

2024 | 73rd edition

Statistical Review of World Energy

In collaboration with



KEARNEY

The Energy Institute (EI) is the professional membership body for the world of energy. The EI Statistical Review of World Energy™ analyses data on world energy markets from the prior year. It has been providing timely, comprehensive and objective data to the energy community since 1952.



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Foreword

This 73rd Statistical Review of World Energy is the second under the custodianship of the Energy Institute (EI).

Energy has always been and remains central to human achievement and progress. It is also, increasingly, central to our very survival. With global temperature increases averaging close to 1.5°C, 2023 was the warmest year since records began, and the increasingly severe impacts of climate change were felt across all continents. We also experienced the continuing effects of geopolitical disruption on energy markets, and the economies and livelihoods they support.

As the chartered professional membership body for people working across the world of energy, the Energy Institute is proud to be the home of the Statistical Review of World Energy. Our aim is to provide an objective, independent and comprehensive evidence base for decision makers in governments, businesses and civil society grappling with these profound challenges.

In this second Statistical Review under the Institute's custodianship, we report on another year of highs in our energy hungry world. Record consumption of fossil fuels and record emissions from energy, but also record generation from renewables, driven by increasingly competitive wind and solar energy.

The progress of the transition is slow, but the big picture masks diverse energy stories playing out across different geographies. This year we provide additional visualisations to bring these contrasts to life – from advanced economies where we see signs of demand for fossil fuels peaking,

The progress of the transition is slow, but the big picture masks diverse energy stories playing out across different geographies.

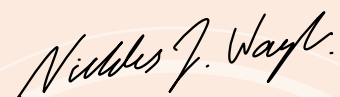
to economies in the Global South for whom economic development and improvements in quality of life continue to drive fossil growth.

This year we also introduce new data sets in areas that will grow in significance over the coming years and decades – in battery storage and battery cells, carbon capture, hydrogen, ammonia, uranium, carbon prices, and additional key minerals and materials. Over the coming months, we'll be engaging with users on further developments, to ensure the way we measure and analyse energy keeps pace and stays relevant as the transition progresses from high to low carbon, from molecule to electron, from supply-led to demand-led.

We are grateful to our co-authors KPMG and Kearney in this vital endeavour, for the support of S&P Global Commodity Insights and bp, and for the data compilation undertaken by Heriot-Watt University. Together we are able to ensure the Statistical Review remains the respected, go-to source of data for the energy community around the world.



Juliet Davenport OBE HonFEI
President, Energy Institute



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CEO, Energy Institute



In collaboration with

KPMG

Businesses worldwide rely on independent and authoritative data to inform their energy transition strategies and investment decisions. The Energy Institute's 2024 Statistical Review of World Energy provides comprehensive insights, which is why KPMG International is proud to collaborate with them on the production of this report.

We saw renewables continuing to scale at pace, with record highs in 2023 and China adding more renewable generation than the rest of the world combined. But fossil fuels grew as well to meet the rising demand for energy globally. As a result, the share of fossil fuels in world energy demand remained stubbornly stuck around the 80% mark.

With record CO₂ emissions as well in 2023, this recent data should serve as a timely reminder for the world to redouble efforts to reduce carbon emissions and reach net zero. In particular, we should do more to provide finance and capacity to support the building of more low-carbon energy sources in the Global South, where demand is growing at a rapid pace.

Kearney

COP28 and rhetoric from world leaders on the energy transition demonstrates the ambition to reduce the world's fossil fuel dependency. However, this ambition is futile unless it is matched with drastic and coordinated actions resulting in real and immediate impact on climate change mitigation.

The Statistical Review of World Energy is the perfect opportunity for us to take a step back and examine the reality of our energy usage to understand just how far we must go on this transitional journey. While progress has been made, 2023 was unfortunately another record year for the consumption of fossil fuels and emissions from energy. With global temperature increases closing in on 1.5°C, we are also seeing a real disconnect with the Paris goals and the progress of the transition is too slow.

We hope that this report will help governments, world leaders and analysts around the world move forward, clear-eyed about the challenge that lies ahead, and ready to take a lead in promoting and enabling the use of clean energy across the world.



Simon Virley CB FEI

Vice Chair and Head of Energy and Natural Resources, KPMG in the UK



Dr Romain Debarre

Partner and Managing Director, Energy Transition Institute, Kearney

2023 Key highlights

2023 was a year of production and consumption records across the board with most markets returning to at least their 2019 pre-COVID long-term trends as supply chain issues finally eased.

Oil consumption in particular rebounded strongly, largely on the back of China relaxing its zero-COVID lockdown policies. Although demand for gas remained flat, consumption of crude oil broke through the 100 million barrels per day level for the first time ever and coal demand beat the previous year's record level. Consumption of renewable energy grew at six times the rate of total primary energy, and electricity demand grew 25% faster than total primary energy consumption.

Energy developments

- Total primary energy consumption increased by 2% over its 2022 level, 0.6% above its ten-year average and over 5% above its 2019 pre-COVID level.
- Renewables' share of total primary energy consumption reached 14.6%, an increase of 0.4% over the previous year. Together with nuclear, they represented over 18% of total primary energy consumption.
- Fossil fuel consumption as a percentage of primary energy dropped 0.4% to 81.5%.

Carbon emissions

- Greenhouse gas emissions from energy use, industrial processes, flaring and methane (in carbon dioxide equivalent terms) increased 2.1% to exceed the record level set in 2022. For the first time ever, energy-related emissions exceeded the 40 GtCO₂e level, with emissions from the direct use of energy breaching 35 GtCO₂e for the first time ever.
- Carbon dioxide emissions from flaring increased by 7% along with emissions from methane and industrial processes that also increased by over 5%.

Oil

- Although Brent crude oil prices fell 18% to average \$83/bbl in 2023, they were still some 29% above their 2019 pre-COVID levels.
- Global oil production increased by 1.8 million b/d to reach a record level of 96 million b/d in 2023. The US remained the largest producer seeing its output grow by over 8%. Overall production from non-OPEC+ countries exceeded global incremental demand growth by 20%.
- In 2022 the combined consumption of oil and biofuel products exceeded 100 million barrels per day for the first time ever. In 2023, consumption of oil products alone exceeded this level.

- Regionally, whilst North America witnessed a modest increase in oil consumption of around 0.8%, demand in Europe fell by nearly 1% to 13.9 million barrels per day. By contrast, the Asia Pacific region saw an increase of over 5% to 38 million barrels per day.
- The ending of China's extended zero-COVID lockdown measures saw demand for gasoline and diesel rebound to 7,179 kbd, 15% above its 2019 pre-COVID levels. Whilst its demand for jet/kerosene grew by 74% in 2023 to 828 kbd, this is still 14% below its 2019 level which was a record year for China.
- China's refining capacity (18,484 kb/d) exceeded the US (18,429 kb/d) for the first time ever making it the largest oil refining market by capacity. However, throughput of refined products from China still lags the US with an overall utilisation of 81.7% versus 86.6%.

Natural gas

- On average natural gas prices in Europe and Asia fell 30% from their record highs recorded in 2022, averaging around \$13/mmBtu. US Henry Hub prices exhibited an even greater fall of 60% to average \$2.5/mmBtu across the year, back to their 2019 pre-COVID level.
- Global gas production remained relatively constant compared to 2022. The US remains the largest producer of gas delivering around a quarter of the world's supply. Output in Europe and the CIS fell by around 7% and 4% respectively. In absolute terms, the Russian Federation saw the largest fall in output with a 5% drop of 32 bcm.
- In 2023 LNG supply grew nearly 2% (10 bcm) to 549 bcm. The US overtook Qatar as the world's largest exporter of LNG, seeing its supply increase nearly 10% versus a 2% drop from Qatar. The Russia Federation saw falls in both its LNG and pipeline exports with LNG dropping nearly 2% (0.8 bcm) and pipeline supplies dropping around 24% (30 bcm).
- Global natural gas demand increased by only 1 bcm in 2023, a rise of only 0.02% and only slightly above its 2019 pre-COVID level. Whilst its share of global fossil fuel consumption remained around the 29% mark, its share of total primary energy consumption fell 0.5% since 2019.
- The global growth in LNG demand was triggered primarily by the Asia Pacific region with China, India, and other non-OECD Asia Pacific countries demand increasing by 11 bcm, 2.6 bcm, and 7.6 bcm respectively. LNG into both Europe and OECD Asia Pacific countries fell by 3 bcm and 11 bcm respectively.

- China regained its position as the world's largest LNG importing country followed by Japan and South Korea. Together, they accounted for around 45% of global LNG trade.
- Overall natural gas pipeline net trade fell by around 8% (or 35 bcm) in 2023. European pipeline imports fell by 26% (40 bcm), almost entirely attributable to supplies from Russia which accounted for 91% of the drop.

Coal

- From the record levels recorded in 2022, coal prices fell 46% on average with European delivered prices settling around \$130/tonne and delivered prices in Asia averaging around \$125/tonne.
- Global coal production reached its highest ever level (179 EJ), beating the previous high set the year before. The Asia Pacific region accounted for nearly 80% of global output with activity concentrated in just four countries, Australia, China, India, and Indonesia.
- Global coal consumption continued to increase and breached 164 EJ for the first time ever. The increase of 1.6% over 2022 was seven times higher than the previous ten-year average growth rate.
- Whilst China is by far the largest consumer of coal (it beat its own record set in 2022 and now accounts for 56% of the world's total consumption), in 2023 India exceeded the combined consumption of Europe and North America for the first time ever. Coal consumption in both Europe and North America fell below 10 EJ each and has been in constant decline over the past 10 years.

Electricity

- Global electricity generation increased by 2.5% in 2023 to reach a record level of 29,925 TWh. Whilst electricity demand in Asia Pacific and the Middle East increased by around 5%, demand in both Europe and North America fell by 2.4% and 1% respectively.
- For fossil fuels, coal retained its position as the dominant fuel for power generation in 2023 with a stable share around 35%. Natural gas' share of the generation fleet also remained stable at around 23%. Oil-fired plant contributed just over 2% of total electrical output.
- Renewables share of total power generation rose from 29% to 30%. At a regional level, Southern & Central America recorded the highest contribution from renewables at 72%. In Brazil, responsible for over 40% of electricity demand in the region, wind and solar increased by 17% and 71% respectively.

- The share of nuclear remained flat at around 9% with new build in China and returns to service of plant in France and Japan being offset by the closure of Germany's remaining plant.
- In 2023, grid-scale battery electricity storage system (BESS) capacity stood at 55.7 GW, nearly 50% of which was installed in China.

Wind and Solar

- Solar and wind capacity continued to grow rapidly in 2023 beating the previous year's record of 276 GW by around 186 GW, a 67% increase.
- Solar accounted for 75% (346 GW) of the capacity additions with China responsible for around a quarter of the growth. Europe installed just over 56 GW of solar, representing 16% of total solar capacity additions.
- Wind achieved a record year for new build with over 115 GW coming online. Nearly 66% of capacity additions were in China and its total installed capacity is now equal to North America and Europe combined. Although Europe has the highest share of offshore in its wind portfolio (12%), China has 37 GW compared to Europe's 32 GW.

Biofuels

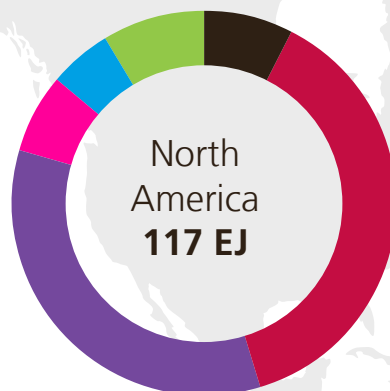
- Global biofuels' production grew by over 8% in 2023 with the biggest increases seen in the US (75 mboe/d) and Brazil (65 mboe/d). Indonesia was responsible for around 46% of Asia Pacific region's production of 422 mboe/d.
- The production split in 2023 was 54% biogasoline and 46% biodiesel.
- The US, Brazil, and Europe were responsible for around three-quarters of all biofuels consumed globally.

Key minerals

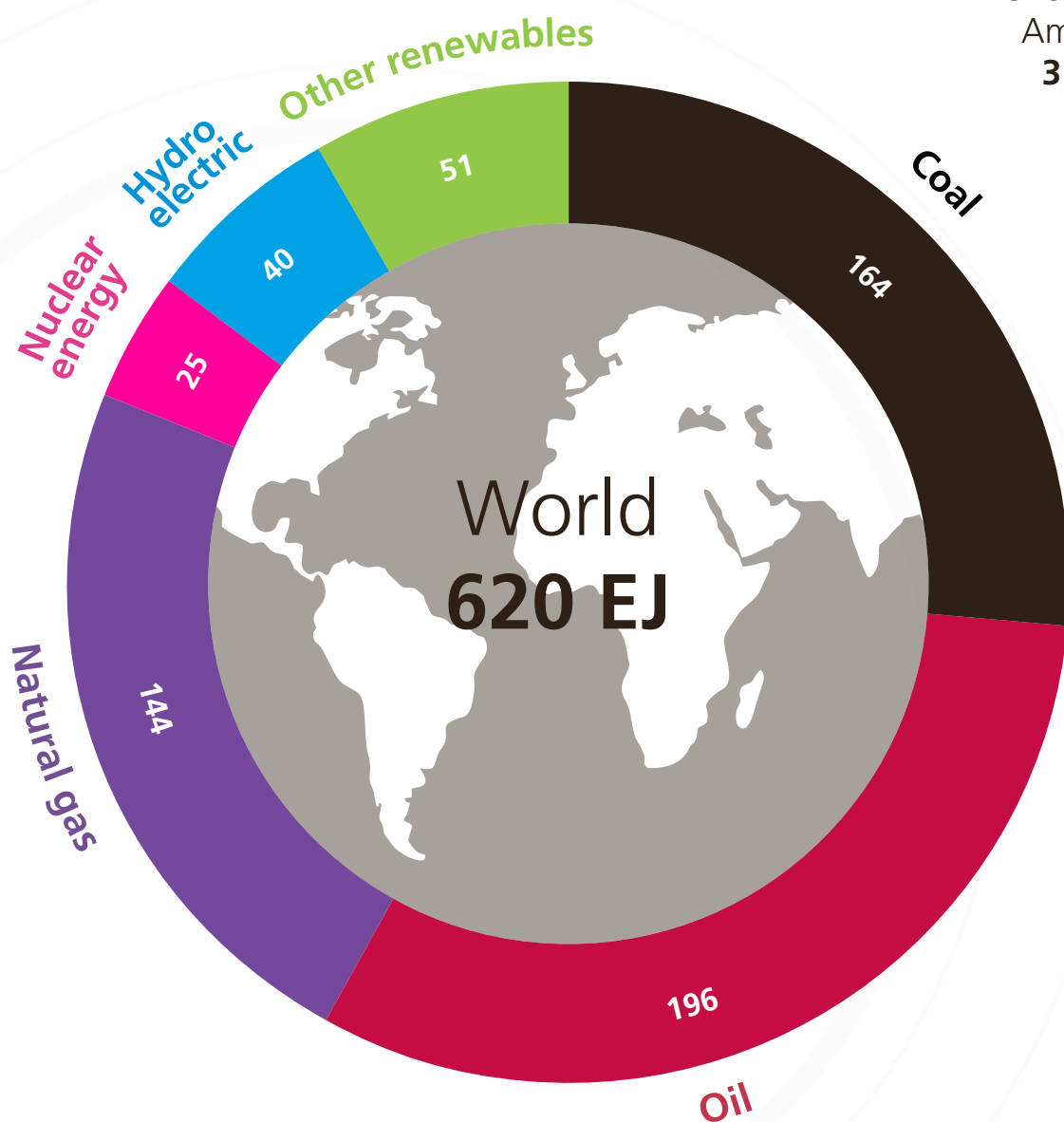
- Across the board, prices for key metals and materials fell by around 26% in 2023. The biggest declines were in cobalt (-47%), pet needle coke (-36%), and lithium carbonate (-32%). Prices for copper and natural graphite fell by only 4% and 15% respectively.
- Africa was responsible for nearly 75% of the world's cobalt production. Within this, the Democratic Republic of Congo was responsible for around 96% (or 56% of the global total).

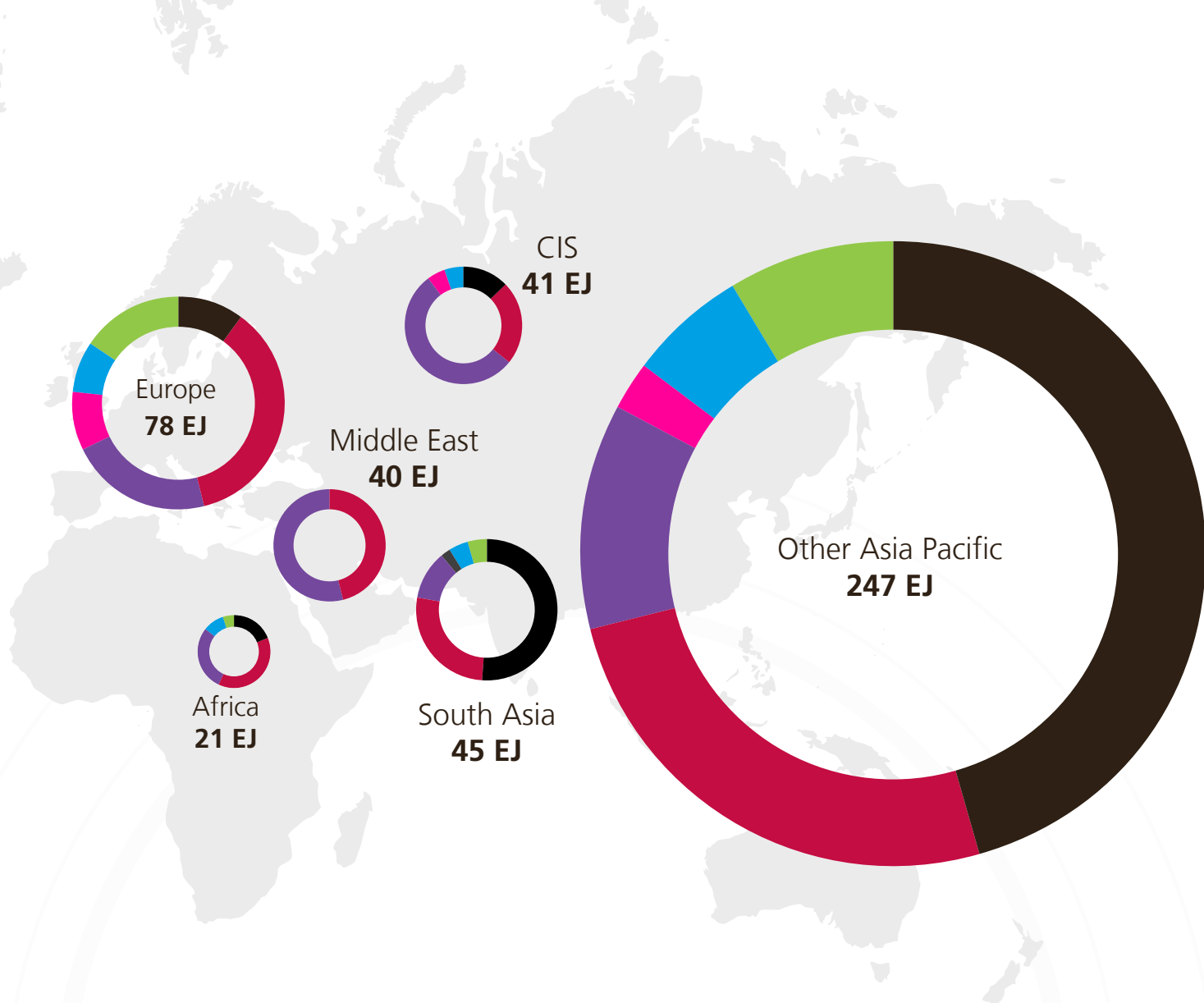
2023 Regional overview – access to energy and sustainability

Global primary energy consumption reached a new record for the second consecutive year with non-OECD countries dominating both the share and annual growth rates. Fossil fuels continue to underpin their development accounting for 84% of their energy mix.



S. & Cent. America
31 EJ





The contrasts between the northern and southern hemispheres is quite stark. Consumption of primary energy in the Global South first exceeded that of the Global North in 2014. In 2023 it accounted for 56% of total energy consumed and grew at twice the global average rate of 2%. The Asia Pacific region was responsible for 85% of the Global South's demand (and 47% of global demand) where the economies of China, India, Indonesia, Japan and South Korea dominated. Whilst Southern & Central America, and Asia Pacific experienced growth rates above the global average, total demand in Africa dropped by 0.4% in 2023 and electricity consumption remained flat. Electricity demand in both North America and Europe experienced falls of -1% and -2% respectively. In these regions, electricity demand in particular is increasingly impacted by energy efficiency regulations, energy-efficient lighting, and changing consumer habits.

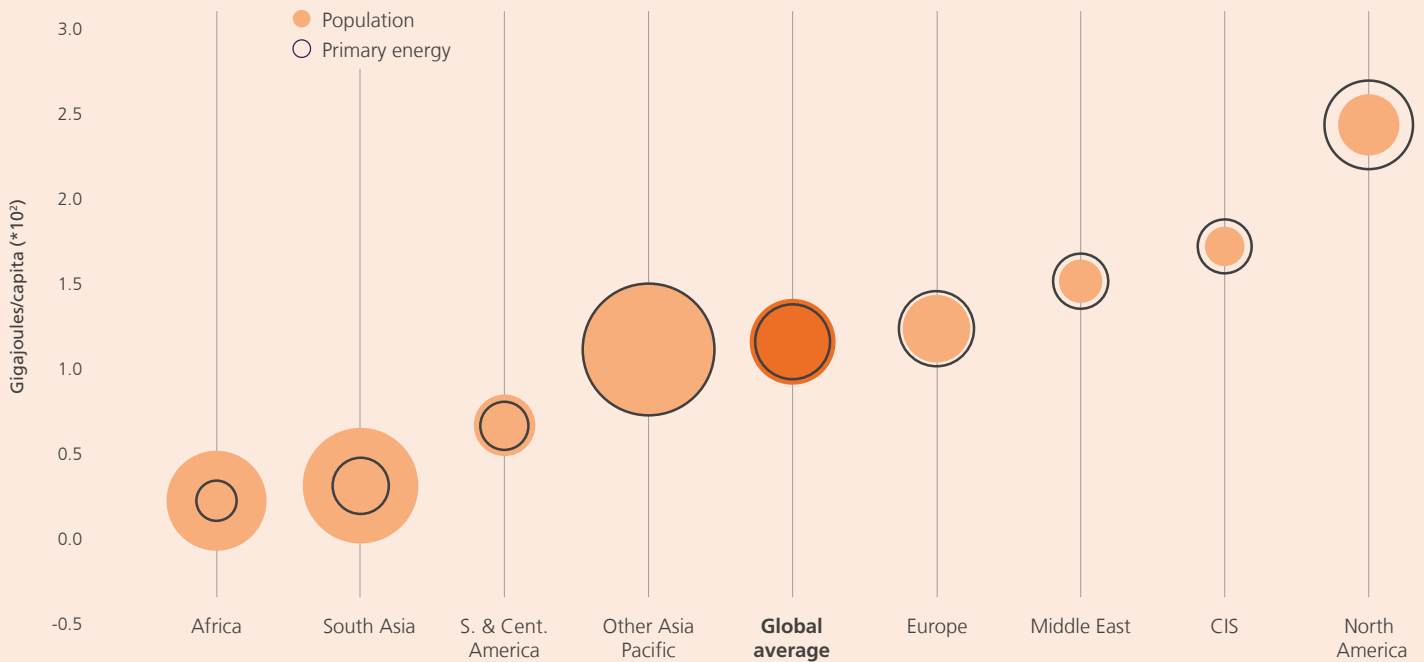
2023 Regional overview – energy access, efficiency, and sustainability

Whilst collectively Africa and South Asia were responsible for less than 10% of the world's energy demand in 2023, a prevalence of developing economies, large populations, low rate of access to energy today, potentially positions them for significant energy demand growth in the future.

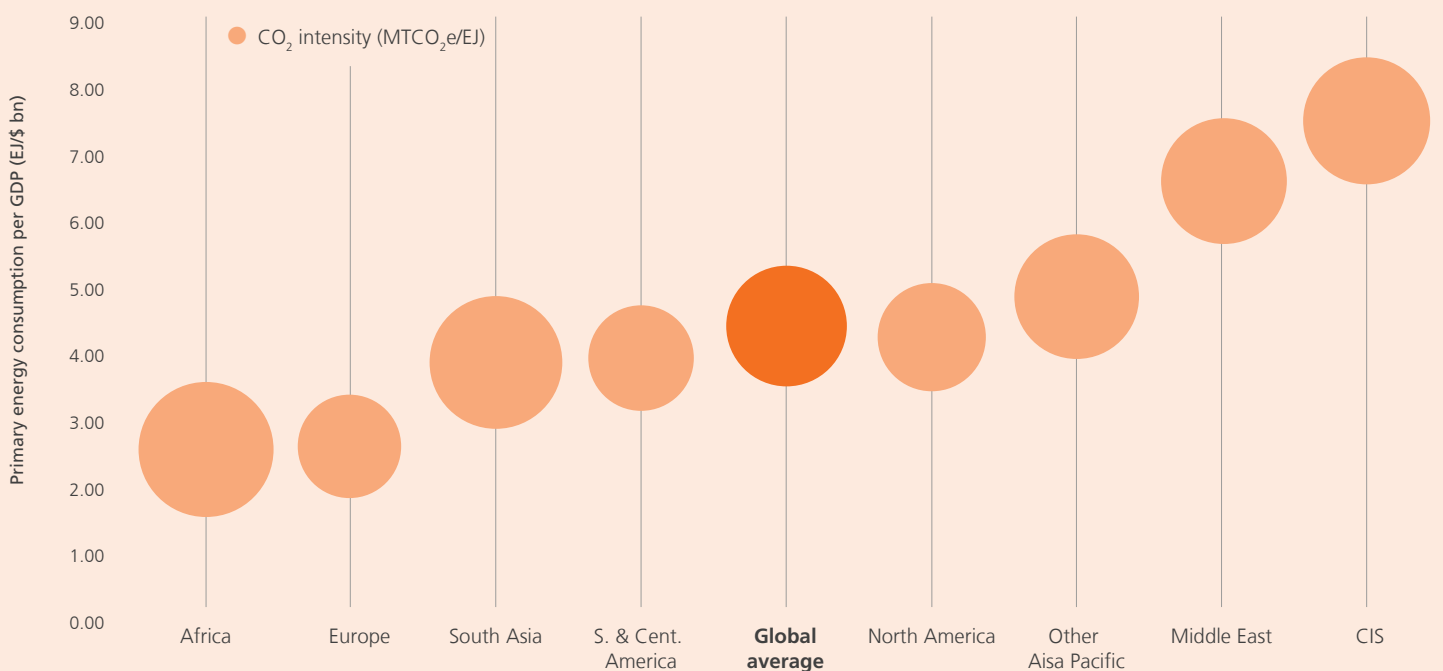
It is estimated that globally around 750 million people – 1 out of 10 – do not have access to electricity to light their homes, refrigerate their food, or keep cool in rising temperatures and around 2.6 billion people rely on heavily polluting biomass fuels such as charcoal, coal, and animal waste for heating and cooking. In 2023 significant geographical variations were evident in the relationships between regional population sizes and regional energy consumption. In Africa, South Asia, and Southern & Central America, the average amount of energy consumed per person stood at 30 Gigajoules (GJ). This was in stark contrast to North America, the CIS, and the Middle East, where energy consumption per capita averaged 180 GJ. In North America, the ratio was over twice the global average of 110 GJ.

A similar pattern also played out for average greenhouse gas emissions per person where Africa, South Asia, and Southern & Central America averaged 2 MtCO₂e relative to a global average of 6.7 MtCO₂e. North America, the CIS, and the Middle East collectively averaged 11.5 MtCO₂e, almost twice the global average. The exception was Other Asia Pacific that was just below the global average for energy consumption per capita but 0.7 MtCO₂e above the global average for greenhouse gas emissions per person. This was primarily due to China, the world's largest consumer of coal and second largest consumer of oil.

Today, both Africa and South Asia have very low levels of energy demand relative to the size of their population



Europe and Southern & Central America are the only regions to be below both the global average for CO₂ Intensity and Energy Consumption per GDP



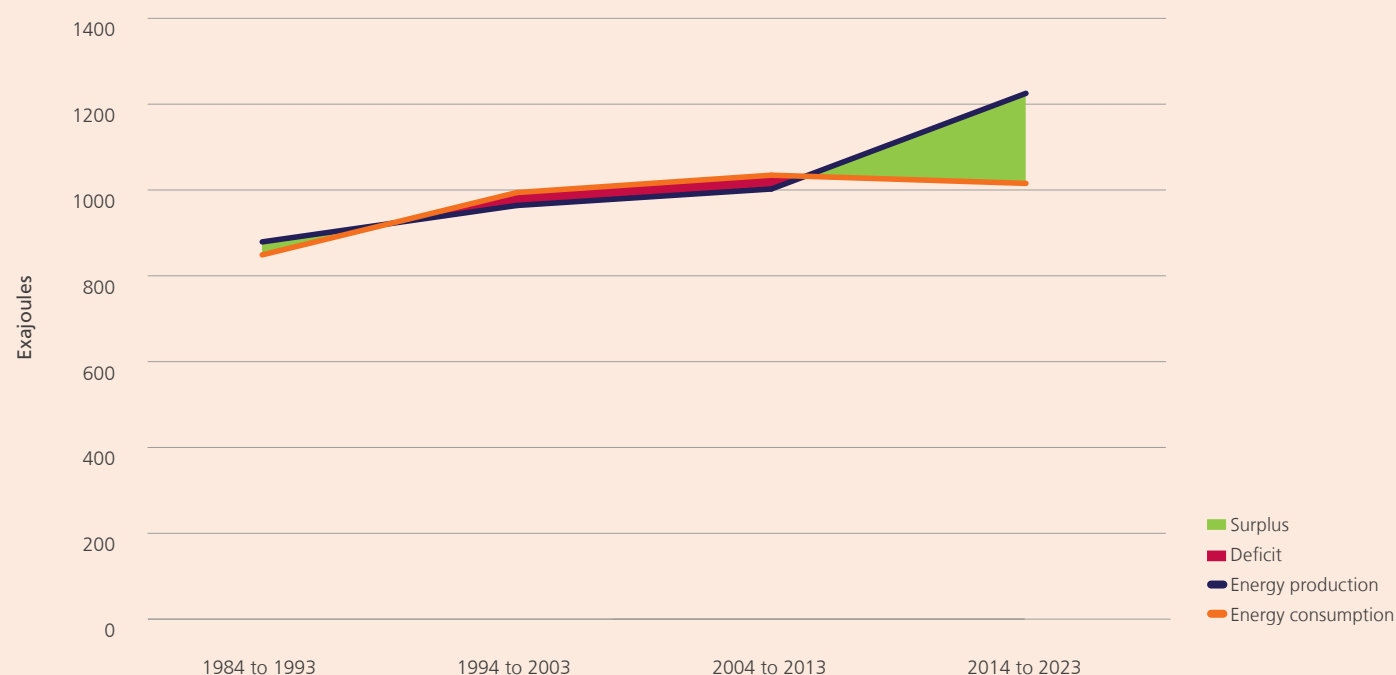
2023 Regional overview – energy security

Along with sustainability and affordability, secure supply of energy is a key pillar of the energy trilemma. In 2023, the total international trade of oil, gas, and coal was 53% higher than it was in 2000. Collectively, North America, Europe, and Asia Pacific regions consumed 78% of the world's total energy in 2023. Over the past two decades, North America's energy system has been transformed by the growth in unconventional oil and gas that began in the early 2000s. As a result, in the past 10 years the region has moved from being a net importer of energy to a net exporter. In 2023, oil production in North America was 16% above its domestic consumption whilst gas production sat at 14% above its demand level. Since the 1980s, Europe has consistently been a net importer of energy. Its biggest deficit in 2023 was

in oil where production only met 23% of demand. Whilst European gas production was only able to meet 44% of consumption, the balance with coal was less severe with production meeting 58% of demand. The Asia Pacific region had the highest demand of any region in 2023, consuming 292 EJ of primary energy, 47% of the world's total demand. Like Europe, it has consistently been a net importer of energy since the 1980s. In 2023, its biggest shortfall was in servicing its demand for oil with production only meeting around 19% of its consumption. Its gas position was more positive with production able to meet 74% of its demand. For coal, production in the Asia Pacific region achieved a surplus in 2023, with supply exceeding the region's demand by 5%.

