObserv'ER.

European Union solid biofuel consumption declined in 2023 for the second year running, having peaked in 2021. EurObserv'ER quantified EU primary energy consumption at 95.3 Mtoe in 2023 compared to 100.1 Mtoe in 2022 and 104.5 Mtoe in 2021. The 2023 downturn has to be viewed against the backdrop of high energy prices and appeals for restraint following the energy crisis weathered by the European Union since February 2022. It is partly due to solid biomass electricity production's lower competitiveness and falling heating needs caused by two particularly mild winters across Europe. Solid biomass electricity output fell by 11.4% between 2022 and 2023 while heat consumption, be it sold via a heating network or directly consumed by the end user, dropped by 3.5%.

76.7 TWh

The electricity production from solid biofuels in the EU27 in 2023

77.8 Mtoe

The heat consumption from solid biofuels in the EU27 in 2023

Solid biofuels, more commonly known as solid biomass, cover all solid organic matter of biological origin that can be used as fuel to produce heat or electricity. In energy statistics, solid biofuels are an aggregate of products equal to the sum of heating wood, wood residues and by-products (including wood pellets), black liquor (a by-product of the paper pulp industry), bagasse (a by-product of the sugar cane industry), animal waste, other plant matter and residue and the renewable fraction of industrial waste. Charcoal falls into the solid biofuel category. However, as by conventionspecial statistical treatment is applied to it, it is not included in the indicators presented in this barometer.. Renewable municipal waste is also subject to special statistical monitoring and is excluded from the category of solid biofuel.

Tabl. n° 1

Primary energy production and gross inland consumption of solid biofuels in the European Union in 2022 and 2023** (in Mtoe)*

	2022		2023**	
	Production	Consumption	Production	Consumption
Germany	14.154	14.313	12.577	12.671
France	10.460	10.618	10.547	10.765
Sweden	10.095	10.065	9.729	9.761
Finland	8.462	8.704	8.346	8.601
Poland	8.675	8.745	8.333	8.317
Italy	7.265	8.403	6.760	7.914
Spain	5.297	5.297	5.466	5.466
Austria	4.600	4.488	4.655	4.511
Czechia	3.727	3.512	3.371	3.217
Romania	3.471	3.419	3.165	3.183
Denmark	1.545	3.111	1.570	3.089
Portugal	2.971	2.800	2.895	2.734
Netherlands	1.649	2.479	1.554	2.008
Hungary	2.091	2.116	1.813	1.841
Belgium	1.301	1.880	1.341	1.667
Latvia	2.513	1.535	2.730	1.509
Slovakia	1.383	1.362	1.457	1.457
Bulgaria	1.589	1.605	1.311	1.303
Lithuania	1.297	1.292	1.284	1.286
Croatia	1.593	1.377	1.362	1.118
Estonia	1.766	1.143	1.672	1.051
Greece	0.797	0.824	0.868	0.879
Slovenia	0.545	0.545	0.528	0.528
Ireland	0.242	0.263	0.188	0.221
Luxembourg	0.179	0.170	0.190	0.202
Cyprus	0.031	0.035	0.025	0.027
Malta	0.000	0.001	0.000	0.001
Total EU 27	97.698	100.104	93.735	95.327

Excluding charcoal. ** Estimate.* ***Source: EurObserv'ER 2023.*

UNHEARD-OF ECONOMIC AND CLIMATE DISRUPTIONS

While solid biofuels are the main category of renewable energy used in the European Union, their contribution has declined for the past two years. EurObserv'ER reports that the European Union's primary consumption of solid biofuels has clearly fallen – by 4.8% – below the 100 Mtoe mark, from 100.1 Mtoe in 2022 to 95.3 Mtoe in 2023. If we compare this with its peak consumption in 2021 (104.5 Mtoe), the margin is even wider – 8.8% – i.e., a drop of 9.2 Mtoe in two years. Now, some countries have consolidated their statistics series and Austria is a case in point. We see from the EurObserv'ER questionnaire returned at the start of December, that it downwardly revised its primary energy consumption and solid biomass electricity output figures for 2022 and 2023. Statistics Austria warned that they would differ from the provisional figures it sent to Eurostat in November 2024.

There are several factors behind the European Union's declining solid biomass energy consumption. Compared to 2021, solid biofuels (wood pellets, wood chips, reclaimed wood, etc.) became less competitive as they bore the full brunt of the 2022 energy crisis with serious consequences for solid biomass electricity production. The 2022 hike in the price of wood pellets, as a corollary to the soaring price of gas and European demand constrained by the embargo on Russian and Belarusian imports, had already disturbed production at biomass-fuelled power plants. Although wood pellet prices tumbled in 2023 from their 2022 level (when they more than doubled), they were still above the previous years' average prices. According to Erisa Senerdem of the Argus Biomass Markets agency Argus Media, industrial wood pellet prices in continental Europe are currently (2024) at around 165 USD/t (€ 157/t), which is far below the heights reached in 2022 of above 300 USD/t (€ 286/t) but are still above the average of 150 USD/t (€ 143/t) observed from 2016 to 2021.

The climate is also largely behind the drop in consumption, leading to lower heating needs across the European Union in 2022 and 2023. This reduced demand was certainly accentuated by both the public authorities' calls for restraint in using energy and the rise in the price of wood fuels.

Space heating needs are gauged using an indicator, the number of **Heating Degree Days (HDD)**, that includes the number of days when heating is required and the amount of that heating. Heating needs, that are spread over a calendar year from January to April and then from September to December, were particularly low across the European Union in 2022 following 2021 which was chillier than average. The figures for 2023, are similar to those of 2022, with a new EU-wide drop in the number of heating degree days (HDDs), that Eurostat claims fell from 2 858 to 2 821 in 2023 (compared to 3 126 in 2021).

