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Modern solid biomass in residential sector in Poland

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9th meeting of the Task Force on Techno-Economic Issues

Annual Meeting - June 12-13, 2023

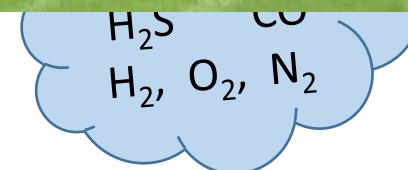


BIOENERGIA

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Bioenergy - energy content in solid, liquid and gaseous products derived from biomass feedstocks and biogas. It includes solid bioenergy, liquid biofuels and biogases.

Modern solid bioenergy - includes all solid bioenergy products (charcoal, fuelwood, dung, agricultural residues, wood waste and other solid biogenic wastes) except the traditional use of biomass. It also includes the use of solid bioenergy in intermediate and advanced improved biomass cook stoves (ISO tier > 1), requiring fuel to be cut in small pieces or often using processed biomass such as pellets.





World energy demand (IEA)

(according to the scenario of OECD countries' composite declarations)¹

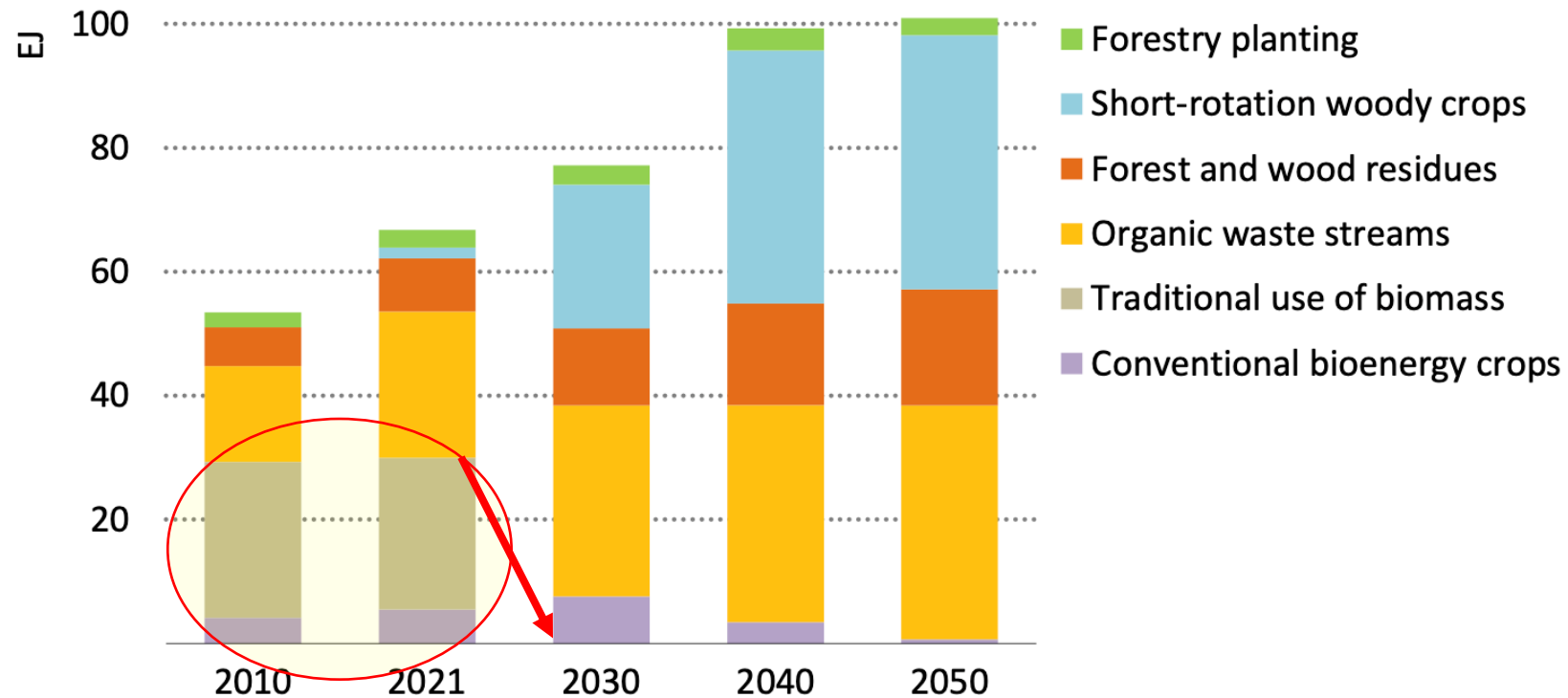
	Announced Pledges Scenario (EJ)						Shares (%)			CAAGR (%) 2021 to:	
	2010	2020	2021	2030	2040	2050	2021	2030	2050	2030	2050
Total final consumption	383	417	439	451	439	433	100	100	100	0.3	-0.1
1 Electricity	64	82	87	108	140	169	20	24	39	2.5	2.3
Liquid fuels	154	159	170	177	149	125	39	39	29	0.4	-1.1
Biofuels	2	4	4	11	18	19	1	2	4	11	5.3
Ammonia	-	-	-	0	1	3	-	0	1	n.a.	n.a.
Synthetic oil	-	-	-	0	1	2	-	0	0	n.a.	n.a.
2 Oil	151	155	166	165	129	101	38	37	23	-0.0	-1.7
Gaseous fuels	58	68	72	71	65	61	17	16	14	-0.3	-0.6
Biomethane	0	0	0	2	3	5	0	0	1	25	11
Hydrogen	-	0	0	1	5	10	0	0	2	87	30
Synthetic methane	-	-	-	-	-	-	-	-	-	n.a.	n.a.
3 Natural gas	57	68	72	67	55	45	16	15	10	-0.8	-1.6
Solid fuels	95	92	93	75	62	53	21	17	12	-2.3	-1.9
4 Solid bioenergy	38	39	40	32	32	34	9	7	8	-2.6	-0.6
Coal	56	52	53	44	30	19	12	10	4	-2.1	-3.4
Heat	12	13	13	13	12	10	3	3	2	-0.1	-1.0
Other	1	3	3	7	11	15	1	1	3	8.3	5.3

