Wood chip production on the Statkraft site at Tofte, Norway.

STATKRAFT

+0.3%

The growth of inland consumption from solid biofuels in the EU of 27 between 2019 and 2020

SOLID BIOFUELS BAROMETER

A study carried out by EurObserv'ER.

At 94.4 Mtoe, solid biofuels primary energy consumption in the EU of 27 improved marginally – by 0.3% – on its 2019 level in 2020, despite the forebodings about the COVID-19 pandemic and new temperature records. This feat can be credited to an increase in electricity recovery from solid biofuels of about 2 TWh, which rose to 82.6 TWh, contrasting with solid biofuels heat consumption which slipped (by 0.8%) to 76.4 Mtoe.

82.6 TWh

The electricity production from solid biofuels in the EU27 in 2020

76.4 Mtoe

The heat consumption from solid biofuels in the EU27 in 2020

CORIANCE / DOMINIQUE DUGAY

Wood chips are the feedstock used in the biofuel boiler house of the city of Auxerre (Bourgogne-Franche- Comté).

The outlook for solid biofuels energy use in 2020 was dull. To start with, the abnormally mild winter and warm weather experienced across Europe curbed the demand for solid biofuels. According to the Copernicus Climate Change Service (C3S) figures, 2020 was the hottest year on record for Europe, and brought the hottest decade ever recorded to a close, while CO_2 concentrations rose relentlessly. In hard terms, Europe's annual temperature was 0.4°C higher than in 2019, and the hottest ever.

A technical indicator, the number of heating degree days (HDD), is used to gauge the heating needs over a given period. This indicator is calculated in relation to a base temperature threshold (17°C in France). If a day's mean temperature is equal to or above that threshold, the number of degree days over the day is zero. Otherwise, it equals the difference between the threshold and the day's mean temperature.

According to the Eurostat database, which provides statistics of this indicator, the number of heating degree days in the EU of 27 fell to its lowest level of the decade in 2020 to 2 759 HDD compared to an average of 2 977, after falling by 5.2% between 2019 and 2020. The reduction in heating needs affected several European climate zones, primarily Northern Europe such as Sweden (with 4 593 HDD or 10.3% less), Western Europe such as France (with 2 038 HDD or 9.3% less), and also Southern Europe such as Spain (with 1 554 HDD or 7% less). This contrasts with Eastern Europe, where heating needs increased slightly with rises in Hungary (to 2 247 HDD or 4.4%), Romania (to 2 666 HDD or 3.8%), Bulgaria, Croatia, Slovenia and Slovakia. But even in the Eastern European countries, the number of HDDs recorded in 2020 was far below the average for the decade.

The COVID pandemic's economic fallout not only resulted in lower heating needs, but also lower energy needs in the European Union. The European Commission's Energy balances – early estimates, published in June 2021, quantified the total drop in the EU's electricity output at about 4% and heat sold (not directly used by the final user) at 3.2%. Solid biofuels energy has enjoyed a much better year in 2021. Europe's 2020-2021 winter heating season was much longer. Now solid biofuels energy should do much better be it for producing electricity or heat. It has emerged unscathed by the huge fossil fuel price hikes and that of natural gas in particular, because of the economic recovery in Europe and all over the world.

PRIMARY ENERGY CONSUMPTION OF 94.4 MTOE IN 2020

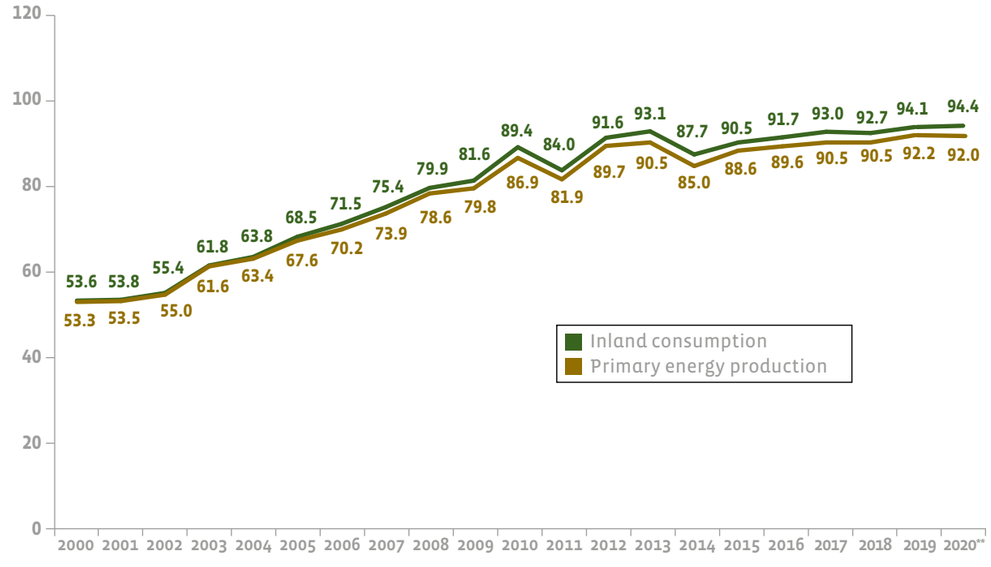
According to EurObserv'ER, which bases its estimates on the official data available early in December 2021, solid biofuels primary energy consumption in the EU of 27 rose by 0.3% over the previous year's level to 94.4 Mtoe in 2020 (table 1). Incidentally, some countries – Spain, Denmark and Austria – made statistical revisions to previous year's figures. This mechanically reduced consumption for 2019 led to a slightly lower level than stated in last year's barometer. Primary energy production from solid biofuels, which accounts for solid biofuels taken from European Union soil, contracted slightly. It is put at 92 Mtoe in 2020, which is a 0.3% drop. The difference, made up by nett imports, plus or minus stock variations, primarily took the form of wood pellets and wood chips from the United States, Canada and Russia. While the European Union is an importer, there are also major exchanges between the Member States. Forested countries such as Finland, Estonia and Latvia export a significant part of their production. They contrast with countries such as Denmark, the Netherlands, Belgium, and Poland that import part of the solid biofuels they use.

