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STATISTICS BOOK

Energy & Environment Statistics: Power, Oil & CO2

12 full reports · 1 charts · Edition November 2026

EUR 0.2896
EU HOUSEHOLD, PER KWH

€0.2832
EU HOUSEHOLD POWER, H1 2026

440
OPERATING REACTORS

2,700 TWh
EU-27 GENERATION

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ABOUT THIS BOOK

Energy & Environment Statistics: Power, Oil & CO2

Energy and environment statistics: electricity, oil and gas, renewables, prices and emissions. Every chart names its original source and date.

Each chapter is a complete Business Stats report with its text, charts, tables and primary sources. The online version of every report is updated continuously; this book shows them as of Nov 6, 2026.

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STATISTICS REPORT

Global Electricity Prices: Statistics and Facts 2026

Updated Oct 6, 2026 · businesstats.com/global-electricity-prices

EUR 0.2896 EU HOUSEHOLD, PER KWH	**EUR 0.4042** IRELAND, HIGHEST IN EU	**17.30c** US RESIDENTIAL 2025
EUR 0.1837 EU BUSINESS, PER KWH	**26.32p** UK CAP, OCT TO DEC 2026	**$95/MWh** EU WHOLESALE 2025

Overview

Electricity prices in 2026: what drives the bill

The price a household pays for a kilowatt hour has three parts: the cost of generating the power, the cost of the networks that carry it, and taxes and levies set by governments. Each part varies widely between countries. Generation costs depend on the fuel mix and on gas prices, which set the marginal price in many markets. Network costs depend on geography and investment needs. Taxes reflect policy choices, such as funding renewable energy or protecting low-income households.

Because these parts are so different, there is no single global electricity price, and comparisons need care. Official statistics use different units, currencies and tax rules. This report therefore presents each source on its own basis: Eurostat for the 27 EU countries, the Energy Information Administration for the United States, Ofgem for Great Britain, Hydro-Quebec for 22 North American cities, the Australian Energy Regulator for Australia and the IEA for wholesale and industrial comparisons.

The broader structure of the power sector, including generation and capacity, is covered in our report on the global electricity market. Here the focus is on the prices that households and businesses actually pay.

3.7xHighest vs lowest EU household priceIreland vs Hungary.+36%EU household prices 2019 to 2024IEA; US: +26 percent.7.2xHighest vs lowest North American citySan Francisco vs Montreal.28.9%Taxes in EU household pricesSecond half of 2025. EU Household Prices

EU household prices: 0.2896 euros per kWh

Eurostat collects household electricity prices twice a year for a standard consumer using 2,500 to 4,999 kWh a year. In the second half of 2025, the EU average was 0.2896 euros per kWh including all taxes, and the euro area average was 0.2999 euros. Ireland had the highest price at 0.4042 euros, followed by Germany at 0.3869 euros, Belgium at 0.3499 euros and Denmark at 0.3312 euros.

Household Electricity Prices in the EU by Country, Second Half of 2025 (euros per kWh)Consumption band 2,500 to 4,999 kWh a year, all taxes and levies included.

Data:

Eurostat, Electricity prices for household consumers, nrg_pc_204, second half of 2025.

Note:

Austria estimated; Croatia and Malta provisional. Compiled by BusinessStats.Switch to the table for exact figures.

Almost four times apart: a household in Ireland paid 0.4042 euros per kWh, 3.7 times the 0.1082 euros paid in Hungary.

The cheapest electricity was in Hungary at 0.1082 euros, Malta at 0.1282 euros and Bulgaria at 0.1355 euros, all countries where governments regulate or subsidise household tariffs. Outside the EU, Norway households paid 0.1922 euros and Turkey 0.0636 euros, while Liechtenstein paid 0.3062 euros. Between the second half of 2024 and the second half of 2025, prices rose most in Romania (58.6 percent), Austria (34.3 percent) and Ireland (32.7 percent), and fell most in Cyprus (14.7 percent), France (12.5 percent) and Denmark (11.9 percent).

Adjusted for purchasing power, the ranking changes sharply. Measured in purchasing power standards, electricity was most expensive for households in Romania, Czechia and Poland, where incomes are lower, and cheapest in Malta, Hungary and Finland. National detail for the two largest markets is covered in our reports on electricity in Europe and the French electricity industry.

COUNTRY	CHANGE	DIRECTION
Romania	plus 58.6 percent	largest increase
Austria	plus 34.3 percent	increase
Ireland	plus 32.7 percent	increase

Denmark	minus 11.9 percent	decrease
France	minus 12.5 percent	decrease
Cyprus	minus 14.7 percent	largest decrease

EU Price Trend

The EU trend: 34 percent higher than in 2019

The EU average household price was stable at about 0.217 euros per kWh in 2019 and 2020. It rose to 0.2415 euros in the second half of 2021 as gas prices climbed, then to 0.2768 euros in late 2022 after Russia cut gas supplies to Europe. Prices peaked at 0.2916 euros in the first half of 2024 and have since stayed close to 0.29 euros.

Average Household Electricity Price in the EU, 2019 to 2025 (euros per kWh)Semester averages, all taxes and levies included.

Data:

Eurostat, Electricity prices for household consumers, EU weighted average.

Note:

S1 = January to June, S2 = July to December. Compiled by BusinessStats.Switch to the table for exact figures.

A new plateau: EU household prices rose 34 percent between the second half of 2019 and the second half of 2025 and have stayed near 0.29 euros since 2023.

The IEA calculates that household electricity prices rose 36 percent on average in the EU between 2019 and 2024, against 26 percent in the United States. Preliminary Eurostat data for the first half of 2026, available for 13 countries, show some declines: Germany fell to 0.3618 euros, France to 0.2485 euros and the Netherlands to 0.2440 euros, while Belgium rose to 0.3575 euros. An EU average for the first half of 2026 had not yet been published.

COUNTRY	H2 2025 (EUROS PER KWH)	H1 2026 (EUROS PER KWH)
Germany	0.3869	0.3618
Belgium	0.3499	0.3575

Czechia	0.3217	0.2884
Romania	0.2893	0.2836
Spain	0.2669	0.2509
France	0.2561	0.2485
Netherlands	0.2558	0.2440
Bulgaria	0.1355	0.1341
Hungary	0.1082	0.1139

Taxes and Levies

Taxes and levies: 28.9 percent of the EU bill

Taxes and levies explain a large part of the differences between countries. On average, they made up 28.9 percent of the household price in the EU in the second half of 2025. The share was highest in Denmark at 49.1 percent, which is why Danish electricity is expensive even though wholesale prices there are moderate. In Luxembourg and the Netherlands the share was negative, at minus 6.3 percent and minus 5.2 percent, because tax credits and support payments to households were larger than the taxes charged.

For businesses, Eurostat excludes VAT and recoverable taxes, so the remaining tax share is smaller. It was highest in Poland at 36.0 percent and Cyprus at 29.9 percent, and lowest in Lithuania at 0.2 percent and Luxembourg at 0.5 percent. Wider energy costs in the region are compared in our report on energy prices in the EU.

49.1%Tax share in DenmarkHighest in the EU.-6.3%Tax share in LuxembourgCredits exceed taxes.36.0%Business tax share, PolandHighest for non-households.0.2%Business tax share, LithuaniaLowest in the EU. Business Prices

Business prices: 0.1837 euros per kWh in the EU

Non-household consumers, mostly businesses, pay less per kWh than households because they buy larger volumes and are connected at higher voltages. For a medium-sized business consumer using 500 to 1,999 MWh a year, the EU average was 0.1837 euros per kWh in the second half of 2025, excluding VAT and recoverable taxes. The highest prices were in Ireland (0.2552 euros), Cyprus (0.2429 euros) and Germany (0.2264 euros), and the lowest in Finland (0.0748 euros) and Sweden (0.0970 euros).

Non-Household Electricity Prices in the EU, Second Half of 2025 (euros per kWh)Business consumers using 500 to 1,999 MWh a year, excluding VAT and recoverable taxes.

Data:

Eurostat, Electricity prices for non-household consumers, nrg_pc_205.

Note:

selected countries; Austria estimated, Malta provisional. Compiled by BusinessStats.Switch to the table for exact figures.

Nordic advantage: Finnish businesses paid 0.0748 euros per kWh, about a third of the price paid in Ireland or Germany.

The EU business average rose from about 0.12 euros in 2019 to a peak of 0.2151 euros in the first half of 2023, then eased to 0.1837 euros. The IEA says that prices for energy-intensive industries in Europe in 2025 were still on average roughly double those in the United States and more than 50 percent higher than in China and India, a gap that weighs on the competitiveness of chemicals, steel and aluminium producers.

YEAR	FIRST HALF (EUROS PER KWH)	SECOND HALF (EUROS PER KWH)
2019	0.1218	0.1192
2021	0.1290	0.1447
2022	0.1837	0.2107
2023	0.2151	0.2003
2024	0.1885	0.1941
2025	0.1903	0.1837

United States

United States: a record 17.30 cents per kWh

In the United States, the EIA reports average residential electricity prices of 12.65 cents per kWh in 2015, almost unchanged until 2020 at 13.15 cents. Prices then rose quickly: 15.04 cents in 2022, 16.00 cents in 2023, 16.48 cents in 2024 and 17.30 cents in 2025, a record. The EIA forecasts 18.20 cents in 2026 and 18.59 cents in 2027.

Average US Residential Electricity Price, 2015 to 2025 (cents per kWh)Average revenue per kWh from residential customers.

Data:

US Energy Information Administration, Electric Power Annual, table 2.4, and Short-Term Energy Outlook table 7c.

Note:

2025 from STEO and may be revised in the Electric Power Annual due in October 2026. Compiled by BusinessStats.Switch to the table for exact figures.

Up 37 percent in ten years: US households paid 17.30 cents per kWh in 2025, against 12.65 cents in 2015, with most of the rise since 2021.

All sectors are getting more expensive. The average commercial price was 13.41 cents in 2025 and the industrial price 8.62 cents, giving an all-sector average of 13.63 cents. In July 2026 the residential price reached 18.31 cents, 4.9 percent higher than a year earlier, and the all-sector average 14.99 cents, up 4.4 percent. Growing demand, including from data centres, and network investment add pressure on US prices, as covered in our report on data centers.

US Electricity Prices by Sector, 2022 to 2025 (cents per kWh)Average revenue per kWh for residential, commercial and industrial customers.

Data:

US Energy Information Administration.

Note:

2025 values from the Short-Term Energy Outlook. Compiled by BusinessStats.Switch to the table for exact figures.

Households pay twice industry: US residential customers paid 17.30 cents per kWh in 2025, twice the 8.62 cents paid by industry.

Broader US energy costs, including gasoline and natural gas, are covered in our reports on energy prices in the US and electricity in the United States.

US States

US states: from 11.5 cents in North Dakota to 42.9 cents in Hawaii

Prices vary more between US states than between most EU countries. In 2024, the latest year with full state data, Hawaii had the highest residential price at 42.86 cents per kWh, because most of its power comes from imported oil. California followed at 31.97 cents, then Massachusetts (29.35 cents), Connecticut (28.75 cents) and Rhode Island (28.65 cents). The cheapest states were North Dakota (11.51 cents), Idaho (11.52 cents), Nebraska (11.53 cents), Louisiana (11.73 cents) and Washington (11.90 cents).

Most and Least Expensive US States for Residential Electricity, 2024 (cents per kWh)Five highest and six lowest states, with the US average.

Data:

US Energy Information Administration, Electric Power Annual 2024, average price by state.

Note:

2025 state figures were not yet published. Compiled by BusinessStats.Switch to the table for exact figures.

A 3.7-fold spread: Hawaii households paid 42.86 cents per kWh in 2024, against 11.51 cents in North Dakota.

Cheap states have large hydroelectric resources, as in Idaho and Washington, or abundant coal, gas and wind, as in North Dakota, Nebraska and Louisiana. Expensive states either import fuel or have high network and policy costs, as in California and New England. Monthly data for July 2026 show the same pattern for all sectors combined: California at 30.71 cents and Massachusetts at 26.56 cents, against North Dakota at 9.09 cents and New Mexico at 9.52 cents.

North American Cities

North American cities: Montreal cheapest, San Francisco most expensive

Every year Hydro-Quebec compares residential electricity bills in 22 major Canadian and US cities, using rates in effect on April 1. For a customer using 1,000 kWh a month, Montreal had the lowest price in 2025 at 8.29 Canadian cents per kWh before taxes, followed by Winnipeg at 10.53 cents and Vancouver at 12.60 cents, all supplied mostly by hydropower.

Residential Electricity Prices in 22 North American Cities, 2025 (Canadian cents per kWh)Monthly consumption of 1,000 kWh, taxes excluded.

Data:

Hydro-Quebec, Comparison of Electricity Prices in Major North American Cities, rates in effect April 1, 2025.

Note:

Canadian cents; US prices converted by Hydro-Quebec at 1 Canadian dollar = 0.6970 US dollars. Compiled by BusinessStats.Switch to the table for exact figures.

Hydro wins: Montreal, Winnipeg and Vancouver have the cheapest power, while San Francisco households pay more than seven times the Montreal price.

The most expensive cities were San Francisco at 59.94 cents, New York at 52.48 cents and Boston at 47.87 cents. Toronto, at 15.57 cents, was the cheapest large city outside the hydro-dominated provinces. The comparison shows how much the source of power matters: cities with hydropower pay a fraction of what cities relying on gas and with expensive networks pay.

United Kingdom

United Kingdom: price cap of 26.32 pence per kWh

In Great Britain, Ofgem sets a quarterly cap on the unit rate and standing charge that suppliers can charge households on default tariffs. For October to December 2026, the cap for electricity paid by direct debit is 26.32 pence per kWh with a standing charge of 54.83 pence per day. The typical dual-fuel bill is 1,723 pounds a year, up 4 percent. VAT on electricity bills has been reduced from 5 percent to zero from October 1, 2026 to March 31, 2027.

UK Energy Price Cap: Electricity Unit Rate, 2024 to 2026 (pence per kWh)GB average unit rate cap for direct debit customers.

Data:

Ofgem, energy price cap, periods October 2024 to December 2026.

Note:

selected periods; unit rates include VAT where charged; from October 2026 VAT on electricity is zero. Compiled by BusinessStats.Switch to the table for exact figures.

Stuck near 26 pence: the UK electricity cap has moved between 24.5 and 27.7 pence per kWh since late 2024.

Standing charges are a large part of UK bills: 54.83 pence per day adds about 200 pounds a year before any electricity is used. From July 2026, Ofgem lowered its typical consumption assumptions to 2,500 kWh of electricity and 9,500 kWh of gas a year, so typical bills before and after that date are not directly comparable.

PERIOD	UNIT RATE (PENCE PER KWH)	STANDING CHARGE (PENCE PER DAY)
October to December 2024	24.50	60.99
October to December 2025	26.35	53.68
January to March 2026	27.69	54.75
April to June 2026	24.67	57.21
July to September 2026	26.11	57.19
October to December 2026	26.32	54.83

Australia

Australia: default offers fall for 2026 to 2027

In Australia, the Australian Energy Regulator sets the Default Market Offer, a maximum annual price for standing-offer customers in New South Wales, South East Queensland and South Australia. For 2026 to 2027, the residential flat-rate offer falls in most areas: by 3.4 percent to 1,899 Australian dollars a year in the Ausgrid area of Sydney, by 5.0 percent to 2,604 dollars in the Essential Energy area, and by 7.2 percent to 1,988 dollars in South East Queensland. South Australia rises 1.4 percent to 2,334 dollars.

Australian Default Market Offer by Network Area, 2026 to 2027 (Australian dollars per year)Maximum annual residential bill on a flat-rate standing offer.

Data:

Australian Energy Regulator, Default Market Offer 2026 to 2027 final determination, effective July 1, 2026.

Note:

values in Australian dollars. Compiled by BusinessStats.Switch to the table for exact figures.

Mostly lower: four of five network areas see lower default offers in 2026 to 2027, led by a 7.2 percent cut in South East Queensland.

Australia shows the effect of cheap solar power on wholesale markets. The IEA reports that average wholesale prices in Australia in the second quarter of 2026 were about 45 percent lower than a year earlier, while prices in the EU and Japan rose more than 30 percent.

Wholesale Prices

Wholesale prices: Europe pays about twice the US level

Wholesale prices, the price at which generators sell power, drive retail bills with a lag. The IEA estimates that the average EU wholesale price in 2025 rose about 10 percent to roughly 95 dollars per MWh. That was about twice the level in the United States and India, 65 percent above Australia and 25 percent above Japan. Futures markets in January 2026 pointed to about 95 dollars per MWh again in 2026 and about 85 dollars in 2027.

The gap widened again in 2026. In its mid-year update, the IEA reported that spot wholesale prices in the EU and Japan rose more than 30 percent year on year in the second quarter of 2026, driven by spikes in LNG prices during the Strait of Hormuz crisis. US prices were largely unchanged and Indian prices rose by less than 10 percent. Because many European power markets set prices from gas plants, gas shocks pass quickly into electricity, a link covered in our reports on gas prices and Russian natural gas.

COMPARISON	FINDING	PERIOD
EU average wholesale price	about 95 dollars per MWh, up about 10 percent	2025
EU vs United States and India	roughly twice as high	2025
EU vs Australia	65 percent higher	2025
EU vs Japan	25 percent higher	2025
Energy-intensive industry, EU vs US	roughly double	2025
Energy-intensive industry, EU vs China and India	more than 50 percent higher	2025
EU and Japan spot prices	up more than 30 percent year on year	Q2 2026

Energy subsidies keep prices far below cost in some countries. The IEA estimates that fossil fuel consumption subsidies worldwide totalled 620 billion dollars in 2023 after passing 1 trillion dollars in 2022,

when subsidies for natural gas and electricity more than doubled. The OECD and IEA put total government support for fossil fuels at 916 billion dollars in 2024, down from 1,031 billion dollars in 2023.

Annual Bills

What a year of electricity costs: an illustration

Prices per kWh are easier to grasp as an annual bill. The table below applies each published price to the same consumption so that markets can be compared on equal terms. For the EU, it uses 3,500 kWh a year, the midpoint of the Eurostat band. For Great Britain, it uses the 2,500 kWh that Ofgem now treats as typical, plus the daily standing charge. These are BusinessStats illustrations, not official bills, and they ignore differences in how much electricity households actually use.

MARKET	PRICE USED	CONSUMPTION	ANNUAL COST
Ireland	0.4042 euros per kWh	3,500 kWh	about 1,415 euros
Germany	0.3869 euros per kWh	3,500 kWh	about 1,354 euros
EU average	0.2896 euros per kWh	3,500 kWh	about 1,014 euros
France	0.2561 euros per kWh	3,500 kWh	about 896 euros
Hungary	0.1082 euros per kWh	3,500 kWh	about 379 euros
Great Britain	26.32 pence per kWh plus 54.83 pence per day	2,500 kWh	about 858 pounds
United States	17.30 cents per kWh	3,500 kWh	about 606 dollars

The same amount of electricity costs almost four times as much in Ireland as in Hungary. In practice, US households use far more electricity than European ones because of air conditioning and electric heating, so their actual bills are higher than the table suggests even though the price per kWh is lower than in most of Western Europe. In Great Britain, the standing charge alone is about a quarter of the illustrative bill, which is why low-use households pay a high effective price per kWh.

Outside the EU, Eurostat data show households in Norway paid 0.1922 euros per kWh in the second half of 2025, Serbia 0.1190 euros and Turkey 0.0636 euros, among the lowest prices in Europe, while Liechtenstein paid 0.3062 euros.

Outlook

Outlook: higher bills in the US, volatile prices in Europe

Three trends will shape electricity prices to 2027. In the United States, the EIA expects residential prices to keep rising, to 18.20 cents in 2026 and 18.59 cents in 2027, as utilities invest in networks and demand grows. In Europe, household prices have stabilised near 0.29 euros, but the 2026 gas price shock shows how exposed the region remains, and the gap with US industrial prices is a policy priority. In markets with large solar and wind fleets, such as Australia, wholesale prices are falling during sunny hours, while network charges rise.

Nuclear and renewable expansion will shape the long-run cost of power, as discussed in our report on global nuclear energy. For households, the most important factors remain where they live, how their country taxes energy and how much of their power comes from gas. Inflation effects on the wider economy are tracked in our report on inflation in Europe.

Key Facts

Electricity prices in eight numbers

EUR 0.2896EU household price per kWhSecond half of 2025.EUR 0.4042Ireland, highest in EUHouseholds.EUR 0.1082Hungary, lowest in EUHouseholds.17.30cUS residential 2025Record high.42.86cHawaii residential 2024Highest US state.8.29cMontreal, Canadian centsCheapest North American city.26.32pUK price cap per kWhOctober to December 2026.$95EU wholesale per MWh 2025About twice the US. FAQ

Questions about what electricity costs around the world

Eurostat puts the EU average household price at 0.2896 euros per kWh in the second half of 2025, including all taxes, for a consumer using 2,500 to 4,999 kWh a year.

Among EU countries, Ireland had the highest household price at 0.4042 euros per kWh in the second half of 2025, followed by Germany at 0.3869 euros and Belgium at 0.3499 euros.

Hungary, at 0.1082 euros per kWh in the second half of 2025, followed by Malta at 0.1282 euros and Bulgaria at 0.1355 euros.

The EIA reports an average residential price of 17.30 cents per kWh in 2025, a record, and forecasts 18.20 cents for 2026. The all-sector average was 13.63 cents.

Hawaii, at 42.86 cents per kWh for residential customers in 2024, followed by California at 31.97 cents and Massachusetts at 29.35 cents.

North Dakota, at 11.51 cents per kWh in 2024, closely followed by Idaho at 11.52 cents and Nebraska at 11.53 cents.

For October to December 2026, Ofgem capped the electricity unit rate at 26.32 pence per kWh with a standing charge of 54.83 pence per day for direct debit customers.

Taxes, levies and network charges make up a large share of the bill. In Denmark taxes and levies were 49.1 percent of the household price in the second half of 2025.

The IEA says energy-intensive industries in Europe paid roughly double the US price in 2025 and more than 50 percent more than in China and India.

Montreal, at 8.29 Canadian cents per kWh before tax for 1,000 kWh a month in 2025, according to Hydro-Quebec. San Francisco was the most expensive at 59.94 cents.

Sources

Eurostat - Electricity price statistics, second half of 2025 (nrg_pc_204, nrg_pc_205).

US Energy Information Administration - Electric Power Annual, average prices by sector and state.

US Energy Information Administration - Short-Term Energy Outlook, September 2026, and Electricity Monthly Update.

Ofgem - Energy price cap, October to December 2026 and earlier periods.

Hydro-Quebec - Comparison of Electricity Prices in Major North American Cities, 2025.

Australian Energy Regulator - Default Market Offer 2026 to 2027.

International Energy Agency - Electricity 2026, prices chapter, and Electricity Mid-Year Update 2026.

International Energy Agency - Energy subsidies.

OECD - Government support for fossil fuels, December 2025.

Prices are shown in each source currency and tax basis and are not converted between currencies. Eurostat household prices include all taxes; non-household prices exclude VAT and recoverable taxes; EIA prices are average revenue per kWh; Hydro-Quebec prices exclude taxes. Percentage changes, ratios and spreads are BusinessStats calculations from published figures.

STATISTICS REPORT

Electricity in Europe — Statistics & Facts 2026

Updated Apr 1, 2026 · businesstats.com/electricity-in-europe

2,700 TWh EU-27 GENERATION	**1,150 GW** INSTALLED CAPACITY	**48%** RENEWABLES SHARE
19% WIND — #1 SOURCE	**€0.28/kWh** EU AVG HH PRICE	**35 GW** OFFSHORE WIND

Overview

2,700 TWh, 48% Renewables — Europe Leads the World in Clean Electricity

The European Union has achieved a remarkable milestone: as of 2025-2026, approximately **48% of EU electricity** comes from renewable sources — making the EU the world's most renewable-intensive major economic region. This transformation has been driven by a combination of extraordinary policy ambition (the EU Green Deal, REPowerEU, the revised Renewable Energy Directive), collapsing renewable technology costs (solar down 90% since 2010, wind down 70%), and the shock of the 2022 Russian gas crisis that made energy independence a strategic imperative. The EU's approximately **2,700 TWh of annual generation** from approximately **1,150 GW of installed capacity** represents a power system undergoing its most fundamental structural change in a century — the transition from fossil fuel-dominated generation to a predominantly renewable system within a single generation.

The diversity within Europe's electricity landscape is extraordinary. **France** generates approximately 70% of its electricity from nuclear — the world's highest share — making it one of the world's least carbon-intensive large electricity systems. **Denmark** generates approximately 88% from renewables — almost entirely wind. **Poland** still generates approximately 70% from coal and lignite, making it the EU's most carbon-intensive electricity system. **Norway** (outside the EU) generates approximately 90%+ from hydropower and has among the world's cheapest and cleanest electricity. This diversity reflects the continent's geographic resource endowment (Scandinavian hydro, North Sea wind, Southern European solar, Eastern European coal) and the very different national policy paths chosen since the 1970s. Understanding France's electricity model in detail is covered in our dedicated France electricity industry analysis, and the broader global electricity context is in our global electricity market article.

The 2022 energy crisis — triggered by Russia's invasion of Ukraine and the subsequent disruption of Russian gas supplies to Europe — was simultaneously the most severe energy shock since the 1970s oil crisis and the most powerful accelerator of Europe's clean energy transition. EU governments collectively spent approximately €700-800 billion supporting households and businesses through the crisis, while accelerating renewable permitting, expanding LNG import infrastructure, and enacting the Electricity Market Reform to prevent future gas price spikes from devastating consumer bills. The crisis's economic consequences for European industry — particularly the energy-intensive chemical, aluminium, and steel sectors — have had lasting competitiveness implications explored in our global chemical industry analysis.

EU-27 electricity 2026: 2,700 TWh from 1,150 GW. Renewables 48% — world's highest major bloc. Wind 19% — now EU's #1 source, overtook gas in 2023. Solar 10%. Hydro 12%. Nuclear 13%. Gas 17%. Coal/lignite 14%. Germany leads at 500 TWh. France 490 TWh (70% nuclear). Denmark 88% renewable. Including UK, Norway, Turkey, Ukraine: total European generation ~3,500 TWh. Offshore wind fleet ~35 GW — world's largest.

Generation by Country

EU Electricity by Country — Germany Leads, France Second, Huge Diversity

Germany is the EU's largest electricity producer at approximately **500 TWh annually**, generated from approximately 260 GW of installed capacity. Germany's electricity mix has undergone a structural revolution — completing its nuclear phase-out in April 2023 (closing the last 3 operating reactors: Isar 2, Emsland, Neckarwestheim 2) while building the world's most ambitious onshore wind and solar capacity at scale. As of 2026, approximately 62% of German electricity comes from renewables (wind ~35%, solar ~12%, biomass ~8%, hydro ~4%), with natural gas approximately 22% and coal/lignite approximately 16%. Germany's electricity prices remain the highest in the EU at approximately €0.31/kWh household — partly because the coal and gas generation required to fill the nuclear gap is more expensive than France's nuclear baseload. The financial market impact of Germany's energy transition is explored in our German financial markets analysis.

Italy (approximately 305 TWh) is the EU's third-largest electricity producer, with a mix that includes gas (~44%), renewables (~45% including significant hydro, solar, and wind), and minimal nuclear (Italy decommissioned all nuclear plants following a 1987 referendum). **Spain** (approximately 295 TWh) has made remarkable progress in renewable deployment — approximately 54% renewable electricity including world-class solar and wind resources. Spain's "Iberian exception" — a temporary gas price cap agreed

with Portugal in 2022 — demonstrated how market design interventions can temporarily insulate consumers from wholesale price spikes. **Poland** (approximately 190 TWh) remains the EU's most coal-dependent large electricity system, generating approximately 70% from coal and lignite — though Poland is accelerating renewable investment significantly and plans to add approximately 15 GW of offshore wind in the Baltic Sea by 2035. The economic impact of Europe's diverse electricity systems on countries' broader competitiveness is reflected in our analysis of the world's largest economies.

EU Countries by Electricity Generation — 2025 (TWh)

Generation RankingsTop EU Countries by Electricity Generation — 2025 (TWh)BusinessStats Research · Eurostat nrg_cb_e · ENTSO-E Transparency Platform 2025 ~500 TWh Germany — #1 Annual Generation (TWh) Top 5 generate ~67% of EU-27 electricity Sources: BusinessStats Research · Eurostat nrg_cb_e 2025 · ENTSO-E Transparency Platform · National TSOs

EU Countries — Renewable Electricity Share 2025 (%)

Renewable Share EU Countries — Renewable Electricity Share 2025 (%) BusinessStats Research · Eurostat Energy Statistics · IRENA 2025 · National Grid Operators

EU Electricity Mix

EU Electricity Mix — Wind 19% Now #1, Coal Declining, Gas Still 17%

The EU's electricity mix in 2025-2026 reflects the most advanced stage of the energy transition of any major economic region. **Wind energy** has become the EU's single largest electricity source at approximately **19-20% of generation** (~510-540 TWh annually) — a historic milestone achieved in 2023 when wind overtook natural gas for the first time. This includes both onshore wind (approximately 230 GW installed, ~14% of EU electricity) and offshore wind (approximately 35 GW installed, ~5% of EU electricity). **Natural gas** has fallen to approximately **17%** (~460 TWh) — down from approximately 25% in 2019, accelerated by the 2022 crisis that made gas extremely expensive and drove both fuel switching and demand reduction. **Nuclear** contributes approximately **13%** (~350 TWh) — almost entirely from France, with smaller contributions from Belgium, Slovakia, Hungary, Sweden, and Finland.

Solar PV contributes approximately **10%** of EU electricity (~270 TWh) and remains the fastest-growing source — growing approximately 20-25% annually. The EU installed approximately 65 GW of new solar in 2023 and 2024, with deployment accelerating across all member states driven by IEA incentive frameworks and dramatically falling module costs. **Hydropower** provides approximately **12%** (~325 TWh),

primarily from Austria (78% renewable, dominated by hydro), Sweden (hydro + wind), France, Portugal, and Italy. Hydro output varies significantly by year depending on precipitation — the 2022 drought reduced EU hydro generation by approximately 20-25% below average. **Coal and lignite** continue their structural decline at approximately **14%** (~380 TWh) — concentrated almost entirely in Poland (approximately 135 TWh from coal), Germany (approximately 80 TWh), and the Czech Republic and Bulgaria. The coal share has fallen from approximately 32% in 2015 to approximately 14% in 2026 — a decline largely driven by EU ETS carbon pricing, renewables competitiveness, and national phase-out commitments. This energy transition has significant implications for the industrial sectors tracked in our chemical industry worldwide analysis, where electrification of industrial processes and green hydrogen production are key growth vectors.

EU-27 Electricity Mix by Source — 2026

EU Electricity Mix EU-27 Electricity Generation by Source — 2026 BusinessStats Research · Eurostat Energy Statistics · ENTSO-E Transparency Platform 2025

Renewables Revolution

Europe's Renewable Revolution — Wind World Leader, Solar Accelerating, Offshore Emerging

Europe is the global pioneer of large-scale renewable electricity deployment — particularly offshore wind, which is almost entirely a European invention. The EU's approximately **230 GW of onshore wind capacity** generates approximately 14% of EU electricity. The **United Kingdom** leads globally in offshore wind with approximately **15 GW** of installed capacity, followed by Germany (~9 GW), the Netherlands (~4 GW), Denmark (~2.5 GW), and Belgium (~2.5 GW). Total European offshore wind capacity reached approximately **35-38 GW** in 2025-2026, generating approximately 130-150 TWh — equivalent to the entire electricity consumption of Belgium and the Netherlands combined. The EU's **offshore wind target of 111 GW by 2030** and **300 GW by 2050** represents the most ambitious offshore build programme in history, requiring approximately 10-15 GW of new installation per year — compared to approximately 3-4 GW per year currently.

Solar PV is the fastest-growing electricity source in Europe as in the rest of the world, with the EU installing approximately **65 GW of new solar annually** in 2023-2024. The EU's total solar installed capacity reached approximately **300+ GW** by end-2025, generating approximately 270 TWh — approximately 10% of EU

electricity. Spain leads EU solar deployment by generation, followed by Germany, the Netherlands, Italy, and France. The declining cost of solar — now approximately €35-50/MWh for utility-scale projects in Southern Europe — has driven a wave of unsubsidised merchant solar projects that compete directly in wholesale markets. The interconnection of solar output across Europe's diverse geography — sunny Southern Europe generating at peak when Northern European solar production is minimal — is one of the key arguments for expanded EU electricity grid interconnection and transmission capacity. The renewable energy investment dynamics are directly relevant to the financial market analysis in our global nuclear energy statistics, which examines how the nuclear and renewable sectors compete and complement each other in decarbonising electricity systems.

EU Renewable Electricity Growth — Wind & Solar 2015 to 2026 (TWh)

Renewables GrowthEU-27 Wind & Solar Generation — 2015 to 2026 (TWh)BusinessStats Research · IRENA EU Renewable Statistics · Eurostat Energy Data 2025 +380 TWhWind Growth +240 TWhSolar Growth

Wind overtook gas as EU's #1 source in 2023 Sources: IRENA Renewable Capacity Statistics 2025 · Eurostat nrg_cb_e · ENTSO-E · BusinessStats Research Key Insight 2023 Landmark — Wind Became EU's Largest Electricity Source

In 2023, wind energy overtook natural gas to become the EU's single largest electricity source for the first time in history — generating approximately 17-18% of EU electricity versus gas at approximately 17%. By 2025-2026, wind's lead had extended to approximately 19-20% versus gas at approximately 17%. This milestone was achieved through the combination of continued onshore wind deployment (approximately 15-16 GW/year in the EU), growing offshore wind generation, and the sharp decline in gas generation following the 2022 crisis. Equally remarkable is that solar — at near-zero EU generation in 2010 — had grown to approximately 10% of EU electricity by 2026, meaning wind and solar together provided approximately 29-30% of EU electricity — more than gas and coal combined in many Northern European countries. The speed of this transformation is unprecedented in energy history.

Prices by Country

EU Electricity Prices — €0.11 Bulgaria to €0.35 Denmark, Industrial Gap vs USA

European electricity prices are among the highest in the world — a structural challenge that sits at the heart of EU industrial competitiveness debates. The EU-27 average household electricity price of approximately

€0.28/kWh is approximately **2× the US average** (~$0.14/kWh) and approximately **3× China's average** (~€0.08/kWh). The 2022 crisis pushed EU average household prices to approximately €0.35/kWh at their peak — with some countries temporarily exceeding €0.40/kWh. By H1 2025, prices had normalised to approximately €0.28/kWh on average as wholesale electricity prices fell from their crisis peaks. The full detailed analysis of EU energy prices by country is covered in our dedicated EU energy prices statistics article.

The price variation within Europe reflects very different national energy policies, tax structures, and generation mixes. Countries with abundant low-cost nuclear (France at €0.24/kWh) or hydropower (Norway at ~€0.10-0.12/kWh, outside the EU) have structural price advantages. Countries with high taxes and levies on electricity (Denmark at €0.35/kWh, Germany at €0.31/kWh) have the highest retail prices — though a significant portion of their electricity bill is tax revenue rather than energy cost per se. **Industrial electricity prices** — at approximately €0.14-0.18/kWh for EU medium-large consumers — are approximately 2-3× higher than US industrial electricity prices (~$0.07/kWh), creating a structural competitiveness disadvantage for energy-intensive European industries. This was highlighted prominently in the **Draghi Report on EU Competitiveness (September 2024)**, which estimated the energy cost gap imposes approximately €800 billion per year of competitive disadvantage on the EU economy versus the United States. The connection between EU electricity prices and the broader financial and corporate performance environment is explored in our German financial markets analysis.

EU Household Electricity Prices — 2025 (€/kWh)

Price ComparisonEU + Selected European Countries — Household Electricity Prices H1 2025 (€/kWh)BusinessStats Research · Eurostat nrg_pc_204 H1 2025 · Including all taxes & levies €0.35Denmark High €0.11Bulgaria Low

3.2× range from Bulgaria €0.11 to Denmark €0.35 Sources: Eurostat nrg_pc_204 H1 2025 · BusinessStats Research · All prices EUR/kWh including taxes

Europe Electricity — Full Country Data Table

Electricity in Europe — Country Data 2025Click column to sort

COUNTRY	GENERATION (TWH)	RENEWABLE %	NUCLEAR %	COAL %	HH PRICE (€/KWH)
Germany	~500	~62%	0%	~16%	€0.310
France	~490	~27%	~70%	0%	€0.238

Italy	~305	~45%	0%	~5%	€0.248
Spain	~295	~54%	~20%	~2%	€0.210
Poland	~190	~22%	0%	~70%	€0.162
Sweden	~175	~72%	~29%	~0%	€0.185
Netherlands	~120	~40%	~3%	~10%	€0.255
Belgium	~90	~28%	~46%	~1%	€0.298
Czech Republic	~83	~17%	~37%	~40%	€0.178
Austria	~73	~78%	0%	~3%	€0.268
Denmark	~43	~88%	0%	~3%	€0.352
Portugal	~60	~67%	0%	~4%	€0.222
Greece	~55	~45%	0%	~18%	€0.195
Finland	~85	~45%	~42%	~2%	€0.132
Romania	~70	~42%	~18%	~20%	€0.158
Bulgaria	~40	~28%	~34%	~25%	€0.112
UK (non-EU)	~310	~48%	~15%	~2%	€0.280
Norway (non-EU)	~165	~93%	0%	0%	€0.110

Key Statistics

Electricity in Europe — Key Statistics at a Glance

2,700 TWhEU-27 Annual GenerationFrom 1,150 GW installed capacity. ~9% of global electricity. 27 member states. 48%EU Renewables ShareWorld's highest major bloc. Wind 19%, Hydro 12%, Solar 10%, Bioenergy 7%. Up from 22% in 2010. 19%Wind — EU's #1 SourceOvertook gas in 2023. ~510-540 TWh. 230 GW onshore + 35 GW offshore. Target 300 GW offshore by 2050. ~500 TWhGermany — EU's #1 Producer62% renewables. 0% nuclear post-April 2023. 22% gas. 16% coal. €0.31/kWh — most expensive. ~490 TWhFrance — 70% NuclearWorld's highest nuclear share. €0.24/kWh. World #1 net exporter. 56 reactors. 6 new EPR2 approved. 88%Denmark — Most Renewable EUAlmost entirely wind. EU's highest renewable share. But also highest electricity price at €0.35/kWh. €0.28/kWhEU-27 Avg Household Price2× US avg

($0.14). 3× China avg ($0.09). Range: €0.11 (Bulgaria) to €0.35 (Denmark). 35 GWEuropean Offshore WindWorld's largest fleet. UK 15 GW, Germany 9 GW, Netherlands 4 GW. Target 111 GW by 2030. 70%Poland — Most Coal-DependentEU's least clean electricity. ~720 gCO/kWh. Transitioning — 15 GW offshore wind planned by 2035. 93%Norway Hydro (Non-EU)Essentially 100% clean electricity. ~€0.10-0.12/kWh. Major exporter to Germany, Netherlands, UK. 65 GWEU Solar Added Per YearRecord 2023-2024. 300+ GW total installed. Solar 10% of EU electricity. Target 600 GW by 2030. 3,500+ TWhTotal European GenerationIncluding UK (~310), Norway (~165), Turkey (~380), Switzerland (~65), Ukraine (~130), and others.

EU Renewables Share Trend — 2010 to 2026 (%)

The white line chart below tracks the EU-27 renewable electricity share from 2010 through 2026, showing the steady structural transformation — from approximately 20% in 2010 to approximately 48% in 2026 — driven by wind and solar cost collapses and successive EU renewable energy directives.

Renewables TrendEU-27 Renewable Electricity Share — 2010 to 2026 (%)BusinessStats Research · Eurostat nrg_cb_e Annual Data · ENTSO-E · IEA 20%2010 48%2026

+28 percentage points in 16 years — fastest of any major region Sources: Eurostat nrg_cb_e · IRENA Renewable Statistics · BusinessStats Research 2026 Estimate

European Offshore Wind Capacity — 2015 to 2030 Target (GW)

The white dual-line chart below shows the growth of European offshore wind installed capacity from 2015 through 2025, with the EU 2030 target of 111 GW shown. The UK leads globally; the EU collectively is targeting a nearly 3× increase in offshore wind capacity by 2030.

Offshore WindEuropean Offshore Wind Capacity — 2015–2026 & 2030 Target (GW)BusinessStats Research · WindEurope Annual Statistics · IRENA 2025 · EU Commission 38 GWEurope 2025 111 GWEU Target 2030

UK world's largest offshore fleet at ~15 GW Sources: WindEurope Annual Statistics 2025 · IRENA Offshore Wind Report · EU Commission REPowerEU · BusinessStats Research Europe electricity forecast 2030: EU-27 generation grows to 3,000-3,200 TWh. Renewables reach 60-65%. Solar target 600 GW (from 300 GW). Offshore wind target 111 GW (from 35 GW). Coal phase-out underway — Germany by 2038, Poland by 2049. EV charging adds 200+ TWh new demand. Heat pumps add 150+ TWh. EU Electricity Market Reform (2024) enables CfDs and PPAs for investment certainty. Norway green hydrogen exports to EU begin.

Baltic Sea offshore wind accelerates.

Forecast 2030

European Electricity Forecast 2030 — 60% Renewables, 3,000+ TWh, Offshore Wind Surge

EU electricity generation is projected to grow from approximately 2,700 TWh (2026) to approximately **3,000-3,200 TWh by 2030** — a CAGR of approximately 2-4% annually, driven by the electrification of road transport (EVs), heating (heat pumps), and industry. The renewable share is projected to reach approximately **60-65% of EU electricity by 2030** — up from approximately 48% today — driven primarily by solar and wind expansion. The EU's REPowerEU programme targets approximately **1,236 GW of total renewable capacity by 2030**, requiring solar capacity to grow from approximately 300 GW to approximately 600 GW and offshore wind from approximately 35 GW to approximately 111 GW. These targets are ambitious — requiring approximately 10-15 GW of offshore wind installation per year (versus approximately 4 GW in 2024) and 80-100 GW of solar per year.

The most transformative near-term development in European electricity will be the **offshore wind surge**. The North Sea is set to become a truly pan-European offshore energy hub — with proposed capacity of approximately 300 GW by 2050 covering the North Sea alone. New projects include the UK's massive Hornsea and Sofia offshore wind farms (each exceeding 1,000 MW), Germany's large-scale Baltic Sea expansion, the Netherlands' ambitious offshore programmes, and Denmark's "energy islands" concept — artificial islands serving as offshore electricity hubs. Poland is developing approximately 15 GW of Baltic Sea offshore wind by 2035, which would transform it from the EU's most coal-dependent to one of its more renewable electricity systems. The investment implications of this offshore wind build-out for European financial markets, utility valuations, and industrial competitiveness are explored in our analysis of the world's largest economies.

The **coal phase-out** will be the most significant structural change in EU electricity supply through 2030. Germany has committed to closing all coal plants by 2038 (most by 2030), Poland — the EU's largest coal generator — has agreed to phase out coal by 2049 with significant reductions by 2030, and most other EU coal-using countries have 2030-2035 phase-out dates. Replacing approximately 380 TWh of coal generation with renewables requires an extraordinary deployment rate — achievable only with reformed permitting, grid expansion, and continued technology cost reduction. The EU Electricity Market Reform (April 2024) supports this transition by expanding Contracts for Difference (CfDs) and Power Purchase

Agreements (PPAs) that provide investment certainty for new clean generation capacity. The nuclear policy dimension — with France building new EPRs, Finland's new EPR operating, and several Central European countries planning new nuclear — is analysed comprehensively in our global nuclear energy statistics report.

European Electricity Outlook Electricity in Europe — 2030 Key Projections 3,000-3,200 TWhEU-27 Generation 2030 60-65%Renewables Share 2030 600 GWSolar Capacity Target 2030 111 GWOffshore Wind Target 2030 €0.22-0.25EU Avg HH Price 2030E ~0%W. Europe Coal Share 2035 Europe electricity forecast 2030: EU-27 grows to 3,000-3,200 TWh. Renewables reach 60-65%. Solar target 600 GW. Offshore wind target 111 GW. Poland 15 GW Baltic offshore by 2035. Coal near-zero in Western Europe by 2030. EV charging +200 TWh. Heat pumps +150 TWh. Norway green hydrogen exports begin. EU Electricity Market Reform CfDs and PPAs support investment certainty.

FAQ

Frequently Asked Questions — Electricity in Europe

The EU-27 generates approximately **2,700 TWh annually** from approximately 1,150 GW of installed capacity. Including all European countries (UK ~310 TWh, Norway ~165 TWh, Turkey ~380 TWh, Ukraine ~130 TWh, Switzerland ~65 TWh), total European generation exceeds **3,500 TWh annually**. Germany leads EU generation at ~500 TWh, followed by France (~490 TWh), Italy (~305 TWh), Spain (~295 TWh), Poland (~190 TWh), and Sweden (~175 TWh). The EU's 2,700 TWh represents approximately 9% of global electricity generation (~29,000 TWh).

Approximately **48% of EU-27 electricity** comes from renewables as of 2025-2026 — the highest share of any major economic region globally. Breakdown: wind ~19% (EU's #1 source), hydro ~12%, solar ~10%, bioenergy ~7%. Several EU members generate 60-90% from renewables: Denmark (~88%), Austria (~78%), Sweden (~72%), Portugal (~67%), Ireland (~50%). Norway (non-EU) generates ~93% from hydro. The EU renewable share has grown from ~22% in 2010. Target: 60-65% by 2030, requiring 80-100 GW solar/year and 10-15 GW offshore wind/year.

Germany is the EU's largest electricity producer at approximately **500 TWh annually**. France is second (~490 TWh), followed by Italy (~305 TWh), Spain (~295 TWh), Poland (~190 TWh), and Sweden (~175 TWh). Outside the EU: Turkey (~380 TWh) and the UK (~310 TWh) are significant producers. Norway (~165 TWh) generates nearly entirely from hydro. Russia (~1,100 TWh) is by far the largest producer in geographic Europe, but is generally excluded from EU/Western European statistics. Top 5 EU countries

generate approximately 67% of EU-27 electricity.