Solid biofuels the world's **fourth** energy carrier in 2050

1) The Announced Commitments Scenario (APS) assumes that all long-term emissions and energy access targets, including net zero commitments, will be met on time and in full, even if policies are not yet in place to meet them.



Global bioenergy supply in the NZE scenario (IEA)



IEA. CC BY 4.0.

The abandonment of traditional biomass use worldwide refers to simple/primitive furnaces, stoves and kitchens that burn solid biofuels (e.g., wood) with low thermal efficiency and high air emissions due to improper combustion and/or inadequate fuel.



BIOENERGY in EU-27

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• **FEEDSTOCK**

• **TECHNOLOGY**

• **OUTPUT**



74.7%
Heat



13.4%
Electricity



11.9%
Transport fuel

BiOenergy
EUROPE

It is worth remembering that the processing of wood from the forest is guided by the laws of economics. Only part of the felled tree is destined for firewood.

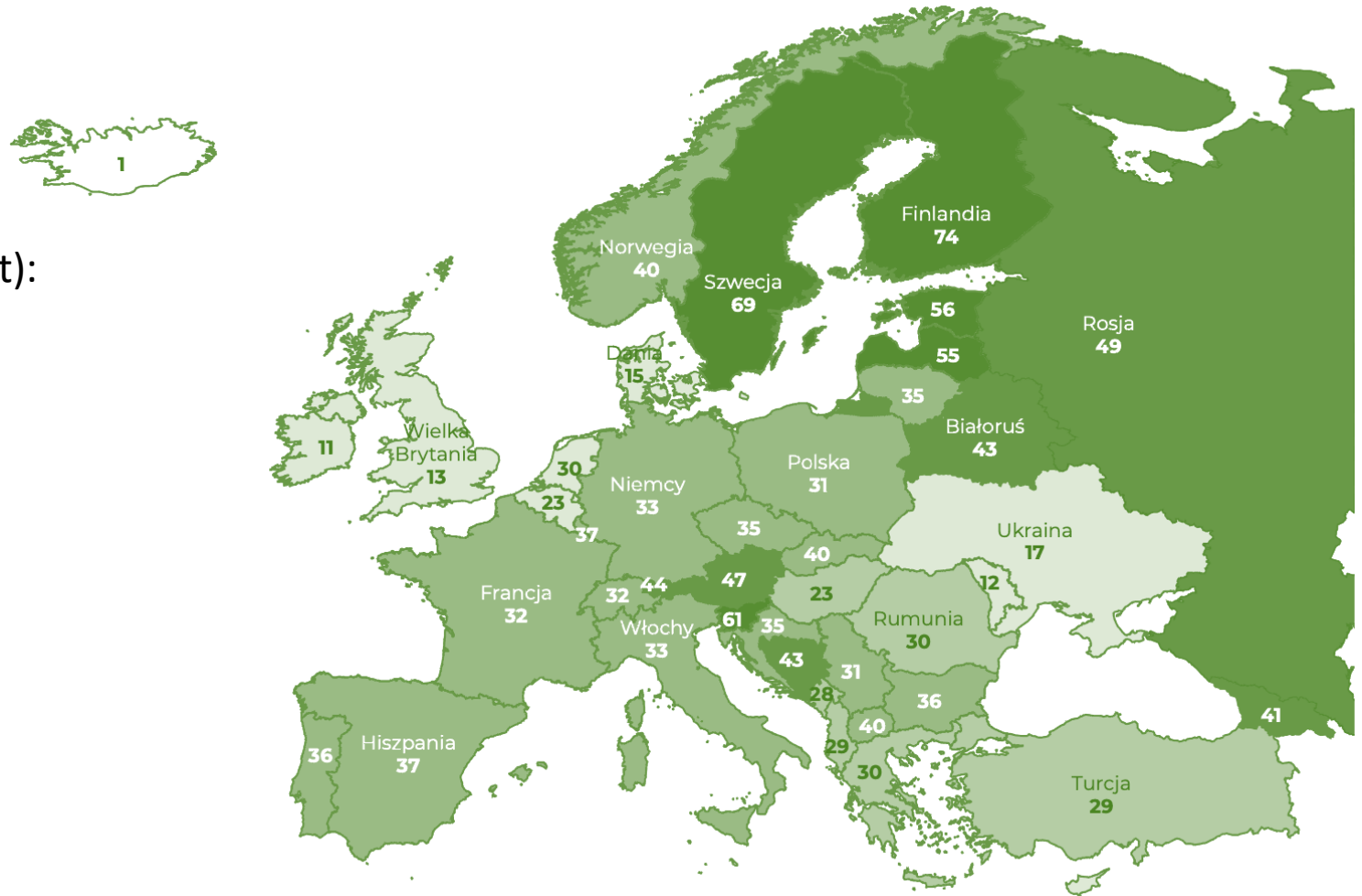
Its most valuable parts are used in the furniture industry and as construction materials.

BiOenergy
EUROPE





Forest cover in Europe in 2021



Production of fuelwood in 2021 (Eurostat):

Poland – 4,7 mln m³ (11,6% of total)

Germany – 23,2 mln m³ (28,1% of total)

France – 26,7 mln m³ (50,5% of total)

Austria – 4,9 mln m³ (26,6% of total)