While primary energy consumption remained almost stable across the EU, individual Member States' variations are more mixed. The strongest increase can be credited to the Netherlands, whose consumption rose from 1.6 Mtoe in 2019 to 2.3 Mtoe in 2020 (by 699 ktoe), posting annual growth of 45%. Much of this can be attributed to higher wood pellet imports for electricity production in its power plants (see further on). Over the same period, solid biofuels primary energy consumption also increased in Sweden (by 303 ktoe or 3.2%), Poland (by 376 ktoe or 5.7%), the Czech Republic (by 119 ktoe or 3.7%) and Portugal (by 108 ktoe or 4.2%). However, it fell in France (by 496 ktoe or 4.8%), Finland (by 571 ktoe or 6.3%) and Germany (by 143 ktoe or 1.1%) in 2020.

EurObserv'ER differentiates the two uses of final energy derived from solid biofuels, namely electricity (table 2) and heat (for heating or industrial processes). Solid biofuels heat is in turn differentiated, depending on whether it comes from the processing sector and then distributed via heating networks (table 3) or used directly by the end consumer (in the residential or industrial sectors) (table 4). According to EurObserv'ER, solid biofuels heat consumption directly used by end consumers across the EU of 27, slipped (by 0.7% compared to 2019) down to 65.2 Mtoe in 2020. Most of this drop can be ascribed to the drop in residential heating needs of several countries. At the same time, solid biofuels heat sold to heating networks (by the processing sector) slipped slightly by 133 ktoe (1.2%) to 11.2 Mtoe. Sweden's heating networks used less solid biofuels (14.1%

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 2000-2018 Eurostat, years 2019 and 2020 EurObserv'ER. Note: Some countries such as Spain and Denmark have carried out statistical revisions over several years in 2021. These revisions have not yet been taken into account in the Eurostat data (2000-2018) presented in this graph which were updated on 12 November 2021. They will be in the next update of the Eurostat database expected by the end of 2021.*

or 355 ktoe less) and account for most of this contraction.
In the European Union of 27, almost three-quarters of the solid biofuels electricity output, quantified at 82.6 TWh in 2020, was generated in CHP plants (73.2%). This input continued to increase (by 2.5% year-on-year) with an additional 2 TWh. However, the growth rate is slightly lower than the previous year's (5.7% between 2018 and 2019, or 4.4 TWh).
The biggest increases can be credited to the Netherlands which doubled its output over the 12 months (by 103.8%) to produce 5.8 TWh (2.9 TWh more), Spain (by 16.9%, 656 GWh more), Poland (by 7.6%, 492 GWh more) and Portugal (by 16.6%, 457 GWh more). A total of 17 European Union countries increased their output. Eight of them posted double-digit growth (Spain, Portugal, Estonia, Croatia, Ireland, Lithuania, Luxembourg and Greece) while the Netherlands posted triple-digit growth. This contrasts with the plunges in output of Sweden (by 15.4% or 1.7 TWh) and Finland (by 12.6% or 1.6 TWh), due to plummeting electricity demand.

Tabl. n° 1

Primary energy production and gross inland consumption of solid biofuels in the European Union in 2019 and 2020** (in Mtoe)*

	2019		2020	
	Production	Consumption	Production	Consumption
Germany	12.778	12.898	12.778	12.754
France	10.376	10.410	9.859	9.914
Sweden	9.458	9.583	9.900	9.886
Finland	8.949	9.006	8.327	8.435
Italy	7.262	8.513	7.124	8.353
Poland	6.208	6.596	6.606	6.972
Spain	5.035	5.035	5.054	5.054
Austria	4.672	4.620	4.804	4.666
Romania	3.456	3.458	3.401	3.395
Czechia	3.370	3.247	3.522	3.367
Denmark	1.493	2.990	1.440	2.993
Portugal	2.830	2.537	2.904	2.645
Netherlands	1.440	1.553	1.531	2.252
Hungary	2.052	2.069	2.025	2.042
Belgium	1.188	1.868	1.174	1.843
Bulgaria	1.620	1.524	1.680	1.609
Latvia	2.451	1.489	2.285	1.407
Croatia	1.487	1.281	1.569	1.304
Slovakia	1.399	1.389	1.292	1.292
Lithuania	1.248	1.263	1.273	1.284
Estonia	1.763	1.043	1.706	1.135
Greece	0.771	0.810	0.741	0.787
Slovenia	0.546	0.546	0.527	0.527
Ireland	0.237	0.263	0.223	0.258
Luxembourg	0.128	0.124	0.185	0.181
Cyprus	0.025	0.027	0.024	0.028
Malta	0.000	0.002	0.000	0.001
Total UE 27	92.242	94.144	91.957	94.384