EU-27 average household electricity: approximately **€0.28/kWh** (H1 2025, Eurostat). Range: Denmark €0.35/kWh (highest EU) to Bulgaria €0.11/kWh (cheapest EU). Germany €0.31, Belgium €0.30, France €0.24, Spain €0.21. Norway (non-EU): ~€0.10-0.12/kWh (abundant cheap hydro). UK: ~€0.28/kWh (~£0.24). EU industrial electricity: approximately €0.14-0.18/kWh — approximately **2-3× more expensive than US** ($0.07/kWh), creating a major competitiveness concern. EU prices have fallen from the 2022-2023 crisis peak of ~€0.35/kWh average.

Wind energy is now the EU's largest single electricity source at approximately **19-20% of generation** — having overtaken natural gas in 2023. This is a historic milestone. The ranking as of 2025-2026: wind ~19%, gas ~17%, hydro ~12%, solar ~10%, nuclear ~13%, bioenergy ~7%, coal/lignite ~14%, other ~4%. Renewables collectively provide approximately 48%. Wind's rise from ~7% (2010) to ~19% (2026) is one of the fastest energy transitions in history. Wind overtaking gas means that on most days, more EU electricity is generated by wind turbines than by gas-fired power plants — unthinkable 15 years ago.

Europe is the **global leader in offshore wind**. European installed offshore wind capacity: approximately **35-38 GW** generating approximately 130-150 TWh annually. UK leads globally at ~15 GW offshore, followed by Germany (~9 GW), Netherlands (~4 GW), Denmark (~2.5 GW), Belgium (~2.5 GW). EU target: **111 GW offshore wind by 2030**, 300 GW by 2050. Major upcoming projects: UK Hornsea 3 (2.8 GW), Germany Baltic Sea expansion, Poland 15 GW Baltic offshore by 2035, France 18 GW offshore by 2035. Offshore wind costs have fallen ~60-70% since 2012. The North Sea is targeted to become a 300 GW pan-European offshore energy hub by 2050.

ENTSO-E (European Network of Transmission System Operators for Electricity) is the association of European electricity transmission system operators (TSOs) — the entities responsible for managing national high-voltage grids. ENTSO-E includes **39 TSOs from 35 countries**. It coordinates: cross-border electricity flows, European grid security, 10-year network development plans (TYNDP), pan-European electricity market data publication, and common technical standards. The European synchronous grid — managed cooperatively through ENTSO-E — is the world's largest synchronously connected AC power system, connecting most of EU and neighbouring countries at 50 Hz. ENTSO-E's Transparency Platform is a key public data source for European electricity statistics.

EU electricity generation projected to reach approximately **3,000-3,200 TWh by 2030** (from ~2,700 TWh). Renewables share projected to reach approximately **60-65%** (from ~48%). REPowerEU targets: solar 600 GW (from ~300 GW), offshore wind 111 GW (from ~35 GW). EV charging adds ~200+ TWh new demand.

Heat pumps add ~150+ TWh. Coal near-zero in Western Europe by 2030. Natural gas falls to ~12-14% as renewables grow. EU household electricity prices projected to fall toward **€0.22-0.25/kWh by 2030** as renewable expansion reduces marginal generation cost. Industrial prices toward €0.12-0.14/kWh via PPAs.

Among EU members, **Denmark** leads at approximately **88% renewables** — predominantly wind. Next: Austria (~78%, mainly hydro), Sweden (~72%, hydro + wind), Portugal (~67%, wind + hydro + solar), Latvia (~65%, hydro + wind), Ireland (~50%, wind). Outside the EU: **Norway ~93% renewables** (essentially all hydro) and Iceland ~100% (hydro + geothermal). Germany at ~62% is remarkable given its scale (~500 TWh). Spain at ~54% and Portugal at ~67% demonstrate Southern Europe's solar + wind potential. Finland at ~45% is rapidly growing due to its new Olkiluoto 3 EPR (nuclear counted as low-carbon but not renewable in EU definitions).

Nuclear provides approximately **13% of EU-27 electricity** (~350 TWh) — almost entirely from France (70% of its electricity), Belgium (~46%), Slovakia (~59%), Hungary (~44%), Finland (~42%), and Sweden (~29%). France's 56 reactors generate approximately 70% of all EU nuclear electricity. **Germany completed its nuclear phase-out April 2023**. The EU taxonomy classifies new nuclear as sustainable. New nuclear: Finland's Olkiluoto 3 EPR (1,600 MW) operational 2023, France planning 6 new EPR2 reactors, Poland developing its first nuclear plant, Sweden reversing phase-out. Nuclear complements renewables by providing 24/7 carbon-free baseload — a key distinction from intermittent solar and wind.

EU generation (~2,700 TWh) is approximately 61% of US (~4,400 TWh) and 30% of China (~9,000 TWh). **EU leads in renewable share**: ~48% vs USA ~25% and China ~36%. **EU prices highest**: ~€0.28/kWh household vs USA ~$0.14/kWh (~€0.13) and China ~€0.08/kWh. **EU industrial electricity most expensive**: ~€0.15-0.18/kWh vs USA ~$0.07 and China ~€0.07 — a 2-3× gap driving industrial competitiveness concerns (Draghi Report). **EU carbon intensity lower** than US and China: ~230 gCO₂/kWh vs USA ~380 and China ~530, primarily due to France's nuclear and growing EU renewables. Norway (non-EU) has the world's cleanest large electricity system at approximately 30 gCO₂/kWh.

The European electricity market is the world's most highly interconnected. EU interconnection target: **at least 15% of installed capacity** by 2030. Key interconnections: France-UK IFA/Eleclink (~5.4 GW total submarine cables), NordLink HVDC Norway-Germany (1.4 GW), NordBalt Sweden-Lithuania (700 MW), Celtic Interconnector Ireland-France (700 MW, under construction), Viking Link UK-Denmark (1.4 GW, operational 2024), extensive AC ties across France/Germany/Switzerland/Austria/Italy/Spain/Benelux. These allow electricity trading, price convergence, and renewable integration across borders. Norway's abundant cheap hydro acts as a "battery" for Northern Europe — storing water when wind/solar is

abundant, generating when it's scarce. Target: a fully integrated EU internal electricity market with 15% interconnection by 2030.

Data Sources & References

Primary: Eurostat — Electricity production, consumption and market overview (nrg_cb_e, nrg_ind_peh) — EU-27 country-level data 2024-2025

Primary: ENTSO-E Transparency Platform — Pan-European electricity generation, interconnection, and market data 2025

Primary: IEA — Europe Energy Outlook 2025 and EU Electricity Statistics

BusinessStats: All country generation rankings, renewable share analysis, electricity mix calculations, price comparisons, offshore wind data, and 2030 forecast projections are BusinessStats proprietary research combining the above primary sources with IRENA Renewable Capacity Statistics 2025, ACER Annual Market Monitoring Report 2025, national TSO annual reports, and BloombergNEF European Power Outlook 2025.

Generation figures for calendar year 2024-2025. EU-27 aggregate data from Eurostat nrg_cb_e. Country-level generation estimates combine Eurostat with national TSO data. UK and Norway included as separate entries (non-EU members). Renewable share percentages based on gross electricity generation. Household electricity prices from Eurostat H1 2025. Not investment or financial advice. electricity in Europe statisticsEurope electricity statistics 2026EU electricity generation 2026European electricity market 2026electricity production Europe by countryEurope electricity mix 2026renewable electricity Europe 2026solar electricity Europe statisticswind electricity Europe statisticsnuclear electricity Europe 2026hydropower Europe statisticscoal electricity Europe 2026gas electricity EuropeEurope electricity price 2026EU electricity prices 2026Germany electricity statistics 2026France electricity statistics 2026UK electricity statistics 2026Italy electricity statistics 2026Spain electricity statistics 2026Poland electricity statistics 2026Sweden electricity statistics 2026Norway electricity statistics 2026Europe electricity consumption 2026Europe electricity per capitaEurope electricity forecast 2030Europe energy transition electricityEU Green Deal electricityEurope net zero electricityelectricity carbon intensity EuropeEurope electricity grid statisticsENTSO-E statistics 2026European electricity market reform 2024electricity interconnection Europeoffshore wind Europe 35 GWEurope electricity investment 2026REPowerEU electricity statisticsEU 48 percent renewables 2026wind EU largest source 2023EU 2700 TWh electricityEU 1150 GW capacityDenmark 88 percent renewablesPoland 70 percent coal electricityEU electricity 60 percent renewables 2030offshore wind 111 GW 2030solar 600 GW Europe 2030EU coal

phase-out statisticsEurope electricity vs USA ChinaEU industrial electricity 2-3x USANorway hydro 93 percent electricity

STATISTICS REPORT

France Electricity Industry — Statistics & Facts 2026

Updated Apr 1, 2026 · businesstats.com/france-electricity-industry

~490 TWh ANNUAL GENERATION	**70%** NUCLEAR SHARE	**56** NUCLEAR REACTORS
€0.24/kWh AVG HH PRICE	**60 gCO□** CARBON INTENSITY/KWH	**#1** NET ELECTRICITY EXPORTER

Overview

490 TWh, 70% Nuclear — The World's Most Nuclear-Dependent Large Economy

France's electricity system is one of the most remarkable in the world — an economy of 68 million people powered predominantly by nuclear energy in a strategic choice made deliberately and rapidly between the mid-1970s and the mid-1990s. Following the 1973 oil shock, France's government under President Pompidou and then Giscard d'Estaing launched the most ambitious peacetime civilian nuclear programme in history — ordering and building 58 nuclear reactors in approximately 25 years. The programme's extraordinary speed was enabled by standardisation: France used just two reactor designs (the standardised series of Framatome Pressurised Water Reactors in 900 MW, 1,300 MW, and 1,450 MW configurations) rather than the bespoke designs used elsewhere, achieving economies of repetition that kept construction times to approximately 5-7 years per unit and costs within budget.

The result is a power system that generates approximately **490 TWh annually** from approximately **150 GW of total installed capacity** — with nuclear contributing approximately **70%**, hydropower approximately **11-12%**, wind approximately **8-9%**, solar approximately **5-6%**, and gas approximately **4-5%** (used primarily for winter peak demand management). France's electricity carbon intensity of approximately **60 grams CO□/kWh** is among the world's lowest for any large industrialised economy — significantly lower than Germany (~380 gCO□/kWh), the United States (~380 gCO□/kWh), or China (~530 gCO□/kWh). This extraordinary low-carbon performance is entirely attributable to the nuclear fleet that France chose to build half a century

ago. For context on how France fits within the global electricity system, see our global electricity market analysis.

France's electricity sector is defined by one dominant player: **EDF (Électricité de France)**, the state-owned utility that the French government fully renationalised in June 2023 by buying out minority shareholders at €12/share — taking EDF back to 100% state ownership after a period of partial privatisation that began with EDF's Paris Stock Exchange listing in 2005. EDF operates all 56 nuclear reactors, the majority of France's large hydropower plants (approximately 25 GW of hydro capacity), and a growing portfolio of wind and solar assets. EDF's Enedis subsidiary operates the national electricity distribution network serving approximately 36 million customers. The scale of France's nuclear commitment and EDF's role in maintaining it has direct implications for French industrial competitiveness — France's electricity price advantage over Germany (approximately €0.07/kWh cheaper for households, more for industry) is a significant economic benefit quantified across the world's largest economies analysis.

France electricity 2026: ~490 TWh generated annually from 150 GW installed capacity. Nuclear 70% — world's highest large-economy share. 56 reactors across 18 sites operated by EDF. World's #1 net electricity exporter (~50-80 TWh net annually). Carbon intensity ~60 gCO₂/kWh — among world's cleanest. Average household price €0.24/kWh. 6 new EPR2 reactors approved for Penly and other sites.

Electricity Mix

France Electricity Mix — Nuclear 70%, Hydro 12%, Wind 9%, Solar 6%, Gas 5%

France's electricity mix is dominated by nuclear to a degree unmatched by any other large economy. In a typical year with normal nuclear availability, France generates approximately **330-340 TWh from nuclear** — approximately 70% of total generation. The remaining 30% is split between hydropower (~55-60 TWh, 11-12%), wind (~40-45 TWh, 8-9%), solar (~25-30 TWh, 5-6%), gas (~20-25 TWh, 4-5%), and bioenergy/other (~10-15 TWh, 2-3%). This mix makes France's electricity approximately **95-96% low-carbon** — a figure that virtually no other large economy can match. Even with Germany's aggressive renewable deployment, Germany's electricity remains approximately 38% fossil fuel-generated, compared to France's approximately 5%.

The 2022 nuclear availability crisis was a stark reminder of the risks of concentrated dependence on a single technology. During 2022, EDF discovered unexpected stress corrosion cracking (SCC) in the cooling circuits of multiple reactors, requiring emergency inspections and repairs. Combined with already-

scheduled maintenance and refuelling outages, this resulted in approximately **32 of 56 reactors being simultaneously offline** at the peak of the crisis in autumn 2022 — a situation without precedent in French nuclear history. French nuclear generation fell from approximately 379 TWh (2021) to approximately **279 TWh (2022)** — a 26% decline — forcing France to become a net electricity importer for the first time in decades and contributing significantly to the pan-European electricity price spike. By 2023-2025, repairs had been completed and reactor availability returned to normal, with nuclear generation recovering to approximately 330-340 TWh. The contrast between France's normally cheap nuclear electricity and its vulnerability during the 2022 crisis is examined in our EU energy prices analysis.

France Electricity Mix — 2025 by Source

The navy donut chart below shows France's electricity generation mix in 2025. Nuclear's dominant position is visually striking — generating more than twice the combined output of all renewable sources.

Electricity Mix France Electricity Generation by Source — 2025 BusinessStats Research · RTE Bilan Électrique 2025 · IEA France Electricity Data

France Electricity Generation — Annual Trend 2015 to 2026 (TWh)

The white line chart below tracks France's total electricity generation from 2015 through 2026, showing the 2022 nuclear availability crisis dip and the subsequent recovery. The trend clearly illustrates how France's total output is almost entirely a function of nuclear plant availability — when nuclear dips, total generation dips.

Generation TrendFrance Total Electricity Generation — 2015 to 2026 (TWh)BusinessStats Research · RTE Bilan Électrique Annual · EDF Production Reports 279 TWh2022 Crisis Low ~490 TWh2025 Recovery

2022 crisis: -26% nuclear → net electricity importer Sources: RTE Bilan Électrique 2015-2025 · EDF Annual Reports · BusinessStats Research 2026 Estimate

Nuclear Fleet

France's Nuclear Fleet — 56 Reactors, 61 GW, World's Most Productive

France operates **56 nuclear power reactors** across 18 power plant sites, with a total installed nuclear capacity of approximately **61.4 gigawatts (GW)**. All French reactors are Pressurised Water Reactors (PWRs) of French design, manufactured by Framatome (formerly Areva NP, now part of EDF and majority-owned by EDF). The fleet divides into three generations: the "900 series" (34 reactors of approximately

900-920 MW each, built 1977-1987), the "1300 series" (20 reactors of approximately 1,300-1,330 MW each, built 1984-1993), and the "1450 series" (4 reactors of approximately 1,450-1,500 MW each, built 1996-1999). The French fleet is the world's second-largest by number of reactors (after the US at 93) and generates the world's third-largest nuclear electricity output (after the US and China). The full global nuclear picture is covered in our global nuclear energy statistics.

EDF's nuclear generation programme delivered an average **capacity factor of approximately 75-78%** in 2024-2025 — below the US nuclear fleet average of approximately 93% due to France's practice of using nuclear plants for load-following (varying output to match demand, particularly over weekends and during low-demand periods). This load-following capability — unusual for nuclear plants globally — reflects France's grid structure: with nuclear providing 70% of generation, France's electricity system would be overwhelmed with surplus power if nuclear plants ran at 100% capacity continuously. The trade-off is lower revenue per reactor but greater grid stability. In 2022, the capacity factor fell to approximately 61% due to the corrosion crisis — with direct economic consequences for EDF, which ultimately required significant government financial support and contributed to the rationale for full nationalisation.

The oldest French reactors (the 900 MW series, built in the late 1970s) are currently being evaluated for 50-year and potentially 60-year operating licences — the French nuclear regulator (ASN, now integrated into ASNR) has approved principle of 50-year extensions, with individual reactor assessments determining actual lifetimes. EDF's "Grand Carénage" programme — a €50 billion investment plan running from approximately 2014 through the 2030s — involves comprehensive safety upgrades, modernisation of ageing components, and post-Fukushima safety improvements across the entire fleet. This investment programme is essential for maintaining the fleet's operational viability and is one of the primary financial burdens that required EDF's renationalisation — the scale of investment was incompatible with EDF's balance sheet as a partly private listed company facing regulated retail tariffs.

French Nuclear Power Plants — Capacity by Site

The navy bar chart below shows France's nuclear power plant sites ranked by installed capacity. The largest sites — Gravelines (5 reactors, ~2,700 MW) and Paluel (4×1,300 MW = 5,200 MW) in Normandy — are among the largest nuclear complexes in the world.

Nuclear SitesFrance Nuclear Power Plant Sites — Installed Capacity (MW)BusinessStats Research · EDF Nuclear Production · IAEA PRIS Q1 2026 5,200 MWPaluel — Largest Installed Capacity (MW) 56 reactors across 18 sites — 61.4 GW total nuclear Sources: EDF Nuclear Production Report · IAEA PRIS Database Q1 2026 · ASN/ASNR · BusinessStats Research

Renewables

France Renewables — Hydro 12%, Wind Accelerating, Offshore Wind Emerging

Despite nuclear's dominance, France has a significant and growing renewable electricity sector. **Hydropower** is France's second-largest electricity source, contributing approximately **55-60 TWh annually** (11-12% of generation) from approximately 25 GW of installed hydro capacity — the third-largest in Europe after Norway and Sweden. France's hydro fleet includes large run-of-river plants on the Rhône, Rhine, and Dordogne rivers, as well as pumped-storage facilities (STEP) that are essential for grid balancing. EDF operates the majority of France's large hydropower (approximately 20 GW), with the remainder operated by CNR (Compagnie Nationale du Rhône) and SHEM. Hydro output varies significantly by year depending on precipitation and snowmelt — the 2022 drought reduced French hydro generation by approximately 20-25% below average, compounding the nuclear availability crisis.

Wind power has grown rapidly, contributing approximately **40-45 TWh (8-9%)** of French electricity from approximately 22-24 GW of installed onshore wind capacity. France is the EU's fourth-largest onshore wind market by installed capacity (after Germany, Spain, and Sweden) but has historically had slower deployment than its renewable resource would suggest — partly due to complex permitting requirements and significant community opposition. The French government has streamlined wind permitting since 2022, and installation rates have improved to approximately 2-3 GW/year. Offshore wind is at an earlier stage — France's first commercial offshore wind farm (Saint-Nazaire, 480 MW, 80 turbines) began operating in 2022, with several larger projects (Fécamp 500 MW, Calvados 448 MW, Dunkerque 600 MW) in construction or advanced development targeting approximately 18 GW of offshore wind by 2035. France's renewable trajectory has direct implications for the broader European industrial energy cost dynamics as renewable build-out gradually reduces marginal generation costs.

Solar PV is France's fastest-growing renewable, reaching approximately 25-30 TWh (5-6% of generation) from approximately 22-25 GW of installed capacity. France's solar market has accelerated significantly since 2022, with approximately 3-4 GW of new solar installed in 2024. The government's Energy Acceleration Law (2023) simplified planning procedures for both solar and wind, targeting approximately 10 GW of new solar per year by 2027-2030. France has particular potential for **agrivoltaics** — combining solar panels with agricultural use — given its large agricultural land area. Several large agrivoltaic projects are in development, and France's regulatory framework for agrivoltaics (adopted 2023) is among the most

developed in Europe.

France Renewable Electricity — Growth by Source 2015 to 2026 (TWh)

The grouped bar chart below shows the growth of wind and solar electricity generation in France from 2015 through 2026, illustrating the acceleration in both technologies — particularly solar — since 2020.

Renewables GrowthFrance Wind & Solar Generation — 2015 to 2026 (TWh)BusinessStats Research · RTE Bilan Électrique Annual · IRENA France Data +32 TWhWind Growth +25 TWhSolar Growth

Solar growing fastest — +3-4 GW/year since 2022 Sources: RTE eco2mix Annual Data · IRENA France · Eurostat Energy Statistics · BusinessStats Research

Prices & Market

France Electricity Prices — €0.24/kWh HH, ARENH Industrial Relief, World's #1 Exporter

France's electricity pricing system is complex — a mixture of regulated tariffs, market prices, and nuclear-specific mechanisms that reflect the unique character of a power system dominated by a single technology with very low marginal costs. The average household electricity price of approximately **€0.24/kWh** (H1 2025) is structured around the TRVe (tarif réglementé de vente d'électricité) — the regulated retail electricity tariff that applies to most residential and small business consumers and is set by the French energy regulator CRE. This regulated tariff typically includes the production component, network charges (TURPE), taxes (CSPE — contribution au service public de l'énergie, and TVA), and other levies. Despite France's cheap nuclear generation, the household price is not dramatically lower than other EU countries because taxes and levies still account for approximately 40% of the bill.

For industrial consumers, the **ARENH (Access Regulated to Historic Nuclear Electricity)** scheme was the most important mechanism — it allowed qualifying industrial consumers to purchase up to a defined volume of nuclear electricity at a regulated tariff of **€42/MWh**, well below the market wholesale price for much of the 2010s and dramatically below market during the 2022 crisis when wholesale prices reached €300-400/MWh. The ARENH system ended at the beginning of 2026 and was replaced by a new framework — the "regulated nuclear access" mechanism under the reformed EU electricity market, which aims to provide industrial consumers with long-term price stability through Contracts for Difference based on nuclear generation costs. Industrial electricity prices in France of approximately **€0.13-0.15/kWh** for medium consumers are significantly below the German industrial price (~€0.19-0.22/kWh) — a competitive

advantage that has attracted energy-intensive manufacturing investment in France. The financial dynamics of European energy markets are explored in our analysis of German financial markets, where French nuclear electricity exports have historically kept German wholesale prices lower than they would otherwise be.

France's role as the **world's largest net electricity exporter** is a direct consequence of its nuclear programme generating surplus baseload power that cannot easily be throttled down. France typically exports approximately **50-80 TWh more electricity than it imports annually** — generating approximately €2-4 billion in annual electricity export revenues. France's main export markets are Germany, the UK (via the IFA cross-Channel interconnectors), Belgium, Italy, and Switzerland. The UK interconnection — currently approximately 4 GW capacity with a further 1.4 GW IFA2 link — makes France a critical electricity security backup for the UK, particularly during periods of low UK wind and solar output. The export capabilities also have implications for broader energy trading monitored through our financial and trading market analysis that tracks broader European economic integration.

France vs Neighbouring Countries — Electricity Price Comparison (€/kWh, 2025)

The white animated bars below compare France's household electricity price against its neighbouring EU countries, illustrating France's competitive advantage — particularly versus Germany — driven by cheaper nuclear baseload electricity.

Price Comparison France vs Neighbours — Household Electricity Price H1 2025 (€/kWh) BusinessStats Research · Eurostat nrg_pc_204 H1 2025 · All prices including taxes & levies Key Insight The Nuclear Price Advantage — France vs Germany: €0.07/kWh Cheaper

France's average household electricity price of €0.24/kWh versus Germany's €0.31/kWh may seem modest, but the difference is economically significant — a French household consuming 5,000 kWh/year saves approximately €350 annually versus an equivalent German household. For industrial consumers, the gap is larger — French industrial electricity at approximately €0.14/kWh versus German industrial at approximately €0.19-0.22/kWh represents a 30-50% cost advantage that directly benefits French manufacturing competitiveness. This nuclear dividend — the accumulated economic benefit of having built cheap baseload capacity in the 1970s-1990s — is estimated at approximately €10-20 billion annually for the French economy compared to a counterfactual where France had followed Germany's energy path. It is the most concrete demonstration of nuclear energy's long-term economic value when a large standardised fleet is built successfully.

France Electricity — Key Data Table by Source and Metric

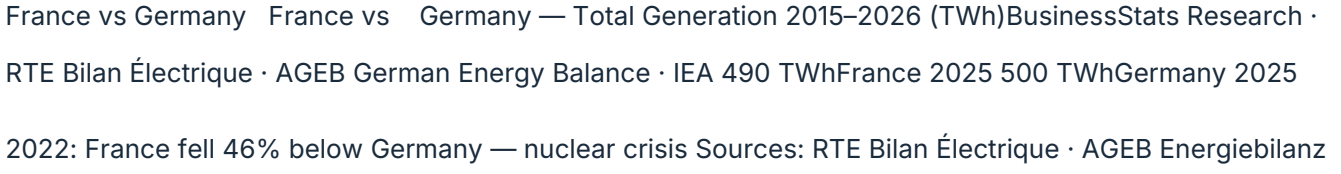
The sortable table below provides comprehensive data on France's electricity sector by generation source, including output, capacity, capacity factor, carbon intensity, and cost per kWh. Click any column to sort.

France Electricity by Source — Full Data 2025Click column to sort

SOURCE	GENERATION (TWH)	SHARE (%)	INSTALLED CAPACITY (GW)	CAPACITY FACTOR (%)	CARBON (GCO /KWH)
Nuclear (PWR)	~335	~70%	61.4 GW	~76%	~5
Hydropower	~57	~12%	~25 GW	~26%	~4
Onshore Wind	~42	~9%	~23 GW	~21%	~8
Solar PV	~27	~6%	~23 GW	~13%	~25
Natural Gas	~22	~5%	~13 GW	~19%	~450
Bioenergy	~10	~2%	~3 GW	~38%	~230
Offshore Wind	~2	~0.4%	~0.5 GW	~40%	~10
Oil / Other	~1	~0.2%	~4 GW	~3%	~600
Total France	~496	100%	~153 GW	~37%	~60

France vs Germany — Electricity Generation 2015–2026 (TWh)

The white dual-line chart below compares France and Germany's total electricity generation from 2015 through 2026. The 2022 nuclear availability crisis is starkly visible — France's generation collapsed 46% below Germany's that year, temporarily reversing their usual near-parity and making France a net importer.



Electricity Carbon Intensity — France vs European Peers (gCO₂/kWh)

The white bar chart below compares grid carbon intensity across European countries in 2025. France's extraordinary low-carbon electricity — driven almost entirely by its nuclear fleet — places it among the world's cleanest electricity systems, far below Germany, Poland, and even the EU average.

Carbon IntensityElectricity Carbon Intensity — France vs European Peers 2025 (gCO₂/kWh)BusinessStats Research · EEA European Environment Agency · RTE eco2mix · Electricitymap.org 60 gFrance 380 gGermany

France 6× cleaner than Germany — nuclear advantage Sources: EEA European Environment Agency · RTE eco2mix 2025 Annual Average · Electricitymap.org · BusinessStats Research France grid carbon intensity 2025: ~60 gCO₂/kWh — among world's lowest for large economies. Sweden ~25 gCO₂/kWh (hydro), Switzerland ~30 gCO₂/kWh. Germany ~380 gCO₂/kWh — 6× higher than France. Poland ~720 gCO₂/kWh — coal-dominated. EU average ~230 gCO₂/kWh. UK ~180 gCO₂/kWh (North Sea wind). France's nuclear fleet delivers approximately 270 Mt CO₂ avoided annually vs a gas-based counterfactual.

France Electricity — Key Statistics at a Glance

~490 TWhAnnual Generation153 GW installed capacity. ~18% of EU-27 electricity. 2nd largest EU electricity producer after Germany. 70%Nuclear ShareWorld's highest large-economy nuclear share. 335 TWh/yr. 56 reactors. 61.4 GW capacity. 60 gCO₂Grid Carbon Intensity (per kWh)Among world's lowest large economies. vs Germany ~380, USA ~380. 95-96% low-carbon electricity. €0.24/kWhAvg Household PriceBelow EU avg €0.28. 22% cheaper than Germany (€0.31). TRVe regulated tariff for most consumers. #1World's Largest Net Exporter~50-80 TWh net exports/year. To Germany, UK, Belgium, Italy, Switzerland. €2-4B annual revenue. 279 TWh2022 Nuclear Crisis Low32/56 reactors offline simultaneously. France became net importer. Drove €700-800B EU support crisis. 6New EPR2 Reactors ApprovedFirst pair at Penly (Normandy). Construction start late 2020s. First power ~2035-2037. €51.7B cost est. €50BGrand Carénage Investment2014-2030s fleet overhaul. Safety upgrades, corrosion repairs, post-Fukushima improvements. EDF programme. €13.7BFlamanville 3 EPR Final CostOriginal estimate: €3.3B. Completed 2025. 12-year delay. Lessons applied to EPR2 design improvements. 18 GWOffshore Wind Target 2035From ~0.5 GW (2025). Saint-Nazaire operational. Fécamp, Calvados, Dunkerque in development. 100%EDF State Ownership (2023)Fully renationalised at €12/share. Required by €50B fleet investment. Enedis subsidiary: 36M customers. 7,500 kWhPer Capita ConsumptionBelow EU avg of ~5,800 kWh/capita. Higher than UK (4,800) and Germany (6,000). Highly electrified economy.

Forecast 2030

France Electricity Forecast 2030 — 530 TWh Target, Nuclear Renaissance, Offshore Wind Launch

France's electricity outlook through 2030 is ambitious — driven by both the need to electrify the French economy (EVs, heat pumps, green hydrogen) and the government's commitment to maintaining and expanding nuclear capacity. Total electricity generation is projected to grow from approximately 490 TWh (2026) to approximately **520-540 TWh by 2030**, reflecting the growing electrification demand. The primary supply-side driver of this growth will be **renewable energy** — particularly solar (accelerating from 3-4 GW/year to potentially 10 GW/year by 2028-2030) and the first tranches of offshore wind capacity (approximately 3-4 GW operational by 2030). Nuclear generation is expected to remain approximately stable at 330-340 TWh through 2030 as the existing fleet's output is maintained, with no new nuclear capacity coming online before approximately 2035-2037.

The electrification of French road transport will be a significant demand driver — France's EV fleet is projected to grow from approximately 1.5 million (2025) to approximately 8-10 million vehicles by 2030, adding approximately 15-20 TWh of new electricity demand. Heat pump adoption — replacing gas boilers — is another major demand driver, with approximately 600,000-800,000 heat pumps installed per year targeted under France's energy renovation programme. RTE's "Futurs Énergétiques 2050" analysis projects that France could require 600-750 TWh of electricity per year by 2050 in decarbonisation scenarios — approximately 25-50% more than today — driven primarily by transport, heating, and industrial electrification, along with green hydrogen production. This demand growth reinforces the case for both new nuclear (the EPR2 programme) and accelerated renewables.

For electricity **prices**, the 2030 outlook is cautiously positive for consumers. The expansion of solar and wind capacity will gradually increase the share of zero-marginal-cost generation in the French mix, with downward pressure on wholesale electricity prices during periods of high renewable output. The new nuclear regulatory framework — replacing ARENH — should provide industrial consumers with access to long-term price stability through nuclear-backed Contracts for Difference. French household electricity prices are expected to remain broadly stable in real terms toward approximately **€0.22-0.25/kWh by 2030**, continuing France's competitive advantage over Germany. The economic impact of France's energy strategy — which prioritises stable, affordable, low-carbon electricity as an industrial policy tool — is reflected in the investment attraction dynamics tracked through our financial market analysis.

France electricity forecast 2030: Generation to reach 520-540 TWh (+30-50 TWh). Nuclear stable at 330-340 TWh. Solar accelerating to 10 GW/year. Offshore wind: 3-4 GW by 2030, 18 GW by 2035. EV demand +15-20 TWh. Heat pump demand +10-15 TWh. EPR2 first electricity ~2035-2037. Household price stable at €0.22-0.25/kWh. France retains EU electricity price competitiveness advantage over Germany through 2030+. France Electricity Outlook France Electricity — 2030 Key Projections 520-540 TWhGeneration Target 2030 335 TWhNuclear Stable 2030 18 GWOffshore Wind 2035 Target 2035-37First EPR2 Power €0.22-0.25HH Price 2030 (€/kWh) 600-750 TWhRTE 2050 Demand Scenario

FAQ

Frequently Asked Questions — France Electricity Industry

Nuclear energy provides approximately **70-75% of France's electricity** as of 2025-2026 — the world's highest nuclear share of any large economy. France operates 56 nuclear reactors with 61.4 GW capacity, generating approximately 330-340 TWh/year. This share temporarily fell to approximately 63-65% in 2022 due to the unprecedented nuclear availability crisis (32 of 56 reactors simultaneously offline for corrosion repairs). By 2024-2026, availability returned to normal. France's electricity is approximately 95-96% low-carbon (nuclear + all renewables), giving it one of the world's lowest grid carbon intensities at approximately 60 gCO₂/kWh.

France generates approximately **490-500 TWh annually** as of 2025-2026 from approximately 153 GW of installed capacity. This is approximately 18% of EU-27 electricity — making France the EU's second-largest electricity producer after Germany. The range over the past decade has been approximately 448 TWh (2022 crisis low) to ~570 TWh (pre-2000 historical high). France's total generation is closely correlated with nuclear plant availability — when nuclear dips, total generation dips proportionately. The system is operated by RTE (Réseau de Transport d'Électricité), France's national transmission operator.

France's average household electricity price is approximately **€0.24/kWh** (H1 2025, Eurostat) — below the EU-27 average of €0.28/kWh and significantly cheaper than Germany (€0.31/kWh). This price advantage is directly attributable to France's large nuclear fleet providing cheap baseload power. Industrial electricity is approximately **€0.13-0.15/kWh** for medium consumers — significantly below Germany's €0.19-0.22/kWh. Household prices are set by the TRVe (regulated tariff) overseen by energy regulator CRE. The ARENH industrial nuclear access scheme (€42/MWh) ended in 2026, replaced by new nuclear CfD-based pricing mechanisms.

EDF (Électricité de France) dominates French electricity — fully renationalised by the French state in June 2023. EDF operates all 56 nuclear reactors, ~20 GW of hydropower, growing wind and solar assets, and the Enedis distribution network (36 million customers). Other significant players: **Engie** (gas, some renewables), **TotalEnergies** (growing solar/wind portfolio), **CNR** (Compagnie Nationale du Rhône — Rhône river hydropower), and dozens of independent renewable energy producers. The transmission grid is operated by **RTE** (majority-owned by EDF but regulated independently). EDF's renationalisation was driven by the need to fund €50B+ in fleet maintenance investment incompatible with private shareholder expectations.

France has approved construction of **6 new EPR2 reactors** with potential for 8 more. The first pair will be built at Penly (Seine-Maritime, Normandy) — a site adjacent to an existing nuclear plant. Construction expected to begin late 2020s; first electricity generation approximately **2035-2037**. EDF's cost estimate for the first 6 units: approximately **€51.7 billion**. The EPR2 is an improved design versus the first-generation EPR — simpler, incorporating lessons from Flamanville 3 (France), Hinkley Point C (UK), and Olkiluoto 3 (Finland) construction experiences. France is also evaluating small modular reactors (SMRs) for later deployment. Flamanville 3 (1,630 MW first-generation EPR) reached criticality December 2024 after a 12-year delay and €13.7B cost overrun.

France is the **world's largest net electricity exporter**, typically exporting approximately **50-80 TWh more than it imports annually**. Main export markets: Germany (largest recipient), UK (via IFA cross-Channel interconnectors, ~4+ GW capacity), Belgium, Italy, Spain, and Switzerland. Export revenues: approximately **€2-4 billion annually** depending on wholesale electricity prices. In 2022, due to the nuclear availability crisis (32 reactors offline simultaneously), France exceptionally became a net electricity importer for the first time in decades — a dramatic reversal that contributed to the pan-European energy price spike. Normal net export status was restored in 2023-2024 as nuclear availability recovered.

Flamanville 3 is France's first new nuclear reactor since the 1990s — a 1,630 MW EPR in Normandy. Originally approved 2004, target completion 2012, budget ~€3.3 billion. Actual outcome: completed 2025, final cost approximately **€13.7 billion** — a **4× cost overrun and 12+ year delay**. The reactor finally achieved criticality (first nuclear chain reaction) in **December 2024** and began generating electricity in 2025. Flamanville 3 became a symbol of the challenges of building first-of-a-kind nuclear in Western countries with lapsed construction supply chains. Its painful lessons directly shaped the EPR2 programme, which incorporates design simplifications, modular construction approaches, and improved project management to avoid similar overruns.

France's electricity mix 2025-2026: **Nuclear ~70%** (~335 TWh), **Hydropower ~12%** (~57 TWh), **Onshore Wind ~9%** (~42 TWh), **Solar PV ~6%** (~27 TWh), **Natural Gas ~5%** (~22 TWh), **Bioenergy ~2%** (~10 TWh), **Offshore Wind ~0.4%** (~2 TWh), other ~0.4%. Total low-carbon sources: approximately **95-96%**. France's carbon intensity of approximately **60 gCO₂/kWh** is among the world's lowest for large economies — compared to Germany ~380, USA ~380, UK ~180, and EU average ~230 gCO₂/kWh.

RTE (Réseau de Transport d'Électricité) is France's national electricity **transmission system operator (TSO)** — responsible for operating, maintaining, and developing France's high-voltage grid. RTE manages approximately **105,000 km of high-voltage lines** and **50 cross-border interconnection lines** with 8 neighbours (Belgium, Luxembourg, Germany, Switzerland, Italy, Spain, Andorra, UK). RTE is majority-owned by EDF but operates as an independent regulated entity. RTE publishes France's electricity data in real-time via its **eco2mix platform** and produces the definitive annual Bilan Électrique (Electricity Balance) report. RTE's "Futurs Énergétiques 2050" study is the key reference for France's long-term electricity planning scenarios.

France and Germany represent contrasting electricity strategies. **France**: ~490 TWh, 70% nuclear, 95% low-carbon, €0.24/kWh household, ~60 gCO₂/kWh. **Germany**: ~500 TWh, 0% nuclear (phase-out April 2023), 62% renewables, 22% gas, 16% coal, €0.31/kWh household, ~380-400 gCO₂/kWh. France's approach delivers: **lower carbon intensity** (6× cleaner), **lower electricity prices** (€0.07/kWh cheaper for households, more for industry), and **net electricity exporter** status vs Germany being a net importer. Germany's approach: **no nuclear risk**, rapid renewables deployment, but continued fossil dependence during low renewable output. France's nuclear price advantage: approximately **€10-20 billion/year** economic benefit for the French economy vs a German-style energy path.

France's PPE (Programmation Pluriannuelle de l'Énergie — Multiannual Energy Plan) is the government's 10-year energy roadmap. The current PPE (2019-2028) was developed under a commitment to reduce nuclear to 50% of electricity by 2035. President Macron reversed this in **February 2022**, announcing France would build new nuclear and maintain nuclear's dominant role. The **2023 Energy Law** confirmed construction of 6 new EPR2 reactors and enabled 50-year+ operating licences for existing plants. The PPE is currently being revised to reflect this nuclear-forward strategy. Key 2030 targets in the revised direction: maintain nuclear at ~67-70% of electricity, reach 33 GW of solar by 2030, 24 GW of onshore wind by 2030, and 18 GW of offshore wind by 2035.

France's revised energy targets include approximately **40% of electricity from non-nuclear renewables by 2030** (from ~27% currently) — primarily via wind and solar expansion. Specific targets: **Solar 33 GW** by

2030 (from ~23 GW), **Onshore Wind 24 GW** by 2030 (from ~23 GW), **Offshore Wind 18 GW** by 2035 (from ~0.5 GW). France's **Energy Acceleration Law (2023)** streamlined planning permissions for wind and solar. Solar installation has accelerated to 3-4 GW/year and is targeted to reach 10 GW/year by 2027-2030. France's renewable targets are lower than many EU peers (e.g., Germany targeting 80%+ by 2030) because nuclear already provides the majority of France's low-carbon electricity — the two technologies are complementary in France's strategy.

Data Sources & References

Primary: RTE — Bilan Électrique 2025 (France's definitive annual electricity balance, generation by source, trade balance)

Primary: EDF — Annual Report 2024 (nuclear production, financial results, Grand Carénage investment programme)

Primary: Eurostat — Electricity prices for household and non-household consumers H1 2025 (nrg_pc_204, nrg_pc_205)

BusinessStats: All generation analysis, nuclear fleet data, renewable growth calculations, price comparisons, 2030 forecast projections, France vs Germany comparisons, and export revenue estimates are BusinessStats proprietary research combining the above primary sources with IAEA PRIS database, ASN/ASNR regulatory reports, French Ministry of Energy Transition documents, and RTE Futurs Énergétiques 2050 scenarios.

Generation data from RTE Bilan Électrique calendar year 2024-2025. Nuclear capacity from IAEA PRIS Q1 2026. Electricity prices from Eurostat H1 2025. Carbon intensity figures from RTE eco2mix annual averages. EPR2 cost estimates from EDF press releases. All projections are forward-looking estimates subject to uncertainty. Not financial or investment advice.

France electricity industry statisticsFrance electricity statistics 2026France electricity generation 2026France electricity marketFrance nuclear energy statisticsFrance electricity mix 2026EDF statistics 2026Electricite de France factsFrance electricity price 2026France renewable energy electricityFrance wind energy statisticsFrance solar energy statisticsFrance hydropower statisticsFrance electricity consumptionFrance electricity per capitaFrance net electricity exporterFrance EPR reactor statisticsFrench nuclear power plantsFrance electricity capacityRTE France electricity 2026France energy transition electricityFrance electricity forecast 2030France electricity carbon intensityFrance electricity gridFrance electricity investmentFrance nuclear capacity factorFrance electricity market reformARENH France nuclear

pricingTRVe France electricity tariffFrance EPEX wholesale priceFrance electricity historyFrance 70 percent nuclear electricityFrance 490 TWh generationFrance 56 nuclear reactorsFrance nuclear fleet 61 GWEDF renationalisation 2023Flamanville 3 EPR cost delayFrance EPR2 Penly reactorFrance offshore wind statisticsFrance electricity export Germany UKFrance cheapest EU electricity nuclearFrance 60 gCO2 kWh carbon intensityFrance electricity vs Germany statisticsGrand Carenage EDF investmentFrance Futurs Energetiques 2050France PPE energy planFrance Energy Acceleration Law 2023France agrivoltaics statisticsFrance electricity security nuclearFrance electricity 2022 crisisFrance 279 TWh 2022 nuclear outage

STATISTICS REPORT

Electricity in the United States — Statistics & Facts 2026

Updated Mar 31, 2026 · businesstats.com/electricity-in-the-united-states

4,400 TWh ANNUAL GENERATION	**$450–500B** MARKET VALUE	**1,250 GW** INSTALLED CAPACITY
43% NATURAL GAS SHARE	**25%** RENEWABLES SHARE	**$0.14/kWh** AVG RESIDENTIAL PRICE

Overview

$450B Market, 4,400 TWh, 1,250 GW — The World's Most Valuable Electricity Market

The United States electricity sector is the world's most valuable electricity market by revenue — a **$450–500 billion annual industry** generating approximately 4,400 terawatt-hours (TWh) from approximately 1,250 gigawatts (GW) of installed capacity across more than 11,000 power plants. Approximately 3,300 electric utilities — a mix of investor-owned utilities (IOUs), publicly owned utilities, cooperatives, and federal power agencies — deliver electricity to approximately 160 million residential, commercial, and industrial customers across all 50 states. The US generates approximately **15% of global electricity** — making it the world's second-largest electricity producer after China — while consuming approximately **13,000 kWh per capita annually**, one of the highest consumption rates among major economies.

The US electricity sector is undergoing its most dramatic transformation since the rural electrification programmes of the 1930s–1950s. The **shale gas revolution** that began around 2008–2010 drove a massive shift from coal to natural gas generation — one of the largest and fastest fuel switches in electricity history, reducing US power sector CO_2 emissions approximately 40% between 2005 and 2025. Simultaneously, the collapse in solar and wind costs has driven renewable energy from approximately 10% to 25% of US generation. The **Inflation Reduction Act (IRA)** of August 2022 — providing approximately $370 billion in clean energy incentives — is now the largest government clean energy programme in world history,

projected to deploy 300–400 GW of new renewable capacity by 2030 and transform the US electricity mix further. The broader context of how the US electricity sector fits into global energy markets is explored in our global electricity market analysis.

The US electricity system faces three simultaneous challenges: **decarbonisation** (reducing power sector emissions toward net-zero by 2035 as proposed by the Biden administration, with continued policy momentum under subsequent administrations), **reliability** (maintaining 24/7 grid stability as coal plants retire and intermittent renewables grow), and **demand growth** (managing the first sustained increase in US electricity demand since 2007, driven by EV charging, heat pumps, and data centres). These challenges are directly connected to broader US financial market dynamics — the clean energy transition is attracting extraordinary private capital flows through IRA tax credits that are reshaping the balance sheets of utilities, oil companies, and technology firms tracked in our US financial markets analysis.

US electricity 2026: 4,400 TWh generated annually from 1,250 GW installed capacity. Natural gas 43% — dominant since shale revolution. Renewables 25% (wind 11%, solar 6%, hydro 6%). Nuclear 19% — 93 reactors. Coal collapsed from 45% (2010) to 15% (2026). Texas leads all states at ~520 TWh. Average residential price $0.14/kWh. Market value $450-500B — world's largest by revenue.

Electricity Mix

US Electricity Mix — Gas 43%, Nuclear 19%, Renewables 25%, Coal 15%

Natural gas is the dominant US electricity source at approximately **43% of generation** (~1,890 TWh annually) — a share that has grown from approximately 24% in 2010, entirely at the expense of coal. The US natural gas power fleet consists of a mix of highly efficient combined-cycle gas turbines (CCGTs) that run continuously as baseload power, and less efficient gas peakers that operate only during periods of high demand. Natural gas's dominance is directly tied to the shale revolution — hydraulic fracturing dramatically increased US natural gas supply and reduced prices from approximately $8–10/MMBtu (2005–2008) to approximately $2–4/MMBtu in recent years, making gas-fired generation consistently cheaper than coal. The full context of US fossil fuel consumption and its relationship to electricity generation is covered in our dedicated US fossil fuel consumption analysis.

Nuclear energy provides approximately **19% of US electricity** (~835 TWh) from 93 operating reactors across 54 sites — the world's largest nuclear fleet by generation. Despite producing no new large plants for approximately 30 years (until Vogtle Units 3&4 in Georgia reached commercial operation in 2023–2024), the existing US nuclear fleet has maintained its generation share through life extensions and

very high capacity factors (~93%). Nuclear is the largest source of carbon-free electricity in the US — generating more zero-carbon electricity than all US wind and solar combined. The US nuclear picture — including the reactor fleet details and the SMR development pipeline — is covered in our global nuclear energy statistics article.