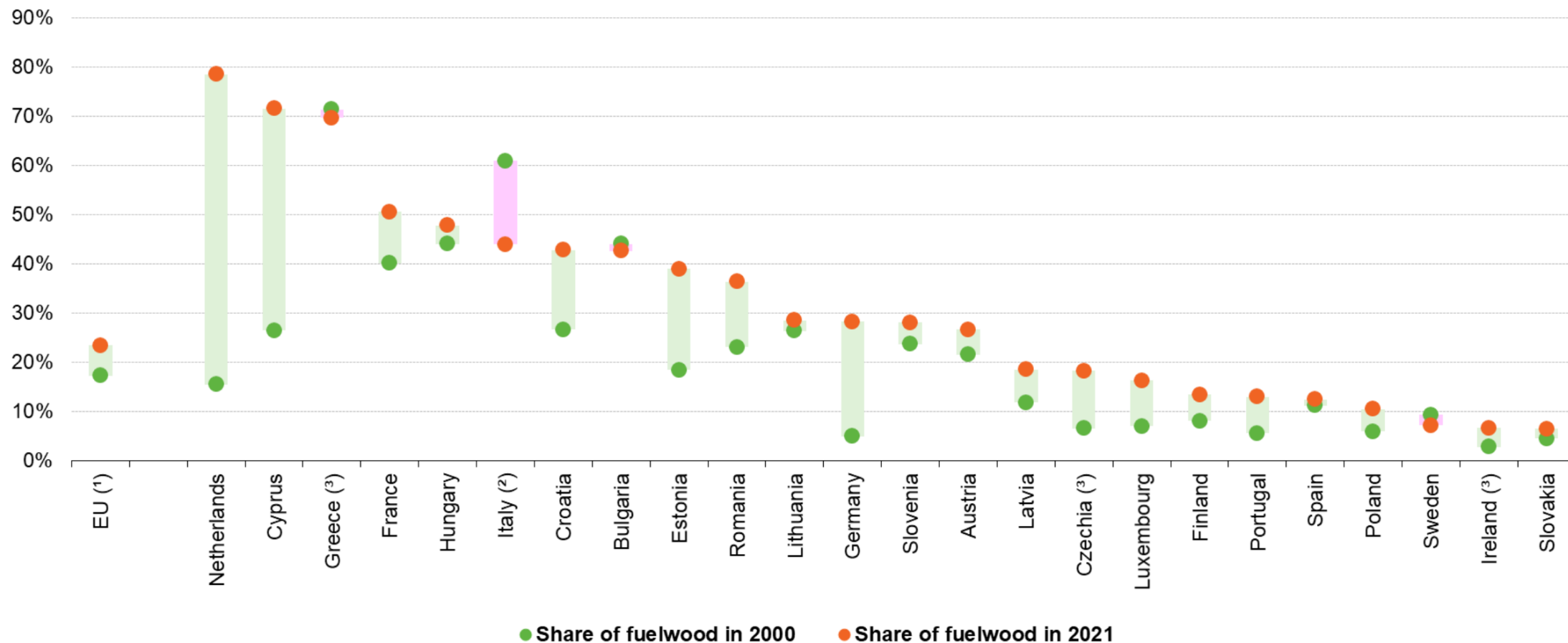
EU-27 – 118,5 mln m³ (23,3 % of total)



BIOENERGY in EU-27 – fuelwood