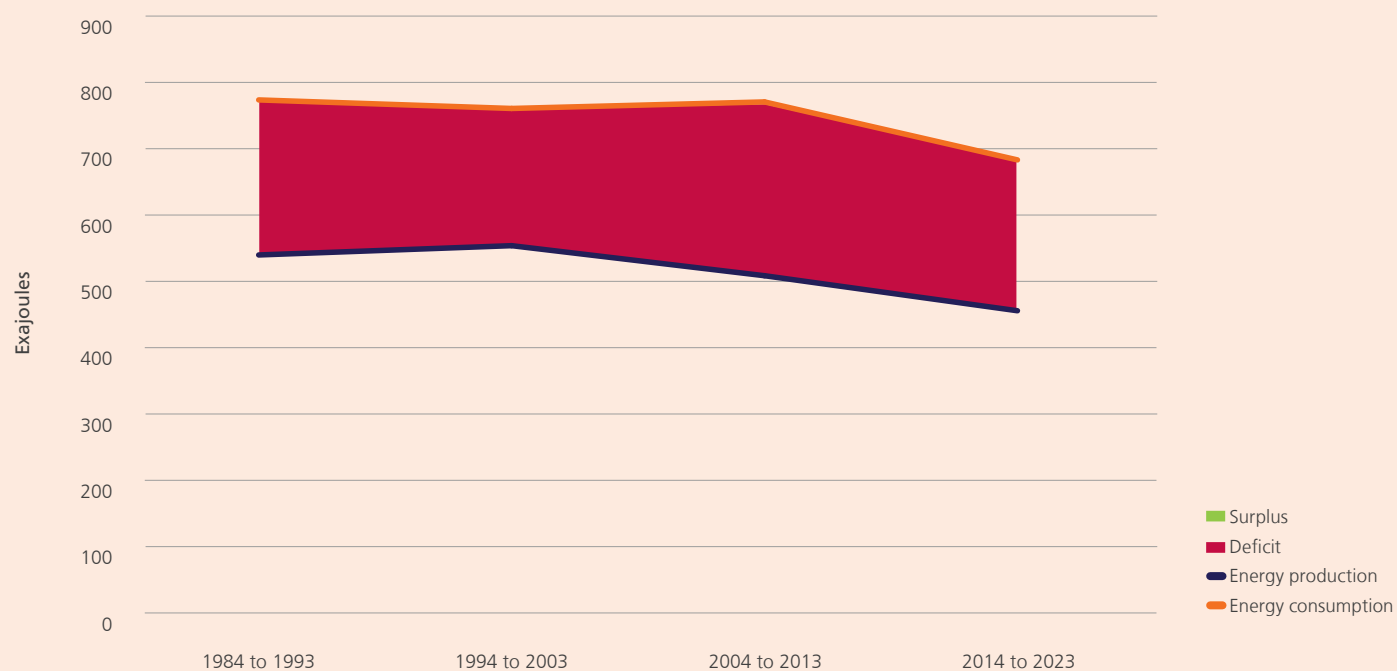
Production vs consumption by region

North America



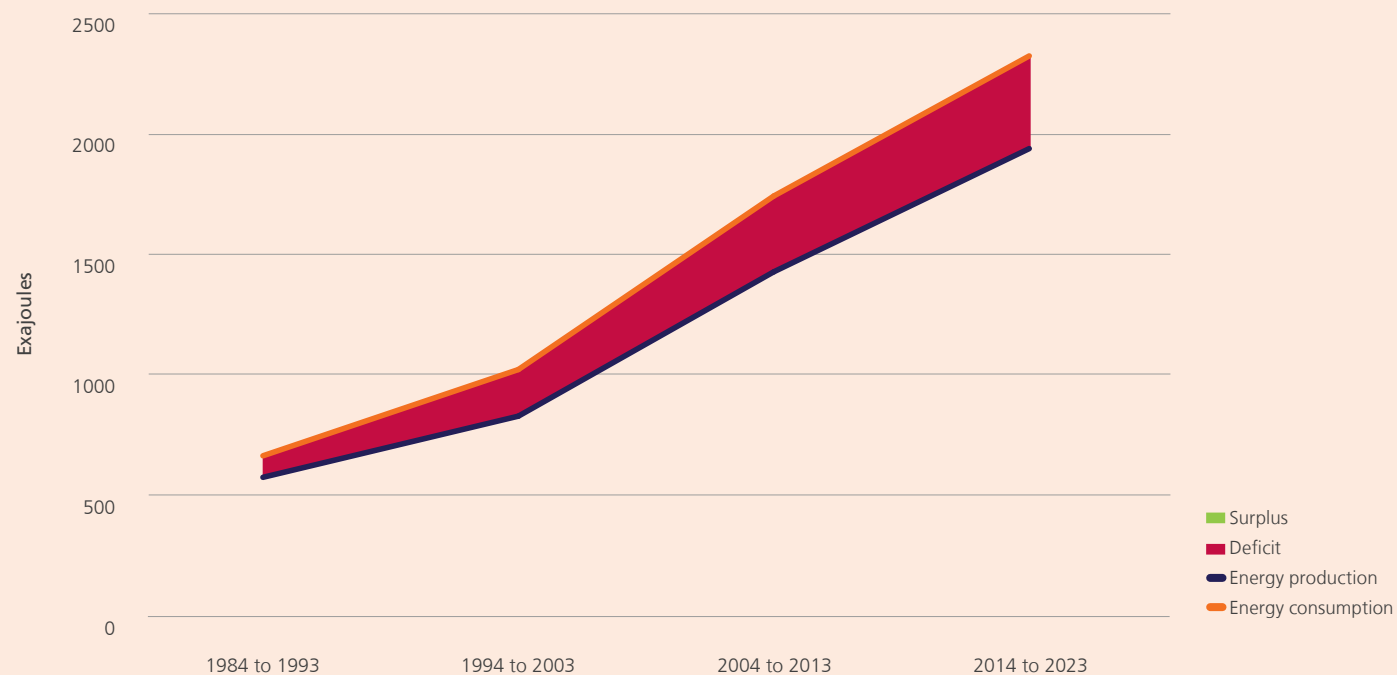
Production vs consumption by region

Europe



Production vs consumption by region

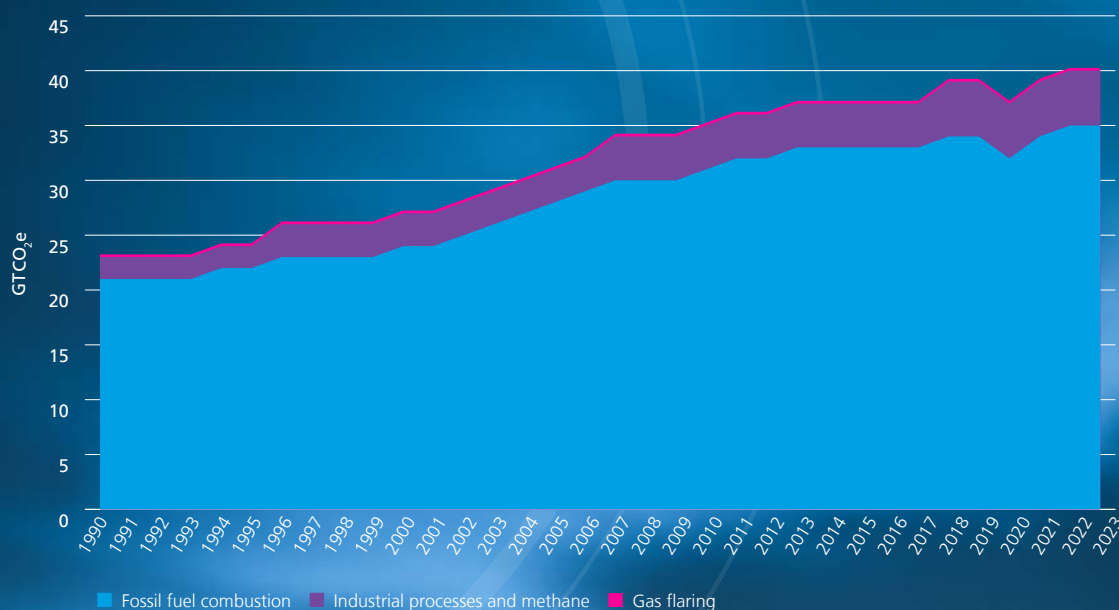
Asia Pacific



Primary energy and carbon

2023 saw a second consecutive record year for global primary energy consumption as it grew by 2%, reaching 620 EJ. Its growth rate was 0.6% above its ten-year average and over 5% above its 2019 pre-COVID level. Whilst a new record in the consumption of fossil fuels (in absolute terms) was recorded. In 2023, it fell to 81.5% compared to almost 81.9% in 2022. With demand for natural gas, a relatively low carbon-intensive fossil fuel, remaining flat, the increased use of more carbon-intensive oil and coal meant that energy-related greenhouse gas emissions also reached a record high, exceeding 40 GtCO₂e for the very first time. CO₂ emissions from the combustion of fossil fuels is by far the largest source of energy-related greenhouse gas emissions contributing around 87% of the total.

2023 global energy-related greenhouse gas emissions exceeded 40 gigatonnes for the first time ever



Million tonnes of carbon dioxide												Growth rate per annum		Share
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2023	2013–23	2023
Canada	3.3	4.3	3.9	2.9	2.9	2.9	2.3	2.5	2.5	2.3	2.6	13.5%	-2.4%	0.8%
Mexico	10.3	11.5	12.1	11.7	9.1	9.2	10.7	13.5	15.8	13.8	14.4	4.9%	3.4%	4.6%
US	18.7	23.0	24.2	18.3	19.5	28.6	34.9	25.0	19.6	17.7	21.0	18.6%	1.2%	6.6%
Total North America	32.4	38.8	40.2	32.8	31.4	40.6	47.9	41.0	37.9	33.8	38.1	12.6%	1.6%	12.0%
Argentina	1.6	1.7	1.5	1.3	1.2	1.6	2.0	2.3	2.7	2.5	2.4	-4.9%	4.0%	0.7%
Bolivia	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-7.3%	1.3%	0.0%
Brazil	3.0	3.4	3.0	3.4	2.6	2.4	2.7	2.3	2.2	2.0	2.7	31.8%	-1.0%	0.8%
Colombia	1.7	1.7	1.6	1.2	1.1	1.0	1.1	0.8	0.7	0.5	0.7	30.0%	-8.8%	0.2%
Peru	0.4	0.5	0.5	0.4	0.3	0.3	0.2	0.3	0.3	0.3	0.3	2.4%	-2.7%	0.1%
Trinidad & Tobago	0.8	0.7	0.6	0.5	0.5	0.5	0.8	0.4	0.3	0.3	0.3	-10.5%	-9.4%	0.1%
Venezuela	19.7	21.1	20.0	20.5	16.1	18.7	21.2	18.9	18.5	19.7	19.1	-3.2%	-0.3%	6.0%
Other S. & Cent. America	2.1	2.6	2.7	2.9	2.6	2.3	2.3	3.1	3.2	3.4	3.9	14.1%	6.6%	1.2%
Total S. & Cent. America	29.3	31.8	30.1	30.2	24.4	26.7	30.3	28.2	28.0	28.9	29.4	1.7%	0.0%	9.3%
Denmark	0.2	0.2	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	-13.1%	-8.7%	0.0%
Germany	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	26.2%	0.6%	0.0%
Italy	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-0.1%	-5.7%	0.0%
Netherlands	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	-6.7%	-2.0%	0.0%
Norway	0.9	0.7	0.8	0.8	0.5	0.4	0.3	0.3	0.4	0.3	0.3	-9.7%	-11.1%	0.1%
Poland	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	69.9%	7.0%	0.0%
Romania	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	-5.7%	-1.9%	0.0%
Ukraine	0.5	0.5	0.5	0.5	0.3	0.3	0.2	0.2	0.3	0.2	0.2	21.6%	-6.3%	0.1%
United Kingdom	2.8	2.7	2.7	2.8	2.8	2.5	2.4	2.2	1.8	1.2	1.4	12.0%	-6.7%	0.4%
Other Europe	0.9	1.0	0.9	0.9	0.6	0.7	0.9	0.8	0.8	0.7	0.7	2.0%	-2.0%	0.2%
Total Europe	5.6	5.6	5.5	5.7	4.7	4.5	4.2	3.9	3.8	2.8	3.0	7.6%	-5.8%	1.0%
Azerbaijan	0.9	0.7	0.4	0.5	0.4	0.5	0.5	0.3	0.3	0.4	0.8	68.0%	-1.9%	0.2%
Kazakhstan	7.4	7.8	7.3	5.3	4.8	4.1	3.1	2.9	3.0	2.0	2.0	-1.2%	-12.2%	0.6%
Russian Federation	42.3	39.4	42.5	48.2	42.3	42.9	48.0	50.6	53.3	52.6	59.4	13.0%	3.5%	18.7%
Turkmenistan	4.5	4.0	3.7	3.6	3.3	3.0	2.7	3.3	2.4	2.2	2.4	11.2%	-6.1%	0.8%
Uzbekistan	3.0	2.6	2.2	2.1	1.7	1.6	1.2	1.1	0.9	0.9	0.8	-9.8%	-12.5%	0.2%
Other CIS	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.3	129.7%	7.3%	0.1%
Total CIS	58.2	54.5	56.2	59.8	52.6	52.1	55.9	58.4	60.1	58.2	65.7	12.8%	1.2%	20.7%
Bahrain	0.2	0.1	0.1	0.2	0.3	0.2	0.4	0.5	0.3	0.2	0.2	-1.7%	2.4%	0.1%
Iran	24.3	26.4	25.7	34.4	37.4	36.5	29.6	28.6	37.3	37.1	43.1	16.3%	5.9%	13.6%
Iraq	26.8	27.9	32.0	35.3	35.4	35.5	35.8	34.7	35.8	35.9	35.6	-0.9%	2.9%	11.2%
Kuwait	3.0	3.1	2.0	2.6	1.8	2.0	1.7	1.8	2.1	1.5	1.6	12.4%	-5.9%	0.5%
Oman	4.6	5.1	4.8	5.6	5.2	5.2	5.2	5.1	5.2	4.2	3.7	-11.6%	-2.1%	1.2%
Qatar	3.5	3.2	2.8	2.8	2.6	2.6	3.3	2.6	2.8	2.6	2.6	1.0%	-2.8%	0.8%
Saudi Arabia	5.4	5.1	5.5	6.3	5.8	5.8	5.2	5.7	5.6	5.1	6.8	31.9%	2.3%	2.1%
Syria	0.9	0.8	1.1	1.2	2.4	1.4	1.9	2.0	2.1	2.2	2.2	2.1%	9.5%	0.7%
United Arab Emirates	2.7	2.2	2.3	2.0	2.2	2.6	2.0	2.2	2.0	2.2	2.1	-5.3%	-2.3%	0.7%
Other Middle East	2.3	2.4	1.3	0.7	0.8	0.9	1.4	1.7	1.9	1.4	0.9	-35.6%	-8.6%	0.3%
Total Middle East	73.7	76.2	77.5	91.0	93.9	92.7	86.5	84.9	95.0	92.5	99.0	7.1%	3.0%	31.2%
Algeria	17.8	18.5	19.5	19.5	18.6	19.0	19.6	18.8	16.4	17.3	16.7	-3.0%	-0.6%	5.3%
Egypt	5.2	6.0	6.1	6.1	5.1	4.9	5.1	5.1	4.7	4.4	4.4	-1.0%	-1.7%	1.4%
Libya	8.3	5.9	5.4	4.9	8.0	9.4	10.2	5.0	12.0	11.0	13.6	24.5%	5.1%	4.3%
Nigeria	18.7	16.7	15.1	14.6	15.2	14.7	15.7	14.2	13.1	10.7	11.5	8.4%	-4.7%	3.6%
Other Africa	18.7	19.5	21.0	21.0	18.9	17.3	16.5	15.8	15.0	15.9	14.5	-9.1%	-2.5%	4.6%
Total Africa	68.8	66.7	67.0	66.2	65.8	65.3	67.2	59.0	61.1	59.2	60.8	2.6%	-1.2%	19.2%
Australia	1.6	2.2	2.2	1.4	1.4	1.7	2.8	2.0	1.6	1.4	1.3	-5.9%	-1.5%	0.4%
Bangladesh	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	-2.5%	6.9%	0.0%
Brunei	0.4	0.4	0.4	0.6	0.6	0.4	0.6	0.3	0.4	0.2	0.3	35.3%	-4.5%	0.1%
China	4.9	5.0	5.0	4.7	3.6	4.0	4.4	5.8	5.4	5.0	4.9	-2.7%	-0.1%	1.5%
India	4.4	4.8	5.4	4.9	4.1	3.7	3.6	4.1	3.8	4.1	4.1	-0.1%	-0.8%	1.3%
Indonesia	6.6	6.4	6.1	5.8	4.9	4.3	4.3	4.0	3.5	3.7	4.2	13.1%	-4.4%	1.3%
Malaysia	6.3	7.2	7.9	6.9	6.2	5.1	5.5	5.4	4.3	3.5	3.4	-2.4%	-5.8%	1.1%
Myanmar	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	-11.6%	-17.8%	0.0%
Pakistan	1.2	0.9	0.9	0.9	0.7	0.6	0.6	0.6	0.5	0.6	0.5	-4.0%	-7.8%	0.2%
Thailand	0.9	0.9	0.9	0.9	0.8	0.7	0.7	0.7	0.7	0.5	0.5	2.6%	-6.4%	0.1%
Vietnam	2.1	2.1	2.0	1.8	1.9	1.6	1.6	1.4	1.1	1.2	1.3	14.3%	-4.6%	0.4%
Other Asia Pacific	1.4	1.7	1.4	1.4	0.9	0.9	0.6	0.6	0.8	0.9	0.8	-15.6%	-5.8%	0.2%
Total Asia Pacific	29.9	31.9	32.4	29.5	25.3	23.1	24.8	25.1	22.4	21.1	21.3	1.2%	-3.3%	6.7%
Total World	297.9	305.6	309.0	315.2	298.1	305.0	316.8	300.5	308.3	296.6	317.4	7.0%	0.6%	100.0%
of which: OECD	41.0	48.0	49.3	41.0	38.5	47.8	55.9	47.7	44.0	38.6	43.1	11.7%	0.5%	13.6%
Non-OECD	256.9	257.6	259.6	274.2	259.6	257.2	260.9	252.8	264.3	258.0	274.3	6.3%	0.7%	86.4%
European Union	1.4	1.6	1.4	1.4	1.0	1.2	1.2	1.1	1.2	1.0	1.0	3.7%	-2.9%	0.3%

Data from 2013 onward: Made utilising VIIRS Nightfire (VNF) nightly data produced by the Earth Observation Group, Payne Institute for Public Policy, Colorado School of Mines. These data include flaring from upstream, downstream oil and gas. Emissions have been calculated using flared natural gas volumes based on standard cubic metres (standardized using a Gross Calorific Value (GCV) of 40 MJ/m³) and the standard conversion factor for emissions from the IPCC. Perfect combustion has been assumed.

Note: Annual changes and shares of total are calculated using exajoules figures.

Carbon Capture, usage and storage (CCUS)

Capture capacity Million tonnes per year												Growth rate per annum		Share
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2023	2013–23	2023
Canada	0.1	1.1	2.3	2.3	2.3	2.3	2.3	4.0	4.0	4.0	4.0	–	48.0%	7.3%
Mexico	–	–	–	–	–	–	–	–	–	–	–	–	–	–
US	19.5	19.5	19.5	19.5	21.9	21.9	21.6	21.6	21.6	21.8	22.5	3.4%	1.5%	40.9%
Total North America	19.5	20.5	21.7	21.7	24.1	24.1	23.9	25.6	25.6	25.8	26.5	2.9%	3.1%	48.3%
Brazil	1.1	2.1	2.8	4.1	4.6	6.5	8.9	9.6	10.3	10.5	10.6	1.0%	25.4%	19.3%
Total S. & Cent. America	1.1	2.1	2.8	4.1	4.6	6.5	8.9	9.6	10.3	10.5	10.6	1.0%	25.4%	19.3%
Norway	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	–	–	3.1%
Other Europe	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.3	0.6	0.7	16.1%	-5.0%	1.3%
Total Europe	2.9	2.9	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.3	2.4	4.3%	-1.8%	4.4%
Russian Federation	–	–	–	–	–	–	–	–	0.4	0.4	0.4	–	–	0.8%
Total CIS	–	–	–	–	–	–	–	–	0.4	0.4	0.4	–	–	0.8%
Qatar	–	–	0.2	0.2	0.2	0.2	2.3	2.3	2.3	2.3	2.3	–	–	4.1%
Saudi Arabia	–	–	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	–	–	2.4%
Other Middle East	0.3	0.3	0.3	1.1	1.1	1.1	1.1	1.4	1.4	1.4	1.4	–	16.4%	2.6%
Total Middle East	0.3	0.3	1.8	2.6	2.6	2.6	4.7	5.0	5.0	5.0	5.0	–	32.0%	9.1%
Algeria	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	–	–	2.2%
Total Africa	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	–	–	2.2%
Australia	–	–	–	–	–	–	–	4.0	4.0	4.0	4.0	–	–	7.3%
China	0.3	0.3	0.4	0.4	0.4	0.7	0.7	0.7	0.9	1.1	3.5	221.8%	28.4%	6.4%
Other Asia Pacific	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.3	1.3	1.3	1.3	–	2.5%	2.3%
Total Asia Pacific	1.3	1.3	1.4	1.4	1.5	1.8	5.8	6.0	6.2	6.4	8.8	38.2%	21.2%	16.0%
Total World	26.3	28.4	31.9	34.0	37.0	39.3	47.6	50.4	51.7	51.6	55.0	6.6%	7.6%	100.0%
of which: OECD	22.1	23.1	24.4	24.4	26.9	26.9	30.7	32.6	32.5	32.1	32.9	2.6%	4.1%	59.8%
Non-OECD	4.2	5.2	7.5	9.6	10.1	12.4	16.9	17.9	19.2	19.6	22.1	13.0%	18.0%	40.2%
European Union	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.3	0.6	0.7	16.7%	-5.2%	1.3%

Source: Rystad Energy. For further information please contact billy.snaih@rystadenergy.com

Carbon Prices

	Compliance Markets				Voluntary Markets				
	UK Emissions trading scheme GBP£/teCO ₂	EU Emissions trading scheme EUR€/teCO ₂	California carbon allowance USD\$/teCO ₂	Regional greenhouse gas initiative USD\$/tonCO ₂	Platts CORSIA-eligible credits (CEC) USD\$/teCO ₂ e	Platts carbon removal credits (CRC) USD\$/teCO ₂ e	Platts CAC USD\$/teCO ₂ e	Platts technological carbon capture USD\$/teCO ₂ e	Platts renewable energy USD\$/teCO ₂ e
2012	–	6.87	–	–	–	–	–	–	–
2013	–	4.53	–	–	–	–	–	–	–
2014	–	6.01	–	–	–	–	–	–	–
2015	–	7.72	–	–	–	–	–	–	–
2016	–	5.36	–	–	–	–	–	–	–
2017	–	5.84	–	–	–	–	–	–	–
2018	–	15.85	–	–	–	–	–	–	–
2019	–	24.91	–	–	–	–	–	–	–
2020	–	24.83	–	–	–	–	–	–	–
2021	66.76	53.52	–	–	4.09	14.53	8.53	7.32	112.80
2022	92.81	81.17	92.81	13.42	4.77	16.00	9.55	6.81	138.84
2023	63.53	85.27	63.53	13.61	1.41	13.36	1.96	3.02	129.72

Source: S&P Global Commodity Insights, ©2024 by S&P Global Inc.

Oil

In 2023, global oil production reached a record level of just over 96 million barrels per day. The US remained the largest producer seeing its output grow by over 8%. In contrast, Russia's production decreased by over 1% as a full year of international sanctions were felt. Southern & Central America continues to grow rapidly post-COVID and recorded the highest growth rate (11%) for any region in 2023. In Asia Pacific, China's production rose by 2%, accounting for around 57% of the region's total production.

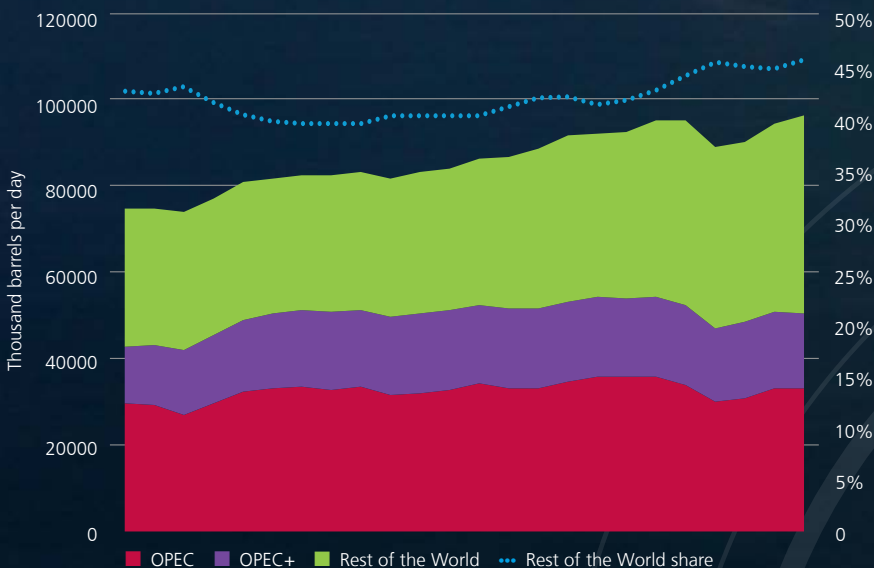
Whilst the US lost its position as the largest oil refining market by capacity with China

reaching 18,484 thousand barrels per day, throughput of refined products from China still lags the US with a utilisation of nearly 82% compared to around 87%.

Consumption of oil exceeded 100 million barrels of oil per day (mbpd) for the first time ever. Gasoline, diesel and kerosene (aviation) use are trending back to or beyond their 2019 levels, but within the data sets there are some national/regional differences. Whilst global gasoline consumption (25 mbpd) was just above its 2019 pre-COVID level, kerosene, although growing strongly (17.5% in 2023), has yet to return to its 2019 peak.

In 2023, production from non-OPEC+ countries exceeded global incremental demand growth by 20%

Oil production





Oil Natural gas liquids production in thousands of barrels per day*

Thousand barrels daily												Growth rate per annum		Share
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2023	2013-23	2023
Canada	514	513	525	595	597	647	682	660	669	708	718	1.4%	3.4%	5.3%
Mexico	353	355	320	302	276	235	217	205	170	158	164	3.8%	-7.3%	1.2%
US	2606	3015	3342	3509	3783	4369	4824	5175	5425	5933	6431	8.4%	9.5%	47.2%
Total North America	3473	3883	4187	4407	4656	5252	5724	6040	6263	6800	7313	7.6%	7.7%	53.7%
Argentina	104	105	114	99	110	102	112	120	114	123	128	3.7%	2.0%	0.9%
Brazil	86	87	88	97	110	104	102	90	86	91	101	10.7%	1.6%	0.7%
Colombia	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ecuador	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Guyana	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Peru	54	54	49	50	48	47	49	48	46	43	43	1.7%	-2.1%	0.3%
Trinidad & Tobago	34	33	30	25	27	24	23	20	17	15	12	-23.4%	-10.2%	0.1%
Venezuela	116	114	117	105	104	88	80	52	49	47	44	-5.0%	-9.2%	0.3%
Other S. & Cent. America	17	14	13	12	15	14	13	13	13	12	11	-9.7%	-4.0%	0.1%
Total S. & Cent. America	412	407	411	389	414	379	378	342	325	331	339	2.4%	-1.9%	2.5%
Denmark	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Italy	-	-	-	-	-	-	-	-	-	2	2	20.8%	-	†
Norway	306	324	338	349	352	335	301	293	252	197	204	3.6%	-4.0%	1.5%
Romania	3	3	3	4	3	3	4	4	4	4	3	-6.2%	1.8%	†
United Kingdom	55	62	60	82	92	90	99	88	67	67	56	-16.3%	0.1%	0.4%
Other Europe	16	14	14	15	18	18	17	15	16	16	15	-1.0%	-0.3%	0.1%
Total Europe	380	404	415	450	466	446	421	400	339	284	281	-1.3%	-3.0%	2.1%
Azerbaijan	1	2	1	1	1	1	1	1	1	1	2	39.5%	2.2%	†
Kazakhstan	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Russian Federation	278	448	470	479	476	479	493	474	544	533	522	-2.2%	6.5%	3.8%
Turkmenistan	17	17	17	20	21	23	27	30	27	30	28	-6.2%	5.3%	0.2%
Uzbekistan	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other CIS	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total CIS	297	467	488	500	497	503	521	505	573	565	551	-2.3%	6.4%	4.0%
Iran	418	441	461	488	448	479	487	496	582	633	722	14.1%	5.6%	5.3%
Iraq	41	40	41	48	64	64	68	64	70	74	84	13.3%	7.3%	0.6%
Kuwait	287	276	288	290	305	313	299	283	291	329	318	-3.2%	1.0%	2.3%
Oman	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Qatar	471	466	470	473	450	471	470	427	441	457	461	0.8%	-0.2%	3.4%
Saudi Arabia	1518	1577	1578	1718	1717	1728	1687	1609	1560	1682	1780	5.8%	1.6%	13.1%
Syria	14	10	8	8	8	8	9	10	10	10	10	-3.0%	-3.9%	0.1%
United Arab Emirates	482	539	614	654	630	600	639	608	625	656	671	2.2%	3.3%	4.9%
Yemen	24	25	26	26	27	28	28	28	28	28	28	-	1.2%	0.2%
Other Middle East	10	10	10	10	10	11	19	18	15	16	16	-1.4%	5.0%	0.1%
Total Middle East	3266	3386	3494	3715	3659	3703	3705	3543	3622	3885	4088	5.2%	2.3%	30.0%
Algeria	210	260	268	261	254	252	247	233	248	265	271	2.2%	2.6%	2.0%
Angola	22	30	16	23	39	40	47	47	47	47	47	-0.8%	7.7%	0.3%
Chad	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Republic of Congo	9	8	7	7	7	7	7	7	7	7	7	-	-2.5%	0.1%
Egypt	67	47	64	60	57	58	56	44	47	45	45	1.5%	-3.8%	0.3%
Equatorial Guinea	21	19	17	19	21	19	17	15	12	13	10	-21.8%	-7.1%	0.1%
Gabon	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Libya	22	8	15	15	20	21	27	15	40	40	40	-	6.0%	0.3%
Nigeria	82	86	80	76	77	79	79	61	59	67	70	4.3%	-1.6%	0.5%
South Sudan	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sudan	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tunisia	6	5	5	7	6	5	4	4	5	3	5	45.0%	-2.6%	†
Other Africa	-	-	-	-	-	1	1	3	7	11	15	39.1%	-	0.1%
Total Africa	440	462	472	469	481	481	486	430	471	497	509	2.4%	1.5%	3.7%
Australia	66	67	56	64	59	60	97	103	109	101	101	0.9%	4.4%	0.7%
Brunei	13	12	11	12	13	12	12	10	8	9	9	-	-3.9%	0.1%
China	-	-	-	-	-	-	-	-	-	-	-	-	-	-
India	136	136	133	144	153	173	174	159	151	130	123	-5.4%	-1.1%	0.9%
Indonesia	46	58	52	44	36	36	35	34	33	34	35	1.9%	-2.7%	0.3%
Malaysia	39	39	35	59	58	60	62	59	60	59	57	-2.1%	4.0%	0.4%
Thailand	225	231	233	231	247	247	246	219	221	185	188	1.6%	-1.8%	1.4%
Vietnam	10	10	9	10	9	13	12	12	11	11	13	10.6%	2.9%	0.1%
Other Asia Pacific	38	36	33	31	32	26	26	21	17	16	14	-13.3%	-9.3%	0.1%
Total Asia Pacific	572	588	562	594	606	626	664	615	610	545	540	-0.9%	-0.6%	4.0%
Total World	8840	9597	10029	10524	10779	11391	11898	11875	12203	12906	13622	5.5%	4.4%	100.0%
of which: OECD	3921	4356	4659	4916	5177	5754	6235	6536	6704	7178	7689	7.1%	7.0%	56.4%
Non-OECD	4918	5241	5370	5608	5602	5637	5663	5339	5499	5728	5933	3.6%	1.9%	43.6%
OPEC	3230	3398	3501	3704	3686	3691	3684	3491	3590	3859	4063	5.3%	2.3%	29.8%
Non-OPEC	5610	6199	6529	6820	7093	7699	8214	8384	8613	9047	9559	5.7%	5.5%	70.2%
European Union	13	12	12	13	13	12	11	10	10	11	11	0.1%	-1.2%	0.1%

Source: Includes data from FGE, FGE Iran Service, and ICIS.

* Includes ethane, LPG and naphtha separated from the production of natural gas. Excludes condensates.

