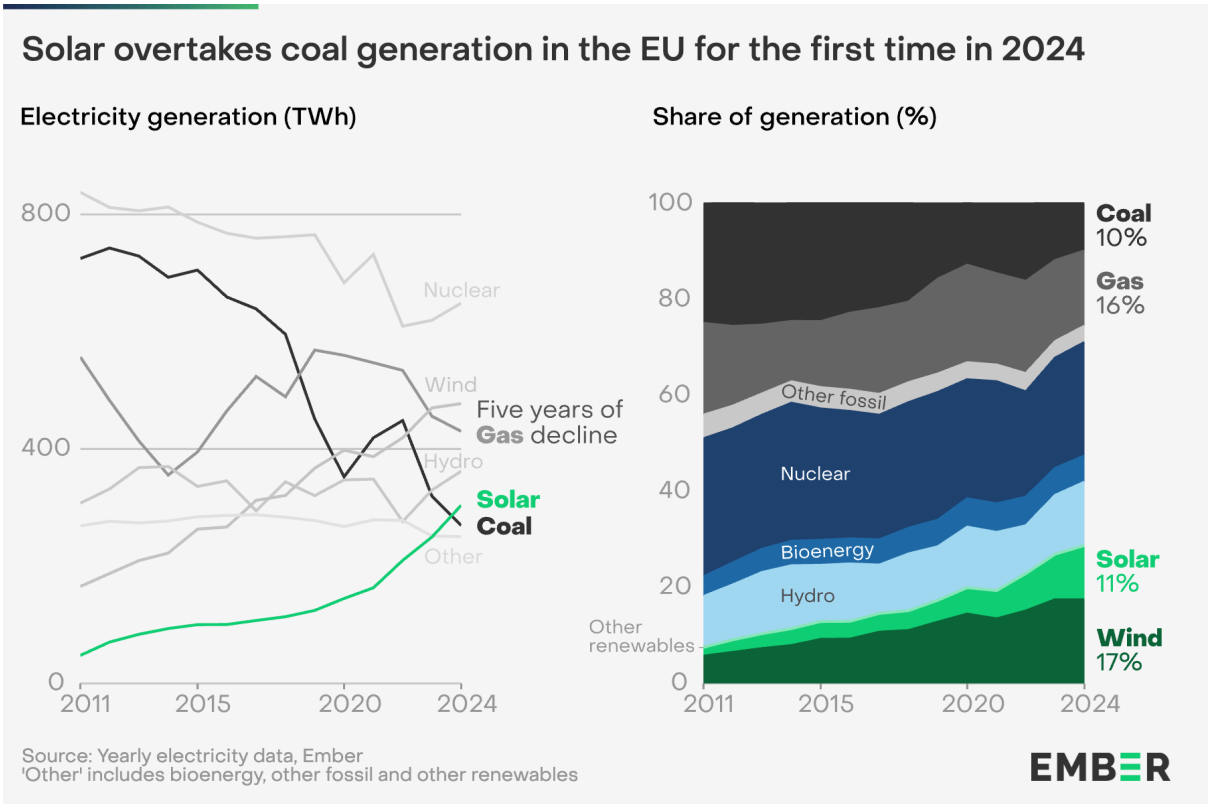
Solar overtakes coal in EU power sector, as gas declines for the fifth year in a row

[Brussels, 23 January 2025] In 2024, solar generated 11% of EU electricity, overtaking coal which fell below 10% for the first time, according to the European Electricity Review published today by think tank Ember. EU gas generation declined for the fifth year in a row and total fossil generation fell to a historic low.

“Fossil fuels are losing their grip on EU energy,” said Dr Chris Rosslowe, senior analyst and lead author of the report. “At the start of the European Green Deal in 2019, few thought the EU’s energy transition could be where it is today; wind and solar are pushing coal to the margins and forcing gas into structural decline.”



The European Electricity Review published today by global energy think tank Ember provides the **first comprehensive overview** of the EU power system in 2024. It analyses full-year electricity generation and demand data for 2024 in all EU-27 countries to understand the region’s progress in transitioning from fossil fuels to clean electricity.