Change in the share of fuelwood in total roundwood production in the EU, 2000–2021

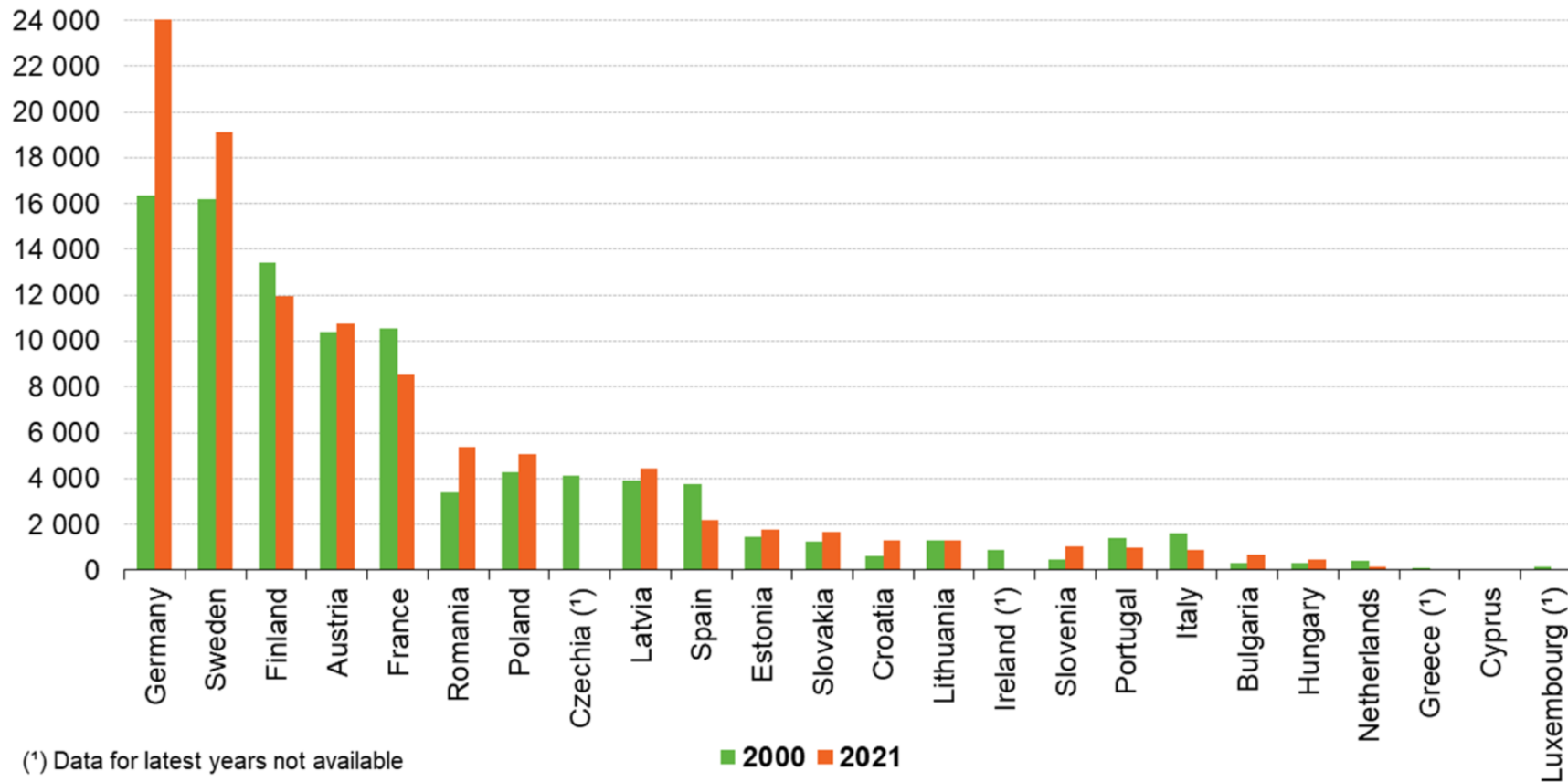
(%)