More variable results emerged from the different European Union climate zones in 2023. Between 2022 and 2023, the heating needs of the EU's Nordic countries (Finland, Sweden, and Denmark) increased, especially in Sweden (with 261 additional HDDs for a total of 5 180 HDDs) and Finland (160 additional HDDs for a total of 5 437 HDDs). Finland scored the highest HDD figure in the EU in 2023. Overall, the heating needs of countries with Atlantic coasts were comparable to those of 2022 if not a little higher. France chalked up 10 additional HDDs for a total of 2 045, Spain had 3 additional HDDs for a total of 1 482 and at 1 047 Portugal had 79 additional HDDs. Yet the further inland countries were from the Atlantic, the lower their heating needs. For example, Germany registered 74 fewer HDDs at 2 662, at 2 973 Poland registered 228 fewer HDDs, Romania at 2 507 had 245 fewer HDDs, and likewise the three Baltic States, with for example, 311 fewer HDDs in Lithuania for a total of 3 462.

If we look back further, Eurostat reports that from 1979 to 2010, the number of HDDs reduced to the European Union's population was always above 3 000 HDDs (the only exception being in 2000) with a maximum of 3 726 HDDs recorded in 1985. Since 2018 the 3 000 HDD threshold has only been crossed once – in 2021. This trend, which is directly linked to climate change, is not about to go into reverse.

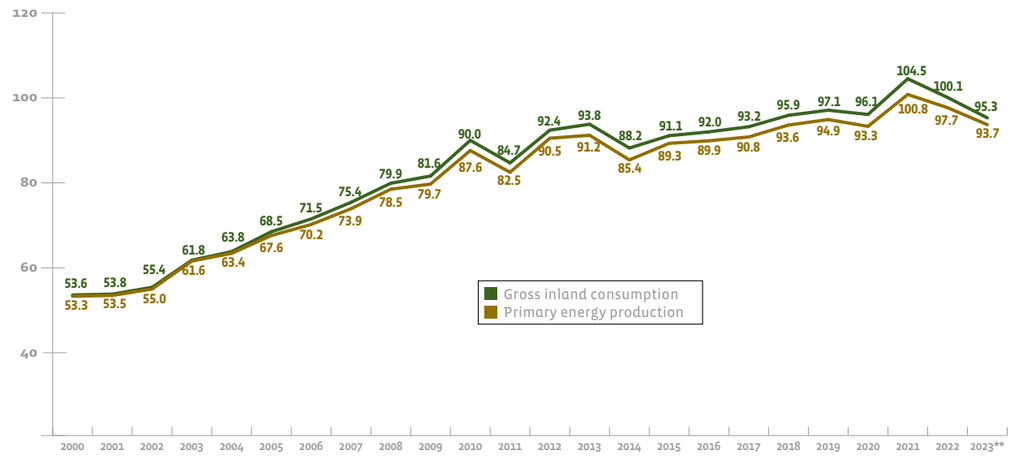
SOLID BIOMASS – THE RENEWABLE ENERGY POWERHOUSE

According to the September 2023 (European) Union Bioenergy Sustainability Report, solid biofuels accounted for 70.3% of all bioenergies in 2021 (of total gross consumption of 148 Mtoe), ahead of liquid biofuels with 12.9% (primarily biodiesel, biopetrol and biokerosene and other liquid biofuels), biogas (10.1%), renewable municipal waste (6.6%) and charcoal (0.2%). Taken together, bioenergies accounted for 58.9% of all renewable energies (put at 251 Mtoe) with solid biofuels amounting to 41.5% of this, far outstripping wind energy 13.2%, hydropower 11.9%, solar energy 7.2% and ambient energy (6%) harnessed by heat pumps and geothermal energy (2.7%).

The full energy balance of the 27 European Union Member States to be found on the Eurostat website gives the most recent data. In contrast to the afore-mentioned EU report, it does not refer to the biomass sustainability criteria and the specifics of the 2018/2001 renewable energy directive. The solid biofuel share of all bioenergies appears to be tapering off in favour of liquid biofuels. It dropped from 69.1% in 2021 to 68.6% in 2022 and should pursue this trend in 2023 leading to a clear increase in biofuel consumption in transport and a further decline in the solid biofuel contribution. The bioenergy share of the renewable total contracted from 60% in 2021 and to 58.7% in 2022 but remains predominant. Solid biofuels taken alone amounted to 41.5% of the renewable total in 2021, 40.3% in 2022, and should logically fall to below 40% of the renewable total in 2023.

Graph. n° 1

Solid biofuels primary energy production and inland consumption growth figures for the EU27 since 2000 (in Mtoe)*



Excluding charcoal. **Estimate.* ***Sources: years 2000-2021 Eurostat, years 2022 and 2023 EurObserv'ER.* *Note: Eurostat data presented for the years 2000 to 2021 are those updated on 24th May 2024 and do not take into account possible statistical revisions at the end of the year 2024*

The Copernicus Climate Change Service (C3S) of the European Union's Earth Observation Programme confirmed, "2024 is now certain to be the hottest year on record and will exceed the 1900 pre-industrial level by more than 1.5 °C", the limit set by the Paris agreement. However, this agreement refers to a long-term trend, the 1.5 °C average warming should be observed over several years to be considered as exceeded.

IMPORTS FROM OUTSIDE THE EU PLUMMETING

EurObserv'ER puts European Union solid biofuel production, i.e., the solid biomass taken from EU soil, at about 93.7 Mtoe in 2023. This amounts to a 4.1% year-on-year drop, equating to a 4-Mtoe drop in output. The difference between the primary energy production data and gross domestic consumption represents the balance of imports and exports, and stock variations.
Across the European Union, net imports of solid biomass remain fairly low and have fallen considerably since 2021 (3.7 Mtoe in 2021, 2.4 Mtoe in 2022 and 1.6 Mtoe in 2023). The drop in imports recorded since 2021 can be attributed to both the effects of the Russian and Belarusian wood pellet embargo and the gradual implementation of European legislation on the use of biomass in major industrial sites, particularly biomass-fuelled power plants (see further on).
The distribution of European Union countries' domestic solid biomass production between the various biomass fuels is clearly dominated by the "wood, wood residue and by-products" category, which includes wood pellet production. According to Eurostat data, the distribution in 2022 (last available figures), by order of importance was 79.3% for "wood, wood residue and by-products" (incl. 6% of wood pellets), 13.7% for black liquor, 4.6% for other plant matters and residues, 1.6% for industrial renewable waste, 0.6% for bagasse and 0.2% for animal waste.