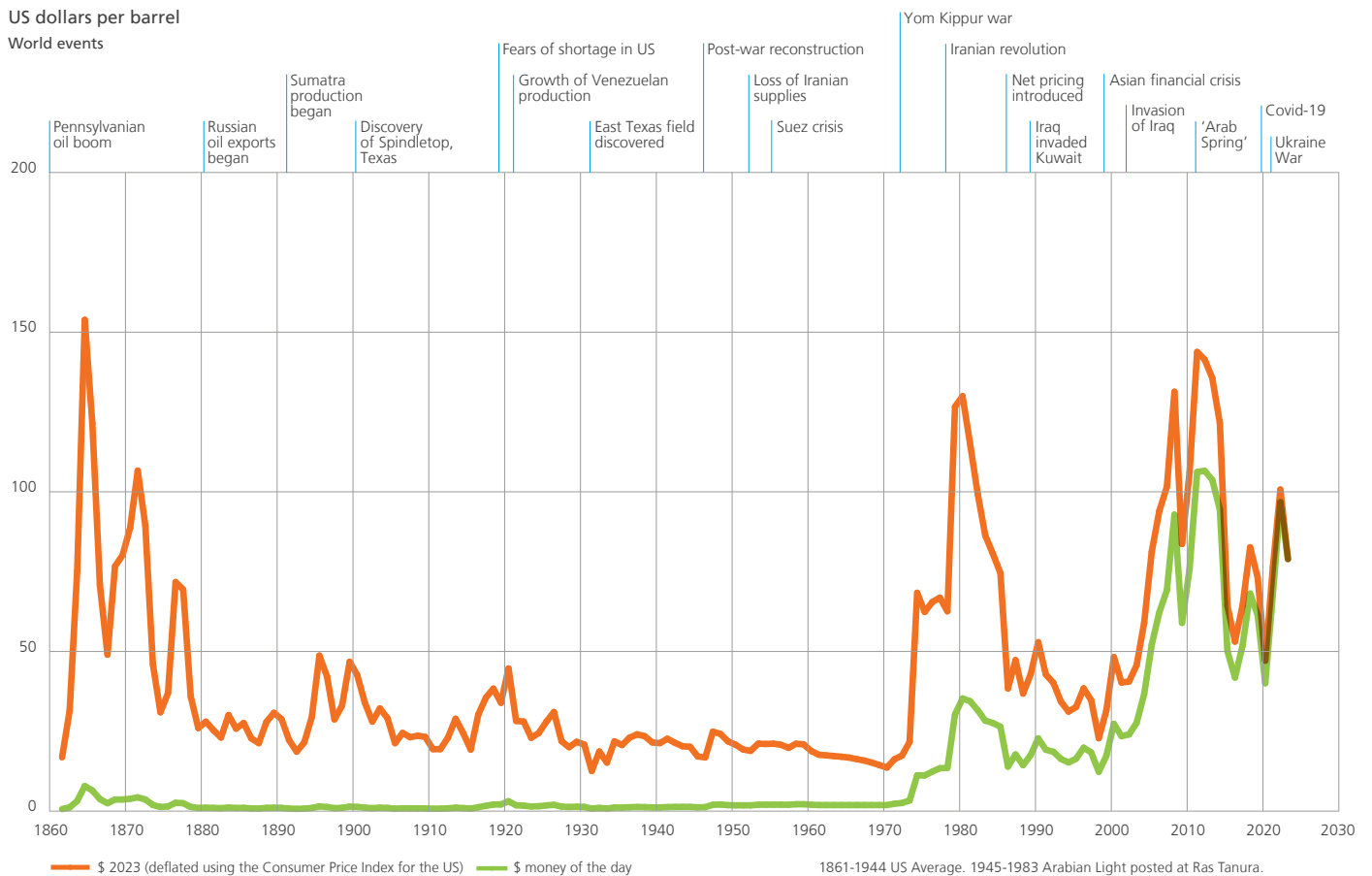
† Less than 0.05%.

Note: Annual changes and shares of total are calculated using thousand barrels daily figures.

US dollars per barrel	Dubai \$/bbl ¹	Brent \$/bbl ²	Nigerian Forcados \$/bbl ³	West Texas Intermediate \$/bbl ⁴
1972	1.90	-	-	-
1973	2.83	-	-	-
1974	10.41	-	-	-
1975	10.70	-	-	-
1976	11.63	12.80	12.87	12.23
1977	12.38	13.92	14.21	14.22
1978	13.03	14.02	13.65	14.55
1979	29.75	31.61	29.25	25.08
1980	35.69	36.83	36.98	37.96
1981	34.32	35.93	36.18	36.08
1982	31.80	32.97	33.29	33.65
1983	28.78	29.55	29.54	30.30
1984	28.06	28.78	28.14	29.39
1985	27.53	27.56	27.75	27.98
1986	13.10	14.43	14.46	15.05
1987	16.95	18.44	18.39	19.19
1988	13.18	14.92	15.00	15.98
1989	15.59	18.23	18.30	19.67
1990	20.21	23.73	23.85	24.46
1991	16.70	20.00	20.11	21.53
1992	17.18	19.32	19.61	20.57
1993	14.99	16.97	17.41	18.45
1994	14.69	15.82	16.25	17.21
1995	16.08	17.02	17.26	18.42
1996	19.26	20.67	21.16	22.16
1997	18.31	19.09	19.33	20.61
1998	12.30	12.72	12.63	14.39
1999	16.90	17.97	17.98	19.31
2000	26.27	28.50	28.42	30.37
2001	22.78	24.44	24.23	25.93
2002	23.60	25.02	25.04	26.16
2003	26.75	28.83	28.68	31.06
2004	33.51	38.27	38.13	41.49
2005	46.78	54.52	55.69	56.59
2006	61.48	65.14	67.07	66.04
2007	67.92	72.39	74.48	72.20
2008	94.28	97.26	101.43	100.06
2009	61.14	61.67	63.35	61.92
2010	77.78	79.50	81.05	79.45
2011	105.93	111.26	113.65	95.04
2012	109.06	111.67	114.21	94.13
2013	105.47	108.66	111.95	97.99
2014	97.02	98.95	101.35	93.28
2015	51.22	52.39	54.41	48.71
2016	41.02	43.73	44.54	43.34
2017	53.02	54.19	54.31	50.79
2018	70.15	71.31	72.47	65.20
2019	63.71	64.21	64.95	57.03
2020	42.41	41.84	42.31	39.25
2021	68.91	70.91	69.76	68.10
2022	96.38	101.32	101.40	94.58
2023	82.09	82.64	83.60	78.88

Source: S&P Global Commodity Insights, ©2024 by S&P Global Inc
¹ 1972-1985 Arabian Light, 1986-2023 Dubai dated.
² 1976-1983 Forties, 1984-2023 Brent dated.
³ Forcados FOB Nigeria.
⁴ 1976-1983 Posted WTI prices, 1984-2023 Spot WTI (Cushing) prices.

Crude oil prices 1861–2023



Thousand barrels daily												Growth rate per annum		Share
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2023	2013-23	2023
Imports														
US	9859	9241	9451	10056	10147	9927	9142	7865	8474	8341	8539	2.4%	-1.4%	12.5%
Europe	12920	12957	14005	14337	14966	14338	14322	12836	12969	14128	12811	-9.3%	-0.1%	18.8%
China	6978	7398	8333	9215	10241	11028	11865	12598	12501	12143	13717	13.0%	7.0%	20.1%
India	4370	4155	4396	4945	4920	5196	5376	4898	5302	5753	5770	0.3%	2.8%	8.5%
Japan	4637	4383	4332	4180	4142	3940	3780	3310	3350	3465	3332	-3.8%	-3.2%	4.9%
Rest of World	20012	21193	22915	28418	25623	25580	25617	27867	23903	24567	23955	-2.5%	1.8%	35.2%
Total World	58776	59328	63431	71151	70039	70009	70101	69374	66500	68397	68124	-0.4%	1.5%	100.0%
Exports														
Canada	3296	3536	3837	3889	4233	4498	4667	4398	4656	4679	4836	3.4%	3.9%	7.1%
Mexico	1347	1293	1321	1405	1283	1302	1252	1247	1216	1173	1271	8.4%	-0.6%	1.9%
US	3563	4033	4562	5082	5881	7039	8010	8136	7959	8549	9108	6.5%	9.8%	13.4%
S. & Cent. America	3790	3939	4103	5736	3989	3711	3424	3567	3034	2843	3417	20.2%	-1.0%	5.0%
Europe	2545	2467	3065	4834	3384	3349	3240	3650	2848	2640	2340	-11.3%	-0.8%	3.4%
Russian Federation	7948	7792	8434	8811	8981	8026	8090	7397	7816	7821	6736	-13.9%	-1.6%	9.9%
Other CIS	2166	2092	2045	2097	2232	2051	2080	2069	2090	2069	2170	4.8%	0.0%	3.2%
Saudi Arabia	8365	7911	8008	8729	8352	8462	8349	8012	7778	8767	8282	-5.5%	-0.1%	12.2%
Middle East (ex Saudi Arabia)	12242	12699	13977	15902	16208	16038	14915	13693	14228	15346	15018	-2.1%	2.1%	22.0%
North Africa	2127	1743	1747	1736	2594	2765	2794	1836	2361	2061	2025	-1.8%	-0.5%	3.0%
West Africa	4590	4849	4889	4458	4490	4516	4728	4268	3953	3580	3285	-8.2%	-3.3%	4.8%
Asia Pacific (ex Japan)	6307	6450	5895	6348	6549	6440	6591	5705	6414	6575	7294	10.9%	1.5%	10.7%
Rest of World	491	524	1549	2124	1863	1811	1959	5398	2148	2295	2341	2.0%	16.9%	3.4%
Total World	58776	59328	63431	71151	70039	70009	70101	69374	66500	68397	68124	-0.4%	1.5%	100.0%

Notes: Unless otherwise stated, this table shows inter-regional trade based on the regional classification in the table 'Oil trade in 2022 and 2023'. Does not include biofuels trade. Bunker fuel use is not included as exports. Intra-area movements (for example, between countries within Europe) are excluded. Annual changes and shares of total are calculated using thousand barrels daily figures.


Oil Trade in 2022 and 2023

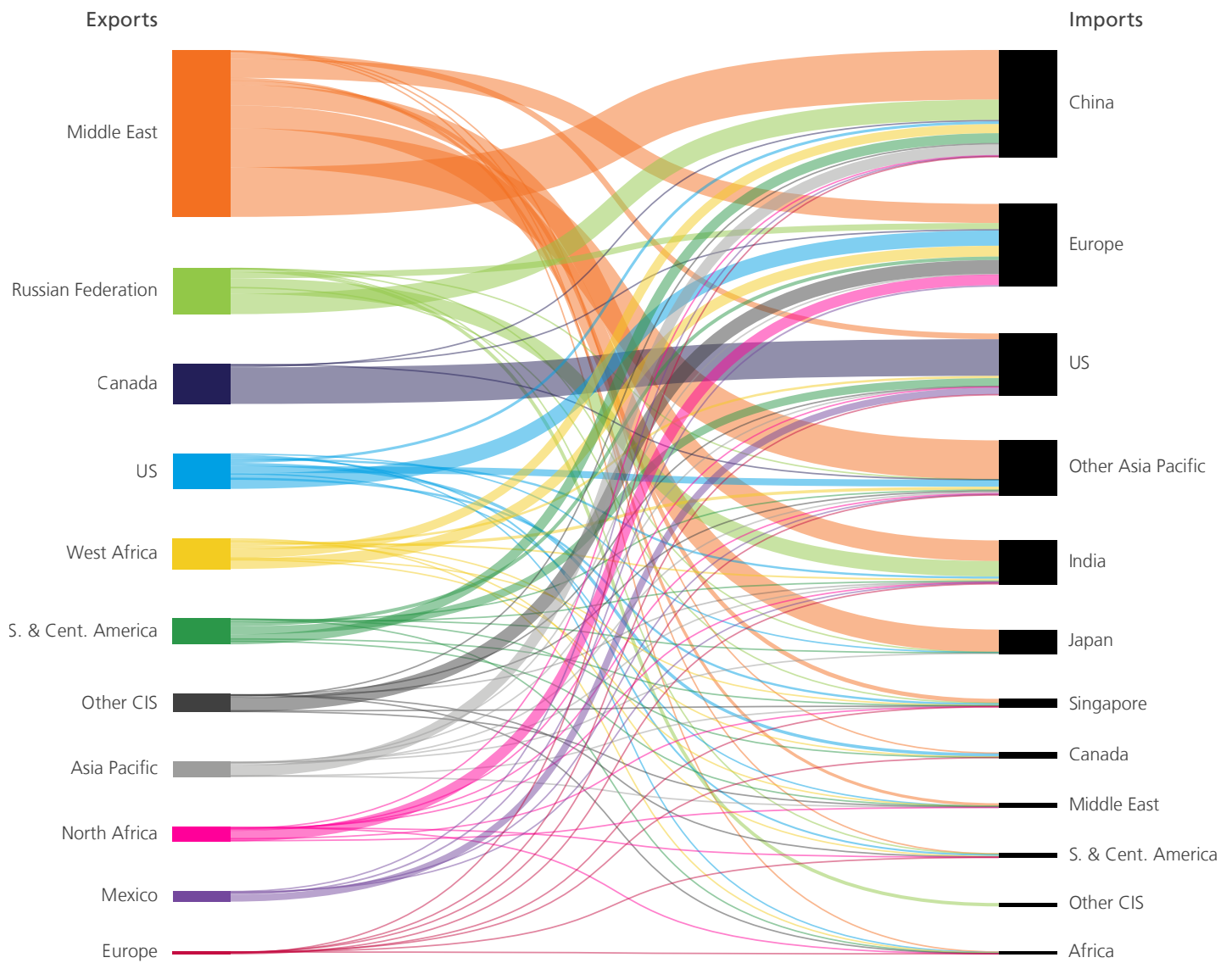
Million tonnes	2022				2023			
	Crude imports	Product imports	Crude exports	Product exports	Crude imports	Product imports	Crude exports	Product exports
Canada	25.8	29.7	198.9	32.8	25.0	27.3	207.2	32.3
Mexico	†	58.9	49.4	8.7	†	58.8	53.8	9.2
US	312.8	98.5	161.3	253.9	323.8	97.5	185.0	258.0
S. & Cent. America	23.9	113.7	111.8	28.6	20.7	105.9	141.2	27.9
Europe	488.8	206.2	19.7	107.3	436.6	193.4	12.1	100.3
Russian Federation	1.8	1.7	262.7	121.8	7.7	1.3	240.8	90.9
Other CIS	16.2	7.6	90.2	12.3	18.0	9.0	91.4	15.9
Iraq	†	10.8	191.1	16.6	†	9.5	184.2	19.8
Kuwait	0.3	0.3	96.0	28.4	0.4	0.3	81.1	37.4
Saudi Arabia	1.7	7.9	367.8	66.0	2.8	6.3	349.1	60.8
United Arab Emirates	7.5	29.9	178.4	90.1	5.3	30.1	170.7	92.5
Other Middle East	15.1	25.2	93.3	62.0	14.6	23.5	90.0	63.3
North Africa	8.9	35.0	76.5	25.1	3.6	35.1	75.6	24.2
West Africa	1.3	50.1	171.3	6.7	1.4	46.7	158.6	4.8
East & S. Africa	6.8	54.8	1.7	2.0	7.3	51.3	3.2	1.3
Australasia	10.4	45.0	11.2	4.5	8.4	54.9	10.0	4.9
China	508.2	92.7	1.7	54.3	563.9	114.4	1.2	61.5
India	231.2	53.1	2.2	87.3	231.0	54.0	1.9	93.3
Japan	132.5	38.5	0.4	16.3	125.5	38.8	†	12.5
Singapore	44.2	72.4	0.3	72.9	42.3	72.2	2.0	78.0
Other Asia Pacific	297.6	188.6	49.2	123.0	288.5	185.2	67.9	126.6
Total World	2135.2	1220.7	2135.2	1220.7	2127.1	1215.5	2127.1	1215.5

Thousand barrels daily	2022				2023			
	Crude imports	Product imports	Crude exports	Product exports	Crude imports	Product imports	Crude exports	Product exports
Canada	518	622	3994	685	503	571	4161	675
Mexico	1	1230	992	182	†	1229	1080	192
US	6281	2060	3240	5308	6502	2038	3716	5393
S. & Cent. America	480	2377	2245	599	416	2213	2835	582
Europe	9817	4311	396	2243	8768	4043	243	2097
Russian Federation	37	36	5275	2546	154	28	4835	1901
Other CIS	325	160	1812	257	361	189	1836	333
Iraq	†	225	3838	348	†	198	3699	414
Kuwait	6	7	1928	595	9	6	1629	783
Saudi Arabia	35	166	7386	1381	56	131	7012	1270
United Arab Emirates	150	625	3584	1884	106	630	3429	1934
Other Middle East	304	527	1874	1296	294	490	1806	1324
North Africa	180	732	1537	525	73	734	1519	507
West Africa	25	1048	3440	139	29	975	3184	100
East & S. Africa	137	1146	35	41	147	1072	65	27
Australasia	209	941	225	93	168	1148	202	103
China	10206	1937	33	1135	11325	2391	24	1285
India	4642	1111	43	1826	4640	1130	38	1951
Japan	2661	804	9	340	2521	811	†	261
Singapore	888	1514	6	1523	849	1509	40	1631
Other Asia Pacific	5977	3942	988	2571	5794	3872	1365	2646
Total World	42879	25518	42879	25518	42716	25408	42716	25408

† Less than 0.05.

‡ Less than 0.5.

Notes: Does not include biofuels trade. Bunker fuel use is not included as exports. Intra-area movements (for example, between countries within Europe) are excluded. Crude imports and exports include condensates.



International trade of crude oil was 2.1 billion tonnes in 2023, similar to 2022. The Middle East dominated exports accounting for 41% of the total. Although Russia's share dropped by 22 million tonnes, its share of the total remained the second highest at 11%. The US increased its share of total exports by 1%, rising to 9% in 2023. On

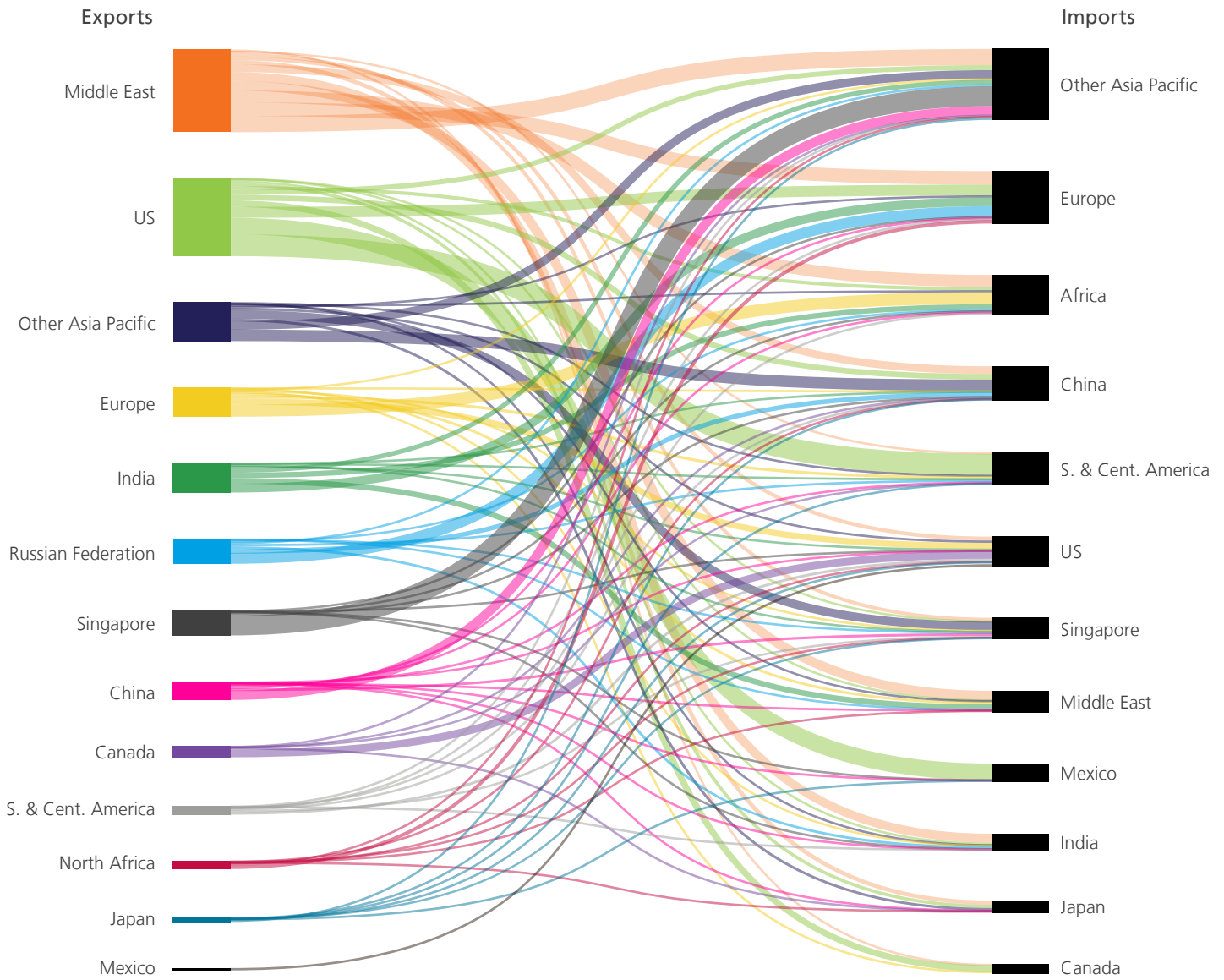
the import side, China was the single largest importer at 0.6 billion tonnes, 27% of the global total. Europe had the second highest share at 21%, followed by the US at 15%. Collectively, China and India increased their imports of Russian crude oil by 53% whilst European reduced its imports by 72%.

Oil Inter-area movements 2023 crude trade

From	To															Total
	Canada	Mexico	US	S. & Cent. America	Europe	Russian Federation	Other CIS	Middle East	Africa	Australasia	China	India	Japan	Singapore	Other Asia Pacific	
Canada	-	-	192.9	-	6.7	-	-	-	†	-	7.5	-	-	-	0.1	207.2
Mexico	-	-	36.5	†	8.0	-	-	-	-	1.6	3.4	-	-	-	4.3	53.8
US	16.9	-	-	9.6	80.4	-	-	0.1	0.7	1.4	14.3	11.3	2.4	11.6	36.5	185.0
S. & Cent. America	0.6	†	42.9	-	18.2	7.6	†	2.9	1.0	†	52.1	7.0	1.9	2.5	4.5	141.2
Europe	0.2	-	2.3	0.1	-	-	†	†	0.3	†	3.1	5.1	-	0.2	0.8	12.1
Russian Federation	-	-	†	0.3	32.4	-	18.0	-	†	-	107.0	81.8	0.1	0.3	0.9	240.8
Other CIS	-	-	1.6	0.1	72.7	†	-	2.4	0.8	†	6.4	0.4	-	0.1	6.7	91.4
Iraq	†	-	10.6	-	49.2	-	-	0.3	0.3	-	59.3	48.8	-	0.9	14.8	184.2
Kuwait	-	-	1.1	-	3.4	-	-	†	1.7	-	24.5	8.1	11.5	0.1	30.8	81.1
Saudi Arabia	2.5	-	17.4	3.2	40.7	-	-	11.7	2.9	-	85.9	35.3	51.4	4.9	93.3	349.1
UAE	†	-	0.8	†	5.4	-	†	†	0.1	†	41.8	13.2	48.6	11.1	49.7	170.7
Other Middle East	-	-	0.4	-	1.8	-	-	3.6	†	-	49.6	3.2	8.2	5.5	17.6	90.0
North Africa	†	-	5.1	1.9	56.5	-	-	1.6	0.3	0.6	3.5	2.2	-	0.2	3.7	75.6
West Africa	4.8	-	11.9	5.4	56.9	-	-	0.3	4.5	0.2	48.1	9.3	-	1.2	16.0	158.6
East & S. Africa	-	-	-	†	1.1	-	-	†	†	-	0.7	0.1	†	0.5	0.8	3.2
Australasia	-	-	0.1	-	0.1	-	-	0.2	-	-	2.0	-	0.5	1.5	5.6	10.0
China	-	-	-	-	0.4	-	-	-	-	-	-	-	-	†	0.8	1.2
India	†	-	-	†	1.9	-	-	-	†	-	-	-	-	†	1.9	†
Japan	-	-	-	†	†	-	-	†	-	-	-	-	-	†	-	†
Singapore	†	-	-	-	0.1	-	-	-	†	†	0.3	-	-	-	1.6	2.0
Other Asia Pacific	-	-	†	†	0.7	†	-	†	†	6.1	56.2	2.0	1.0	1.9	-	67.9
Total imports	25.0	†	323.8	20.7	436.6	7.7	18.0	23.2	12.4	8.4	563.9	231.0	125.5	42.3	288.5	2127.1

† Less than 0.05. Notes: Does not include biofuels trade. Bunker fuel use is not included as exports. Intra-area movements (for example, between countries within Europe) are excluded. Crude imports and exports include condensates.

Oil Inter-area movements 2023 – Refined product



At 1.2 billion tonnes, international trade of refined product was around 57% that of crude oil trade in terms of volume and similar to 2022 levels. Between them, the Middle East and the US accounted for 44% of the total exports at 0.27 and 0.26 billion tonnes respectively. At 0.5 billion tonnes,

Asia Pacific region accounted for around 43% of total imports. Europe was the second-largest importer of refined products at 0.2 billion tonnes, 16% of the total. It reduced its imports from Russia by 51%.

Oil Inter-area movements 2023 refined product

Product (million tonnes)	To																Total
	Canada	Mexico	US	S. & Cent. America	Europe	Russian Federation	Other CIS	Middle East	Africa	Australasia	China	India	Japan	Singapore	Other Asia Pacific		
Canada	–	0.1	26.3	1.7	0.5	–	†	†	†	†	0.6	0.2	2.2	†	0.9	32.3	
Mexico	†	–	8.5	0.1	0.2	–	–	†	0.1	†	†	†	†	0.4	†	9.2	
US	22.0	55.7	–	73.5	37.0	†	†	1.7	12.2	1.2	19.1	8.1	10.7	1.3	15.5	258.0	
S. & Cent. America	0.1	0.1	9.2	–	3.1	†	†	0.5	2.3	†	4.4	0.8	0.4	5.9	1.0	27.9	
Europe	4.2	0.3	21.1	10.0	–	0.2	2.0	9.4	40.6	†	1.9	2.0	0.5	4.4	3.8	100.3	
Russian Federation	†	–	–	7.6	37.5	–	6.7	1.1	4.7	–	16.2	8.7	–	2.8	5.6	90.9	
Other CIS	†	–	0.3	0.1	12.8	0.8	–	0.1	0.7	–	0.7	–	†	0.3	0.2	15.9	
Iraq	–	–	4.9	†	5.0	–	†	5.1	0.1	–	0.5	1.4	†	0.3	2.5	19.8	
Kuwait	0.4	–	1.2	0.5	11.0	–	–	3.9	3.0	†	2.2	3.4	2.9	2.6	6.4	37.4	
Saudi Arabia	†	–	4.3	1.5	13.3	–	†	8.4	12.9	0.2	2.7	6.7	1.1	2.3	7.3	60.8	
UAE	†	†	0.7	1.5	9.0	†	0.1	8.3	16.3	0.2	11.7	10.8	4.9	5.3	23.6	92.5	
Other Middle East	0.1	†	1.7	0.6	7.5	–	0.1	6.3	9.0	0.1	9.2	7.9	4.7	1.3	14.9	63.3	
North Africa	†	–	2.6	0.2	11.9	†	†	0.8	0.4	†	0.8	0.1	0.6	1.1	5.6	24.2	
West Africa	†	–	1.2	0.3	1.0	†	†	0.1	0.3	†	0.9	†	–	0.2	0.7	4.8	
East & S. Africa	†	†	†	†	0.1	†	†	0.2	0.4	†	†	†	†	0.5	†	1.3	
Australasia	†	†	0.1	†	0.8	–	†	†	†	–	0.6	†	1.7	0.3	1.4	4.9	
China	0.1	1.2	0.5	3.9	6.5	0.2	0.1	1.8	4.7	2.7	–	0.5	1.2	9.0	29.1	61.5	
India	†	†	5.2	1.7	29.8	†	†	19.0	17.8	4.8	0.9	–	0.2	2.9	11.2	93.3	
Japan	0.2	0.7	0.7	0.9	0.1	†	†	†	†	2.5	1.1	†	–	2.4	3.7	12.5	
Singapore	†	0.5	1.3	0.3	1.4	†	†	0.4	2.6	15.1	2.8	1.5	0.2	–	51.8	78.0	
Other Asia Pacific	0.1	0.2	7.7	1.4	4.9	0.1	†	2.6	5.1	28.1	38.2	1.9	7.5	28.8	–	126.6	
Total imports	27.3	58.8	97.5	105.9	193.4	1.3	9.0	69.7	133.0	54.9	114.4	54.0	38.8	72.2	185.2	1215.5	

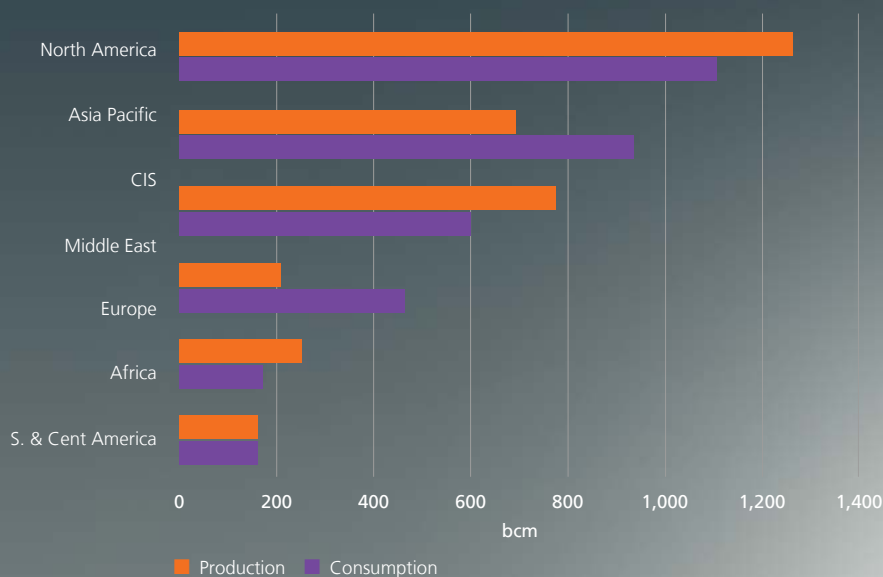
† Less than 0.05.

Notes: Does not include biofuels trade. Bunker fuel use is not included as exports. Intra-area movements (for example, between countries within Europe) are excluded. Crude imports and exports include condensates.

Natural gas

Global gas demand remained stable in 2023 rising by just 1 bcm. This was not sufficient to recover the losses seen in 2022 when overall demand dropped by 0.4% (15 bcm). In Europe, natural gas demand fell by 7% (34 bcm) in 2023, down to its lowest level since 1994. Similarly, gas production in the region declined by around 7% driven by decreases in its top producing countries, Norway, UK, and the Netherlands. Gas demand in the Asia Pacific region grew

nearly 2%, driven by China and India's 7% growth increases. When combining all trade routes, whether by sea or pipeline, Russia's share of EU gas imports fell from 45% in 2021 to 24% in 2022, and then a further 15% in 2023 to sit behind Norway and the US. In just eight years, LNG exports from the US rocketed from just 0.2 bcm in 2013 to 114 bcm in 2023, making it the world's leading LNG supplier, moving ahead of Qatar and Australia in 2023.