*Excluding charcoal. **Estimate. **Source: EurObserv'ER 2021.***

THE PANDEMIC HARDLY AFFECTED WOOD PELLET CONSUMPTION

As a result of their very low moisture content, of less than 10%, wood pellets are the most energy-efficient wood fuel. Their calorific value ranges from 4.6 kWh to 5.3 kWh of LHV/kg compared to 3.8 kWh of LHV/kg for logs. The transport, storage and convenience of wood pellet fuel makes it suitable for many needs in the industrial, residential and service sectors. The Bioenergy Europe Statistical Report 2021 puts global wood pellet consumption for 2020 at just under 40 million tonnes (Mt), an increase of about 7%. The climate ambitions and renewable energy goals of the EU of 27, make the single market the world's biggest wood pellet user. According to the above publication, European Union consumption rose by 4.5% year-on-year to 19.3 Mt in 2020. Brexit, which came into effect on 31 January 2020, dealt a heavy blow to EU wood pellet consumption, as UK consumption is put at 9.4 Mt in 2020. The EU's top wood pellet consumer countries are now Italy (3.4 Mt, 0.1% less over the 12 months to the end of 2020), Denmark (2.9 Mt, 2.9% less), Germany (2.3 Mt, 1.3% more) and the Netherlands (2.2 Mt, 113.6% more). The top four wood pellet producers in 2020 were: Germany (3.1 Mt, 9.9% more), Latvia (1.8 Mt, 12.0% more), France (1.7 Mt, 6.3% more) and Austria (1.5 Mt, 6.9% more). Industry is the biggest European Union consumer of wood pellets (61% of the total), ahead of the residential sector at 31% (<50-kW domestic heating appliances) and the commercial sector with 8% (<50-kW heating appliances).
The report points out that during 2020 the wood pellet sector held up particularly well to the COVID 19 pandemic, as its market players managed to remain stocked, despite the slowdown in sawmill activity which supplies part of the raw material for wood pellet production. The reason for this slowdown in activity observed in the first months of 2020 is the pandemic-driven slump that reduced needs for lumber and the demand for manufactured products. This decline in activity was mitigated by other factors, such as the proliferation of bark beetle. One of the few uses that can be made of poor quality or parasite-damaged woods is conversion to energy, so this wood parasite that infests softwoods, increased the amount of material available allotted to bioenergies in the main affected areas, primarily Germany and the Czech Republic. Moreover, the impact of temporary sawmill closures on wood pellet production was cushioned by the high wood pellet stocks held in Europe. The report also points out that the recent electricity and gas price hikes did not spill over into the biomass and wood pellet sector whose prices remained stable. Wood fuel has turned out to be apt for limiting energy dependency on natural gas imports while tackling the energy price crisis currently challenging Europe.

Tabl. n° 2

Gross electricity production from solid biofuels in the European Union in 2019 and 2020** (in TWh)*

	2019			2020		
	Electricity only plant	CHP plant	Total	Electricity only plant	CHP plant	Total
Germany	5,055	5,984	11,039	5,169	6,058	11,227
Finland	1.318	10.999	12.317	1.030	9.730	10.760
Sweden	0.000	11.220	11.220	0.000	9.496	9.496
Poland	1.564	4.877	6.441	1.557	5.376	6.933
Netherlands	0.537	2.300	2.838	1.012	4.773	5.785
Spain	3.009	0.876	3.885	3.646	0.895	4.541
Italy	2.132	2.108	4.240	2.180	2.291	4.470
Denmark	0.000	4.353	4.353	0.000	4.302	4.302
France	0.506	3.375	3.882	0.670	3.289	3.959
Austria	0.763	2.922	3.686	0.890	2.745	3.634
Belgium	1.990	1.301	3.291	2.034	1.285	3.319
Portugal	1.041	1.709	2.750	1.454	1.753	3.207
Czechia	0.002	2.397	2.399	0.002	2.497	2.499
Hungary	1.501	0.268	1.769	1.414	0.252	1.666
Bulgaria	0.314	1.232	1.546	0.301	1.179	1.480
Estonia	0.245	1.015	1.260	0.278	1.151	1.429
Slovakia	0.000	1.130	1.130	0.000	1.021	1.021
Croatia	0.000	0.477	0.477	0.000	0.565	0.565
Latvia	0.000	0.575	0.575	0.000	0.520	0.520
Romania	0.047	0.403	0.450	0.061	0.433	0.494
Ireland	0.329	0.017	0.346	0.408	0.025	0.433
Lithuania	0.000	0.331	0.331	0.000	0.373	0.373
Luxembourg	0.047	0.160	0.207	0.000	0.266	0.266
Slovenia	0.000	0.151	0.151	0.000	0.157	0.157
Greece	0.009	0.016	0.024	0.012	0.038	0.050
Total UE 27	20.410	60.198	80.607	22.115	60.469	82.584