Tabl. n° 2

Gross electricity production from solid biofuels in the European Union in 2022 and 2023** (in TWh)*

	2022				2023**			
	Electricity only plants	CHP plants	Total	Compliant*** (%)	Electricity only plants	CHP plants	Total	Compliant*** (%)
Finland	0.000	11.908	11.908	98.8%	0.000	10.642	10.642	99.1%
Sweden	0.000	11.284	11.284	99.4%	0.000	10.291	10.291	99.5%
Germany	4.931	5.732	10.663	100.0%	4.367	5.630	9.997	100.0%
Poland	1.222	4.712	5.934	100.0%	1.600	4.774	6.374	89.5%
Denmark	0.000	5.679	5.679	99.0%	0.000	4.992	4.992	100.0%
Netherlands	1.905	4.849	6.755	85.1%	1.385	3.541	4.926	97.5%
France	0.889	3.658	4.547	100.0%	1.260	3.458	4.717	100.0%
Spain	4.125	0.807	4.932	93.5%	3.288	0.759	4.047	97.8%
Italy	2.266	2.092	4.358	100.0%	1.629	1.811	3.439	85.0%
Portugal	1.473	2.071	3.544	100.0%	1.354	1.896	3.250	100.0%
Czechia	0.001	2.658	2.659	100.0%	0.001	2.438	2.439	100.0%
Austria	1.126	0.880	2.006	40.8%	1.101	0.760	1.861	100.0%
Belgium	1.464	1.379	2.843	87.6%	0.481	1.304	1.785	100.0%
Bulgaria	0.409	1.644	2.053	0.1%	0.186	1.522	1.708	100.0%
Estonia	0.553	0.970	1.523	98.7%	0.493	0.828	1.321	100.0%
Hungary	0.620	1.073	1.693	86.4%	0.300	0.826	1.126	90.2%
Slovakia	0.006	1.043	1.049	100.0%	0.000	0.963	0.963	97.7%
Croatia	0.000	0.720	0.720	100.0%	0.000	0.706	0.706	100.0%
Latvia	0.000	0.552	0.552	100.0%	0.000	0.477	0.477	100.0%
Lithuania	0.000	0.394	0.394	100.0%	0.000	0.416	0.416	100.0%
Romania	0.062	0.494	0.557	26.7%	0.002	0.377	0.379	100.0%
Ireland	0.482	0.026	0.508	4.2%	0.322	0.026	0.347	98.8%
Luxembourg	0.000	0.288	0.288	100.0%	0.000	0.289	0.289	100.0%
Slovenia	0.000	0.162	0.162	100.0%	0.000	0.196	0.196	100.0%
Greece	0.009	0.043	0.052	100.0%	0.023	0.031	0.055	100.0%
Total EU 27	21.544	65.117	86.661	92.7%	17.791	58.952	76.743	97.8%

Excluding charcoal. **Estimation. ***Compliant with the criteria of Article 29 of Directive (EU) 2018/2001* ***Source: EurObserv'ER 2024.*


The Lima wood burner sold by the company Hase, has the Green Flame label
HASE

SOLID BIOMASS ELECTRICITY OUTPUT FALLS

Primary energy is the energy contained in natural resources prior to any processing. Final energy is the energy used by the consumer, after being transformed and transported, used and invoiced at the point of use. EurObserv'ER distinguishes two types of use of solid biofuel-sourced final energy, namely electricity (table 2) and heat. Solid biofuel heat is differentiated according to whether it comes from the processing sector, i.e., is distributed via heating networks (table 3) or used directly by the end users (in the residential, industrial and agricultural sectors), excluding the transport sector (table 4).
In the EU-27, solid biofuel electricity

EUROPE'S INDUSTRIES REIN IN THEIR WOOD PELLET CONSUMPTION

Bioenergy Europe reports that in 2023, the European Union was the world's biggest wood pellet consumer bloc with 22 m tonnes of the global consumption figure of 44.2 m tonnes used (i.e., about 50%). Yet European Union consumption fell by about 3.3% YoY, while EU production stabilized at 20.7 m tonnes, making it a net importer of about 1.3 m tonnes of wood pellets.
Bioenergy Europe points out that as previously stated, geopolitical tensions between 2021 and 2022 affecting supplies led to this drop in pellet consumption as well as the concurrent energy crisis that had a strong impact on the price of wood pellets, and hence demand. Bioenergy Europe indicates that changes to the profitability of major biomass-fuelled power plants caused the downturn in European wood pellet consumption. The EU wood pellet market is increasingly geared to cogeneration and residential uses. Bioenergy Europe reports that residential market consumption was stable overall between 2022 and 2023.

Gilles Gauthier, Development Director at Hawkins Wright penned an expert opinion piece in Bioenergy Europe's annual statistical report Pellets Report 2024 where he explains why wood pellet demand has declined in Europe and the EU in the industrial market segment. He attributes this fall in demand to several factors, such as the morose economic environment, power plant outages, support mechanism changes and mild weather. Going into detail, the drop in demand by Europe's leading industrial pellet consumer – the UK – was about 900 000 tonnes between 2022 and 2023. It was largely due to the CfD (Contracts for Difference) incentive mechanism which made biomass electricity production unprofitable from the end of 2022 until September 2023 and affected production at the Drax and Lynemouth power plants. The Netherlands, Europe's second biggest market for industrial uses, recorded a 28% (700 000-tonne) fall in pellet consumption over the year, sparked by power plant outages at RWE's Amer and EemShaven facilities and lower production at the RWE and Uniper co-combustion plants. Denmark, which is the No. 3 European pellet user for industrial uses, witnessed a fall of 5% (using 100 000 tonnes less YoY). The expert explains that consumption at Hofor's Amagerværket cogeneration plant increased in 2023 while demand for pellets by plants run by the Ørsted group varied. Pellet consumption increased at Ørsted's Studstrup CHP plant, which reverted to using pellets in the Q2 of 2023 after a long period of downtime caused by a fire. In contrast, pellet use declined in the Avedøre plant mainly because of a maintenance fault that extended through to Q3 of 2023. Finally in Belgium, Engie decided to close its Max Green biomass plant at Rodenhuize, which is unprofitable. The facility has been used as a cold backup for the Knippegroen plant since 2023. From the end of Q1 of 2023, this plant, that burned Canadian wood pellets, stopped benefitting from the green certificate aid scheme. The situation was compounded by new constraints facing very large power plant operators for producing heat and/or electricity (with ≥ 20-MWth boilers), such as the implementation of certification schemes proving that the biomass fuels met the RED Directive 2018/2001 sustainability criteria (and in particular the sustainability and GHG emission reduction or low ILUC risk criteria). This certification is a prerequisite for eligibility for production incentives and for the Member States and for inclusion in the national targets. The Commission Implementing Regulation (EU) 2022/996 dated 14 June 2022 on rules to verify these criteria was planned to come into force on 30 December 2023.