The top four regions responsible for 80% of gas production are also responsible for 85% of its consumption



Natural gas Consumption in billion cubic metres*

Billion cubic metres	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Growth rate per annum		Share
												2023	2013-23	2023
Canada	105.4	109.8	110.3	105.6	109.6	117.7	118.7	115.3	118.6	123.8	120.7	-2.5%	1.4%	3.0%
Mexico	77.8	78.8	80.8	83.0	86.0	90.3	93.4	92.2	91.6	90.9	97.6	7.3%	2.3%	2.4%
US	707.0	722.3	743.6	749.1	740.0	822.0	851.0	834.5	836.4	879.6	886.5	0.8%	2.3%	22.1%
Total North America	890.3	911.0	934.7	937.8	935.7	1029.9	1063.0	1042.1	1046.7	1094.3	1104.8	1.0%	2.2%	27.5%
Argentina	46.0	46.2	46.7	48.2	48.3	48.7	46.6	43.9	45.9	45.9	44.9	-2.0%	-0.2%	1.1%
Brazil	38.4	40.7	42.9	37.1	37.6	35.9	35.7	31.4	40.4	32.0	30.0	-6.3%	-2.4%	0.7%
Chile	5.3	4.4	4.8	5.9	5.6	5.6	6.5	6.2	6.8	7.3	7.0	-3.5%	2.8%	0.2%
Colombia	10.5	11.4	11.2	12.1	11.8	12.7	12.9	13.1	12.6	12.6	13.1	3.7%	2.2%	0.3%
Ecuador	0.9	0.9	0.8	0.9	0.9	0.8	0.7	0.6	0.6	0.5	0.5	-7.9%	-5.3%	†
Peru	6.7	7.4	7.6	8.5	7.5	8.0	8.2	8.2	8.9	9.8	10.1	2.8%	4.2%	0.3%
Trinidad & Tobago	20.4	20.5	19.6	16.9	18.3	17.4	17.5	15.2	15.6	15.5	14.5	-6.2%	-3.3%	0.4%
Venezuela	32.3	34.0	37.0	37.2	38.6	31.6	25.6	21.6	28.1	29.1	29.7	2.2%	-0.8%	0.7%
Central America	-	-	-	-	-	0.2	0.5	0.4	0.3	0.6	1.2	83.6%	-	†
Other Caribbean	3.6	3.7	3.7	3.8	3.5	4.0	4.5	4.6	5.5	5.3	6.4	20.8%	5.9%	0.2%
Other South America	3.3	3.5	3.4	3.6	3.9	4.0	3.9	3.4	3.7	4.0	4.4	11.1%	2.9%	0.1%
Total S. & Cent. America	167.3	172.6	177.8	174.3	176.1	169.0	162.5	148.6	168.5	162.4	161.7	-0.5%	-0.3%	4.0%
Austria	8.2	7.5	8.0	8.3	9.1	8.7	8.9	8.5	9.0	7.9	6.9	-13.0%	-1.7%	0.2%
Belgium	16.5	14.5	15.8	16.2	16.4	16.9	17.4	17.0	17.0	14.6	13.7	-5.8%	-1.9%	0.3%
Bulgaria	2.8	2.7	3.0	3.1	3.2	3.0	2.8	2.9	3.3	2.7	2.5	-6.6%	-0.9%	0.1%
Croatia	2.7	2.3	2.4	2.5	2.9	2.7	2.8	2.9	2.8	2.5	2.5	0.8%	-0.6%	0.1%
Cyprus	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Czech Republic	8.1	7.2	7.5	8.2	8.4	8.0	8.3	8.5	9.1	7.4	6.7	-9.2%	-1.9%	0.2%
Denmark	3.8	3.3	3.3	3.4	3.2	3.1	2.9	2.3	2.4	1.7	1.6	-3.7%	-8.2%	†
Estonia	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.4	0.4	-8.4%	-5.4%	†
Finland	3.0	2.7	2.3	2.0	1.8	2.1	2.0	2.1	2.1	1.1	1.2	6.2%	-8.7%	†
France	45.1	37.9	40.8	44.5	44.8	42.8	43.7	40.6	43.0	38.4	33.9	-11.7%	-2.8%	0.8%
Germany	85.0	73.9	77.0	84.9	87.7	85.9	89.3	87.1	91.7	77.5	75.7	-2.4%	-1.2%	1.9%
Greece	4.1	3.2	3.4	4.4	5.4	5.2	5.8	6.3	7.0	6.2	5.4	-13.1%	2.6%	0.1%
Hungary	9.1	8.1	8.7	9.3	9.9	9.6	9.8	10.2	10.8	9.2	8.2	-10.9%	-1.0%	0.2%
Iceland	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ireland	4.5	4.3	4.4	4.9	5.0	5.2	5.3	5.3	5.1	5.2	4.8	-7.2%	0.8%	0.1%
Italy	66.7	59.0	64.3	67.5	71.6	69.2	70.8	67.6	72.4	65.2	58.6	-10.1%	-1.3%	1.5%
Latvia	1.4	1.3	1.3	1.3	1.2	1.4	1.3	1.1	1.2	0.8	0.8	-5.3%	-5.9%	†
Lithuania	2.5	2.4	2.4	2.1	2.2	2.2	2.2	2.4	2.2	1.6	1.6	-2.6%	-4.6%	†
Luxembourg	1.0	1.0	0.9	0.8	0.8	0.8	0.8	0.7	0.8	0.6	0.6	-6.3%	-5.7%	†
Netherlands	39.1	34.3	33.8	35.2	36.3	35.6	37.2	36.1	34.8	27.5	25.8	-6.4%	-4.1%	0.6%
North Macedonia	0.2	0.1	0.1	0.2	0.3	0.2	0.3	0.3	0.4	0.3	0.4	26.6%	8.9%	†
Norway	4.0	4.3	4.6	4.4	4.6	4.5	4.6	4.5	4.3	3.9	3.8	-3.4%	-0.6%	0.1%
Poland	17.4	17.0	17.1	18.3	19.2	19.9	20.9	21.1	22.4	18.6	19.6	5.3%	1.2%	0.5%
Portugal	4.3	4.1	4.8	5.1	6.3	5.8	6.1	6.0	5.8	5.6	4.5	-19.8%	0.4%	0.1%
Romania	11.4	10.9	10.4	10.5	11.3	11.6	10.8	11.3	11.6	9.7	9.1	-6.4%	-2.3%	0.2%
Slovakia	5.3	4.4	4.5	4.5	4.8	4.7	4.8	4.8	5.3	4.4	4.2	-4.8%	-2.3%	0.1%
Slovenia	0.8	0.7	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.8	0.8	-3.5%	-0.6%	†
Spain	30.3	27.5	28.5	29.1	31.7	31.5	36.0	32.5	34.3	33.0	29.3	-11.1%	-0.3%	0.7%
Sweden	1.0	0.8	0.9	1.0	1.0	1.0	1.0	1.0	1.1	0.8	0.7	-10.4%	-3.5%	†
Switzerland	3.6	3.1	3.3	3.5	3.5	3.3	3.4	3.3	3.6	3.0	2.7	-7.4%	-2.6%	0.1%
Türkiye	44.0	46.6	46.0	44.5	51.6	47.2	43.4	46.2	57.3	51.2	48.4	-5.5%	1.0%	1.2%
Ukraine	47.7	40.3	32.0	31.4	30.2	30.6	28.3	29.3	27.3	18.3	18.7	2.6%	-8.9%	0.5%
United Kingdom	76.3	70.1	72.0	79.9	78.2	78.8	77.9	73.1	76.9	70.9	63.5	-10.4%	-1.8%	1.6%
Other Europe	4.2	4.1	4.5	4.6	5.3	5.3	5.5	5.5	6.2	6.7	7.0	4.3%	5.2%	0.2%
Total Europe	554.9	500.3	509.3	537.2	559.3	548.3	555.4	541.8	572.5	497.7	463.4	-6.9%	-1.8%	11.6%
Azerbaijan	9.4	9.9	11.1	10.9	10.6	10.8	11.8	12.4	12.8	13.6	15.1	11.1%	4.8%	0.4%
Belarus	19.3	19.1	17.9	17.8	18.2	19.3	19.2	17.8	18.8	18.5	16.8	-9.1%	-1.4%	0.4%
Kazakhstan	11.2	14.8	13.8	15.0	16.7	16.7	19.7	17.7	21.6	21.3	21.4	0.7%	6.7%	0.5%
Russian Federation	424.9	422.2	408.7	420.6	431.1	454.5	444.3	423.5	431.5	448.4	453.4	1.1%	0.7%	11.3%
Turkmenistan	19.3	20.0	25.4	25.1	24.8	28.4	27.7	34.3	36.8	37.5	36.8	-2.1%	6.6%	0.9%
Uzbekistan	46.2	48.5	46.3	43.3	44.8	44.4	44.6	43.6	46.5	48.3	46.6	-3.6%	0.1%	1.2%
Other CIS	4.8	5.3	5.2	5.1	5.1	5.9	5.6	5.9	5.8	5.5	6.0	8.7%	2.3%	0.1%
Total CIS	535.0	539.8	528.4	538.0	551.2	580.0	572.9	555.0	573.8	593.1	596.0	0.5%	1.1%	14.9%
Iran	153.8	173.4	184.0	196.3	205.0	212.6	218.4	236.8	229.5	239.4	245.6	2.6%	4.8%	6.1%
Iraq	7.1	7.5	7.3	9.9	11.4	14.6	19.5	18.5	16.4	18.4	18.7	1.9%	10.2%	0.5%
Israel	6.6	7.2	8.0	9.2	9.8	10.6	10.7	11.3	11.7	12.1	12.6	3.5%	6.7%	0.3%
Kuwait	17.8	17.9	20.3	21.1	21.0	21.2	18.4	17.9	19.8	21.7	22.5	3.7%	2.4%	0.6%
Oman	21.7	21.3	23.1	22.9	23.4	25.0	25.0	25.9	28.0	28.5	29.5	3.4%	3.1%	0.7%
Qatar	35.3	38.4	43.3	41.3	41.1	40.3	41.4	38.4	40.1	40.3	44.2	9.6%	2.3%	1.1%
Saudi Arabia	95.0	97.3	99.2	105.3	109.3	112.1	111.2	113.1	114.5	116.7	114.1	-2.2%	1.8%	2.8%
United Arab Emirates	64.7	63.4	71.5	71.9	65.7	59.6	67.2	67.9	65.5	66.1	66.9	1.1%	0.3%	1.7%
Other Middle East	21.3	20.9	22.5	23.1	23.2	22.0	23.2	23.2	23.6	22.8	23.7	4.1%	1.1%	0.6%
Total Middle East	423.3	447.4	479.3	501.1	509.8	517.9	534.8	552.9	549.1	566.1	577.7	2.0%	3.2%	14.4%
Algeria	32.1	36.1	37.9	38.6	39.5	43.4	45.1	43.4	48.2	50.3	46.3	-8.0%	3.7%	1.2%
Egypt	49.5	46.2	46.0	49.4	55.9	59.6	59.0	58.3	62.1	60.6	60.0	-0.9%	1.9%	1.5%
Morocco	1.2	1.2	1.2	1.2	1.2	1.1	1.0	0.8	0.8	0.2	0.9	298.8%	-3.1%	†
South Africa	4.1	4.3	4.3	3.7	4.0	4.4	4.3	4.0	4.2	4.3	4.7	11.2%	1.6%	0.1%
Eastern Africa	1.1	1.3	1.6	2.0	2.0	2.1	2.4	2.3	2.7	2.9	2.9	3.0%	9.9%	0.1%
Middle Africa	4.0	3.9	4.2	5.5	5.5	5.6	5.0	5.4	6.0	5.7	4.9	-13.3%	2.1%	0.1%
Western Africa	12.7	16.0	23.9	21.1	22.1	23.6	24.3	26.0	34.5	33.0	32.0	-3.1%	9.7%	0.8%
Other Northern Africa	12.3	11.3	11.6	13.6	15.4	15.6	16.6	14.1	18.1	17.7	19.4	9.3%	4.6%	0.5%
Other Southern Africa	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Africa	117.0	120.2	130.8	135.0	145.6	155.3	157.7	154.2	176.6	174.7	171.2	-2.0%	3.9%	4.3%
Australia	35.0	37.6	39.0	38.0	37.3	37.2	44.1	42.3	39.6	43.2	40.1	-7.2%	1.4%	1.0%
Bangladesh	22.0	23.0	25.9	26.5	26.6	27.4	30.9	29.9	30.6	28.7	28.1	-2.0%	2.5%	0.7%
China	171.9	188.4	194.7	209.4	241.3	283.9	308.4	336.6	380.3	377.6	404.8	7.2%	8.9%	10.1%
China Hong Kong SAR	2.5	2.4	3.0	3.1	3.1	3.0	3.1	4.9	4.8	4.5	4.8	6.9%	6.9%	0.1%
India	49.0	48.5	47.8	50.8	53.6	58.0	59.2	60.4	62.4	58.3	62.6	7.5%	2.5%	1.6%
Indonesia	42.5	42.6	44.0	45.4	44.5	45.3	45.5	42.6	42.9	44.0	45.4	3.2%	0.7%	1.1%
Japan	123.5	124.8	118.7	116.4	117.0	115.7	108.1	104.1	103.5	100.2	92.4	-7.8%	-2.9%	2.3%
Malaysia	44.6	44.7	46.8	45.0	45.0	44.7	45.2	43.6	51.4	51.9	46.1	-11.3%	0.3%	1.1%
New Zealand	4.7	5.2	4.8	4.8	5.0	4.5	4.8	4.6	3.9	3.6	3.8	5.1%	-2.1%	0.1%
Pakistan	35.6	35.0	36.5	4.0	40.7	43.6	44.5	41.2	44.9	38.2	37.8	-0.9%	0.6%	

Natural gas Consumption in exajoules*

Exajoules												Growth rate per annum		Share
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2023	2013-23	2023
Canada	3.80	3.95	3.97	3.80	3.95	4.24	4.27	4.15	4.27	4.46	4.35	-2.5%	1.4%	3.0%
Mexico	2.80	2.84	2.91	2.99	3.10	3.25	3.36	3.32	3.30	3.27	3.51	7.3%	2.3%	2.4%
US	25.45	26.00	26.77	26.97	26.64	29.59	30.64	30.04	30.11	31.67	31.91	0.8%	-2.3%	22.1%
Total North America	32.05	32.79	33.65	33.76	33.68	37.08	38.27	37.52	37.68	39.40	39.77	1.0%	2.2%	27.6%
Argentina	1.66	1.66	1.68	1.74	1.74	1.75	1.68	1.58	1.65	1.65	1.62	-2.0%	-0.2%	1.1%
Brazil	1.38	1.46	1.55	1.34	1.35	1.29	1.29	1.13	1.46	1.15	1.08	-6.3%	-2.4%	0.7%
Chile	0.19	0.16	0.17	0.21	0.20	0.20	0.23	0.22	0.25	0.26	0.25	-3.5%	2.8%	0.2%
Colombia	0.38	0.41	0.40	0.43	0.43	0.46	0.46	0.47	0.45	0.45	0.47	3.7%	2.2%	0.3%
Ecuador	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02	-7.9%	-5.3%	†
Peru	0.24	0.27	0.28	0.31	0.27	0.29	0.30	0.29	0.32	0.35	0.36	2.8%	4.2%	0.3%
Trinidad & Tobago	0.73	0.74	0.71	0.61	0.66	0.63	0.63	0.55	0.56	0.56	0.52	-6.2%	-3.3%	0.4%
Venezuela	1.16	1.22	1.33	1.34	1.39	1.14	0.92	0.78	1.01	1.05	1.07	2.2%	-0.8%	0.7%
Central America	–	–	–	–	–	0.01	0.02	0.01	0.01	0.02	0.04	83.6%	–	†
Other Caribbean	0.13	0.13	0.13	0.14	0.12	0.14	0.16	0.17	0.20	0.19	0.23	20.8%	5.9%	0.2%
Other South America	0.12	0.13	0.12	0.13	0.14	0.14	0.14	0.12	0.13	0.14	0.16	11.1%	2.9%	0.1%
Total S. & Cent. America	6.02	6.21	6.40	6.27	6.34	6.08	5.85	5.35	6.07	5.85	5.82	-0.5%	-0.3%	4.0%
Austria	0.30	0.27	0.29	0.30	0.33	0.31	0.32	0.31	0.32	0.28	0.25	-13.0%	-1.7%	0.2%
Belgium	0.60	0.52	0.57	0.58	0.59	0.61	0.63	0.61	0.61	0.52	0.49	-5.8%	-1.9%	0.3%
Bulgaria	0.10	0.10	0.11	0.11	0.12	0.11	0.10	0.11	0.12	0.10	0.09	-6.6%	-0.9%	0.1%
Croatia	0.10	0.08	0.09	0.09	0.10	0.10	0.10	0.11	0.10	0.09	0.09	0.8%	-0.6%	0.1%
Cyprus	–	–	–	–	–	–	–	–	–	0.00	0.00	–	–	–
Czech Republic	0.29	0.26	0.27	0.29	0.30	0.29	0.30	0.30	0.33	0.27	0.24	-9.2%	-1.9%	0.2%
Denmark	0.14	0.12	0.12	0.12	0.12	0.11	0.10	0.08	0.09	0.06	0.06	-3.7%	-8.2%	†
Estonia	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	-8.4%	-5.4%	†
Finland	0.11	0.10	0.08	0.07	0.07	0.08	0.07	0.07	0.07	0.04	0.04	6.2%	-8.7%	†
France	1.63	1.36	1.47	1.60	1.61	1.54	1.57	1.46	1.55	1.38	1.22	-11.7%	-2.8%	0.8%
Germany	3.06	2.66	2.77	3.06	3.16	3.09	3.21	3.14	3.30	2.79	2.72	-2.4%	-1.2%	1.9%
Greece	0.15	0.11	0.12	0.16	0.19	0.19	0.21	0.23	0.25	0.22	0.19	-13.1%	2.6%	0.1%
Hungary	0.33	0.29	0.31	0.34	0.36	0.35	0.35	0.37	0.39	0.33	0.29	-10.9%	-1.0%	0.2%
Iceland	–	–	–	–	–	–	–	–	–	0.00	0.00	–	–	–
Ireland	0.16	0.16	0.16	0.18	0.18	0.19	0.19	0.19	0.18	0.19	0.17	-7.2%	0.8%	0.1%
Italy	2.40	2.12	2.32	2.43	2.58	2.49	2.55	2.43	2.61	2.35	2.11	-10.1%	-1.3%	1.5%
Latvia	0.05	0.05	0.05	0.05	0.04	0.05	0.05	0.04	0.04	0.03	0.03	-5.3%	-5.9%	†
Lithuania	0.09	0.09	0.09	0.08	0.08	0.08	0.08	0.08	0.08	0.06	0.06	-2.6%	-4.6%	†
Luxembourg	0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.02	-6.3%	-5.7%	†
Netherlands	1.41	1.24	1.22	1.27	1.31	1.28	1.34	1.30	1.25	0.99	0.93	-6.4%	-4.1%	0.6%
North Macedonia	0.01	^	^	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	26.6%	8.9%	†
Norway	0.15	0.16	0.17	0.16	0.17	0.16	0.17	0.16	0.15	0.14	0.14	-3.4%	-0.6%	0.1%
Poland	0.63	0.61	0.62	0.66	0.69	0.72	0.75	0.76	0.81	0.67	0.70	5.3%	1.2%	0.5%
Portugal	0.16	0.15	0.17	0.18	0.23	0.21	0.22	0.22	0.21	0.20	0.16	-19.8%	0.4%	0.1%
Romania	0.41	0.39	0.37	0.38	0.41	0.42	0.39	0.41	0.42	0.35	0.33	-6.4%	-2.3%	0.2%
Slovakia	0.19	0.16	0.16	0.16	0.17	0.17	0.17	0.17	0.19	0.16	0.15	-4.8%	-2.3%	0.1%
Slovenia	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	-3.5%	-0.6%	†
Spain	1.09	0.99	1.03	1.05	1.14	1.13	1.30	1.17	1.24	1.19	1.05	-11.1%	-0.3%	0.7%
Sweden	0.04	0.03	0.03	0.04	0.03	0.04	0.04	0.04	0.04	0.03	0.03	-10.4%	-3.5%	†
Switzerland	0.13	0.11	0.12	0.13	0.13	0.12	0.12	0.12	0.13	0.11	0.10	-7.4%	-2.6%	0.1%
Türkiye	1.58	1.68	1.65	1.60	1.86	1.70	1.56	1.66	2.06	1.84	1.74	-5.5%	1.0%	1.2%
Ukraine	1.72	1.45	1.15	1.13	1.09	1.10	1.02	1.06	0.98	0.66	0.67	2.6%	-8.9%	0.5%
United Kingdom	2.75	2.52	2.59	2.88	2.82	2.84	2.80	2.63	2.77	2.55	2.29	-10.4%	-1.8%	1.6%
Other Europe	0.15	0.15	0.16	0.17	0.19	0.19	0.20	0.20	0.22	0.24	0.25	4.3%	5.2%	0.2%
Total Europe	19.98	18.01	18.34	19.34	20.13	19.74	20.00	19.50	20.61	17.92	16.68	-6.9%	-1.8%	11.6%
Azerbaijan	0.34	0.35	0.40	0.39	0.38	0.39	0.42	0.45	0.46	0.49	0.54	11.1%	4.8%	0.4%
Belarus	0.69	0.69	0.64	0.64	0.66	0.70	0.69	0.64	0.68	0.66	0.60	-9.1%	-1.4%	0.4%
Kazakhstan	0.40	0.53	0.50	0.54	0.60	0.60	0.71	0.64	0.78	0.77	0.77	0.7%	6.7%	0.5%
Russian Federation	15.30	15.20	14.71	15.14	15.52	16.36	16.00	15.25	15.54	16.14	16.32	1.1%	0.7%	11.3%
Turkmenistan	0.70	0.72	0.91	0.90	0.89	1.02	1.00	1.23	1.32	1.35	1.32	-2.1%	6.6%	0.9%
Uzbekistan	1.66	1.75	1.67	1.56	1.61	1.60	1.61	1.57	1.67	1.74	1.68	-3.6%	0.1%	1.2%
Other CIS	0.17	0.19	0.19	0.19	0.18	0.21	0.20	0.21	0.21	0.20	0.22	8.7%	2.3%	0.1%
Total CIS	19.26	19.43	19.02	19.37	19.84	20.88	20.62	19.98	20.66	21.35	21.46	0.5%	1.1%	14.9%
Iran	5.54	6.24	6.62	7.07	7.38	7.66	7.86	8.52	8.26	8.62	8.84	2.6%	4.8%	6.1%
Iraq	0.25	0.27	0.26	0.36	0.41	0.53	0.70	0.67	0.59	0.66	0.67	1.9%	10.2%	0.5%
Israel	0.24	0.26	0.29	0.33	0.35	0.38	0.39	0.41	0.42	0.44	0.45	3.5%	6.7%	0.3%
Kuwait	0.64	0.64	0.73	0.76	0.76	0.76	0.66	0.64	0.71	0.78	0.81	3.7%	2.4%	0.6%
Oman	0.78	0.77	0.83	0.83	0.84	0.90	0.90	0.93	1.01	1.03	1.06	3.4%	3.1%	0.7%
Qatar	1.27	1.38	1.56	1.49	1.48	1.45	1.49	1.38	1.44	1.45	1.59	9.6%	2.3%	1.1%
Saudi Arabia	3.42	3.50	3.57	3.79	3.93	4.04	4.00	4.07	4.12	4.20	4.11	-2.2%	1.8%	2.8%
United Arab Emirates	2.33	2.28	2.57	2.59	2.36	2.14	2.42	2.44	2.36	2.38	2.41	1.1%	0.3%	1.7%
Other Middle East	0.77	0.75	0.81	0.83	0.84	0.79	0.83	0.84	0.85	0.82	0.85	4.1%	1.1%	0.6%
Total Middle East	15.24	16.11	17.25	18.04	18.35	18.64	19.25	19.90	19.77	20.38	20.80	2.0%	3.2%	14.4%
Algeria	1.16	1.30	1.37	1.39	1.42	1.56	1.62	1.56	1.73	1.81	1.67	-8.0%	3.7%	1.2%
Egypt	1.78	1.66	1.66	1.78	2.01	2.15	2.13	2.10	2.24	2.18	2.16	-0.9%	1.9%	1.5%
Morocco	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.03	0.01	0.03	298.8%	-3.1%	†
South Africa	0.15	0.15	0.16	0.13	0.14	0.16	0.15	0.14	0.15	0.15	0.17	11.2%	1.6%	0.1%
Eastern Africa	0.04	0.05	0.06	0.07	0.07	0.08	0.09	0.08	0.10	0.10	0.11	3.0%	9.9%	0.1%
Middle Africa	0.14	0.14	0.15	0.20	0.20	0.20	0.18	0.20	0.22	0.20	0.16	-21.5%	1.1%	0.1%
Western Africa	0.46	0.58	0.86	0.76	0.79	0.85	0.87	0.93	1.24	1.19	1.15	-3.1%	9.7%	0.8%
Other Northern Africa	0.44	0.41	0.42	0.49	0.56	0.56	0.60	0.51	0.65	0.64	0.70	9.3%	4.6%	0.5%
Other Southern Africa	–	–	–	–	–	–	–	–	–	0.00	0.00	–	–	–
Total Africa	4.21	4.33	4.71	4.86	5.24	5.59	5.68	5.55	6.36	6.29	6.15	-2.3%	3.9%	4.3%
Australia	1.26	1.35	1.40	1.37	1.34	1.34	1.59	1.52	1.42	1.56	1.44	-7.2%	1.4%	1.0%
Bangladesh	0.79	0.83	0.93	0.95	0.96	0.99	1.11	1.08	1.10	1.03	1.01	-2.0%	2.5%	0.7%
China	6.19	6.78	7.01	7.54	8.69	10.22	11.10	12.12	13.69	13.60	14.57	7.2%	8.9%	10.1%
China Hong Kong SAR	0.09	0.09	0.11	0.11	0.11	0.11	0.11	0.18	0.17	0.16	0.17	6.9%	6.9%	0.1%
India	1.76	1.75	1.72	1.83	1.93	2.09	2.13	2.17	2.25	2.10	2.25	7.5%	2.5%	1.6%
Indonesia	1.53	1.53	1.59	1.64	1.60	1.63	1.64	1.53	1.55	1.59	1.64	3.2%	0.7%	1.1%
Japan	4.45	4.49	4.27	4.19	4.21	4.17	3.89	3.75	3.73	3.61	3.33	-7.8%	-2.9%	2.3%
Malaysia	1.60	1.61	1.69	1.62	1.62	1.61	1.63	1.57	1.85</					

	LNG USD\$/mmBTU			Natural gas USD\$/mmBTU				Hydrogen USD\$/kg				Ammonia USD\$/mt			
	Japan ¹	China (mainland) ²	South Korea ²	Zeebrugge ²	UK NBP ³	Netherlands TTF ³	US Henry Hub ⁴	US Gulf Coast ⁵	Northwest Europe ⁵	Middle East ⁵	Far East Asia ⁵	US Gulf Coast ⁶	Northwest Europe ⁷	Middle East ⁸	Far East Asia ⁹
1984	5.10	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1985	5.23	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1986	4.10	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1987	3.35	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1988	3.34	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1989	3.28	–	–	–	–	–	1.70	–	–	–	–	–	–	–	–
1990	3.64	–	–	–	–	–	1.64	–	–	–	–	–	–	–	–
1991	3.99	–	–	–	–	–	1.49	–	–	–	–	–	–	–	–
1992	3.62	–	–	–	–	–	1.77	–	–	–	–	–	–	–	–
1993	3.52	–	–	–	–	–	2.12	–	–	–	–	–	–	–	–
1994	3.18	–	–	–	–	–	1.92	–	–	–	–	–	–	–	–
1995	3.46	–	–	–	–	–	1.69	–	–	–	–	–	–	–	–
1996	3.66	–	–	–	1.87	–	2.76	–	–	–	–	–	–	–	–
1997	3.91	–	–	–	1.96	–	2.53	–	–	–	–	–	–	–	–
1998	3.05	–	–	–	1.86	–	2.08	–	–	–	–	–	–	–	–
1999	3.14	–	–	–	1.58	–	2.27	–	–	–	–	–	–	–	–
2000	4.72	–	–	–	2.71	–	4.23	–	–	–	–	–	–	–	–
2001	4.64	–	–	–	3.17	–	4.07	–	–	–	–	–	–	–	–
2002	4.27	–	–	–	2.37	–	3.33	–	–	–	–	–	–	–	–
2003	4.77	–	–	–	3.33	–	5.63	–	–	–	–	–	–	–	–
2004	5.18	–	–	–	4.46	–	5.85	–	–	–	–	–	–	–	–
2005	5.80	–	7.18	7.11	7.11	5.81	8.80	–	–	–	–	–	–	–	–
2006	6.86	–	8.64	7.63	7.49	7.26	6.74	–	–	–	–	–	–	–	–
2007	7.47	3.76	8.84	6.09	5.98	5.90	6.95	–	–	–	–	–	–	–	–
2008	12.24	4.79	13.27	10.78	10.66	10.67	8.84	–	–	–	–	–	–	–	–
2009	8.73	4.41	9.28	4.84	4.79	4.91	3.92	–	–	–	–	–	–	–	–
2010	10.55	6.19	9.74	6.61	6.52	6.69	4.38	–	–	–	–	–	–	–	–
2011	14.30	8.80	12.37	9.14	9.00	9.18	3.99	–	–	–	–	–	–	–	–
2012	16.17	10.69	14.37	9.39	9.42	9.37	2.75	–	–	–	–	–	–	–	–
2013	15.55	11.15	14.47	10.52	10.60	10.52	3.72	–	–	–	–	–	–	–	–
2014	15.73	11.76	15.84	8.13	8.22	8.11	4.34	–	–	–	–	–	–	–	–
2015	9.96	8.66	10.28	6.41	6.52	6.45	2.61	–	–	–	–	–	–	–	–
2016	6.73	6.54	6.69	4.50	4.65	4.53	2.81	–	–	–	–	–	–	–	–
2017	7.87	7.33	7.84	5.66	5.78	5.71	2.96	–	–	–	–	–	–	–	–
2018	9.78	9.43	9.96	7.84	7.97	7.88	3.12	–	–	–	–	–	–	–	–
2019	9.70	9.15	9.58	4.39	4.46	4.46	2.51	–	–	–	–	–	–	–	–
2020	7.65	6.73	7.41	3.07	3.17	3.13	1.99	–	–	–	–	–	–	–	–
2021	9.93	10.66	10.50	15.57	15.45	15.67	3.84	–	–	–	–	–	–	–	–
2022	16.98	15.59	20.00	30.96	24.55	37.09	6.38	2.25	–	4.67	7.78	1174.26	1241.78	1042.60	999.74
2023	13.22	12.11	14.82	12.69	12.30	12.87	2.53	1.52	3.92	2.92	3.90	506.97	542.17	432.53	501.43

¹ Source: EDMC Energy Trend, bp analysis to 2004. From 2005, S&P Global Commodity Insights, ©2024 by S&P Global Inc.

² Source: S&P Global Commodity Insights, ©2024 by S&P Global Inc.

³ Source: ICIS Heren Energy Ltd to 2004. From 2005, S&P Global Commodity Insights, ©2024 by S&P Global Inc.

⁴ Source: US Energy Information Administration (EIA) to 2004. From 2005, S&P Global Commodity Insights, ©2024 by S&P Global Inc.

⁵ S&P Global Commodity Insights, ©2024 by S&P Global Inc, carbon neutral hydrogen ex-works \$/kg.

⁶ S&P Global Commodity Insights, ©2024 by S&P Global Inc, CFR \$/mt.

⁷ S&P Global Commodity Insights, ©2024 by S&P Global Inc, FOB \$/mt.

Note: cfr = cost+freight (average prices), fob = free on board (average prices).


Hydrogen

Production capacity thousand tonnes	2013–2023											Growth rate per annum			Share
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2023	2013–23	2023	
North America															
Blue	1217.9	1217.9	1546.4	1546.4	1546.4	1546.4	1546.4	2090.1	2090.1	2090.1	2091.6	0.1%	5.6%	43.3%	
Green	–	3.9	3.9	3.9	3.9	4.2	4.2	4.5	7.3	18.7	19.4	3.8%	–	0.4%	
Total North America	1217.9	1221.8	1550.3	1550.3	1550.3	1550.5	1550.6	2094.6	2097.3	2108.8	2111.0	0.1%	5.7%	43.7%	
S. & Cent. America															
Blue	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
Green	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	1.1	309.3%	30.7%	†	
Total S. & Cent. America	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	1.1	309.3%	30.7%	†	
Europe															
Blue	–	–	43.9	43.9	43.9	43.9	43.9	43.9	43.9	43.9	44.1	0.6%	–	0.9%	
Green	1.9	2.1	2.1	2.2	14.9	15.6	16.2	18.8	21.2	27.3	31.6	16.1%	32.6%	0.7%	
Total Europe	1.9	2.1	46.0	46.0	58.8	59.5	60.1	62.6	65.0	71.1	75.8	6.5%	44.7%	1.6%	
CIS															
Blue	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
Green	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
Total CIS	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
Middle East															
Blue	291.4	291.4	428.2	428.2	428.2	428.2	428.2	428.2	428.2	621.9	621.9	–	7.9%	12.9%	
Green	–	–	–	–	–	–	–	–	0.1	0.1	0.1	–	–	†	
Total Middle East	291.4	291.4	428.2	428.2	428.2	428.2	428.2	428.2	428.3	622.0	622.0	–	7.9%	12.9%	
Africa															
Blue	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
Green	–	–	–	–	–	–	–	–	–	1.7	1.7	–	–	†	
Total Africa	–	–	–	–	–	–	–	–	–	1.7	1.7	–	–	†	
Asia Pacific															
Blue	1859.3	1859.3	1859.3	1934.3	1934.3	1934.3	1934.3	1859.3	1859.3	1929.3	1929.7	†	0.4%	39.9%	
Green	0.3	0.4	0.4	0.6	0.6	0.9	1.4	3.3	8.6	40.1	93.6	133.3%	80.3%	1.9%	
Total Asia Pacific	1859.6	1859.8	1859.8	1934.9	1934.9	1935.2	1935.7	1862.6	1867.9	1969.5	2023.3	2.7%	0.8%	41.8%	
World															
Blue	3368.6	3368.6	3877.8	3952.8	3952.8	3952.8	3952.8	4421.6	4421.6	4685.2	4687.3	†	3.4%	96.9%	
Green	2.2	6.5	6.5	6.7	19.5	20.7	21.9	26.6	37.1	88.2	147.6	67.4%	52.1%	3.1%	
Total World	3370.8	3375.1	3884.3	3959.5	3972.3	3973.5	3974.7	4448.1	4458.7	4773.4	4834.9	1.3%	3.7%	100.0%	
OECD															
Blue	1217.9	1217.9	1590.2	1665.2	1665.2	1665.2	1665.2	2134.0	2134.0	2134.0	2136.1	0.1%	5.8%	44.2%	
Green	1.9	6.0	6.0	6.1	18.8	19.8	20.5	23.9	29.3	47.9	53.9	12.4%	39.8%	1.1%	
Total OECD	1219.8	1223.9	1596.2	1671.3	1684.1	1685.0	1685.7	2157.9	2163.3	2181.9	2189.9	0.4%	6.0%	45.3%	
Non-OECD															
Blue	2150.7	2150.7	2287.6	2287.6	2287.6	2287.6	2287.6	2287.6	2287.6	2551.2	2551.2	0.0%	1.7%	52.8%	
Green	0.3	0.5	0.5	0.6	0.6	0.9	1.4	2.7	7.8	40.3	93.8	132.8%	75.6%	1.9%	
Total Non-OECD	2151.1	2151.2	2288.1	2288.2	2288.2	2288.5	2289.0	2290.2	2295.4	2591.5	2645.0	2.1%	2.1%	54.7%	

† Less than 0.05%.