Renewables collectively contribute approximately **25% of US electricity** — with wind at approximately 11% (~484 TWh), solar at approximately 6% (~264 TWh), conventional hydro at approximately 6% (~264 TWh), and bioenergy and geothermal at approximately 2% combined. Wind is the largest renewable source of US electricity, with approximately 150–160 GW installed across 41 states — dominated by Texas, Iowa, Oklahoma, Kansas, and Illinois. Solar has grown from negligible in 2010 to approximately 180–200 GW installed, with California, Texas, Florida, Nevada, and Arizona leading. **Coal** has fallen dramatically from approximately 45% of US electricity (2010) to approximately **15% (2026)** — approximately 660 TWh — as low gas prices and stricter environmental regulations have driven over 100 GW of coal retirements since 2010.

US Electricity Mix — Historical Shift 2010 to 2026 (%)

The grouped bar chart below shows the dramatic shift in the US electricity mix between 2010 and 2026, illustrating coal's collapse, gas's rise, and renewables' steady growth — one of the most significant structural changes in any major national energy system in history.

Mix TransformationUS Electricity Mix — 2010 vs 2026 (% of Total Generation)BusinessStats Research · EIA Electric Power Monthly · EIA Annual Energy Review -30ptsCoal Decline +15ptsRenewables Rise

Coal: 45% → 15% in 16 years Sources: EIA Electric Power Monthly 2025 · EIA Annual Energy Review · BusinessStats Research

Generation by State

US Electricity by State — Texas Leads, California Cleanest Large State

Texas is the United States' largest state electricity market, generating approximately **520–530 TWh annually** — approximately 12% of US total generation. Texas's electricity system operates on the ERCOT grid, which is almost entirely isolated from the rest of the US. Texas leads the US in both wind generation (approximately 25–27% of its electricity, approximately 40–45 GW of installed wind capacity) and in absolute terms is also the largest state solar market. Texas's electricity demand has grown steadily driven by population growth (fastest-growing major US state), industrial expansion (petrochemical and

manufacturing), and increasingly, data centres and cryptocurrency mining. The electricity sector's role in supporting Texas's broader industrial economy connects to the macro financial dynamics tracked through US equity market analysis, where energy sector stocks are major index components.

California is the second-largest state electricity market at approximately **280–300 TWh annually** and leads the US in electricity sector decarbonisation. California generates approximately 60–65% of its electricity from zero-carbon sources (approximately 30% renewables, approximately 15% large hydro, approximately 9% nuclear from Diablo Canyon, approximately 7% imports of clean energy from neighbouring states). California has the world's largest electricity storage deployment — approximately 10–12 GW of battery storage connected to the grid — and leads the US in rooftop solar, with approximately 12–15 GW installed on residential and commercial buildings. **Florida** (approximately 260 TWh) is the third-largest market, served primarily by natural gas (~76% of generation) with rapidly growing solar. **Pennsylvania** (~200 TWh) and **Illinois** (~190 TWh) are the fourth and fifth largest, both with significant nuclear generation through Exelon's large nuclear fleet.

Top 15 US States by Electricity Generation — 2025 (TWh)

The navy bar chart below shows the top 15 US states by annual electricity generation. Texas's dominant position — generating more than California and Florida combined — reflects both its enormous geographic size and its role as America's energy capital.

State RankingsTop 15 US States by Electricity Generation — 2025 (TWh)BusinessStats Research · EIA Electric Power Monthly · EIA Form EIA-923 ~525 TWhTexas — #1 Annual Generation (TWh) Texas = ~12% of all US electricity Sources: BusinessStats Research · EIA Electric Power Monthly 2025 · EIA Form EIA-923 State-Level Data

US States — Renewable Electricity Share (%)

The white animated bars below show the renewable electricity share (solar + wind + hydro + other renewables) for US states. Iowa's near-60% renewable share — driven almost entirely by wind — contrasts sharply with West Virginia's near-zero renewable generation from its historically coal-dominated system.

Renewable Share US States — Renewable Electricity Share 2025 (%) BusinessStats Research · EIA Electric Power Monthly · State Grid Operator Data 2025

Grid & Markets

US Power Grid — Three Interconnections, Nine ISOs, 600,000 Miles of Lines

The US power grid is one of the most complex engineered systems ever built — a vast network of approximately **600,000 miles of transmission lines**, approximately 70,000 substations, and approximately 5.5 million miles of local distribution lines delivering electricity to 160 million customers. The grid consists of three major interconnected systems: the **Eastern Interconnection** (covering the eastern two-thirds of the US and parts of Canada — the world's largest synchronously connected AC grid), the **Western Interconnection** (covering the western US, parts of Canada and Mexico), and the **ERCOT Interconnection** (covering approximately 90% of Texas, almost entirely isolated from both other interconnections). Within these interconnections, approximately 9 independent system operators (ISOs) and regional transmission organisations (RTOs) manage competitive wholesale electricity markets covering approximately 80% of US electricity load.

The **PJM Interconnection** — the largest ISO in the US and the world — operates the wholesale power market for 13 states from Illinois to New Jersey, serving approximately 65 million people. PJM manages approximately 180 GW of generating capacity and approximately $50–60 billion in annual wholesale electricity transactions. **ERCOT** in Texas manages approximately 135–140 GW of capacity for approximately 26–27 million customers, with a uniquely deregulated retail market where approximately 60% of residential customers can choose their electricity provider. ERCOT became a subject of national attention following the catastrophic failure during **Winter Storm Uri** in February 2021 — extreme cold caused approximately 4.5 million households to lose power for days, resulting in approximately 250 deaths and approximately $200 billion in economic damages. The post-Uri weatherisation requirements and grid reforms have improved cold-weather resilience significantly, though concerns about ERCOT's reserve margins in extreme heat remain. The AI-driven data centre boom is particularly relevant to grid planning — data centres could add 200–300 TWh of incremental US electricity demand by 2030, requiring urgent grid expansion investment. This connection between AI infrastructure and energy demand is explored in our AI market size analysis.

Grid infrastructure investment has become the critical bottleneck in the US energy transition. Interconnection queues — the pipeline of solar, wind, battery, and other projects waiting for grid connection approval — contain approximately **2,600 GW of capacity** as of early 2026 — more than double the entire currently installed US generation capacity. Average interconnection wait times have grown from approximately 2–3 years (2015) to approximately 5–7 years (2025), as grid operators struggle to assess and

approve the enormous backlog of new projects. The Federal Energy Regulatory Commission (FERC) Order 1920 (2024) — the most significant US transmission reform in two decades — is designed to accelerate long-range transmission planning and permitting, but implementation will take several years. The data centre investment surge is creating additional urgency, as large tech companies (Microsoft, Google, Amazon, Meta) are signing unprecedented electricity procurement agreements that require new transmission capacity in specific regions.

US electricity grid 2026: Three interconnections (Eastern, Western, ERCOT). Nine ISOs/RTOs covering 80% of load. 600,000 miles transmission lines. PJM world's largest ISO (~180 GW, 65M customers). ERCOT Texas ~135 GW — deregulated retail market. Interconnection queue: 2,600 GW waiting for grid connection — major clean energy deployment bottleneck. FERC Order 1920 (2024) to accelerate transmission planning. IRA driving $900B+ in US clean energy investment through 2032.

Prices by State

US Electricity Prices by State — $0.09 Louisiana to $0.42 Hawaii

US retail electricity prices vary more widely by state than virtually any other consumer good — a 4–5× range from the cheapest to the most expensive state. **Hawaii** has by far the highest residential electricity price at approximately **$0.38–0.44/kWh**, reflecting its heavy historical dependence on imported petroleum for electricity generation (oil still generates approximately 20% of Hawaii electricity) and its physical isolation from the continental grid that prevents importing cheaper electricity. **California** (~$0.26–0.30/kWh), **Massachusetts** (~$0.25–0.28/kWh), and **Connecticut** (~$0.24–0.27/kWh) have the next-highest residential rates, reflecting a combination of high distribution infrastructure costs, renewable energy surcharges, and capacity market costs.

The most affordable residential electricity is found in states with abundant low-cost generation resources. **Louisiana** (~$0.09–0.10/kWh) benefits from low-cost natural gas (proximity to Gulf Coast gas production), low state taxes, and regulated utility rates. **Oklahoma** and **Arkansas** (~$0.09–0.11/kWh) similarly benefit from abundant cheap gas and wind. **Washington state** (~$0.09–0.10/kWh) benefits from its dominant hydropower system — the Columbia River Basin's dams provide enormous amounts of carbon-free electricity at very low operating cost. The electricity price differential across states has significant economic consequences — high electricity prices are a competitiveness challenge for energy-intensive industries in the Northeast, while low prices in Texas and the Southeast have attracted data centres, semiconductor fabs, and battery gigafactories seeking affordable power. The relationship between energy

costs and industrial competitiveness connects to the patterns analysed in our data centre location statistics .

US Residential Electricity Prices by State — 2025 ($/kWh)

The white rank bars below show the US states with the highest residential electricity prices in 2025. Hawaii's extraordinary premium — more than 3× the national average — is immediately apparent, as is the Northeast cluster of high-price states.

US Electricity — Full State Data Table

The sortable table below provides comprehensive electricity data for major US states, including generation, renewable share, primary fuel, number of power plants, and residential electricity price. Click any column to sort.

US Electricity by State — Full Data 2025Click column to sort

STATE	GENERATION (TWH)	RENEWABLE %	PRIMARY FUEL	GRID	AVG PRICE ($/KWH)
Texas	~525	~32%	Nat. Gas + Wind	ERCOT	~$0.13
California	~290	~63%	Renewables	CAISO	~$0.28
Florida	~260	~8%	Natural Gas	PJM/Other	~$0.13
Pennsylvania	~200	~14%	Nuclear + Gas	PJM	~$0.15
Illinois	~190	~22%	Nuclear + Wind	PJM/MISO	~$0.13
Georgia	~150	~12%	Gas + Nuclear	PJM/SOCO	~$0.12
North Carolina	~140	~25%	Gas + Nuclear	PJM/SOCO	~$0.12
Ohio	~140	~10%	Nat. Gas + Coal	PJM	~$0.13
Indiana	~110	~18%	Coal + Wind	MISO	~$0.12
Washington	~110	~82%	Hydro	NWPP	~$0.10
Iowa	~85	~62%	Wind	MISO	~$0.11
Louisiana	~95	~7%	Natural Gas	MISO	~$0.09
New York	~135	~38%	Nuclear + Hydro	NYISO	~$0.21

West Virginia	~70	~4%	Coal	PJM	~$0.11
Hawaii	~12	~41%	Oil + Solar	Isolated	~$0.42

Key Insight Coal's Historic Collapse — From 45% to 15% in 16 Years

The decline of US coal power generation from approximately 1,960 TWh (45% of US electricity) in 2010 to approximately 660 TWh (15%) in 2025 represents one of the largest and fastest fuel switches in the history of any national energy system. Over 100 GW of coal capacity has been retired — enough to power France and Spain combined. The primary drivers were not government mandates (though EPA regulations played a role) but straightforward economics: low natural gas prices from shale production made coal uncompetitive on cost, while simultaneously, stricter pollution control requirements would have required multi-billion dollar investments in ageing plants. The result has been a approximately 40% reduction in US power sector CO emissions since 2005 — more than any other major economy in absolute terms — achieved primarily through market-driven coal-to-gas substitution rather than through renewable growth. The remaining US coal fleet is concentrated in the Midwest and Southeast, with most plants expected to retire by the mid-2030s.

Key Statistics

US Electricity — Key Statistics at a Glance

4,400 TWhAnnual US GenerationWorld's 2nd largest. 15% of global electricity. 1,250 GW installed capacity. 11,000+ power plants. $450–500BUS Electricity Market ValueWorld's largest by revenue. Retail sales to 160M customers. 3,300 utilities. 43%Natural Gas Share~1,890 TWh. Up from 24% in 2010. Shale revolution drove coal substitution. 19%Nuclear Share93 reactors. ~835 TWh. World's 2nd largest nuclear output. Vogtle 3&4 new in 2023-24. 25%Renewables Share 2026Wind 11%, Solar 6%, Hydro 6%, Other 2%. Up from ~10% in 2010. 15%Coal Share 2026~660 TWh. Down from 45% (2010). 100+ GW retired. Most to retire by mid-2030s. $0.14/kWhNational Avg Residential PriceRange: $0.09 (Louisiana) to $0.42 (Hawaii). 4.7× difference between cheapest and most expensive. ~525 TWhTexas — Largest State Market~12% of US total. ERCOT isolated grid. Wind 25-27% of Texas electricity. Fastest growing. $370BIRA Clean Energy IncentivesInflation Reduction Act (2022). Largest clean energy law in world history. 300-400 GW new renewables by 2030. 2,600 GWInterconnection Queue BacklogSolar, wind, battery projects waiting for grid connection. 2× entire installed US capacity. 5-7yr avg wait. 13,000 kWhPer Capita ConsumptionAmong world's highest. vs EU ~5,800 kWh. Japan ~7,900 kWh. China ~6,300 kWh. -40%Power Sector CO Since 2005Largest absolute reduction of any major economy. Primarily coal-to-gas shift + renewables growth.

Forecast 2030

US Electricity Forecast 2030 — 4,800–5,200 TWh, Renewables 40%, IRA Drives Build-Out

US electricity demand is projected to grow from approximately 4,400 TWh (2026) to approximately **4,800–5,200 TWh by 2030** — a CAGR of approximately 2–4% annually. This represents the first sustained period of meaningful US electricity demand growth since approximately 2007, when efficiency gains and manufacturing offshoring kept demand flat for over 15 years. The key demand drivers are: EV charging (approximately 100–150 TWh of incremental demand by 2030 as the US EV fleet grows from approximately 5 million to 30 million+ vehicles), data centres and AI infrastructure (approximately 200–300 TWh of incremental demand — Microsoft, Google, Amazon, and Meta alone have announced data centre investments exceeding $200 billion through 2030), semiconductor fabs (CHIPS Act-funded fab construction requires enormous electricity — each large fab uses 500–1,000 MW continuously), and heat pump adoption replacing gas heating.

On the supply side, the IRA is driving an extraordinary renewable deployment programme. BloombergNEF estimates approximately **900 billion in total clean energy investment** in the US through 2032 triggered by IRA incentives — approximately half from solar, approximately 25% from batteries and storage, and the remainder from wind, nuclear, and other clean technologies. Solar capacity is projected to grow from approximately 180–200 GW (2026) to approximately **500–600 GW by 2030**, making the US the world's second-largest solar market after China. Wind capacity is projected to reach approximately 200–230 GW by 2030, including approximately 20–30 GW of offshore wind (primarily in the Northeast and mid-Atlantic states). Battery storage is projected to grow from approximately 30–35 GW (2026) to approximately **100–150 GW by 2030** — critical for managing the intermittency of the expanding solar and wind fleet.

Coal's continued retirement is virtually certain — EIA projects essentially all remaining US coal capacity to retire by the mid-2030s under current economic and regulatory conditions. Natural gas capacity will likely remain significant as a backup to intermittent renewables, but gas generation as a percentage of the mix is projected to fall from approximately 43% (2026) toward approximately **30–35% by 2030** as renewables grow faster than demand. Nuclear's role is expected to remain stable or grow slightly — existing plants are receiving 80-year licence extensions, and SMR projects could add modest new capacity by the late 2020s to early 2030s. The US grid's ability to manage this enormous transition — doubling renewable capacity while retiring coal, maintaining reliability, and accommodating new demand categories — is the defining infrastructure challenge of the 2020s, with direct implications for the investment patterns tracked in our US

financial markets analysis.

US electricity forecast 2030: Demand grows to 4,800-5,200 TWh (+2-4%/yr). Renewables reach ~40% of generation. Solar capacity grows from 200 GW to 500-600 GW. Battery storage grows to 100-150 GW. EV charging adds 100-150 TWh new demand. Data centres add 200-300 TWh. Coal retires to near-zero by mid-2030s. IRA-triggered clean energy investment: ~$900B through 2032. US power sector CO falls 50-60% from 2005 levels by 2035. US Electricity Outlook US Electricity — 2030 Key Projections 4,800–5,200 TWhGeneration 2030 ~40%Renewables Share 2030 500–600 GWSolar Capacity 2030 100–150 GWBattery Storage 2030 $900BIRA Investment 2022-2032 -50-60%Power CO vs 2005 by 2035

FAQ

Frequently Asked Questions — US Electricity

The United States generates approximately **4,400 TWh annually** as of 2025-2026 — approximately 15% of global electricity, making it the world's second-largest producer after China (~9,000 TWh). The US system includes approximately **1,250 GW of installed capacity** from 11,000+ power plants operated by 3,300 electric utilities. US electricity generation has remained relatively flat since approximately 2007 (averaging 4,100–4,400 TWh), as efficiency improvements offset demand from electronics and data centres. This is now changing — demand is projected to grow 2–4% annually through 2030 driven by EVs, AI data centres, and industrial reshoring.

US electricity mix 2025-2026: **Natural gas ~43%** (~1,890 TWh), **Nuclear ~19%** (~835 TWh), **Wind ~11%** (~484 TWh), **Solar ~6%** (~264 TWh), **Hydro ~6%** (~264 TWh), **Coal ~15%** (~660 TWh), **Bioenergy/Geothermal ~2%**. Total renewables: approximately 25%. The mix has transformed dramatically since 2010 — coal fell from 45% to 15%, gas rose from 24% to 43%, and renewables doubled from ~10% to ~25%. Zero-carbon sources (nuclear + renewables) collectively provide approximately 44% of US electricity.

Texas generates the most electricity of any US state at approximately **525 TWh annually** — approximately 12% of US total. Texas operates the ERCOT grid (almost entirely isolated from the rest of the US) and leads the nation in both wind generation (25-27% of Texas electricity) and is also the largest state solar market. California is second (~290 TWh), followed by Florida (~260 TWh), Pennsylvania (~200 TWh), and Illinois (~190 TWh). Texas generates more electricity than the next two states (California + Florida) combined.

The US average residential electricity price is approximately **$0.14–0.16/kWh** as of 2025-2026. Prices vary enormously by state: **Highest** — Hawaii (~$0.42/kWh), California (~$0.28), Massachusetts (~$0.26),

Connecticut (~$0.25). **Lowest** — Louisiana (~$0.09), Washington state (~$0.10 — abundant hydro), Oklahoma (~$0.10), Arkansas (~$0.10). **Industrial rates** are approximately 20-35% lower than residential at approximately $0.07–0.09/kWh nationally. The 4.7× price range between the cheapest and most expensive state reflects differences in fuel costs, grid infrastructure, renewable energy levies, and state regulatory approaches.

Approximately **25% of US electricity** comes from renewables as of 2025-2026, up from approximately 10% in 2010. This includes wind (~11%, approximately 150-160 GW installed), solar (~6%, approximately 180-200 GW), conventional hydro (~6%), and bioenergy/geothermal (~2%). The IRA (2022) is projected to accelerate this to approximately **40% by 2030** by driving 300-400 GW of new renewable capacity. Iowa (~62% renewable from wind), Washington state (~82% from hydro), and California (~63% from all renewables including solar) lead US states in renewable share. West Virginia (~4%) and Kentucky (~5%) have the lowest renewable shares.

US coal generation has declined dramatically — from approximately **1,960 TWh (45% of US electricity) in 2010 to approximately 660 TWh (15%) in 2025** — a 66% decline in absolute generation. Over **100 GW of coal capacity** has been retired since 2010. The primary driver was economics — cheap shale gas made coal uncompetitive on cost, while EPA pollution regulations would have required expensive upgrades to aging plants. The coal-to-gas shift is the primary reason US power sector CO emissions fell approximately 40% from 2005 to 2025. Remaining US coal is concentrated in the Midwest (Indiana, Ohio, Kentucky) and Southeast, with most plants expected to retire by the mid-2030s.

The IRA (August 2022) is the largest clean energy investment law in world history — approximately **$370 billion in clean energy incentives** over 10 years. Key electricity provisions: Investment Tax Credit (ITC) for solar and storage (30-40% of project costs), Production Tax Credit (PTC) for wind (~$0.028/kWh for 10 years), clean electricity PTCs for all zero-carbon generation (including nuclear and geothermal), 10% domestic content bonus, and energy community bonuses. BloombergNEF estimates IRA will trigger approximately **$900 billion** in total clean energy investment through 2032, delivering 300-400 GW of new renewable capacity and reducing US power sector emissions by approximately **50-60%** from 2005 levels by 2035.

ERCOT (Electric Reliability Council of Texas) manages the Texas electricity grid — covering ~90% of Texas load and serving approximately **26-27 million customers** with approximately 135-140 GW of capacity. ERCOT is almost entirely isolated from the rest of the US grid (connected by only ~1,100 MW of DC ties). It operates a deregulated retail market where ~60% of residential customers can choose their provider.

ERCOT gained national attention during **Winter Storm Uri (February 2021)** — extreme cold caused ~4.5 million households to lose power, approximately 250 deaths, and approximately $200 billion in economic damage. Post-Uri weatherisation requirements significantly improved cold-weather resilience. ERCOT is the largest state electricity market in the US and a global leader in wind power deployment.

The US generates approximately **260-280 TWh from solar (~6% of US electricity)** annually. Solar capacity has grown from approximately 2 GW (2010) to approximately **180-200 GW (2026)** — a roughly 90-100× increase in 16 years. California leads by installed solar capacity, followed by Texas, Florida, Nevada, and Arizona. The US installs approximately 25-30 GW of new solar annually (2024-2025), with this pace expected to accelerate to 50-80 GW/year by 2027-2030 under IRA incentives. Solar is projected to grow from 6% to approximately 15% of US electricity by 2030, becoming the second-largest single electricity source after natural gas.

US electricity demand is projected to grow from approximately 4,400 TWh (2026) to approximately **4,800-5,200 TWh by 2030** — CAGR of approximately 2-4%, the first sustained demand growth since 2007. Key demand drivers: **EV charging** (~100-150 TWh new demand as US EV fleet grows to 30M+), **data centres/AI** (~200-300 TWh — tech giants investing $200B+ in new US data centres), **semiconductor fabs** (each large CHIPS Act fab uses 500-1,000 MW continuously), and **heat pumps** replacing gas heating. EIA Reference Case projects approximately 2-3% CAGR; higher scenarios possible if EV adoption and data centre build-out exceed current projections.

Largest US electric utilities by revenue: **Duke Energy** (Charlotte, NC, ~$28B revenue, 8.2M customers in Carolinas, FL, IN, OH, KY), **NextEra Energy** (Juno Beach, FL, ~$24B — parent of Florida Power & Light, world's largest renewable generator), **Southern Company** (Atlanta, ~$23B — Georgia, Alabama, Mississippi), **Exelon** (Chicago, ~$19B — largest US nuclear operator), **American Electric Power** (Columbus OH, ~$18B), **Dominion Energy** (Richmond VA, ~$17B). NextEra is the world's largest generator of renewable energy from wind and solar. The top 10 US utilities collectively serve approximately 60% of US retail electricity customers.

US grid reliability is lower than most comparable OECD countries. The average US customer experiences approximately **7-8 hours of outage per year (SAIDI)** — vs approximately 15-30 minutes in Japan, Germany, and the UK. The higher US outage rate reflects: (1) aging distribution infrastructure (much built in the 1950s-1970s, predominantly overhead lines exposed to weather), (2) increasingly frequent extreme weather events (hurricanes, ice storms, wildfires, heat waves) causing major disruptions, and (3) grid architecture with less redundancy than European systems. Winter Storm Uri (2021, ~$200B damage),

California wildfire outages, and hurricane-related outages are the most prominent examples. US grid investment is approximately $150-200B/year in T&D, but modernising a system serving 330 million people is a multi-decade challenge.

The US interconnection queue — the pipeline of electricity generation projects waiting for grid connection approval — contained approximately **2,600 GW of capacity** as of early 2026, primarily solar, wind, and battery storage projects. This is more than double the entire currently installed US generation capacity. Average interconnection wait times have grown from approximately 2-3 years (2015) to approximately **5-7 years (2025)**, as grid operators struggle to assess cumulative grid impact of the enormous project backlog. This is the single largest bottleneck to clean energy deployment in the US. **FERC Order 1920 (2024)** mandated significant reforms to transmission planning and cost allocation, but implementation will take several years. Without faster interconnection, IRA-funded projects cannot physically connect to the grid.

Data Sources & References

Primary: US Energy Information Administration — Electric Power Monthly & Annual Energy Review (electricity generation, capacity, prices by state and fuel)

Primary: EIA Annual Energy Outlook 2025 — US electricity demand and supply projections through 2050

Primary: FERC — US Electricity Market Data, ISO/RTO Performance Reports, and Grid Connection Queue Statistics

BusinessStats: All generation rankings, state-level data, electricity mix analysis, price comparisons, IRA impact estimates, and 2030 forecast projections are BusinessStats proprietary research combining the above primary sources with BloombergNEF US Clean Energy Outlook 2025, Wood Mackenzie US Power & Renewables Forecast, and North American Electric Reliability Corporation (NERC) reliability assessments.

Generation figures for calendar year 2024-2025 from EIA Form EIA-923. Installed capacity as of January 2025 from EIA Form EIA-860. Retail electricity prices from EIA Form EIA-861. State data represents approximate annual averages; actual figures vary month to month and are subject to EIA revision. Not investment advice. electricity United States statisticsUS electricity statistics 2026United States electricity generationUS electricity market 2026US electricity consumption statisticsUS electricity production by stateUS electricity mix 2026natural gas electricity USA percentagecoal electricity USA declinerenewable electricity USA 2026solar electricity USA statisticswind electricity USA statisticsnuclear electricity USA 19 percentUS electricity price by stateelectricity cost USA 2026US electricity per capitaUS power grid statisticsERCOT Texas electricity statisticsPJM electricity market statisticsUS electricity demand 2026US

electricity forecast 2030US electricity growth 2026EIA electricity statistics USAUS electricity infrastructure 2026Texas electricity statistics 2026California electricity statisticsFlorida electricity statisticsUS electricity export importUS electricity sector jobslargest US electric utilitiesUS electricity deregulationUS electricity market 2026 factsUS installed power capacity 1250 GWUS generation capacity by fuelcoal retirement USA statisticsnatural gas power USA 43 percentwind power USA 11 percentsolar power USA 6 percenthydropower USA 6 percentnuclear power USA 19 percentUS grid reliability statisticsblackout statistics USAUS electricity resilienceUS electricity investment IRAclean energy USA statisticsInflation Reduction Act electricityIRA 370 billion clean energyUS electricity net zero 2035us electricity 2030 forecastinterconnection queue 2600 GWFERC Order 1920 transmissionWinter Storm Uri ERCOT statisticsUS electricity 4400 TWhUS electricity 450 billion marketNextEra Duke Energy Southern CompanyHawaii electricity expensiveLouisiana electricity cheapIowa wind electricity 62 percentWashington state hydro electricityUS electricity EV demand 2030US electricity data centre demand

STATISTICS REPORT

Global Electricity Market — Statistics & Facts 2026

Updated Mar 31, 2026 · businesstats.com/global-electricity-market

$2.8T MARKET VALUE 2026	**29,000 TWh** ANNUAL GENERATION	**8.5 TW** INSTALLED CAPACITY
35% RENEWABLES SHARE	**685M** WITHOUT ACCESS	**$900B** ANNUAL INVESTMENT

Overview

$2.8 Trillion, 29,000 TWh — The World's Most Essential Market

Electricity is the world's most essential commodity — the invisible backbone of modern civilisation that powers everything from hospitals and data centres to electric vehicles and smartphones. The global electricity market, valued at approximately **$2.8 trillion annually**, is simultaneously one of the world's largest industries and one in the midst of its most fundamental transformation since Thomas Edison switched on the first commercial power station in New York in 1882. Approximately **29,000 terawatt-hours (TWh) of electricity** are generated globally each year from approximately **8.5 terawatts (TW) of installed capacity** — enough to power every home, factory, office, and data centre on Earth, yet still leaving approximately **685 million people** without any electricity access whatsoever.

The electricity sector is undergoing a structural revolution driven by four simultaneous forces. First, the **renewable energy cost collapse**: solar photovoltaic costs have fallen approximately 90% since 2010, making solar the cheapest new electricity source in most of the world and triggering a global build-out that is fundamentally reshaping the electricity mix. Second, **electrification of end-use sectors**: road transport (electric vehicles), heating (heat pumps), and industrial processes (electric furnaces, green hydrogen electrolysers) are all shifting from fossil fuel combustion to electricity consumption, driving demand growth at rates not seen for decades. Third, the **AI and data centre electricity boom**: the explosion of AI compute infrastructure is creating an unprecedented new category of electricity demand — data centres could consume approximately 1,000+ TWh globally by 2030, with direct implications for both electricity market

pricing and the urgency of clean power supply. These trends are directly connected to the AI market growth dynamics reshaping global technology investment.

Fourth, and running counter to the transition, is the sheer scale of continued **fossil fuel electricity generation** — coal still generates approximately 35-36% of global electricity and natural gas another 22%, together accounting for well over half of global generation. The tension between these two opposing forces — the renewable revolution and continued fossil fuel dependence — defines the global electricity market in 2026 and will determine whether the world achieves its climate commitments through 2030 and beyond. The role of fossil fuels in the current electricity mix is directly connected to the patterns analysed in our US fossil fuel consumption research, where the electricity sector is the largest single end-user of fossil energy.

Global electricity market 2026: $2.8 trillion industry, 29,000 TWh generated annually from 8.5 TW installed capacity. China leads at 9,000 TWh (31% of global). USA 4,400 TWh (15%). EU 2,700 TWh (9%). India 2,100 TWh (7%). Renewables: 35% of global electricity (solar 6%, wind 8%, hydro 15%). Coal still 35-36%. 685 million people lack access. Investment: $900 billion annually.

Generation by Country

Electricity Generation by Country — China's 31% Global Share

China is by far the world's largest electricity producer, generating approximately **9,000 TWh annually** — approximately 31% of all electricity generated globally. China's electricity system growth is staggering in historical context: from approximately 1,200 TWh in 2000 to 9,000 TWh by 2026, a 7.5× increase in just 26 years driven by the most rapid industrialisation and urbanisation in human history. China's electricity mix includes coal (approximately 55-58%), hydropower (~16%), wind (~9%), nuclear (~5%), solar (~6%), and gas/other sources. China also holds the world's largest installed capacity of solar PV, wind, and hydropower — an extraordinary achievement in renewable deployment that coexists with continued coal dependence. The scale of China's electricity system is directly relevant to understanding why China is simultaneously the world's largest carbon emitter and the world's largest investor in renewable energy.

The **United States** generates approximately **4,400 TWh annually** — approximately 15% of global electricity from the world's most valuable electricity market by revenue (~$450-500 billion in retail sales). The US electricity mix has transformed dramatically since 2010: coal has fallen from approximately 45% to approximately 15% of generation, while natural gas rose to approximately 43% and renewables grew from approximately 10% to approximately 25%. The US has the world's most liquid electricity market, with

competitive wholesale power markets covering approximately 80% of the national load through independent system operators (ISOs). **India** at approximately **2,100 TWh** (7%) is the world's third-largest electricity consumer and the most significant growth market — India's electricity demand is expected to roughly double by 2035 as its economy grows and hundreds of millions of rural households increase their consumption. The broader economic context of these national electricity markets relates to how the world's largest economies are decarbonising their energy systems.

The **European Union** collectively generates approximately **2,700 TWh annually** (9% of global), with a uniquely diverse mix across member states — France heavily nuclear, Germany and Spain transitioning rapidly to renewables, Poland still largely coal-dependent, and Scandinavia dominated by hydropower. The EU has made the most progress of any major economic region in reducing electricity sector carbon intensity — average EU electricity generation carbon intensity has fallen approximately 40% since 2005. **Russia** (approximately 1,100 TWh, 4%), **Japan** (~1,000 TWh, 3.5%), **South Korea** (~620 TWh, 2%), **Canada** (~680 TWh, 2.3%), and **Brazil** (~680 TWh, 2.3%) complete the major electricity economies. The nuclear component within these electricity systems is analysed in depth in our dedicated global nuclear energy statistics article.

Top 15 Countries by Electricity Generation — 2025 (TWh)

The navy bar chart below shows the world's top 15 electricity-producing countries. China's extraordinary lead — generating more than twice the US total and more than all of Europe combined — is the defining feature of global electricity geography.

Generation RankingsElectricity Generation by Country — 2025 (TWh)BusinessStats Research · IEA World Energy Statistics · BP Statistical Review 2025 9,000 TWh China — #1 Annual Generation (TWh) China = 31% of world electricity Sources: BusinessStats Research · IEA World Energy Statistics 2025 · BP Statistical Review · National Grid Operators

Global Electricity Mix

World Electricity Mix — Coal 35%, Gas 22%, Renewables 35%, Nuclear 10%

The global electricity mix in 2026 reflects the extraordinary tension between the renewable energy revolution and the continued dependence on fossil fuels — particularly coal — in major developing economies. **Coal** remains the single largest electricity source globally at approximately **35-36% of generation** (~10,200 TWh annually), despite years of coal retirement in Western markets. The reason:

China and India's coal generation in absolute terms has grown faster than Western coal retirements, keeping global coal electricity generation roughly flat despite dramatic declines in Europe and the United States. **Natural gas** is the second-largest source at approximately **22% of global electricity** (~6,400 TWh) — dominant in the US (43% of US electricity), Russia, Middle East, and growing in Southeast Asia.

Renewables collectively now account for approximately **35% of global electricity** — a milestone that represents a fundamental shift from the 22% share of 2015. Within this, **hydropower** contributes the largest renewable share at approximately **15% of global electricity** (~4,300 TWh) — dominated by China (Yangtze River mega-dams), Brazil (Itaipu, Belo Monte), Canada, and Norway. **Wind** contributes approximately **8% of global electricity** (~2,300 TWh) — growing rapidly in China, the US, UK, and Germany. **Solar PV** contributes approximately **6% of global electricity** (~1,700 TWh) — growing fastest of all sources, up from less than 1% in 2013. **Nuclear** contributes approximately **10%** (~2,600 TWh). The full nuclear picture — including the renaissance of reactor construction globally — is covered in our dedicated nuclear energy statistics analysis.

Global Electricity Mix — Sources Share 2026

The navy donut chart below shows the composition of global electricity generation by source in 2026. The approximate equality of coal (~35%) and all renewables combined (~35%) illustrates the current balance point of the energy transition — a moment of genuine inflection where the forces of change and incumbency are almost evenly matched in electricity generation terms.

Electricity Mix Global Electricity Generation by Source — 2026 BusinessStats Research · IEA World Energy Statistics 2025 · BP Statistical Review of World Energy 2025

Renewables Revolution

The Renewables Revolution — Solar +90% Cost Cut, Wind Overtakes Coal in Europe

The transformation of the global electricity mix since 2010 has been driven primarily by the extraordinary collapse in renewable energy costs — particularly solar PV, which has seen its utility-scale cost fall by approximately **90% since 2010**, from approximately $380/MWh to approximately $35-50/MWh in the sunniest locations. This cost revolution has made solar the **cheapest new electricity source in most of the world** — cheaper than new coal, new gas, and new nuclear in virtually every market. Wind has similarly fallen approximately 60-70% in cost since 2010. The result has been an extraordinary surge in deployment:

global solar installed capacity has grown from approximately 40 GW (2010) to approximately **2,500 GW (2026)**, while wind capacity has grown from approximately 200 GW to approximately **1,100 GW**.

Solar electricity generation has grown from approximately 130 TWh (2013) to approximately **1,700 TWh (2025)** — a 13× increase in 12 years, making solar the world's fastest-growing major energy source in history by percentage growth rate. China is the world's largest solar generator, having installed more solar capacity in the past five years than the rest of the world combined. The United States, Japan, India, Germany, Australia, Brazil, and Spain are also major solar markets. The connection between solar growth and the digital economy is direct and powerful — the same silicon supply chains that produce solar panels underpin the semiconductor industry, a relationship explored in our analysis of global data centre statistics.

Wind electricity has overtaken coal as the largest electricity source in the UK and Germany — a landmark that seemed impossible a decade ago. Offshore wind is the fastest-growing segment of wind power, with the UK, Denmark, China, and the Netherlands leading global deployment. The global offshore wind pipeline exceeds 1,000 GW in various stages of development. Battery storage — essential for managing the intermittency of solar and wind — has grown from approximately 10 GWh of installed capacity globally (2020) to approximately **100 GWh (2026)** and is projected to reach 500-700 GWh by 2030. The investment dynamics of the renewable energy build-out are directly relevant to broader global financial market allocation patterns, as clean energy has attracted over $500 billion in new capital annually in each of the past three years.

Global Renewable Electricity — Growth 2015 to 2026 (TWh)

The white line chart below tracks the explosive growth of solar and wind electricity generation from 2015 through 2026, illustrating the extraordinary pace of change that has made renewables collectively equal to coal in global electricity generation within just 11 years.

Renewables GrowthSolar & Wind Electricity Generation — 2015 to 2026 (TWh)BusinessStats Research · IRENA Renewable Statistics 2025 · IEA Electricity Statistics +1,570 TWhSolar Growth +1,700 TWhWind Growth

Solar fastest-growing source — +1,570 TWh since 2015 Sources: IRENA Renewable Capacity Statistics 2025 · IEA Electricity Statistics · BusinessStats Research

Access & Prices

Electricity Access & Prices — 685M Without Power, Germany Pays 4× India

Despite extraordinary global economic and technological progress, approximately **685-700 million people** — predominantly in Sub-Saharan Africa — still lack access to electricity as of 2026. This figure has fallen from approximately 1.2 billion in 2010, primarily through electrification programmes in South and Southeast Asia (India connected approximately 500 million people to the grid between 2010 and 2019 through its Saubhagya programme). But Sub-Saharan Africa has proven far more resistant to universal electrification — approximately **600 million Africans remain without electricity**, representing approximately 43% of the continent's population, despite decades of development spending and energy programmes. The countries with the highest numbers of people without electricity access are concentrated in the DRC, Nigeria, Ethiopia, Tanzania, and Uganda — countries where population growth has outpaced grid extension in many rural areas.

Retail electricity prices vary enormously across countries — a reflection of generation costs, fuel subsidies, grid infrastructure investment, taxes, and renewable energy policy levies. **Germany** has the world's highest residential electricity prices at approximately **€0.30-0.35/kWh** ($0.33-0.38/kWh) — reflecting high renewable energy levies (Erneuerbare-Energien-Gesetz surcharges), grid fees, and taxes that together account for approximately 55-60% of the electricity bill. **Denmark, Belgium, and the UK** also rank among the world's most expensive electricity markets for households. The **United States** averages approximately $0.12-0.16/kWh residential — relatively affordable by OECD standards, with significant state-level variation. **China** averages approximately $0.08-0.10/kWh residential, while **India** averages approximately $0.07-0.09/kWh. The most heavily subsidised markets — Qatar (~$0.03/kWh), Iran (~$0.01-0.02/kWh), and Libya — have effectively zero retail electricity prices, with the full cost borne by the state.

The electricity price divergence between countries has significant economic consequences — high electricity prices are a major competitive challenge for European industrial electricity consumers (chemical companies, aluminium smelters, data centres), who face electricity costs 3-5× higher than their US or Chinese competitors. This cost differential was a major driver of the political pressure for the EU's Energy Emergency interventions in 2022-2023 following the Russia-Ukraine war's impact on European gas prices. The interaction between electricity price competitiveness and industrial economic performance connects to the cost challenges explored in our analysis of the global chemical industry, where electricity is a critical production input.

Global Electricity Price by Country — Residential Rate 2025 ($/kWh)

The white rank bars below compare residential electricity prices across key countries, illustrating the extraordinary range — from near-zero in subsidised Gulf and MENA markets to above $0.30/kWh in Germany and Denmark.

Global Electricity by Country — Full Data Table

The sortable table below provides comprehensive electricity data for the world's major electricity markets, including generation, capacity, renewable share, per-capita consumption, and retail electricity price. Click any column to sort.

Global Electricity Market — Full Country Data 2025Click column to sort

COUNTRY	GENERATION (TWH)	GLOBAL SHARE	RENEWABLE %	PER CAPITA (KWH)	RETAIL PRICE
China	~9,000	~31%	~36%	~6,300	$0.08-0.10
United States	~4,400	~15%	~25%	~13,000	$0.12-0.16
India	~2,100	~7%	~22%	~1,400	$0.07-0.09
European Union	~2,700	~9%	~48%	~5,800	$0.25-0.35
Russia	~1,100	~4%	~21%	~7,600	$0.05-0.07
Japan	~1,000	~3.5%	~24%	~7,900	$0.22-0.28
Canada	~680	~2.3%	~69%	~17,000	$0.10-0.13
Brazil	~680	~2.3%	~83%	~3,100	$0.12-0.16
South Korea	~620	~2.1%	~10%	~12,000	$0.10-0.13
Germany	~500	~1.7%	~62%	~6,000	$0.30-0.35
Saudi Arabia	~430	~1.5%	~3%	~11,000	$0.04-0.06
France	~490	~1.7%	~28%	~7,400	$0.20-0.25
Australia	~280	~1.0%	~38%	~10,500	$0.22-0.28
Indonesia	~320	~1.1%	~15%	~1,100	$0.09-0.11
Mexico	~330	~1.1%	~26%	~2,400	$0.09-0.13

Key Insight The AI Electricity Shock — Data Centres Could Use 1,000+ TWh by 2030

The explosion of AI infrastructure is creating an electricity demand shock that few grid planners anticipated. Data centres globally consumed approximately 250-300 TWh in 2022; by 2030, BloombergNEF and the IEA project this could reach 1,000-1,500 TWh annually — equivalent to adding Japan's entire electricity consumption as a new demand category. Each large AI training cluster (100,000+ GPUs) requires 50-200+ MW of continuous power — the equivalent of a small city. Microsoft, Google, Amazon, and Meta are collectively committing to build tens of GW of new data centre capacity, driving urgent demand for 24/7 carbon-free electricity. This is a key driver of renewed interest in nuclear power (including SMRs and the restart of Three Mile Island), and is a defining new variable in electricity market modelling that connects the technology sector tracked in our data centre statistics analysis directly to physical energy infrastructure planning.

Key Statistics

Global Electricity Market — Key Statistics at a Glance

$2.8TGlobal Electricity Market ValueIncluding generation, transmission, distribution, retail. Largest single industry by infrastructure value. 29,000 TWhAnnual Global GenerationFrom 8.5 TW installed capacity. Growing ~3-4% annually. 190+ countries. 9,000 TWhChina — World #131% of global electricity. 7.5× growth since 2000. World's largest solar, wind, hydro capacity. 35%Renewables Share 2026Up from 22% in 2015. Solar 6%, Wind 8%, Hydro 15%, Bioenergy 3%, Other 3%. 35-36%Coal Share (Still #1 Source)~10,200 TWh. Falling in West, resilient in Asia. Coal = renewables in global share. -90%Solar Cost Decline Since 2010From ~$380/MWh to ~$35-50/MWh. Now cheapest new electricity source globally. 685MWithout Electricity AccessDown from 1.2B in 2010. ~600M in Sub-Saharan Africa. UN SDG7 target at risk. $900BAnnual Sector InvestmentSolar $380-400B. Grids $300B+. Wind $180B. Storage $60-80B. Clean 4:1 vs fossil. $0.35/kWhGermany — Most ExpensiveWorld's highest residential electricity price. vs $0.01/kWh in Iran. 35× price range globally. 83%Brazil — Highest Renewable ShareDominated by hydropower (Itaipu, Belo Monte). Wind and solar growing rapidly. 2,500 GWGlobal Solar Installed CapacityUp from 40 GW (2010). China leads. Now world's largest electricity capacity by source. 1,000+ TWhAI Data Centre Demand 2030EFrom ~280 TWh (2022). Largest new demand category. Driving nuclear PPA surge.

Forecast 2030

Global Electricity Market Forecast 2030 — $3.5T, Renewables 45%, EVs Drive Demand

The global electricity market is projected to grow from approximately $2.8 trillion (2026) to approximately **$3.5-4.0 trillion by 2030**, driven by demand growth, renewable build-out, and grid modernisation investment. Global electricity generation is projected to reach approximately **33,000-36,000 TWh by 2030** — representing approximately 3-5% annual growth driven by electrification of transport, heating, and industry. The most significant driver is the rapid growth of electric vehicles: approximately 300-400 million EVs on the road globally by 2030 will add approximately **400-600 TWh of additional electricity demand** — equivalent to adding France's entire electricity consumption as a new demand category.

The electricity mix will continue shifting rapidly toward renewables. **Solar** is projected to become the world's largest installed capacity source by a wide margin by 2030 — solar already crossed this threshold in 2024 by installed capacity, and solar generation will approach 12-15% of global electricity by 2030 (from 6% today), growing at approximately 20% annually. **Wind** is projected to reach approximately 12% of global electricity (from 8% today). Together, solar and wind generation could exceed coal generation globally for the first time in the early 2030s — a landmark that once seemed decades away. The IEA projects that in its Net Zero scenario, **renewables supply approximately 60% of global electricity by 2030** — requiring extraordinary acceleration from today's 35%. Tracking these investment flows within the broader context of global financial markets is essential for understanding where capital is being allocated in the 2020s.

The challenges are equally significant. **Grid infrastructure** — the transmission and distribution networks that deliver electricity from wherever it is generated to wherever it is consumed — is the critical bottleneck in the global energy transition. The IEA estimates that global grid investment must increase from approximately $300 billion annually (2025) to approximately **$600 billion annually by 2030** to absorb the renewable electricity being built. Grid interconnection queues in the US, UK, and Germany contain hundreds of gigawatts of solar and wind projects waiting years for grid connection approval. Without grid infrastructure keeping pace with generation, renewable deployment will be throttled. The interaction between grid investment patterns and broader infrastructure capital allocation connects to the industrial investment trends tracked in our global chemical industry analysis, where grid-connected industrial electrification is a key growth vector.