SOLID BIOFUELS BAROMETER 2024 – **EUROBSERV'ER** – DECEMBER 2024


ENGIE SOLUTIONS

The wood heating plant of the city of Reims commissioned in 2023 is fired using reclaimed wood, also known as "B wood". The plant incinerates wood waste that comes from packaging, furniture and demolition wood sourced from a 100-kilometre catchment area around the plant. The site will supply the equivalent of 20 000 dwellings with renewable heat.

output continued to stall in 2023 and was measured at 76.7 TWh – i.e. 11.4% (9.9 TWh) less than in 2022. The 2023 output level is very similar to that of 2018 (76.2 TWh). Over the past two years, the drop in output rose to as much as 17.2%, namely a loss of 16 TWh (from 92.7 TWh in 2021 to 76.7 TWh in 2023). Electricity production from solid biofuels fell to 75.1 TWh in 2023 from its 2022 level of 80.3 TWh ... a 6.6% drop, if we only include in our calculations the part that complies with the RED 2018/2001 Directive requirements for inclusion in European targets. On a positive note, the share of electricity production certified as compliant, communicated by the Member States, increased sharply between 2022 and 2023 rising from 92.7 to 97.8% in 2023. Hence, negligible amounts of solid biofuels that in principle are non-compliant are being used in the European Union's power plants – which was one of the RED II targets.

Incidentally, the drop in solid biomass electricity output should be set against the sharp rise in that of wind energy, which across the EU should reach 477 TWh (55.4 TWh more than in 2022). It will outstrip the EU's natural gas-fired electricity output, which is in steep decline, for the first time (by about 469 TWh in 2023).

There is no change to the rankings of the top three EU solid biomass electricity producer countries. The two major forest countries, Finland and Sweden monopolise the top two ranks with respective solid biomass electricity outputs of 10.6 TWh (10.6% less YoY) and 10.3 TWh (8.8% less YoY), all of which was produced in CHP plants. Germany remains in third place with 10 TWh despite its 6.2% drop in output. The sharpest drops felt can be ascribed to the European Union's two largest wood pellet importers, namely Denmark, whose output fell by 12.1% to 5 TWh (0.7 TWh less YoY) and the Netherlands whose output fell by 27.1% to 4.9 TWh (1.8 TWh less YoY). Only France and Poland of the main producer countries' club increased their outputs between 2022 and 2023 (Poland by 7.4% and France by 3.7%) with respective gains of 440 GWh (for a total of 6.4 TWh) and 170 GWh (for a total of 4.7 TWh).

Heat consumption, including final energy consumption (directly used by end consumers) and heat from the processing sector (heat sold), continued to decline in 2023 (by 3.5% YoY), albeit it not as sharply as in 2022 (5.0% down from its 2021 level), falling from 80.6 Mtoe in 2022 to 77.8 Mtoe in 2023. Almost 99% (98.6% in 2023) of this consumption was deemed compliant by the European Union's Member States judging by the first indications of the national SHARES files used to calculate the 2018/2001 RES directive targets.

Going into detail, solid biomass heat consumption directly used by end consumers slipped by 2.4 Mtoe or 3.5% YoY to 65.9 Mtoe. In 2023, Germany recorded the sharpest drop in final solid biomass energy consumption after having increased it sharply in 2022 (see below), which declined by 1.5 Mtoe (13.8%) for a total of 9.6 Mtoe. The YoY drop in Poland's consumption was 539 ktoe for a total of 6.5 Mtoe.

Gross solid biomass heat output (from the processing sector) sold to heating networks declined by 0.4 Mtoe to 11.9 Mtoe (a 3.2% YoY drop). Most of this decline can be put down to lower demand made of Sweden's CHP plants

Tabl. n° 3

Gross heat production in the transformation sector from solid biofuels in the European Union in 2022 and in 2023** (in Mtoe)*

	2022				2023**			
	heat only plants	CHP plants	Total	Compliant*** %	heat only plants	CHP plants	Total	Compliant*** %
Sweden	0.707	1.904	2.611	99.6%	1.036	1.194	2.230	99.5%
Finland	0.961	1.013	1.975	98.5%	1.083	1.036	2.119	99.1%
Denmark	0.505	1.032	1.537	99.0%	0.550	1.035	1.585	100.0%
France	0.659	0.622	1.281	100.0%	0.671	0.516	1.187	100.0%
Austria	0.627	0.334	0.961	22.1%	0.601	0.314	0.915	98.1%
Germany	0.159	0.473	0.632	100.0%	0.171	0.480	0.652	100.0%
Poland	0.145	0.353	0.498	100.0%	0.153	0.375	0.528	89.5%
Lithuania	0.393	0.149	0.543	100.0%	0.377	0.149	0.526	100.0%
Latvia	0.192	0.216	0.408	100.0%	0.211	0.180	0.391	100.0%
Estonia	0.140	0.224	0.364	100.0%	0.142	0.227	0.368	100.0%
Netherlands	0.115	0.222	0.337	59.7%	0.090	0.192	0.282	82.7%
Czechia	0.044	0.178	0.222	100.0%	0.042	0.188	0.230	100.0%
Italy	0.087	0.121	0.208	100.0%	0.094	0.130	0.224	93.5%
Bulgaria	0.015	0.133	0.147	9.4%	0.013	0.119	0.132	100.0%
Slovakia	0.052	0.087	0.139	100.0%	0.049	0.081	0.130	100.0%
Luxembourg	0.005	0.089	0.094	100.0%	0.006	0.087	0.093	100.0%
Hungary	0.033	0.060	0.093	81.6%	0.030	0.055	0.086	86.2%
Croatia	0.000	0.091	0.091	100.0%	0.000	0.077	0.077	100.0%
Romania	0.011	0.060	0.071	99.9%	0.009	0.051	0.061	100.0%
Slovenia	0.015	0.031	0.046	100.0%	0.013	0.026	0.039	100.0%
Belgium	0.000	0.024	0.024	100.0%	0.000	0.037	0.037	100.0%
Total EU 27	4.865	7.417	12.282	91.1%	5.342	6.551	11.893	98.5%