Source: Rystad Energy. For further information please contact billy.snaith@rystadenergy.com

Billion cubic metres												Growth rate per annum		Share
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2023	2013–23	2023
US														
Pipeline imports	75.9	71.8	71.6	79.5	80.5	76.7	73.3	68.2	75.9	82.1	79.0	-3.8%	0.4%	8.4%
LNG imports	2.7	1.7	2.5	2.4	2.2	2.1	1.5	1.3	0.6	0.7	0.5	-33.4%	-16.1%	†
Total imports	78.6	73.5	74.1	82.0	82.7	78.8	74.7	69.5	76.5	82.8	79.5	-4.0%	0.1%	8.5%
Pipeline exports	42.5	40.4	47.2	58.7	65.7	67.8	77.4	78.9	84.3	82.8	89.1	7.6%	7.7%	9.5%
LNG exports*	0.2	0.4	0.7	4.0	17.1	28.6	47.4	61.3	94.5	104.5	114.4	9.4%	93.8%	12.2%
Total exports	42.7	40.8	47.9	62.7	82.8	96.3	124.8	140.2	178.8	187.3	203.4	8.6%	16.9%	21.7%
Other North America														
Pipeline imports	42.5	40.4	47.2	58.7	65.7	67.8	77.4	78.9	84.3	82.8	89.1	7.6%	7.7%	9.5%
LNG imports	8.8	9.8	7.4	5.9	7.0	7.5	7.1	3.4	1.6	0.9	1.2	30.6%	-18.4%	0.1%
Total imports	51.3	50.2	54.7	64.5	72.7	75.3	84.5	82.2	85.9	83.7	90.2	7.8%	5.8%	9.6%
Pipeline exports	75.9	71.8	71.6	79.5	80.5	76.7	73.3	68.2	75.9	82.1	79.0	-3.8%	0.4%	8.4%
LNG exports*	-	†	†	†	†	0.1	†	†	†	†	0.1	22.3%	-	†
Total exports	75.9	71.9	71.6	79.6	80.6	76.7	73.3	68.2	75.9	82.1	79.1	-3.7%	0.4%	8.4%
Brazil														
Pipeline imports	11.0	11.4	11.2	9.8	8.4	7.6	6.4	6.2	7.1	6.1	5.4	-11.8%	-6.9%	0.6%
LNG imports	5.2	7.1	6.8	2.6	1.7	2.9	3.2	3.3	10.1	2.3	1.3	-42.5%	-13.0%	0.1%
Total imports	16.3	18.5	18.0	12.4	10.1	10.5	9.7	9.5	17.2	8.4	6.7	-20.1%	-8.5%	0.7%
LNG exports*	0.1	0.2	†	0.6	0.2	0.1	-	-	0.1	-	0.3	-	-15.5%	†
Total exports	0.1	0.2	†	0.6	0.2	0.1	-	-	0.1	-	0.3	-	-15.5%	†
Other S&C America														
LNG imports	12.9	12.5	12.1	12.6	11.7	11.6	9.9	10.5	14.2	11.9	14.5	22.0%	1.2%	1.5%
Total imports	12.9	12.5	12.1	12.6	11.7	11.6	9.9	10.5	14.2	11.9	14.5	22.0%	1.2%	1.5%
Pipeline exports	11.0	11.4	11.2	9.8	8.4	7.6	6.4	6.2	7.1	6.1	5.4	-11.8%	-6.9%	0.6%
LNG exports*	24.1	23.3	21.4	19.9	19.1	21.4	22.5	19.8	13.2	16.4	16.6	1.0%	-3.7%	1.8%
Total exports	35.1	34.7	32.6	29.7	27.5	29.0	28.9	26.0	20.3	22.6	22.0	-2.5%	-4.6%	2.3%
Europe														
Pipeline imports	234.1	209.4	215.0	230.6	247.2	247.4	236.9	211.0	232.8	151.4	111.6	-26.3%	-7.1%	11.9%
LNG imports	51.8	52.1	56.0	56.4	64.8	71.2	119.4	116.2	107.5	172.1	169.1	-1.8%	12.6%	18.0%
Total imports	285.9	261.5	271.0	287.0	312.0	318.6	356.3	327.2	340.3	323.6	280.7	-13.2%	-0.2%	30.0%
LNG exports*	9.0	13.0	11.0	10.6	7.9	11.7	8.8	7.0	4.2	7.9	9.2	15.9%	0.2%	1.0%
Total exports	9.0	13.0	11.0	10.6	7.9	11.7	8.8	7.0	4.2	8.1	10.2	25.9%	1.3%	1.1%
Russia														
Pipeline imports	32.9	33.1	26.5	24.3	28.6	24.6	30.3	10.7	14.8	7.7	5.7	-26.2%	-16.1%	0.6%
Total imports	32.9	33.1	26.5	24.3	28.6	24.6	30.3	10.7	14.8	7.7	5.7	-26.2%	-16.1%	0.6%
Pipeline exports	210.7	189.6	194.2	202.0	219.7	222.4	220.7	197.4	201.3	125.0	95.4	-23.6%	-7.6%	10.2%
LNG exports	14.5	13.6	14.6	14.6	15.4	24.9	39.1	41.8	39.5	43.4	42.7	-1.8%	11.4%	4.6%
Total exports	225.2	203.2	208.8	216.7	235.2	247.3	259.8	239.2	240.9	168.4	138.1	-18.0%	-4.8%	14.7%
Other CIS														
Pipeline imports	24.0	26.3	25.4	26.3	28.8	30.4	29.8	26.7	26.7	24.7	24.9	0.9%	0.4%	2.7%
Total imports	24.0	26.3	25.4	26.3	28.8	30.4	29.8	26.7	26.7	24.7	24.9	0.9%	0.4%	2.7%
Pipeline exports	69.5	75.4	72.6	72.8	78.0	80.8	85.2	61.5	75.4	69.9	65.7	-6.0%	-0.6%	7.0%
Total exports	69.5	75.4	72.6	72.8	78.0	80.8	85.2	61.5	75.4	69.9	65.7	-6.0%	-0.6%	7.0%
Middle East														
Pipeline imports	6.3	7.6	9.6	7.3	4.6	2.1	1.6	0.6	0.8	1.0	0.6	-41.5%	-21.4%	0.1%
LNG imports	4.3	5.3	9.8	13.7	13.0	9.4	9.4	9.1	9.6	9.5	10.1	7.1%	8.9%	1.1%
Total imports	10.6	12.9	19.4	21.1	17.7	11.5	11.0	9.7	10.4	10.4	10.7	2.6%	0.1%	1.1%
Pipeline exports	8.9	9.3	8.1	8.0	11.0	8.8	8.0	7.7	13.9	15.5	13.9	-10.2%	4.6%	1.5%
LNG exports	135.2	132.2	125.4	126.0	122.3	125.9	127.5	127.3	129.6	133.3	131.1	-1.7%	-0.3%	14.0%
Total exports	144.2	141.5	133.5	133.9	133.2	134.8	135.6	135.0	143.5	148.9	145.0	-2.6%	0.1%	15.5%
Africa														
Pipeline imports	-	-	-	-	-	-	-	2.1	4.0	6.2	9.2	47.8%	-	1.0%
LNG imports	-	-	3.9	10.7	8.3	3.2	-	-	-	-	†	-	-	†
Total imports	-	-	3.9	10.7	8.3	3.2	-	2.1	4.0	6.2	9.2	48.0%	-	1.0%
Pipeline exports	34.4	29.4	30.2	38.6	37.2	37.5	27.9	25.6	37.8	34.8	33.5	-3.6%	-0.3%	3.6%
LNG exports	47.0	49.5	48.5	46.2	55.7	53.5	61.6	56.0	58.1	54.1	55.5	2.6%	1.7%	5.9%
Total exports	81.4	78.9	78.7	84.8	92.9	91.0	89.5	81.6	95.9	88.9	89.0	0.1%	0.9%	9.5%
China														
Pipeline imports	26.4	30.3	32.4	36.8	39.9	47.9	47.7	45.1	53.2	58.4	61.3	5.0%	8.8%	6.5%
LNG imports	25.1	27.3	27.0	36.8	52.9	73.5	84.7	94.0	110.1	87.0	97.8	12.4%	14.6%	10.4%
Total imports	51.5	57.5	59.4	73.5	92.8	121.3	132.5	139.1	163.4	145.4	159.2	9.4%	12.0%	17.0%
LNG exports*	-	-	-	-	-	-	0.1	-	-	0.8	1.3	68.6%	-	0.1%
Total exports	-	-	-	-	-	-	0.1	-	-	0.8	1.3	68.6%	-	0.1%
India														
LNG imports	18.0	19.1	20.0	24.3	26.0	30.5	32.4	36.6	33.8	28.4	31.0	9.1%	5.6%	3.3%
Total imports	18.0	19.1	20.0	24.3	26.0	30.5	32.4	36.6	33.8	28.4	31.0	9.1%	5.6%	3.3%
LNG exports*	-	-	0.4	0.1	0.1	-	0.1	-	-	-	-	-	-	-
Total exports	-	-	0.4	0.1	0.1	-	0.1	-	-	-	-	-	-	-
OECD Asia														
Pipeline imports	5.9	5.2	5.8	5.5	4.9	4.9	4.3	5.3	4.8	2.3	0.9	-62.0%	-17.3%	0.1%
LNG imports	175.7	173.6	161.6	159.9	165.4	173.2	161.1	157.2	165.3	161.8	151.0	-6.7%	-1.5%	16.1%
Total imports	181.6	178.8	167.4	165.3	170.2	178.1	165.5	162.5	170.1	164.1	151.8	-7.5%	-1.8%	16.2%
LNG exports*	30.6	32.2	40.1	60.5	76.8	91.9	104.7	106.1	108.7	107.5	107.4	-0.1%	13.4%	11.5%
Total exports	30.6	32.2	40.1	60.5	76.8	91.9	104.7	106.1	108.7	107.5	107.4	-0.1%	13.4%	11.5%
Other Asia														
LNG imports	22.4	25.2	29.8	33.0	40.2	45.5	55.3	58.4	63.0	64.7	72.7	12.5%	12.5%	7.8%
Total imports	22.4	25.2	29.8	33.0	40.2	45.5	55.3	58.4	63.0	64.7	72.7	12.5%	12.5%	7.8%
Pipeline exports	6.1	8.1	9.5	9.2	8.1	7.8	8.7	9.2	8.7	6.3	4.5	-27.6%	-2.8%	0.5%
LNG exports*	66.2	69.3	75.0	75.8	78.5	72.4	72.4	70.7	68.0	71.3	70.3	-1.4%	0.6%	7.5%
Total exports	72.3	77.5	84.5	85.0	86.6	80.2	81.1	79.9	76.7	77.5	74.8	-3.5%	0.4%	8.0%
World														
Inter-regional pipeline trade	459.1	435.5	444.7	478.6	508.7	509.3	507.7	454.7	504.5	422.8	387.7	-8.3%	-1.7%	41.4%
LNG trade	326.8	333.6	337.1	358.3	393.3	430.4	484.2	490.0	515.9	539.3	549.2	1.8%	5.3%	58.6%
Total trade	785.9	769.1	781.8	836.9	902.0	939.8	991.8	944.6	1020.4	962.0	936.9	-2.6%	1.8%	100.0%

* LNG exports include re-exports.
 † Less than 0.05%.
 Note: As far as possible, the data above represents standard cubic metres (measured at 15°C and 1013 mbar) and has been standardised using a gross calorific value (GCV) of 40 MJ/m³.

Natural gas LNG imports

Billion cubic metres												Growth rate per annum		Share
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2023	2013-23	2023
Canada	1.0	0.5	0.6	0.3	0.4	0.6	0.5	0.8	0.7	0.3	0.2	-19.4%	-13.6%	†
Mexico	7.8	9.3	6.8	5.6	6.6	6.9	6.6	2.5	0.9	0.6	0.9	54.9%	-19.2%	0.2%
US	2.7	1.7	2.5	2.4	2.2	2.1	1.5	1.3	0.6	0.7	0.5	-33.4%	-16.1%	0.1%
Total North America	11.4	11.5	10.0	8.3	9.2	9.6	8.6	4.6	2.2	1.6	1.6	2.3%	-17.8%	0.3%
Argentina	6.3	6.2	5.6	5.1	4.6	3.6	1.8	1.8	3.7	2.4	2.7	14.5%	-8.1%	0.5%
Brazil	5.2	7.1	6.8	2.6	1.7	2.9	3.2	3.3	10.1	2.3	1.3	-42.5%	-13.0%	0.2%
Chile	3.8	3.5	3.7	4.5	4.4	4.3	3.3	3.7	4.5	3.3	3.6	6.8%	-0.6%	0.7%
Other S. & Cent. America	2.8	2.8	2.8	3.0	2.8	3.7	4.8	5.1	6.0	6.2	8.2	33.2%	11.4%	1.5%
Total S. & Cent. America	18.1	19.6	18.9	15.2	13.5	14.5	13.1	13.9	24.3	14.2	15.8	11.7%	-1.4%	2.9%
Belgium	3.1	2.9	3.6	2.4	1.3	3.3	7.3	6.4	5.4	12.5	11.8	-5.5%	14.2%	2.1%
France	8.3	6.9	6.4	9.1	10.9	12.7	23.2	19.1	17.6	35.5	30.7	-13.5%	14.0%	5.6%
Italy	5.8	4.5	5.9	5.9	8.3	8.2	13.5	12.5	9.5	14.7	16.3	11.4%	10.9%	3.0%
Spain	15.7	16.2	13.7	13.8	16.6	15.0	22.0	20.9	20.4	28.8	24.9	-13.5%	4.8%	4.5%
Türkiye	5.9	7.1	7.5	7.6	10.9	11.4	12.9	14.8	13.9	15.1	14.8	-2.3%	9.6%	2.7%
United Kingdom	9.2	11.2	13.7	10.7	6.6	7.2	17.1	18.6	15.0	26.1	19.4	-25.5%	7.7%	3.5%
Other European Union	3.7	3.3	5.2	6.9	10.2	13.4	23.5	23.8	25.5	39.4	51.0	29.5%	29.9%	9.3%
Rest of Europe	-	†	-	†	0.1	†	†	0.1	0.1	0.1	0.1	7.1%	-	†
Total Europe	51.8	52.1	56.0	56.4	64.8	71.2	119.4	116.2	107.5	172.1	169.1	-1.8%	12.6%	30.8%
Egypt	-	-	3.9	10.7	8.3	3.2	-	-	-	-	†	-	-	†
Kuwait	2.3	3.6	4.3	4.7	4.8	4.3	5.1	5.7	7.7	8.5	8.9	5.4%	14.6%	1.6%
United Arab Emirates	1.6	1.6	2.9	4.2	3.0	1.0	1.6	1.5	1.7	0.9	1.1	15.4%	-3.9%	0.2%
Other Middle East & Africa	0.5	0.1	2.7	4.8	5.3	4.0	2.7	1.9	0.2	0.1	0.2	92.4%	-9.5%	†
Total Middle East & Africa	4.3	5.3	13.7	24.5	21.4	12.5	9.4	9.1	9.6	9.5	10.2	7.2%	8.9%	1.9%
China	25.1	27.3	27.0	36.8	52.9	73.5	84.7	94.0	110.1	87.0	97.8	12.4%	14.6%	17.8%
India	18.0	19.1	20.0	24.3	26.0	30.5	32.4	36.6	33.8	28.4	31.0	9.1%	5.6%	5.6%
Japan	120.4	121.8	115.9	113.6	113.9	113.0	105.5	101.7	101.2	98.0	90.3	-7.8%	-2.8%	16.4%
Malaysia	2.0	2.2	2.2	1.5	2.0	1.8	3.3	3.6	2.3	3.9	3.2	-16.7%	4.9%	0.6%
Pakistan	-	-	1.5	4.0	6.1	9.4	11.8	10.6	12.2	9.5	10.1	5.6%	-	1.8%
Singapore	1.3	2.6	3.0	3.2	4.1	4.5	5.0	5.7	5.0	5.3	6.8	29.8%	18.3%	1.2%
South Korea	55.3	51.8	45.8	46.3	51.4	60.2	55.6	55.4	64.1	63.8	60.6	-5.0%	0.9%	11.0%
Taiwan	17.2	18.6	19.6	20.4	22.7	22.9	22.8	24.3	26.7	27.5	27.4	-0.5%	4.8%	5.0%
Thailand	2.0	1.9	3.6	3.9	5.2	6.0	6.7	7.5	9.2	11.5	16.1	39.4%	23.3%	2.9%
Other Asia Pacific	-	-	-	-	-	0.8	5.7	6.6	7.6	6.9	9.2	31.9%	-	1.7%
Total Asia Pacific	241.2	245.2	238.5	253.9	284.5	322.6	333.6	346.2	372.3	341.9	352.5	3.1%	3.9%	64.2%
Total World	326.8	333.6	337.1	358.3	393.3	430.4	484.2	490.0	515.9	539.3	549.2	1.8%	5.3%	100.0%

Source: Includes GLGNL, S&P Global Commodity Insights.

Gross LNG trade.

† Less than 0.05%.

Natural gas LNG exports

Billion cubic metres												Growth rate per annum		Share
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2023	2013-23	2023
US	0.2	0.4	0.7	4.0	17.1	28.6	47.4	61.3	94.5	104.5	114.4	9.4%	93.8%	20.8%
Peru	5.7	5.7	5.0	5.5	5.5	4.8	5.3	5.0	3.5	5.1	5.3	3.9%	-0.7%	1.0%
Trinidad & Tobago	18.4	17.6	16.4	14.3	13.5	16.6	17.1	14.3	9.1	10.5	10.5	-0.2%	-5.5%	1.9%
Other Americas*	0.1	0.2	†	0.6	0.3	0.1	0.1	0.5	0.7	0.8	1.1	36.3%	31.6%	0.2%
Total Americas	24.3	23.9	22.1	24.5	36.5	50.1	69.9	81.2	107.8	121.0	131.4	8.6%	18.4%	23.9%
Russia	14.5	13.6	14.6	14.6	15.4	24.9	39.1	41.8	39.5	43.4	42.7	-1.8%	11.4%	7.8%
Norway	3.8	4.6	5.6	6.1	5.4	6.8	6.9	4.3	0.2	3.7	5.5	46.8%	3.6%	1.0%
Other Europe*	5.2	8.4	5.4	4.5	2.5	5.0	1.9	2.7	4.1	4.2	3.7	-11.5%	-3.3%	0.7%
Total Europe & CIS	23.5	26.6	25.6	25.3	23.4	36.7	47.9	48.8	43.7	51.3	51.8	1.0%	8.2%	9.4%
Oman	11.5	10.6	10.2	11.0	11.4	13.6	14.1	13.2	14.1	15.3	15.3	-0.1%	2.9%	2.8%
Qatar	105.8	103.6	105.6	107.3	103.6	104.9	105.8	106.5	106.8	110.5	108.4	-2.0%	0.2%	19.7%
United Arab Emirates	7.9	8.6	7.6	7.7	7.3	7.4	7.7	7.6	8.8	7.5	7.7	2.9%	-0.3%	1.4%
Yemen	9.9	9.4	1.9	-	-	-	-	-	-	-	-	-	-100.0%	†
Total Middle East	135.2	132.2	125.4	126.0	122.3	125.9	127.5	127.3	129.6	133.3	131.4	-1.5%	-0.3%	23.9%
Algeria	15.0	17.4	16.6	15.5	16.4	13.1	16.8	14.6	15.6	14.4	19.0	31.9%	2.4%	3.5%
Angola	0.4	0.4	-	0.9	5.0	5.2	5.8	6.1	4.7	4.2	4.9	17.9%	28.2%	0.9%
Egypt	3.9	0.4	-	0.8	1.2	2.0	4.7	1.8	9.1	9.2	4.9	-46.8%	2.3%	0.9%
Nigeria	22.5	26.1	26.9	24.6	28.3	27.8	28.8	28.4	23.4	20.0	17.5	-12.1%	-2.4%	3.2%
Other Africa	5.2	5.0	5.0	4.4	4.8	5.4	5.6	5.1	5.4	6.3	9.2	45.8%	5.8%	1.7%
Total Africa	47.0	49.5	48.5	46.2	55.7	53.5	61.6	56.0	58.1	54.1	55.6	2.8%	1.7%	10.1%
Australia	30.5	32.0	39.9	60.4	76.6	91.8	104.7	106.0	108.5	107.4	107.4	†	13.4%	19.6%
Brunei	9.5	8.6	8.7	8.6	9.1	8.5	8.8	8.4	7.5	6.5	6.2	-4.8%	-4.2%	1.1%
Indonesia	23.1	21.7	21.6	22.4	21.7	20.8	16.5	16.8	14.6	15.6	16.1	3.3%	-3.5%	2.9%
Malaysia	33.6	34.0	34.3	33.6	36.1	33.0	35.2	32.5	33.6	37.3	36.3	-2.7%	0.8%	6.6%
Papua New Guinea	-	5.0	10.1	10.9	11.1	9.5	11.6	11.5	11.5	11.4	11.5	1.0%	-	2.1%
Other Asia Pacific*	0.1	0.2	0.8	0.5	0.8	0.6	0.5	1.4	1.0	1.3	1.5	18.3%	32.1%	0.3%
Total Asia Pacific	96.8	101.5	115.5	136.4	155.4	164.3	177.3	176.8	176.7	179.5	179.0	-0.3%	6.3%	32.6%
Total LNG exports	326.8	333.6	337.1	358.3	393.3	430.4	484.2	490.0	515.9	539.3	549.2	1.8%	5.3%	100.0%

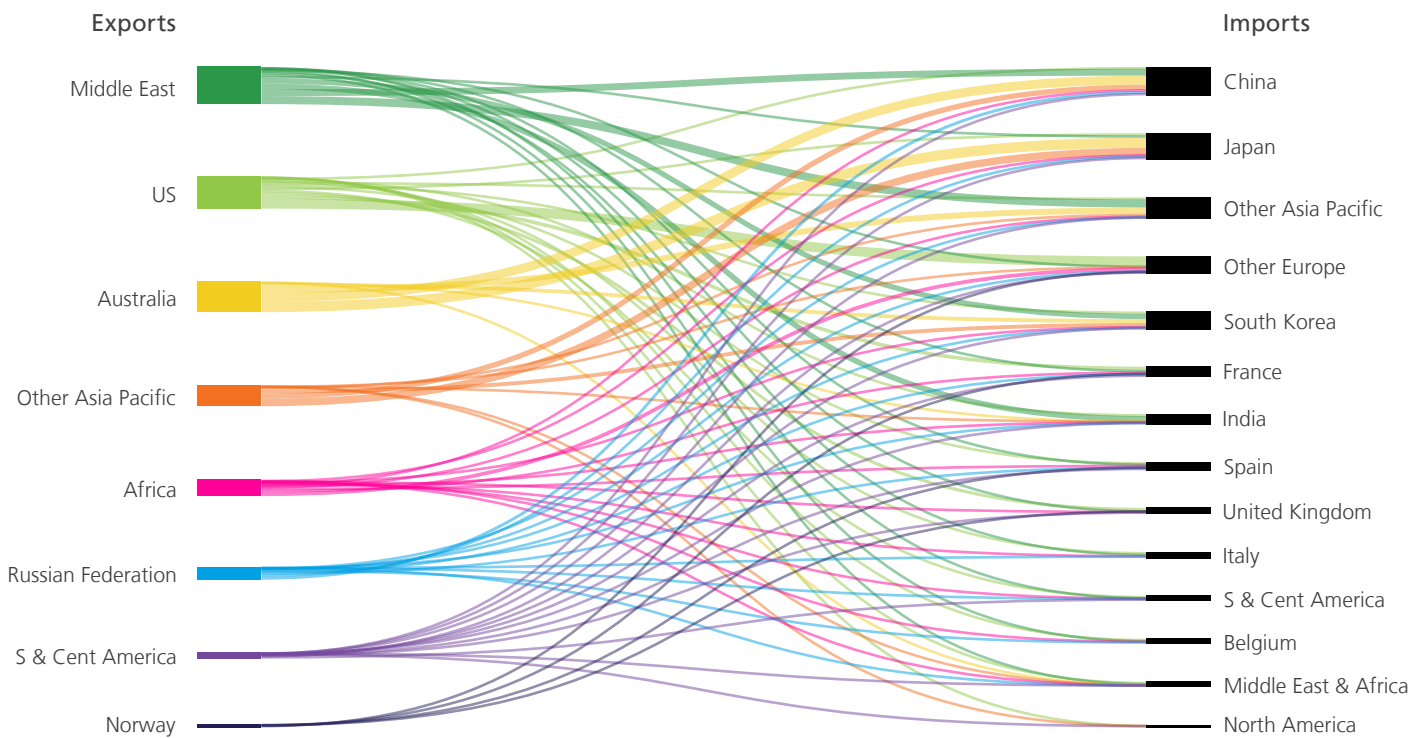
Source: Includes GLGNL, S&P Global Commodity Insights.

Gross LNG trade.

* Largely consists of re-exports.

† Less than 0.05%.

Natural gas Major trade movements 2023 – LNG



Notes: As far as possible, the data above represents standard cubic metres (measured at 15°C and 1013 mbar) and has been standardised using a gross calorific value (GCV) of 40 MJ/m³.

International gas trade has been fluctuating between 900-1,000 bcm since 2017, with an overall fall of 2.7% to 936 bcm in 2023. LNG exports rose 1.8% to 549 bcm. LNG now accounts for nearly 59% of all globally traded gas. The US overtook both Australia and the Middle East to become the world's largest exporter of LNG. Collectively they represented 64% of total LNG exports. China overtook

Japan to become the largest importer of LNG with one-third of its imports coming from Australia. Collectively, the Asia Pacific region accounted for 64% of all LNG imports. Europe increased its imports from the US by 6% whilst its LNG imports from the Russian Federation remained relatively stable at around 19 bcm.

Natural gas Trade movements 2023 as LNG*

Billion cubic metres To	From																			Total imports							
	US	Peru	Trinidad & Tobago	Other Americas*	Norway	Other Europe**	Russian Federation	Oman	Qatar	United Arab Emirates	Yemen	Algeria	Angola	Egypt	Nigeria	Other Africa	Australia	Brunei	Indonesia		Malaysia	Papua New Guinea	Other Asia Pacific*				
Canada	†	0.1	0.1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.2		
Mexico	0.4	0.2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.9	
US	–	–	0.3	0.1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.5	
North America	0.4	0.3	0.5	0.1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1.6	
Argentina	2.1	–	0.2	–	–	†	–	–	0.2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2.7	
Brazil	1.0	–	†	–	–	0.1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1.3	
Chile	0.9	–	2.0	–	–	†	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3.6	
Other S. & Cent. America	3.5	0.2	1.9	0.7	–	0.4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	8.2	
S. & Cent. America	7.5	0.2	4.1	0.7	–	0.5	0.1	–	0.2	–	–	0.2	0.3	0.1	1.5	0.8	†	–	–	–	–	–	–	–	–	15.8	
Belgium	2.6	–	–	–	†	†	3.9	–	4.6	–	–	0.2	0.3	0.1	0.1	0.1	–	–	–	–	–	–	–	–	–	†	11.8
France	13.2	0.4	0.4	–	1.2	0.1	4.8	0.1	2.3	–	–	5.6	0.9	0.2	0.6	0.9	–	–	–	–	–	–	–	–	–	–	30.7
Italy	5.3	–	–	–	–	0.8	0.3	–	6.7	–	–	2.3	–	0.3	0.3	0.4	–	–	–	–	–	–	–	–	–	–	16.3
Spain	7.4	0.5	0.5	0.1	0.3	0.1	6.5	0.3	1.3	–	–	1.8	0.3	0.4	4.8	0.6	†	–	–	–	–	–	–	–	–	–	24.9
Türkiye	3.8	–	0.2	0.2	0.3	0.8	1.4	0.1	–	–	–	6.1	–	1.3	0.5	0.1	–	–	–	–	–	–	–	–	–	–	14.8
United Kingdom	11.6	2.1	0.4	–	0.4	†	–	–	2.8	–	–	0.5	0.8	0.3	0.5	–	–	–	–	–	–	–	–	–	–	–	19.4
Other European Union	32.4	0.1	2.7	†	3.2	0.4	2.5	0.3	3.2	0.1	–	0.7	1.4	0.6	2.5	0.7	–	–	–	–	–	–	–	–	–	–	51.0
Rest of Europe	–	–	–	–	–	0.1	0.1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.1
Europe	76.2	3.1	4.2	0.3	5.5	2.3	19.4	0.8	20.8	0.1	–	17.2	3.7	3.2	9.3	2.7	†	–	0.1	–	–	–	–	–	–	–	169.1
Egypt	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	†
Kuwait	0.9	–	0.2	–	–	–	–	0.1	0.5	5.2	0.1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	8.9
United Arab Emirates	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1.1
Other Middle East & Africa	0.1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.2
Middle East & Africa	1.0	–	0.2	–	–	–	0.1	0.6	6.2	0.1	–	0.1	–	–	1.2	0.3	0.1	–	†	0.2	–	–	–	–	–	–	10.2
China	4.3	0.2	0.5	†	–	0.2	11.0	1.4	22.9	1.0	–	0.5	–	0.4	1.6	1.2	33.0	1.0	5.5	9.7	3.5	–	–	–	–	–	97.8
India	4.4	–	0.4	–	–	0.6	0.6	1.1	15.0	4.5	–	0.5	1.0	0.3	1.0	1.2	0.5	–	–	–	–	–	–	–	–	–	31.0
Japan	7.5	0.3	0.1	–	–	0.1	8.4	3.0	4.0	1.1	–	0.1	–	0.2	0.3	0.4	37.5	3.4	4.1	14.3	5.2	0.3	–	–	–	–	90.3
Malaysia	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2.9	0.3	–	–	–	–	–	–	–	3.2
Pakistan	0.1	–	0.1	–	–	–	–	0.1	8.8	–	–	–	–	–	0.6	–	–	–	–	–	–	–	–	–	–	–	10.1
Singapore	0.6	–	0.1	–	–	†	0.1	–	1.8	–	–	–	–	†	–	–	–	–	–	–	–	–	–	–	–	–	6.8
South Korea	7.1	1.0	†	–	–	0.1	2.3	6.9	11.8	0.6	–	0.2	–	0.4	0.8	0.8	14.3	0.7	4.0	8.3	0.9	0.5	–	–	–	–	60.6
Taiwan	2.7	0.2	–	–	–	–	–	0.5	7.6	0.2	–	–	–	0.1	0.4	0.1	11.0	0.4	0.6	0.9	2.0	–	–	–	–	–	27.4
Thailand	1.6	–	0.3	–	–	–	–	0.8	3.9	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	16.1
Other Asia Pacific	0.9	–	0.1	–	–	–	–	–	5.3	0.1	–	0.3	0.3	0.2	0.3	0.2	0.8	–	–	–	–	–	–	–	–	–	9.2
Asia Pacific	29.3	1.7	1.5	†	–	0.9	23.1	14.0	81.1	7.5	–	1.6	1.3	1.6	5.5	5.5	107.3	6.2	15.7	36.1	11.5	1.2	–	–	–	–	352.5
Total exports	114.4	5.3	10.5	1.1	5.5	3.7	42.7	15.3	108.4	7.7	–	19.0	4.9	4.9	17.5	9.2	107.4	6.2	16.1	36.3	11.5	1.5	–	–	–	549.2	

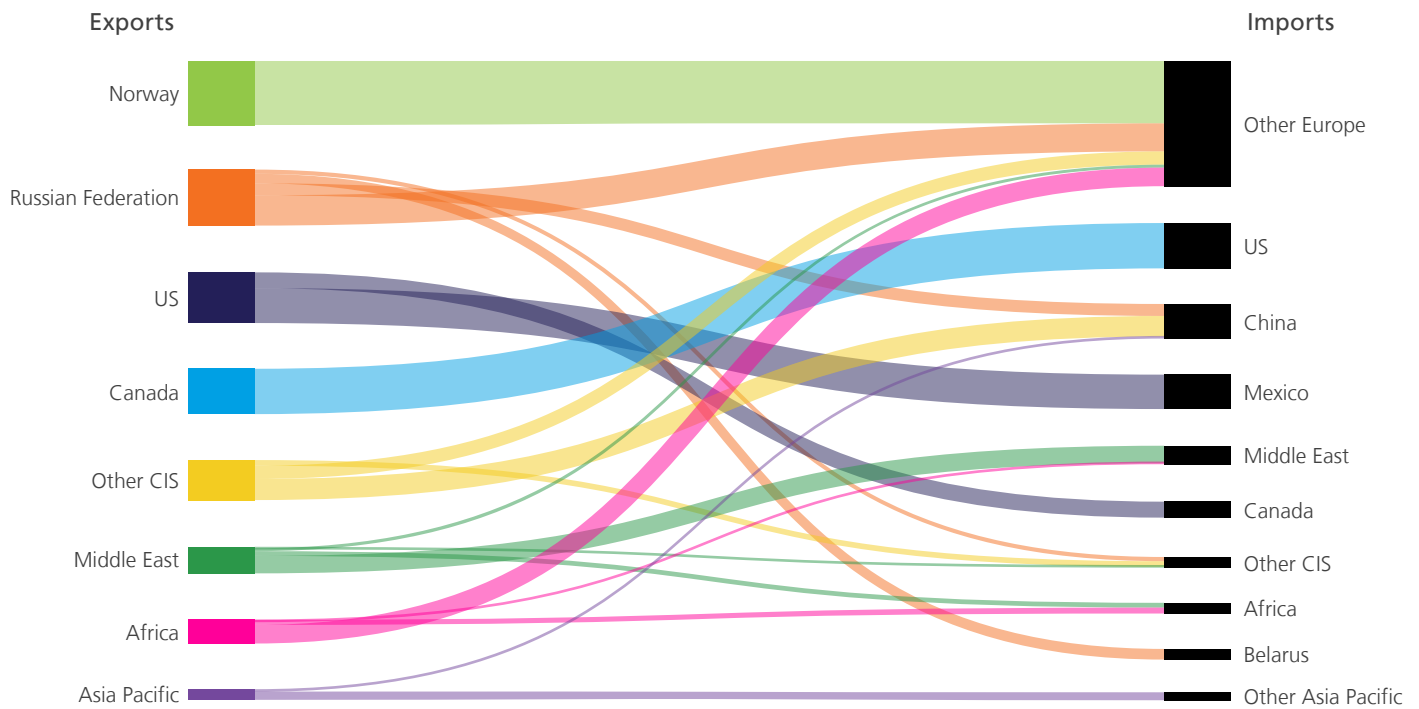
Source: Includes data from GIIGNL, S&P Global Commodity Insights.