Global electricity forecast 2030: Market grows to $3.5-4.0T. Generation reaches 33,000-36,000 TWh (+3-5%/yr). Renewables reach 45-60% of global electricity. Solar approaches 15% of global generation. EVs

add 400-600 TWh new demand. AI data centres add 1,000+ TWh. Grid investment must double to $600B/yr to avoid bottleneck. China installs 6-8 reactors/yr. 33,000-36,000 TWh total generation by 2030. Market Outlook Global Electricity Market — 2030 Key Projections $3.5-4.0TMarket Value 2030 33-36K TWhGeneration 2030 45-60%Renewables Share 2030 +600 TWhEV New Demand 2030 $600BGrid Investment Needed/yr 2,500 GWSolar Capacity Now Installed

FAQ

Frequently Asked Questions — Global Electricity Market

The global electricity market is valued at approximately **$2.8 trillion annually** as of 2026, encompassing generation, transmission, distribution, and retail sales across 190+ countries. This includes approximately $1.2 trillion in retail electricity sales, approximately $900 billion in capital investment in new capacity and grids annually, and approximately $700 billion in fuel and operating costs. Total generation is approximately **29,000 TWh annually** from approximately 8.5 TW of installed capacity. The electricity sector directly employs approximately 25-30 million people globally and underpins the entire global economy.

China is the world's largest electricity producer at approximately **9,000 TWh annually** — approximately 31% of global electricity. China's system grew 7.5× from 2000 to 2026, driven by industrialisation and urbanisation. The US is second at approximately **4,400 TWh** (15% of global), followed by the EU collectively (~2,700 TWh, 9%), India (~2,100 TWh, 7%), Russia (~1,100 TWh, 4%), and Japan (~1,000 TWh, 3.5%). The top 5 countries/regions generate approximately 65% of all global electricity.

Approximately **35% of global electricity** comes from renewables as of 2026 — up from 22% in 2015 and 27% in 2020. This includes hydropower (~15%), wind (~8%), solar (~6%), bioenergy (~3%), and other renewables (~3%). **Coal** remains the world's largest single source at approximately 35-36%. Solar is the world's fastest-growing electricity source, growing approximately 20-25% annually. Renewables share is projected to reach approximately **45-60% by 2030** depending on scenario. The EU leads major economies with approximately 48% renewable electricity.

Global electricity demand is projected to grow from approximately 29,000 TWh (2026) to approximately **33,000-36,000 TWh by 2030** — a CAGR of approximately 3-5%. Key demand drivers: EV charging (~400-600 TWh new demand by 2030), heat pumps (rapid growth in Europe and Asia), AI data centres (~1,000+ TWh by 2030), and industrial electrification (electric furnaces, green hydrogen). Most incremental demand growth will come from China, India, and Southeast Asia. IEA Net Zero scenario requires electricity demand to grow even faster — reaching approximately 38,000-40,000 TWh by 2030 as electrification

accelerates across all sectors.

Residential electricity prices range globally from near-zero in subsidised markets to above $0.35/kWh in high-cost OECD countries: **Germany** ~$0.30-0.35/kWh (world's highest major economy), **Denmark/Belgium** ~$0.25-0.35/kWh, **UK/Japan/Australia** ~$0.22-0.28/kWh, **USA** ~$0.12-0.16/kWh, **Brazil** ~$0.12-0.16/kWh, **China** ~$0.08-0.10/kWh, **India** ~$0.07-0.09/kWh, **Russia** ~$0.05-0.07/kWh, **Saudi Arabia** ~$0.04-0.06/kWh, **Iran** ~$0.01-0.02/kWh. Industrial rates are typically 20-40% lower than residential. The approximately **35× price range** between the most and least expensive markets reflects fuel costs, subsidies, taxes, and grid investment levels.

China generates approximately **9,000 TWh annually** — approximately 31% of all global electricity. China's electricity system grew from approximately 1,200 TWh (2000) to 9,000 TWh (2026) — a 7.5× increase. China's electricity mix: coal (~55-58%), hydro (~16%), wind (~9%), solar (~6%), nuclear (~5%), gas/other (~6%). China has the world's largest installed capacity of solar PV, wind power, and hydropower simultaneously. China also has the world's largest nuclear construction programme. Despite its massive renewable build, China's absolute coal electricity generation has also grown, as total demand growth is so large that new renewables don't replace coal — they serve incremental demand on top of it.

Approximately **685-700 million people** lack electricity access as of 2026 — down from approximately 1.2 billion in 2010. Nearly all progress has been in Asia (particularly India's Saubhagya programme connecting ~500M people). Sub-Saharan Africa still has approximately **600 million people without electricity** — ~43% of Africa's population. Highest concentrations of people without electricity: DRC (~80M), Nigeria (~85M), Ethiopia (~60M), Tanzania (~35M). The UN SDG7 target of universal electricity access by 2030 now appears very unlikely without significant acceleration. Off-grid solar systems (solar home systems, mini-grids) are increasingly seen as the most practical solution for remote rural populations in Africa.

Coal remains the world's largest single electricity source at approximately **35-36% of global generation** (~10,200 TWh annually). Despite coal retirement in Western markets, China and India's coal generation has grown faster than Western retirements. Natural gas is second at approximately 22% (~6,400 TWh). Hydropower is third at approximately 15% (~4,300 TWh). Nuclear is fourth at approximately 10% (~2,600 TWh). Wind is fifth at approximately 8% (~2,300 TWh). Solar is sixth at approximately 6% (~1,700 TWh) — but growing fastest. By **installed capacity**, solar PV has already overtaken all other sources globally (2024), with approximately 2,500 GW installed — reflecting solar's lower capacity factor (~12-18%) versus coal (~55-70%).

Solar electricity is the world's fastest-growing major energy source, growing approximately **20-25% annually** in generation and 25-30% in installed capacity. Global solar generation grew from approximately 130 TWh (2013) to approximately **1,700 TWh (2025)** — a 13× increase in 12 years. Solar's share of global electricity has risen from less than 1% (2013) to approximately 6% (2025) and is projected to reach 10-15% by 2030. **Solar cost** has fallen approximately 90% since 2010 — from ~$380/MWh to ~$35-50/MWh — making it the cheapest new electricity source globally. China is the world's largest solar generator and solar panel manufacturer.

Global electricity sector investment totals approximately **$800-900 billion annually** as of 2026. Breakdown: solar power (~$380-400B — single largest category), electricity grids (~$300B), wind power (~$180-200B), battery storage (~$60-80B), nuclear (~$40-50B), and gas power (~$60-70B). **Clean electricity investment exceeds fossil fuel generation investment 4:1**. China accounts for approximately 40-45% of global clean electricity investment. The IEA estimates that achieving net-zero emissions by 2050 requires total electricity investment to rise to approximately **$1.5-2 trillion annually by 2030** — roughly double current levels, with grid infrastructure doubling the most urgently needed component.

Largest electricity companies globally by revenue: **State Grid Corporation of China** (~$500B revenue — world's largest utility, operating China's national grid, Fortune Global 500 top 5), **China Southern Power Grid** (~$120B), **EDF** France (~$100B), **E.ON** Germany (~$90B), **Enel** Italy (~$88B), **Iberdrola** Spain (~$45B — world's largest renewable energy company), **Duke Energy** USA (~$28B), **NextEra Energy** USA (~$24B — world's largest renewable energy generator). Most large electricity utilities have pivoted heavily toward renewable investment, with Enel, Iberdrola, and NextEra among the most active clean energy investors globally.

The global electricity market is projected to reach approximately **$3.5-4.0 trillion by 2030**. Key projections: renewables share rises from 35% to approximately 45-60%. Solar becomes the world's largest generation source by 2030s. Coal falls in Europe and North America but stays significant in Asia. EV charging adds ~400-600 TWh new demand. Battery storage grows from ~100 GWh (2025) to 500-700 GWh. AI/data centre demand reaches 1,000+ TWh. Grid investment must double to ~$600B/yr. At COP28, 130+ countries pledged to triple renewable capacity by 2030 — a goal that, if met, would deliver approximately **11,000 GW of renewable capacity** globally by 2030, up from approximately 3,700 GW in 2023.

Data Sources & References

Primary: IEA World Energy Statistics & Balances — Global electricity generation, capacity, and consumption data 2025

Primary: IRENA — Renewable Capacity Statistics 2025 & World Energy Transitions Outlook

Primary: BP Statistical Review of World Energy 2025 — Electricity generation by fuel and country

BusinessStats: All country rankings, market value estimates, electricity mix analysis, price comparisons, access statistics, and 2030 forecast projections are BusinessStats proprietary research combining the above primary sources with BloombergNEF New Energy Outlook 2025, World Bank energy access data, Lazard LCOE Analysis, and national grid operator data.

Generation figures for calendar year 2024-2025. Market value estimates include generation, transmission, distribution, and retail segments. Renewable share percentages may differ slightly between sources due to different methodologies for accounting for hydro and bioenergy. All 2030 projections are scenario-based estimates, not guarantees. Not investment advice.

global electricity market statisticsworld electricity market 2026global electricity generation statisticselectricity market size worldwideelectricity production by country 2026global power generation statisticsworld electricity consumption 2026electricity market growth raterenewable electricity share globalsolar electricity generation worldwidewind electricity generation worldwidecoal electricity generation worldwidenatural gas electricity generationnuclear electricity generation worldwidehydropower electricity generationelectricity market forecast 2030global electricity demand 2030global electricity investment 2026smart grid statisticselectricity access worldwide 2026energy transition electricity statisticselectricity price by country 2026electricity cost worldwideChina electricity generation 2026USA electricity generation statisticsIndia electricity generation 2026EU electricity market statisticselectricity market value 2026electricity per capita worldwidebattery storage electricity statisticsgrid electricity statisticspower sector statistics 2026electricity sector decarbonizationnet zero electricity statisticsgreen electricity statistics 2026wholesale electricity priceretail electricity price worldwidedistributed generation statisticsrooftop solar electricityelectricity storage statistics 2026data centre electricity demandAI electricity demand 2030EV electricity demand 203029000 TWh global electricity2.8 trillion electricity market8.5 TW installed capacitysolar 90 percent cost reductionsolar 2500 GW installedwind 1100 GW installed685 million without electricitysub-saharan africa electricity accessGermany electricity price expensivesolar fastest growing energycoal 35 percent electricityelectricity 35 percent renewablesState Grid China largest utilityNextEra largest renewable companyIberdrola clean energyIEA net zero electricityelectricity market 2030 forecastglobal electricity CAGR 3 percentelectricity grid investment

neededoffshore wind electricity statistics

STATISTICS REPORT

Household Electricity and Gas Prices in the EU, First Half of 2026

EU households paid an average of 0.2832 euro per kWh for electricity in the first half of 2026, according to Eurostat, with Ireland the most expensive member state at 0.3871 euro and Hungary the cheapest at 0.1139 euro. This report sets out the official figures released on 30 October 2026: prices in euro and in purchasing power standards, the change on a year, the share of taxes, business electricity and household gas, plus euro area energy inflation through September 2026.

Updated Nov 2, 2026 · businesstats.com/energy-prices-in-the-eu

€0.2832 EU HOUSEHOLD POWER, H1 2026	€0.3871 IRELAND, HIGHEST	€0.1139 HUNGARY, LOWEST
28.4% TAXES AND LEVIES SHARE	€0.1103 EU HOUSEHOLD GAS, H1 2026	18.9% ENERGY INFLATION, SEP 2026

QUICK ANSWER

EU households paid an average of 0.2832 euro per kWh for electricity in the first half of 2026

Electricity prices in Europe eased slightly in 2026 but stayed far above their pre-2022 level. According to Eurostat, which published its data for the first half of 2026 on 30 October 2026, **the average household electricity price in the European Union was 0.2832 euro per kWh including all taxes and levies**, down 2.2 percent from 0.2896 euro in the second half of 2025. The figure covers a medium-size household using between 2,500 and 4,999 kWh a year and is a weighted average of the 27 member states.

The gap between countries is wide. **Ireland had the most expensive household electricity in the EU at 0.3871 euro per kWh**, 37 percent above the EU average, followed by Germany at 0.3618 euro and Belgium at 0.3575 euro. Hungary had the cheapest at 0.1139 euro, followed by Malta at 0.1268 euro and Bulgaria at 0.1341 euro. An Irish household therefore paid 3.4 times as much per kWh as a Hungarian one. Household

gas was cheaper and falling faster: the EU average was 0.1103 euro per kWh, the lowest since the first half of 2022.

€0.2832

EU household electricity, per kWh

First half of 2026, all taxes included.

€0.3871

Ireland, highest in the EU

37 percent above the EU average.

28.4%

Taxes and levies in the bill

EU average, including 15.1 percent VAT.

18.9%

Euro area energy inflation

September 2026, up from minus 0.4 percent a year earlier.

These semester prices end in June 2026, so they capture only the start of the energy shock linked to the Middle East conflict. Monthly consumer price data tell the rest of the story. Euro area energy inflation, which was negative at minus 4.0 percent in January 2026, reached 18.9 percent in September 2026, and the European Central Bank said on 29 October 2026 that energy prices had continued to rise. This report covers the official Eurostat price data for households and businesses in the EU. For a comparison of electricity tariffs across the whole world see our report on global electricity prices, and for American power and gas bills see energy prices in the US.

HIGHEST AND LOWEST

Ireland, Germany and Belgium pay the most; Hungary, Malta and Bulgaria pay the least

Eurostat ranks member states by the price a typical household pays per kWh, converted into euro. In the first half of 2026 the three most expensive countries were in north-western Europe and the three cheapest were in central Europe and the Mediterranean. Ireland moved to the top after its prices rose 19.8 percent in national currency over the year. Germany, which led the ranking in the first half of 2025 at 38 euro per 100 kWh according to the Eurostat Energy in Europe 2026 edition, fell to second place at 0.3618 euro per kWh.

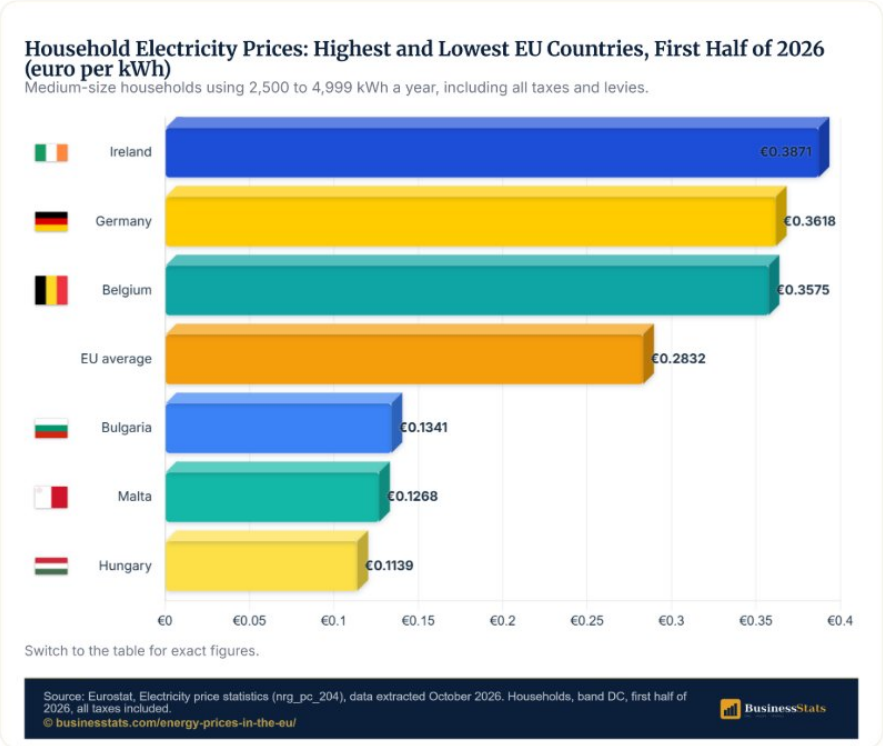


Figure 1: Household Electricity Prices: Highest and Lowest EU Countries, First Half of 2026 (euro per kWh)

3.4 times apart: an Irish household paid 0.3871 euro per kWh, against 0.1139 euro in Hungary.

At the bottom, Hungary had the cheapest power in the EU for yet another semester. Hungary, Malta and Bulgaria all paid less than half the EU average price. Taxes play a part: in Malta VAT made up just 4.7 percent of the final price, the lowest share in the EU, against 21.2 percent in Hungary. Low euro prices in these countries do not always mean low bills relative to income, which is why Eurostat also publishes prices in purchasing power standards, covered in the next section.

To put the per kWh figures in household terms, the table below multiplies each price by 3,500 kWh, a level of use inside the consumption band Eurostat uses for its headline figure. These are BusinessStats calculations for illustration, not bills reported by Eurostat, and actual bills depend on the tariff, the standing charge structure and the exact amount of electricity used.

COUNTRY	PRICE PER KWH (EURO)	COST OF 3,500 KWH (EURO)	VERSUS EU AVERAGE
Ireland	0.3871	1,355	+36.7%
Germany	0.3618	1,266	+27.8%
Belgium	0.3575	1,251	+26.2%
EU average	0.2832	991	n/a

Bulgaria	0.1341	469	-52.6%
Malta	0.1268	444	-55.2%
Hungary	0.1139	399	-59.8%

Source: Eurostat, Electricity price statistics, data extracted October 2026 (dataset nrg_pc_204), first half of 2026, band DC. Annual amounts are BusinessStats calculations: price per kWh multiplied by 3,500 kWh.

What the ranking shows

- Ireland, Germany and Belgium were the three member states Eurostat named as most expensive in the first half of 2026, each above 0.35 euro per kWh.
- Hungary at 0.1139 euro was 70.6 percent cheaper than Ireland and 59.8 percent below the EU average.
- The EU average of 0.2832 euro sits much closer to the expensive end of the range because large, high-price countries such as Germany carry heavy weight in the consumption-weighted average.

PURCHASING POWER

Adjusted for living costs, Romania, Poland and Czechia have the most expensive power

Euro prices ignore differences in income and in the general price level. Eurostat corrects for this by expressing prices in purchasing power standards (PPS), an artificial currency that buys the same basket of goods in every country. On this basis the ranking turns upside down. **Romania had the highest household electricity price in the EU at 46.9 PPS per 100 kWh**, followed by Poland at 41.1 PPS and Czechia at 34.3 PPS. Malta at 13.8 PPS, Hungary at 14.7 PPS and Luxembourg at 15.5 PPS were the cheapest.

Household Electricity Prices in Purchasing Power Standards, First Half of 2026 (PPS per 100 kWh)

Interactive chart online: businesstats.com/energy-prices-in-the-eu

The ranking flips: once living costs are taken into account, Romania, Poland and Czechia have the most expensive household electricity in the EU.

Romania is the clearest example of how the two measures differ. In euro its price is not among the highest, but its household prices rose 51.9 percent in a year after the support measures for household and business electricity invoices ended, and incomes and general prices are lower than the EU average, so electricity takes a bigger bite out of household budgets. Luxembourg shows the opposite effect: it has relatively high incomes and price levels, so a mid-ranking euro price becomes one of the lowest in PPS. For the income side of this comparison, see our ranking of GDP per capita by country.

CHANGE ON A YEAR

Prices rose in 13 member states and fell in 11 between mid 2025 and mid 2026

Eurostat compares each semester with the same semester a year earlier, using national currencies so that exchange rate swings do not distort the result. Between the first half of 2025 and the first half of 2026, household electricity prices increased in 13 EU countries, decreased in 11 and remained broadly stable in 3. The changes were large in both directions.

Largest Changes in Household Electricity Prices, First Half of 2026 vs First Half of 2025 (%)

Interactive chart online: businesstats.com/energy-prices-in-the-eu

Both directions: Romanian prices rose by about half after support measures ended, while Danish prices fell by almost a third.

Romania recorded the largest increase at 51.9 percent, followed by Ireland at 19.8 percent and Finland at 18.4 percent. Romanian national notes to the Eurostat article state that support measures for household and non-household electricity invoices were no longer in place in the first half of 2026. The largest decreases were in Denmark at minus 31.7 percent, Luxembourg at minus 24.1 percent and Czechia at minus 11.8 percent. Denmark, which was the third most expensive country a year earlier at 35 euro per 100 kWh, dropped out of the top three as a result.

At EU level the movement was small. The EU average fell 2.2 percent from the second half of 2025, and it was 2.9 percent below its peak of 0.2916 euro per kWh in the first half of 2024. The table compares the extremes Eurostat reported for the first half of 2025 with the latest semester.

POSITION	FIRST HALF OF 2025 (EURO PER 100 KWH)	FIRST HALF OF 2026 (EURO PER KWH)

Highest	Germany 38	Ireland 0.3871
Second highest	Belgium 36	Germany 0.3618
Third highest	Denmark 35	Belgium 0.3575
Lowest	Hungary 10	Hungary 0.1139
Second lowest	Malta 12	Malta 0.1268
Third lowest	Bulgaria 13	Bulgaria 0.1341
EU average	n/a	0.2832

Source: Eurostat, Energy in Europe 2026 edition (first half of 2025, rounded to whole euro per 100 kWh) and Electricity price statistics, data extracted October 2026 (first half of 2026). Denmark was not among the extremes named for the first half of 2026.

EU AVERAGE OVER TIME

Prices have stabilised since 2023, but at a level well above the 2008 to 2021 range

Eurostat describes three phases in the EU average household price. Between 2008 and 2021 prices excluding taxes generally moved between 0.10 and 0.15 euro per kWh and prices including taxes mostly between 0.15 and 0.23 euro. In 2022 and early 2023 prices rose sharply, especially the part excluding taxes, which covers energy, supply and network costs. That component peaked at 0.2385 euro per kWh in the first half of 2023.

Since then prices have stabilised but have not returned to the old range. Prices excluding taxes have stayed between 0.20 and 0.24 euro per kWh and fell to 0.2027 euro in the first half of 2026, 15.0 percent below the 2023 peak. Prices including taxes have stayed between 0.25 and 0.30 euro, with a peak of 0.2916 euro in the first half of 2024. The total has fallen less than the underlying cost because governments have been phasing out the tax cuts they introduced during the crisis.

EU Average Energy Prices, Second Half of 2025 vs First Half of 2026 (euro per kWh)

Interactive chart online: businesstats.com/energy-prices-in-the-eu

All four averages fell: household gas dropped 10.2 percent on the half year, household electricity 2.2 percent and business electricity 2.0 percent.

The chart shows the latest move for the four EU averages covered on this page. All four fell between the second half of 2025 and the first half of 2026. Household gas fell the most, by 10.2 percent, while the household electricity price including taxes slipped 2.2 percent. Business electricity fell 2.0 percent on the half year and 5.4 percent on the year. The European picture of generation and demand behind these prices is covered in our report on electricity in Europe.

TAXES AND LEVIES

Taxes and levies make up 28.4 percent of the average EU electricity bill

At EU level, taxes and levies accounted for **28.4 percent of the household electricity price in the first half of 2026**, down 0.5 percentage points from 28.9 percent in the second half of 2025. VAT alone was 15.1 percent of the total price. The remaining 71.6 percent covered energy, supply and network costs. This tax share is much lower than before the crisis: Eurostat reports that it fell from 41.0 percent in the second half of 2019 as governments cut energy taxes, then rose again from 2023 as relief measures were phased out.

What Makes Up the EU Household Electricity Price, First Half of 2026 (%)

Interactive chart online: businesstats.com/energy-prices-in-the-eu

Close to three quarters is cost: energy, supply and network made up 71.6 percent of the average bill; VAT and other taxes the rest.

National tax policy explains much of the gap between countries. Poland had the highest share of taxes and levies at 46.9 percent of the household price, followed by Germany at 34.0 percent. At the other end, Malta had a share of 5.9 percent and the Netherlands had a negative share of minus 9.9 percent, because its energy tax reduction, which remained in place in the first half of 2026, outweighed the taxes charged. A negative share means that allowances and credits returned more to households than the taxes they paid on electricity.

MEASURE	SHARE OF TOTAL PRICE	NOTE
EU average, all taxes and levies	28.4%	Down 0.5 points from 28.9% in the second half of 2025
EU average, VAT only	15.1%	Part of the 28.4%

Highest: Poland	46.9%	Highest share in the EU
Second highest: Germany	34.0%	Price 0.3618 euro per kWh
Malta	5.9%	VAT 4.7%, the lowest VAT share
Netherlands	minus 9.9%	Energy tax reduction remained in place
Highest VAT share: Hungary	21.2%	VAT only

Source: Eurostat, Electricity price statistics, data extracted October 2026 (datasets nrg_pc_204 and nrg_pc_204_c). Household consumers, band DC, first half of 2026.

Network charges are the other large regulated part of the bill. Eurostat publishes the share of transmission and distribution costs once a year; the latest data are for 2025.

- **Distribution costs** are by far the larger network item. Their share was highest in Luxembourg at 100.0 percent of network costs, Slovakia at 91.5 percent and Finland at 90.0 percent in 2025.
- **Transmission costs** had the highest shares in Lithuania at 43.5 percent, Estonia at 33.0 percent and Denmark at 32.0 percent. Eurostat notes that countries with lower population density need a more extensive transmission network.
- **Ireland** has applied a reduced VAT rate of 9 percent on electricity and gas bills, down from 13.5 percent, since 1 May 2022, according to the national notes in the Eurostat article.

BUSINESS PRICES

Business electricity averaged 0.1800 euro per kWh, with Ireland again the most expensive

Eurostat also tracks prices for non-household consumers, using a medium-size business band of 500 to 1,999 MWh a year. These prices exclude VAT and other recoverable taxes, because businesses can usually reclaim them. **The EU average non-household price was 0.1800 euro per kWh in the first half of 2026**, down 2.0 percent from 0.1837 euro in the second half of 2025 and down 5.4 percent from 0.1903 euro in the first half of 2025. Excluding all taxes it was 0.1466 euro, the lowest since the beginning of 2022.

Business Electricity Prices: Highest and Lowest EU Countries, First Half of 2026 (euro per kWh)

Interactive chart online: businesstats.com/energy-prices-in-the-eu

Ireland tops both lists: its businesses paid 0.2666 euro per kWh, 48 percent above the EU average and 2.9 times the price in Finland.

Ireland had the highest business price at 0.2666 euro per kWh, 48 percent above the EU average, followed by Cyprus at 0.2306 euro and Italy at 0.2253 euro. The Nordic countries were cheapest: Finland at 0.0928 euro and Sweden at 0.1177 euro. Over the year, business prices fell in 19 member states and rose in 7. The largest increases were in Sweden at 18.8 percent, Finland at 18.7 percent and Bulgaria at 14.2 percent, and the largest falls in Luxembourg at minus 23.8 percent, Czechia at minus 11.9 percent and Greece at minus 11.8 percent.

The business price peaked earlier than the household price. Including non-recoverable taxes it reached 0.2151 euro per kWh in the first half of 2023, and the component without taxes peaked at 0.1987 euro in the second half of 2022. The same Middle East shock that pushed up consumer energy inflation in 2026 also lifted crude oil prices, and its effect on industrial power costs will show up in the data for the second half of 2026.

HOUSEHOLD GAS

Household gas fell to 0.1103 euro per kWh, the lowest since early 2022

Natural gas is the second big household energy bill in most of the EU, used for heating, hot water and cooking. In the first half of 2026 **the EU average household gas price was 0.1103 euro per kWh** including taxes, down 10.2 percent from 0.1228 euro in the second half of 2025 and down 3.5 percent from 0.1143 euro in the first half of 2025. Eurostat notes that the usual seasonal pattern, with higher prices in the winter half of the year, has returned after being disrupted by the 2022 crisis.

EU Average Household Gas Price by Semester, First Half of 2023 to First Half of 2026 (euro per kWh)

Interactive chart online: businesstats.com/energy-prices-in-the-eu

A winter and summer rhythm again: gas prices now rise in the second half of each year and fall in the first; the first half of 2026 was the lowest point in the series.

The chart shows how gas prices now swing between the two halves of each year. The highest EU average on record, 0.1244 euro per kWh, was in the second half of 2024, and the latest value is the lowest in the series shown. Excluding taxes, the price was 0.0749 euro per kWh. Taxes and levies made up 32.1 percent

of the household gas price, a larger share than for electricity, after rising 1.07 percentage points from the second half of 2025; VAT accounted for 15.4 percent. In the second half of 2025 the tax share was highest in the Netherlands at 51.8 percent and Denmark at 48.9 percent.

Sweden had the most expensive household gas in the first half of 2026 at 0.2201 euro per kWh, twice the EU average, followed by the Netherlands at 0.16 euro and France and Portugal at 0.13 euro. Hungary was cheapest at 0.0330 euro, followed by Croatia at 0.05 euro and Romania and Slovakia at 0.06 euro. Cyprus, Malta and Finland do not report household gas prices and the Polish data are confidential.

Household Gas Prices in Purchasing Power Standards, First Half of 2026 (PPS per 100 kWh)

Interactive chart online: businesstats.com/energy-prices-in-the-eu

Sweden leads in both measures: it had the highest gas price in euro (0.2201 per kWh) and in PPS (17.7 per 100 kWh).

In purchasing power standards the highest gas prices were in Sweden at 17.7 PPS per 100 kWh, Portugal at 15.0 PPS and the Netherlands at 13.8 PPS, and the lowest in Hungary at 4.3 PPS, Luxembourg at 6.6 PPS and Croatia at 6.8 PPS. Over the year, household gas prices fell in 12 of 23 reporting countries, rose in 7 and were stable in 4. The largest falls were in Bulgaria at minus 14.5 percent, Greece at minus 11.3 percent and Spain at minus 10.0 percent; the largest increases were in Romania at 9.3 percent, Croatia at 8.9 percent and Slovakia at 6.6 percent.

Business gas prices fell almost everywhere. The EU average non-household gas price was 0.0616 euro per kWh in the first half of 2026, and prices dropped in every member state except Sweden, which recorded a rise of 3.1 percent. Sweden was also the most expensive at 0.1118 euro, 81 percent above the EU average, while Bulgaria at 0.0438 euro and Belgium at 0.0439 euro were the cheapest. For the background on pipeline supply see our page on Russian natural gas, and for motor fuel at the pump see gas prices and the gasoline and diesel market in Europe.

ENERGY INFLATION

Euro area energy inflation went from minus 4.0 percent in January 2026 to 18.9 percent in September

The semester price survey shows levels; the harmonised index of consumer prices (HICP) shows how fast prices change each month. Its energy component covers electricity, gas, heating fuels and motor fuels, so it reacts quickly to oil and wholesale gas prices. The chart below shows the annual rate of energy inflation in the euro area in December of each year from 2021 to 2025, plus the latest month available, September 2026.

Euro Area Energy Inflation, December 2021 to December 2025 and September 2026 (annual rate, %)

Interactive chart online: businesstats.com/energy-prices-in-the-eu

From crisis to calm and back: energy inflation fell from 25.5 percent in December 2022 to minus 6.7 percent a year later, then reached 18.9 percent in September 2026.

The 2022 crisis is clear in the data. Energy inflation was 25.9 percent in December 2021, stayed above 38 percent every month from May to October 2022, with 42.0 percent in June and 41.5 percent in October, and was still 25.5 percent in December 2022. It then turned negative: minus 6.7 percent in December 2023 and minus 1.9 percent in December 2025. In most of the months of 2024 and 2025 shown in Eurostat releases, energy prices were lower than a year earlier, which helped bring overall inflation back toward the 2 percent target. For the wider inflation picture see our global inflation report.

Euro Area Energy Inflation by Month, September 2025 to September 2026 (annual rate, %)

Interactive chart online: businesstats.com/energy-prices-in-the-eu

A 22.9 point swing in eight months: energy inflation rose from minus 4.0 percent in January 2026 to 18.9 percent in September 2026.

The monthly series for the last year shows how sharp the 2026 turn has been. Energy inflation was minus 4.0 percent in January and minus 3.1 percent in February 2026, then jumped to 5.1 percent in March, when energy prices rose 7.0 percent in a single month. It reached 10.8 percent in April and May, eased to 8.5 percent in June and then accelerated to 14.3 percent in August and 18.9 percent in September. In

September energy contributed 1.71 percentage points of the 3.8 percent headline rate, nearly half of all euro area inflation, although energy has a weight of only 9.03 percent in the index. Inflation excluding energy was 2.3 percent.

Euro area inflation, September 2026

- Headline HICP: 3.8 percent in the euro area and 3.8 percent in the EU, up from 2.2 and 2.6 percent a year earlier.
- Energy: 18.9 percent annual rate and 4.0 percent month on month.
- All items excluding energy: 2.3 percent. Services: 3.2 percent.
- Highest national rates: Romania at 6.5 percent, Lithuania at 6.1 percent and Bulgaria at 5.6 percent.

2026 ENERGY SHOCK

What the ECB and the European Commission say about the 2026 energy shock

The rise in energy inflation followed the escalation of the Middle East conflict, which the Commission links to extra fossil fuel spending from March 2026. The official statements below set out how EU institutions describe it. On 19 March 2026, Commission President Ursula von der Leyen said that the gas price had gone up by 30 percent that day after attacks on Qatari gas infrastructure, and that in some member states electricity is taxed up to 15 times more than gas. For the oil supply side of the crisis see our report on the oil industry in the Middle East.

- **European Commission, 22 April 2026:** the Commission presented its AccelerateEU package of actions to address rising energy costs, in light of the escalating Middle East conflict. It states that the EU spent an extra 100 billion euro on fossil fuels between March and the end of September 2026, after fossil fuel imports worth 340 billion euro in 2025, and that 57 percent of the energy consumed in the EU is imported fossil fuel.
- **Household measures:** the Commission suggests that member states use timely, temporary and targeted support, such as income support schemes, energy vouchers and lower excise duties on electricity for vulnerable households.
- **European Central Bank, 29 October 2026:** the Governing Council kept its three key interest rates unchanged, with the deposit facility rate at 2.50 percent. It said that energy prices have continued to rise, posing upside risks to inflation and downside risks to growth, and that diesel and petrol prices

reached new peaks in September.

- **ECB outlook:** the ECB expects energy prices to keep headline inflation well above target over the coming quarters, with declining energy inflation thereafter supporting a return to the 2 percent target.

For household electricity bills the timing matters. Retail tariffs follow wholesale prices with a lag, and the Eurostat survey for the first half of 2026 ends in June. National notes in the Eurostat article also show policy changes still to come: Italy reported that most of the measures in its new decree will affect prices from the second half of 2026, and Poland reported that in 2026 there is no longer any support for household end users. The next Eurostat release, covering July to December 2026, is therefore the first that will show the full effect of the shock on household electricity and gas prices.

IN CONTEXT

How to read EU electricity prices against other markets

The Eurostat figures are the official benchmark for the EU, but they are not directly comparable with national statistics elsewhere. Other countries publish averages built in different ways, for example across all residential customers rather than for one consumption band, and with different treatment of taxes and fixed charges, so cross-border comparisons need care. Our page on energy prices in the US covers that series, and the global electricity prices report compares tariffs across countries outside the EU.

Within Europe, the differences between member states come from three sources that the Eurostat data let you separate: the cost of energy and networks, which depends on the generation mix and on interconnection; the tax and levy policy of each government; and the general price level, captured by the PPS measure. Countries with a large share of nuclear or hydro power can still have high retail prices if taxes are high, and countries with low euro prices can still have expensive power relative to income. For the role of nuclear generation in that mix see our report on global nuclear energy, and for the regional economic context see the Europe topic overview.

METHODOLOGY

How the figures on this page were compiled

All price levels come from Eurostat. Household electricity prices are from dataset nrg_pc_204 for consumption band DC (2,500 to 4,999 kWh a year), including all taxes, levies and VAT. Non-household electricity prices are from dataset nrg_pc_205 for band ID (500 to 1,999 MWh a year), including non-

recoverable taxes and excluding VAT and other recoverable taxes. Household gas prices are from dataset nrg_pc_202 for medium-size household consumers. EU averages are weighted by national consumption; for the first half of 2026 Eurostat used 2024 consumption data as weights.

Year-on-year changes by country are calculated by Eurostat in national currency, so they are not affected by exchange rates; euro prices for countries outside the euro area are converted by Eurostat and therefore move with exchange rates. Purchasing power standards remove differences in price levels between countries; for the EU as a whole one PPS equals one euro, so the EU values in the PPS charts are the euro averages expressed per 100 kWh. The annual cost table, the comparison of the EU average with its 2024 peak, the 15.0 percent fall in the price excluding taxes, the 71.6 percent non-tax share and the energy share of headline inflation are BusinessStats calculations from the Eurostat figures.

Inflation data are Eurostat HICP releases for the euro area: the flash and final estimates for September 2026 (2 and 16 October 2026), March 2026 (16 April 2026), December 2024 (17 January 2025), December 2022 (18 January 2023) and October 2022 (17 November 2022). Eurostat revises earlier semesters when countries send updated data. For example, its first release for the first half of 2024 gave an EU average household price of 28.9 euro per 100 kWh, while the current data show 0.2916 euro per kWh for the same semester. This page uses the latest published values.

Eurostat publishes values for all reporting countries in its database, but this page lists only the country values stated in the Eurostat article text and news releases, so the charts show the highest and lowest member states rather than all 27. Gas prices for the Netherlands, France, Portugal, Croatia, Romania and Slovakia are shown rounded to two decimals as published in the Eurostat news release. The previous edition of this page described Denmark as the most expensive country at 0.35 euro per kWh, Bulgaria as the cheapest, and taxes as 35 to 55 percent of most bills, all labelled 2026; those figures were out of date or could not be confirmed and have been replaced with the Eurostat data above.

KEY FACTS

EU energy prices in ten numbers

- **0.2832 euro per kWh:** EU average household electricity price, first half of 2026, down 2.2 percent on the half year.
- **0.3871 euro:** Ireland, the most expensive member state; Germany 0.3618 euro and Belgium 0.3575 euro followed.

- **0.1139 euro:** Hungary, the cheapest; Malta 0.1268 euro and Bulgaria 0.1341 euro followed.
- **46.9 PPS:** Romania, the highest price once living costs are taken into account.
- **51.9 percent:** rise in Romanian household prices in a year, the largest in the EU; Denmark fell 31.7 percent.
- **28.4 percent:** share of taxes and levies in the EU household electricity price, with VAT at 15.1 percent.
- **0.1800 euro per kWh:** EU average business electricity price, down 5.4 percent on the year.
- **0.1103 euro per kWh:** EU household gas price, the lowest since the first half of 2022.
- **18.9 percent:** euro area energy inflation in September 2026, up from minus 4.0 percent in January 2026.
- **100 billion euro:** extra EU spending on fossil fuels from March to September 2026, according to the European Commission.

FAQ

Questions about energy prices in the EU

FREQUENTLY ASKED QUESTIONS

What is the average electricity price in Europe?

Eurostat put the EU average household electricity price at 0.2832 euro per kWh in the first half of 2026, including all taxes and levies, for a household using 2,500 to 4,999 kWh a year. That was 2.2 percent below the 0.2896 euro of the second half of 2025. Excluding taxes the average was 0.2027 euro per kWh.

Which EU country has the most expensive electricity?

Ireland, at 0.3871 euro per kWh in the first half of 2026, 37 percent above the EU average. Germany (0.3618 euro) and Belgium (0.3575 euro) followed. Adjusted for living costs in purchasing power standards, Romania was the most expensive at 46.9 PPS per 100 kWh.

Which EU country has the cheapest electricity?

Hungary, at 0.1139 euro per kWh in the first half of 2026, followed by Malta at 0.1268 euro and Bulgaria at 0.1341 euro. In purchasing power standards Malta was cheapest at 13.8 PPS per 100 kWh, ahead of Hungary at 14.7 and Luxembourg at 15.5.

How much of an EU electricity bill is tax?

Taxes and levies made up 28.4 percent of the EU average household electricity price in the first half of 2026, including VAT at 15.1 percent. The share was highest in Poland at 46.9 percent and Germany at 34.0 percent, and negative in the Netherlands at minus 9.9 percent because of an energy tax reduction.

Are electricity prices in Europe going down?

The latest semester data show a small fall: the EU household average dropped 2.2 percent between the second half of 2025 and the first half of 2026. But those data end in June 2026. Euro area energy inflation, which includes electricity, gas and fuels, rose from minus 4.0 percent in January 2026 to 18.9 percent in September 2026.

How much do businesses pay for electricity in the EU?

The EU average non-household price was 0.1800 euro per kWh in the first half of 2026 for consumers using 500 to 1,999 MWh a year, excluding VAT and recoverable taxes. It was down 5.4 percent on a year. Ireland was highest at 0.2666 euro and Finland lowest at 0.0928 euro.

What is the average gas price for EU households?

The EU average household gas price was 0.1103 euro per kWh in the first half of 2026, down 10.2 percent from the second half of 2025 and the lowest since the first half of 2022. Sweden was most expensive at 0.2201 euro and Hungary cheapest at 0.0330 euro.

Why did Romanian electricity prices rise so much?

Romanian household electricity prices rose 51.9 percent between the first half of 2025 and the first half of 2026, the largest increase in the EU, according to the Eurostat article. Romanian national notes state that support measures for household and non-household electricity invoices were no longer in place in the first half of 2026.

SOURCES

Eurostat: Electricity price statistics, Statistics Explained, data extracted October 2026, published 30 October 2026 (PDF version); datasets nrg_pc_204, nrg_pc_204_c, nrg_pc_205 and nrg_pc_206.

Eurostat: Household electricity prices ease in 1st half of 2026, news article, 30 October 2026.

Eurostat: EU household gas prices decrease in first half of 2026, news article, 30 October 2026.

Eurostat: Natural gas price statistics, Statistics Explained, editions with data extracted April 2026 and October 2026 (dataset nrg_pc_202).

Eurostat: Energy in Europe, 2026 edition (household prices for the first half of 2025).

Eurostat: Tax hikes hinder gas price drop, raise electricity costs, news article, 28 October 2024 (first release for the first half of 2024).

Eurostat: Annual inflation up to 3.8% in the euro area, euro indicators, 16 October 2026, and the flash estimate of 2 October 2026.

Eurostat: Annual inflation up to 2.6% in the euro area, euro indicators, 16 April 2026.

Eurostat: Annual inflation up to 2.4% in the euro area, euro indicators, 17 January 2025.

Eurostat: Euro area annual inflation down to 9.2%, euro indicators, 18 January 2023, and the release of 17 November 2022.

European Central Bank: Monetary policy statement, 29 October 2026, and monetary policy decisions press release (as published by Banco de Espana).

European Commission: AccelerateEU: strengthen EU energy resilience, package presented 22 April 2026.

European Commission: Statement by President von der Leyen at the joint press conference with President Costa, 19 March 2026.

Related Reading

- Global electricity prices
- Energy prices in the US
- Gas prices
- Electricity in Europe
- Russian natural gas
- Global inflation
- Global electricity market
- Energy and environment statistics

STATISTICS REPORT

Energy Prices in the US: Electricity, Natural Gas and Heating Fuels, Data to August 2026

American households paid an average of 18.16 cents per kWh for electricity in August 2026, according to the US Energy Information Administration (EIA), 3.4 percent more than a year earlier, while businesses paid 14.47 cents. This report brings together the latest official figures: monthly power prices by sector, the most and least expensive states, regional prices, the Henry Hub and residential natural gas prices, heating oil and propane, and the EIA forecasts for heating bills in winter 2026-27 and for prices in 2027.

Updated Nov 6, 2026 · businesstats.com/energy-prices-in-the-us

18.16¢ RESIDENTIAL POWER, AUG 2026	**14.47¢** COMMERCIAL POWER, AUG 2026	**+6.8%** RESIDENTIAL, JAN TO AUG VS 2025
$2.76 HENRY HUB, AUG 2026 PER MMBTU	**$16.09** HOME GAS PER MCF, 2026 FORECAST	**+34%** HEATING OIL PRICE, WINTER 2026-27

QUICK ANSWER

US homes paid 18.16 cents per kWh for electricity in August 2026, up 3.4 percent on a year

Electricity is the energy price that most American households feel every month, and it has kept climbing. According to the EIA Electric Power Monthly released on 23 October 2026, **the average residential electricity price in the United States was 18.16 cents per kWh in August 2026**, up from 17.57 cents in August 2025. Across the first eight months of 2026 the residential average was 18.19 cents, 6.8 percent higher than the 17.03 cents of January to August 2025. The highest monthly figure so far in 2026 was 18.86 cents in April.

Prices for other customers rose too. Commercial customers such as shops, offices and data centers paid 14.47 cents per kWh in August 2026, 4.3 percent more than a year earlier. Industrial customers paid 9.64 cents, up 7.3 percent, and the average across all sectors was 14.87 cents, up 5.1 percent. The EIA counted

46 states and the District of Columbia with higher average prices than in August 2025, and only four states with lower ones.

18.16¢

Residential electricity, per kWh

August 2026, up 3.4 percent on a year.

29.02¢

California, highest in the lower 48

All sectors, August 2026.

$2.76

Henry Hub gas, per MMBtu

August 2026 average, down from 2.93 dollars in July.

$2,115

Heating oil bill, winter 2026-27

EIA forecast, up 21 percent.

Natural gas tells a different story. The wholesale benchmark at Henry Hub in Louisiana averaged 2.76 dollars per million British thermal units (MMBtu) in August 2026, far below the 7.72 dollars of January 2026, when winter storm Fern pushed up heating demand and cut supply. Household gas prices move much more slowly than the wholesale price, and the EIA forecasts a 2026 residential average of 16.09 dollars per thousand cubic feet (Mcf). Heating oil, which follows crude oil and diesel rather than natural gas, is the fuel under the most pressure this winter. For gasoline and diesel at the pump, see our separate report on gas prices; this page covers power, natural gas and home heating fuels.

ELECTRICITY BY MONTH

Residential prices have been above 17 cents in every month since March 2025

The EIA calculates its average price as the revenue utilities and other retailers collect from each sector divided by the kWh they sell, so it captures energy charges, delivery charges and fixed fees together. Residential prices have a seasonal pattern: in both 2025 and 2026 they were lowest in January and rose through the spring. The chart shows all three main sectors from January 2025 to August 2026.

US Average Electricity Price by Sector, January 2025 to August 2026 (cents per kWh)

Interactive chart online: businesstats.com/energy-prices-in-the-us

Three sectors, one direction: each sector paid more in August 2026 than in August 2025, with industrial prices up 7.3 percent.

Two features stand out. First, the gap between households and industry is wide and stable: in August 2026 a residential kWh cost 1.88 times as much as an industrial one, because large plants take power at high voltage and in steady volumes, which is cheaper to deliver. Second, commercial and industrial prices peak in summer, while the residential price peaked in April 2026 at 18.86 cents. July 2026 was the costliest month of the year for industrial users at 9.77 cents per kWh.