Excluding charcoal. **Estimation. ***Compliant with the criteria of Article 29 of Directive (EU) 2018/2001.* ***Source: EurObserv'ER 2024.*

Tabl. n° 4

Final energy consumption from solid biofuels** in the European Union in 2022 and in 2023*** (in Mtoe)*

	2022	Compliant**** %	2023	Compliant**** %
Germany	11.148	100.0%	9.614	100.0%
France	8.002	100.0%	8.108	100.0%
Italy	6.708	100.0%	6.564	100.0%
Poland	7.083	100.0%	6.544	89.5%
Sweden	5.533	99.6%	5.836	99.5%
Finland	4.815	100.0%	4.801	99.3%
Spain	3.816	98.7%	4.124	97.8%
Romania	3.367	100.0%	3.162	100.0%
Austria	2.483	100.0%	2.541	100.0%
Czechia	2.663	100.0%	2.402	100.0%
Portugal	1.821	100.0%	1.799	100.0%
Hungary	1.570	99.6%	1.508	100.0%
Belgium	1.266	99.8%	1.270	100.0%
Croatia	1.040	100.0%	1.002	100.0%
Latvia	0.954	99.9%	0.962	100.0%
Denmark	0.834	100.0%	0.879	100.0%
Greece	0.804	100.0%	0.857	100.0%
Bulgaria	1.007	96.4%	0.852	100.0%
Slovakia	0.940	100.0%	0.760	100.0%
Netherlands	0.669	95.1%	0.612	95.1%
Lithuania	0.610	100.0%	0.594	100.0%
Slovenia	0.471	100.0%	0.454	100.0%
Estonia	0.445	100.0%	0.422	100.0%
Ireland	0.164	55.3%	0.149	96.4%
Luxembourg	0.034	100.0%	0.033	100.0%
Cyprus	0.031	100.0%	0.025	100.0%
Malta	0.001	99.6%	0.001	100.0%
Total EU 27	68.278	99.7%	65.877	98.7%

Final Energy Consumption in Industry and Other sectors, excluding Transport. **Excluding charcoal ***Estimation ** Compliant with the criteria of Article 29 of Directive (EU) 2018/2001.*
Source: EurObserv'ER 2024.

SOLID BIOFUELS BAROMETER 2024 – **EUROBSERV'ER** – DECEMBER 2024


SERGE MARIZY

The Bois Rouge power plant in Reunion uses locally-sourced biomass feedstock: bagasse, forest wood, pruning wood, etc., supplemented by imported wood pellets from certified forests

Tabl. n° 5

Heat consumption* from solid biofuels** in the countries of the European Union in 2022 and 2023 (in Mtoe)***

	2022	Compliant**** 2022 %	2023***	Compliant**** 2023 %
Germany	11.781	100.0%	10.266	100.0%
France	9.283	100.0%	9.295	100.0%
Sweden	8.144	99.6%	8.066	99.5%
Poland	7.581	100.0%	7.072	89.5%
Finland	6.790	99.6%	6.920	99.3%
Italy	6.917	100.0%	6.788	99.8%
Spain	3.816	98.7%	4.124	97.8%
Austria	3.444	78.3%	3.456	99.5%
Romania	3.438	100.0%	3.223	100.0%
Czechia	2.885	100.0%	2.632	100.0%
Denmark	2.372	99.4%	2.464	100.0%
Portugal	1.821	100.0%	1.799	100.0%
Hungary	1.663	98.6%	1.594	99.2%
Latvia	1.362	99.9%	1.352	100.0%
Belgium	1.289	99.8%	1.308	100.0%
Lithuania	1.153	100.0%	1.121	100.0%
Croatia	1.131	100.0%	1.079	100.0%
Bulgaria	1.154	85.3%	0.984	100.0%
Netherlands	1.005	83.2%	0.893	91.2%
Slovakia	1.080	100.0%	0.890	100.0%
Greece	0.804	100.0%	0.857	100.0%
Estonia	0.809	100.0%	0.791	100.0%
Slovenia	0.517	100.0%	0.493	100.0%
Ireland	0.164	55.3%	0.149	96.4%
Luxembourg	0.128	100.0%	0.126	100.0%
Cyprus	0.031	100.0%	0.025	100.0%
Malta	0.001	99.6%	0.001	100.0%
Total EU 27	80.560	98.4%	77.770	98.6%

** Gross heat production in the transformation sector and final energy consumption in Industry and «Other sectors» (excluding Transport) ** Excluding charcoal *** Estimation **** Compliant with the criteria of Article 29 of Directive (EU) 2018/2001.* ***Source: EurObserv'ER 2024.***

(see below). Sweden actually witnessed a drop of about 14.6% (0.4 Mtoe) in heat sales to heating networks between 2022 and 2023, with a total of 2.2 Mtoe in 2023. Further north, Finland made greater demand of its heat production plants, increasing output by 7.3% (145 ktoe YoY) for a total of 2.1 Mtoe in 2023.