* Includes re-exports.

† Less than 0.05.

Note: As far as possible, the data above represents standard cubic metres (measured at 15°C and 1013 mbar) and has been standardised using a gross calorific value (GCV) of 40 MJ/m³.

Natural gas Major trade movements 2023 – pipeline



Notes: As far as possible, the data above represents standard cubic metres (measured at 15°C and 1013 mbar) and has been standardised using a gross calorific value (GCV) of 40 MJ/m³.
Source: Includes data from FGE MENA gas service, IHS.

In 2023, pipeline trade of natural gas continued to decline falling 8% to 388 bcm. The fall in supply was most noticeable in the Russia Federation which saw its exports fall by 24% to 95 bcm. The global balance between LNG and pipeline trade is now almost the complete inverse of the position back in 2017 with pipeline gas now accounting for only 41% of traded gas. Norway remains the largest

supplier of pipeline gas to its European counterparts where imports from the Russian Federation fell by 42% to 50 bcm. Although Russian pipeline exports experienced an overall decline, building on the 62% fall in 2022, its exports to China increased 45% to just over 21 bcm and by 53% to other CIS countries to 7 bcm.

Natural gas Trade movements 2023 by pipeline

Billion cubic metres To	From																				Total Imports				
	Canada	Mexico	US	Bolivia	Other S. & Cent. America	European Union	Norway	Other Europe	Azerbaijan	Kazakhstan	Russian Federation	Turkmenistan	Uzbekistan	Iran	Qatar	Other Middle East	Algeria	Libya	Other Africa	Indonesia		Myanmar	Other Asia Pacific		
Canada	-	-	28.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28.0	
Mexico	-	-	61.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	61.1
US	79.0	†	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	79.0
North America	79.0	†	89.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	168.1
Argentina	-	-	-	2.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.2
Brazil	-	-	-	5.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.4
Other S. & Cent. America	-	-	-	-	1.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.6
S. & Cent. America	-	-	-	7.6	1.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9.2
European Union	-	-	-	-	-	18.0	85.1	95.6	11.7	-	25.7	-	-	-	-	-	-	30.6	2.4	-	-	-	-	-	269.1
Rest of Europe	-	-	-	-	-	0.2	25.5	4.8	11.9	-	24.1	-	-	-	-	-	-	-	-	-	-	-	-	-	71.7
Europe	-	-	-	-	-	18.2	110.7	100.3	23.6	-	49.8	-	-	-	-	-	-	30.6	2.4	-	-	-	-	-	340.8
Belarus	-	-	-	-	-	-	-	-	-	-	16.8	-	-	-	-	-	-	-	-	-	-	-	-	-	16.8
Kazakhstan	-	-	-	-	-	-	-	-	-	0.2	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6
Russian Federation	-	-	-	-	-	-	-	-	0.3	0.7	4.7	-	-	-	-	-	-	-	-	-	-	-	-	-	5.7
Other CIS	-	-	-	-	-	-	-	0.2	-	7.3	3.9	†	0.4	-	-	-	-	-	-	-	-	-	-	-	11.9
CIS	-	-	-	-	-	-	-	0.2	0.3	0.7	24.3	9.0	†	0.4	-	-	-	-	-	-	-	-	-	-	34.9
United Arab Emirates	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18.0	-	-	-	-	-	-	-	-	-	18.0
Other Middle East	-	-	-	-	-	-	-	-	†	-	-	-	-	8.8	1.5	2.8	-	-	0.6	-	-	-	-	-	13.6
Middle East	-	-	-	-	-	-	-	-	†	-	-	-	-	8.8	19.5	2.8	-	-	0.6	-	-	-	-	-	31.6
South Africa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.1	-	-	-	-	4.1
Other Africa	-	-	-	-	-	-	-	0.9	-	-	-	-	-	-	-	8.4	3.9	-	1.0	-	-	-	-	-	14.2
Africa	-	-	-	-	-	-	-	0.9	-	-	-	-	-	-	-	8.4	3.9	-	5.1	-	-	-	-	-	18.2
Australia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.9	0.9	
China	-	-	-	-	-	-	-	-	-	4.6	21.3	30.5	1.2	-	-	-	-	-	-	-	-	-	3.7	-	61.3
Malaysia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4	-	-	-	-	0.4
Singapore	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.1	-	-	2.1	-	6.2
Thailand	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.4	-	-	-	5.4
Asia Pacific	-	-	-	-	-	-	-	-	-	4.6	21.3	30.5	1.2	-	-	-	-	-	-	4.5	9.0	3.0	3.0	3.0	74.2
Total exports	79.0	†	89.1	7.6	1.6	18.2	110.7	101.4	23.9	5.3	95.4	39.5	1.2	14.3	19.5	11.1	34.5	2.4	5.7	4.5	9.0	3.0	3.0	3.0	677.0

Source: Includes data from FGE MENA gas service, S&P Global Commodity Insights.

Note: As far as possible, the data above represents standard cubic metres (measured at 15°C and 1013 mbar) and has been standardized using a gross calorific value (GCV) of 40 MJ/m³.

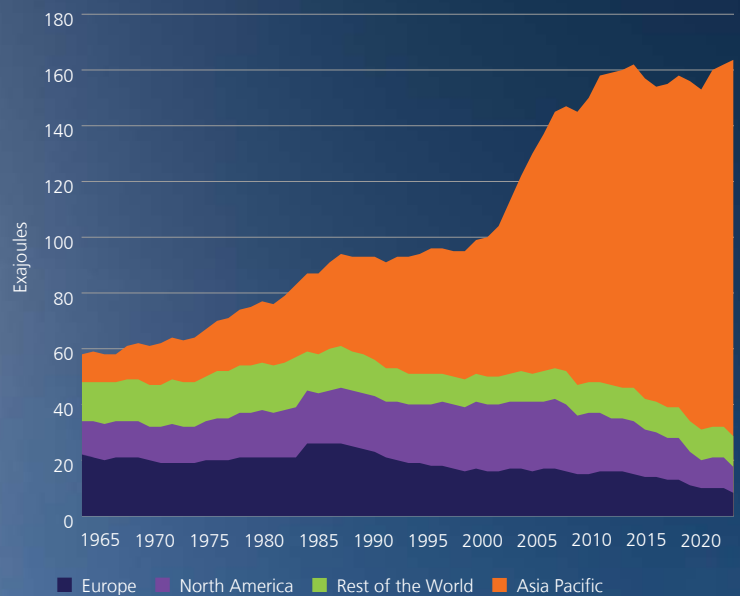
† Less than 0.05.

Coal

In 2023, global coal production reached its highest ever level (179 EJ), beating the previous high set the year before. The Asia Pacific region accounted for nearly 80% of global output with activity concentrated in just four countries, Australia, China, India, and Indonesia (jointly responsible for 97% of the region's output). China alone was responsible for just over half of total global production. North America, Southern & Central America, Europe and the Commonwealth of Independent States all saw their production fall relative to 2022 levels.

Global coal consumption breached 164 EJ for the first time ever. An increase of 1.6% over 2022 was seven times higher than the previous ten-year average growth rate. Whilst China is by far the largest consumer of coal (56% of the world's total), in 2023 India exceeded the combined consumption of Europe and North America for the first time ever. Coal consumption in both Europe and North America each fell below 10 EJ, their lowest levels since 1965.

Global coal consumption



Coal consumption in India exceeded the combined consumption of Europe and North America for the first time ever

Million tonnes	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Growth rate per annum		Share
												2023	2013–23	2023
Canada	68.4	68.3	62.4	62.4	60.6	55.0	53.2	46.1	47.6	46.7	48.6	4.0%	-3.3%	0.5%
Mexico	14.6	14.9	12.3	11.4	12.9	11.9	9.8	7.7	5.5	5.5	5.6	0.1%	-9.2%	0.1%
US	893.4	907.2	813.7	660.8	702.7	686.0	640.8	485.7	523.8	539.0	526.5	-2.3%	-5.1%	5.8%
Total North America	976.5	990.4	888.3	734.5	776.2	752.9	703.7	539.6	577.0	591.3	580.6	-1.8%	-5.0%	6.4%
Brazil	9.5	9.4	8.0	7.5	5.8	6.4	5.8	7.1	8.0	7.6	6.8	-10.1%	-3.2%	0.1%
Colombia	86.1	89.4	86.5	91.2	91.5	86.9	85.9	54.4	59.1	58.0	54.5	-5.9%	-4.4%	0.6%
Venezuela	1.2	0.8	0.8	0.7	0.7	0.7	0.4	0.3	0.2	0.8	0.8	-	-4.1%	†
Other S. & Cent. America	3.2	4.5	3.4	2.8	1.8	1.6	1.1	0.4	0.2	0.3	0.3	11.8%	-21.5%	†
Total S. & Cent. America	99.9	104.0	98.8	102.3	99.9	95.6	93.3	62.2	67.6	66.6	62.5	-6.2%	-4.6%	0.7%
Bulgaria	28.6	31.3	35.9	31.3	34.3	30.6	28.3	22.6	28.4	35.6	21.0	-40.9%	-3.0%	0.2%
Czech Republic	49.1	47.1	46.5	45.5	44.9	43.8	41.0	31.6	31.5	35.1	30.0	-14.7%	-4.8%	0.3%
Germany	190.6	185.8	184.3	175.4	175.1	168.8	131.3	107.4	126.3	130.8	102.3	-21.8%	-6.0%	1.1%
Greece	53.9	50.8	46.2	32.6	37.7	36.5	27.4	14.1	12.4	14.3	10.9	-23.6%	-14.8%	0.1%
Hungary	9.6	9.6	9.3	9.2	8.0	7.9	6.8	6.1	5.0	4.9	4.1	-17.4%	-8.2%	†
Poland	142.9	137.1	135.8	131.0	127.1	122.4	112.4	100.7	107.6	107.8	88.7	-17.7%	-4.6%	1.0%
Romania	24.7	23.6	25.5	23.0	25.8	23.7	21.7	15.0	17.7	18.2	14.8	-18.8%	-5.0%	0.2%
Serbia	40.3	29.8	37.8	38.5	39.8	37.6	38.9	39.7	36.4	35.1	31.9	-9.1%	-2.3%	0.4%
Spain	4.4	3.9	3.1	1.7	3.0	2.4	0.1	0.1	0.1	0.1	0.1	-	-33.7%	†
Türkiye	60.4	65.2	58.4	73.0	74.1	83.9	87.1	74.7	86.5	95.3	66.4	-30.4%	1.0%	0.7%
Ukraine	64.9	45.7	30.4	32.2	24.7	26.8	26.1	24.4	26.2	24.1	23.3	-3.3%	-9.7%	0.3%
United Kingdom	12.8	11.6	8.6	4.2	3.0	2.8	2.6	1.7	1.1	0.7	0.5	-22.3%	-27.6%	†
Other Europe	70.7	67.2	64.5	61.7	65.1	66.3	56.8	50.2	47.6	50.7	46.2	-8.9%	-4.2%	0.5%
Total Europe	752.8	708.8	686.3	659.4	662.6	653.5	580.5	488.3	526.7	552.6	440.1	-20.4%	-5.2%	4.8%
Kazakhstan	119.6	114.0	107.3	103.1	112.3	118.5	115.0	113.4	116.2	117.8	116.4	-1.2%	-0.2%	1.3%
Russian Federation	355.2	357.5	372.5	386.6	411.0	441.3	440.7	399.8	434.1	439.0	432.5	-1.5%	2.0%	4.8%
Uzbekistan	4.1	4.4	3.5	3.9	4.0	4.2	4.0	4.1	5.1	5.4	6.2	15.5%	4.3%	0.1%
Other CIS	4.2	4.1	4.0	4.6	5.7	7.7	7.9	6.2	6.6	8.6	8.4	-2.4%	7.2%	0.1%
Total CIS	483.1	480.0	487.3	498.1	533.0	571.6	567.6	523.5	561.9	570.8	563.4	-1.3%	1.6%	6.2%
Total Middle East	1.5	1.5	1.6	1.8	1.8	2.2	2.0	2.1	2.4	4.9	10.3	110.1%	21.1%	0.1%
South Africa	256.3	261.4	252.2	249.7	252.3	250.0	254.4	248.1	233.7	229.9	228.5	-0.6%	-1.1%	2.5%
Zimbabwe	3.1	5.8	4.3	2.7	2.9	3.3	2.6	2.7	3.2	3.9	5.0	26.6%	4.9%	0.1%
Other Africa	8.3	9.4	9.7	9.2	16.7	20.3	15.1	13.2	17.3	23.3	23.6	1.1%	11.1%	0.3%
Total Africa	267.7	276.6	266.2	261.7	271.9	273.7	272.2	264.0	254.3	257.2	257.1	†	-0.4%	2.8%
Australia	472.8	505.3	503.7	502.1	487.2	502.2	505.6	470.0	460.3	440.1	455.8	3.6%	-0.3%	5.0%
China	3974.3	3873.9	3746.5	3410.6	3523.6	3697.7	3846.3	3901.6	4125.8	4558.6	4710.0	3.3%	1.7%	51.8%
India	608.5	646.2	674.2	689.8	711.7	760.4	753.9	760.2	812.1	910.8	1010.9	11.0%	5.2%	11.1%
Indonesia	474.4	458.1	461.6	456.2	461.2	557.8	616.2	563.7	614.0	687.4	775.2	12.8%	5.1%	8.5%
Japan	1.2	1.3	1.2	1.3	1.4	1.0	0.8	0.8	0.7	0.7	0.6	-8.8%	-6.2%	†
Mongolia	33.3	24.4	24.1	35.1	49.5	54.6	57.1	43.1	32.3	39.3	83.2	111.6%	9.6%	0.9%
New Zealand	4.6	4.0	3.4	2.9	2.9	3.2	3.0	2.8	2.9	2.6	2.6	-1.4%	-5.6%	†
Pakistan	3.0	3.4	3.3	4.1	4.2	4.4	7.1	9.5	10.2	10.0	17.1	71.0%	19.1%	0.2%
South Korea	1.8	1.7	1.8	1.7	1.5	1.2	1.1	1.0	0.9	0.8	0.6	-21.1%	-9.8%	†
Thailand	18.1	18.0	15.2	17.0	16.3	14.9	14.1	13.3	14.2	13.6	12.8	-6.1%	-3.4%	0.1%
Vietnam	41.1	41.1	41.7	38.7	38.4	42.4	46.4	44.6	48.3	49.9	48.2	-3.4%	1.6%	0.5%
Other Asia Pacific	43.7	44.2	47.7	64.2	61.6	58.8	64.9	60.9	57.5	64.0	64.6	0.9%	4.0%	0.7%
Total Asia Pacific	5676.8	5621.7	5524.3	5223.8	5359.5	5698.5	5916.5	5871.5	6179.2	6777.9	7181.6	6.0%	2.4%	79.0%
Total World	8258.3	8183.0	7952.8	7481.6	7704.9	8048.1	8135.7	7751.2	8169.1	8821.3	9095.7	3.1%	1.0%	100.0%
of which: OECD	2111.9	2147.8	2016.5	1842.1	1872.1	1855.2	1738.4	1427.0	1491.7	1504.2	1418.0	-5.7%	-3.9%	15.6%
Non-OECD	6146.5	6035.3	5936.3	5639.5	5832.8	6192.9	6397.3	6324.2	6677.4	7317.1	7677.6	4.9%	2.3%	84.4%
European Union	543.9	527.3	521.3	481.6	492.2	473.4	397.3	318.8	348.9	368.2	291.7	-20.8%	-6.0%	3.2%

* Commercial solid fuels only, i.e. bituminous coal and anthracite (hard coal), and lignite and brown (sub-bituminous) coal, and other commercial solid fuels.

† Includes coal produced for Coal-to-Liquids and Coal-to-Gas transformations.

† Less than 0.05%.

Note: Annual changes and shares of total are calculated using million tonnes figures.

Exajoules	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Growth rate per annum		Share
												2023	2013–23	2023
Canada	1.53	1.51	1.36	1.37	1.33	1.22	1.20	1.15	1.21	1.19	1.24	4.1%	-2.0%	0.7%
Mexico	0.30	0.30	0.29	0.25	0.31	0.28	0.23	0.19	0.14	0.14	0.14	0.1%	-7.5%	0.1%
US	20.05	20.33	17.99	14.70	15.66	15.40	14.29	10.73	11.62	12.07	11.84	-1.9%	-5.1%	6.6%
Total North America	21.87	22.15	19.64	16.33	17.30	16.90	15.72	12.07	12.97	13.40	13.21	-1.4%	-4.9%	7.4%
Brazil	0.15	0.15	0.12	0.11	0.09	0.10	0.09	0.10	0.12	0.11	0.10	-11.1%	-4.4%	0.1%
Colombia	2.48	2.57	2.49	2.62	2.63	2.50	2.47	1.57	1.70	1.67	1.57	-5.9%	-4.4%	0.9%
Venezuela	0.04	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.02	0.02	-	-6.8%	†
Other S. & Cent. America	0.07	0.12	0.10	0.08	0.05	0.05	0.03	0.01	0.01	0.01	0.01	12.3%	-20.0%	†
Total S. & Cent. America	2.74	2.87	2.73	2.84	2.80	2.67	2.61	1.69	1.83	1.80	1.69	-6.1%	-4.7%	0.9%
Bulgaria	0.20	0.21	0.25	0.21	0.24	0.21	0.20	0.16	0.20	0.25	0.15	-40.9%	-3.1%	0.1%
Czech Republic	0.74	0.71	0.71	0.67	0.64	0.62	0.56	0.43	0.44	0.48	0.40	-15.2%	-5.9%	0.2%
Germany	1.89	1.85	1.79	1.66	1.65	1.58	1.19	0.98	1.15	1.19	0.92	-23.2%	-7.0%	0.5%
Greece	0.28	0.27	0.24	0.17	0.19	0.18	0.13	0.07	0.06	0.07	0.05	-23.6%	-15.4%	†
Hungary	0.07	0.07	0.06	0.06	0.05	0.05	0.04	0.04	0.03	0.03	0.03	-17.4%	-8.7%	†
Poland	2.39	2.26	2.22	2.18	2.08	1.98	1.87	1.68	1.76	1.71	1.48	-13.2%	-4.6%	0.8%
Romania	0.19	0.19	0.20	0.18	0.19	0.17	0.16	0.11	0.13	0.12	0.09	-18.8%	-7.0%	0.1%
Serbia	0.32	0.24	0.30	0.30	0.30	0.28	0.29	0.30	0.26	0.25	0.23	-9.1%	-3.4%	0.1%
Spain	0.07	0.07	0.05	0.03	0.05	0.04	^	^	^	^	^	-	-32.7%	†
Türkiye	0.65	0.68	0.54	0.65	0.63	0.69	0.73	0.66	0.75	0.83	0.58	-29.7%	-1.0%	0.3%
Ukraine	1.60	1.09	0.72	0.76	0.57	0.61	0.60	0.53	0.57	0.53	0.51	-3.3%	-10.8%	0.3%
United Kingdom	0.32	0.29	0.21	0.11	0.08	0.08	0.07	0.05	0.03	0.02	0.01	-22.3%	-26.8%	†
Other Europe	0.72	0.64	0.59	0.59	0.60	0.60	0.52	0.46	0.44	0.45	0.42	-8.3%	-5.2%	0.2%
Total Europe	9.45	8.57	7.88	7.58	7.28	7.08	6.36	5.47	5.82	5.92	4.88	-17.7%	-6.4%	2.7%
Kazakhstan	2.15	2.09	1.66	1.75	1.92	1.98	1.88	1.86	1.92	1.95	1.92	-1.2%	-1.1%	1.1%
Russian Federation	7.25	7.39	7.80	8.12	8.62	9.23	9.23	8.42	9.25	9.35	9.21	-1.5%	2.5%	5.1%
Uzbekistan	0.05	0.05	0.04	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.07	15.5%	4.3%	†
Other CIS	0.06	0.06	0.07	0.07	0.09	0.12	0.12	0.11	0.11	0.14	0.13	-3.6%	8.8%	0.1%
Total CIS	9.51	9.60	9.57	10.00	10.68	11.37	11.28	10.43	11.34	11.50	11.34	-1.4%	1.8%	6.3%
Total Middle East	0.03	0.03	0.03	0.04	0.04	0.05	0.04	0.04	0.04	0.06	0.09	37.4%	11.2%	†
South Africa	6.08	6.20	5.96	6.01	5.97	6.01	6.02	5.88	5.53	5.44	5.41	-0.6%	-1.1%	3.0%
Zimbabwe	0.08	0.16	0.12	0.07	0.08	0.09	0.07	0.07	0.09	0.11	0.13	26.6%	4.9%	0.1%
Other Africa	0.21	0.24	0.25	0.24	0.43	0.53	0.39	0.34	0.45	0.60	0.61	1.6%	11.0%	0.3%
Total Africa	6.38	6.59	6.33	6.32	6.49	6.63	6.48	6.29	6.06	6.15	6.15	0.1%	-0.3%	3.4%
Australia	11.97	12.81	12.80	12.83	12.50	13.10	13.18	12.09	11.75	11.24	11.66	3.8%	-0.2%	6.5%
China	79.32	78.05	76.59	70.82	73.17	76.87	79.76	80.51	83.44	91.32	93.10	2.0%	1.6%	51.9%
India	10.71	11.28	11.77	11.89	11.99	12.80	12.60	12.59	13.38	15.05	16.75	11.3%	4.6%	9.3%
Indonesia	10.44	10.15	10.19	9.87	9.69	11.44	12.84	11.78	12.68	13.95	15.73	12.8%	4.2%	8.8%
Japan	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02	-5.0%	-5.8%	†
Mongolia	0.64	0.47	0.46	0.67	0.94	1.04	1.09	0.82	0.62	0.75	1.59	111.6%	9.6%	0.9%
New Zealand	0.12	0.10	0.09	0.07	0.07	0.08	0.07	0.07	0.07	0.07	0.07	-0.3%	-5.9%	†
Pakistan	0.06	0.06	0.06	0.08	0.08	0.08	0.13	0.18	0.19	0.19	0.32	71.0%	19.1%	0.2%
South Korea	0.03	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.01	-21.1%	-9.4%	†
Thailand	0.20	0.19	0.16	0.18	0.17	0.16	0.15	0.14	0.15	0.14	0.13	-6.1%	-3.8%	0.1%
Vietnam	0.96	0.96	0.98	0.91	0.90	0.99	1.09	1.05	1.13	1.17	1.13	-3.4%	1.6%	0.6%
Other Asia Pacific	1.08	1.09	1.13	1.40	1.33	1.22	1.38	1.30	1.21	1.35	1.37	1.1%	2.5%	0.8%
Total Asia Pacific	115.55	115.25	114.27	108.78	110.91	117.83	122.33	120.55	124.66	135.26	141.88	4.9%	2.1%	79.2%
Total World	165.52	165.06	160.45	151.88	155.49	162.52	164.82	156.54	162.73	174.09	179.24	3.0%	0.8%	100.0%
of which: OECD	43.40	44.41	41.32	37.85	38.33	38.21	36.37	29.95	30.95	30.93	30.21	-2.3%	-3.5%	16.9%
Non-OECD	122.12	120.65	119.13	114.03	117.16	124.31	128.45	126.59	131.78	143.16	149.04	4.1%	2.0%	83.1%
European Union	6.22	5.97	5.82	5.47	5.42	5.16	4.42	3.67	3.96	4.04	3.31	-18.2%	-6.1%	1.8%

* Commercial solid fuels only, i.e. bituminous coal and anthracite (hard coal), and lignite and brown (sub-bituminous) coal, and other commercial solid fuels. Includes coal produced for

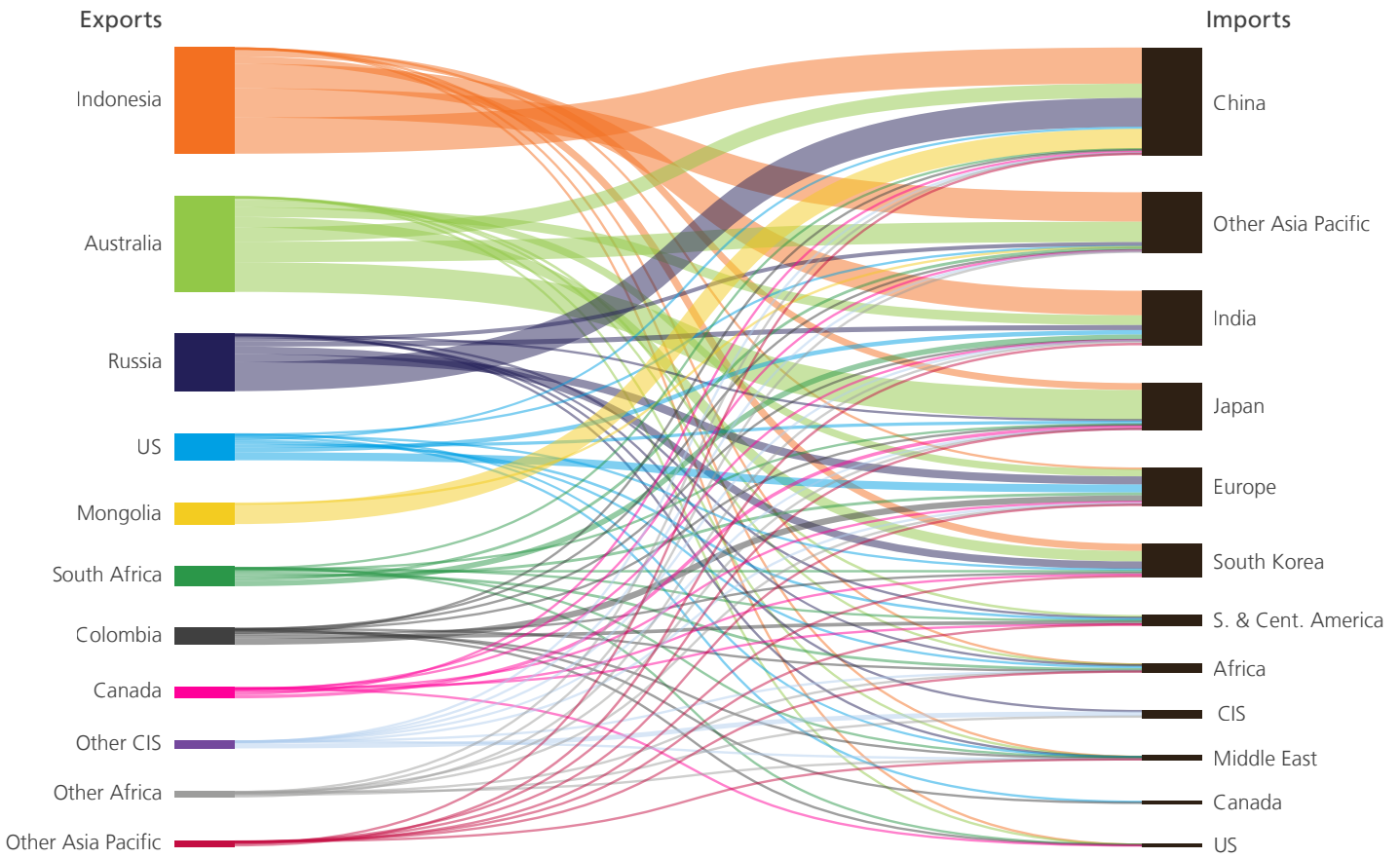
Coal-to-Liquids and Coal-to-Gas transformations.

^ Less than 0.005.

† Less than 0.05%.

Note: Annual changes and shares of total are calculated using exajoules figures.

Coal Trade movements



Notes: Commercial solid fuels only, i.e. bituminous coal and anthracite (hard coal), and lignite and brown (sub-bituminous) coal, and other commercial solid fuels. Intra-area movements (for example, between countries in Europe) are excluded.

Overall, international coal trade increased by almost 10% in 2023 reaching its highest level since 2018. Indonesia, Australia, and Russia were jointly responsible for around 70% of total global exports with Indonesia alone accounting for around 40% of that (over a quarter of total global exports). China was by far the largest importer

of coal at around 10 EJ, almost double that of India, the second-highest ranked country. Russian exports increased by 1.5% with China accounting for just over half of its overseas markets. Overall, the Asia Pacific region accounted for 82% of global coal imports. Europe's imports fell to their lowest level since 2000.

Coal Inter-area movements 2023

From	To														Total
	Canada	Mexico	US	S. & Cent. America	Europe	CIS	Middle East	Africa	China	India	Japan	South Korea	Other Asia Pacific		
Canada	-	†	0.02	0.02	0.09	-	†	†	0.22	0.05	0.32	0.20	0.06	0.99	
US	0.15	0.01	-	0.25	0.76	†	0.01	0.19	0.18	0.42	0.30	0.13	0.07	2.47	
Colombia	0.04	0.06	0.07	0.34	0.59	-	0.11	0.02	0.12	0.01	0.04	0.15	0.03	1.59	
Europe	†	†	0.01	0.01	-	†	0.01	0.08	0.01	0.10	†	†	0.01	0.23	
Russia	-	-	-	0.04	0.77	0.04	0.01	0.13	2.75	0.48	0.09	0.71	0.38	5.39	
Other CIS	-	-	†	-	0.16	0.46	0.01	0.01	0.01	†	†	†	0.01	0.65	
South Africa	†	-	†	0.02	0.27	-	0.07	0.26	0.05	0.52	0.09	0.18	0.28	1.74	
Other Africa	-	-	†	-	0.04	-	0.03	0.10	0.02	0.21	†	0.05	0.08	0.53	
Australia	†	†	†	0.25	0.68	-	0.01	0.02	1.36	0.92	2.83	0.99	1.94	9.00	
China	†	0.01	†	0.02	0.03	†	0.01	0.01	-	0.02	0.03	0.01	0.16	0.31	
Indonesia	†	-	†	†	0.10	-	†	†	3.43	2.33	0.65	0.68	2.79	10.00	
Mongolia	-	-	-	-	†	†	-	-	1.92	-	-	†	0.04	1.96	
Other Asia Pacific	†	†	†	0.01	0.03	†	†	†	0.08	0.23	0.02	0.08	-	0.46	
Rest of World	†	†	†	0.01	0.02	†	†	†	0.01	0.05	†	0.01	0.01	0.13	
Total imports	0.19	0.08	0.11	0.96	3.56	0.50	0.27	0.82	10.16	5.35	4.39	3.19	5.86	35.43	

Note: Commercial solid fuels only, i.e. bituminous coal and anthracite (hard coal), and lignite and brown (sub-bituminous) coal, and other commercial solid fuels. Intra-area movements (for example, between countries in Europe) are excluded.
† Less than 0.05%.