*Excluding charcoal. **Estimate. **Source: EurObserv'ER 2021.***

SOLID BIOFUELS BAROMETER – **EUROBSERV'ER** – DECEMBER 2021

NEWS FROM AROUND THE COUNTRIES

THE NETHERLANDS DOUBLES ITS SOLID BIOFUELS ELECTRICITY OUTPUT

According to Statistics Netherlands, the country's primary solid biofuels energy consumption rose by 45% between 2019 and 2020 (by 699 ktoe) to just under 2.3 Mtoe – the strongest growth in Europe. An increase in nett imports (the balance between imports and exports) from 113 ktoe in 2019 to 721 ktoe in 2020 is behind most of this growth. These wood pellets were mainly used in its power plants. Thanks to the rollout of its SDE+ scheme, the country more than doubled its solid biofuels electricity output between 2019 and 2020 from 2.8 to 5.8 TWh. This increase was driven by higher wood pellet consumption used in co-combustion with coal in the RWE Amers 9 and Uniper MPP3 power plants. Had it not been for a fire in the storage unit of the RWE Eemshaven plant, consumption could have been even higher. The Netherlands is also developing biomass heat which increased by 27% over the year to 321 ktoe in 2020, primarily by commissioning new CHP power plants such as Andjik, at the very start of 2020. This plant is equipped with a 15-MWth boiler and a 3.4-MWe steam turbine and uses wood chips from pruning waste. It will supply heat to six greenhouse horticultural firms.

RELIANCE ON BIOMASS PLANTS DWINDLES IN SWEDEN AND FINLAND

Statistics Finland reports that its biomass primary energy consumption tumbled in 2020, namely by 6.3% for consumption measured at 8.4 Mtoe. The underlying reason for this is that overall electricity demand declined, resulting in a 12.6% fall in the load factor of its solid biofuels power plants (for a total of 10.8 TWh). Germany overtook Finland as the top solid biofuels electricity producer country in 2020. Statistics Finland claims that the solid biofuels heat (from the processing sector) delivered by heating networks remained stable at just over 1.6 Mtoe in 2020 (0.5% down on its 2019 level). Direct solid biofuels consumption by end users fell even more (by 6.8% or 379 ktoe between 2019 and 2020) with consumption standing at 5.2 Mtoe.

Sweden's situation is slightly different, as primary solid biofuels energy consumption did not falter, according to Statistics Sweden. Rather, it increased by 303 ktoe (3.2%) over the previous 12 months to 9.9 Mtoe. However, the load factor of the country's CHP plants and biomass boilers serving heating networks was much lower. Solid biofuels electricity production fell by 15.4% between 2019 and 2020 to 9.5 TWh. At the same time, heat production from the processing sector fell by 14.1% to 2.2 Mtoe. Direct heat consumption by end users, especially industrial users, led by the paper and pulp industries, spearheaded the rise in primary energy consumption. In 2020, industry used 5 Mtoe of solid biofuels, which is 0.7 Mtoe more than in 2019. The residential sector improved, but only used 860 ktoe in 2020 (97 ktoe more than in 2019). Some of the paper industry's higher energy consumption can be put down to the increase in packaging volumes driven by online purchases, which burgeoned as a result of Covid-19 lockdown measures. Finnish and Swedish cogeneration plant load factors should pick up strongly in 2021 because of the longer 2020-2021 winter heating period and better market conditions (electricity price hike and high fossil fuel prices).

The MPP3 (Maasvlakte Power Plant 3) co-combustion plant in the Netherlands was commissioned in 2016. Its feedstocks are biofuel and coal.

UNIPER

DEMAND FOR HEATING FALLS IN FRANCE

According to the Data and Statistical Studies Department (SDES) that reports to the Ministry for Ecological Transition, primary energy consumption fell (by 0.5 Mtoe between 2019 and 2020) to below the 10 Mtoe threshold in 2020, to 9.9 Mtoe to be precise. Final solid biofuels energy consumption fell because of the particularly mild temperatures. Final energy directly consumed by end users contracted by 5.4% between 2019 and 2020 (by 439 ktoe) to 7.7 Mtoe. The SDES points out that solid biofuels energy consumption appears to have stagnated in recent years if they apply corrections for climatic variations, because the recently installed wood-burning appliances are smaller than at the end of the 2000s and early 2010s. Solid biofuels electricity production is progressing positively. Output increased by 2% in 2020 to reach 4 TWh (a 77-GWh rise between 2019 and 2020). Heat production from the processing sector declined (by 6.9% between 2019 and 2020) because of a shorter heating season but remained above the 1-Mtoe threshold (at 1.1 Mtoe in 2020).

CONTINGENT CONVERSION PROJECTS

Energy operators, industrialists and suppliers are left no option by the implementation of national legislation schemes to stop using coal as a fossil fuel but to convert their plants to biomass or go out of business. In Germany, for example, the network regulator (BNA) is putting out tenders for closing coal production capacities. Closures are also scheduled through agreements between the Government and power plant owners.
Some operators opt for converting their power plants when aid for converting existing facilities, or renewable

Tabl. n° 3

Gross heat production from solid biofuels in the European Union in 2019 and in 2020** (in Mtoe) in the transformation sector*