BIOENERGY in EU-27 – sawnwood

Sawnwood production, 2000 and 2021 (1 000 m³)



(¹) Data for latest years not available
Data for Belgium, Denmark and Malta not available
Source: Eurostat (online data code: for_swpan)

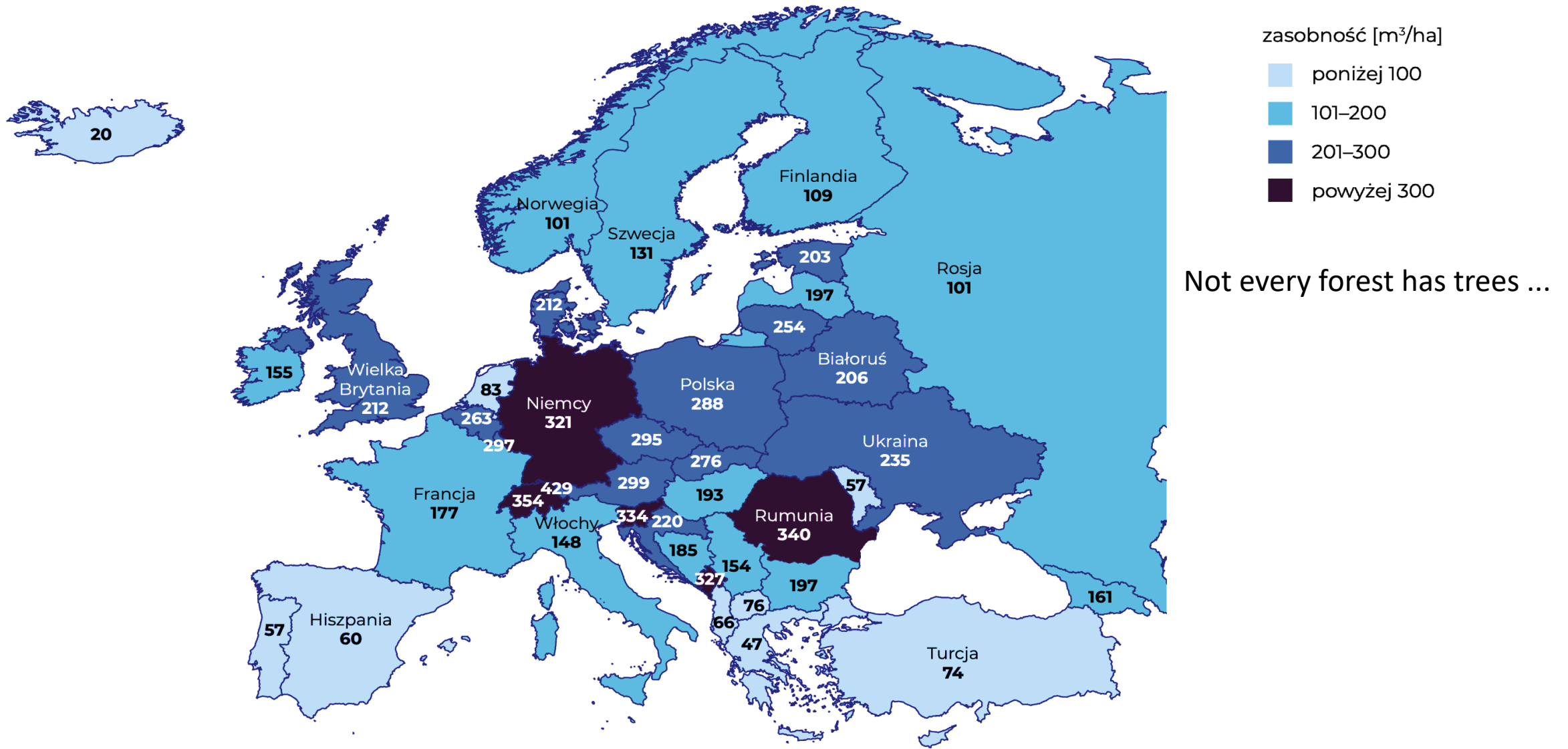
Zrzut ekranu

Sawnwood, as a result of its processing in a sawmill, yields chips and