To translate the averages into a monthly bill, the table below prices 1,000 kWh at the August residential average in each of the last three years. These are BusinessStats illustrations: real bills depend on the tariff, the fixed charge, the season and the amount of power each home uses.

MONTH	RESIDENTIAL PRICE (CENTS PER KWH)	COST OF 1,000 KWH	CHANGE ON A YEAR
August 2024	16.60	$166.00	n/a
August 2025	17.57	$175.70	+5.8%
August 2026	18.16	$181.60	+3.4%

Source: EIA Electric Power Monthly, Table 5.3, released 23 October 2026. Cost of 1,000 kWh is a BusinessStats calculation (price multiplied by 1,000 kWh).

PRICES BY SECTOR

The residential price rose 37 percent between 2016 and 2025

On an annual basis the climb is steep. The EIA put the 2025 residential average at 17.23 cents per kWh in its October 2026 edition, up from 16.48 cents in 2024 and 12.55 cents in 2016, a rise of 37.3 percent in nine years. Most of that increase came after 2021. Between 2021 and 2025 the residential price rose 26.1 percent, the commercial price 19.2 percent and the industrial price 18.5 percent. The jump in 2022, when natural gas prices spiked worldwide, was the largest single-year rise in the series: residential prices went from 13.66 to 15.04 cents.

US Average Electricity Price by Sector, 2016 to 2025 (cents per kWh)

Interactive chart online: businesstats.com/energy-prices-in-the-us

A step change after 2021: residential power cost 26.1 percent more in 2025 than in 2021, against 8.8 percent more in 2021 than in 2016.

The year-to-date numbers show that 2026 is running ahead of 2025 in every sector. The table compares the January to August averages published in the October 2026 Electric Power Monthly.

SECTOR	JAN TO AUG 2025	JAN TO AUG 2026	CHANGE	AUGUST 2026
Residential	17.03	18.19	+6.8%	18.16
Commercial	13.29	14.04	+5.6%	14.47
Industrial	8.50	9.09	+6.9%	9.64
Transportation	13.73	15.64	+13.9%	14.86
All sectors	13.50	14.37	+6.4%	14.87

Source: EIA Electric Power Monthly, Table 5.3, released 23 October 2026 (year-to-date rows). Changes are BusinessStats calculations. Transportation covers mainly electrified rail and transit.

On a rolling 12-month basis, which smooths out the seasons, the residential price reached 18.04 cents per kWh in the year to August 2026, against 16.94 cents a year before, an increase of 6.5 percent. For a wider view of how much power the country generates and uses, and where it comes from, see our report on electricity in the United States.

What the sector data show

- The EIA expects residential prices to grow about 5.3 percent in 2026, well above the general inflation of about 2 percent it assumes for winter 2026-27.
- Industrial prices are the most volatile because they track wholesale power more closely; they rose 7.3 percent in the year to August 2026.
- Transportation prices, a small sector, jumped 13.9 percent in the first eight months of 2026, the largest rise of any sector.

HIGHEST AND LOWEST STATES

California, Massachusetts and Rhode Island pay the most; North Dakota pays the least

State prices differ by a factor of three or more. In its Electricity Monthly Update for August 2026, the EIA named **California as the most expensive state in the contiguous US at 29.02 cents per kWh** across all sectors, followed by Massachusetts at 26.42 cents and Rhode Island at 25.34 cents. North Dakota had the

lowest average at 8.91 cents, ahead of Louisiana at 9.86 cents and New Mexico at 10.08 cents. A Californian customer therefore paid 3.3 times as much per kWh as a customer in North Dakota.

Highest and Lowest Average Electricity Prices in the Contiguous US, August 2026 (cents per kWh)

Interactive chart online: businesstats.com/energy-prices-in-the-us

3.3 times apart: the average kWh cost 29.02 cents in California in August 2026 and 8.91 cents in North Dakota.

The pattern reflects how each state makes and moves its power. Low-price states such as North Dakota and Louisiana sit on large local coal, gas or wind resources and have big industrial loads, which pull down the all-sector average. New England and California rely more on fuel and power brought in from elsewhere and carry high network costs. Household prices are higher than these all-sector averages: nationally, homes paid 18.16 cents per kWh in August 2026, against 14.87 cents for all sectors.

Price changes over the past year were just as uneven. Hawaii, where most power still comes from oil-fired plants, recorded the largest increase at 25.6 percent between August 2025 and August 2026, as oil prices surged in 2026. Georgia followed at 17.3 percent and the District of Columbia at 14.0 percent. Connecticut posted the largest decrease, down 18.2 percent, ahead of New Mexico at minus 5.4 percent and Utah at minus 3.5 percent.

Largest Increases and Decreases in Electricity Prices by State, August 2026 vs August 2025 (%)

Interactive chart online: businesstats.com/energy-prices-in-the-us

From plus 25.6 to minus 18.2 percent: Hawaii saw the steepest rise and Connecticut the steepest fall between August 2025 and August 2026.

Monthly state rankings move with the seasons, so the full-year picture is a useful check. The latest complete year in the EIA state electricity profiles is 2024, released in November 2025. On that basis Hawaii was by far the most expensive state at 38.00 cents per kWh across all sectors, almost three times the US average of 12.94 cents, and North Dakota was the cheapest at 7.93 cents.

RANK	MOST EXPENSIVE	PRICE	LEAST EXPENSIVE	PRICE
1	Hawaii	38.00	North Dakota	7.93

2	California	27.04	Louisiana	8.80
3	Connecticut	24.37	Nebraska	9.07
4	Rhode Island	24.15	Oklahoma	9.09
5	Massachusetts	23.94	Wyoming	9.14
6	Alaska	22.17	New Mexico	9.18
7	New Hampshire	20.61	Iowa	9.34
8	Maine	19.66	Idaho	9.51
9	New York	19.66	Arkansas	9.59
10	Vermont	18.41	Texas	9.79
	US total	12.94		

Source: EIA, State Electricity Profiles, data year 2024, released 10 November 2025. Average retail price across all sectors. Maine and New York are tied at 19.66 cents. The EIA has scheduled 2025 state profiles for November 2026.

Connecticut stands out in both lists. It was the third most expensive state in 2024, but its prices fell 18.2 percent in the year to August 2026. Hawaii moved the other way, which shows how exposed an oil-based power system is to the crude oil shock of 2026 described in our report on the US and Israel war with Iran.

REGIONAL PRICES

New England households pay about twice as much as the West North Central states

The EIA Short-Term Energy Outlook publishes residential prices for the nine census divisions, which smooths out the noise in individual states. In its October 2026 edition, the EIA expected **New England to average 29.06 cents per kWh in 2026**, the highest of any division, followed by the Pacific at 25.57 cents and the Middle Atlantic at 24.90 cents. The West North Central division, which runs from Minnesota and Iowa to the Dakotas, Kansas and Missouri, was the cheapest at 14.44 cents. New England households therefore pay 2.0 times as much per kWh as those in the West North Central states.

Residential Electricity Price by Census Division, 2025 and 2026 (cents per kWh)

Interactive chart online: businesstats.com/energy-prices-in-the-us

Fastest rise in the Middle Atlantic: the EIA expects New York, New Jersey and Pennsylvania to pay 9.7 percent more in 2026 than in 2025.

The largest increases are in the Middle Atlantic and East North Central divisions. The EIA expects the Middle Atlantic residential price to rise 9.7 percent in 2026 and the East North Central division, which includes Illinois, Ohio and Michigan, to rise 8.9 percent. By contrast New England, already the most expensive region, is forecast to rise only 0.5 percent, and the Mountain division 2.6 percent. The commercial sector shows a similar order, with New England at 23.31 cents and the West South Central division, dominated by Texas, the cheapest at 9.13 cents per kWh in the 2026 forecast.

CENSUS DIVISION	RESIDENTIAL 2025	RESIDENTIAL 2026	CHANGE	COMMERCIAL 2026
New England	28.91	29.06	+0.5%	23.31
Middle Atlantic	22.70	24.90	+9.7%	19.04
East North Central	17.70	19.27	+8.9%	14.08
West North Central	13.95	14.44	+3.5%	10.77
South Atlantic	15.31	16.17	+5.6%	12.05
East South Central	14.10	14.78	+4.8%	13.60
West South Central	14.65	15.27	+4.2%	9.13
Mountain	14.41	14.78	+2.6%	11.33
Pacific	24.74	25.57	+3.4%	21.61
United States	17.30	18.21	+5.3%	14.00

Source: EIA, Short-Term Energy Outlook, October 2026, Table 7c. 2026 values combine reported and forecast months. Changes are BusinessStats calculations.

WHY POWER PRICES RISE

Wires, weather and demand push retail power up even when gas is cheap

Retail electricity prices in 2026 rose while the main fuel for US power plants became cheaper. Henry Hub gas averaged 2.87 dollars per MMBtu in the third quarter of 2026, below the 3.03 dollars of the third quarter of 2025, yet residential prices were higher. The EIA explains that residential prices include other expenses such as transmission and distribution upgrades, so wholesale power is only part of the bill. Several forces are at work.

Five drivers of US retail power prices in 2026

- **Grid spending:** utilities are recovering the cost of new transmission lines, distribution upgrades and storm and wildfire hardening through their rates.
- **Wholesale power:** the EIA expects wholesale prices to average 52 dollars per MWh in 2026, 11 percent more than in 2025, mainly because of winter storm Fern and a hot summer.
- **Volatile peaks:** in August 2026 wholesale prices in PJM, the largest US grid, ranged from 37 to 150 dollars per MWh, against 47 to 91 dollars in New England.
- **Growing demand:** the EIA forecasts commercial electricity demand, which includes data centers, to grow 2.8 percent in 2027.
- **Fuel for oil-fired systems:** in Hawaii, where oil is the main fuel, average power prices rose 25.6 percent in the year to August 2026.

Fuel costs for power plants were moderate through the summer. In August 2026 Henry Hub gas was equivalent to 22.09 dollars per MWh of electricity, down from 23.47 dollars in July, while Central Appalachian coal at 3.24 dollars per MMBtu was equivalent to 34.99 dollars per MWh. Gas is the largest source of US electricity: the EIA expects it to generate 1,753 billion kWh in 2026, about 40 percent of the 4,392 billion kWh total, while utility-scale solar rises to 355 billion kWh, about 8 percent. The rise of large computing loads is covered in our data center statistics, and the global context in our report on the global electricity market.

HENRY HUB GAS

Henry Hub gas fell from 7.72 dollars in January 2026 to 2.76 dollars in August

The Henry Hub spot price is the main benchmark for US natural gas. It was unusually volatile in 2026. January averaged **7.72 dollars per MMBtu**, according to the EIA, after winter storm Fern raised heating demand and reduced supply. Prices then fell sharply, to an average of 2.95 dollars in the second quarter and 2.87 dollars in the third quarter. Monthly averages were 2.93 dollars in July and 2.76 dollars in August 2026, 64 percent below the January level.

Henry Hub Natural Gas Spot Price by Quarter, 2025 to 2027 (dollars per MMBtu)

Interactive chart online: businesstats.com/energy-prices-in-the-us

A winter spike, then a summer slump: Henry Hub averaged 4.79 dollars in the first quarter of 2026 and 2.87 dollars in the third.

Over a full year the swings largely cancel out. The EIA puts the 2025 average at 3.53 dollars per MMBtu, up 61 percent from 2.19 dollars in 2024, and expects 3.48 dollars in 2026 and 3.16 dollars in 2027, a 9 percent fall. The reason is supply. The EIA forecasts dry gas production of 112.2 billion cubic feet per day in 2026, up 4.3 percent from 107.6 billion in 2025, which more than covers the rise in liquefied natural gas (LNG) exports from 15.1 to 17.6 billion cubic feet per day. Storage is expected to end October 2026 at 3,850 billion cubic feet, about 2 percent above the five-year average, a buffer against a cold winter.

INDICATOR	2024	2025	2026	2027
Henry Hub spot (dollars per MMBtu)	2.19	3.53	3.48 (forecast)	3.16 (forecast)
Dry gas production (billion cubic feet per day)	n/a	107.6	112.2 (forecast)	116.1 (forecast)
Total consumption (billion cubic feet per day)	n/a	91.9	92.4 (forecast)	93.8 (forecast)
LNG gross exports (billion cubic feet per day)	11.9	15.1	17.6 (forecast)	18.6 (forecast)

Source: EIA, Short-Term Energy Outlook, 6 October 2026, overview table and Table 5a. n/a: not shown in the October 2026 edition tables used here.

The US gas market is now tied more closely to the rest of the world through LNG. Exports are forecast at about 16 percent of dry gas production in 2026, and the EIA expects them to keep growing in 2027. For the European side of this trade, see our reports on energy prices in the EU and Russian natural gas.

RESIDENTIAL GAS

Households pay four to five times the Henry Hub price for natural gas

The price a household pays for gas includes interstate pipeline transport, local distribution, the utility fixed charge and taxes on top of the commodity. The EIA expects the US residential natural gas price to average **16.09 dollars per thousand cubic feet in 2026**, 5.2 percent more than the 15.30 dollars of 2025, and then to fall to 14.16 dollars in 2027. Converted to the same unit, the 2026 Henry Hub forecast is 3.61 dollars per Mcf, so households pay about 4.5 times the wholesale price.

Residential Natural Gas Price vs Henry Hub Spot Price, Q1 2025 to Q3 2026 (dollars per Mcf)

Interactive chart online: businesstats.com/energy-prices-in-the-us

Opposite seasons: Henry Hub peaks in winter, but the residential price per Mcf peaks in summer, at 25.56 dollars in the third quarter of 2026.

The summer peak in the residential price does not mean summer bills are high. Homes use very little gas in July and August, so the fixed charges in each bill are divided by a small volume. The price that matters most for household budgets is the winter price, which the EIA forecasts at 13.44 dollars per Mcf for November 2026 to March 2027, 9 percent below last winter. Regional prices vary widely, as the table shows.

CENSUS DIVISION	2025	2026 (FORECAST)	2027 (FORECAST)
New England	22.25	23.78	22.21
Middle Atlantic	15.97	16.95	14.69
East North Central	11.73	12.56	11.29
West North Central	12.42	13.20	11.78
South Atlantic	18.34	19.23	16.68
East South Central	14.12	15.21	12.85

West South Central	18.38	20.43	15.30
Mountain	11.48	11.82	12.12
Pacific	20.67	19.64	17.29
United States	15.30	16.09	14.16

Source: EIA, Short-Term Energy Outlook, 6 October 2026, Table 5b. 2026 combines reported and forecast months.

New England is again the most expensive region at 23.78 dollars per Mcf in the 2026 forecast, while the Mountain states pay the least at 11.82 dollars. The East North Central division, which includes large heating markets such as Illinois, Ohio and Michigan, is also among the cheapest at 12.56 dollars. The Pacific is the only division where the EIA expects the 2026 residential price to be lower than in 2025.

HEATING OIL AND PROPANE

Heating oil is forecast at 5.26 dollars a gallon this winter, 34 percent more than last winter

Heating oil is a distillate fuel, close to diesel, and its price follows crude oil and global refining rather than US natural gas. That made it the fuel most exposed to the 2026 oil shock. The EIA expects the retail heating oil price to average **5.10 dollars per gallon in 2026**, against 3.62 dollars in 2025, and 5.81 dollars in the fourth quarter of 2026. Heating oil futures rose from 4.23 dollars per gallon in August 2026 to 4.86 dollars in September, and the crack spread over Brent crude widened from 2.13 to 2.44 dollars per gallon.

US Retail Heating Oil Price by Quarter, 2025 to 2027 (dollars per gallon)

Interactive chart online: businesstats.com/energy-prices-in-the-us

Up 58 percent in a year: the EIA forecast of 5.81 dollars a gallon for the fourth quarter of 2026 compares with 3.68 dollars a year earlier.

The EIA points to three reasons. Global refining activity has fallen, raising international distillate and crude prices. US distillate exports rose 20 percent in the first seven months of 2026 compared with a year earlier, and US distillate inventories are expected to be about 11 percent below the five-year average in the fourth quarter of 2026. The STEO attributes the rise in oil and diesel prices to disruption in the Middle East,

including attacks on the East-West pipeline and the risk to tankers. Weekly crude prices are tracked in our report on crude oil prices, and the refining side in our global oil refinery industry statistics.

Propane has escaped the shock. Most US propane is produced at natural gas processing plants, and its price is set in a well-supplied domestic market rather than by crude oil alone. The EIA forecasts the Mont Belvieu spot price at 74 cents per gallon in 2026 and 69 cents in 2027, and a residential propane price of **2.52 dollars per gallon for winter 2026-27**, 2 percent less than last winter.

FUEL	FORECAST WINTER PRICE	CHANGE VS LAST WINTER	FORECAST USE PER HOME	CHANGE IN USE
Natural gas	$13.44 per Mcf	-9%	48 Mcf	0%
Electricity	18.23 cents per kWh	+3%	6,562 kWh	+1%
Propane	$2.52 per gallon	-2%	494 gallons	-1%
Heating oil	$5.26 per gallon	+34%	402 gallons	-9%

Source: EIA, Winter Fuels Outlook 2026-27, published 6 October 2026 with the Short-Term Energy Outlook. US averages for homes that use each fuel as their main heating source.

WINTER HEATING BILLS

Heating oil homes face a 2,115 dollar winter bill; gas homes about 640 dollars

The EIA Winter Fuels Outlook, published with the October 2026 Short-Term Energy Outlook, combines price and weather forecasts into average heating spending for November 2026 to March 2027. It expects **a mixed winter**: spending falls for homes heated by natural gas (down 9 percent to 640 dollars) and propane (down 3 percent to 1,246 dollars), but rises for electricity (up 4 percent to 1,196 dollars) and heating oil (up 21 percent to 2,115 dollars). A household heating with oil is expected to spend 3.3 times as much as one heating with gas.

Average Household Heating Expenditure by Main Fuel, Winter 2026-27 Forecast (dollars)

Interactive chart online: businesstats.com/energy-prices-in-the-us

Heating oil costs most: the average oil-heated home is forecast to spend 2,115 dollars this winter, against 640 dollars for a gas-heated home.

Weather shifts the regional picture. The EIA assumes a warmer winter than last year in the Northeast, where heating degree days are forecast 12 percent lower, and a much colder one in the West, up 25 percent. As a result gas spending is forecast to fall 14 percent in the Northeast to 879 dollars but to rise 7 percent in the West to 590 dollars. Electric heating bills rise 9 percent in the West to 1,151 dollars and fall 3 percent in the Northeast to 1,637 dollars. The EIA warns that a strong El Nino pattern could make temperatures differ substantially from its forecast.

REGION	NATURAL GAS SPENDING	GAS PRICE PER MCF	ELECTRICITY SPENDING	POWER PRICE PER KWH	PROPANE SPENDING
Northeast	$879 (-14%)	$16.12	$1,637 (-3%)	26.19 cents	$1,687 (-15%)
Midwest	$613 (-10%)	$10.38	$1,380 (+3%)	16.87 cents	$1,305 (-4%)
South	$511 (-15%)	$14.13	$1,079 (+3%)	15.75 cents	$1,164 (0%)
West	$590 (+7%)	$15.10	$1,151 (+9%)	20.47 cents	n/a

Source: EIA, Winter Fuels Outlook 2026-27, 6 October 2026. Changes in brackets are versus winter 2025-26. The EIA publishes propane for three regions and heating oil for the US only.

Which fuel a home uses depends heavily on where it is. Natural gas is the main heating fuel for 60.96 million US households in October 2026, 45.4 percent of the total, while electricity heats 57.88 million, 43.1 percent. Electric heating dominates in the South, where 34.89 million homes use it. Heating oil is now the main fuel for only 4.13 million homes, 3.1 percent, and 3.39 million of them are in the Northeast. That number has fallen 18 percent since 2021, while electric heating has grown 8.5 percent.

US Households by Main Heating Fuel, October 2026 (thousands)

Interactive chart online: businesstats.com/energy-prices-in-the-us

Gas and electricity heat 88.5 percent of homes: heating oil, the fuel facing the steepest price rise, heats 3.1 percent.

OUTLOOK TO 2027

The EIA expects power to keep rising in 2027 while gas and heating oil ease

The October 2026 Short-Term Energy Outlook extends to December 2027. It expects the residential electricity price to rise again, by about 2.6 percent to 18.68 cents per kWh in 2027, after about 5.3 percent growth in 2026. Wholesale power, by contrast, is forecast to fall from 52 to 49 dollars per MWh. Gas and oil prices are expected to retreat: Henry Hub to 3.16 dollars per MMBtu, the residential gas price to 14.16 dollars per Mcf and retail heating oil to 4.44 dollars per gallon. The next STEO is due on 10 November 2026.

PRICE	2025	2026	2027	CHANGE 2026 TO 2027
Residential electricity (cents per kWh)	17.30	18.21	18.68	+2.6%
Commercial electricity (cents per kWh)	13.41	14.00	14.21	+1.5%
Industrial electricity (cents per kWh)	8.62	9.05	9.15	+1.1%
Henry Hub gas (dollars per MMBtu)	3.53	3.48	3.16	-9.2%
Residential gas (dollars per Mcf)	15.30	16.09	14.16	-12.0%
Commercial gas (dollars per Mcf)	10.96	11.46	9.59	-16.3%
Retail heating oil (dollars per gallon)	3.62	5.10	4.44	-12.9%
WTI crude oil (dollars per barrel)	65.40	88.21	79.74	-9.6%

Source: EIA, Short-Term Energy Outlook, 6 October 2026, Table 2. 2025 values are the STEO estimates; 2026 and 2027 include forecasts. Changes are BusinessStats calculations.

Forecasts carry real uncertainty. The EIA flags weather as the biggest risk for heating fuels this winter, and oil prices depend on how the Middle East disruption develops. Electricity is the most predictable of the four, because most retail rates are regulated and change slowly. The residential average has risen in nominal terms in every year from 2019 to 2025.

IN CONTEXT

US households still pay less for electricity than most of Europe

Despite the increases, American power remains cheap by the standards of other rich economies. At 18.16 cents per kWh in August 2026, the US residential average is well below the EU household average of 0.2832 euro per kWh reported by Eurostat for the first half of 2026, which is set out in our report on energy prices in the EU. Our global electricity prices ranking compares tariffs across more countries.

Energy also matters for the wider cost of living. Electricity, gas and heating fuels are part of the consumer price index, which we follow in our monthly series on the inflation rate in the United States, and housing and utilities are covered in our report on the US cost of living. For how much of each fuel the country burns, see US fossil fuel consumption, and for the economy behind the demand, the GDP of the United States.

METHODOLOGY

How the figures on this page were compiled

Electricity prices are from the EIA Electric Power Monthly, Table 5.3, in the edition released on 23 October 2026, which covers data to August 2026. The EIA does not collect tariffs directly; it divides the revenue that utilities and power marketers report from each sector by the kWh they sell, so the figures include energy, delivery and fixed charges. Values for 2025 and 2026 are preliminary and are revised from one edition to the next. In the October 2026 edition the 2025 residential average was revised to 17.23 cents per kWh from 17.30 cents; the Short-Term Energy Outlook of 6 October 2026 and the Monthly Energy Review of October 2026 still use the earlier figure. Each table on this page states which edition it uses.

State figures for August 2026 come from the EIA Electricity Monthly Update, which names the three highest and three lowest states in the contiguous US by average revenue per kWh across all sectors, and the states with the largest changes. Full-year state values are from the EIA State Electricity Profiles for 2024, the latest complete year published. Regional prices, natural gas prices, heating oil prices and all forecasts are from the October 2026 Short-Term Energy Outlook (Tables 2, 5a, 5b and 7c), and winter spending, prices and household counts from the EIA Winter Fuels Outlook 2026-27. Quarterly values for the third quarter of 2026 include EIA estimates for the final weeks of the quarter.

Bill illustrations, shares of households, ratios and percent changes are BusinessStats calculations from the EIA values. Natural gas is shown per MMBtu for Henry Hub and per thousand cubic feet for retail prices, as

published; one Mcf of gas holds a little more than one MMBtu of energy, which is why the Henry Hub price per Mcf in the STEO is slightly higher. Gasoline and diesel prices are covered in a separate report. The previous edition of this page gave a 2026 average electricity price of 17.14 cents per kWh as an all-time high, a 2025 Henry Hub price of 3.90 dollars, a Hawaii rate of 46 cents and annual household energy spending of 3,450 dollars; those figures could not be confirmed and have been replaced with the EIA data above.

KEY FACTS

US energy prices in ten numbers

- **18.16 cents per kWh:** average US residential electricity price in August 2026, up 3.4 percent on a year.
- **18.19 cents:** residential average for January to August 2026, 6.8 percent above the same months of 2025.
- **14.47 cents:** commercial electricity price in August 2026; industrial was 9.64 cents, up 7.3 percent.
- **29.02 cents:** California, the most expensive state in the contiguous US in August 2026; North Dakota was cheapest at 8.91 cents.
- **25.6 percent:** rise in Hawaii power prices in the year to August 2026, the largest of any state; Connecticut fell 18.2 percent.
- **29.06 cents:** forecast 2026 residential price in New England, the highest census division.
- **7.72 dollars per MMBtu:** Henry Hub average in January 2026; it fell to 2.76 dollars in August.
- **16.09 dollars per Mcf:** forecast 2026 residential natural gas price, up 5.2 percent on 2025.
- **5.26 dollars per gallon:** forecast heating oil price for winter 2026-27, up 34 percent.
- **18.68 cents per kWh:** EIA forecast for the 2027 residential electricity price.

FAQ

Questions about energy prices in the US

FREQUENTLY ASKED QUESTIONS

What is the average price of electricity in the US?

The EIA put the average US residential electricity price at 18.16 cents per kWh in August 2026, the latest month available, up 3.4 percent from 17.57 cents in August 2025. Commercial customers paid 14.47 cents, industrial customers 9.64 cents and the average across all sectors was 14.87 cents. Over January to August 2026 the residential average was 18.19 cents.

How much have US electricity prices gone up?

Residential prices averaged 18.19 cents per kWh in January to August 2026, 6.8 percent more than in the same months of 2025. On an annual basis the residential price rose from 13.66 cents in 2021 to 17.23 cents in 2025, an increase of 26.1 percent, according to the EIA Electric Power Monthly of October 2026.

Which state has the most expensive electricity?

In August 2026 California had the highest average price in the contiguous US at 29.02 cents per kWh across all sectors, followed by Massachusetts at 26.42 cents and Rhode Island at 25.34 cents. Over the full year 2024 Hawaii was the most expensive state at 38.00 cents per kWh.

Which state has the cheapest electricity?

North Dakota, at 8.91 cents per kWh across all sectors in August 2026, followed by Louisiana at 9.86 cents and New Mexico at 10.08 cents. North Dakota was also the cheapest state over the full year 2024, at 7.93 cents per kWh.

What is the Henry Hub natural gas price?

Henry Hub averaged 2.76 dollars per MMBtu in August 2026, down from 2.93 dollars in July and 7.72 dollars in January 2026, when winter storm Fern lifted demand. The EIA expects an average of 3.48 dollars for 2026 and 3.16 dollars for 2027.

How much do households pay for natural gas?

The EIA forecasts a US residential natural gas price of 16.09 dollars per thousand cubic feet in 2026, up from 15.30 dollars in 2025, and 13.44 dollars per Mcf for winter 2026-27. New England pays the most, at a forecast 23.78 dollars per Mcf in 2026.

Why are heating oil prices so high this winter?

The EIA expects heating oil to average 5.26 dollars a gallon in winter 2026-27, 34 percent more than last winter. It cites lower global refining activity, higher crude and distillate prices linked to the Middle East disruption, US distillate exports up 20 percent in the first seven months of 2026 and inventories about 11 percent below the five-year average.

How much will it cost to heat a home this winter?

The EIA Winter Fuels Outlook forecasts average spending from November 2026 to March 2027 of 640 dollars for homes heated by natural gas (down 9 percent), 1,196 dollars for electricity (up 4 percent), 1,246 dollars for propane (down 3 percent) and 2,115 dollars for heating oil (up 21 percent).

Will electricity prices go down in 2027?

Not according to the EIA. Its October 2026 Short-Term Energy Outlook forecasts the residential price to rise about 2.6 percent to 18.68 cents per kWh in 2027, even though wholesale power prices are expected to fall from 52 to 49 dollars per MWh.

SOURCES

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U.S. Energy Information Administration: Short-Term Energy Outlook, October 2026, released 6 October 2026: Table 2, U.S. Energy Prices, Table 7c, U.S. Regional Electricity Prices, Tables 5a and 5b and the full report (PDF).

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U.S. Energy Information Administration: State Electricity Profiles, data year 2024, released 10 November 2025.

Related Reading

- Gas prices
- Energy prices in the EU
- Global electricity prices

- Electricity in the United States
- Crude oil prices weekly
- Monthly inflation rate in the United States
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STATISTICS REPORT

Global Nuclear Energy — Statistics & Facts 2026

Updated Mar 30, 2026 · businesstats.com/global-nuclear-energy

440 OPERATING REACTORS	**413 GW** TOTAL INSTALLED CAPACITY	**2,600 TWh** ANNUAL GENERATION
10% WORLD ELECTRICITY SHARE	**~60** UNDER CONSTRUCTION	**$400B** INDUSTRY VALUE

Overview

440 Reactors, 10% of World Electricity — The Nuclear Renaissance

Nuclear energy's global story in 2026 is one of remarkable resurgence after a decade of decline. Following the 2011 Fukushima Daiichi accident, global nuclear capacity stagnated as Germany, Japan, and several other countries reduced or reversed their nuclear commitments. But four powerful forces have since converged to trigger a genuine nuclear renaissance: the **climate imperative** (net-zero carbon commitments requiring 24/7 low-carbon baseload power that solar and wind cannot consistently provide), **energy security** (Russia's 2022 Ukraine invasion exposed European dependence on Russian natural gas, driving renewed interest in domestic nuclear), **AI electricity demand** (data centres need uninterrupted carbon-free power that only nuclear and hydroelectric can currently provide at scale), and **new reactor technology** (small modular reactors promising faster, cheaper construction).

The numbers reflect this revival. Approximately **60 reactors are currently under construction** globally — the highest number since the late 1980s. Over **100 additional reactors are in planning stages**. Countries that had committed to nuclear phase-outs — Belgium, Japan, South Korea, Sweden — have reversed course. The United States has seen its first new nuclear construction in decades with Vogtle Units 3&4 in Georgia reaching commercial operation. Technology companies including Microsoft, Google, and Amazon have signed nuclear Power Purchase Agreements (PPAs) — a development virtually unimaginable five years ago. The connection between AI infrastructure growth and clean energy demand is directly relevant to trends tracked in our AI market size analysis, where electricity consumption by data centres is projected to roughly double between 2024 and 2028.

As of 2026, nuclear energy generates approximately **2,600 terawatt-hours (TWh) annually** — approximately 10% of global electricity from 440 operating reactors across 32 countries with approximately 413 GW of installed capacity. This compares to a peak of approximately 2,660 TWh in 2006 and a post-Fukushima low of approximately 2,350 TWh in 2012. Nuclear is the world's **second-largest source of low-carbon electricity** after hydropower, and its carbon intensity of approximately 4-12 grams CO₂-equivalent per kWh makes it comparable to wind power and far cleaner than solar, gas, or coal. The total global nuclear industry — encompassing fuel supply, reactor construction, operation, and services — is valued at approximately **$400 billion annually**.

Global nuclear energy 2026: 440 operating reactors across 32 countries. Total capacity 413 GW. Annual generation ~2,600 TWh — 10% of world electricity. USA leads with 93 reactors (778 TWh). France 70% nuclear electricity share — world's highest. China 28 reactors under construction — world's largest programme. ~60 reactors globally under construction. Nuclear industry total value: ~$400 billion.

Nuclear by Country

Nuclear Energy by Country — USA Leads Capacity, France Leads Share

The **United States** operates 93 nuclear reactors at 54 sites with a total capacity of approximately **95 GW**, generating approximately **778 TWh annually** — approximately 19% of US total electricity. The US nuclear fleet is the world's largest by absolute generation, though it is also among the oldest — with an average reactor age of approximately 42 years. Several US reactors have received 80-year licence extensions (vs the original 40-year licences), meaning the fleet will remain operational deep into the 2040s-2060s. The US also has approximately $500 billion in nuclear-related infrastructure including national laboratories, uranium enrichment facilities, and fuel fabrication plants that underpin both the civilian nuclear programme and the national security nuclear complex. The relationship between US energy production economics and broader market dynamics is explored in our US fossil fuel consumption analysis.

France operates 56 reactors with approximately 61 GW of capacity — generating approximately **70% of French electricity**, the world's highest nuclear share of any large economy. France's nuclear programme was constructed rapidly between 1974 and 1999 using standardised Pressurised Water Reactor (PWR) designs, which enabled economies of repetition that kept costs lower than the bespoke approach used in the US and UK. France is consistently the world's largest net electricity exporter, selling surplus nuclear power to Germany, the UK, Belgium, Italy, and Switzerland. However, France's reactor fleet requires significant maintenance investment — approximately 32 reactors experienced corrosion issues in 2022-

2023, temporarily reducing output before repairs were completed. The French government has announced construction of 6 new European Pressurised Reactors (EPRs) plus 8 additional contingent on the first batch's progress.

China has transformed itself from a modest nuclear power (13 reactors in 2013) into the world's third-largest nuclear operator (55+ reactors as of 2026) in just over a decade — and is building the fastest. China's **28 reactors under construction** represent the world's most ambitious nuclear programme, with approximately 6-8 new reactors receiving grid connection approval each year. China is targeting **150 GW of nuclear capacity by 2035** — which would make it the world's largest nuclear power producer, surpassing the United States. China is deploying both foreign-derived designs (Westinghouse AP1000, French EPR) and indigenous designs (the Hualong One/HPR1000, which it is also exporting internationally). The enormous energy infrastructure demands of data centres and digital infrastructure in China are a significant driver of this nuclear expansion.

Nuclear Electricity Generation by Country — 2025 (TWh)

The navy bar chart below shows the top 15 countries by nuclear electricity generation. The USA's dominant absolute position — driven by 93 reactors running at high capacity factors — contrasts with France's much smaller fleet generating a far higher share of national electricity.

Generation RankingsNuclear Electricity Generation by Country — 2025 (TWh)BusinessStats Research · IAEA PRIS · IEA World Energy Statistics 2025 778 TWh USA — #1 Annual Generation (TWh) Top 5 generate ~74% of global nuclear Sources: BusinessStats Research · IAEA PRIS Database Q1 2026 · IEA Electricity Statistics · BP Statistical Review 2025

Nuclear Share of National Electricity — Top Countries (%)

The white animated bars below show nuclear energy's share of total national electricity generation for the world's top nuclear-dependent countries. France's extraordinary 70% share dwarfs all other large economies, while Slovakia, Ukraine, and Hungary also show unusually high nuclear dependence.

Nuclear Share Nuclear Share of National Electricity — 2025 (%) BusinessStats Research · IAEA PRIS · IEA Electricity Statistics 2025

Under Construction

~60 Reactors Under Construction — China Leads, Global Pipeline Strongest Since 1980s

Approximately **60 nuclear reactors are under construction worldwide** as of early 2026 — the largest global pipeline since the late 1980s and a clear indicator of nuclear's renewed momentum. China accounts for approximately **28 of these reactors** — nearly half the global total — reflecting its extraordinary state-directed nuclear expansion programme. India follows with approximately **7 reactors under construction**, including 4 units at the Rawatbhata site and 2 units of the Prototype Fast Breeder Reactor (PFBR) programme. South Korea (3), Russia (3), and Turkey (4 — the Akkuyu plant being built by Russia's Rosatom) are also significant contributors to the global construction pipeline.

In Western markets, nuclear construction has been more challenging. The UK's **Hinkley Point C** — two 1,630 MW EPR units being built by EDF in Somerset, England — is currently the largest nuclear construction project in the Western world, with an estimated cost that has risen from approximately £18 billion (2016 estimate) to approximately £32-35 billion. Hinkley Point C is expected to begin generating electricity in the late 2020s. In the United States, the **Vogtle Units 3&4** in Georgia — the first new US nuclear units in approximately 30 years — reached commercial operation in 2023-2024 after significant cost overruns (total cost approximately $35 billion for 2.2 GW, versus the original $14 billion estimate). These cost experiences in Western markets have strengthened the case for small modular reactors (SMRs) as an alternative approach. The significant capital investment requirements of nuclear construction are comparable in scale to the infrastructure commitments discussed in our analysis of global financial markets and capital allocation patterns.

Outside China, the most exciting new-build pipelines are in Eastern Europe and the Middle East. **Poland** — historically 100% dependent on coal — has selected Westinghouse AP1000 technology for its first-ever nuclear power plant, targeting first generation in the mid-2030s. The **UAE's Barakah** plant has 3 of its 4 units now in commercial operation, making the UAE the Arab world's first nuclear power generator. **Egypt, Bangladesh, and Turkey** are all proceeding with Rosatom-built plants under intergovernmental agreements with Russia. **Sweden and Finland** are both planning new nuclear capacity to support their energy security and decarbonisation objectives. The broader energy context — including the interplay between nuclear, fossil fuels, and renewables in national energy mixes — relates to the fossil fuel consumption patterns we track in our fossil fuel analysis.

Reactors Under Construction by Country — 2026

The white rank bars below show the number of reactors under construction by country as of early 2026. China's overwhelming dominance of the global nuclear construction pipeline is immediately apparent — China alone is building nearly as many reactors as the rest of the world combined.

Economics & Cost

Nuclear Economics — Cheap When Running, Expensive to Build New

The economics of nuclear power are defined by a fundamental dichotomy: **existing plants are among the cheapest electricity sources in operation**, while **new plants in Western markets have become among the most expensive to build**. This dichotomy creates a complex policy environment — extending the life of existing nuclear plants is economically compelling, but building new large nuclear plants in the US or UK has proven financially challenging.

For **existing nuclear plants** — where construction costs are largely sunk — the operational economics are highly attractive. US nuclear plants generate electricity at approximately **$30-50 per megawatt-hour (MWh)**, making them competitive with or cheaper than most other dispatchable electricity sources. Operating costs are predominantly fuel (uranium) and maintenance — uranium fuel costs approximately $5-8/MWh of nuclear generation, exceptionally low compared to natural gas ($20-50/MWh depending on gas prices). This cost advantage means that US nuclear plants that would otherwise be uneconomic to operate have received state and federal subsidies to remain open — a recognition that the 24/7 carbon-free electricity they provide has value beyond simple LCOE comparisons. The economic role of nuclear in national energy systems connects to the broader analysis of how the world's largest economies are decarbonising their electricity grids.

For **new large nuclear plants**, construction costs have proven highly variable. South Korea and China construct new nuclear at approximately **$3,000-5,000 per kilowatt (kW)** of capacity — delivering competitive LCOEs of approximately $50-70/MWh. By contrast, the Vogtle Units 3&4 in the US cost approximately **$16,000/kW**, and Hinkley Point C in the UK is on track for approximately **£19,000-20,000/kW** — among the highest construction costs ever recorded for a power plant. These Western overruns reflect the loss of nuclear construction supply chains and workforce expertise following decades without new build, regulatory complexity, first-of-a-kind construction risks, and inflation. Restoring Western nuclear competitiveness is a key policy challenge — and a primary rationale for the SMR approach. The chemical industry's nuclear-related product streams — from zircaloy fuel cladding to

reactor coolant chemicals — are directly tied to the nuclear construction and operating cost structure.

Nuclear Generation Cost — LCOE by Country and Reactor Type ($/MWh)

The white line chart below compares the levelised cost of electricity (LCOE) for nuclear energy across different countries and reactor types, illustrating the extraordinary gap between East Asian construction economics and Western market costs for new build.

LCOE AnalysisNuclear LCOE by Country/Type — 2024 ($/MWh)BusinessStats Research · Lazard LCOE Analysis 2024 · OECD/NEA Projected Costs 2025 $35US Existing $180US New Build

Eastern builds 3-5× cheaper than Western new builds Sources: Lazard LCOE Analysis v17 2024 · OECD/NEA Projected Costs of Generating Electricity 2025 · BusinessStats

SMRs & New Technology

Small Modular Reactors — The Technology That Could Transform Nuclear

Small Modular Reactors (SMRs) — defined as reactors with an output below **300 megawatts electric (MWe)** — are the most significant potential transformation in nuclear technology since the development of Pressurised Water Reactors in the 1950s. Over **80 SMR designs** are in development globally as of 2026, ranging from scaled-down versions of conventional PWR technology to radical new concepts including molten salt reactors, high-temperature gas reactors, and fast neutron reactors. The core promise of SMRs is factory manufacturing — building reactor modules in controlled factory environments and shipping them to site, rather than constructing bespoke plants from scratch in the field. This approach could theoretically reduce construction costs, construction times, and the risk of the cost overruns that have plagued large nuclear projects in Western markets.

The most advanced commercial SMR projects include **NuScale Power** (USA) with its VOYGR 77 MWe module — the first SMR design to receive Nuclear Regulatory Commission (NRC) design approval — though NuScale's first commercial project (Carbon Free Power Project in Idaho) was cancelled in 2023 due to cost increases. **Rolls-Royce SMR** (UK) is developing a 470 MWe PWR-based design targeting £2.5 billion per unit at scale. **GE Hitachi's BWRX-300** is among the most commercially advanced globally, with commitments from utilities in Canada, Poland, the US, and Sweden. **X-energy's Xe-100** (high-temperature gas-cooled reactor) is being developed with US Department of Energy support and commitments from Dow Chemical to replace fossil fuel steam at an industrial site in Texas — a potentially transformative application of nuclear heat for industrial decarbonisation, with direct implications for the global chemical industry's

energy transition.

The technology giant interest in SMRs is transformative for the industry's commercial prospects. **Microsoft signed a 20-year PPA with Constellation Energy** to restart Unit 1 of the Three Mile Island plant as Crane Clean Energy Center in Pennsylvania — operational as of late 2024. **Google signed nuclear PPAs with Kairos Power** for SMR output beginning in 2030. **Amazon has invested in X-energy** and signed agreements for SMR power. These deals represent approximately 10+ GW of committed nuclear demand from tech companies — a new class of nuclear customer whose reliability requirements (99.99% uptime for data centres) align perfectly with nuclear's 24/7 availability advantage. The convergence of AI compute demand and nuclear energy represents a structural shift in the energy industry that we track in our analysis of global data centre growth statistics.

SMR landscape 2026: 80+ designs in development globally. BWRX-300 (GE Hitachi) most commercially advanced — commitments from Canada, Poland, USA, Sweden. Rolls-Royce SMR (470 MWe) targeting £2.5B per unit at scale. Microsoft restarted Three Mile Island (Crane Clean Energy Center) for data centre power. Google signed Kairos Power SMR PPA for 2030+ delivery. Amazon invested in X-energy. Tech company nuclear PPA demand: 20+ GW by 2040.

SMR Designs in Development — Technology Type Breakdown

The grouped bar chart below shows the count of SMR designs in development globally by reactor technology type, illustrating the extraordinary breadth of innovation occurring across the nuclear sector — from scaled-down conventional PWRs to radical advanced concepts.

SMR TechnologySMR Designs in Development by Technology Type — 2026BusinessStats Research · IAEA SMR Technology Status Report · OECD/NEA 80+Total Designs 2030sFirst Commercial

PWR-based SMRs most advanced for near-term deployment Sources: IAEA Advanced Reactors Information System (ARIS) · OECD/NEA · BusinessStats Research 2026

Global Nuclear — Full Country Data Table

The sortable table below provides comprehensive nuclear data for all major nuclear nations, including reactors operating, capacity, annual generation, national electricity share, and reactors under construction. Click any column to sort.

Global Nuclear Energy by Country — Full Data 2025-2026Click column to sort

COUNTRY	REACTORS	CAPACITY (GW)	GENERATION (TWH)	NAT'L SHARE	BUILDING
United States	93	95.5 GW	778 TWh	~19%	0
France	56	61.4 GW	~340 TWh	~70%	2
China	55+	57.0 GW	~432 TWh	~5%	28
Russia	37	29.4 GW	~215 TWh	~20%	3
South Korea	26	26.0 GW	~180 TWh	~30%	3
Canada	19	14.1 GW	~96 TWh	~15%	0
Ukraine	15	13.8 GW	~88 TWh	~55%	2
United Kingdom	9	5.9 GW	~43 TWh	~15%	2
Japan	12*	11.2 GW*	~75 TWh	~9%	2
Germany	0	0 GW	0 TWh	0%	0
India	23	7.5 GW	~47 TWh	~3%	7
Belgium	7	5.9 GW	~43 TWh	~46%	0
Sweden	6	6.9 GW	~55 TWh	~29%	0
Slovakia	5	2.3 GW	~17 TWh	~59%	2
UAE	3	4.0 GW	~22 TWh	~20%	1

Key Insight Germany Turned Off Nuclear — And Emissions Rose

Germany completed its nuclear phase-out in April 2023, shutting down its last three operating reactors (Isar 2, Emsland, Neckarwestheim 2 — total ~4 GW). The decision — accelerated following Fukushima in 2011 — replaced approximately 60 TWh of zero-carbon electricity annually. The immediate result was a significant increase in German gas and coal consumption to fill the gap, raising German power sector CO emissions in 2023 compared to the counterfactual of keeping the plants open. A peer-reviewed study estimated the German nuclear phase-out has cost approximately €12 billion in additional carbon damage and thousands of premature deaths from fossil fuel air pollution. The German experience has become a cautionary case study in global energy policy — cited repeatedly by countries reconsidering nuclear phase-outs. Several German economists and climate scientists have publicly stated the phase-out was an error from a climate perspective.