	2019			2020		
	heat only plant	CHP plant	Total	heat only plant	CHP plant	Total
Sweden	0.667	1.852	2.519	0.604	1.561	2.165
Finland	0.747	0.894	1.641	0.784	0.849	1.633
Denmark	0.497	0.927	1.424	0.480	1.002	1.482
France	0.600	0.595	1.196	0.547	0.567	1.113
Austria	0.536	0.357	0.893	0.598	0.349	0.947
Germany	0.156	0.437	0.593	0.154	0.454	0.608
Lithuania	0.397	0.140	0.537	0.368	0.144	0.512
Italy	0.085	0.432	0.517	0.096	0.409	0.506
Poland	0.078	0.302	0.380	0.100	0.345	0.446
Latvia	0.183	0.165	0.347	0.172	0.163	0.335
Netherlands	0.056	0.197	0.253	0.095	0.227	0.321
Estonia	0.086	0.201	0.287	0.090	0.209	0.298
Czechia	0.038	0.145	0.183	0.040	0.174	0.214
Bulgaria	0.009	0.141	0.151	0.009	0.137	0.146
Slovakia	0.041	0.085	0.126	0.038	0.079	0.117
Luxembourg	0.004	0.055	0.059	0.004	0.092	0.096
Hungary	0.033	0.051	0.084	0.034	0.054	0.088
Romania	0.023	0.043	0.066	0.021	0.061	0.082
Croatia	0.000	0.074	0.074	0.000	0.081	0.081
Slovenia	0.012	0.023	0.035	0.014	0.026	0.039
Belgium	0.000	0.008	0.008	0.000	0.011	0.011
Total UE 27	4.248	7.124	11.373	4.249	6.991	11.240

Excluding charcoal. **Estimate.* ***Source: EurObserv'ER 2021.*

electricity earnings levels are high enough. RWE has made this choice in the Netherlands and has undertaken phased conversion of its Eemshaven and Amer power plants to run on biomass fuels. TrustEnergy (the joint subsidiary of Engie and Marubeni), the main shareholder of the coal-fired 628-MWe Pego power plant in Portugal (the other shareholder is Endesa) is also going down that route. The plant, which was the country's last coal-fired PP in service shut down on 20 November 2021. Thus, Portugal joins Belgium, Austria and Sweden, to become the fourth European nation to stop using coal. To restart the electricity production, TrustEnergy is examining the alternative of replacing coal with forestry biomass, but its policy is under fire from environmental NGOs like Biofuelwatch that reckons that the demand for wood fuel will be much too high and call for the expansion of dedicated monoculture eucalyptus plantation areas or wood pellet imports from the American continent (USA, Canada, Brazil). TrustEnergy is keen to highlight the investments it has already made in the power plant to limit its environmental impact, such as installing a flue gas desulphurization system and other devices to reduce particle emissions. The final decision will depend on the financing terms and the national and European aids that could be injected into this conversion project.

In July 2021, France's EDF announced that it was giving up its Ecocombust project (launched in 2016) to convert its Cordemais coal-fired plant (1.2 GW) to biomass fuels. The energy company cited as reasons for its U-turn, the cost of the conversion (140 million euros), and the departure of its industrial partner Véolia, which would have postponed the commissioning to 2024 from its scheduled date of winter 2022–2023. Cordemais will thus continue to generate electricity using 100% coal for a maximum of 750 hours per annum. In March 2021, RTE, the French grid system operator had extended its electricity supply alert in France to the next three winters and recommended keeping Cordemais in service until 2026, either in its current form or converted to biomass, notwithstanding the fact that France intended to close its last coal-fired power plants by 2022, to comply with the November 2019 energy and climate bill.

Tabl. n° 4

Heat consumption from solid biofuels in the countries of the European Union in 2019 and 2020** (in Mtoe)*

	2019			2020		
	Total	of which final energy consumption	Of which derived heat***	Total	of which final energy consumption	Of which derived heat***
Germany	10.239	9.647	0.593	10.021	9.413	0.608
France	9.342	8.146	1.196	8.821	7.708	1.113
Sweden	7.660	5.140	2.519	8.130	5.965	2.165
Italy	7.205	6.688	0.517	6.969	6.463	0.506
Finland	7.228	5.587	1.641	6.841	5.208	1.633
Poland	5.275	4.895	0.380	5.534	5.088	0.446
Austria	3.950	3.057	0.893	3.966	3.019	0.947
Spain	3.810	3.810	0.000	3.648	3.648	0.000
Romania	3.451	3.385	0.066	3.432	3.350	0.082
Czechia	2.695	2.511	0.183	2.796	2.582	0.214
Denmark	2.460	1.036	1.424	2.465	0.983	1.482
Portugal	1.812	1.812	0.000	1.802	1.802	0.000
Hungary	1.604	1.520	0.084	1.608	1.520	0.088
Bulgaria	1.173	1.022	0.151	1.298	1.152	0.146
Latvia	1.313	0.965	0.347	1.240	0.905	0.335
Belgium	1.211	1.203	0.008	1.147	1.136	0.011
Lithuania	1.150	0.612	0.537	1.143	0.631	0.512
Croatia	1.116	1.043	0.074	1.123	1.043	0.081
Slovakia	1.123	0.997	0.126	1.114	0.997	0.117
Netherlands	0.925	0.672	0.253	1.018	0.697	0.321
Greece	0.789	0.789	0.000	0.760	0.760	0.000
Estonia	0.691	0.405	0.287	0.730	0.432	0.298
Slovenia	0.514	0.479	0.035	0.499	0.460	0.039
Ireland	0.185	0.185	0.000	0.180	0.180	0.000
Luxembourg	0.083	0.024	0.059	0.124	0.027	0.096
Cyprus	0.025	0.025	0.000	0.025	0.025	0.000
Malta	0.002	0.002	0.000	0.001	0.001	0.000
Total UE 27	77.030	65.657	11.373	76.434	65.194	11.240