sawdust, which are used to produce solid biofuel - wood pellets.

Poland is the 4th largest producer of wood pellets in the European Union, which we export annually more than 1 million tons to Italy, Germany, Denmark, France



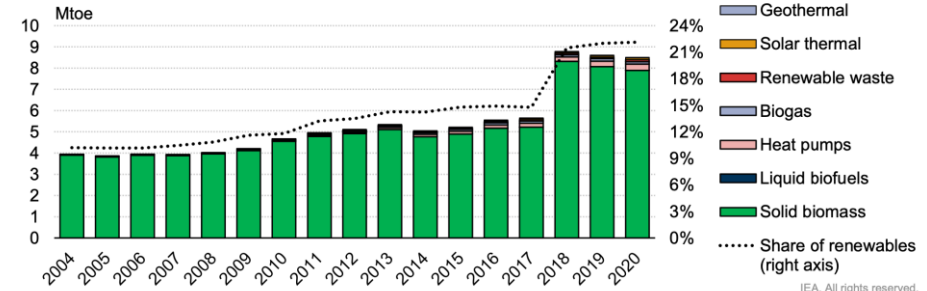
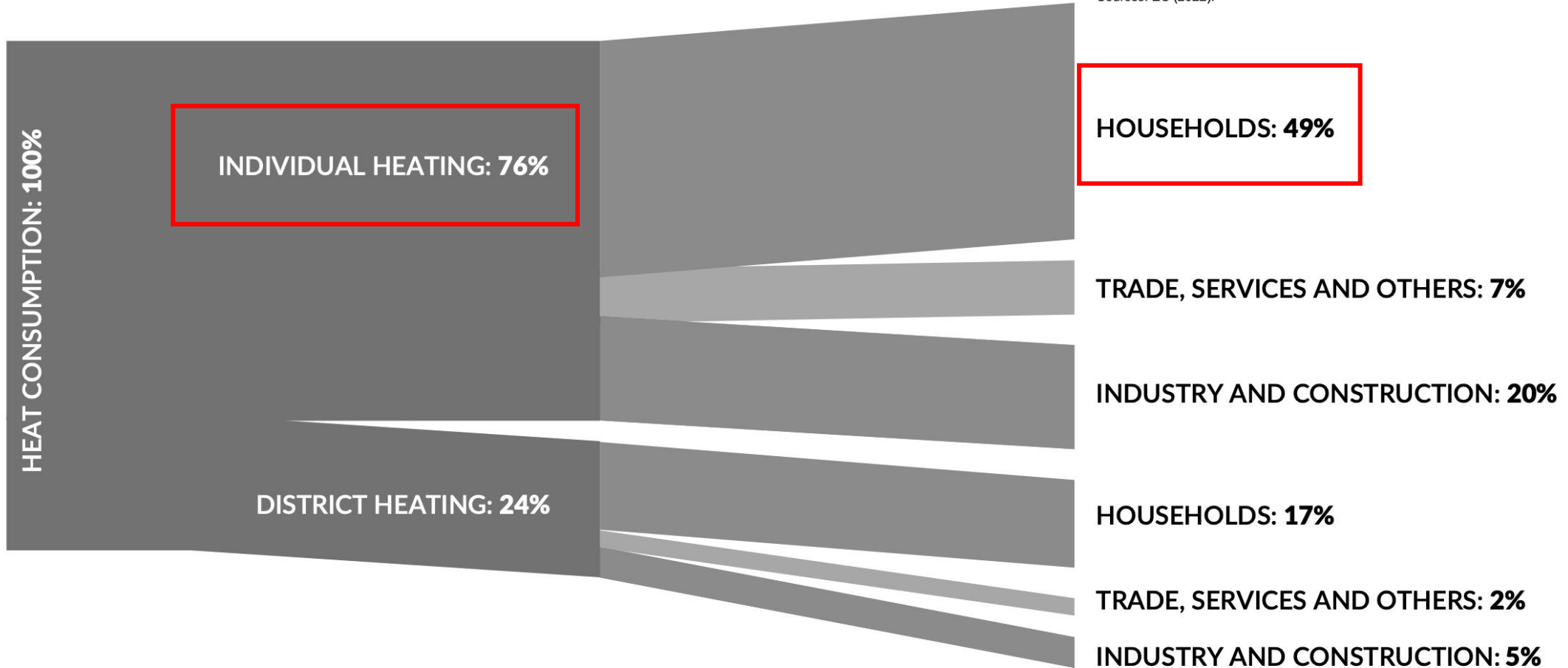
BIOENERGY in Poland - forests