Key Statistics

Global Nuclear Energy — Key Statistics at a Glance

440Operating Reactors (2026)32 countries. 413 GW capacity. 2,600 TWh/yr. 10% of world electricity. 778 TWhUSA — #1 by Generation93 reactors. 95.5 GW. ~19% of US electricity. Avg reactor age ~42 years. 70%France — Highest Share56 reactors. 61.4 GW. World's largest net electricity exporter. 6 new EPRs planned. 28China — Most Under Construction55+ operating. Target 150 GW by 2035. 6-8 new approvals/year. Hualong One exported. ~60Reactors Under ConstructionHighest since late 1980s. China 28, India 7, Turkey 4, South Korea 3, Russia 3. 4-12 gCO₂Carbon Intensity (per kWh)Comparable to wind. Far lower than solar, gas, or coal. IPCC-endorsed low-carbon source. 80+SMR Designs in DevelopmentFirst commercial SMR grid connection expected late 2020s. Tech companies signing PPAs. $35BVogtle 3&4 Final Cost (USA)2.2 GW. ~$16,000/kW. First new US units in ~30 years. vs $3,000-5,000/kW in Asia. 59%Slovakia — 2nd Highest Share5 reactors. 2.3 GW. Nuclear supplies majority of national electricity. 2 more being added. ~$100/lbUranium Price (2024 Peak)Up from $25/lb (2020). Driven by nuclear renaissance investment + supply concerns. 400K+Direct Nuclear Industry JobsGlobal direct employment. US alone ~100,000. Highly skilled, high-wage positions. 0.03Deaths per TWh (Safest Energy)Comparable to wind/solar. Coal: 24.6. Oil: 18.4. Gas: 2.8. Nuclear is statistically safest.

Forecast 2030

Global Nuclear Forecast 2030 — Capacity to Reach 500 GW, Renaissance Accelerating

Global nuclear capacity is projected to grow from approximately 413 GW (2026) to approximately **480-520 GW by 2030**, driven primarily by China's construction programme, Indian expansion, and reactor life extensions in the United States and Europe. By 2035, capacity could reach **550-600 GW** if current construction pipelines progress on schedule. The IEA's Net Zero by 2050 scenario envisions global nuclear capacity reaching approximately **800-900 GW by 2050** — more than double the current level — as nuclear provides the baseload carbon-free power that intermittent renewables cannot consistently supply.

The most significant near-term growth drivers are well-established. China's addition of 6-8 reactors per year will drive its fleet from approximately 57 GW to approximately **150 GW by 2035**. India's ambitious target of **22.5 GW by 2031** (from 7.5 GW currently) requires completing 7 reactors under construction and building several new sites. South Korea — which had planned to phase out nuclear under the previous

government — has now reversed course and committed to maintaining nuclear at approximately 30% of the electricity mix through 2038 and beyond, with new builds likely. Eastern European countries including Poland, Romania, Czech Republic, and Bulgaria are all progressing with new nuclear projects — recognising that the continent's energy security requires diversification away from Russian gas imports. The relationship between nuclear energy expansion and economic development in the world's largest economies makes nuclear capacity a key leading indicator of industrial energy security planning.

The **SMR wildcard** could significantly accelerate nuclear growth beyond these baseline projections. If BWRX-300, Rolls-Royce SMR, or another design achieves commercial deployment with costs near initial targets, the 2030s could see an SMR construction wave comparable in scale to the wind and solar buildout of the 2010s. The technology companies that have signed nuclear PPAs — representing cumulative demand potentially exceeding **20 GW by 2040** — are effectively pre-funding the SMR industry's commercial scale-up. The role of digital economy growth in driving electricity demand — and therefore nuclear investment — is a crucial structural driver that few energy analysts adequately captured even five years ago.

Global nuclear forecast 2030: Capacity to reach 480-520 GW by 2030 (from 413 GW). China targeting 150 GW by 2035. IEA Net Zero scenario requires 800-900 GW by 2050. SMR first commercial deployment expected late 2020s. Tech companies (Microsoft, Google, Amazon) driving 20+ GW of nuclear demand through data centre PPAs. Eastern Europe building first-ever nuclear capacity in Poland, Romania, Czech Republic. Nuclear Outlook Global Nuclear Energy — 2030 Key Projections 480-520 GWGlobal Capacity 2030 150 GWChina Target 2035 800-900 GWIEA NZ2050 Target 2030sFirst SMR Commercial 20+ GWTech Company PPA Demand +12%World Elec. Share 2030E

FAQ

Frequently Asked Questions — Global Nuclear Energy

As of 2026, there are approximately **440 operating nuclear reactors** across 32 countries, with a total installed capacity of approximately **413 gigawatts (GW)**. Approximately 60 additional reactors are under construction globally, predominantly in China (28), India (7), South Korea (3), and Russia (3). The US has the largest fleet (93 reactors), followed by France (56), China (55+), Russia (37), and South Korea (26). Global nuclear capacity peaked at ~395 GW in 1996, dipped post-Fukushima, and has since recovered and expanded past its previous peak.

Nuclear energy provides approximately **10% of global electricity**, generating approximately 2,600 TWh annually out of ~28,000-29,000 TWh total. This share peaked at approximately **17.5% in 1996** and fell through the 2000s-2010s. It has stabilised since ~2016 and is projected to grow toward 12-15% by 2040 as new capacity comes online in China, India, and Eastern Europe. Nuclear is the **world's second-largest low-carbon electricity source** after hydropower, ahead of wind and solar in absolute generation terms.

The **United States has the world's largest nuclear fleet with 93 reactors** at 54 sites, generating approximately 778 TWh/year (~19% of US electricity). By nuclear electricity share, **France leads** at approximately 70% from 56 reactors. By construction pace, **China leads** with 28 reactors under construction and the world's fastest-growing nuclear fleet. By 2035, China is targeting 150 GW — which would make it the world's largest nuclear electricity producer by capacity, surpassing the United States.

France generates approximately **70% of its electricity from nuclear power** — the highest share of any large economy. France operates 56 reactors across 18 sites with total capacity of approximately 61 GW. France's nuclear programme was built rapidly 1974-1999 using standardised PWR designs enabling economies of repetition. France is the **world's largest net electricity exporter**, selling surplus nuclear power to Germany, UK, Belgium, Italy, and Switzerland. The French government has committed to building 6 new EPR reactors, with potentially 8 more, targeting continued high nuclear share through 2050.

China has approximately **28 nuclear reactors under construction** as of 2026 — the world's largest nuclear construction programme. China's fleet has grown from 13 reactors (2013) to 55+ (2026). China receives grid connection approval for approximately 6-8 new reactors annually. The national target is **150 GW by 2035** and 200+ GW by 2050. China deploys both foreign-derived designs (Westinghouse AP1000, French EPR) and its own Hualong One (HPR1000) which is also being exported internationally to Pakistan and Argentina.

SMRs are nuclear reactors below **300 MWe output** — smaller than conventional plants (1,000-1,600 MWe). The key advantage is **factory manufacturing** — building modular reactor components in controlled factory environments then shipping to site, theoretically reducing construction time and cost. Over 80 SMR designs are in development globally. The most advanced commercially include the BWRX-300 (GE Hitachi), Rolls-Royce SMR (UK), and X-energy Xe-100. First commercial deployment expected **late 2020s to early 2030s**. Tech companies (Microsoft, Google, Amazon) have signed nuclear PPAs targeting SMR output from ~2030.

Nuclear energy produces **approximately 4-12 grams of CO_2 equivalent per kWh** on a full life-cycle basis — comparable to wind (7-15 gCO/kWh) and much lower than solar (20-50), gas (400-490), or coal (820-1,050). The modest lifecycle carbon comes from uranium mining, reactor manufacturing, and

decommissioning — not electricity generation itself, which produces **zero direct CO_2 emissions**. The IPCC consistently identifies nuclear as a key low-carbon technology for limiting warming to 1.5°C. Nuclear is categorised as a sustainable activity in the EU Taxonomy for sustainable finance.

The March 2011 Fukushima Daiichi disaster triggered significant nuclear policy changes globally. **Japan shut all 54 reactors** by May 2012; approximately 12 have restarted as of 2026. **Germany accelerated its phase-out**, closing all nuclear plants by April 2023. Belgium, Switzerland, and Taiwan announced phase-outs. However, the global impact was less severe than feared — France maintained its fleet, South Korea continued building, China's programme paused briefly. Global nuclear generation fell ~11% in 2011-2012 but has since recovered. Most strikingly, many countries that announced phase-outs post-Fukushima (Belgium, Japan, South Korea, Sweden) have since **reversed course** — recognising nuclear's role in energy security and decarbonisation.

Nuclear is statistically one of the safest energy sources per unit of energy generated. Life-cycle studies show nuclear causes approximately **0.03-0.07 deaths per TWh** — similar to wind (0.04) and solar (0.02-0.03), and far safer than coal (24.6), oil (18.4), and gas (2.8). Even including the major accidents at **Chernobyl** (1986, ~30-60 direct deaths, disputed long-term cancer toll of 4,000-60,000) and **Fukushima** (2011, zero confirmed direct radiation deaths, ~2,200 evacuation-related deaths), nuclear remains far safer per unit of energy than fossil fuels when accounting for ongoing air pollution mortality. The WHO estimates air pollution from fossil fuel combustion causes approximately 7 million deaths annually worldwide.

Nuclear LCOE varies enormously by market and plant type. **Existing US nuclear plants**: approximately $30-50/MWh — among the cheapest dispatchable electricity. **New large nuclear in South Korea/China**: approximately $50-70/MWh at $3,000-5,000/kW construction cost. **New large nuclear in the US**: approximately $130-180/MWh post-Vogtle overruns (~$16,000/kW). **New large nuclear in the UK** (Hinkley Point C): approximately £90-100/MWh ($110-130/MWh) at current cost trajectory. **SMRs** are projected to reach $60-90/MWh once manufacturing scales up in the 2030s. The cost competitiveness gap between Asian and Western new nuclear builds is the defining challenge of the global nuclear renaissance.

Global uranium mine production totals approximately **48,000-52,000 tonnes of uranium (tU) annually**. **Kazakhstan leads** at approximately 43% of global output (~21,000 tU/yr). Canada is second (~7,000-8,000 tU/yr) from the Athabasca Basin's high-grade deposits. Namibia, Uzbekistan, Russia, Australia, and Niger are also significant. Global reactors require approximately **67,000-69,000 tU annually** — the gap between mine supply and demand is met by secondary sources (reprocessed uranium, inventory drawdown). Uranium prices rose from approximately **$25/lb (2020) to ~$100/lb (2024)** driven by nuclear

renaissance investment and supply chain concerns.

Countries with active nuclear construction in 2026: **China** (28 reactors), **India** (7), **Turkey** (4 — Akkuyu, built by Rosatom), **Egypt** (4 — El-Dabaa, Rosatom), **South Korea** (3), **Russia** (3), **UK** (2 — Hinkley Point C), **France** (2 — Flamanville 3 completing), **Slovakia** (2 — Mochovce 3&4), **Bangladesh** (2 — Rooppur, Rosatom), **UAE** (1 — Barakah Unit 4), **Ukraine** (2), **Japan** (2). Additionally, **Poland, Sweden, Netherlands, Czech Republic, Romania** have new nuclear projects in planning/early development stages.

Nuclear's outlook has improved dramatically since 2022. Key drivers: **energy security** (Russia-Ukraine war), **decarbonisation** (net-zero commitments need 24/7 carbon-free power), and **AI data centre demand** (tech companies need uninterrupted clean electricity). The IEA's Net Zero scenario requires nuclear to **double to 800-900 GW by 2050**. China alone will add ~100 GW by 2035. SMRs could enable a new construction wave in the 2030s. Countries that planned phase-outs (Belgium, Japan, South Korea, Sweden) have reversed course. At the COP28 climate conference in 2023, 22 countries signed a declaration to triple global nuclear capacity by 2050. Nuclear's prospects today are the brightest in 40 years.

Data Sources & References

Primary: IAEA Power Reactor Information System (PRIS) — Global reactor database, capacity, construction status Q1 2026

Primary: IEA World Energy Statistics & Balances — Nuclear generation by country, electricity share data

Primary: OECD/NEA — Projected Costs of Generating Electricity 2025 Edition

BusinessStats: All country rankings, capacity analysis, LCOE comparisons, SMR technology assessments, and 2030 forecast projections are BusinessStats proprietary research combining IAEA PRIS, IEA, OECD/NEA, BP Statistical Review 2025, Lazard LCOE Analysis v17, and national energy ministry data.

Reactor counts from IAEA PRIS as of Q1 2026. Generation figures for calendar year 2024-2025 from IEA and national grid operators. Japan reactor count (*) reflects units with restart approval as of 2026, not all 33 operable units. LCOE figures in 2024 USD. Not investment advice.

global nuclear energy statisticsnuclear energy worldwide 2026nuclear power statistics 2026nuclear energy factsnuclear reactors worldwide 2026nuclear capacity by countrynuclear energy production by countryUSA nuclear energy statisticsFrance nuclear energy percentageChina nuclear energy statisticsRussia nuclear energynuclear power plants worldwidenuclear energy percentage world electricitynuclear energy market sizenuclear energy growthsmall modular reactors SMRnuclear energy

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STATISTICS REPORT

Fossil Fuel Consumption in the U.S. — Statistics & Facts 2026

Updated Mar 28, 2026 · businesstats.com/us-fossil-fuel-consumption

97.3 TOTAL QUADS (2023)	**80%** FOSSIL FUEL SHARE	**20 mb/d** OIL CONSUMPTION
30.5 Tcf NATURAL GAS/YR	**5,000 MT** CO_2 EMISSIONS	**$780B** MARKET VALUE

Overview

$780B Market — US Fossil Fuel Consumption at a Crossroads

The United States energy system is undergoing its most significant structural transformation since the electrification of the 20th century — yet fossil fuels remain overwhelmingly dominant. At approximately **97.3 quadrillion British thermal units (quads)** of total primary energy consumption in 2023, the US is the world's second-largest energy consumer in absolute terms (behind China's ~157 quads) and the world's highest per-capita energy consumer among major economies at approximately **290 million BTU (MMBtu) per person per year**. Of this total, fossil fuels — petroleum, natural gas, and coal — account for approximately **78 quads, or roughly 80% of all energy consumed**. This represents a gradual but real decline from the fossil fuel peak share of approximately 93% in the 1970s, driven by the growth of nuclear power in the 1980s-1990s and the explosive growth of wind and solar since 2010. But 80% is still 80%: four out of every five units of energy that powers American homes, factories, vehicles, and data centres comes from burning carbon-containing fuels that were laid down millions of years ago.

Understanding the scale of US fossil fuel consumption requires context. The US alone consumes approximately **20% of the world's oil production** despite having just 4.2% of the global population. American cars, trucks, and aircraft burn approximately **9 million barrels of gasoline per day** — more than the total oil consumption of every country in Africa combined. American homes and businesses consume approximately **30.5 trillion cubic feet of natural gas annually** — enough to heat 78 million homes for a full year. American power plants, steel mills, and industrial facilities burn approximately **439 million short tons**

of coal per year — down 60% from the 2007 peak but still a substantial quantity by global standards. The economic value of this fossil fuel consumption is approximately **$780 billion annually** in end-use energy expenditure — representing one of the largest single commodity flows in the global economy and a foundational driver of the US financial markets and broader economic activity.

The transformation currently underway is both real and — by the standards of energy systems, which typically take decades to shift — rapid. Coal's collapse from 50% of US electricity generation (2005) to 16-17% (2023) is genuinely historic, driven by a combination of cheap shale gas, falling wind and solar costs, and increasingly stringent environmental regulations. Electric vehicle adoption is accelerating, with EVs representing approximately 7-8% of new car sales in 2023-2024, threatening the long-term dominance of gasoline in transportation. The Inflation Reduction Act's $369 billion in clean energy incentives is triggering a construction boom in solar, wind, and battery storage that is expected to add more clean energy capacity in the 2023-2032 decade than in the previous three decades combined. Yet the inertia of the existing fossil fuel system is enormous: approximately **280 million gasoline and diesel vehicles** are on US roads, requiring decades to replace; industrial processes (steel, cement, chemicals) remain deeply dependent on fossil fuel combustion that is technically and economically difficult to decarbonise; and natural gas is so deeply embedded in US electricity, heating, and industrial infrastructure that even optimistic clean energy scenarios see it remaining a major fuel through at least 2035. The interaction between fossil fuel demand and the broader macroeconomy is one of the key drivers of inflation dynamics that central banks and policymakers must manage.

US total primary energy consumption: 97.3 quads (2023). Fossil fuels supply 80%: petroleum 36%, natural gas 32%, coal 12%. Nuclear provides 8% and renewables 12% of primary energy (21% of electricity). The US consumes 20 million barrels of oil per day — 20% of global supply. CO_2 emissions total approximately 5,000 million metric tonnes annually.

Oil Consumption

US Oil Consumption — 20 Million Barrels Per Day, 36% of Total Energy

Petroleum remains the largest single component of US energy consumption, accounting for approximately **35-36 quads (36% of total primary energy)** in 2023. In volume terms, the US consumed approximately **20.0-20.5 million barrels of oil per day (mb/d)** — making it the world's largest oil consumer by a considerable margin, accounting for approximately 20% of global petroleum consumption. The uses of petroleum in the US are dominated by **transportation**, which accounts for approximately 70% of all

petroleum consumption. Gasoline alone — the fuel for America's approximately 280 million passenger cars and light trucks — consumes approximately **9 mb/d**, or approximately 44% of total US petroleum. Diesel fuel (for heavy trucks, freight, and some passenger vehicles) accounts for approximately **4.8 mb/d (24%)**. Jet fuel powers the world's busiest aviation system at approximately **1.8 mb/d (9%)**. The remaining petroleum consumption (approximately 23%) is split between industrial feedstocks (petrochemicals used to make plastics, fertilisers, and other materials), propane for heating, heavy fuel oil for ships and industrial boilers, lubricants, and asphalt.

Despite consuming approximately 20 mb/d, the US also produces approximately **13.2 mb/d** — making it simultaneously the world's largest oil producer. The US shale revolution — enabled by hydraulic fracturing (fracking) and horizontal drilling technologies that unlocked oil from previously inaccessible tight rock formations — transformed the US from a net oil importer of approximately 10 mb/d in 2007 to a net exporter on an annual basis by 2019-2020. The Permian Basin in West Texas and New Mexico is the epicentre of US production, accounting for approximately 6 mb/d alone — more than most OPEC member countries produce. Despite this domestic production boom, the US still imports approximately **6-8 mb/d** (primarily heavy crude oil grades from Canada, which is the largest US oil supplier, followed by Mexico and Saudi Arabia) because US refineries are configured to process heavier crudes that shale production cannot provide. This complex trade dynamic — simultaneously producing and importing at large scale — reflects the technical realities of refinery configurations and crude oil quality matching. The infrastructure supporting this massive oil ecosystem is deeply embedded in the world's largest economy and represents trillions of dollars of sunk capital.

The long-term trajectory of US oil consumption is downward, but slowly. Electric vehicles (EVs) are the primary threat to gasoline demand — EVs represented approximately 7-8% of new car sales in 2023-2024, and if current adoption trends continue, could displace approximately 1-2 mb/d of gasoline demand by 2030. However, with 280 million existing gasoline and diesel vehicles on the road — and average vehicle lifetimes of 12-15 years — the transition will take decades to fully materialise in fuel demand statistics. Aviation fuel demand has largely recovered from COVID-19 and shows limited near-term alternatives (sustainable aviation fuel represents less than 0.1% of jet fuel currently). Industrial petrochemical demand is actually growing, driven by plastics demand in packaging, construction, and consumer goods. The EIA's base-case forecast projects US liquid fuel consumption declining from approximately 20 mb/d to approximately 18-19 mb/d by 2030 — a real but gradual reduction. The extraordinary growth of data centers — which require massive electricity inputs — is one of the paradoxes of the digital economy: it reduces direct oil consumption but increases electricity demand that is partly met by natural gas.

US Petroleum Consumption by Sector — 2023

The animated horizontal bars below show US petroleum consumption by end-use sector, with transportation's overwhelming dominance immediately visible. The industrial sector's growing role as a petroleum feedstock consumer (rather than combustion fuel) reflects the increasingly chemical rather than thermal nature of much petroleum use in advanced economies.

Oil by Sector US Petroleum Consumption by Sector — 2023 (Million Barrels/Day) BusinessStats Research · EIA Monthly Energy Review 2024

Natural Gas

US Natural Gas Consumption — 30.5 Tcf, World's Largest Consumer

Natural gas has become the backbone of the US energy system — supplying approximately **32% of total primary energy** and serving as the single largest fuel for electricity generation. US natural gas consumption reached approximately **30.5 trillion cubic feet (Tcf)** in 2023 — the world's largest national gas consumption by a significant margin. The shale gas revolution, which unlocked vast quantities of natural gas from tight rock formations across Texas, Pennsylvania, Louisiana, and other states, has been transformative: US natural gas production surged from approximately 18 Tcf in 2005 to over 36 Tcf in 2023 — a near-doubling in production that drove prices from $10+ per MMBtu (pre-shale) to as low as $1.50-2.00/MMBtu in periods of supply glut. These low prices made natural gas the primary replacement fuel for retiring coal power plants, dramatically lowering US electricity-sector CO_2 emissions even before large-scale renewable energy deployment became significant.

Natural gas consumption divides across four major sectors. **Electric power generation** is the largest at approximately **36% of total gas use (~11 Tcf)** — natural gas-fired power plants now generate approximately 43% of US electricity, surpassing coal as the dominant power generation fuel beginning around 2016 and maintaining that lead through 2026. **Industrial** uses account for approximately **33% (~10 Tcf)** — including chemical manufacturing (natural gas as both feedstock and fuel), oil refining, food processing, metal production, and glass and cement manufacturing. **Residential** sector accounts for approximately **15% (~4.6 Tcf)** — primarily for space heating (approximately 47% of US homes heat with gas), water heating, and cooking. **Commercial** buildings (offices, stores, restaurants, hospitals) account for approximately **10% (~3 Tcf)** for similar applications. The remaining approximately 6% covers pipeline operations (gas used to compress and move gas through the pipeline system) and the fast-growing LNG export terminal operations. The US became the world's largest LNG exporter in 2023, with approximately

11-12 Bcf/d of LNG export capacity representing one of the most significant shifts in global energy trade flows of the decade. The growth of AI computing infrastructure — discussed in our analysis of the AI market size — is also driving significant growth in US natural gas demand through increased data center electricity consumption.

Unlike coal and oil, US natural gas consumption is projected to remain relatively stable or even grow modestly through the late 2020s, before declining as renewable energy capacity displaces gas-fired power generation. The expansion of LNG export capacity (with projects like Sabine Pass, Corpus Christi, and Golden Pass adding approximately 4-5 Bcf/d of new capacity through 2027) will absorb substantial volumes of domestically produced gas for export, maintaining demand for gas production even as domestic power-sector use begins to decline. The industrial sector's gas demand is highly stable — chemical and fertiliser plants represent multi-decade capital investments with essentially no ability to switch fuels rapidly. Residential heating demand is very slowly declining as heat pump adoption grows (heat pumps are now outselling gas furnaces in the US for the first time) and building efficiency standards improve. The net effect is a US natural gas market that remains very large through the 2020s and 2030s, even as its share of electricity generation gradually declines. The impact of natural gas price volatility on consumers connects directly to the broader dynamics tracked in consumer spending and discretionary income research.

US Natural Gas Consumption by Sector — 2023 (Tcf)

The navy bar chart below shows US natural gas consumption by end-use sector, illustrating the balance between power generation, industrial, residential, commercial, and export-related demand. Each bar can be hovered or tapped for exact figures.

Natural Gas Sectors US Natural Gas Consumption by Sector — 2023 (Trillion Cubic Feet) BusinessStats Research · EIA Monthly Energy Review 2024 11.0 Tcf Electric Power Gas Consumption (Tcf) Electric power is largest sector at 36% Sources: BusinessStats Research · EIA Monthly Energy Review · DOE

Coal Decline

US Coal Consumption — 60% Decline Since 2007, 16% of Electricity Generation

The decline of US coal consumption is one of the most dramatic energy transitions in American history. From a peak of approximately **1.13 billion short tons in 2007**, US coal consumption fell to approximately

439 million short tons in 2023 — a **61% reduction in just 16 years**. This collapse is not primarily a policy-driven transition (though environmental regulations played a role) but fundamentally an economic one: the shale gas revolution made natural gas so cheap that coal-fired power plants became economically uncompetitive, and the rapid cost decline of wind and solar has continued that displacement process. The economic logic is stark: in 2023, the average cost of new wind and solar generation was approximately **$25-45/MWh** — cheaper than the operating costs alone of many existing coal plants, which average approximately **$30-40/MWh** in fuel and operating costs, before even accounting for capital costs or emissions compliance.

Coal in the US is now almost exclusively a power generation fuel: approximately **91% of coal consumption** goes to electric power plants, with the remaining 9% going to industrial coking coal (for steel production in blast furnaces). Coal's share of US electricity generation fell from **50% in 2005** to approximately **16-17% in 2023** — a 34-percentage-point decline in 18 years. The states most affected by this transition are the traditional coal-producing and coal-consuming regions of Appalachia (West Virginia, Kentucky), the Powder River Basin (Wyoming, Montana), and the industrial Midwest (Illinois, Indiana). The coal workforce has declined from approximately 90,000 miners in 2012 to approximately 40,000 in 2023 — devastating communities that built their economies around coal production. The social and economic dimensions of this transition are deeply complex: communities that depended on coal jobs for generations face unemployment, reduced tax bases, and difficulty attracting alternative industries. The Inflation Reduction Act includes specific provisions for "energy communities" — defined as coal-dependent areas — that receive enhanced tax credits for clean energy investment, a deliberate policy to direct clean energy economic development to the regions most harmed by coal's decline. The transition of the financial technology sector has also created opportunities for digital-economy investment in post-coal communities, though uptake has been uneven.

US Coal Consumption — Decline from 2007 Peak to 2026 (Million Short Tons)

The white line chart below tracks US coal consumption from 2000 through 2026, capturing the plateau in the 2000s, the post-2008 decline driven by shale gas competition, and the acceleration of that decline as solar and wind costs fell through the 2010s and 2020s. The downward trajectory is clear and structural — not cyclical.

Coal Consumption Trend US Coal Consumption — 2000 to 2026 (Million Short Tons) BusinessStats Research · EIA Annual Coal Report · Monthly Energy Review 439M2023 Tons -61%Since 2007 Peak 16%Electricity Share

Structural decline — gas + renewables replacing coal Sources: BusinessStats Research · EIA Annual Coal Report · Monthly Energy Review Key Insight In 2023, the US Generated More Electricity from Wind Alone Than from Coal

For the first time in American energy history, wind power generated more electricity than coal in the United States for multiple months in 2023, and wind came close to matching coal's annual generation for the full year (approximately 430 TWh vs 770 TWh). Solar + wind combined now generates approximately 14% of US electricity — a figure that was essentially zero in 2005. Coal, which generated 50% of US electricity in 2005, has fallen to approximately 16-17%. The displacement is driven by economics, not ideology: a new wind or solar plant built in 2024 generates electricity at approximately $25-35/MWh — cheaper than operating an existing coal plant, let alone building a new one. At the current rate of coal retirement (approximately 5-10 GW per year), coal could supply less than 10% of US electricity by 2030.

CO_2 Emissions

US Fossil Fuel CO_2 Emissions — 5,000 $MTCO_2$, Down 16% from 2007 Peak

Fossil fuel combustion in the United States produces approximately **4,900-5,100 million metric tonnes of CO_2 equivalent ($MTCO_2e$) annually**, making the US the world's second-largest greenhouse gas emitter after China. US energy-related CO_2 emissions peaked at approximately **6,000 $MTCO_2$ in 2007** before declining — primarily due to the substitution of natural gas for coal in electricity generation (gas produces approximately 50% less CO_2 per unit of electricity than coal) and improvements in vehicle fuel efficiency standards. The decline from the 2007 peak represents approximately a **16% reduction** over 16 years — meaningful progress, but far slower than what climate scientists assess is necessary to meet the Paris Agreement goals of limiting global warming to 1.5-2°C above pre-industrial levels.

The **transportation sector** is now the largest source of US CO_2 emissions, accounting for approximately **29%** of total GHG emissions — surpassing the electric power sector (approximately 25%) for the first time in 2016 and maintaining that lead since. This shift reflects the dramatic success of coal-to-gas and coal-to-renewables switching in the electricity sector, which has significantly reduced power-sector emissions, while transportation has proven more resistant to decarbonisation due to the slow fleet turnover described above. **Industry** accounts for approximately 23% of emissions, **commercial and residential buildings** approximately 13%, and **agriculture** approximately 10%. The US emits approximately **14.8 metric tonnes of CO_2 per person annually** — among the highest of any major developed economy, substantially above the EU average (~6.7 Mt/person), Japan (~8.6 Mt/person), and Canada (~14.2 Mt/person), though below the

Gulf states and some other high-income nations. The implications of US emissions for global capital markets and the clean energy transition are enormous — as the world's second-largest emitter, US climate policy decisions ripple through international negotiations, energy markets, and investment flows globally.

The IRA's projected emissions reductions are substantial but still insufficient to meet the US's stated climate goals. Even with full IRA implementation, the US is projected to reduce emissions to approximately **40-45% below 2005 levels by 2030** — meaningfully short of the Biden Administration's pledged 50-52% reduction target, though significantly better than the pre-IRA trajectory of approximately 28-30% below 2005. The gap between stated policy targets and projected outcomes reflects the difficulty of decarbonising aviation, shipping, heavy industry, and agriculture — sectors where current technology cannot simply substitute electricity or renewables for fossil fuels. Methane emissions from natural gas production and distribution are also a growing concern: methane is approximately 80× more potent as a greenhouse gas than CO_2 over 20 years, and the expansion of US natural gas production has created significant methane leakage that partially offsets the CO_2 benefits of coal-to-gas switching in power generation.

US Energy Mix — How the Electricity Generation Fuel Share Has Shifted

The navy donut chart below shows the current US electricity generation fuel mix (2023), illustrating how dramatically the electricity sector has changed from the coal-dominant picture of 2005. Natural gas (43%) is now the clear leader, with renewables (21%) having nearly caught and surpassed coal (17%). The transformation of the electricity sector is the central achievement of US energy transition to date — and the foundation for future decarbonisation through electrification of vehicles, heating, and industry.

Electricity Generation US Electricity Generation by Fuel — 2023 BusinessStats Research · EIA Electric Power Monthly 2024

US CO_2 Emissions by Sector vs 2005 Baseline

The white grouped bar chart below compares US CO_2 emissions by major sector in 2005 (near-peak) versus 2023, illustrating where reductions have been achieved (electric power: down ~40%) and where progress has been limited (transportation: down only ~8%). The contrast between the electricity sector's success and transportation's stubbornness captures the fundamental challenge of the US clean energy transition.

Emissions Comparison US CO_2 Emissions by Sector — 2005 vs 2023 ($MTCO_2$) BusinessStats Research · EPA GHG Inventory 2024 · EIA -16%Total Since 2007 -40%Power Sector

Power sector leads; transport lags Sources: BusinessStats Research · EPA GHG Inventory · EIA Monthly Energy Review

US vs Major Economies — Per Capita Fossil Fuel CO_2 Emissions

The white rank bars below compare per capita CO_2 emissions across the world's major economies, placing the US in international context. At approximately 14.8 metric tonnes per person, US per capita emissions are among the highest of any major economy — reflecting the combination of high vehicle ownership and distances travelled, energy-intensive homes (often larger than international peers), and energy-intensive industrial and agricultural systems. The global comparison context is critical for understanding the stakes of US climate policy.

US CO_2 emissions: approximately 5,000 $MTCO_2$ annually — down 16% from 2007 peak. Transportation (29%) is now the largest sector, surpassing electric power (25%) as coal-to-gas and renewables switching reduced power sector emissions by approximately 40% since 2005. Per capita US emissions: 14.8 metric tonnes — 2× the EU average. The IRA projects reducing emissions 40-45% below 2005 levels by 2030.

US Energy Consumption — Full Data Table by Fuel and Sector

The sortable table below provides comprehensive US energy data by fuel type and key metrics, from total consumption through CO_2 intensity and year-over-year change. Click any column header to sort. Note the dramatic contrast between coal (-61% since peak) and natural gas (+67% since 2005) — both measured in their dominant end-use metric.

US Fossil Fuel Consumption — Key Metrics 2023 Click column to sort

FUEL	CONSUMPTION	ENERGY SHARE	CO_2 EMISSIONS	VS 2005	PRIMARY USE
Petroleum (Oil)	~20.2 mb/d	36%	~2,350 $MTCO_2$	-5%	Transportation (70%)
Natural Gas	30.5 Tcf	32%	~1,700 $MTCO_2$	+37%	Power + Industrial (69%)
Coal	439M short tons	12%	~820 $MTCO_2$	-61% vs 2007	Electric power (91%)
Nuclear	~8.0 quads	8%	~0 $MTCO_2$	+5%	Electric power (100%)
Renewables (all)	~12 quads	12%	~0 $MTCO_2$	+200%	Power + Transport
Wind	~4.2 quads	4%	~0 $MTCO_2$	+1,400%	Electric power (100%)
Solar	~2.1 quads	2%	~0 $MTCO_2$	+5,000%	Electric power (100%)

Hydropower	~2.5 quads	2.6%	~0 $MTCO_2$	-10%	Electric power (100%)

Key Statistics

US Fossil Fuel Consumption — Key Statistics at a Glance

97.3 QTotal Primary Energy (2023)Quadrillion BTU. World's 2nd largest consumer after China (157 quads). 80%Fossil Fuel Share of EnergyDown from 93% (1970s peak). Oil 36%, gas 32%, coal 12%. 20 mb/dOil ConsumptionWorld's largest. 20% of global supply. Gasoline alone: 9 mb/d. 30.5 TcfNatural Gas ConsumptionWorld's largest. 43% of US electricity. Power sector: 11 Tcf. 439MCoal Consumption (Short Tons)Down 61% from 2007 peak (1.13B tons). Power sector: 91% of use. 16-17%Coal's Electricity ShareDown from 50% (2005). Wind+Solar now: 14% and rising fast. 5,000 MTAnnual CO_2 EmissionsWorld #2 after China. Down from 6,000 MT peak (2007). -16%. 14.8 MTPer Capita CO_2 (tonnes/person)2× EU average (6.7). Transport: 29% of total emissions. $780BFossil Fuel Market ValueEnd-use expenditure. Gasoline: $350B. Utility gas: $150B. $369BInflation Reduction ActClean energy incentives 2022-2032. Largest US climate investment ever. 21%Renewables Electricity ShareWind 10%, hydro 6%, solar 4%, biomass 1%. Up from 10% (2010). 13.2 mb/dUS Oil ProductionWorld's largest producer. Permian Basin: ~6 mb/d alone. Shale revolution.

Forecast 2028

US Energy Forecast 2028 — Fossil Fuels to ~74%, EVs Accelerate, Coal Below 300M Tons

The EIA's Annual Energy Outlook 2025 and Short-Term Energy Outlook project that US total primary energy consumption will remain relatively stable at approximately **95-98 quads through 2028** — roughly flat from today despite economic and population growth, reflecting continued energy efficiency improvements across all sectors. Within this flat total, however, the composition will continue to shift away from fossil fuels. The EIA's base case projects fossil fuels declining from approximately 80% of total energy (2023) to approximately **74-76% by 2028** — driven primarily by continued renewable energy growth in electricity and the early impacts of EV adoption in transportation. Coal is projected to fall below **300 million short tons by 2028**, potentially below 10% of electricity generation. Natural gas is projected to remain the largest electricity generation fuel through 2028, declining gradually as wind and solar capacity additions outpace demand growth.

The Inflation Reduction Act's full economic impact is still emerging — the law was passed in August 2022 and most of its major incentives will take 5-10 years to fully deploy. Goldman Sachs estimates total clean energy investment triggered by the IRA at approximately **$3 trillion through 2032** — far exceeding the $369 billion in direct government outlays, as private capital follows the incentives into solar, wind, battery storage, EV manufacturing, and clean hydrogen. If this investment materialises as projected, the US could be generating approximately **35-40% of its electricity from wind and solar by 2030** — up from 14% in 2023 — representing the largest peacetime industrial buildout in American history. The interaction between the clean energy transition and the growth of power-hungry technologies like AI data centres — explored in our fintech and digital infrastructure analysis — creates an interesting paradox: AI could simultaneously accelerate clean energy deployment while also increasing electricity demand that is partly met by natural gas in the near term.

US energy forecast 2028: fossil fuels declining from 80% to ~74-76% of total energy. Coal to fall below 300M short tons and under 10% of electricity. Wind+Solar to reach 35-40% of electricity by 2030. EV adoption projected to displace 1-2 mb/d of gasoline by 2030. IRA expected to trigger $3T in private clean energy investment by 2032 — the largest US industrial buildout in modern history. Energy Transition Outlook Key US Energy Projections — 2028 74-76%Fossil Fuel Share 2028 <300MCoal Consumption (Short Tons) 35-40%Wind + Solar Electricity 2030 -1-2 mb/dOil Demand from EV Displacement $3TIRA Private Investment by 2032 -40%Emissions vs 2005 by 2030 (Target)

FAQ

Frequently Asked Questions — US Fossil Fuel Consumption

The US consumed approximately **97.3 quadrillion BTU (quads)** of total primary energy in 2023, with fossil fuels accounting for approximately **78 quads — roughly 80% of the total**. By fuel: petroleum (oil) accounts for approximately 35-36 quads (36%), natural gas approximately 31-32 quads (32%), and coal approximately 11-12 quads (12%). The remaining 20% comes from nuclear energy (~8%) and renewables (~12% of primary energy, or ~21% of electricity generation). The US is both the world's largest energy consumer per capita among major economies and the world's largest oil and natural gas producer.

Fossil fuels supply approximately **80% of total US primary energy** as of 2023-2024, down from approximately 93% in the 1970s. This breaks down as petroleum (36%), natural gas (32%), and coal (12%). The electricity sector shows the fastest transition: coal fell from 50% of generation (2005) to approximately **16-17% in 2023**, displaced by natural gas and renewables. Transportation remains the most fossil-fuel-

dependent sector at approximately 90%+ petroleum-powered, while the industrial sector uses gas for both process heat and chemical feedstocks. Despite the transition's progress, the US is still fundamentally a fossil fuel economy as of 2026.

The US consumes approximately **20.0-20.5 million barrels of oil per day (mb/d)** — the world's largest by a considerable margin, representing approximately 20% of global petroleum consumption. Gasoline accounts for approximately 44% (~9 mb/d), diesel approximately 24% (~4.8 mb/d), jet fuel ~9% (~1.8 mb/d), and other petroleum products the remainder. The US also produces approximately 13.2 mb/d (world's largest) but still imports approximately 6-8 mb/d primarily from Canada. Despite EV growth, liquid fuel consumption is projected to decline only gradually to approximately 18-19 mb/d by 2030 given the 280 million existing gasoline vehicles on US roads.

The US consumed approximately **30.5 trillion cubic feet (Tcf)** of natural gas in 2023 — the world's largest national gas consumption. Electric power generation accounts for approximately 36% (~11 Tcf), industrial 33% (~10 Tcf), residential 15% (~4.6 Tcf), and commercial 10% (~3 Tcf). Natural gas generates approximately **43% of US electricity** — the single largest electricity source. The shale gas revolution doubled US gas production since 2005, making the US also the world's largest LNG exporter in 2023. Gas consumption is projected to remain flat-to-slightly-declining through 2028 as renewable electricity growth offsets rising LNG export and data center demand.

US coal consumption fell from approximately **1.13 billion short tons (2007 peak)** to approximately **439 million short tons in 2023** — a 61% decline in 16 years. Approximately 91% of remaining coal goes to electric power generation, where coal now supplies only approximately **16-17% of US electricity** — down from 50% in 2005. The decline is primarily economic: cheap shale gas and falling wind/solar costs made coal plants economically uncompetitive. The coal workforce has halved since 2012 to approximately 40,000 miners. Coal is projected to fall below 300 million short tons by 2028, potentially below 10% of electricity generation, as more coal plants retire and are replaced by gas and renewables.

Fossil fuel combustion emits approximately **4,900-5,100 MTCO$_2$e annually** in the US — making it the world's second-largest emitter after China. Emissions peaked at approximately **6,000 MTCO$_2$ in 2007** and have declined approximately 16% since, driven primarily by coal-to-gas switching in electricity. Transportation is now the largest source at approximately **29% of total GHG emissions**, followed by electric power (~25%), industry (~23%), and buildings (~13%). US per capita emissions of approximately **14.8 metric tonnes/person** are approximately 2× the EU average. The Inflation Reduction Act targets approximately 40-45% below 2005 levels by 2030.

The US is the world's largest per-capita energy consumer among major economies at approximately **290 MMBtu/person/year** — approximately 4× China's per capita figure (~103 MMBtu) and 2× the EU average (~140 MMBtu). In absolute terms, China has surpassed the US as the world's largest total energy consumer (~157 quads vs US ~97 quads). However, US per capita CO_2 emissions (~14.8 MT/person) are among the highest of any major developed economy — substantially above Germany (~8.4 MT), UK (~4.7 MT), France (~4.5 MT), and Japan (~8.6 MT). The US economy generates approximately $70,000 GDP per capita — meaning it is also relatively energy-efficient per unit of economic output compared to many emerging markets.

Four structural forces drive declining US fossil fuel share: **(1) Shale gas displacing coal** — cheap gas made coal power plants economically unviable. **(2) Wind and solar cost collapse** — new wind/solar now cheaper than operating existing coal plants at ~$25-35/MWh vs coal's ~$35-40/MWh operating cost. **(3) Energy efficiency improvements** — vehicles, appliances, and buildings are significantly more efficient than in 2000. **(4) EV adoption** — displacing gasoline demand in transportation, projected to grow from 7-8% of new sales (2024) to potentially 30-40% by 2030 under IRA incentives. The Inflation Reduction Act ($369B in clean energy incentives) is dramatically accelerating all four of these trends simultaneously.

The US fossil fuel energy market represents approximately **$780 billion in annual end-use expenditure** — including consumer spending on gasoline (~$350B), utility natural gas bills (~$150B), electricity from fossil fuel plants (~$200B), and industrial fossil fuel purchases (~$80B). The broader fossil fuel industry contributes approximately 8% of US GDP directly and supports over **2 million jobs** across extraction, refining, distribution, and services. The oil and gas extraction sector alone employs approximately 150,000-160,000 directly. These economic ties make the energy transition politically complex — fossil fuel revenues support state budgets, pension funds, and communities that have few immediate alternatives.

US total primary energy consumption has been remarkably flat since 2000 — the country consumed approximately 98-100 quads then, peaked at approximately 101 quads in 2007-2008, and has fluctuated between **92-98 quads since**. Despite flat totals, the composition shifted dramatically: coal down approximately 61%, oil approximately flat (slightly down), natural gas up approximately 67%, nuclear flat, and renewables up approximately 5×. This flat total despite GDP doubling and population growing 20% since 2000 reflects significant energy efficiency improvements — the US economy now generates approximately **2× as much GDP per BTU** of energy as in 1980, an extraordinary productivity achievement driven by efficiency standards, deindustrialisation of energy-intensive manufacturing, and technology-sector growth.

Fossil fuels generated approximately **60% of US electricity in 2023** — down from approximately 70% in 2010 and 83% in 2000. Natural gas is now the largest single source at approximately **43% of US electricity generation**. Coal has fallen from 50% (2005) to approximately 16-17% (2023). Petroleum generates less than 1% of US electricity. Renewables have grown from approximately 10% to approximately **21% of US electricity generation**, driven primarily by wind (~10%) and solar (~4%), with hydro (~6%) and biomass (~1%). Nuclear provides approximately 19% of US electricity from approximately 93 operating reactors. The electricity sector has been the most dynamic in US energy transition, with coal continuing to decline rapidly and wind+solar growing at 15-20% annually.

The Inflation Reduction Act (IRA), signed August 2022, is the largest US climate and clean energy investment in history — providing approximately **$369 billion in clean energy tax credits** through 2032. Key provisions include production tax credits for wind and solar, investment tax credits for battery storage, up to **$7,500 in EV purchase credits**, manufacturing credits for US-made clean energy components, and enhanced credits for projects in coal communities. Goldman Sachs projects total private investment triggered by the IRA at approximately **$3 trillion by 2032**. The IRA is projected to reduce US GHG emissions by approximately 40% below 2005 levels by 2030 — substantially better than the pre-IRA trajectory of ~28-30% — though still short of the 50-52% target.

Data Sources & References

Primary: US Energy Information Administration — Monthly Energy Review

Primary: EIA Annual Energy Outlook 2025

Primary: EPA — Inventory of US Greenhouse Gas Emissions and Sinks 2024

Primary: IEA — Energy Statistics and Balances

BusinessStats: All sector-level breakdowns, market value calculations, per capita comparisons, international benchmarking, historical trend analysis, and 2028 forecast projections are BusinessStats proprietary research combining the above primary government sources with BP Statistical Review 2024, Rystad Energy market data, Goldman Sachs clean energy investment research, and Bloomberg New Energy Finance projections.

All energy figures reported in units standard to the US EIA: quadrillion BTU (quads) for primary energy, trillion cubic feet (Tcf) for natural gas, million barrels per day (mb/d) for petroleum, and million short tons for coal. CO_2 equivalent figures use IPCC AR5 GWP values. Market value estimates are BusinessStats calculations based on EIA price data and consumption volumes — not official government figures. All

analysis by BusinessStats Research Desk. Not financial or investment advice. US Fossil Fuel Consumption 2026 US Energy Statistics Oil Consumption USA Natural Gas USA US Coal Decline US CO_2 Emissions Energy Mix USA Inflation Reduction Act US Electricity Generation EV Impact on Oil Clean Energy Transition EIA Data US Renewables Carbon Emissions USA

STATISTICS REPORT

Russian Natural Gas Industry — Statistics & Facts 2026

Updated Mar 28, 2026 · businesstats.com/russian-natural-gas

47.8T m³ WORLD'S LARGEST RESERVES	**638 bcm** 2023 PRODUCTION	**$172B** 2022 PEAK EXPORT REVENUE
-80% EUROPE PIPELINE EXPORTS	**38 bcm** CHINA (POWER OF SIBERIA)	**$54B** 2023 EXPORT REVENUE

Overview

$172B Market — Russian Natural Gas in the Age of Geopolitical Disruption

For half a century, Russian natural gas was the foundational energy relationship of the European continent. Beginning with the first Soviet gas pipeline to Western Europe in the 1960s — a Cold War-era deal that surprised many observers — Russia gradually became the dominant supplier of natural gas to Europe's largest economies. By 2021, Russia was supplying approximately **150 billion cubic meters (bcm) annually to Europe** — roughly 40% of the continent's total gas consumption — through an intricate web of pipeline infrastructure spanning thousands of kilometres. The revenues generated by this arrangement were transformative for Russia: at peak, Gazprom's annual revenues from European gas sales exceeded the entire Russian federal budget allocation for defence. The interdependence was deep, mutual, and — as February 2022 would demonstrate — catastrophically fragile.