Excluding charcoal **Estimate * Gross heat production in the transformation sector.* ***Source: EurObserv'ER 2021.***

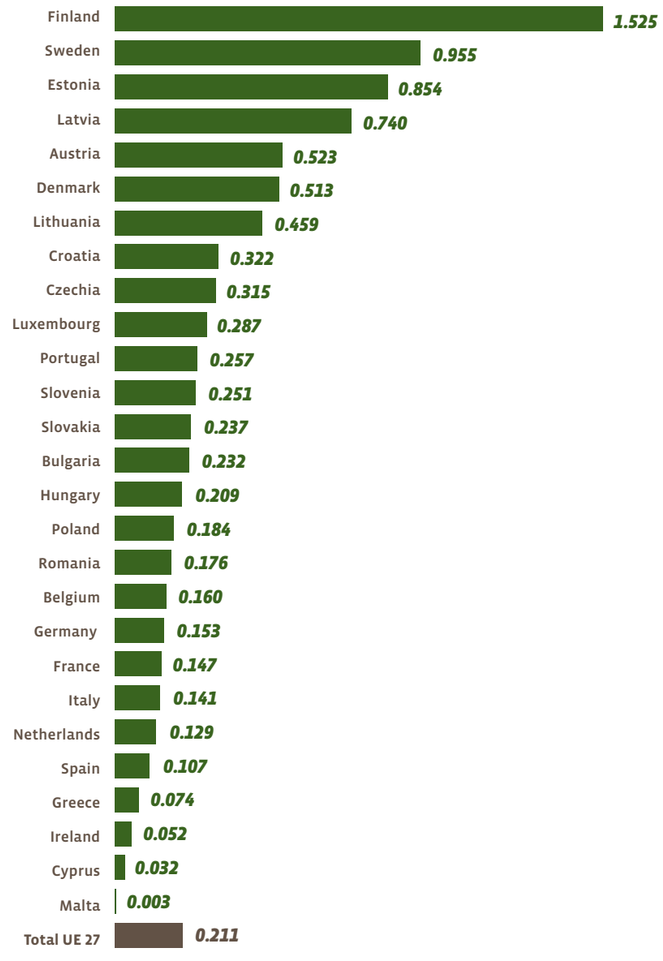
BIOMASS, THE KEY ENERGY FOR DECARBONISING INDUSTRY

Over and above these utility companies' projects, major industrial heat consumers are also embarking on energy transition biomass projects on their production sites. Industrial decarbonisation using biomass or Solid Recovered Fuels (SRFs) is less controversial. These projects tend to use local resources and are viewed as part of the circular economy movement. By way of illustration, last May, the paper group Koehler announced that it was converting its Oberkirch CHP in Germany, that currently fires bituminous coal and by-products of its business, into a CHP plant that will run entirely on biomass, using forestry chips, shredder residues and organic waste. The plant currently supplies 100 GWh of electricity and 330 000 metric tonnes of steam per annum. It heats the town's outdoor swimming pool. The planned investment is for 60 million euros with commissioning scheduled in 2024. The group explains that the German Fuel Emissions Trading Act (BEHG) which makes it harder to use fossil fuels prompted it to fast-forward its conversion to three years earlier than planned. This law, which was decreed on 19 December 2019 as part of the German climate action programme for 2030, introduced an exchange system for emission rights in the heating and transport sectors in 2021.

In France, the Novawood project, led by Novacarb, a Sequens group and ENGIE Solutions subsidiary, is for the construction of a 14.6-MW biomass

Graph. 2

Gross inland consumption of solid biofuels by toe per inhab in the European Union in 2020***



Excluding charcoal ** Estimate* ***Source: EurObserv'ER 2021.*


JAMES K. LINDSEY / WIKIMEDIA

One of the few uses that can be made of poor quality or parasite-damaged woods is conversion to energy. Photo of bark beetles – a wood parasite that infests softwoods.