Exajoules											Growth rate per annum		Share	
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2023	2013-23	2023
Imports														
Canada	0.22	0.26	0.22	0.19	0.22	0.23	0.21	0.17	0.19	0.18	0.19	6.7%	-1.3%	0.5%
Mexico	0.20	0.22	0.23	0.21	0.32	0.32	0.25	0.13	0.05	0.05	0.08	72.5%	-8.4%	0.2%
US	0.24	0.28	0.28	0.25	0.19	0.15	0.17	0.65	0.14	0.16	0.11	-34.8%	-7.6%	0.3%
S. & Cent. America	1.08	1.08	1.03	1.08	1.20	1.18	1.12	1.04	1.25	1.05	0.96	-8.3%	-1.1%	2.7%
Europe	5.84	6.08	6.02	5.38	5.83	6.34	5.08	3.93	4.44	4.94	3.56	-27.9%	-4.8%	10.0%
CIS	0.58	0.59	0.58	0.52	0.60	0.65	0.70	0.66	0.64	0.49	0.50	1.3%	-1.6%	1.4%
Middle East	0.44	0.49	0.39	0.34	0.36	0.37	0.34	0.38	0.34	0.24	0.27	9.4%	-4.9%	0.8%
Africa	0.82	0.37	0.46	0.50	0.63	0.82	0.92	0.52	0.68	0.73	0.82	11.7%	†	2.3%
China	7.62	6.62	4.69	5.65	5.87	6.00	6.40	6.61	6.68	5.83	10.16	74.3%	2.9%	28.7%
India	3.66	4.65	4.92	10.11	5.25	5.68	4.70	4.74	4.67	4.99	5.35	7.3%	3.9%	15.1%
Japan	5.06	5.00	5.05	5.01	5.06	5.00	4.90	4.56	4.84	4.82	4.39	-9.0%	-1.4%	12.4%
South Korea	3.32	3.43	3.54	3.53	3.89	3.90	3.73	3.28	3.35	3.36	3.19	-4.9%	-0.4%	9.0%
Other Asia Pacific	3.49	3.58	3.79	4.47	4.90	5.34	5.22	6.36	6.22	5.53	5.86	6.0%	5.3%	16.5%
Total World	32.57	32.66	31.19	37.25	34.32	35.99	33.72	33.03	33.51	32.37	35.43	9.5%	0.8%	100.0%
Exports														
Canada	1.12	1.03	0.85	0.78	0.95	1.03	1.02	0.95	0.96	0.97	0.99	1.5%	-1.3%	2.8%
US	2.88	2.37	1.90	1.53	2.41	2.89	2.21	1.74	2.18	2.23	2.47	10.6%	-1.5%	7.0%
Colombia	2.05	2.27	2.19	2.33	2.48	2.42	2.09	1.82	1.67	1.59	1.59	†	-2.5%	4.5%
Europe	0.68	0.13	0.10	0.13	0.19	0.25	0.24	0.21	0.22	0.15	0.23	49.4%	-10.4%	0.6%
Russian Federation	3.54	3.91	4.10	4.45	5.09	5.76	5.79	5.66	6.03	5.31	5.39	1.4%	4.3%	15.2%
Other CIS	0.53	0.54	0.53	0.48	0.50	0.49	0.55	0.63	0.65	0.72	0.65	-8.9%	2.1%	1.8%
South Africa	2.11	2.19	2.27	2.14	2.68	2.95	1.41	1.73	1.62	1.72	1.74	1.0%	-1.9%	4.9%
Other Africa	0.11	0.18	0.28	5.68	0.66	0.24	0.28	0.74	0.37	0.47	0.53	12.5%	16.5%	1.5%
Australia	9.16	9.89	9.91	9.84	9.63	9.71	9.60	9.33	9.60	8.21	9.00	9.6%	-0.2%	25.4%
China	0.28	0.37	0.45	0.50	0.40	0.41	0.31	0.18	0.28	0.31	0.31	-0.2%	1.1%	0.9%
Indonesia	8.51	8.35	7.41	7.69	8.01	8.49	8.49	8.79	8.98	9.19	10.00	8.8%	1.6%	28.2%
Mongolia	0.49	0.53	0.41	0.73	0.95	0.99	1.04	0.83	0.49	0.90	1.96	116.8%	14.8%	5.5%
Other Asia Pacific	0.96	0.80	0.67	0.79	0.32	0.29	0.60	0.34	0.36	0.44	0.46	5.5%	-7.1%	1.3%
Rest of World	0.15	0.09	0.13	0.17	0.06	0.08	0.09	0.08	0.08	0.14	0.13	-13.0%	-1.6%	0.4%
Total World	32.57	32.66	31.19	37.25	34.32	35.99	33.72	33.03	33.51	32.37	35.43	9.5%	0.8%	100.0%

† Less than 0.05.

Note: Commercial solid fuels only, i.e. bituminous coal and anthracite (hard coal), and lignite and brown (sub-bituminous) coal, and other commercial solid fuels. Intra-area movements (for example between countries in Europe) are excluded.

Mined energy resource prices

	Coal \$/te								Uranium \$/lb
	United States ¹	Colombia ²	Northwest Europe ³	South Africa ⁴	Indonesia ⁵	South China ⁶	Japan ⁷	Australia ⁸	Canada ⁹
1987	-	-	31.30	-	-	-	-	-	-
1988	-	-	39.94	-	-	-	-	-	-
1989	-	-	42.08	-	-	-	-	-	-
1990	31.59	-	43.48	-	-	-	-	-	-
1991	29.01	-	42.80	-	-	-	-	-	-
1992	28.53	-	38.53	-	-	-	-	-	-
1993	29.85	-	33.68	-	-	-	-	-	-
1994	31.72	-	37.18	-	-	-	-	-	-
1995	27.01	-	44.50	-	-	-	-	-	-
1996	29.86	-	41.25	-	-	-	-	-	-
1997	29.76	-	38.92	-	-	-	-	-	-
1998	31.00	-	32.00	-	-	-	-	-	-
1999	31.29	-	28.79	-	-	-	-	-	-
2000	29.90	-	35.99	-	-	-	-	-	-
2001	50.15	-	39.03	-	-	27.52	-	-	-
2002	33.20	-	31.65	-	-	31.78	37.69	-	-
2003	38.52	-	43.60	-	-	33.19	31.47	-	-
2004	64.90	-	72.13	-	-	31.74	39.61	-	-
2005	70.12	-	60.54	-	-	42.76	74.22	-	-
2006	57.82	-	64.11	-	-	51.34	64.62	-	-
2007	49.73	-	88.79	-	-	53.53	65.22	-	-
2008	117.42	-	147.67	-	-	61.23	95.59	-	-
2009	60.73	-	70.39	-	-	104.97	157.88	-	-
2010	67.87	59.21	92.50	-	-	87.86	83.59	-	-
2011	84.75	79.73	121.48	-	-	110.08	108.47	-	-
2012	67.28	65.02	92.50	-	-	127.27	126.13	-	-
2013	69.72	54.18	81.69	-	-	111.89	100.30	-	-
2014	67.08	50.25	75.38	62.80	-	95.42	90.07	-	-
2015	51.57	47.31	56.79	47.48	-	84.12	76.13	-	-
2016	51.45	52.62	60.09	53.04	-	67.53	60.10	-	-
2017	63.83	68.75	84.51	71.59	-	71.35	71.66	-	-
2018	72.84	72.76	91.83	78.03	-	94.72	96.02	-	-
2019	57.16	51.26	60.17	55.67	50.53	99.45	112.73	71.13	-
2020	42.77	45.16	50.13	48.30	45.22	35.20	73.57	54.24	-
2021	68.54	100.39	122.60	96.49	95.22	30.64	61.03	44.75	30.46
2022	157.57	248.37	291.28	212.99	127.65	124.70	114.59	83.26	35.16
2023	73.59	99.87	129.54	99.66	84.61	120.65	130.25	103.59	60.37

¹Source: S&P Global Commodity Insights, ©2024 by S&P Global Inc. Prices are for CAPP 12,500 Btu, 1.2 SO₂ coal, FOB. Prices for 1996-2000 are by coal price publication date, 2001-2005 by coal price assessment date. From 2006, average daily OTC.
²Source: S&P Global Commodity Insights, ©2024 by S&P Global Inc 6,000 kcal/kg NAR FOB.
³Source: IHS Northwest Europe prices for 1990-2000 average monthly marker prices, 2001-2018 average weekly prices. From 2019, monthly average of S&P Global Commodity Insights, ©2024 by S&P Global Inc Thermal Coal CIF ARA 6,000 kcal/kg NAR.
⁴Source: S&P Global Commodity Insights, ©2024 by S&P Global Inc FOB Richards Bay 5500 kcal/kg NAR 7-45 Day \$/mt.
⁵Source: S&P Global Commodity Insights, ©2024 by S&P Global Inc FOB Kalimantan 5,000 kcal/kg GAR.
⁶South China prices are the average monthly price for 2000-2005, weekly prices 2006-2018, from 2019 monthly average of S&P Global Commodity Insights, ©2024 by S&P Global Inc CFR South China 5,500 kilocalories per kilogram NAR.
⁷Source: 2001-2018 IHS Japan prices basis = 6,000 kilocalories per kilogram NAR CIF. From 2019, monthly average of S&P Global Commodity Insights, ©2024 by S&P Global Inc NEAT 5,750 kcal/kg NAR.
⁸Source: S&P Global Commodity Insights, ©2024 by S&P Global Inc FOB Newcastle High Ash 5500 kcal/kg NAR 7-45 Day \$/mt.
⁹ S&P Global Commodity Insights, ©2024 by S&P Global Inc Uranium U3O8 Spot Canada Mo01 \$/lb.
Note: CAPP = Central Appalachian, CIF = cost+insurance+freight (average prices); FOB = free on board, NAR = net as received, CFR = cost+freight.

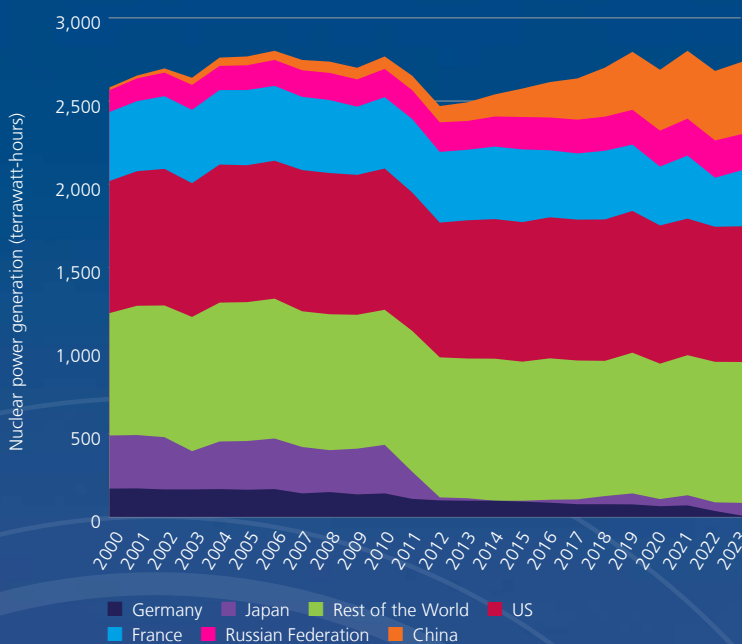
Exajoules												Growth rate per annum		Share
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2023	2013-23	2023
Canada	0.86	0.82	0.77	0.77	0.80	0.65	0.61	0.53	0.47	0.39	0.37	-3.7%	-8.1%	0.2%
Mexico	0.53	0.53	0.53	0.52	0.64	0.57	0.54	0.24	0.20	0.24	0.26	8.1%	-6.8%	0.2%
US	18.08	18.04	15.58	14.26	13.87	13.28	11.34	9.20	10.57	9.91	8.20	-17.3%	-7.6%	5.0%
Total North America	19.48	19.39	16.89	15.55	15.30	14.50	12.49	9.97	11.24	10.54	8.83	-16.2%	-7.6%	5.4%
Argentina	0.05	0.06	0.06	0.04	0.05	0.05	0.03	0.04	0.05	0.05	0.05	-14.1%	-1.5%	†
Brazil	0.69	0.73	0.74	0.67	0.70	0.69	0.65	0.59	0.71	0.59	0.57	-2.2%	-1.8%	0.3%
Chile	0.32	0.32	0.31	0.31	0.32	0.31	0.31	0.26	0.29	0.24	0.18	-26.4%	-5.7%	0.1%
Colombia	0.21	0.22	0.21	0.23	0.17	0.16	0.19	0.17	0.11	0.10	0.16	52.9%	-3.0%	0.1%
Ecuador	^	^	^	^	^	^	^	^	^	^	^	-13.9%	16.8%	†
Peru	0.04	0.04	0.03	0.04	0.03	0.03	0.03	0.02	0.03	0.03	0.03	-3.4%	-2.2%	†
Venezuela	0.01	0.01	0.01	0.01	0.01	^	^	^	^	0.01	0.01	-	-2.6%	†
Central America	0.04	0.04	0.05	0.06	0.04	0.06	0.07	0.06	0.07	0.05	0.05	15.1%	3.3%	†
Other Caribbean	0.08	0.08	0.08	0.08	0.07	0.07	0.10	0.12	0.11	0.12	0.12	1.7%	4.6%	0.1%
Other South America	^	^	^	^	^	^	^	^	^	^	^	11.4%	6.2%	†
Total S. & Cent. America	1.43	1.50	1.48	1.43	1.40	1.38	1.39	1.27	1.38	1.19	1.16	-1.8%	-2.0%	0.7%
Austria	0.14	0.13	0.14	0.13	0.13	0.12	0.12	0.10	0.11	0.10	0.10	-6.6%	-3.5%	0.1%
Belgium	0.15	0.14	0.14	0.13	0.13	0.13	0.13	0.10	0.11	0.12	0.10	-14.9%	-3.9%	0.1%
Bulgaria	0.25	0.27	0.27	0.24	0.26	0.23	0.21	0.17	0.22	0.26	0.16	-38.7%	-4.3%	0.1%
Croatia	0.03	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.01	-17.4%	-6.7%	†
Cyprus	^	^	^	^	^	^	^	^	^	^	^	-9.0%	60.9%	†
Czech Republic	0.71	0.69	0.68	0.69	0.67	0.67	0.60	0.52	0.54	0.56	0.47	-15.3%	-4.0%	0.3%
Denmark	0.14	0.11	0.08	0.09	0.07	0.07	0.04	0.03	0.04	0.04	0.03	-33.6%	-14.2%	†
Estonia	0.17	0.17	0.15	0.16	0.18	0.18	0.13	0.10	0.11	0.12	0.10	-19.7%	-5.5%	0.1%
Finland	0.21	0.19	0.16	0.18	0.17	0.18	0.15	0.11	0.12	0.12	0.09	-26.1%	-8.2%	0.1%
France	0.53	0.39	0.37	0.36	0.39	0.36	0.29	0.20	0.27	0.23	0.18	-23.3%	-10.3%	0.1%
Germany	3.47	3.33	3.29	3.20	3.01	2.90	2.25	1.85	2.24	2.31	1.83	-21.0%	-6.2%	1.1%
Greece	0.29	0.28	0.24	0.18	0.20	0.20	0.13	0.08	0.07	0.07	0.05	-28.3%	-16.6%	†
Hungary	0.10	0.09	0.10	0.09	0.09	0.09	0.08	0.07	0.06	0.05	0.04	-30.2%	-9.2%	†
Iceland	^	^	^	^	^	^	^	^	^	^	^	-28.1%	-2.7%	†
Ireland	0.09	0.08	0.09	0.09	0.08	0.06	0.04	0.04	0.05	0.04	0.03	-31.7%	-10.8%	†
Italy	0.57	0.55	0.52	0.46	0.40	0.37	0.28	0.21	0.23	0.31	0.22	-30.3%	-9.1%	0.1%
Latvia	^	^	^	^	^	^	^	^	^	^	^	-45.4%	-20.1%	†
Lithuania	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	^	-38.7%	-8.3%	†
Luxembourg	^	^	^	^	^	^	^	^	^	^	^	-18.5%	-3.5%	†
Netherlands	0.34	0.38	0.46	0.43	0.39	0.35	0.27	0.17	0.23	0.23	0.16	-31.6%	-7.4%	0.1%
North Macedonia	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.03	0.03	0.04	0.04	5.5%	-2.7%	†
Norway	0.03	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.03	0.03	2.7%	0.7%	†
Poland	2.23	2.07	2.04	2.07	2.08	2.09	1.86	1.72	1.90	1.78	1.51	-15.6%	-3.8%	0.9%
Portugal	0.11	0.11	0.14	0.12	0.14	0.11	0.05	0.02	0.01	^	^	-28.6%	-46.6%	†
Romania	0.25	0.24	0.25	0.22	0.23	0.21	0.21	0.15	0.17	0.15	0.11	-24.5%	-7.4%	0.1%
Slovakia	0.14	0.14	0.14	0.13	0.14	0.14	0.11	0.10	0.12	0.10	0.10	-4.5%	-3.9%	0.1%
Slovenia	0.06	0.04	0.04	0.05	0.05	0.05	0.04	0.04	0.04	0.03	0.03	-8.5%	-6.4%	†
Spain	0.48	0.49	0.57	0.44	0.56	0.48	0.21	0.12	0.13	0.16	0.12	-24.2%	-13.0%	0.1%
Sweden	0.09	0.08	0.08	0.08	0.08	0.08	0.08	0.07	0.07	0.07	0.07	-1.8%	-2.9%	†
Switzerland	0.01	0.01	0.01	^	^	^	^	^	^	^	^	-	-3.6%	†
Türkiye	1.32	1.51	1.45	1.61	1.65	1.71	1.76	1.70	1.74	1.76	1.65	-6.3%	2.3%	1.0%
Ukraine	1.73	1.49	1.14	1.36	1.08	1.17	1.09	0.96	0.95	0.54	0.49	-10.5%	-11.9%	0.3%
United Kingdom	1.57	1.26	1.00	0.51	0.41	0.35	0.25	0.23	0.23	0.21	0.18	-12.6%	-19.3%	0.1%
Other Europe	0.61	0.50	0.58	0.60	0.59	0.59	0.57	0.59	0.56	0.54	0.51	-5.6%	-1.7%	0.3%
Total Europe	15.86	14.88	14.24	13.74	13.29	12.98	11.06	9.57	10.44	10.02	8.39	-16.2%	-6.1%	5.1%
Azerbaijan	^	^	^	^	^	^	^	^	^	^	^	-	-32.3%	†
Belarus	0.04	0.03	0.03	0.03	0.04	0.05	0.06	0.04	0.04	0.04	0.04	3.5%	1.5%	†
Kazakhstan	1.57	1.55	1.14	1.34	1.47	1.52	1.44	1.37	1.40	1.41	1.39	-1.7%	-1.2%	0.8%
Russian Federation	3.79	3.67	3.86	3.74	3.51	3.63	3.57	3.29	3.43	3.84	3.83	-0.2%	0.1%	2.3%
Uzbekistan	0.07	0.07	0.05	0.06	0.06	0.09	0.08	0.10	0.09	0.11	0.14	28.0%	6.7%	0.1%
Other CIS	0.06	0.07	0.08	0.08	0.09	0.09	0.09	0.09	0.10	0.09	0.09	1.5%	4.5%	0.1%
Total CIS	5.52	5.39	5.17	5.25	5.16	5.38	5.23	4.88	5.05	5.49	5.49	†	†	3.3%
Iran	0.03	0.04	0.05	0.04	0.04	0.06	0.07	0.08	0.08	0.08	0.08	1.8%	9.5%	†
Israel	0.30	0.28	0.27	0.23	0.21	0.20	0.21	0.18	0.16	0.16	0.14	-13.5%	-7.3%	0.1%
Kuwait	0.01	0.01	0.01	0.01	0.01	0.01	0.01	^	^	0.01	0.01	-	-7.0%	†
Oman	^	^	^	^	^	^	^	^	^	0.01	0.01	-	10.5%	†
Qatar	^	^	^	^	^	^	^	^	^	^	^	14.1%	5.7%	†
Saudi Arabia	^	0.01	^	^	^	^	^	^	^	^	^	-	0.9%	†
United Arab Emirates	0.07	0.08	0.07	0.08	0.09	0.08	0.07	0.09	0.11	0.10	0.10	1.8%	3.3%	0.1%
Other Middle East	0.02	0.03	0.02	0.02	0.02	0.02	0.01	0.01	0.02	0.03	0.04	76.5%	7.9%	†
Total Middle East	0.44	0.44	0.42	0.38	0.38	0.37	0.38	0.37	0.38	0.38	0.38	0.2%	-1.5%	0.2%
Algeria	0.01	0.01	0.01	^	0.01	0.02	0.02	0.01	0.01	0.01	0.01	-11.1%	0.5%	†
Egypt	0.02	0.02	0.03	0.05	0.05	0.09	0.08	0.03	0.05	0.04	0.05	13.7%	12.0%	†
Morocco	0.13	0.17	0.19	0.18	0.19	0.22	0.28	0.29	0.31	0.31	0.29	-6.2%	8.8%	0.2%
South Africa	3.70	3.75	3.52	3.78	3.72	3.53	3.76	3.68	3.59	3.38	3.33	-1.6%	-1.0%	2.0%
Eastern Africa	0.16	0.24	0.21	0.16	0.20	0.22	0.18	0.18	0.20	0.22	0.24	11.6%	4.4%	0.1%
Middle Africa	^	^	^	^	0.01	0.01	0.01	0.01	0.01	0.02	0.02	33.9%	33.4%	†
Western Africa	0.02	0.03	0.03	0.05	0.05	0.05	0.05	0.05	0.07	0.07	0.07	-5.6%	13.9%	†
Other Northern Africa	-	-	-	-	^	^	^	^	^	^	^	-	-	†
Other Southern Africa	0.05	0.06	0.06	0.06	0.07	0.07	0.06	0.05	0.07	0.07	0.08	1.2%	4.4%	†
Total Africa	4.08	4.27	4.04	4.29	4.29	4.21	4.45	4.30	4.31	4.12	4.08	-1.0%	†	2.5%
Australia	1.89	1.88	1.95	1.94	1.88	1.83	1.75	1.69	1.63	1.54	1.51	-2.3%	-2.2%	0.9%
Bangladesh	0.05	0.03	0.11	0.08	0.09	0.10	0.17	0.19	0.15	0.20	0.28	41.3%	18.2%	0.2%
China	82.45	82.10	80.38	78.03	78.90	80.47	82.52	84.25	87.54					

Nuclear energy

Despite a small drop in total installed capacity, electricity generation from nuclear power plant increased in 2023 by 2%. However, it was still 58 terawatt-hours below its 2019 pre-COVID level and 2% below its peak output in 2006. Output from nuclear in Europe fell by 1% with the recovery of France's nuclear fleet from prolonged outages in 2022 offset by Germany's closure of its last three remaining units early in the year. China continues to lead the way in building new capacity. Since 2000 it has built around 60% of all new nuclear capacity additions.

In late 2023, commercial operations began at its onshore small modular reactor (SMR) demonstration project, a world first featuring the latest Generation IV technology and incorporating inherent safety systems. Following events in Fukushima in 2011, Japan has gradually returned units to service and, in 2023 output increased by 50%. Whilst output from nuclear in the US remained relatively flat, it was still equal to the combined outputs of China and France, operators of the second and third-largest fleets.

Before Fukushima in 2011, nuclear met 25% of Japan's electricity demand and 23% of Germany's. In 2023, it met only around 8% in Japan and just 2% in Germany



China commissioned the world's first onshore demonstration of a small modular reactor (SMR)

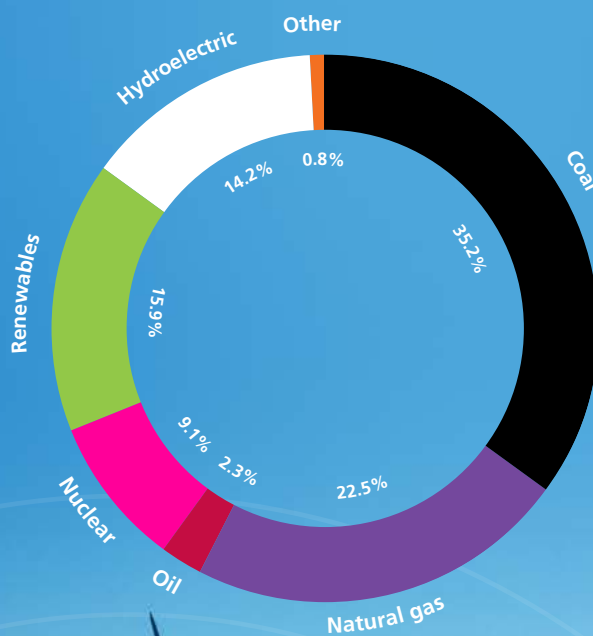
Terawatt-hours												Growth rate per annum		Share
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2023	2013–23	2023
Canada	102.7	106.5	101.1	100.7	100.6	100.0	100.5	97.5	92.0	86.6	89.0	2.8%	-1.4%	3.3%
Mexico	11.8	9.7	11.6	10.6	10.9	13.6	11.2	11.2	11.9	10.8	12.4	14.2%	0.5%	0.5%
US	830.5	839.1	839.1	848.1	847.3	849.6	852.0	831.5	820.7	812.1	816.2	0.5%	-0.2%	29.8%
Total North America	945.1	955.3	951.8	959.4	958.8	963.1	963.7	940.1	924.6	909.6	917.6	0.9%	-0.3%	33.5%
Argentina	6.2	5.5	7.0	8.3	6.1	6.9	8.4	10.0	10.2	7.5	9.0	20.0%	3.7%	0.3%
Brazil	15.4	15.4	14.7	15.9	15.7	15.7	16.1	14.1	14.7	14.6	14.5	-0.3%	-0.6%	0.5%
Chile	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Colombia	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ecuador	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Peru	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trinidad & Tobago	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Venezuela	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Central America	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Caribbean	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other South America	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total S. & Cent. America	21.7	20.9	21.8	24.1	21.8	22.5	24.6	24.1	24.9	22.0	23.5	6.6%	0.8%	0.9%
Austria	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Belgium	42.6	33.7	26.1	43.5	42.2	28.6	43.5	34.4	50.3	43.9	32.9	-25.0%	-2.6%	1.2%
Bulgaria	14.2	15.9	15.4	15.8	15.5	16.1	16.6	16.6	16.5	16.5	16.2	-1.7%	1.3%	0.6%
Croatia	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyprus	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Czech Republic	30.7	30.3	26.8	24.1	28.3	29.9	30.2	30.0	30.7	31.0	30.4	-2.0%	-0.1%	1.1%
Denmark	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Estonia	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Finland	23.6	23.6	23.2	23.2	22.5	22.8	23.9	23.3	23.6	25.3	34.2	35.2%	3.8%	1.3%
France	423.7	436.5	437.4	403.2	398.4	412.9	399.0	353.8	379.4	294.7	338.2	14.7%	-2.2%	12.4%
Germany	97.3	97.1	91.8	84.6	76.3	76.0	75.1	64.4	69.1	34.7	7.2	-79.2%	-22.9%	0.3%
Greece	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hungary	15.4	15.6	15.8	16.1	16.1	15.7	16.3	16.1	16.0	15.8	15.9	0.7%	0.4%	0.6%
Iceland	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ireland	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Italy	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Latvia	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lithuania	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Luxembourg	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Netherlands	2.9	4.1	4.1	4.0	3.4	3.5	3.9	4.1	3.8	4.2	4.0	-4.1%	3.3%	0.1%
North Macedonia	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Norway	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Poland	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Portugal	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Romania	11.6	11.7	11.6	11.3	11.5	11.4	11.3	11.5	11.3	11.1	11.2	0.9%	-0.4%	0.4%
Slovakia	15.7	15.5	15.1	14.8	15.1	14.8	15.3	15.4	15.7	15.9	18.3	15.2%	1.6%	0.7%
Slovenia	5.3	6.4	5.6	5.7	6.3	5.8	5.8	6.4	5.7	5.6	5.6	-	0.6%	0.2%
Spain	56.7	57.3	57.3	58.6	58.1	55.8	58.3	58.3	56.6	58.6	56.8	-3.0%	-	2.1%
Sweden	66.5	64.9	56.3	63.1	65.7	68.5	66.1	49.2	53.0	51.9	48.4	-6.8%	-3.1%	1.8%
Switzerland	26.2	27.8	23.3	21.3	20.5	24.4	25.3	23.0	18.5	23.1	23.3	1.0%	-1.1%	0.9%
Türkiye	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ukraine	83.2	88.4	87.6	81.0	85.6	84.4	83.0	76.2	86.2	62.1	52.4	-15.6%	-4.5%	1.9%
United Kingdom	70.6	63.7	70.3	71.7	70.3	65.1	56.2	50.3	45.9	47.7	40.7	-14.6%	-5.3%	1.5%
Other Europe	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Europe	986.2	992.4	968.0	941.9	935.9	935.8	929.7	833.0	882.3	742.2	735.9	-0.8%	-2.9%	26.9%
Azerbaijan	-	-	-	-	-	-	-	0.3	5.8	4.7	11.7	150.5%	-	0.4%
Belarus	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kazakhstan	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Russian Federation	172.5	180.8	195.5	196.6	203.1	204.6	209.0	215.9	222.4	223.7	217.4	-2.8%	2.3%	7.9%
Turkmenistan	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Uzbekistan	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other CIS	2.4	2.5	2.8	2.4	2.6	2.1	2.2	2.8	2.0	2.8	2.7	-4.8%	1.4%	0.1%
Total CIS	174.9	183.2	198.3	199.0	205.8	206.7	211.2	219.0	230.2	231.2	231.8	0.3%	2.9%	8.5%
Iran	4.3	4.1	3.5	6.5	7.0	6.9	6.4	6.3	3.5	6.6	6.6	1.1%	4.5%	0.2%
Iraq	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Israel	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kuwait	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Oman	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Qatar	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Saudi Arabia	-	-	-	-	-	-	-	-	-	-	-	-	-	-
United Arab Emirates	-	-	-	-	-	-	-	1.6	10.5	20.1	32.3	60.5%	-	1.2%
Other Middle East	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Middle East	4.3	4.1	3.5	6.5	7.0	6.9	6.4	8.0	14.1	26.7	38.9	45.9%	24.8%	1.4%
Algeria	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Egypt	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Morocco	-	-	-	-	-	-	-	-	-	-	-	-	-	-
South Africa	14.1	13.8	12.2	15.0	14.2	11.6	13.3	9.9	12.4	10.1	8.9	-11.9%	-4.5%	0.3%
Eastern Africa	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Middle Africa	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Western Africa	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Northern Africa	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Southern Africa	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Africa	14.1	13.8	12.2	15.0	14.2	11.6	13.3	9.9	12.4	10.1	8.9	-11.9%	-4.5%	0.3%
Australia	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bangladesh	-	-	-	-	-	-	-	-	-	-	-	-	-	-
China	111.5	133.2	171.4	213.2	248.1	295.0	348.7	366.2	407.5	417.8	434.7	4.1%	14.6%	15.9%
China Hong Kong SAR	-	-	-	-	-	-	-	-	-	-	-	-	-	-
India	33.3	34.7	38.3	37.9	37.4	39.1	45.2	44.6	43.9	46.2	48.2	4.4%	3.8%	1.8%
Indonesia	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Japan	14.6	-	4.5	17.7	29.1	49.1	65.6	43.0	61.2	51.8	77.5	49.6%	18.2%	2.8%
Malaysia	-	-	-	-	-	-	-	-	-	-	-	-	-	-
New Zealand	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pakistan	4.3	4.7	4.3	5.3	8.1	9.2	9.2	9.5	15.7	22.2	22.4	0.6%	18.0%	0.8%
Philippines	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Singapore	-	-	-	-	-	-	-	-	-	-	-	-	-	-
South Korea	138.8	156.4	164.8	162.0	148.4	133.5	145.9	160.2	158.0	176.1	180.5	2.5%	2.7%	6.6%
Sri Lanka	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Taiwan	41.6	42.4	36.5	31.7	22.4	27.7	32.3	31.4	27.8	23.8	17.8	-25.1%	-8.1%	0.7%
Thailand	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vietnam	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Asia Pacific	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Asia Pacific	344.1	371.4	419.7	467.7	493.6	553.6								

Electricity and renewables

Global electricity generation increased by 2.5% in 2023 to reach a record level of 29,925 TWh. Recording a growth rate that was 25% faster than total global primary energy consumption suggests that the world's energy system is increasingly electrifying. Whilst electricity demand in Asia Pacific and the Middle East increased by around 5%, demand in both Europe and North America fell by 2.4% and 1% respectively.

Coal retained its position as the dominant fuel for power generation with fossil fuels overall forming 60% of global electricity generation. Renewables share of total power generation rose from 29% to 30%. At a regional level, Southern & Central America recorded the highest contribution from renewables at 72%. The share of nuclear remained flat at around 9% with new build in China and returns to service of plant in France and Japan being offset by the closure of Germany's remaining plant. In 2023, grid-scale battery electricity storage system (BESS) capacity stood at 56 GW, nearly 50% of which was installed in China.