The invasion of Ukraine triggered a chain of decisions that permanently restructured global natural gas flows. European governments, motivated by a combination of economic sanctions policy, energy security concerns, and public opinion, made the strategic decision to **eliminate dependency on Russian gas** — a goal they pursued with a speed that surprised even optimistic analysts. By end-2023, EU imports of Russian pipeline gas had fallen to approximately **25-28 bcm** — down from 150 bcm in 2021, an **80% reduction in just two years**. The operational sabotage of the Nord Stream 1 and Nord Stream 2 pipelines in September 2022 — destroying approximately 55 bcm of annual capacity — physically prevented any easy resumption even if political conditions changed. Russia found itself with massive production infrastructure

and no viable market for approximately 100-120 bcm of previously-exported gas. The impact on Russia's federal finances has been severe: global inflation and energy market disruptions that Russia partly caused have ironically also harmed its own fiscal position, as the collapse of gas export revenues has forced Moscow to draw on sovereign wealth funds and increase domestic borrowing to fund its war expenditure.

The numbers tell the story with brutal clarity. Russia's natural gas export revenue peaked at an extraordinary **$172 billion in 2022** — a figure that reflects both the continued flow of gas through the early months of the year and the surge in European spot prices (the TTF natural gas benchmark reached a record **€343 per megawatt-hour in August 2022**, approximately 13 times pre-war levels) as markets anticipated supply disruptions. By 2023, the combination of sharply lower export volumes and normalised European gas prices drove revenues down to approximately **$54 billion** — less than one-third of the peak in just one year. The structural nature of this collapse — driven not by a business cycle but by a geopolitical realignment that has fundamentally reshuffled global energy infrastructure — means that the revenue reduction is likely permanent at current geopolitical conditions. Russia's gas industry is now executing a painful, multi-decade pivot toward Asian markets, domestic consumption, and LNG, with outcomes that remain deeply uncertain. For context on how these energy flows shape the broader economies involved, see our analysis of global GDP rankings — energy revenues represent a disproportionate share of Russia's economic output.

Russia holds 47.8 trillion m³ of proven natural gas reserves — the world's largest at 25% of the global total. Annual production reached 638 bcm in 2023. Export revenues peaked at $172 billion in 2022 before collapsing to ~$54 billion by 2023 as Europe cut pipeline imports by 80%. Gazprom reported its first net loss in 25 years in FY2023.

Reserves & Production

Russian Gas Reserves & Production — World's Largest at 47.8 Trillion m³

Russia's natural gas resource base is simply without parallel on Earth. With **proven reserves of approximately 47.8 trillion cubic meters (tcm)** — equal to approximately 24-25% of all proven global natural gas reserves — Russia has more gas than the next three reserve-holders (Iran at 33.9 tcm, Qatar at 24.9 tcm, Turkmenistan at 13.6 tcm) combined. These reserves are concentrated primarily in Western Siberia, which hosts some of the world's largest individual gas fields: the **Urengoy field** (approximately 10.9 tcm, the world's second-largest gas field), **Yamburg** (~6.0 tcm), **Bovanenkovo** on the Yamal Peninsula (~4.9 tcm), and **Zapolyarnoye** (~3.3 tcm). The Yamal Peninsula in particular — a remote, permafrost-

covered peninsula in the Russian Arctic — has become the focal point of Russian gas development in the 21st century, with new fields opening to replace the maturing Urengoy and Yamburg deposits. At current production rates of approximately 638 bcm per year, Russia's proven reserves would theoretically sustain output for approximately **75 years** — making the resource constraint effectively irrelevant compared to market access and infrastructure challenges.

Russian natural gas **production peaked at approximately 762 bcm in 2021**, the year before the war in Ukraine. The decline to 638 bcm in 2023 — a reduction of approximately 124 bcm or 16% — directly mirrors the loss of European export markets. This is a critical point: Russia did not reduce production because of declining reserves or rising costs, but because it had no market for the gas. Pipeline gas, unlike oil, cannot easily be redirected — a cubic meter of gas that was destined for Germany via Nord Stream cannot simply be loaded onto a tanker and shipped to China. The infrastructure to redirect Russian gas — Power of Siberia and future pipelines, additional LNG liquefaction plants — takes many years to build, meaning that the volume loss is structural and persistent in the medium term. Domestic Russian gas consumption (primarily for power generation, industrial use, and residential heating) provides a floor of approximately **500 bcm per year** that absorbs most of the production, but at subsidised domestic prices that generate minimal hard-currency revenue for either Gazprom or the federal budget.

The production geography of Russian gas has important implications for future development. The major producing fields of Western Siberia — Urengoy, Yamburg, and Medvezhye — are **maturing rapidly**, with natural production decline rates that require massive ongoing investment in new wells, compression, and processing infrastructure simply to maintain flat output. Gazprom has been investing in the Yamal Peninsula (particularly Bovanenkovo and Kharasavey fields) as the successor production base. However, Western sanctions following 2022 have significantly impaired access to critical technology — particularly advanced drilling equipment, compressors, and digital reservoir management systems — that are needed to maintain production rates from these technically challenging Arctic fields. The medium-term risk is that production could decline further as existing fields mature faster than new ones come online, particularly if sanctions on oil and gas technology remain in place through the late 2020s. The development of new fields also requires the kind of long-term infrastructure planning that depends on stable export markets — a confidence that Russian gas developers currently lack given the European market disruption.

Russian Natural Gas Production — 2010 to 2026 (bcm)

The navy bar chart below tracks Russian annual gas production from 2010 through 2026, including the 2021 peak (762 bcm), the 2022-2023 decline following European market loss, and the projected

stabilisation through 2026. Hover or tap each bar for the exact figure.

Gas Production Russian Natural Gas Production — 2010 to 2026 (bcm) BusinessStats Research · IEA · BP Statistical Review · Rystad Energy 762 bcm 2021 — Peak Actual Production Estimate -16% from 2021 peak — market loss, not resource Sources: BusinessStats Research · IEA · BP Statistical Review 2024 · Rystad Energy

World's Largest Natural Gas Reserves — Country Comparison

The animated rank bars below compare proven natural gas reserves by country. Russia's commanding 47.8 tcm lead is immediately apparent — it holds more reserves than Iran, Qatar, and Turkmenistan combined, the next three largest reserve holders. The irony of Russia's current position: it has more gas than any other nation on Earth, yet generates drastically less export revenue than at any point in the past decade due to self-imposed market access constraints through its geopolitical choices.

Export Revenue Collapse

Export Revenue — From $172B Peak to $54B: The Sharpest Energy Revenue Collapse in History

The collapse of Russian natural gas export revenues between 2022 and 2023 represents one of the most dramatic single-year revenue declines in the history of any commodity market. From the extraordinary peak of approximately **$172 billion in 2022** — itself inflated by panic-level gas prices during the early months of the supply crisis — revenues fell to approximately **$54 billion in 2023** and are estimated at approximately **$50-55 billion in 2024**. This $118 billion annual revenue loss (the difference between 2022 and 2023) exceeds the entire GDP of approximately 100 countries. To appreciate the structural nature of this collapse: it was not caused by declining oil prices, production problems, or temporary demand weakness. It was caused by a permanent political decision by Russia's largest customers to cease purchasing its primary export product.

The mechanics of the revenue collapse involved two simultaneous forces. **Volume collapse:** European pipeline gas imports fell from approximately 150 bcm in 2021 to approximately 25-28 bcm by 2023, as EU nations found alternative supplies from Norway (pipeline), the US and Qatar (LNG), and through aggressive demand reduction (European gas consumption fell approximately 12-15% in 2022-2023, driven by a combination of high prices, industrial shutdowns, and weather). **Price normalisation:** European gas prices (TTF benchmark) fell from the August 2022 peak of €343/MWh to approximately €35-45/MWh through

2023-2024 — still above pre-war levels (~€20-25/MWh) but a fraction of the crisis peak. The gas that Russia continues to export — primarily to China via Power of Siberia and to Turkey via TurkStream — is sold at significantly discounted prices: estimates suggest Russian gas to China is priced at approximately $130-180 per thousand cubic meters, compared to $600-900 per tcm that European buyers were paying at the 2022 peak. The revenue per unit exported has therefore collapsed even for the gas that Russia can still sell. The macroeconomic consequences for Russia are substantial and directly relevant to understanding how European German and other UK financial markets adapted to the supply shock through energy transition investments.

The impact on Russia's federal budget has been severe. Natural gas export taxes and dividends from Gazprom historically contributed approximately **$40-60 billion annually to the Russian federal budget** in the pre-war period. By 2023-2024, this contribution had essentially collapsed: Gazprom paid no dividend in 2023 (after reporting a net loss), and gas export tax revenues fell dramatically with the volume and price declines. Russia has partially compensated through oil export revenues (which remained substantial despite sanctions-related discounts) and by running larger fiscal deficits funded by the National Wealth Fund. However, the gas revenue loss is structural — it cannot be recovered without either a fundamental geopolitical resolution that allows European market re-entry, or the construction of massive new pipeline infrastructure to China (Power of Siberia 2, with a 50 bcm capacity, remains under negotiation and faces years of construction time even if approved). The broader context of how energy market disruptions feed through to consumer spending patterns and economic instability is one of the defining macroeconomic themes of 2022-2026.

Russian Natural Gas Export Revenue — 2015 to 2026 ($B)

The white line chart below illustrates the extraordinary revenue trajectory — the build-up to the 2022 peak, the catastrophic 2022-to-2023 collapse, and the projected stabilisation at a structurally lower level through 2028. The shaded zone represents the analyst estimate range for 2024-2026.

Export Revenue Russian Gas Export Revenue — 2015 to 2026 ($ Billions) BusinessStats Research · IEA · Russia Federal Customs Service · CREA $172B2022 Peak $54B2023 -69%1-Year Drop

Largest single-year energy revenue collapse in history Sources: BusinessStats Research · IEA · Russia Federal Customs · CREA Fossil Fuel Tracker

Russian natural gas export revenue collapsed from $172B (2022 peak) to $54B (2023) — a 69% decline in one year, representing the largest single-year energy commodity revenue collapse in modern history.

European pipeline imports fell 80% (150 bcm to ~27 bcm). The TTF benchmark fell from €343/MWh peak to €35-45/MWh by 2023. Russia's China pivot (Power of Siberia, 38 bcm) only partially compensates at deeply discounted prices.

Pipelines & Routes

Russian Gas Pipelines — Nord Stream Destroyed, TurkStream Active, China Pivot

Russia's gas export infrastructure — built over five decades at enormous cost — is the physical manifestation of its energy geopolitical strategy. At its peak, the pipeline network included **Nord Stream 1** (55 bcm annual capacity, Germany to Russian Baltic coast), **Nord Stream 2** (additional 55 bcm, same route, never commissioned), **Yamal-Europe** (33 bcm, through Belarus and Poland to Germany), **Brotherhood/Urengoy-Pomary-Uzhhorod** (~80 bcm historical capacity, via Ukraine), and **TurkStream** (31.5 bcm, Russia to Turkey via the Black Sea). Together, these pipelines represented approximately **200+ bcm of theoretical export capacity** to Europe. As of 2026, the operational situation is dramatically different: Nord Stream 1 was sabotaged in September 2022 (with responsibility disputed among multiple parties), taking 55 bcm of capacity permanently offline. Nord Stream 2 was never commissioned and is also damaged. Yamal-Europe flows have been minimal since early 2022. Ukrainian transit was halted in January 2025 when Ukraine declined to renew the transit agreement. Only TurkStream — carrying approximately 15.75 bcm to Turkey and 15.75 bcm to Southern/Central Europe — remained fully operational into 2026.

The **Power of Siberia (Sila Sibiri)** pipeline to China is the centrepiece of Russia's Eastern pivot strategy. Running approximately 3,000 km from the Chayandinskoye and Kovyktinskoye gas fields in Eastern Siberia to the Chinese border near Blagoveshchensk, Power of Siberia began commercial operations in December 2019 and has ramped up steadily — reaching its design capacity of **38 bcm in 2024**, ahead of the original schedule. The pipeline operates under a 30-year supply agreement between Gazprom and CNPC signed in 2014, reportedly at a price of approximately $350 per thousand cubic meters (tcm) — significantly below the $600-900/tcm that European buyers paid at 2022 peak prices, though the exact terms remain confidential. The proposed **Power of Siberia 2** — which would connect Western Siberian fields (the same giant fields that previously supplied Europe) to China via Mongolia — has a planned capacity of 50 bcm but has been in protracted negotiations since 2022, with China leveraging its position as Russia's only viable large-scale buyer to push for even lower prices. A final investment decision was still pending as of early 2026, and even if approved, construction would take 5-7 years. The **Turkish Gas Hub** concept —

Gazprom's proposal to make Turkey a gas transit hub for European supply, potentially routing additional volumes through TurkStream — has progressed as a concept but faces significant implementation challenges, including the physical infrastructure required in Turkey and the willingness of EU member states to purchase gas from a Russian-controlled hub. For context on how Germany's energy security transformation has reshaped its capital markets, see our analysis of Nasdaq and global equity markets — energy transition stocks have been among the decade's top performers.

Russia's LNG strategy represents the third pillar of its export diversification. **Yamal LNG** (16.5 million tonnes per year, or mtpa) and **Sakhalin-2** (~10 mtpa) have continued to operate and export, primarily to Asian markets (Japan, China, South Korea, Taiwan) and to Europe (via spot market) despite the political tensions. Together they represent approximately **40 mtpa of LNG capacity** — equivalent to approximately 55 bcm of pipeline gas. However, Russia's ambitions for LNG expansion have been severely curtailed by Western sanctions: the **Arctic LNG 2** project (19.8 mtpa, planned to come online 2023-2026) has been effectively paralysed after the withdrawal of TotalEnergies, Shell, and other Western investors and the cutoff of critical liquefaction technology from Chart Industries and Air Products. As of 2026, Arctic LNG 2 has ships and modules but cannot complete construction without Western equipment, and no viable non-Western alternative has emerged. Russia's total LNG capacity is therefore effectively capped at approximately 40 mtpa for the foreseeable future — far less than the 100 mtpa that government plans had envisioned for 2030. The implications of this technology blockade extend to Russia's entire hydrocarbon sector, where the role of AI and digital technology in reservoir management and production optimisation has also been constrained by the exit of Western technology firms.

Russian Gas Export Routes — Volume by Destination (2024)

The white horizontal bars below compare Russian gas export volumes by destination in 2024, illustrating the fundamental geographic shift from a Europe-dominated export profile (pre-2022) to a China/Turkey-dominated profile (post-2022). The stark decline in the European bar captures the structural market loss that defines Russia's current gas challenge.

Export Destinations Russian Gas Export by Destination — 2024 (bcm) BusinessStats Research · IEA · ENTSOG · Rystad Energy · 2024 estimated flows

Gazprom Statistics

Gazprom Statistics — First Loss in 25 Years, $7B Deficit, 500,000 Employees

Gazprom PJSC is the world's largest natural gas company by reserves and one of Russia's most strategically important state assets. Founded in 1989 from the dissolution of the Soviet Ministry of Gas Industry, Gazprom holds a legally mandated monopoly on natural gas pipeline exports from Russia — meaning all of Russia's pipeline gas exports flow through Gazprom, directly or through subsidiaries. At its peak (FY2022), Gazprom reported revenues of approximately **$130 billion** and paid Russia's largest-ever corporate dividend of approximately **$22 billion** — a crucial source of hard-currency revenue for the Russian state. The company operates approximately **170,000 km of gas transmission pipelines** (approximately 25% of the world's total), employs approximately **500,000 people** (including subsidiaries), and manages underground gas storage facilities with a total capacity of approximately 73 bcm — the largest in the world.

The FY2023 financial results marked a historic turning point: Gazprom reported a **net loss of approximately $7 billion** — its first annual net loss in 25 years. The loss reflected the combination of collapsed European export volumes, lower gas prices, massive write-downs on stranded assets (including pipeline infrastructure built to serve European markets that are now underutilised), and higher domestic gas supply obligations at regulated (below-market) prices. Gazprom's total revenues fell from approximately $130 billion in FY2022 to approximately $70-80 billion in FY2023. Critically, Gazprom paid **no dividend in 2023 or 2024** — a stark departure from its role as Russia's most important dividend-paying state asset, and a significant loss of hard-currency income for Russia's sovereign wealth structure. The company's market capitalisation on the Moscow Exchange has fallen dramatically from its ~$130 billion peak to approximately $40-50 billion, reflecting investor assessment of permanently impaired European market access. The broader implications of Gazprom's financial distress for Russia's ability to fund its geopolitical ambitions connect directly to the dynamics analysed in our coverage of global financial markets.

Gazprom's non-gas businesses provide some insulation from the export revenue collapse. The company owns **Gazprom Neft** — Russia's fourth-largest oil producer, with revenues of approximately $35-40 billion annually that have held up better than gas revenues due to oil's continued global demand and somewhat less severe sanctions impacts on Russian oil exports (the G7 oil price cap of $60/barrel has been only partially effective, with Russian oil trading at $55-70/barrel in Asian markets). Gazprom also owns **Gazprombank** (Russia's third-largest bank, now sanctioned by the US and EU), Gazprom Energoholding (power generation), and various media and industrial assets. These diversified businesses reduce but do

not eliminate the profound damage that the European gas market loss has inflicted. Gazprom's strategic challenge is stark: its core business — selling pipeline gas to Europe — has been largely destroyed by geopolitical events, and the replacement strategy (China, Turkey, LNG) generates significantly less revenue per unit of gas and is constrained by infrastructure, technology, and negotiating leverage limitations. The transformation required is effectively a complete reinvention of Russia's gas business model within a decade — a challenge of extraordinary complexity and cost. The intersections between Gazprom's financial challenges and Russian fintech and banking sector disruptions from Western sanctions paint a comprehensive picture of Russia's economic stress.

Gazprom Key Financials — 2018 to 2024

The grouped bar chart below compares Gazprom's revenue and net income (loss) from 2018 through 2024, capturing the extraordinary boom-and-bust cycle driven by European gas market dynamics. The FY2022 revenue peak and FY2023 net loss are both historically unprecedented for the company.

Gazprom Financials Gazprom Revenue & Net Income — 2018 to 2024 ($ Billions) BusinessStats Research · Gazprom Annual Reports · Moscow Exchange $130BFY2022 Revenue Peak -$7BFY2023 Net Loss

First net loss in 25 years — FY2023 Sources: BusinessStats Research · Gazprom PJSC Annual Reports · Interfax Energy

Russian Gas Industry — Key Data Comparison (Donut)

The navy donut chart below illustrates Russia's share of global natural gas reserves compared to other major reserve holders. Russia's 25% dominance of global reserves is visually striking — nearly a quarter of all proven natural gas on Earth lies beneath Russian territory, providing an enormous strategic resource base that geopolitical events have, for the moment, proven incapable of fully monetising.

Global Reserves World Natural Gas Reserves by Country — Share of 197 tcm Total BusinessStats Research · BP Statistical Review 2024 · IEA

Gazprom's financial collapse: revenues fell from $130B (FY2022) to ~$75B (FY2023) with a net loss of $7B — first in 25 years. Power of Siberia reached 38 bcm capacity to China in 2024. TurkStream (31.5 bcm) remains the only active major Europe pipeline. Arctic LNG 2 (19.8 mtpa) paralysed by Western sanctions. Russia's gas export revenue is forecast to stabilise at $50-70B through 2028.

Russian Gas: Key Metrics Comparison Table

The sortable table below provides comprehensive data on Russia's gas industry across key metrics, comparing the pre-war baseline (2021), the peak disruption year (2022-2023), and current 2024-2025 estimates. Click any column to sort and explore the data.

Russian Natural Gas — Key Metrics 2019–2025 Click column to sort

YEAR	PRODUCTION (BCM)	EU PIPELINE EXPORTS	CHINA EXPORTS	EXPORT REVENUE	GAZPROM NET
2019	739 bcm	~150 bcm	~5 bcm	$41B	+$19B
2020	692 bcm	~137 bcm	~10 bcm	$29B	+$11B
2021	762 bcm ↑ Peak	~150 bcm	~16 bcm	$65B	+$29B
2022	674 bcm	~61 bcm	~22 bcm	$172B ↑ Peak	+$17B
2023	638 bcm	~27 bcm	~30 bcm	$54B	-$7B ↓ Loss
2024	~625 bcm	~12 bcm	~38 bcm	~$52B	~-$2B
2025E	~620 bcm	~5 bcm	~40 bcm	~$55B	~+$3B

Key Statistics

Russian Natural Gas Industry — Key Statistics at a Glance

47.8 tcmWorld's Largest Proven Reserves25% of global total. Urengoy field: 10.9 tcm alone. 75yr supply at current output. 638 bcm2023 Annual ProductionDown from 762 bcm peak (2021). World's 2nd largest producer after US (980 bcm). $172B2022 Peak Export RevenueDriven by TTF €343/MWh record. Fell to $54B in 2023 — 69% decline in 1 year. -80%EU Pipeline Export Collapse150 bcm (2021) → ~12 bcm (2024). Nord Stream sabotaged Sept 2022. 38 bcmChina — Power of SiberiaReached design capacity 2024. Power of Siberia 2 (50 bcm) still under negotiation. €343/MWhTTF Gas Price Peak (Aug 2022)13× pre-war level. Fell to €35-45/MWh by 2023-2024 as Europe found alternatives. -$7BGazprom FY2023 Net LossFirst net loss in 25 years. Revenue fell from $130B (FY2022) to ~$75B (FY2023). 500,000Gazprom Employees170,000 km pipelines operated. World's largest gas transmission network. 40 mtpaLNG Export CapacityYamal LNG (16.5 mtpa) + Sakhalin-2 (10 mtpa). Arctic LNG 2 paralysed by sanctions. 16%Russia's Share of Global OutputDown from 18% (2021 peak). US: 28%. Iran: 7%. China: 6%. Qatar: 5%. $0Gazprom Dividend (2023-2024)No dividend paid. Was Russia's largest corporate dividend payer ($22B in FY2022).

500 bcmRussian Domestic ConsumptionProvides production floor but at subsidised prices — minimal hard-currency revenue.

Forecast 2028

Russian Gas Forecast 2028 — Structural Revenue Depression, China Pivot, LNG Constraints

Looking toward 2028, the outlook for Russia's natural gas industry is one of **structural adaptation under severe constraint** rather than recovery to pre-war revenue levels. The base case scenario — which assumes no fundamental geopolitical resolution that would allow European market re-entry — projects Russian gas export revenue remaining in the range of **$50-70 billion annually through 2028**. This compares to the $172 billion 2022 peak and the $65 billion 2021 pre-war level, and implies that even in the most optimistic realistic scenario, Russia will not recover European gas revenue levels within the 2025-2028 horizon. The structural reasons for this pessimism are compelling: Europe has invested hundreds of billions of euros in energy infrastructure diversification (LNG terminals, pipeline interconnectors, renewables capacity) that will not be abandoned even if political conditions change; and the gas market relationships built over 50 years have been irreparably damaged by the supply weaponisation of 2021-2022.

The China pivot via Power of Siberia represents the single most important growth vector, but faces fundamental constraints. Power of Siberia is at design capacity (38 bcm) and cannot be expanded significantly without new pipeline construction. The proposed Power of Siberia 2 (50 bcm additional capacity) remains in negotiation as of 2026, with China leveraging its monopsony (single-buyer) power to drive prices down to levels that may barely cover Gazprom's production costs. Even if Power of Siberia 2 is approved and built by 2030-2032, it would bring Russia's China exports to approximately 88 bcm — still less than the approximately 120 bcm that was lost from Europe, and at significantly lower revenue per unit. The Turkish Gas Hub concept — using Turkey as a transit point for Russian gas to reach European buyers via a non-sanctioned route — has geopolitical appeal but faces practical obstacles including the construction of additional pipeline capacity in Turkey and the willingness of EU countries to formally purchase Russian-origin gas, even if routed via Turkey. Russia's LNG expansion ambitions are constrained by Western technology sanctions that have effectively capped capacity at approximately 40 mtpa for the foreseeable future.

Gas Industry Outlook Key Projections — 2028 Forecast $50-70BAnnual Export Revenue 2028 ~88 bcmChina Target (PoS1 + PoS2) ~600 bcmProduction Forecast 2028 <10 bcmEurope Pipeline Exports 40 mtpaLNG Capacity (Capped) TurkeyHub Strategy — Uncertain

FAQ

Frequently Asked Questions — Russian Natural Gas Industry

Russia produced approximately **638 billion cubic meters (bcm)** in 2023, making it the world's second-largest natural gas producer after the United States (~980 bcm). Peak production was approximately **762 bcm in 2021**. The decline from 2021 to 2023 (-16%) reflects the collapse of European pipeline gas exports following the Ukraine war — Russia had no way to redirect the gas that had previously flowed through Nord Stream and Ukrainian transit pipelines. By 2025-2026, production is estimated at approximately **600-620 bcm**, stabilised by domestic consumption (~500 bcm) and the growing China export via Power of Siberia (~38-40 bcm).

Russia holds the world's largest proven natural gas reserves at approximately **47.8 trillion cubic meters (tcm)** — representing approximately 24-25% of all proven global reserves. Iran is second (33.9 tcm), Qatar third (24.9 tcm), and Turkmenistan fourth (13.6 tcm). Russia's Urengoy field alone contains approximately 10.9 tcm — the world's second-largest individual gas field. At current production rates (~638 bcm/yr), Russia's reserves would last approximately **75 years**, making resource depletion essentially irrelevant compared to market access and infrastructure challenges.

Russian pipeline gas exports to Europe collapsed approximately **80% from 150 bcm (2021) to ~12 bcm (2024)**. The collapse began following Russia's invasion of Ukraine in February 2022, which triggered EU energy security decisions and deliberate policies to eliminate Russian gas dependency. The Nord Stream 1 pipeline (55 bcm capacity) was sabotaged in September 2022. Ukrainian transit (~50 bcm capacity) ended in January 2025 when Ukraine declined to renew the agreement. Only TurkStream (31.5 bcm) to Turkey and Southern Europe remained. Europe replaced Russian gas with US LNG, Norwegian pipeline gas, and demand reduction measures.

Gazprom's revenues peaked at approximately **$130 billion in FY2022**, when high European gas prices and continued (though falling) export volumes briefly generated enormous revenues. However, Gazprom reported a **net loss of approximately $7 billion in FY2023** — its first annual net loss in 25 years — as European export volumes collapsed and gas prices normalised. FY2024 revenues are estimated at approximately $70-80 billion. Gazprom paid no dividend in 2023 or 2024, having previously paid Russia's

largest-ever corporate dividend of $22 billion in FY2022. The company employs approximately 500,000 people and operates 170,000 km of gas transmission pipelines.

Russia's export geography has fundamentally shifted since 2022. **China** is now the primary growth market: Power of Siberia deliveries reached approximately **38-40 bcm in 2024-2025**. **Turkey** receives approximately 20-22 bcm via TurkStream and remains a key transit hub. **Europe residual** flows via TurkStream to Southern/Central Europe are approximately 10-15 bcm. Ukrainian transit ended in January 2025. **LNG exports** from Yamal LNG and Sakhalin-2 (approximately 40 mtpa combined) reach Asian markets and spot LNG markets globally. Total pipeline exports are approximately 60-70 bcm, down from ~160 bcm pre-war.

Russian natural gas export revenues peaked at approximately **$172 billion in 2022** — driven by record European gas prices (TTF €343/MWh peak) despite falling volumes. By 2023, revenues collapsed to approximately **$54 billion** as European prices normalised (€35-45/MWh) and import volumes fell sharply. In 2024, revenues are estimated at approximately **$50-52 billion**. The revenue per unit exported has also declined: Russian gas to China via Power of Siberia is estimated at $130-180 per tcm, versus $600-900/tcm that European buyers paid at the 2022 peak. Revenue is forecast to remain in the $50-70B range through 2028 absent a geopolitical resolution.

Power of Siberia (Sila Sibiri) is Russia's major natural gas pipeline to China — running approximately 3,000 km from Eastern Siberian fields to the Chinese border. It began commercial deliveries in December 2019 and reached its design capacity of **38 bcm in 2024**. A proposed **Power of Siberia 2** (50 bcm additional capacity via Mongolia) remains under negotiation as of 2026, with China leveraging its monopsony position to drive prices to levels reportedly near $130-180/tcm. Even if approved, PoS2 would take approximately 5-7 years to build. Together, both pipelines could eventually deliver approximately 88 bcm to China — partially compensating for the ~120 bcm lost from Europe, but at significantly lower revenue per unit.

The Russia-Ukraine war triggered the most significant structural reshaping of global natural gas markets since the 1970s oil shocks. **For Europe:** gas prices surged to record levels (TTF €343/MWh), causing industrial shutdowns, 12-15% demand reduction, and approximately €300B in emergency energy security investment. **For Russia:** the loss of European markets devastated Gazprom — first net loss in 25 years, no dividend, $118B annual revenue reduction. **For global LNG:** US LNG exports surged to record highs as Europe scrambled for alternative supply, making the US the world's **largest LNG exporter in 2023** — a title that had belonged to Qatar. Gas market geography has permanently shifted.

Russia accounts for approximately **16-17% of global natural gas production** as of 2023-2024, down from approximately 18% at its 2021 peak. The US is the largest producer at approximately **28% of global output** (~980 bcm/yr), followed by Russia (~16%), Iran (~7%), China (~6%), and Qatar (~5%). Russia's production share decline reflects the absolute output reduction (762 bcm to 638 bcm) and continued US shale gas growth. Despite this, Russia retains the world's largest reserve base — giving it significant long-term production potential that current geopolitical constraints prevent from being fully monetised.

LNG (Liquefied Natural Gas) is gas cooled to -162°C for tanker transport — enabling global trade without pipelines. Russia's LNG capacity is approximately **40 mtpa** from Yamal LNG (16.5 mtpa) and Sakhalin-2 (10 mtpa). These continue to export primarily to Asian markets. However, Russia's LNG expansion is severely constrained by Western sanctions: **Arctic LNG 2** (19.8 mtpa planned) has been paralysed after TotalEnergies and other Western investors withdrew and critical liquefaction equipment was cut off. Russia's LNG capacity is effectively capped at ~40 mtpa — far below the 100 mtpa government target for 2030 — as no viable non-Western technology alternative exists for large-scale LNG liquefaction trains.

The global gas triumvirate: **Russia** has the largest reserves (47.8 tcm) but has lost significant market position since 2022. **United States** has the highest production (~980 bcm/yr) and is now the world's largest LNG exporter (~100 mtpa capacity) — a status achieved in 2023 as Europe scrambled for non-Russian gas. **Qatar** has the most sophisticated LNG infrastructure with the world's lowest production costs (~$2-3/mmBtu) and plans to expand from 77 mtpa to 126 mtpa by 2027. Russia's pipeline gas model — which dominated European supply — is being systematically replaced by US and Qatari LNG, with Russia's remaining export market concentrated in China, Turkey, and its own domestic consumption.

Russia's natural gas industry faces a fundamental structural challenge: its primary export market (Europe, ~150 bcm/yr at peak) has been largely lost, while the main replacement market (China) demands gas at significantly lower prices. Power of Siberia at 38 bcm, even if expanded to 88 bcm via PoS2 by 2032, would replace only about 60% of lost European volume at lower revenue per unit. LNG expansion is capped by Western technology sanctions. The most likely scenario is that Russia's gas export revenue remains structurally depressed at **$50-70 billion annually** through 2028 — less than half the $172B 2022 peak — with recovery contingent on geopolitical resolution or successful PoS2 finalisation with China at acceptable prices.

Data Sources & References

Primary: IEA — Natural Gas Information & Global Gas Trade Data

Primary: BP Statistical Review of World Energy 2024

Primary: Gazprom PJSC — Annual Reports & Financial Statements

Primary: CREA — Fossil Fuel Export Revenue Tracker (Russia)

Primary: ENTSOG — European Gas Pipeline Flow Transparency Data

BusinessStats: All production trend analysis, export revenue calculations, pipeline flow comparisons, Gazprom financial breakdowns, global reserve share analysis, and 2028 forecast projections are BusinessStats proprietary research combining the above primary sources with Rystad Energy gas market data, Oxford Institute for Energy Studies research, and Interfax Energy news monitoring.

All production and trade figures in billion cubic meters (bcm) at standard conditions. Revenue figures in USD; converted from RUB where necessary using average annual exchange rates. Gazprom financials reflect consolidated group reporting in USD equivalent. Forecast figures represent BusinessStats base-case scenario assuming no fundamental geopolitical resolution enabling European market re-entry. All analysis by BusinessStats Research Desk. Not financial or investment advice. Russian Natural Gas 2026 Gazprom Statistics Gas Export Revenue Nord Stream Power of Siberia Europe Gas Imports Russia Energy Natural Gas Reserves LNG Russia TurkStream TTF Gas Price Russia Ukraine War Energy Gas Production bcm China Gas Imports

STATISTICS REPORT

Annual CO_2 Emissions Worldwide — 1940 to 2026

Updated Jun 13, 2026 · businesstats.com/global-co2-emissions

37.4 Gt RECORD CO EMISSIONS 2024	**424.6 ppm** MAUNA LOA CO 2024 RECORD	**7.5×** INCREASE SINCE 1940 (5.0 GT)
1.5°C PARIS AGREEMENT TARGET	**31.8%** CHINA'S SHARE OF GLOBAL CO	**−43%** REQUIRED CUT BY 2030 VS 2019

Executive Summary

From 5 Billion Tonnes to 37.4: The 84-Year Carbon Story Reshaping Earth's Climate

In 1940, the world emitted approximately **5.0 billion tonnes (Gt) of CO_2** from fossil fuels and industry — an economy powered mostly by coal, with oil just beginning its rise. By 2024, that figure reached **37.4 Gt**, a 7.5-fold increase driven by industrialization, population growth from 2.3 billion to 8.2 billion people, and the energy demands of modern civilization. The surge in energy demand and fossil fuel consumption that powered this growth is among the most consequential trends in economic history.

The emissions trajectory has not been linear. Growth accelerated through the postwar 1950s–60s boom at ~5–6% per year, briefly plateaued after the 1973 and 1979 oil shocks, then surged again through the 1990s–2000s as China industrialized at an unprecedented pace. Since 2010, growth has slowed to under 1% per year — but critically, it has never reversed for more than one consecutive year. The **only meaningful interruptions** in this 84-year upward march were the Soviet collapse (1991, −3.6%), the 2008–09 financial crisis (−1.4%), and COVID-19 (2020, −5.4%). Each time, emissions rebounded sharply.

Industrial Emissions:

Fossil fuel combustion and industrial processes account for ~37.4 Gt CO per year as of 2024 — the highest level ever recorded. Source: IEA Global Energy Review 2025.

The 2024 data from the **IEA Global Energy Review** confirms the alarming persistence: energy-related emissions grew 0.8% to exactly 37.4 Gt — a new all-time record. Natural gas was the single largest contributor to this growth, rising 2.5% (180 Mt CO, while coal rose 0.9% (135 Mt CO driven by China, India, and Southeast Asia. Advanced economies (US, EU, Japan) collectively reduced emissions by 1.1%, but were outweighed by emerging market growth of 1.5%.

The physical consequences are now unmistakable. Atmospheric COreached **424.6 ppm at Mauna Loa in 2024** — the largest single-year increase (3.75 ppm) in the 67-year instrument record, according to NOAA. The global mean surface temperature in 2024 temporarily exceeded **1.5°C above pre-industrial levels** for the first time on an annual basis, driven partly by the 2023–24 El Niño event. The Energy & Climate category on BusinessStats tracks the full spectrum of these trends in real time.

5.0 GtGlobal COin 1940 37.4 GtGlobal CORecord 2024 650%Total Increase 1940–2024 280 ppmPre-Industrial COLevel 424.6 ppmMauna Loa CO2024 +3.75 ppmLargest Annual CORise on Record

Historical Emissions Chart

Annual Global CO_2 Emissions 1940–2026: The 84-Year Record

The chart below shows annual global COemissions from fossil fuels and industrial processes from 1940 through 2026 (with 2025–2026 as projections based on IEA and Global Carbon Project trajectories). The data illustrates the full scope of humanity's carbon trajectory: a near-continuous upward climb punctuated only by brief recessionary dips, and a recent growth slowdown that still falls far short of the sustained decline required for climate stabilization.

Annual Emissions Tracker Global COEmissions (Gt CO — 1940 to 2026 37.4 Gt 2024 Record Historical Data Projected

+2.3% avg CAGR (1940–2024) Sources: Global Carbon Project (GCP), IEA Global Energy Review 2025, CDIAC · * 2025–2026 projected

Several inflection points stand out clearly in the data. The **1950s–60s surge** represents peak growth, when emissions roughly doubled from 6 Gt to over 14 Gt as postwar reconstruction gave way to mass consumerism and the petrochemical age. The **1970s plateau** reflects the dual oil price shocks of 1973 and 1979.

The **1990s–2000s acceleration** coincided with China's WTO integration and the construction of thousands of coal-fired power plants. The post-2015 **growth deceleration** reflects the maturation of Chinese industrial

growth alongside rapid renewables scaling in Europe, China, and the United States. The 2024 data confirms this slow-growth regime continues — but growth has not stopped.

Decade-by-Decade Data

CO_2 Emissions by Decade: 1940s to 2020s

The table below presents global CO_2 emissions aggregated by decade, providing a long-run perspective on growth pace, dominant drivers, and the cumulative carbon burden added to the atmosphere over eight decades.

Global CO_2 Emissions by Decade (Fossil Fuels & Industry)

Click headers to sort

DECADE	AVG ANNUAL (GT CO_2)	PEAK YEAR (GT)	DECADE TOTAL (GT)	% CHANGE VS PRIOR DECADE	KEY DRIVERS
1940s	5.2	5.9 (1949)	52	+10% vs 1930s	Post-war reconstruction, US industrial boom
1950s	7.2	8.5 (1959)	72	+38%	Eisenhower boom, European recovery, mass auto
1960s	11.0	14.1 (1969)	110	+53%	Petrochemical age, global manufacturing expansion
1970s	16.6	19.4 (1979)	166	+51%	Oil crises caused plateau; coal & gas still growing
1980s	20.2	21.5 (1989)	202	+22%	Reagan-era growth; East Asia industrializing
1990s	23.1	25.2 (1999)	231	+14%	China WTO path; Soviet collapse briefly cut emissions
2000s	28.5	31.0 (2008)	285	+23%	China's infrastructure supercycle; India rising
2010s	35.0	36.7 (2019)	350	+23%	Chinese coal peak; renewables emerging; coal still rising elsewhere
2020s*	36.9	37.4 (2024 record)	221 (6yr est.)	+5%*	COVID dip 2020; sharp rebound; record 37.4 Gt in 2024

* 2020s data covers 2020–2025 (six years). Percentage change vs 2010s based on annualized comparison. Sources: IEA, Global Carbon Project, CDIAC.

Country Rankings 2024

Top 10 CO_2 Emitting Countries in 2024

The top 5 emitters account for approximately **60% of all global CO_2**, while the top 10 account for roughly 67%. China's 31.8% share makes it larger than the next four combined. According to the IEA's 2025 review, **China's 2024 growth slowed to just 0.4%** year-on-year as clean energy expansion helped offset fossil demand increases.

India recorded the highest emissions growth rate of any major economy in 2024, up 5.3%, driven by record economic expansion, infrastructure buildout, and severe heatwaves that boosted electricity demand. India's trajectory is now the most watched variable after China's in global climate modelling. The historical per-capita responsibility picture — explored in more detail below — tells a very different story from absolute totals.

Country Rankings — 2024 Top 10 CO Emitting Countries (Gt CO 2024) Fossil fuels & industrial processes · Sources: IEA Global Energy Review 2025, Global Carbon Project 2024 * Per-capita 2024 est.: US 15.0t, Saudi Arabia 18.7t, Canada 14.2t, Russia 12.5t, South Korea 12.6t, Japan 8.7t, China 8.4t, Germany 8.1t, Iran 8.8t, India 2.0t · Global avg: 4.7t

Emissions by Sector

Global CO_2 Emissions by Sector: Where the Carbon Comes From

No single sector accounts for a majority of emissions, meaning decarbonization must advance across the entire economy simultaneously. Energy/power and industry together account for nearly **58% of total CO_2**, representing the highest-priority targets. According to the IEA, **natural gas overtook coal as the largest individual driver of emissions growth** in 2024 for the first time, rising 2.5% (180 Mt CO — a significant shift in the emissions landscape.

Coal remains the single highest-carbon fuel globally, but its growth is slowing in advanced economies. The energy and power sector's decarbonization is being driven by renewables reaching **32% of global electricity generation in 2024** (up from 20% in 2015), with solar and wind alone contributing over 15%. Transport remains the hardest sector to decarbonize at pace, though EV adoption is accelerating rapidly —

global EV sales reached **17.1 million units in 2025**.

Sector Analysis — 2024 Global CO Emissions by Sector (2024) Total: ~37.4 Gt CO from fossil fuels & industry · Sources: IEA, Global Carbon Project 2024

Energy Transition:

Renewables now supply 32% of global electricity (2024). Solar additions alone hit 530 GW in 2024 — yet fossil CO continues rising as overall energy demand grows faster than clean capacity is added. Source: IEA.

Atmospheric CO Trend

Total Emissions vs. Atmospheric CO_2 Concentration: The Keeling Curve in Context

The chart below overlays annual global CO emissions (left axis) with atmospheric CO concentration from the Mauna Loa Observatory (right axis). The tight positive correlation reflects the fundamental physical reality: approximately **50% of all CO_2 emitted by human activity** accumulates in the atmosphere. Every Gt emitted adds roughly 0.13 ppm to the atmospheric total permanently.

The 2024 reading of **424.6 ppm at Mauna Loa** is the highest in the 67-year instrumental record — and almost certainly the highest in at least **3 million years** of Earth history, according to NOAA paleoclimate records. Atmospheric CO is now 52% above pre-industrial levels (280 ppm), and the rate of increase is itself accelerating: the annual rise in 2024 was the largest ever measured, driven by both record emissions and a weakened land carbon sink due to 2023–24 El Niño drought stress.

Dual-Axis Trend Chart Annual CO Emissions (Gt) vs. Atmospheric CO Concentration (ppm) — 1940–2025 Left axis: Gt CO from fossil fuels & industry · Right axis: ppm atmospheric CO (Mauna Loa / global avg)

Sources: Global Carbon Project 2024, NOAA Mauna Loa Observatory, CDIAC · 3.75 ppm rise in 2024 = largest annual increase ever recorded (NOAA) Updated 2024 Carbon Budget How Much CO Can We Still Emit? The Shrinking Budget

The IPCC estimates the remaining carbon budget for a 50% probability of limiting warming to 1.5°C was approximately **500 Gt CO_2 from early 2023**. After two more years at ~37–38 Gt/year, that budget has shrunk to roughly **425 Gt CO_2 as of early 2026** — only about **11 years** of current emissions. For the 2°C target, approximately 1,050 Gt CO remains (~28 years at current rates). Every year without significant cuts

consumes a larger fraction of the remaining safe emissions space and makes the required subsequent transition steeper and more costly.

Per-Capita Analysis

CO_2 Emissions Per Capita: Who Emits the Most Per Person?

Per-capita data fundamentally reframes the emissions picture. The global average in 2024 was approximately **4.7 tonnes of CO_2 per person per year** — but this masks disparities ranging from under 0.2t in the least-developed nations to over 18t in the most fossil-fuel-intensive economies. Saudi Arabia leads major economies at 18.7t per capita, followed by Australia (14.0t), Canada (14.2t), and the United States (15.0t).

China's 8.4t per capita is now above the EU average (6.2t), underscoring how rapidly China's living standards and energy consumption have grown. India's 2.0t reflects its development stage — hundreds of millions still lack reliable electricity. The cumulative per-capita framing remains central to climate justice debates: the US has historically emitted approximately **20× more CO_2 per capita** than the average Indian citizen since 1750.

United States 15.0 t CO/ person (2024) Advanced economies collectively cut emissions 1.1% in 2024. US emissions declined modestly, aided by gas-coal switching and IRA-driven clean energy investment of $369B. Still 3.2× the global average per capita. China 8.4 t CO/ person (2024) China's 2024 growth slowed to 0.4% (IEA) as record clean energy additions (~280 GW solar) offset most fossil demand growth. Coal consumption still rising but at decelerating pace. Peak emissions expected 2025–2028. European Union 6.2 t CO/ person (2024) EU led advanced economy reductions. Coal emissions fell 5.7% across advanced economies in 2024. EU ETS carbon price and Fit-for-55 policy package driving structural decarbonization. Down ~32% since 1990. India 2.0 t CO/ person (2024) Highest growth rate of any major economy in 2024 (+5.3%). Severe heatwaves boosted electricity demand by 5%. Added 35 GW of solar/wind — but renewables couldn't keep pace with surging demand. Net zero target: 2070. Australia 14.0 t CO/ person (2024) Among the highest per-capita OECD emitters. Grid renewables surpassed 42% of generation in 2025, driven by solar expansion. Coal export economy remains a major emissions driver. Domestic emissions on slow decline. Saudi Arabia 18.7 t CO/ person (2024) Highest per-capita of any major economy. Oil-subsidized electricity, energy-intensive desalination, industrial expansion, and extreme air conditioning demand in a hot climate drive the world's highest per-capita intensity.

COVID-19 Impact & Rebound

The Pandemic Dip: A 5.4% Drop That Fully Reversed Within Two Years

The COVID-19 pandemic caused the largest single-year decline in global CO since World War II. In 2020, emissions fell approximately **5.4% (2.0 Gt)** — from 36.7 Gt (2019) to 34.8 Gt. Aviation near-ceased, road transport fell 40–50% in locked-down regions, and industrial production halted across major economies. For climate scientists, the event provided an inadvertent natural experiment into what large-scale activity restriction looks like in emissions data.

The result was sobering: even the worst peacetime economic contraction in modern history cut CO by only 5.4%. By 2021, emissions had rebounded 5.7%. By 2022, they exceeded the pre-pandemic record. By 2024, they set a new all-time high. The COVID episode confirmed what climate economists had long argued — reducing emissions requires **structural transformation of energy systems**, not behavioral change alone.

