bp Energy Outlook 2025

EU insights

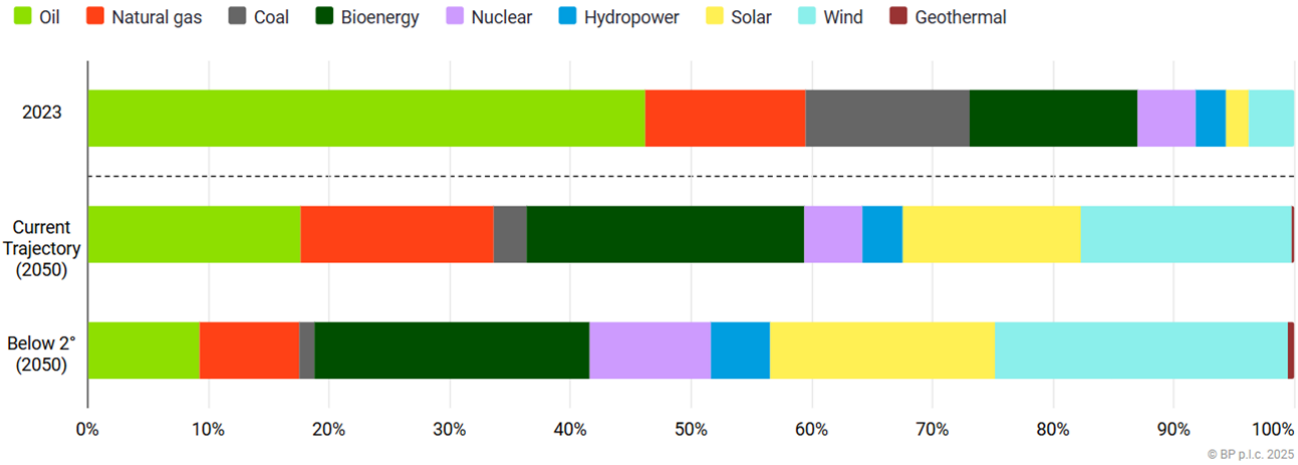
The EU is on a rapid path toward deep decarbonization and widespread electrification

The share of **electricity** in energy consumption **increases** from 21% in 2023 to **45-55% by 2050**

The share of **fossil fuels** in primary energy **declines** from 76% in 2023 to **20-35% by 2050**

Emissions decline from 2.7GtCO$_2$e in 2023 to between **0.1-0.7GtCO$_2$e by 2050**

Primary energy consumption mix by source



Summary

- Primary energy consumption decreases between 25% and 50% in **Current Trajectory** and **Below 2°** respectively compared to 2023 levels.
- Despite the decline in primary energy, renewables grow by around 140% in **Current Trajectory** by 2050. This shows that the EU is in the substitution phase of the energy transition, with low carbon sources crowding out oil, natural gas, and coal, which decline by 68%, 46%, and 84% respectively. In **Below 2°**, the decline of all fossil fuels is accelerated, with each declining between 80% and 95%.
- Solar and wind deployment increases four-fold in both scenarios, reaching around 2,000GW of installed capacity by 2050. This expansion is accompanied by a rapid electrification. Electricity generation grows between 70% and 80% over the period 2023–50, depending on the scenario.
- The decline in oil demand is largely explained by the electrification of the transport sector which accounts for around 75% of the decline in both scenarios to 2050, with industry contributing approximately another 15%. Oil demand from road transportation falls by more than 4Mb/d in **Current Trajectory** and by almost 5Mb/d in **Below 2°**. At the same time, electricity demand from the road transport sector increases by 4EJ in both scenarios.
- Natural gas consumption in **Current Trajectory** declines by just over 5EJ by 2050, compared to around 12EJ in 2023. The electrification of final energy demand, the increasing replacement of gas with renewable energy in power generation, and the growing use of biomethane are the key drivers of this decline. In **Below 2°**, the decline in natural gas consumption is sharper – around 80% by 2050 – as the energy system undergoes deep decarbonization.
- Bioenergy increases by around 40% by 2050 in **Current Trajectory**, driven primarily by the rise in biomethane consumption. In **Below 2°**, however, bioenergy consumption declines slightly – by about 4% – mainly due to the reduced use of biomass in the power sector, as it is increasingly displaced by renewable energy.

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	Level in 2050			Shares in 2050 (%)		Change 2023-2050 (% p.a.)	
	2023	Current Trajectory	Below 2°	2023	Current Trajectory	Below 2°	Current Trajectory	Below 2°
Primary energy consumption by energy type (EJ)								
Total	**52**	**39**	**27**	**100%**	**100%**	**100%**	**-1.1%**	**-2.3%**
Oil†	21	6.9	2.6	41%	18%	9.3%	-4.1%	-7.6%
Natural gas	12	6.2	2.3	22%	16%	8.3%	-2.3%	-5.9%
Coal	6.3	1.0	0.3	12%	2.6%	1.2%	-6.5%	-10%
Nuclear	2.2	1.9	2.8	4.3%	4.8%	10%	-0.7%	0.8%
Hydro	1.2	1.3	1.3	2.3%	3.4%	4.9%	0.4%	0.5%
Renewables (incl. biofuels)	9.1	21	18	18%	55%	66%	3.2%	2.6%
Primary energy consumption (native units)								
Oil† (Mb/d)	10	3.4	1.3				-4.1%	-7.5%
Natural gas (Bcm)	320	172	63				-2.3%	-5.9%
Total final consumption by sector (EJ)								
Total	**46**	**36**	**27**	**100%**	**100%**	**100%**	**-0.9%**	**-1.9%**
Transport	15	9.5	8.5	33%	26%	31%	-1.7%	-2.1%
Feedstocks	3.2	2.9	1.9	7.0%	8.1%	7.1%	-0.4%	-1.9%
Buildings	14	11	7.8	30%	31%	29%	-0.8%	-2.1%
Industry	14	12	9.1	30%	34%	33%	-0.5%	-1.6%
Generation								
Power (TWh)	2,704	4,859	4,608				2.2%	2.0%
Hydrogen (Mt)	5.3	10	17				2.5%	4.4%
Production								
Liquids† (Mb/d)	0.5	1.5	1.5				3.9%	3.9%
Natural gas (Bcm)	34	14	2.1				-3.3%	-9.9%
Coal (EJ)	3.3	1.0	0				-4.3%	
Emissions								
Carbon emissions†† (Gt of CO_2e)	2.7	0.7	0.1				-4.7%	
CCS (Mt of CO_2)	0	-92	-206					

EJ = exajoules

Primary energy is accounted using the direct equivalent method, which directly equates secondary energy from non-combustible sources to the primary energy used to produce it.

† Oil supply includes crude oil, shale oil, oil sands, natural gas liquids, liquid fuels derived from coal and gas, refinery gains, and biofuels.

†† Carbon emissions include CO_2 emissions from energy use, industrial processes, natural gas flaring, and methane emissions from energy production.

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