Residential sector in Poland

Heating consumption



Sources: EC (2022).

Source: Heating in Poland – edition 2019. Forum Energii



Residential sector in Poland

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Actual data based on residents' declarations - updated 26.04.2023

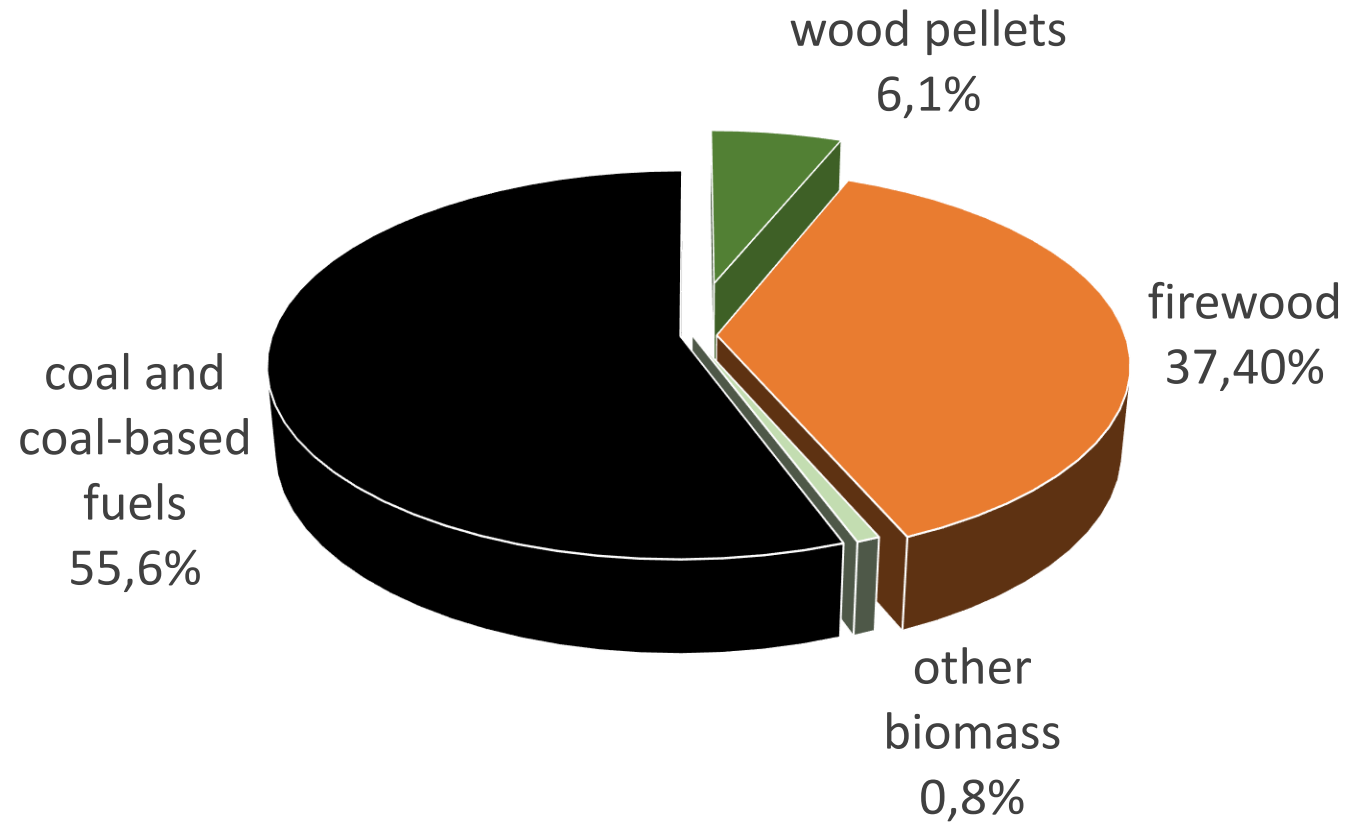
Gas boilers and other gas heating appliances Kocioł gazowy / bojler gazowy / podgrzewacz gazowy przepływowy / kominek gazowy	3 304 634	23,8%
Solid fuel boiler (coal, wood, pellets or other type of biomass) with manual fuel feed /hopper Kocioł na paliwo stałe (węgiel, drewno, pellet lub inny rodzaj biomasy) z ręcznym podawaniem paliwa / zasypowy	3 146 294	22,6%
Electric heating / electric boiler Ogrzewanie elektryczne / bojler elektryczny	1 638 269	11,8%
Fireplace / solid fuel heater (wood, pellets or other biomass, coal) Kominek / koza / ogrzewacz powietrza na paliwo stałe (drewno, pellet lub inny rodzaj biomasy, węgiel)	1 550 807	11,2%
Solid fuel boiler (coal, wood, pellets or other biomass) with automatic fuel feed Kocioł na paliwo stałe (węgiel, drewno, pellet lub inny rodzaj biomasy) z automatycznym podawaniem paliwa	1 464 793	10,5%
Cook stove / stove / coal kitchen Trzon kuchenny / piecokuchnia / kuchnia węglowa	809 028	5,8%
Tiled stove for solid fuel (coal, wood, pellets or other biomass) Piec kaflowy na paliwo stałe (węgiel, drewno, pellet lub inny rodzaj biomasy)	678 273	4,9%
Municipal district heating network / system heat / local district heating network Miejska sieć ciepłownicza / ciepło systemowe / lokalna sieć ciepłownicza	430 495	3,1%
Solar collectors for domestic hot water or with heating support function Kolektory słoneczne do ciepłej wody użytkowej lub z funkcją wspomaganą ogrzewania	413 663	3,0%
Heat pump Pompa ciepła	318 195	2,3%
Oil boiler Kocioł olejowy	137 249	1,0%



Residential sector in Poland

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Structure of the type of fuels used in solid fuel boilers





Summary

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Modern solid bioenergy includes not only all solid bioenergy products with the exception of traditional biomass use but also its use in intermediate and advanced improved biomass cookstoves (ISO level > 1).

Energy scenarios through 2050 predict that demand for biomass fuels will remain.

However, to 2050 the traditional use of biomass will decrease, while the amount of short-rotation woody crops will increase.

Not every forest has trees - despite the fact that Poland is characterized by moderate forest cover, the abundance of Polish forests is among the richer in comparison with other European countries.

Most European countries have increased the supply of firewood over the past 20 years.

The vast majority of heat consumption is directed towards individual household heating.

Poles heat their households 33% through solid fuel boilers, of which about 44% are fired by biomass fuels.

Thank you for your attention!

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