There are many signs of positive progress at the country level, and a feeling that a peak in global fossil CO emissions is imminent — but the global peak remains elusive.

— Dr. Glen Peters, CICERO Center for International Climate Research, Global Carbon Budget 2024

COVID-19 Emissions Impact (2019–2024) The Pandemic Dip & Full Rebound in Numbers 36.7 Gt2019 Pre-Pandemic Peak 34.8 Gt2020 Trough (−5.4%) 36.3 Gt2021 Rebound (+5.7%) 36.8 Gt2022 Above Pre-Pandemic 37.4 Gt2023 & 2024 New Records +3.75 ppmLargest CO Annual Rise 2024

Paris Agreement & Climate Targets

The Emissions Gap: How Far Are We From the Paris Agreement in 2026?

The Paris Agreement commits 196 signatories to limiting warming to **well below 2°C, pursuing 1.5°C** above pre-industrial levels. Countries submit Nationally Determined Contributions (NDCs) — emissions reduction pledges updated every five years. The **2025 UNEP Emissions Gap Report** finds that even full NDC implementation puts the world on track for approximately **2.6–2.8°C of warming by 2100**. The current policy trajectory without any additional action is closer to **3.0°C**.

The gap between where emissions are and where they need to be has never been wider. 2030 emissions under current policies are projected at ~33 Gt — more than **12 Gt above** the ~21 Gt required for the 1.5°C pathway. COP30, scheduled for Belém, Brazil in late 2025, has been identified by the UNFCCC as the critical moment for countries to submit significantly stronger NDCs ahead of the 2035 deadline.

1 1.5°C Target: 43% Cut by 2030, Net Zero ~2050 Global emissions must fall from 36.7 Gt (2019 baseline) to ~20–21 Gt by 2030 and reach net zero by 2050. This requires annual reductions averaging ~1.5 Gt/year through 2030 — a rate never achieved historically. The IEA's Net Zero by 2050 scenario requires no new fossil fuel development from 2021 onward, and solar additions of 630+ GW/year. 2 2°C Target: 25% Reduction by 2030, Net Zero ~2070 A more achievable but still demanding pathway. Emissions must fall to ~27–28 Gt by 2030. Current updated NDC trajectories project ~31–33 Gt in 2030 — still 3–5 Gt above what is required. The 2024 record of 37.4 Gt means the world needs to cut approximately 10 Gt by 2030 to stay on the 2°C pathway — equivalent to eliminating the emissions of the entire US and EU combined. 3 Current Policy Track: ~2.6–3.0°C by 2100 According to Climate Action Tracker (October 2025 update), current policies — not pledges but implemented policies — put the world on track for 2.6–3.0°C of warming by 2100. This would expose hundreds of millions to catastrophic heat stress, food system collapse, mass displacement, and multi-metre sea level rise over the coming centuries. 4 Carbon Dioxide Removal: Still Negligible at Scale All 1.5°C pathways require deploying Carbon Dioxide Removal (CDR) — including Direct Air Capture (DAC), BECCS, afforestation, and enhanced weathering. In 2025, global DAC facilities captured approximately 0.01 Mt CO/year — one millionth of annual emissions (confirmed by Global Carbon Budget 2024). Scaling CDR to the required gigatonne levels by 2050 is among the largest technological challenges in human history.

Energy Transition & 2026 Outlook

How the Clean Energy Transition Is — and Is Not — Bending the Curve

Despite record emissions, the structural trajectory of the global energy system has shifted decisively. In 2024, the world added approximately **530 GW of new solar and wind capacity** — more than the entire installed nuclear capacity of the United States. Solar PV costs have fallen **90% since 2010**. Renewables now produce **32% of global electricity**, up from 20% in 2015. The falling cost of clean energy is reshaping electricity markets globally, with new solar and wind now cheaper than new coal or gas in most of the world.

Yet the core problem remains: energy demand is growing faster than clean energy is being added, so fossil fuel use keeps rising in absolute terms. The IEA confirms that **advanced economies collectively reduced emissions by 1.1% in 2024**, but developing economies increased by 1.5%, and natural gas — a bridge fuel — rose 2.5% globally. The path to stabilization requires not just adding clean energy but actively retiring fossil infrastructure at scale. EVs, explored in detail in our EV market statistics, displaced approximately 1.6 million barrels of oil per day in 2024.

Energy Transition Metrics — 2025/2026 The Clean Energy Numbers That Signal a Real Structural Shift

Solar accounts for ~6.5% of global electricity (up from 0.5% in 2012). Wind provides ~8%. Combined renewables (solar, wind, hydro, geothermal, biomass) supply **32% of global electricity in 2024** — up 12 percentage points since 2010. Global EV sales hit **17.1 million in 2025**, representing 18% of all new vehicle sales. China accounts for 60% of global EV sales. Electric vehicles are projected to displace 4–5 million bbl/day of oil demand by 2028. Clean energy investment reached approximately $1.8 trillion in 2024 — still less than half the $4.5 trillion/year the IEA says is needed by 2030.

Coal in 2024–2026: The Decisive Variable

Coal remains the single highest-impact lever in global CO Despite declines in the US and EU, global coal consumption hit all-time highs in 2023 and remained near those levels in 2024. China consumes approximately **4.6 billion tonnes per year** (55% of global coal). Coal's carbon intensity of ~820 gCO kWh is roughly twice that of gas and infinitely more than renewables.

Eliminating coal from global electricity generation would alone reduce annual CO by approximately **7–8 Gt** — the single largest emissions reduction measure available. China's coal peak, expected between 2025 and 2030 by most analysts, is therefore the most important near-term variable in global emissions modelling. IEA data confirms China's 2024 coal growth slowed to 0.9% from 3%+ in 2023 — a potential inflection signal.

Country Emission Profiles 2024

Key Country Profiles: Leaders, Laggards, and Structural Transformers

The global emissions story is a collection of national stories, each shaped by its energy mix, development level, political economy, and climate commitments. The 2024 IEA data reveals widening divergence: advanced economies declining, emerging markets rising. The following profiles highlight seven key emitters whose trajectories will define whether global temperature targets can be achieved.

China · 11.9 Gt (31.8%) Growth slowed to 0.4% in 2024; coal peak approaching China installed ~280 GW of solar in 2024 alone — more than the rest of the world combined. Yet total emissions still grew slightly due to surging electricity demand. The timing of China's coal peak (2025–2030) is the single most important near-term climate variable. United States · 5.0 Gt (13.4%) On structural decline; IRA ($369B) driving clean investment US emissions declined modestly in 2024 as part of the advanced economy 1.1% collective reduction. The Inflation Reduction Act is projected to cut 1.0–1.5 Gt by 2030 vs baseline. Natural

gas remains dominant in the US power mix. India · 2.8–3.0 Gt (7.5%) Fastest-growing major economy emissions (+5.3% in 2024) India's 35 GW of new renewables in 2024 could not keep pace with a 5% surge in electricity demand driven by economic growth and extreme heat. India has pledged 500 GW non-fossil capacity by 2030 and net zero by 2070. Near-term coal expansion continues. European Union · ~2.6 Gt (7.0%) Led global advanced economy reductions; coal at historic lows EU coal emissions fell 5.7% in 2024. Germany's coal-to-renewables transition, REPowerEU, and EU ETS carbon pricing are producing structural decarbonization. Fit for 55 targets a 55% cut vs 1990 by 2030. Down ~32% since 1990 already. Russia · 1.8 Gt (4.8%) Emissions stable; fossil exports redirected to Asia post-2022 Western sanctions following the Ukraine invasion redirected Russian oil and gas exports to China, India, and the Global South — sustaining fossil revenues. Russia's gas-intensive economy and cold climate make rapid decarbonization structurally difficult without regime-level policy change. Japan · 1.1 Gt (2.9%) Declining; nuclear restarts reducing fossil dependence Japan's emissions surged after 2011 Fukushima but are now declining as nuclear capacity restarts. Japan has set a 46% reduction target by 2030 and net zero by 2050, with hydrogen and ammonia co-firing at coal plants as key near-term strategies.

2030 & 2050 Projections

Global CO_2 Projections to 2030 and 2050: Three Scenarios

Climate scenario analysis provides quantitative bounds on how emissions might evolve. The IPCC AR6 uses five Shared Socioeconomic Pathways (SSPs). The following three scenarios represent the most policy-relevant cases: transformative action, pledged policies, and the status quo. The gap between the best and worst cases in 2030 is approximately **12 Gt CO_2/year** — equivalent to shutting down the combined US and EU economies.

The most credible optimistic analysis (IEA Net Zero Roadmap, BloombergNEF New Energy Outlook) identifies a technology pathway that is physically and economically feasible — based primarily on solar, wind, batteries, heat pumps, and electrified transport. The constraint is not technological feasibility but the pace of capital mobilization, policy implementation, and international coordination required. COP30 (Belém, 2025) and the 2035 NDC submission cycle represent the next critical decision points.

Scenario Analysis — IEA WEO 2025 & IPCC AR6 Global CO Emissions Projections: Three Pathways ~21 GtNet Zero 2050 Path (2030) ~27 GtCurrent NDC Pledges (2030) ~33 GtCurrent Policies Only (2030) Net ZeroNZ2050 Path (2050) ~5 GtNDC Pledges Path (2050 est.) ~40+ GtCurrent Policies Path (2050)

Frequently Asked Questions

CO_2 Emissions: Frequently Asked Questions — Updated 2026

Global energy-related CO emissions reached a record **37.4 Gt** in 2024 — up 0.8% from 2023 — according to the IEA Global Energy Review 2025. Natural gas was the largest contributor to growth (+2.5%, 180 Mt), while coal grew 0.9% (135 Mt). Advanced economies cut emissions 1.1%, but were outweighed by 1.5% growth in emerging markets. Including land-use change (deforestation), total CO was approximately **41.6 Gt** (Global Carbon Project 2024). Atmospheric CO hit a record 424.6 ppm at Mauna Loa — the largest single-year increase (3.75 ppm) ever recorded.

China leads at approximately **11.9 Gt (31.8%)** of global CO in 2024, though its growth slowed to just 0.4% (IEA). The United States is second (~5.0 Gt, 13.4%), followed by India (~2.8–3.0 Gt, 7.5% — highest growth rate at +5.3%), Russia (1.8 Gt, 4.8%), and Japan (1.1 Gt, 2.9%). Per capita, Saudi Arabia (18.7t), Australia (14.0t), and the US (15.0t) lead all major economies, while India's 2.0t is below the 4.7t global average.

Global CO has increased approximately **7.5× (650%)** since 1940 — from 5.0 Gt to 37.4 Gt. The post-WWII boom (1945–73) nearly tripled emissions. China's industrialization (1990–2015) drove the second major surge, contributing ~8–10 Gt of the ~14 Gt increase during that period. The only significant interruptions were the 1973/1979 oil shocks, the Soviet collapse (1991, −3.6%), the 2008–09 financial crisis (−1.4%), and COVID-19 (2020, −5.4%). Emissions have never sustained a multi-year decline.

As of early 2026, atmospheric CO is approximately **425–427 ppm**, based on the Mauna Loa Observatory trend. The 2024 annual average was 424.61 ppm at Mauna Loa — a record — with the largest single-year increase (3.75 ppm) ever measured, per NOAA. The global average was 422.8 ppm in 2024. This is 52% above pre-industrial levels (280 ppm) and the highest level in at least **3 million years** of Earth history according to paleoclimate records.

The 2024 Global Carbon Budget (Friedlingstein et al., published Nov 2024) found fossil CO emissions of **37.4 Gt in 2024**, up 0.8% — a new record. Including land-use change, total CO was ~41.6 Gt. The study found there is still **"no sign" that global fossil CO_2 emissions have peaked**. Technology-based CDR (Direct Air Capture) removes only about one-millionth of annual fossil emissions. The land CO sink weakened in 2023–24 due to El Niño drought stress, pushing atmospheric CO up at record pace.

For **1.5°C**: emissions must fall ~43–45% from 2019 levels (36.7 Gt) to ~20–21 Gt by 2030, then reach net zero by ~2050. Current policies put 2030 emissions at ~33 Gt — about **12 Gt above** the required level. For **2°C**: a ~25% cut to ~27–28 Gt by 2030 is needed. The remaining carbon budget for 1.5°C (50% probability) is now approximately **425 Gt CO_2 as of early 2026** — only about 11 years at current rates.

The six major emission sectors in 2024: **Energy & Power (34%)** — coal, gas, oil for electricity/heat; **Industry (24%)** — cement, steel, chemicals; **Transport (21%)** — road, aviation, shipping; **Agriculture & Land Use (12%)** — deforestation and farming; **Buildings (6%)** — heating, cooling, cooking; **Waste & Other (3%)**. In 2024, natural gas was the largest single driver of growth (+2.5%), marking a historic shift from coal's traditional role. Coal still dominates energy CO₂ by volume at ~40% of total.

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STATISTICS REPORT

Global Climate Change — Statistics & Facts 2026

Updated Jun 13, 2026 · businesstats.com/global-climate-change

+1.60°C 2024 TEMP. ANOMALY VS. PRE-INDUSTRIAL (HOTTEST YEAR)	**+1.47°C** 2025 TEMP. ANOMALY — 3RD WARMEST YEAR ON RECORD	**430.5** ATMOSPHERIC CO PEAK (PPM) — MAY 2025 RECORD
60.63 Bt TOTAL GHG EMISSIONS 2025 (CO E)	**37.4 Gt** FOSSIL FUEL CO EMISSIONS 2024 RECORD	**4.1 mm** ANNUAL SEA LEVEL RISE (2016–2025 AVG, DOUBLED SINCE 1993)

Executive Summary

Global Climate Change in 2026: Record Emissions, Record Heat, and a Widening Paris Gap

The Earth's climate system is in an unprecedented state of flux. Every major indicator — atmospheric greenhouse gas concentrations, global surface temperature, ocean heat content, sea level, and the frequency of extreme weather events — is trending in the wrong direction at the very moment international climate action is being challenged by geopolitical headwinds. Global greenhouse gas emissions hit a fresh record of **60.63 billion tonnes of CO_2 equivalent (Bt CO_2e) in 2025**, according to Climate TRACE data released in February 2026. Fossil fuel CO alone reached **37.4 billion tonnes in 2024**, another all-time high. These trends are well-documented in the broader context of oil industry statistics & facts, where fossil fuels continue to dominate despite the renewable energy revolution gathering pace.

The temperature record tells the same story. The year 2024 was the warmest in the 176-year observational record, with a mean near-surface temperature anomaly of **+1.60°C above pre-industrial levels** (1850–1900 baseline), making it the first year on record to breach the 1.5°C Paris Agreement threshold. In 2025, the full-year average came in at **+1.47°C above pre-industrial** (Copernicus/ERA5), ranking as the third warmest year — just 0.01°C below 2023 and 0.13°C below 2024. Crucially, the three-year average for 2023–2025 stands at 1.48°C, marking the **first time any three-year period has exceeded 1.5°C** in the instrumental record. The last 11 consecutive years — from 2015 through 2025 — have individually each ranked among the warmest years ever recorded. The mathematical probability of this occurring by natural variation alone

is essentially zero: it is the unambiguous fingerprint of human-caused warming. Atmospheric CO peaked at **430.5 ppm in May 2025** (NOAA), the first monthly average above 430 ppm in over 3 million years.

11/11Years (2015–2025) Each Among Hottest on Record (2024 hottest at +1.60°C) 53%Increase in Atmospheric CO Since Pre-Industrial Era 9×Consecutive Years Ocean Heat Content Set Records +60%Growth in Global Fossil CO Emissions Since 1990 43%Emissions Cut Needed by 2030 to Limit 1.5°C Warming $14TAnnual Cost by 2100 if 2°C Sea Level Target Missed

Despite decades of international climate negotiations — from the 1992 Rio Earth Summit to the 2015 Paris Agreement and the annual COP process — global emissions have not yet peaked. The gap between what nations have pledged and what the science requires is enormous. UNEP's 2025 Emissions Gap Report found that current NDC pledges put the world on a **2.3–2.5°C trajectory by 2100**, while current implemented policies alone lead to **2.8°C**. To limit warming to 1.5°C, the world must cut annual emissions by **55% by 2035** compared to 2019 levels — a reduction that would require the fastest economic transformation in human history. Yet in 2025, the US formally withdrew from the Paris Agreement under the Trump administration, and the EPA rescinded the Endangerment Finding in February 2026, further widening the global ambition gap. The direct relationship between energy cost and fossil fuel demand is explored in detail in our U.S. energy prices statistics & facts.

Global Temperature Rise

Global Temperature Statistics: +1.60°C in 2024, +1.47°C in 2025 — 11 Consecutive Record Years

The global mean surface temperature anomaly for 2024 was **+1.60°C above the 1850–1900 pre-industrial baseline**, according to multiple independent datasets including HadCRUT5, NASA GISS, NOAA, Berkeley Earth, and ERA5 — the first calendar year to breach the 1.5°C Paris Agreement threshold. In 2025, the full-year average settled at **+1.47°C (Copernicus ERA5)** or +1.44°C (WMO consolidated average of eight datasets), ranking as the third warmest year on record behind 2024 (+1.60°C) and 2023 (+1.46°C). Temperatures were 0.13°C cooler in 2025 than 2024, partly reflecting the transition from El Niño to La Niña conditions in the equatorial Pacific — yet the scale of warmth without El Niño support underscores how profoundly human-caused warming has shifted the baseline. In a historic milestone, the three-year average for 2023–2025 is **1.48°C above pre-industrial levels — the first three-year period on record to exceed 1.5°C**.

Critical Threshold The 1.5°C Threshold: What Crossing It Means

The 2015 Paris Agreement's 1.5°C target was chosen because the IPCC's Special Report on 1.5°C (2018) found that even a half-degree difference between 1.5°C and 2.0°C of warming dramatically changes outcomes: at 2°C vs. 1.5°C, coral reef die-off increases from 70–90% to over 99%, sea level rise adds an additional 0.1m, extreme heat events affecting 5% of land area at 1.5°C affect 14% at 2°C, and Arctic sea ice-free summers go from once per century to once per decade. Exceeding 1.5°C even temporarily increases the probability of triggering irreversible tipping points in the West Antarctic Ice Sheet and Amazon rainforest. The WMO Secretary-General stated in November 2025 that limiting warming to 1.5°C without temporarily overshooting is "virtually impossible," making the 2°C target the operational focus of current climate diplomacy.

For 2026, Berkeley Earth projects temperatures will likely rank as approximately the **fourth-warmest year since 1850**, with La Niña conditions potentially providing a slight cooling influence on the global average. However, Copernicus Director Carlo Buontempo warned that if the warming El Niño phenomenon returns in 2026, it could produce another record-breaking year. The long-term warming trend driven by greenhouse gases means new records are a question of when, not if. Scientists now estimate that long-term global warming has reached around **1.4°C above pre-industrial**, and at the current rate the Paris Agreement's 1.5°C limit could be crossed on a sustained long-term basis before the end of this decade — more than ten years earlier than anticipated when the agreement was signed in 2015. Atmospheric CO continues to rise: the Met Office forecasts the 2026 annual average at Mauna Loa will reach **429.4 ppm**, with the May 2026 seasonal peak projected to hit **432.2 ppm**.

Temperature Anomaly by Year — Historical Record

Global Temperature Anomaly vs Pre-Industrial (1850–1900) Global Mean Surface Temperature Anomaly, 1990–2030 °C above pre-industrial baseline · Multiple datasets · WMO, HadCRUT5, NASA GISS +1.60°C 2024 Record Observed Projected

+0.02°C per year avg. warming trend ■Sources: WMO State of the Global Climate 2025; HadCRUT5; NASA GISS; Carbon Brief 2026 projection. * Projected values based on Carbon Brief model and IPCC SSP2-4.5 pathway.

Greenhouse Gas Concentrations

Greenhouse Gas Emissions Statistics: 60.63 Bt in 2025 — A New Record

Global greenhouse gas (GHG) emissions reached **60.63 billion tonnes of CO_2 equivalent (Bt CO_2e)** in 2025, a 0.50% increase over 2024, according to Climate TRACE's full-year data released on February 26, 2026. This includes all major greenhouse gases — carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated gases — weighted by their global warming potential. Fossil fuel CO_2 emissions alone, measured by the Global Carbon Project, reached **37.4 Gt CO_2 in 2024**, continuing an alarming trend where total emissions have grown by more than 60% since 1990 despite three decades of international climate agreements. The sheer scale of these emissions is inseparable from the trajectory of the fossil fuel industry, which shows no signs of an imminent peak despite the renewable energy transition.

The composition of global GHG emissions reveals critical structural challenges. CO_2 from fossil fuels and cement accounts for the largest share at approximately 66% of total GHG by CO_2e. **Methane (CH_4)** — which has 80 times the warming power of CO_2 over 20 years — accounts for approximately 20% of total GHG, with global methane emissions increasing 1.03% in 2025 to a new record of **412.59 million tonnes of CH_4**. Nitrous oxide (N_2O), primarily from agriculture, accounts for approximately 5%, while fluorinated gases (F-gases) from industrial processes make up the remainder. By sector, the power sector (26% of total emissions) is the largest single source, followed by fossil fuel operations (which saw a 4.1% surge in 2025), transportation, agriculture, manufacturing, and buildings.

Global GHG Emissions by Sector — 2025 Data

Click column to sort

SECTOR	EMISSIONS (BT CO_2E)	SHARE OF TOTAL (%)	YOY CHANGE	PRIMARY SOURCE
Power & Electricity	15.76	26.0%	▼−0.13%	Coal, gas power plants
Fossil Fuel Operations	9.86	16.3%	▲+4.10%	Oil & gas extraction
Transportation	8.49	14.0%	▲+4.76%	Road, air, sea
Agriculture	7.28	12.0%	▲+0.80%	Livestock, rice, fertiliser
Manufacturing & Industry	6.67	11.0%	▲+0.60%	Steel, cement, chemicals
Buildings	3.64	6.0%	▲+0.30%	Heating, cooling, appliances
Waste	2.43	4.0%	▲+0.20%	Landfills, wastewater
Land Use & Forestry	6.50	10.7%	Flat	Deforestation, peatlands

This unprecedented streak of high temperatures, combined with last year's record increase in greenhouse gas levels, makes it clear that it will be virtually impossible to limit global warming to 1.5°C in the next few years without temporarily overshooting this target.

— Celeste Saulo, WMO Secretary-General, November 2025

Emissions by Country

CO_2 Emissions by Country: China Leads at 30%, US Power Sector Falls

The distribution of global CO emissions remains highly concentrated among a small number of major emitters. **China** is responsible for approximately 30% of global fossil fuel CO emissions, making it by far the world's largest national emitter — though in a historic shift, China's power sector emissions declined in 2025 for the first time since Climate TRACE began tracking, falling 0.39% driven by massive renewable energy deployment. The **United States** accounts for approximately 14% of global CO and emitted 7.01 Bt CO e in 2025, virtually unchanged from its 2015 level of 7.04 Bt CO e despite a 25.5% fall in power sector emissions — offset by a 29.8% increase in fossil fuel operations. For a comprehensive breakdown of these national contributions, the share of oil reserves by country dataset provides essential context on which nations hold the largest fossil fuel endowments and their resulting outsized emissions responsibility.

Share of Global CO_2 Emissions by Major Emitter — 2025

GLOBAL CO SHARE BY COUNTRY 2025 CO Emissions Share by Country or Bloc Fossil fuel CO only · Climate TRACE, Global Carbon Project · 2025 data

Fossil fuel CO only. Percentages are approximations from Climate TRACE & Global Carbon Project. Land-use emissions excluded.

Per Capita CO Emissions — Top Emitters 2024 CO Emissions Per Person (Tonnes CO yr) Fossil fuel CO only · Global Carbon Project · 2024 data * Global average: ~4.7 t CO person. Per capita emissions reveal vast disparities — some high-income nations emit 100× more than the poorest. Source: Global Carbon Project, Our World in Data.

Per capita emissions tell a profoundly different story than national totals. While China's aggregate emissions dwarf those of most nations, its per capita emissions of approximately 8.4 tonnes CO per year remain well below those of major Gulf oil-producing nations and the United States. The massive disparities in per capita emissions have long been a source of tension in global climate negotiations, with developing nations arguing that historical cumulative emissions — dominated by the US and Europe — should bear the

greatest responsibility for financing the energy transition. This equity debate is central to the global energy transition economics and the design of climate finance mechanisms under the UNFCCC.

Sea Level Rise

Sea Level Rise Statistics: 4.1 mm/Year (2016–2025) — Rate Has Doubled Since 1993

Global mean sea level rise is one of the most consequential and measurable impacts of climate change, driven by two principal mechanisms: the thermal expansion of warming ocean water (approximately 42% of observed rise) and the melting of glaciers, ice caps, and ice sheets (approximately 44%). Between 1901 and 2018, global sea levels rose by 15–25 cm (6–10 inches). The rate has accelerated dramatically: from approximately 2.1 mm per year between 1993 and 2002, to **4.1 mm per year between 2016 and 2025** — a near-doubling in just over two decades, according to WMO data. The year 2024 set a new observed record for annual global mean sea level. Preliminary 2025 data show a slight drop from early 2025 levels, attributed to temporary La Niña and other short-term factors — scientists expect the long-term rising trend to resume. Since 1890, total sea level rise has reached approximately 21–24 cm.

Sea Level Rise Scenarios — 2100 Projections Sea Level Rise Under Different Warming Pathways 0.3mMinimum (1.5°C Pathway) by 2100 0.74mMedian Under 1.5°C Warming Scenario 0.80mMedian Under 2.0°C Warming Scenario 2.0mHigh-End Scenario With Rapid Ice Sheet Collapse $14TAnnual Economic Cost by 2100 if 2°C Target Missed 1 BillionPeople Currently Impacted by Rising Seas

The economic costs of unmitigated sea level rise are catastrophic at scale. A study published in Environmental Research Letters found that flooding from rising seas could cost the global economy **$14 trillion per year by 2100** if the 2°C temperature target is missed. The Climate Impact Lab's open-source model estimates costs of **$2.9–3.4 trillion per year by 2100** under high-emissions scenarios, even with some adaptation measures. Asia-Pacific coastal damages alone could reach $500 billion per year by 2100 without adaptation, according to the Asian Development Bank. The 23 mm of sea level rise per decade compounding over 80 years means coastal cities from Miami to Mumbai, Jakarta to Dhaka, Shanghai to Amsterdam face fundamental questions about their long-term habitability. Over **600 million people** currently live in low-elevation coastal areas (less than 10 meters above sea level), and rising seas threaten to displace communities on a scale that would dwarf any migration event in human history.

Rising seas are already impacting 1 billion people worldwide. The rate of sea level rise has more than doubled since the 1970s, driven by melting glaciers and thermal expansion of warming oceans. Low-lying

coastal nations and major port cities face existential challenges as the rate of rise accelerates toward 5+ mm per year.

Extreme Weather Events

Extreme Weather Statistics: The New Normal of Climate Disruption

The fingerprint of climate change is most viscerally felt in the intensification of extreme weather events. As global temperatures rise, the atmosphere holds more moisture (approximately 7% more water vapor per degree Celsius of warming, per the Clausius-Clapeyron relation), intensifying precipitation events, while heat waves become longer, more frequent, and more lethal. In 2025, approximately **half of the global land area experienced more days than average with strong heat stress** (feels-like temperature above 32°C), and around **770 million people experienced record-warm annual conditions** where they live — while not a single location recorded a record-cold annual average, according to Berkeley Earth. The WMO's State of the Global Climate 2025 documented devastating flooding across multiple African and Asian nations, severe wildfires in Europe (which recorded its highest annual wildfire emissions ever) and North America, extreme heat across multiple continents, and deadly tropical cyclones — all within a single year.

Heat Waves: Longer, Hotter, More Lethal Climate attribution science has established that virtually every major heat wave since 2015 was made significantly more likely and more intense by human-caused climate change. The proportion of the world's land area experiencing extreme heat (defined as temperatures in the top 10% of historical records) has expanded dramatically. In Europe, heat waves that occurred once every 50 years in a pre-industrial climate now occur once every 5–10 years at current temperatures. A 2°C world would see them once every 2–3 years. In South Asia, 2°C warming could push heat-humidity combinations (wet-bulb temperature) beyond human physiological limits for extended periods in parts of India, Pakistan, and Bangladesh. Tropical Cyclones: More Intense, Slower-Moving While the total number of tropical cyclones is not clearly increasing, climate change is causing storms that do form to reach higher peak intensities, move more slowly (increasing local rainfall totals), and maintain intensity at higher latitudes. Rapid intensification events — where a hurricane strengthens by 35+ mph in 24 hours — are becoming more frequent as the oceans store record quantities of heat. Hurricane Ian (2022), Typhoon Doksuri (2023), and multiple 2024–2025 Atlantic storms demonstrated the catastrophic potential of rapidly intensifying storms making landfall near densely populated coastal areas. Flooding: Heavier Rainfall, More Frequent 1-in-100-Year Events A warmer atmosphere holds more moisture, making the heaviest rainfall events more frequent and more extreme. Events that historically occurred once per century are now occurring once per 20–30 years, and climate projections suggest they will occur once per 5–10 years in a

2°C world. The 2025 flooding season caused displacement across multiple African and Asian nations, contributing to the global displacement crisis in ways that are now recognized as a direct consequence of climate change by the UNHCR and IPCC. Wildfires: Longer Seasons, Larger Burn Areas The global wildfire season has lengthened by an average of 18.7% since 1979, driven by increased temperatures, drought, and decreased humidity. Canada's record 2023 wildfire season (18.4 million hectares burned) was followed by deadly fires in Greece, Chile, and Hawaii. In 2025, Europe and North America again experienced above-average wildfire activity. Climate-driven wildfires are now reversing air quality improvements achieved over decades in North America, according to a 2025 study on wildfire pollution trends.

Ocean Heat & Ice Loss

Ocean Heat Content & Cryosphere: Nine Consecutive Record Years

The world's oceans absorb approximately 90% of the excess energy trapped by greenhouse gases, making ocean heat content (OHC) the most comprehensive measure of Earth's energy imbalance. In 2025, OHC reached a new record for the **ninth consecutive year**, according to a report published in January 2026 in Advances in Atmospheric Sciences. The total heat accumulated in the oceans since the 1940s amounts to approximately **500 zettajoules (10^{21} joules)**. To put 2025's single-year increase in perspective: the approximately 23 zettajoules of heat added to the oceans in 2025 alone equals approximately **39 times the total primary energy produced by all human activities on Earth in 2023**. This ocean heat drives sea level rise through thermal expansion, intensifies hurricanes, bleaches coral reefs, and disrupts marine food chains — impacts that cascade through the entire Earth system.

Arctic Sea Ice 2025: Lowest Winter Maximum on Record — 13.8 million km² Arctic sea ice extent after the winter freeze in March 2025 reached just 13.8 million km², the lowest winter maximum ever recorded in the satellite era. The summer minimum of 4.6 million km² (September 2025) was also below the long-term average. Arctic warming is occurring approximately 4× faster than the global average — a phenomenon known as "Arctic Amplification" driven by the ice-albedo feedback (ice reflects sunlight; as ice melts, darker ocean absorbs more heat). Seasonal ice-free Arctic summers are projected with high confidence before 2040 under current emissions trajectories. Antarctic Sea Ice 2025: Largest Glacier Loss on Record — 450 Gigatonnes Reference glaciers monitored by the World Glacier Monitoring Service recorded a global annual mass balance of −1.3 metres of water equivalent in 2025, equivalent to

450 gigatonnes of ice lost

— the largest loss on record back to 1950, and equivalent to approximately 1.2 mm of global mean sea level rise from glaciers alone in a single year. Antarctic sea ice extent was third-lowest on record for both the annual minimum (2.1 million km² in February 2025) and maximum (17.9 million km² in September 2025). The Antarctic ice sheet, which holds 58 metres of potential sea level rise, is showing accelerating mass loss particularly in the vulnerable West Antarctic Ice Sheet — a potential tipping point at warming levels now considered increasingly likely. Greenland Ice Sheet 247 Bn tonnes/year mass loss (2012–2016) Ice loss from the Greenland Ice Sheet increased seven-fold from approximately 34 billion tonnes per year in 1992–2001 to 247 billion tonnes per year in 2012–2016. Record losses occurred in 2012 and 2019. The warming already experienced has committed Greenland to losing approximately 3.3% of its volume — equivalent to 27 cm of sea level rise — regardless of future emissions. Modeling research suggests the tipping point for near-complete Greenland ice melt could occur between 1.7°C and 2.3°C of global warming. Coral Reefs Caribbean hard coral cover down 48% since 1980 A December 2025 report from the Global Coral Reef Monitoring Network found that Caribbean hard coral cover declined by 48% between 1980 and 2024, driven primarily by ocean warming and acidification. The Great Barrier Reef experienced its most widespread bleaching event on record in 2024, covering over 73% of surveyed reefs. At 1.5°C of warming, 70–90% of coral reefs are projected to decline significantly; at 2°C, more than 99% of corals are at risk of near-complete functional collapse.

Paris Agreement Gap

The Emissions Gap: How Far Off Track Are We From Paris Agreement Goals?

UNEP's 16th Emissions Gap Report, titled "Off Target" and published in November 2025, provides the most authoritative annual assessment of the gap between national climate commitments and what science requires. The report's headline finding is stark: global warming projections based on full implementation of current NDC pledges are **2.3–2.5°C**, while current implemented policies put the world on a **2.8°C pathway by 2100**. Neither scenario is remotely compatible with the 1.5°C target, and both significantly exceed the "well below 2°C" goal. To align with the 2°C pathway, annual global emissions must fall by **35% by 2035** compared to 2019 levels; for 1.5°C, the cut must be **55% by 2035**.

Paris Agreement Gap Analysis — UNEP 2025 Emissions Gap Report

SCENARIO	2100 WARMING PROJECTION	REQUIRED 2030 CUT VS. 2019	REQUIRED 2035 CUT VS. 2019	STATUS

Paris 1.5°C Target	1.5°C	43% reduction	55% reduction	Target
Paris 2.0°C Target	2.0°C	27% reduction	35% reduction	Target
Full NDC Implementation	2.3–2.5°C	~10% reduction	Insufficient	Off Target
Current Policies Only	2.8°C	Emissions rising	Emissions rising	Critically Off Track
No Climate Policies	3.0–3.5°C+	N/A	N/A	Baseline Risk

The political landscape for climate action became significantly more challenging in 2025–2026. The United States, historically the world's second-largest emitter, formally withdrew from the Paris Agreement under the Trump administration. The EPA rescinded the Endangerment Finding (the legal basis for regulating CO as a pollutant) on February 12, 2026. Climate Action Tracker downgraded the US's climate rating to "critically insufficient" in September 2025. UNEP noted that the upcoming US withdrawal from the Paris Agreement effectively cancels 0.1°C of the modest improvement achieved through new NDCs submitted for COP30, underscoring how political reversals can rapidly erode years of diplomatic progress. The EU, by contrast, provisionally agreed to a **90% reduction target for greenhouse gas emissions by 2040** (compared to 1990 levels), and EU wind and solar energy surpassed fossil power (30% vs. 29% of electricity generation) for the first time in 2025.

Clean Energy Transition

Clean Energy Transition: Renewables Surge, But Fossil Fuels Still Rising

The clean energy transition is genuinely transformational in its pace, but it is not yet fast enough to bend the global emissions curve. Solar and wind capacity additions have broken records for multiple consecutive years. In the EU, wind and solar provided **30% of electricity in 2025**, surpassing fossil power (29%) for the first time. China's massive deployment of renewables caused its power sector emissions to decline for the first time in 2025. Solar PV costs have fallen by approximately 90% over the past decade, making new solar and wind the cheapest sources of electricity in most markets globally. Electric vehicle sales continue to surge, with EVs capturing an increasing share of new vehicle sales in major markets — though their overall share of the global car fleet remains modest, limiting emissions displacement thus far.

Clean Energy Progress vs. Emissions Gap Why Renewables Are Growing Fast But Emissions Are Still Rising

The paradox of the energy transition is that renewable energy additions are adding to total energy supply, not fully replacing fossil fuels. Global primary energy demand continues to grow, driven by economic development in Asia, Africa, and Latin America. While renewables now supply the marginal growth in electricity demand, coal, oil, and gas are not being retired fast enough to reduce total emissions. The rate of emissions growth has slowed — from 1.9% annually in 2005–2015 to approximately 0.2–0.5% annually in 2015–2025 — but stabilization, not reduction, is the current trajectory. Net-zero by 2050 requires an unprecedented 7–8% annual decline in fossil fuel emissions starting immediately, a trajectory that would require shutting down coal plants, gas infrastructure, and combustion engine vehicles far faster than current policy frameworks support. Steel and cement — which together account for over 15% of global CO — remain especially hard to decarbonize, as carbon intensity of global steel production has been increasing since 2018.

Regional Impacts

Regional Climate Change Impacts: Who Is Most Vulnerable?

Climate change impacts are not distributed equally. Developing nations — which have contributed the least to cumulative historical emissions — are disproportionately exposed to climate risks through geography (tropical latitudes, coastal lowlands, drought-prone regions), economic dependence on climate-sensitive sectors (agriculture, tourism, fisheries), and limited adaptive capacity. The IPCC's Sixth Assessment Report (AR6) identified Sub-Saharan Africa, South Asia, Small Island Developing States (SIDS), and the Arctic as regions facing the most severe and systemic climate risks. This regional disparity is central to debates about climate justice, loss and damage compensation, and the design of climate finance flows.

South & Southeast Asia Largest exposed population; 44M people at risk from sea level rise in 23 Asian cities by 2100 Bangladesh, Vietnam, and the Philippines face severe threats from sea-level rise combined with increasingly intense tropical storms. Up to 18% of Bangladesh's coastal land may be permanently submerged by 2100 under high emissions. Asia-Pacific coastal damages could reach $500B/year by 2100. Heat-humidity combinations in Pakistan and India are approaching physiological stress limits, impacting agricultural productivity and outdoor labor. Indonesia, Thailand, and India are experiencing unprecedented flood-related disasters that threaten economic growth in agriculture, fisheries, and tourism. Sub-Saharan Africa Sea level damages could reach 2–4% of GDP by 2050; lowest per-capita emissions, highest vulnerability Africa faces a profound climate injustice: it is responsible for less than 4% of cumulative global CO emissions but is among the most vulnerable regions to climate impacts. Twelve major African cities could sustain cumulative damages of $65–138 billion by 2050 from sea level rise alone. Across sub-

Saharan Africa, sea level rise damage could reach 2–4% of GDP by 2050. In East Africa, 750,000 people face coastal displacement by 2050. Droughts, shifting rainfall patterns, and rising temperatures threaten food security for hundreds of millions of people in rain-fed agriculture systems. Small Island States (SIDS) Existential threat; Maldives highest point is 1.5m above sea level For Small Island Developing States — from Tuvalu and Kiribati in the Pacific to the Maldives and Seychelles in the Indian Ocean — climate change is an existential rather than merely economic threat. The Maldives' average elevation is 1.5 meters above mean sea level; a 1-meter rise would inundate 77% of its land area. Papua New Guinea faces potential GDP loss of up to 15.2% annually by 2100 from climate damages — the highest in the Pacific. The remoteness of many island nations compounds adaptation challenges, limiting access to materials, technology, and financing. Europe & North America EU: 30% renewables surpass fossil in 2025; Sea level costs €872B for EU&UK under high-end scenario Even wealthy regions face substantial climate costs. A high-end sea level rise scenario would cost the EU and UK an estimated €872 billion (1.26% of GDP), with some coastal regions facing losses of 9–21% of regional GDP. Heat wave mortality has increased sharply — the 2003 European heat wave caused 70,000 excess deaths; the 2022 event caused 61,000. The EU is the global leader in climate ambition, with a provisional 90% emissions reduction target for 2040. Wind and solar supplied more EU electricity than fossil fuels for the first time in 2025, generating more power than fossil sources in 14 of 27 EU countries.

2030–2050 Outlook

Climate Outlook 2030–2050: What the Science Projects

The trajectory of global climate change over the next 25 years will be determined primarily by decisions made in the next decade — in particular, whether the massive renewable energy deployment underway accelerates fast enough to peak and then rapidly reduce fossil fuel consumption. The IPCC AR6 Synthesis Report (2023) and subsequent analyses are unambiguous: every fraction of a degree of warming avoided translates to meaningfully lower losses for people and ecosystems, lower adaptation costs, and reduced reliance on uncertain carbon dioxide removal (CDR) technologies. The window to limit warming to 1.5°C is effectively closing, but the difference between 2.0°C and 2.8°C — and between 2.8°C and 3.5°C — represents profoundly different futures for billions of people.

2030–2050 Climate Projections Key Climate Indicators: Science-Based Outlook ~1.5°CLikely Near-Term Overshoot (Early 2030s) 2.3–2.5°CFull NDC Warming by 2100 2.8°CCurrent Policies Warming by 2100 0.5–1mProjected Sea Level Rise by 2100 (2°C path) >99%Coral Reefs at Risk at 2°C of Warming 2040sFirst Ice-Free Arctic Summer Projected

The UNEP Emissions Gap Report 2025 emphasizes that the required clean energy technologies to deliver large emissions cuts already exist — wind and solar development is booming, deployment costs are falling, and the technological pathway to a decarbonized economy is clear. What is missing is the political will, financial flows to developing nations, and regulatory frameworks to ensure that the energy transition happens fast enough. The report calls for reductions to annual emissions of **35% by 2035 for the 2°C pathway** and **55% for 1.5°C**. Each year of delay makes the remaining pathway steeper and more expensive. Crucially, every fraction of a degree avoided matters: the difference between 1.5°C and 2°C represents hundreds of millions of additional people exposed to life-threatening heat, hundreds of thousands of additional premature deaths per year, and trillions of dollars in additional economic damages. This interconnection between energy systems and climate outcomes is detailed comprehensively in our analysis of the oil industry's role in global emissions.

Frequently Asked Questions

Climate Change Statistics — FAQ

Global average surface temperatures in 2024 were 1.60°C above pre-industrial levels (1850–1900 baseline), making it the hottest year in the 176-year observational record and the first full calendar year to breach the Paris Agreement's 1.5°C threshold. In 2025, the full-year average was 1.47°C above pre-industrial levels (Copernicus ERA5), ranking as the third warmest year. The three-year average for 2023–2025 is 1.48°C — the first three-year period on record to exceed 1.5°C. Berkeley Earth projects 2026 will likely rank approximately fourth warmest since 1850, though an El Niño return could push it to another record.

Atmospheric CO_2 peaked at 430.5 ppm in May 2025 (NOAA), the first monthly average to exceed 430 ppm in over 3 million years — up 3.8 ppm from the May 2024 peak of 426.7 ppm. The 2024 global annual average was 422.8 ppm, with the 2024 Mauna Loa annual average at 424.61 ppm — a record 3.75 ppm jump from 2023. The Met Office forecasts the 2026 annual average to reach 429.4 ppm. Pre-industrial CO_2 was approximately 278 ppm, meaning concentrations are now 54% higher. The 10-year average growth rate (2015–2024) has accelerated to 2.6 ppm per year.

Global greenhouse gas emissions reached a new record high of 60.63 billion tonnes of CO_2 equivalent (Bt CO_2e) in 2025, according to Climate TRACE data released in February 2026. This represented a 0.50% increase over 2024. Fossil fuel CO_2 emissions alone reached 37.4 billion tonnes in 2024 (a record high), with coal (40%), oil (32%), and natural gas (21%) as the primary sources. China emits approximately 30%

of global CO₂ followed by the US (14%), EU (8%), and India (7%).

The rate of global mean sea level rise has nearly doubled from 2.1 mm per year (1993–2002) to 4.1 mm per year (2016–2025), according to WMO data. The year 2024 set a new observed record for annual global mean sea level. Between 1993 and 2018, melting ice sheets and glaciers accounted for 44% of sea level rise, while thermal expansion of warming oceans contributed 42%. Glacier losses reached a record 450 gigatonnes in 2025 alone. Under high emissions scenarios, sea level rise could cost the global economy $2.9–3.4 trillion per year by 2100, or up to $14 trillion per year if the 2°C Paris target is missed.

No. UNEP's Emissions Gap Report 2025 ("Off Target") projects global warming of 2.3–2.5°C under full NDC implementation, and 2.8°C under current policies — both far above the Paris targets. To align with 2°C, emissions must fall 35% by 2035 vs. 2019; for 1.5°C, 55% by 2035. The WMO Secretary-General stated in 2025 that limiting warming to 1.5°C without overshoot is "virtually impossible." The US withdrawal from the Paris Agreement in 2025 further widens the ambition gap.

China is the world's largest CO₂ emitter at approximately 30% of the global total, followed by the United States (14%), the European Union (8%), and India (7%). In a historic milestone, China's power sector emissions declined in 2025 for the first time, driven by massive renewable energy deployment. The US emitted 7.01 Bt CO₂e in 2025, nearly unchanged from 2015 despite a 25.5% fall in power emissions. Per capita, wealthy nations and oil-producing Gulf states emit the most, with some countries emitting 100× more per person than the poorest nations.

Ocean heat content (OHC) measures the total heat stored in the world's oceans, which absorb approximately 90% of the excess energy trapped by greenhouse gases. In 2025, OHC reached a new record for the ninth consecutive year. The heat increase in 2025 alone — approximately 23 zettajoules more than 2024 — equals roughly 39 times the total energy produced by all human activities on Earth in 2023. Ocean warming drives sea level rise through thermal expansion, intensifies hurricanes and cyclones, causes coral bleaching, and disrupts marine food chains, creating cascading effects throughout the Earth's climate system.

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▲All temperature anomalies reported relative to the 1850–1900 pre-industrial baseline as defined by the IPCC AR6. GHG totals include all Kyoto Protocol gases weighted by 100-year global warming potential (GWP100). Projections are central estimates from cited sources; uncertainty ranges are noted in the body text. BusinessStats does not generate primary climate data and relies on authoritative scientific bodies. Climate Change CO₂ Emissions Global Warming Paris Agreement Sea Level Rise Greenhouse Gases Net Zero IPCC Energy Transition Carbon Budget Temperature Anomaly Climate Finance Ocean Heat Content Arctic Ice Extreme Weather COP30 2025

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Methodology

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