NEWS FROM AROUND THE MAIN COUNTRIES

GERMANY'S SOLID BIOMASS HEAT CONSUMPTION DROPS

Germany was one of the few countries to increase its consumption of solid biofuels in 2022, despite its heating needs having decreased considerably from their 2021 level. The increase was particularly noticeable in the industrial sector, because of heightened tensions about natural gas supplies in the wake of Russia's war of aggression on its Ukrainian neighbour. The year 2023 was marked by a measure of return to normal with a sharp decline in solid biofuel consumption through lack of competitiveness. AGEE-Stat, the Working Group on Renewable Energy Statistics responsible for statistical monitoring on behalf of the Federal Ministry of the Economy and climate protection, quantified the YoY decrease in this consumption at 11.5% to 12.7 Mtoe (1.6 Mtoe less). Most of this decrease can be put down to lower consumption of solid biomass heat and in particular the heat used directly by end users (a 1.5-Mtoe drop). The amount of solid biomass heat generated by the processing sector (heating networks) remained stable (increasing by 20 ktoe YoY) for a total of 652 ktoe. At the same time, solid biomass electricity output declined by 6.2% (0.7 TWh) totalling 10 TWh in 2023. The decline's extent in the solid biomass heat contribution had significant consequences on the aggregated European Union data by emphasising it.

SLIGHTLY HIGHER FRENCH CONSUMPTION

According to the SDES which provides statistical services to the French ministries of the environment, energy, construction, housing and transport, France's primary solid biomass energy consumption increased slightly between 2022 and 2023 from 10.6 to 10.8 Mtoe. The SDES points out that wood energy still accounts for most of the country's primary renewable energy consumption for heat uses with a 58% share compared to a 28% share of renewable heat drawn by heat pumps (ambient energy). This primary consumption covers the renewable energy directly used by end consumers (for example, home wood-fired heating) and those used for the production of heat sold (mainly via heating networks). The country's 2023 heating requirements were similar to those of 2022 with final energy consumption rising from 8.0 to 8.1 Mtoe (breaking down as 6 Mtoe of consumption in the residential sector and 1.7 Mtoe in industry) and heat sold on to networks slipping from 1.3 to 1.2 Mtoe. Solid biomass electricity output increased slightly from 4.5 to 4.7 TWh aided by the conversion of the Bois rouge and Le Gol coal-fired power plants on Reunion to 100% biomass, by the Albioma electricity supplier, completed in 2023. The net electrical capacity of France's solid biomass power plants increased from 911 to 1 027 MW between 2022 and 2023 according to the SDES.

November 2024 was also marked by the agreement between the State and the operator, GazelEnergie, on restarting the Gardanne biomass power plant in the Bouches du Rhône department as from 1 January 2025. The Council of State had cancelled operation of this power plant in 2023, as it felt that the impact study had insufficiently analysed the effects of its supply plan on the environment. Following an appeal lodged with the administrative court, a stay of enforcement was granted on the basis that the impact study would be strengthened. This agreement applies to an eight-year electricity purchasing contract, to the tune of 800 million euros. The plant's production time will be reduced to 4 000 hours, while the biomass supplies will be reduced from 850 000 to 450 000 tonnes. The 150-MW capacity plant will contribute to enhancing electricity supply security to the Provence-Alpes-Côte-d'Azur region.

A CHALLENGING WINTER FOR COGENERATION IN SWEDEN

According to Statistics Sweden, primary solid biomass energy consumption fell

Graph. 2

Gross inland consumption of solid biofuels* by toe per inhabitant in the European Union in 2023**

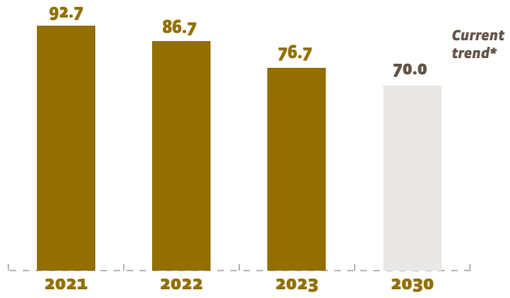
Excluding charcoal ** Estimate* ***Source: EurObserv'ER 2024.*

below the 10 Mtoe bar in 2023 (9.8 Mtoe), having crossed this threshold two years running (10.1 Mtoe in 2022 and 10.2 Mtoe in 2021). Nonetheless, the 2023 consumption level was the third highest recorded in Sweden. The only reason for the decrease was lower demand from its biomass-fired CHP plants. The country's solid biomass electricity output, produced exclusively by CHP plants thus fell by 8.8% (1 TWh) YoY for a total of 10.3 TWh, while heat output from CHP plants plummeted by 37.3% in a single year (from 1.9 to 1.2 Mtoe). Yet, additional contribution from plants only producing heat compensated for this fall, which limited the year-on-year drop in heat sales to 14.6%, giving an overall drop of 0.4 Mtoe (from 2.6 to 2.2 Mtoe). While the production of heat for sale decreased, solid biomass heat directly used by end consumers fared better. It increased by 5.5% to 5.8 Mtoe in 2023 (0.3 Mtoe more than in 2022). In Sweden's case, this increase in final energy consumption can be exclusively ascribed to the industrial sector (0.4 Mtoe) (essentially the paper pulp industry), as households' solid biomass consumption decreased slightly between 2022 and 2023.

The cogeneration sector's difficulties in Sweden can be attributed to rising biofuel prices (wood pellets in particular), which came after Russia invaded Ukraine in February 2022, triggering an embargo on biomass imports from Russia and Belarus, and Russia being Europe's biggest supplier (at about 3 million tonnes according to Bioenergy Europe). An article in Montel News, by Anton Tigerstedt, dated 4 October 2024, reports that Swedish solid biomass producers were denied the drop in the price of biomass fuels partly because of the weakening exchange rate of the Swedish krona to the euro that boosted Swedish biofuel exports at the expense of CHP plants. "Many of our neighbouring countries that previously imported from Russia, Ukraine, and Belarus have instead turned to Sweden," industry association Swedenergy said, adding that average prices since January 2022 had risen by 80% for forest chips and 160% for reclaimed wood. The biofuel price hikes have affected the competitiveness of the countries' cogeneration plants, as operators try to save as much biofuel as possible for cold snaps – periods when the electricity price is at its highest. According to the market players polled by Montel, Nordic operators of combined heat and power plants (CHPs) are preparing for the-2025 winter to be characterised by high biofuel prices and tight supply… a situation that could increase the risk of electricity prices spiking during cold snaps.