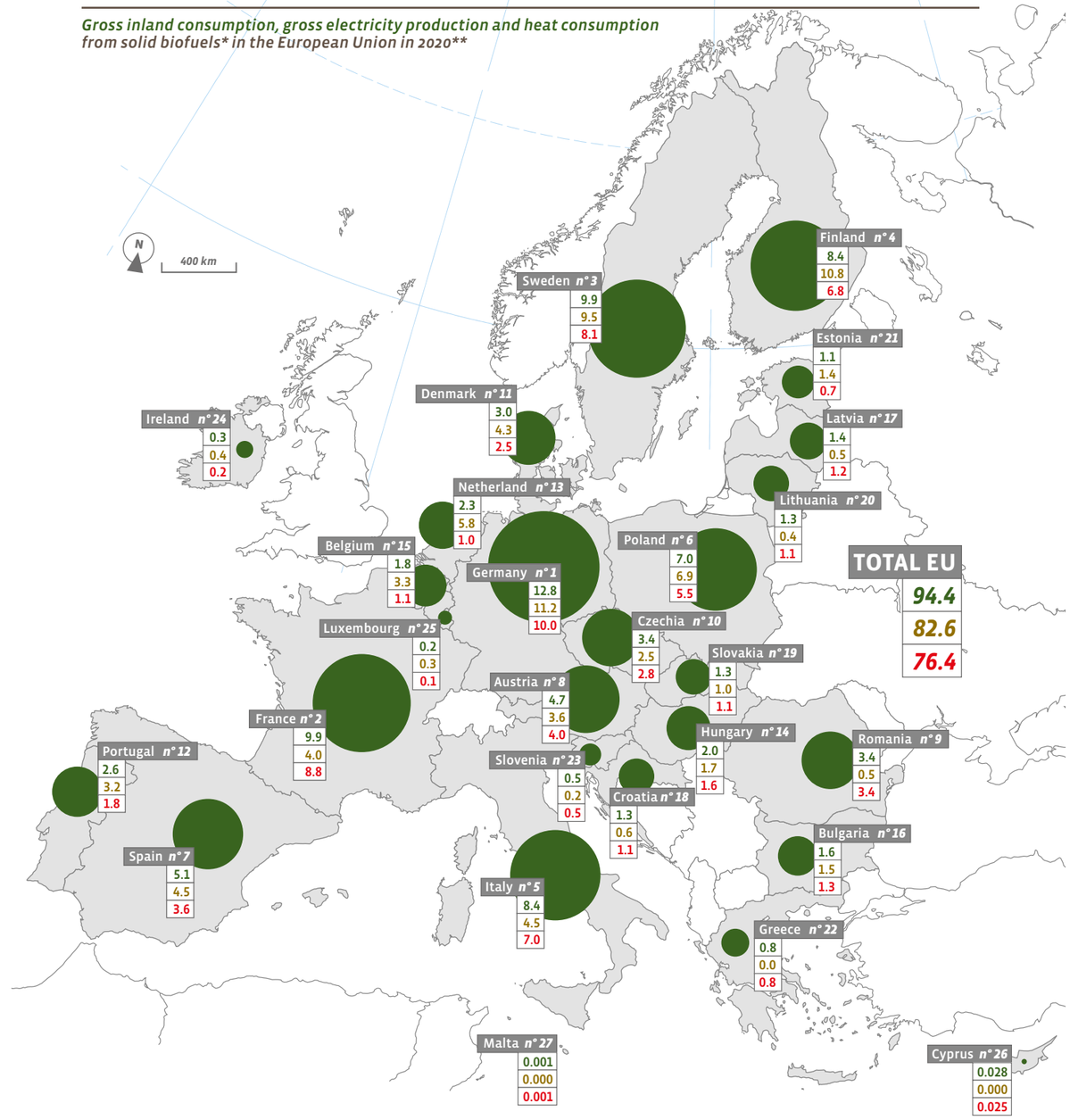
cogeneration plant to replace two coal-fired furnaces on the Novacarb bicarbonate and carbonate manufacturing site. Novawood was a successful contender for the 2020 French Energy Regulatory Commission's CRE 5-3 Call for Projects to install biomass cogeneration plants. The biomass used will be sourced from salvage wood to ensure that its feedstock is sustainable and responsible: 60% will be collected in the Grand Est region (furniture, parquet, doors, pallets, etc. from regional collection centres) and 40% from railway sleepers replaced on the national railway network. The CHP plant will eventually generate 115 GWh of green electricity per annum, i.e., that equates to the consumption of 65 000 households. Novarcarb's energy transition will take off through this project. Two of the site's five main coal-fired furnaces will shut down, thereby slashing its coal consumption by 40%. Novasteam, its second project, is in development to diversify the site's energy mix by using solid recovered fuels. The solution should enable Novacarb to close the final chapter on coal by 2024 and ensure the site's long-term sustainability.

THE CARBON STORAGE CHALLENGE

The European Union is committing considerable resources into CO2 capture technologies. The Commission has created a 15 billion euro innovation fund through its reform of the European carbon market. Half of this fund is earmarked to subsidise large-scale projects to decarbonise the economy. These grants will support projects that aim to launch cutting-edge technologies in the major energy-consuming sectors, the hydrogen, capture, carbon use and storage and renewable energy sectors. On 16 November, the European Commission announced the selection of the first seven wide-scale innovation projects based in Belgium, Italy, Finland, France, the Netherlands, Norway, Spain and Sweden.

The Stockholm Exergi BECCS@STHLM project is the only BECCS (Bioenergy with carbon capture storage) application to be chosen by the European Commission. Its scope covers carbon capture and storage for its KVV biomass cogeneration plant. The site should be up and running in 2025, with annual sequestration capacity of almost 800 000 tonnes of biogenic CO2. Exergi is working on contracts to transport and permanently store the captured carbon in geological aquifers below the sea bed or in depleted North Sea oil and gas fields. The energy company is relying on receiving income from the sale of negative emission rights embodied in carbon removal certificates with permanent geological storage to make its project profitable. Exergi intends to develop more BECCS installations in other bio-cogeneration and waste incineration facilities after 2030. By 2045, it could potentially capture up to 1.7 million tonnes of CO2.