Wind and solar continue their meteoric rise in the EU

The EU power sector is undergoing a deep transformation, spurred on by the European Green Deal. Solar generation (11%) overtook coal (10%) for the first time in 2024, as wind (17%) generated more electricity than gas (16%) for the second year in a row. Strong solar growth, combined with a recovery of hydropower, pushed the share of renewables to nearly half of EU power generation (47%). Fossil fuels generated 29% of the EU’s electricity in

2024. In 2019, before the Green Deal, fossil fuels provided 39% of EU electricity while renewables provided 34%.

These trends are widespread. Solar is growing in every EU country and more than half now have either no coal power or a share below 5% in their power mix. Coal has fallen from being the EU's third largest power source in 2019 to the sixth largest in 2024, bringing the end into sight for the dirtiest fossil fuel. EU gas generation also declined for the fifth year in a row (-6%), despite a very small rebound in power demand (+1%).

The EU is reaping the benefits of reduced fossil fuel dependency

The surge in wind and solar generation has reduced the EU's reliance on imported fossil fuels and its exposure to volatile prices since the energy crisis. Ember's analysis found that without new wind and solar capacity added over the last five years, the EU would have imported an additional 92 billion cubic metres of fossil gas and 55 million tonnes of coal, costing €59 billion.

"While the EU's electricity transition has moved faster than anyone expected in the last five years, further progress cannot be taken for granted," continued Dr Rosslowe. "Delivery needs to be accelerated particularly in the wind sector, which has faced unique challenges and a widening delivery gap. Between now and 2030, annual wind additions need to more than double compared to 2024 levels. However, the achievements of the past five years should instil confidence that, with continued drive and commitment, challenges can be overcome and a more secure energy future be achieved."

Dr Beatrice Petrovich, senior analyst at Ember said: "The EU is striding closer towards a clean energy future powered by homegrown wind and solar. This new energy system will reduce the bloc's vulnerability to fossil price shocks, tackle the climate crisis, and deliver affordable energy for its households and companies. Timely policy action that sustains wind and solar growth, accelerates the deployment of clean flexibility, and promotes electrification, will help to secure the future of EU competitiveness."

Walburga Hemetsberger, CEO of SolarPower Europe said: "This milestone is about more than just climate action; it is a cornerstone of European energy security and industrial competitiveness. Renewables are steadily pushing fossil fuels to the margins, with solar leading the way. We now need more flexibility to kick-in, making sure the energy system is adapting to new realities: more storage and more smart electrification in heating, transport and industries."

Jacopo Tosoni, head of policy at EASE said: "The European Union's competitiveness is intrinsically tied to the rapid deployment of clean energy and flexibility solutions, paving the way toward affordable and sustainable energy. It comes as no surprise that renewables and energy storage are becoming the cornerstone of the energy transition"

—Ends—

Notes to the editor
The European Electricity Review analyses full-year electricity generation and demand data for 2024 in all EU-27 countries to understand the region's progress in transitioning from fossil fuels to clean electricity.

Media pack - press release, report PDF, data sets, graphics

The report will be published online on 23 January 2025 here:
https://ember-energy.org/latest-insights/european-electricity-review-2025/

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About Ember
Ember is an independent energy think tank that uses data and policy to accelerate the clean energy transition. It creates targeted data insights to advance policies that urgently shift the world to a clean, electrified energy future.

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Data table: EU electricity generation, 2023 vs 2024
For full data release see the Media Pack

	2023	**2024**	**Change** (2023 vs 2024)
	Generation (TWh) (% share of total generation)	Generation (TWh) (% share of total generation)	Generation change (TWh) (% change)
Solar	250 TWh (9.3%)	304 TWh (11.1%)	+54 TWh (+21.7%)
Wind	470 TWh (17.4%)	477 TWh (17.4%)	+7 TWh (+1.5%)
Hydro	330 TWh (12.2%)	362 TWh (13.2%)	+32 TWh (+9.8%)
Bioenergy	152 TWh (5.6%)	150 TWh (5.5%)	-1.9 TWh (-1.3%)
Other Renewables*	7 TWh (0.3%)	7 TWh (0.3%)	+0.3 TWh (+4%)
Nuclear	620 TWh (23.0%)	649 TWh (23.7%)	+29 TWh (+4.7%)
Coal	319 TWh	269 TWh	-50 TWh

	(11.8%)	(9.8%)	(-15.7%)
Gas	456 TWh (16.9%)	430 TWh (15.7%)	-26 TWh (-5.6%)
Other Fossil**	93 TWh (3.5%)	94 TWh (3.4%)	+0.3 TWh (+0.3%)
Electricity demand	2,694 TWh	2,725 TWh	+31 TWh (+1.2%)

*Other Renewables generation includes geothermal, tidal and wave generation.

**Other Fossil generation includes generation from oil and petroleum products, as well as manufactured gases and waste.