Graph. n° 3

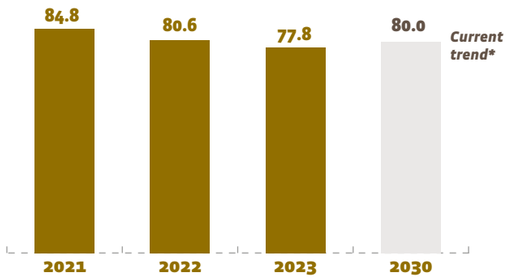
EurObserv'ER projection of electricity production from solid biofuels in the EU 27 (in TWh)*



* Excluding charcoal. **Source: EurObserv'ER 2024.**

Graph. n° 4

EurObserv'ER projection of heat consumption from solid biofuels** in the EU 27 (in Mtoe)*

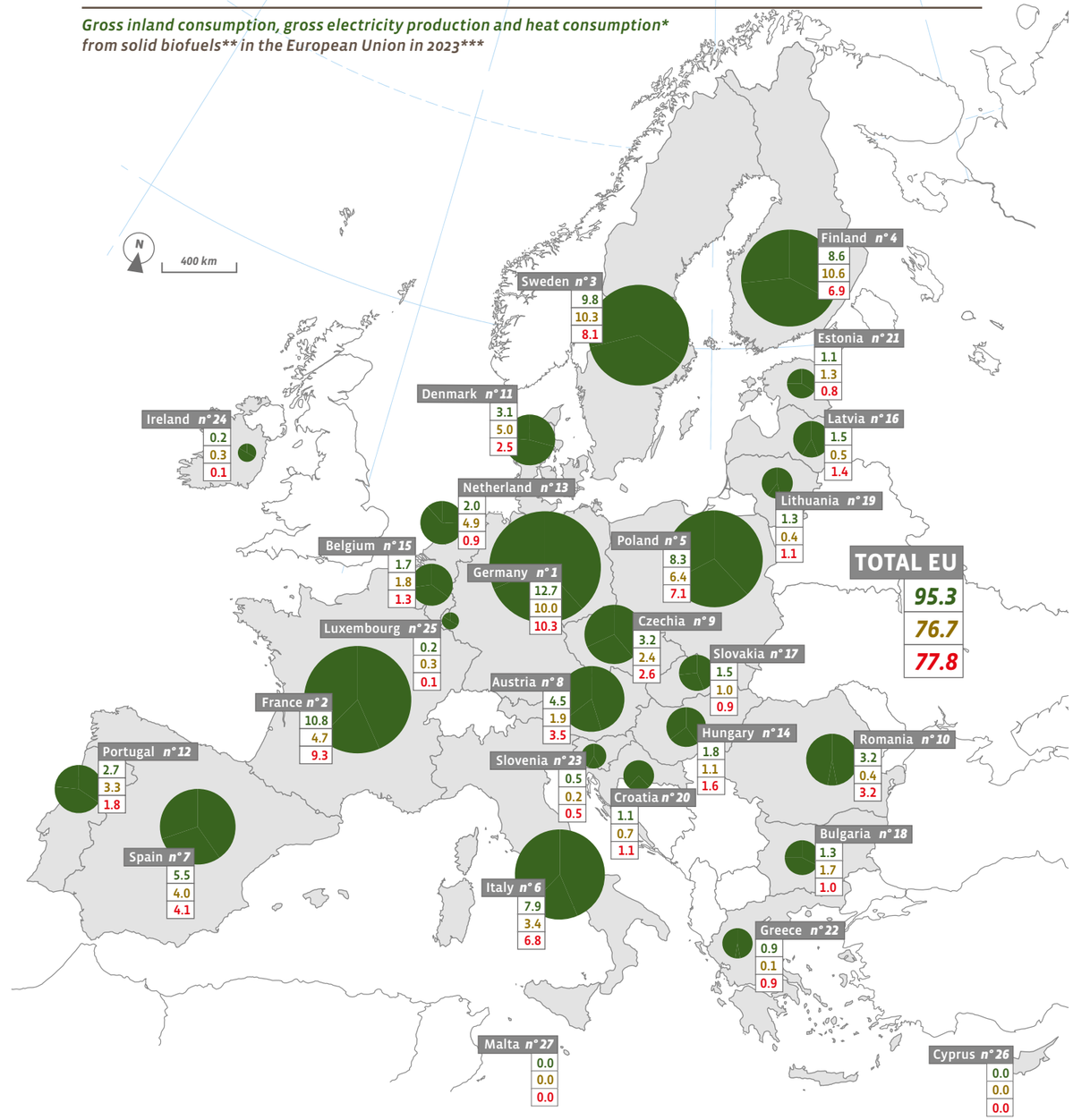


*Gross heat production in the transformation sector and Final Energy Consumption in Industry and Other sectors, excluding Transport. ** Excluding charcoal.* **Source: EurObserv'ER 2024.**

RED III GIVES SUSTAINABILITY CRITERIA A BROADER SCOPE

For the European Commission, greater use of biomass in the EU may contribute to diversifying Europe's energy supply both in the heat production and electricity production segments, creating growth and jobs and reducing GHG emissions. However, if energy recovery from biomass is to be efficient in reducing GHG emissions and if it is to continue maintaining ecosystem services (such as oxygen and air production) and preserving biodiversity, the biomass must be sustainably produced and used. Biomass production involves a chain of activities, ranging from growing the raw materials to final energy conversion. Each stage of the process may pose various sustainability challenges that must be managed. To this end, the European Union has laid down tougher sustainability criteria firstly within the

Gross inland consumption, gross electricity production and heat consumption from solid biofuels** in the European Union in 2023****



Key

95.3 Inland consumption of solid biofuels in the European Union in 2023** (in Mtoe)

76.7 Gross electricity production from solid biofuels in the European Union in 2023** (in TWh).

81.4 Heat consumption*** from solid biofuels in the European Union in 2023** (in Mtoe).

*Gross heat production in the transformation sector and Final Energy Consumption in Industry and Other sectors, excluding Transport. ** Excluding charcoal. *** Estimation.*
Source : EurObserv'ER 2024.