Gross inland consumption, gross electricity production and heat consumption from solid biofuels* in the European Union in 2020**



Key

94.4 Inland consumption of solid biofuels in the European Union in 2020* (in Mtoe).

82.6 Gross electricity production from solid biofuels in the European Union in 2020* (in TWh).

76.4 Heat consumption from solid biofuels in the European Union in 2020* (in Mtoe).

Excluding charcoal ** Estimate* ***Source : EurObserv'ER 2021.*

THE COMMISSION'S PROPOSAL FOR STRICTER SUSTAINABILITY CRITERIA

The European Commission's recent "Fit for 55" package has underlined the EU's continued commitment to sustainable biomass energy. To achieve its climate and environmental goals, it plans to strengthen sustainability criteria for stepping up bioenergy use and get Member States to roll out bioenergy support schemes for wood biomass that is eligible under the cascade use principle. The principle stipulates that the highest economic and environmental value use of wood biomass must be applied in the following order of priority: the production of wood-based products, the extension of their useful life, their reuse, recycling and only then followed by energy recovery or treatment as waste.

The Commission's proposal for stricter sustainability criteria is also consistent with European strategy for protecting biodiversity, primarily through the ban on using biomass from virgin forests, peat bogs and wetlands for energy purposes. From 2026 onwards, financial support for using forest biomass in all-electric facilities will be curtailed. Likewise, there will be no financial incentive to produce energy from sawlogs, veneer logs, stumps and roots for installations. Lastly, the EU's sustainability criteria for biomass usage will apply to ≥ 5 MW heat and electricity facilities.
Implementation of these stricter criteria should enable biomass energy to contribute fully to the more ambitious renewable energy targets under the terms of a revised Renewable Energy Directive. The proposal includes an annual binding national 1.1 percentage point increase, an indicative renewable energy target of 2.1 percentage points in heating and cooling networks, a new indicative target of a 1.1 percentage point annual increase in renewable energy use in industry and a reference to achieve at least a 49% renewable energy share of the energy used in buildings. European policy in favour of renewable heat in all the key decarbonation sectors will be reset if all these measures are adopted.
The contribution of solid biofuels to electricity production in this new arrangement should continue to expand over the next decade but at a slower pace. Carbon neutrality in the electricity sector will be primarily achieved by the intermittent energies, the use of solid biofuels, while more generally bioenergies (biogas and waste-to-energy) will have a more supplementary role to smooth out variations and contribute to adjusting supply to demand during peaks in demand.

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Major European operators of biomass plants in 2020

Operator	Country	Operational capacity (MW)	Biomass and cofiring plants
Orsted	Denmark	Cofiring plants with biomass conversion 1 672 MWe , 2022 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 biomass plants, 195 MWe, 2209 MWth	Lelystad (NL), Märkisches Viertel (GER) 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 868 MWe, 1 652 MWth	Hämeenkyrön Voima (Fin), Kymin Voima (Fin), Laanilan Voima (Fin), Kaukaan Voima (Fin), Alholmens Kraft (Fin), Porin Prosessivoima (Fin), Rauman Biovoima (Fin), Vaskiluodon Voima (Fin)
Fortum	Finland	Multifuel (biomass-coal CHP) 399 MWe, 624 MWth	Multifuel (biomass -coal) CHP: Częstochowa 5-(Pol), Zabrze (Pol), Naantali (Fin)
RWE	Germany	CHP biomass plant and cofiring plant 655 MWe, 350 MWth	Markinch CHP biomass plant (UK) Amer biomass and hard-coal fired power plant (80 % biomass (NL) RWE Eemshaven (15 % biomass) NL
Engie	France	Biomass plant, 205 MWe	Rodenhuize (Bel)

Sources : EurObserv'ER 2021 based on companies annual reports and communication

Furthermore, priority will be given to energy efficiency. Growth will essentially be underpinned by the development of CHP plants at the same time, to meet the renewable heat demand coming from heating networks and industry. In 2020, cogeneration already accounted for just under three-quarters of the European Union's solid biofuels electricity production of 60.5 TWh out of a total of 82.6 TWh.
Basing its calculations on the National Climate and Energy Plans (NECPs), Bioenergy Europe forecasts that collectively, bioenergies will contribute about 15 Mtoe (equating to 174.4 TWh) by 2030. In 2019, Eurostat claimed that solid biofuels accounted for just over half of the bioenergy feedstock used in generating electricity (50.5%). An overall increase of about 1.5 Mtoe (17.4 TWh) is forecast over the next decade for the EU of 27, namely 10% growth. Most of this increase should be provided by solid biofuels, given the weaker growth momentum of the biogas, renewable municipal waste and liquid biofuel sectors for producing electricity.
In its report on biomass supply, Bioenergy Europe emphasizes the fact that the rise in bioenergy use has developed through more efficient use of residue and growing synergies with the forestry industry, rather than by scaling up harvesting practices. It also points out that forests are increasingly subject to climate change stresses that weaken individual trees' defence systems, thereby increasing the overall vulnerability of forests. The response is becoming increasingly important as the forest area affected by parasites, fires and other climate disturbances grows every year. Accordingly, forest management, surveillance and maintenance are crucial if the health status of this natural resource is to be safeguarded. Thus, bioenergies play an essential role by supplying a market for wood waste or timber affected by diseases or insects thereby contributing to preserving the good environmental status of their forest resources. □

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, STATEC (Luxembourg), NSO (Malta), EurObserv'ER, Eurostat early estimate.

The next barometer will be dedicated to wind power.

Funded by the European Commission