Pfeifer Group pellet production site at Lauterbach, Germany

Tabl. n° 6

Major European operators of biomass plants in 2024

Operator	Country	Operational capacity (MW)	Biomass and cofiring plants
Orsted	Denmark	Cofiring plants with biomass conversion 1 672 MWe 2032 MWth (only heat generation capacity based on biomass)	Avedøre 1(Den), Avedøre 2 (Den), Asnæs 6 (Den), Herning (Den), Skærbæk 3 (Den), Studstrup 3(Den)
Vattenfall	Sweden	CHP biomass plants and heat plants 59.5 MWe 1 962.6 MWth	Lelystad (NL) and in Sweden Gotland, Vänersborg, Motala, Askersund, Lyviksverket – Ludvika, Craboverket – Fagersta, Idbäcksverket – Nyköping, Jordbro, Ekobacken, Fisksätra, Knivsta, Uppsala, Storvreta, Bollmora
Pohjolan Voima	Finland	Multifuel (biomass, peat, fossil) CHP plant 596 MWe 1 169 MWth	Kymin Voima (Fin) (76 % ownership), Kaukaan Voima (Fin) (54 % ownership), Alholmens Kraft (Fin) (49,9 % ownership), Porin Prosessivoima (Fin) (89 % ownership), Rauman Biovoima (Fin) (72 % ownership)
Fortum	Finland	Multifuel (biomass-coal CHP) 399 MWe, 624 MWth	Multifuel (biomass -coal) CHP: Cz stochowa 5-(Pol), Zabrze (Pol), Naantali (Fin) jointly owned (Fortum' share 53.5 %)
RWE	Germany	CHP biomass plant and cofiring plant: - Eemshaven 1 560 MWe (15 % biomass) - Amer 600 Mwe - 350 MWth (80 % biomass) - Markinch 55 MW (CHP capacity) (100 % biomass)	Markinch CHP biomass plant (UK) Amer biomass and hard-coal fired power plant (80 % biomass (NL) RWE Eemshaven (15 % biomass) (NL)

Sources : EurObserv'ER 2024 based on companies annual reports and communication

framework of the Renewable Energy Directive 2018/2001 (known as RED II), and subsequently "broadened" them within the framework of the recast Renewable Energy Directive 2023/2413 (known as RED III) on 18 October 2023 (see inset). RED III aims to extend the scope of the sustainability criteria further so that they apply to an even higher number of installations. It also aims to discourage the use of sawlogs, industrial quality timber for energy purposes, and similarly the use of biofuels exclusively for producing electricity. It also ensures that the Member States respect the cascading principle of using waste according to its hierarchy, the biomass energy must be produced so as to minimise the distortive effects on the raw materials market. The text of RED III came into force on 20 November 2023 giving the Member States 18 months (until 21/05/25) to transpose a specified number of the text's provisions into their national legislation, including those that amend articles 3, 29 and 30 that cover bioenergies and strengthening the sustainability criteria. Article 3 introduces restrictions on public aid for the exclusive production of electricity from forestry biomass. It stipulates that the Member States shall grant no new support or renew support to promote electricity production from forestry biomass in exclusively electrical facilities, with the exception of electricity produced in an outermost region (NB: an outermost region is a European Union territory situated outside the European continent) or if is produced by CO_2 capture and storage. The Member States must not award direct financial support for the use of sawlogs or veneer, industrial quality roundwood, stumps or roots for energy production. The same applies to the production of renewable energy through waste incineration, unless the separate collection obligations laid down in Directive 2008/98/EC have been met. As for Article 29 paragraph 1, the directive lowers the minimum application threshold of the sustainability criteria applicable to biomass-sourced fuels in installations that produce heat, electricity and cooling from the current 20 MW to 7.5 MW. It aims to guarantee greater environmental efficiency of the sustainability and GHG emission reduction criteria. Article 29-3 adds "subnatural forests" (namely, semi-natural ancient forests) and moors in areas where felling is forbidden to safeguard biodiversity. Lastly, Article 30, paragraphs 1 and 6, stipulate the obligations for conducting audits and setting up simplified national systems for electricity, heating and cooling producing installations whose total rated thermal input is between 7.5 and 20 MWth.

EurObserv'ER reckons that the European Union's political determination to reduce the "industrial" uses of solid biofuels could significantly affect their contribution to renewable targets, because during the 2010s much of the increase in solid biofuel consumption was borne by the commissioning of major power plants via the conversion of coal-fired plants to biomass fuels or by the construction of large biomass-fired cogeneration plants. While the current difficulties of major industrial production plants using solid biofuels are more cyclical and stem from solid biomass electricity's lack of competitiveness due to high fossil fuel prices, the curtailment of grants for production could result in new plant closures in the coming years through lack of profitability. A situation of this nature will not be anodyne for the balance of electrical systems because biomass plants can operate in base load mode and respond to demand peaks in very cold weather. The long-term trend is that solid biofuels will be primarily used to meet heating needs, in direct use or via heat sales from biomass heating plants or cogeneration plants. □

Sources : AGEE-Stat (Germany), GSE (Italy), SDES (France), Ministry of Industry and Trade (Czech Rep.), Danish Energy Agency, Statistics Netherlands, GUS (Poland), Ministry for the Ecological Transition and the Demographical Challenge (Spain), Statistics Austria, SPF Economie (Belgium), Statistics Finland, Statistic Sweden, CRES (Greece), Central Statistical Bureau of Latvia, Statistics Estonia, DGEG (Portugal), NSI (Bulgaria), SEAI (Ireland Rep.), Statistics Lithuania, Statistical Office of the Republic of Slovenia, NSI (Romania), Republic of Slovenia Statistical office, Hungarian Central Statistical, NSO (Malta), EurObserv'ER, SHARES Eurostat.

The next barometer will be dedicated to wind power.

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