**Fossil fuels
contributed 60% of
total global electricity
generated in 2023**



Terawatt-hours												Growth rate per annum		Share
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2023	2013-23	2023
Canada	655.7	653.0	661.1	668.2	669.6	661.5	656.0	653.9	649.9	658.9	633.2	-3.9%	-0.3%	2.1%
Mexico	297.1	303.3	310.3	320.3	329.1	349.3	344.6	325.7	330.0	340.1	354.9	4.3%	1.8%	1.2%
US	4330.3	4363.3	4349.9	4348.9	4303.8	4464.5	4414.1	4287.6	4400.9	4537.7	4494.0	-1.0%	0.4%	15.0%
Total North America	5283.1	5319.5	5321.3	5337.4	5302.5	5475.3	5414.7	5267.2	5380.9	5536.8	5482.0	-1.0%	0.4%	18.3%
Argentina	139.4	138.6	145.4	147.2	145.6	146.8	139.5	144.6	153.2	145.6	146.4	0.6%	0.5%	0.5%
Brazil	570.8	590.5	581.2	578.9	589.3	601.4	633.3	628.8	656.1	677.2	710.0	4.8%	2.2%	2.4%
Chile	73.0	71.6	74.5	77.7	78.6	82.3	83.6	83.7	87.4	88.0	88.2	0.2%	1.9%	0.3%
Colombia	69.8	72.7	75.0	74.4	75.0	78.3	80.4	79.4	86.0	89.5	93.9	4.9%	3.0%	0.3%
Ecuador	23.3	24.3	26.0	27.3	28.0	29.2	32.3	31.2	32.2	33.0	35.4	7.1%	4.3%	0.1%
Peru	43.3	45.5	48.3	51.7	52.7	55.0	57.0	52.8	57.5	59.7	62.1	3.9%	3.7%	0.2%
Trinidad & Tobago	9.5	9.4	9.6	9.4	9.3	9.2	9.2	9.2	9.3	9.8	9.7	-0.7%	0.2%	†
Venezuela	132.6	131.0	126.3	116.2	110.3	92.3	78.1	81.6	83.9	87.6	85.8	-2.2%	-4.3%	0.3%
Central America	48.1	49.4	52.2	53.8	54.5	56.4	59.3	57.2	61.6	63.0	65.3	3.5%	3.1%	0.2%
Other Caribbean	76.8	76.0	77.8	78.7	74.4	76.2	79.5	78.7	80.0	79.3	84.5	6.7%	1.0%	0.3%
Other South America	84.2	80.9	82.7	91.3	87.9	87.9	80.1	74.4	72.1	75.0	83.3	11.1%	-0.1%	0.3%
Total S. & Cent. America	1270.9	1290.0	1299.0	1306.6	1305.8	1314.9	1332.4	1321.6	1379.3	1407.7	1464.5	4.0%	1.4%	4.9%
Austria	68.4	65.6	65.5	68.5	71.3	68.6	74.2	72.6	70.8	68.5	72.6	6.0%	0.6%	0.2%
Belgium	83.5	72.5	69.7	85.6	86.6	75.0	93.6	89.5	100.5	95.9	81.9	-14.7%	-0.2%	0.3%
Bulgaria	43.8	47.5	49.2	45.3	45.6	46.8	44.3	40.8	47.6	50.5	39.9	-21.0%	-0.9%	0.1%
Croatia	14.1	13.6	11.4	12.8	12.0	13.6	12.8	13.4	15.2	14.2	17.3	21.9%	2.1%	0.1%
Cyprus	4.3	4.4	4.5	4.9	5.0	5.0	5.1	4.8	5.1	5.3	5.4	1.9%	2.3%	†
Czech Republic	86.9	86.0	83.9	83.3	87.0	88.0	87.0	81.4	84.9	84.5	76.1	-9.9%	-1.3%	0.3%
Denmark	34.7	32.2	28.9	30.5	31.0	30.4	29.5	28.7	33.1	35.1	33.6	-4.4%	-0.3%	0.1%
Estonia	13.3	12.4	10.4	12.2	13.2	12.4	7.6	6.1	7.1	8.9	7.0	-21.6%	-6.2%	†
Finland	71.3	68.1	68.6	68.8	67.5	70.3	68.7	69.3	72.1	72.2	81.3	12.6%	1.3%	0.3%
France	575.3	564.8	571.6	556.2	554.0	573.9	562.7	524.3	547.2	466.5	519.7	11.4%	-1.0%	1.7%
Germany	637.7	626.6	647.0	649.2	652.3	641.4	608.2	574.7	587.1	577.9	513.7	-11.1%	-2.1%	1.7%
Greece	57.2	50.5	51.9	54.4	55.3	53.3	48.6	48.3	54.7	52.6	49.8	-5.4%	-1.4%	0.2%
Hungary	30.3	29.4	30.4	31.9	32.9	32.1	34.3	34.9	36.1	35.8	34.9	-2.4%	1.4%	0.1%
Iceland	18.1	18.1	18.8	18.5	19.2	19.8	19.5	19.1	19.6	20.1	20.2	0.6%	1.1%	0.1%
Ireland	26.1	26.3	28.4	30.5	30.9	31.1	31.0	32.3	31.9	33.9	31.1	-8.1%	1.8%	0.1%
Italy	289.8	279.8	283.0	289.8	295.8	289.7	293.9	280.5	289.1	284.0	265.3	-6.6%	-0.9%	0.9%
Latvia	6.2	5.1	5.5	6.4	7.5	6.7	6.4	5.7	5.8	5.0	6.2	23.1%	0.1%	†
Lithuania	4.8	4.4	4.9	4.3	4.2	3.5	4.0	5.5	5.1	4.8	5.4	13.6%	1.3%	†
Luxembourg	2.9	3.0	2.8	2.2	2.2	2.2	1.9	2.2	2.2	2.2	2.3	4.7%	-2.1%	†
Netherlands	100.9	103.4	110.2	115.2	117.2	114.4	121.4	123.3	122.1	121.8	122.3	0.4%	1.9%	0.4%
North Macedonia	6.1	5.4	5.6	5.6	5.6	5.6	5.9	5.3	5.5	5.9	6.9	17.1%	1.3%	†
Norway	134.1	142.0	144.5	149.1	149.6	147.1	134.9	155.2	157.9	146.7	154.8	5.5%	1.4%	0.5%
Poland	164.6	159.1	164.9	166.6	170.5	170.0	164.0	158.0	179.6	179.7	167.0	-7.1%	0.1%	0.6%
Portugal	51.7	52.8	52.4	60.3	59.4	59.6	53.2	53.1	51.0	48.8	49.2	0.7%	-0.5%	0.2%
Romania	58.9	63.3	66.3	65.1	64.3	64.8	59.5	55.8	59.3	55.9	58.2	4.1%	-0.1%	0.2%
Slovakia	28.8	27.4	26.9	27.1	27.7	27.0	28.4	28.8	30.0	26.8	30.3	12.8%	0.5%	0.1%
Slovenia	16.1	17.4	15.1	16.5	16.3	16.3	16.1	17.2	15.9	13.6	15.9	16.8%	-0.1%	0.1%
Spain	285.3	278.8	281.0	274.6	275.6	274.5	267.5	263.4	274.3	292.5	282.0	-3.6%	-0.1%	0.9%
Sweden	153.2	153.7	162.1	156.1	164.3	164.3	168.4	163.8	171.8	173.1	166.5	-3.8%	0.8%	0.6%
Switzerland	70.4	72.0	67.9	63.3	63.3	67.6	71.9	70.2	64.7	64.1	73.6	14.8%	0.4%	0.2%
Türkiye	240.2	252.0	261.8	274.4	297.3	304.8	303.9	306.7	334.7	328.4	328.0	-0.1%	3.2%	1.1%
Ukraine	194.4	182.8	163.7	164.6	156.0	159.9	154.1	147.8	155.5	112.7	103.4	-8.3%	-6.1%	0.3%
United Kingdom	358.3	338.1	338.9	339.2	338.2	333.7	327.1	314.7	308.9	322.0	285.6	-11.3%	-2.2%	1.0%
Other Europe	90.1	80.2	85.2	89.0	82.9	92.5	87.6	86.7	94.8	89.3	97.6	9.3%	0.8%	0.3%
Total Europe	4021.5	3938.5	3983.1	4022.0	4061.9	4065.0	3997.2	3884.2	4041.3	3899.4	3805.1	-2.4%	-0.6%	12.7%
Azerbaijan	23.4	24.7	24.7	25.0	24.3	25.2	26.1	25.8	27.9	29.0	29.3	0.9%	2.3%	0.1%
Belarus	31.5	34.7	34.2	33.6	34.5	38.9	40.5	38.7	41.2	39.7	41.8	5.3%	2.9%	0.1%
Kazakhstan	92.6	94.6	91.6	94.6	103.1	107.3	106.5	108.6	115.1	113.5	113.0	-0.4%	2.0%	0.4%
Russian Federation	1059.1	1064.2	1067.5	1091.0	1091.2	1109.2	1118.1	1085.4	1157.1	1166.9	1178.2	1.0%	1.1%	3.9%
Turkmenistan	18.9	20.1	21.5	22.6	22.8	24.2	22.5	25.8	28.4	32.6	33.5	2.7%	5.9%	0.1%
Uzbekistan	54.9	55.4	57.3	59.1	60.8	62.9	63.5	66.5	71.4	74.3	78.0	5.0%	3.6%	0.3%
Other CIS	43.3	44.1	44.0	43.5	46.3	48.6	49.2	49.1	50.2	49.8	51.0	2.4%	1.6%	0.2%
Total CIS	1323.7	1337.9	1340.9	1369.3	1383.0	1416.4	1426.4	1400.0	1491.2	1505.8	1524.8	1.3%	1.4%	5.1%
Iran	258.9	275.6	280.2	286.1	305.2	312.4	318.9	337.2	356.4	367.1	382.9	4.3%	4.0%	1.3%
Iraq	62.1	71.2	75.3	86.3	93.6	99.0	115.2	116.8	118.1	131.4	139.4	6.1%	8.4%	0.5%
Israel	61.4	61.3	64.3	67.4	67.7	69.3	72.4	72.8	73.8	76.0	77.2	1.6%	2.3%	0.3%
Kuwait	61.0	65.1	68.3	70.1	72.8	74.2	75.1	74.8	80.8	83.5	88.3	5.7%	3.8%	0.3%
Oman	26.2	29.1	32.8	34.2	36.1	37.7	38.8	38.3	41.0	41.7	44.3	6.4%	5.4%	0.1%
Qatar	34.7	38.7	41.5	42.3	45.6	47.9	49.9	49.3	51.6	50.0	54.4	8.7%	4.6%	0.2%
Saudi Arabia	294.7	328.2	350.6	357.7	395.0	374.8	378.5	380.9	392.9	401.3	422.9	5.4%	3.7%	1.4%
United Arab Emirates	110.0	116.5	127.4	129.6	134.6	136.0	138.5	137.3	149.1	153.3	165.0	7.6%	4.1%	0.6%
Other Middle East	99.5	97.1	93.9	93.0	95.7	103.4	108.6	102.4	98.2	88.0	89.1	1.3%	-1.1%	0.3%
Total Middle East	1008.4	1083.0	1134.4	1166.8	1246.2	1254.7	1295.9	1309.8	1361.9	1392.2	1463.4	5.1%	3.8%	4.9%
Algeria	59.9	64.2	68.8	71.0	76.0	76.7	81.5	79.2	85.4	91.2	85.9	-5.8%	3.7%	0.3%
Egypt	165.1	171.2	181.8	188.2	193.2	199.4	200.6	198.6	209.7	216.7	220.1	1.6%	2.9%	0.7%
Morocco	28.1	29.3	30.3	30.7	31.6	34.4	40.1	38.5	41.0	41.2	42.2	2.6%	4.1%	0.1%
South Africa	256.1	254.8	250.4	253.1	255.4	256.3	252.6	239.5	244.3	234.8	224.4	-4.4%	-1.3%	0.7%
Eastern Africa	87.0	93.5	98.6	97.1	103.4	108.6	110.7	110.7	117.1					

Electricity Generation by fuel*

Terawatt-hours	2022								2023							
	Oil	Natural gas	Coal	Nuclear energy	Hydro-electric	Renewables	Other†	Total	Oil	Natural Gas	Coal	Nuclear energy	Hydro-electric	Renewables	Other†	Total
Canada	5.2	84.7	26.2	86.6	397.7	54.5	3.9	658.9	4.8	89.9	23.6	89.0	364.2	57.0	4.7	633.2
Mexico	32.7	192.1	21.4	10.8	35.6	47.6	-	340.1	33.4	204.9	27.9	12.4	20.4	55.9	-	354.9
US	24.7	1814.1	906.7	812.1	251.3	717.3	11.6	4537.7	17.7	1937.7	738.4	816.2	236.3	737.3	10.3	4494.0
Total North America	62.6	2090.9	954.3	909.6	684.6	819.5	15.4	5536.8	55.9	2232.5	789.8	917.6	620.9	850.2	15.1	5482.0
Argentina	16.1	76.6	2.3	7.5	22.8	19.5	0.8	145.6	9.0	75.9	1.8	9.0	29.9	20.0	0.8	146.4
Brazil	10.1	42.1	14.2	14.6	427.1	166.8	2.3	677.2	9.8	37.7	14.2	14.5	428.7	202.8	2.4	710.0
Other S. & Cent. America	68.5	114.4	37.0	-	295.2	69.8	-	584.9	74.5	127.6	37.7	-	291.4	76.9	-	608.1
Total S. & Cent. America	94.8	233.1	53.6	22.0	745.1	256.0	3.1	1407.7	93.2	241.3	53.7	23.5	749.9	299.7	3.2	1464.5
France	2.4	47.1	3.1	294.7	44.3	66.8	8.2	466.5	1.8	32.3	0.9	338.2	55.5	84.3	6.7	519.7
Germany	5.7	79.1	180.0	34.7	17.6	237.0	23.8	577.9	4.9	77.7	127.8	7.2	19.6	252.8	23.6	513.7
Italy	12.8	141.4	24.2	-	28.4	72.1	5.0	284.0	10.6	117.5	20.0	-	38.9	75.1	3.2	265.3
Netherlands	1.6	47.7	17.4	4.2	-	48.3	2.6	121.8	1.6	45.9	10.7	4.0	0.1	58.1	2.1	122.3
Poland	2.4	11.4	126.7	-	2.0	35.7	1.7	179.7	2.0	16.4	100.2	-	2.4	44.0	2.0	167.0
Spain	10.6	86.0	8.7	58.6	17.6	105.3	5.8	292.5	10.7	61.7	4.3	56.8	25.5	116.5	6.5	282.0
Türkiye	0.4	75.1	113.7	-	66.8	71.0	1.4	328.4	0.7	69.7	118.3	-	63.9	74.1	1.4	328.0
Ukraine	0.5	7.2	24.3	62.1	11.1	7.5	-	112.7	0.9	8.1	21.6	52.4	12.7	7.7	-	103.4
United Kingdom	2.2	125.0	5.6	47.7	5.6	129.4	6.5	322.0	2.4	97.9	3.5	40.7	5.2	129.8	6.1	285.6
Other Europe	19.5	129.8	155.1	240.2	370.7	270.6	28.0	1214.0	17.8	109.7	122.4	236.6	414.9	288.3	28.2	1218.0
Total Europe	58.1	749.7	658.8	742.2	564.1	1043.7	82.9	3899.4	53.3	636.9	529.9	735.9	638.7	1130.6	79.8	3805.1
Kazakhstan	2.4	32.7	65.0	-	9.2	4.1	-	113.5	2.4	32.3	63.9	-	8.8	5.6	-	113.0
Russian Federation	7.0	527.1	198.6	223.7	197.7	7.4	5.4	1166.9	6.8	528.4	211.1	217.4	200.9	8.2	5.4	1178.2
Other CIS	2.3	163.1	8.5	7.5	41.3	2.1	0.6	225.4	2.1	161.6	9.1	14.4	43.3	2.4	0.6	233.6
Total CIS	11.7	723.0	272.1	231.2	248.2	13.6	5.9	1505.8	11.4	722.3	284.1	231.8	253.0	16.3	5.9	1524.8
Iran	30.2	313.4	0.9	6.6	14.0	2.0	-	367.1	26.9	323.6	0.9	6.6	22.7	2.1	-	382.9
Saudi Arabia	153.0	246.0	-	-	-	2.3	-	401.3	152.1	265.0	-	-	-	5.8	-	422.9
United Arab Emirates	-	125.5	-	20.1	-	7.8	-	153.3	-	118.9	-	32.3	-	13.8	-	165.0
Other Middle East	124.7	306.9	17.7	-	4.1	16.8	0.2	470.5	129.9	320.5	17.4	-	4.9	19.6	0.2	492.6
Total Middle East	307.9	991.8	18.6	26.7	18.2	28.8	0.2	1392.2	308.9	1028.1	18.4	38.9	27.6	41.3	0.2	1463.4
Egypt	16.2	176.3	-	-	13.3	10.9	-	216.7	16.6	178.7	-	-	13.8	11.0	-	220.1
South Africa	3.6	-	197.2	10.1	3.1	16.3	4.5	234.8	4.8	-	185.9	8.9	1.7	18.4	4.7	224.4
Other Africa	44.0	203.3	40.3	-	139.9	23.3	0.6	451.2	40.8	204.7	38.8	-	146.1	27.4	0.6	458.4
Total Africa	63.8	379.5	237.4	10.1	156.3	50.6	5.1	902.7	62.2	383.4	224.7	8.9	161.6	56.7	5.3	902.9
Australia	4.7	50.8	129.2	-	16.7	70.8	0.7	272.9	4.9	46.7	125.6	-	15.3	80.0	0.7	273.1
China	11.5	275.6	5412.7	417.8	1298.1	1372.5	60.5	8848.7	11.2	297.8	5753.9	434.7	1226.0	1668.1	64.7	9456.4
India	2.4	46.5	1354.2	46.2	174.9	203.8	1.3	1829.3	2.8	52.6	1471.3	48.2	149.2	232.8	1.3	1958.2
Indonesia	6.1	56.1	205.3	-	27.3	38.1	0.6	333.5	6.6	61.0	216.8	-	24.6	40.6	1.1	350.6
Japan	42.5	351.5	325.6	51.8	74.9	138.3	56.0	1040.6	33.4	320.9	304.3	77.5	74.5	149.0	53.7	1013.3
Malaysia	1.6	68.5	77.8	-	31.8	4.0	-	183.6	1.2	69.2	81.4	-	31.5	4.5	-	187.8
South Korea	8.3	174.4	206.2	176.1	3.5	51.9	4.1	624.6	7.7	167.0	202.8	180.5	3.7	52.0	4.2	617.9
Taiwan	4.4	112.0	121.0	23.8	5.8	16.2	4.9	288.2	3.8	111.6	119.2	17.8	4.0	21.1	4.7	282.1
Thailand	1.7	114.6	35.5	-	6.6	21.9	-	180.4	0.9	129.4	30.4	-	6.6	23.2	-	190.5
Vietnam	0.1	29.2	104.0	-	95.9	35.2	0.7	265.1	1.3	26.3	129.6	-	80.9	37.9	0.5	276.4
Other Asia Pacific	60.4	221.6	157.9	22.2	171.5	41.8	1.1	676.5	39.5	219.3	177.2	22.4	172.0	44.3	0.8	675.5
Total Asia Pacific	143.8	1500.9	8129.6	737.8	1907.1	1994.5	129.8	14543.4	113.2	1501.8	8612.4	781.1	1788.2	2353.5	131.8	15282.0
Total World	742.6	6668.9	10324.4	2679.6	4323.4	4206.7	242.4	29188.1	698.1	6746.3	10513.0	2737.7	4240.0	4748.4	241.3	29924.8
of which: OECD	171.6	3475.7	2211.4	1790.0	1394.8	2149.4	158.3	11351.2	150.5	3463.5	1904.5	1831.7	1385.5	2290.5	152.5	11178.6
Non-OECD	571.0	3193.1	8113.0	889.6	2928.7	2057.2	84.2	17836.8	547.6	3282.8	8608.6	906.0	2854.5	2457.9	88.7	18746.2
European Union	52.1	534.8	469.5	609.3	274.2	805.3	67.1	2812.4	46.3	452.2	343.0	619.4	325.7	886.0	64.7	2737.2

* Based on gross output.

† Includes uncatagorised generation, statistical differences and sources not specified elsewhere e.g. pumped hydro, non-renewable waste and heat from chemical sources.

^ Less than 0.05.

Electricity Grid-scale battery energy storage systems (BESS)

Installed capacity (Gigawatts)	Growth rate per annum											Share		
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2023	2013–23	2023
Canada	^	^	^	^	^	^	^	0.1	0.1	0.1	0.4	426.1%	69.7%	0.7%
Mexico	-	-	-	-	-	-	-	-	-	^	^	-	-	†
US	0.2	0.2	0.4	0.6	0.7	0.9	1.1	1.7	5.1	9.3	15.8	70.0%	55.0%	28.3%
Total North America	0.2	0.2	0.4	0.6	0.8	1.0	1.2	1.8	5.2	9.4	16.2	72.8%	55.2%	29.0%
Brazil	-	-	-	-	-	-	-	-	^	^	^	-	-	0.1%
Chile	^	^	^	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	98.0%	18.3%	0.3%
Other S. & Cent. America	^	^	^	^	^	^	^	^	^	^	0.1	206.6%	38.7%	0.1%
Total S. & Cent. America	^	^	^	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.3	145.2%	23.3%	0.5%
Germany	^	^	^	0.2	0.3	0.4	0.5	0.6	0.7	1.3	1.7	27.9%	54.9%	3.1%
Ireland	^	-	-	-	-	-	-	^	0.2	0.3	0.4	27.6%	-	0.8%
United Kingdom	^	^	^	0.2	0.2	0.6	0.8	1.0	1.7	2.3	3.6	54.2%	111.7%	6.5%
Other Europe	^	^	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.9	1.2	36.0%	59.2%	2.2%
Total Europe	^	0.1	0.1	0.3	0.6	1.1	1.4	1.8	2.9	4.9	7.0	41.9%	69.7%	12.5%
Kazakhstan	-	-	-	-	-	-	-	-	^	^	^	-	-	†
Other CIS	^	^	^	^	^	^	^	^	^	^	^	-	5.2%	†
Total CIS	^	^	^	^	^	^	^	^	^	^	^	-	25.9%	0.1%
United Arab Emirates	^	^	^	^	^	0.1	0.1	0.1						

Terawatt-hours	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Growth rate per annum		Share
												2023	2013–23	2023
Canada	391.8	382.5	382.2	385.4	394.6	385.9	381.8	386.5	382.4	397.7	364.2	-8.4%	-0.7%	8.6%
Mexico	28.0	38.9	30.9	30.0	30.9	32.2	23.6	26.8	34.7	35.6	20.4	-42.6%	-3.1%	0.5%
US	266.5	255.8	246.5	263.8	296.8	289.5	285.5	282.8	249.0	251.3	236.3	-6.0%	-1.2%	5.6%
Total North America	686.3	677.1	659.5	679.2	722.3	707.6	690.8	696.1	666.1	684.6	620.9	-9.3%	-1.0%	14.6%
Argentina	32.8	32.4	32.3	29.8	31.6	32.3	27.5	23.7	19.6	22.8	29.9	31.3%	-0.9%	0.7%
Brazil	391.0	373.4	359.7	380.9	370.9	389.0	397.9	396.4	362.8	427.1	428.7	0.4%	0.9%	10.1%
Chile	19.9	23.0	23.6	19.7	21.3	23.4	21.4	21.7	18.1	20.4	24.0	17.9%	1.9%	0.6%
Colombia	44.4	44.7	44.7	46.8	57.3	56.7	54.4	49.8	60.5	64.3	59.8	-7.0%	3.0%	1.4%
Ecuador	11.0	11.5	13.1	15.8	20.1	20.7	24.6	24.3	25.6	24.6	25.3	2.9%	8.7%	0.6%
Peru	22.3	22.2	23.7	24.1	29.1	30.7	31.5	30.5	31.9	29.7	29.1	-2.3%	2.7%	0.7%
Trinidad & Tobago	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Venezuela	81.5	80.4	74.7	63.0	70.0	65.3	62.8	67.2	67.8	68.5	65.6	-4.3%	-2.1%	1.5%
Central America	21.9	21.6	22.5	22.8	27.1	26.8	21.6	26.9	29.8	31.4	25.4	-19.3%	1.5%	0.6%
Other Caribbean	2.5	1.8	1.4	1.9	2.7	2.4	1.6	1.8	2.0	2.0	1.6	-17.2%	-3.9%	†
Other South America	72.5	68.2	67.4	74.6	70.9	69.9	62.2	54.8	50.8	54.2	60.5	11.7%	-1.8%	1.4%
Total S. & Cent. America	699.8	679.2	663.2	679.3	701.1	717.2	705.5	697.1	669.0	745.1	749.9	0.6%	0.7%	17.7%
Austria	42.0	41.0	37.2	40.0	38.3	37.6	40.8	42.0	38.8	34.0	38.9	14.4%	-0.8%	0.9%
Belgium	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.4	0.3	0.4	44.7%	0.3%	†
Bulgaria	4.0	4.6	5.7	3.9	2.8	5.1	2.9	2.8	4.8	3.8	3.1	-17.7%	-2.5%	0.1%
Croatia	8.6	9.0	6.4	6.9	5.3	7.7	5.8	5.7	7.1	5.5	8.2	49.7%	-0.5%	0.2%
Cyprus	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Czech Republic	2.7	1.9	1.8	2.0	1.9	1.6	2.0	2.1	2.4	2.1	2.3	11.9%	-1.5%	0.1%
Denmark	^	^	^	^	^	^	^	^	^	^	^	31.7%	3.9%	†
Estonia	^	^	^	^	^	^	^	^	^	^	^	15.5%	0.2%	†
Finland	12.8	13.4	16.8	15.8	14.8	13.3	12.4	15.9	15.8	13.5	15.2	12.5%	1.7%	0.4%
France	70.8	62.8	54.6	59.9	49.0	63.9	56.0	61.7	58.7	44.3	55.5	25.4%	-2.4%	1.3%
Germany	23.0	19.6	19.0	20.5	20.2	17.7	19.7	18.3	19.7	17.6	19.6	11.4%	-1.6%	0.5%
Greece	6.3	4.5	6.1	5.5	4.0	5.7	4.0	3.3	5.9	3.9	3.9	2.4%	-4.6%	0.1%
Hungary	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	24.7%	0.4%	†
Iceland	12.9	12.9	13.8	13.5	14.1	13.8	13.5	13.2	13.8	14.2	14.2	0.2%	1.0%	0.3%
Ireland	0.6	0.7	0.8	0.7	0.7	0.7	0.9	0.9	0.7	0.7	0.9	33.2%	4.5%	†
Italy	52.8	58.5	45.5	42.4	36.2	48.8	46.4	47.6	45.4	28.4	38.9	37.1%	-3.0%	0.9%
Latvia	2.9	2.0	1.9	2.5	4.4	2.4	2.1	2.6	2.7	2.7	3.8	38.2%	2.7%	0.1%
Lithuania	0.5	0.4	0.3	0.5	0.6	0.4	0.3	0.3	0.4	0.5	0.5	-3.0%	-1.5%	†
Luxembourg	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	40.9%	-2.7%	†
Netherlands	0.1	0.1	0.1	0.1	0.1	0.1	0.1	^	^	^	0.1	36.0%	-5.1%	†
North Macedonia	1.6	1.2	1.9	1.9	1.1	1.8	1.2	1.3	1.5	1.3	1.6	20.6%	0.2%	†
Norway	128.1	135.5	137.3	142.8	142.4	139.0	125.3	140.9	143.3	127.6	136.1	6.6%	0.6%	3.2%
Poland	2.4	2.2	1.8	2.1	2.6	2.0	2.0	2.1	2.3	2.0	2.4	21.8%	-0.2%	0.1%
Portugal	13.7	15.6	8.7	15.7	5.9	12.4	8.8	12.1	11.9	6.5	12.1	84.8%	-1.3%	0.3%
Romania	14.8	18.5	16.6	18.0	14.5	17.7	15.6	15.4	17.4	14.0	18.2	30.5%	2.1%	0.4%
Slovakia	4.8	4.2	3.9	4.4	4.3	3.6	4.4	4.5	4.3	3.7	4.7	29.0%	-0.2%	0.1%
Slovenia	4.6	6.1	3.8	4.5	3.9	4.7	4.5	4.9	4.7	3.1	5.0	57.9%	0.7%	0.1%
Spain	36.8	39.2	28.1	36.4	18.3	34.3	22.5	30.5	29.6	17.6	25.5	44.8%	-3.6%	0.6%
Sweden	61.4	63.8	75.3	62.1	65.1	62.1	65.3	72.3	73.8	69.8	66.0	-5.4%	0.7%	1.6%
Switzerland	38.5	38.0	38.3	34.6	34.1	34.6	37.6	37.5	36.6	29.6	37.0	25.1%	-0.4%	0.9%
Türkiye	59.4	40.6	67.1	67.2	58.2	59.9	88.8	78.1	55.9	66.8	63.9	-4.4%	0.7%	1.5%
Ukraine	13.8	8.5	5.4	7.7	8.9	10.4	6.5	7.6	10.4	11.1	12.7	14.6%	-0.8%	0.3%
United Kingdom	4.7	5.9	6.3	5.4	5.9	5.4	5.9	6.9	5.4	5.6	5.2	-7.9%	1.0%	0.1%
Other Europe	36.0	32.6	32.3	35.7	28.8	38.8	32.3	29.7	40.3	33.6	42.4	26.0%	1.6%	1.0%
Total Europe	661.7	644.0	637.4	653.5	586.7	646.5	628.3	660.9	654.4	564.1	638.7	13.2%	-0.4%	15.1%
Azerbaijan	1.5	1.3	1.6	2.0	1.7	1.8	1.6	1.1	1.3	1.6	1.8	10.5%	1.7%	†
Belarus	0.1	0.1	0.1	0.1	0.4	0.3	0.4	0.4	0.4	0.4	0.3	-18.9%	8.1%	†
Kazakhstan	7.7	8.3	9.3	11.6	11.2	10.4	10.0	9.7	9.2	9.2	8.8	-4.4%	1.3%	0.2%
Russian Federation	181.2	173.4	168.0	184.6	185.2	190.6	194.4	212.4	214.5	197.7	200.9	1.6%	1.0%	4.7%
Turkmenistan	^	^	^	^	^	^	^	^	^	^	^	-	†	†
Uzbekistan	6.3	6.2	6.0	6.9	7.9	5.9	6.5	5.0	5.0	5.3	7.0	31.7%	1.1%	0.2%
Other CIS	32.7	31.9	30.4	30.7	33.9	35.3	35.7	34.1	34.4	34.1	34.3	0.6%	0.5%	0.8%
Total CIS	229.4	221.1	215.4	235.9	240.3	244.3	248.5	262.7	264.8	248.2	253.0	1.9%	1.0%	6.0%
Iran	14.6	14.5	13.3	15.4	17.2	9.8	33.9	23.2	13.8	14.0	22.7	61.8%	4.5%	0.5%
Iraq	4.6	2.8	2.5	3.4	2.2	1.8	5.0	4.2	3.3	2.7	3.4	27.8%	-3.0%	0.1%
Israel	^	^	^	^	^	^	^	^	^	^	^	-1.0%	-1.7%	†
Kuwait	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Oman	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Qatar	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Saudi Arabia	-	-	-	-	-	-	-	-	-	-	-	-	-	-
United Arab Emirates	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Middle East	4.2	2.6	0.9	1.4	1.2	1.1	1.7	1.8	1.4	1.5	1.5	2.9%	-9.8%	†
Total Middle East	23.5	19.9	16.8	20.2	20.6	12.8	40.6	29.2	18.6	18.2	27.6	51.9%	1.6%	0.7%
Algeria	0.1	0.2	0.1	0.1	0.1	0.1	0.2	^	^	^	0.1	329.9%	-3.6%	†
Egypt	13.2	13.6	13.7	13.2	12.8	12.9	14.1	14.9	13.9	13.3	13.8	4.0%	0.4%	0.3%
Morocco	2.8	1.6	1.9	1.3	1.2	1.7	1.3	0.9	0.8	0.4	0.2	-53.5%	-24.7%	†
South Africa	1.1	1.8	0.7	0.6	0.8	1.1	0.7	1.5	2.0	3.1	1.7	-45.6%	4.3%	†
Eastern Africa	61.5	65.7	65.0	61.5	64.5	68.4	68.5	73.5	77.1	79.6	82.1	3.2%	2.9%	1.9%
Middle Africa	19.4	20.7	21.0	22.0	24.9	28.0	29.6	32.2	32.7	32.8	33.7	2.9%	5.7%	0.8%
Western Africa	17.1	17.9	16.0	18.4	18.8	19.9	22.5	22.4	24.0	25.6	28.0	9.3%	5.1%	0.7%
Other Northern Africa	0.1	0.1	0.1	^	^	^	0.1	^	^	^	^	-38.3%	-17.1%	†
Other Southern Africa	2.0	2.3	2.3	2.0	2.2	1.9	1.6	2.2	1.8	1.5	2.1	34.8%	0.3%	†
Total Africa	117.2	123.9	120.7	119.1	125.2	134.1	138.5	147.7	152.5	156.3	161.6	3.4%	3.3%	3.8%
Australia	19.1	14.5	14.1	17.6	13.5	17.3	14.0	14.4	15.9	16.7	15.3	-8.4%	-2.2%	0.4%
Bangladesh	0.7	0.6	0.9	0.9	1.0	0.9	0.8	0.7	0.7	0.8	0.7	-11.8%	-0.6%	†
China	909.6	1059.7	1114.5	1153.3	1165.1	1198.9	1272.5	1321.7	1300.0	1298.1	1226.0	-5.6%	3.0%	28.9%
China Hong Kong SAR	-	-	-	-	-	-	-	-	-	-	-	-	-	-
India	132.0	139.0	133.3	128.4	135.8	139.8	162.1	163.7	160.3	174.9	149.2	-14.7%	1.2%	3.5%
Indonesia	16.9	15.2	13.7	18.7	18.6	21.6	21.2	24.3	24.7	27.3	24.8	-9.2%	3.9%	0.6%
Japan	79.3	81.7	85.8	79.4	79.2	81.0	73.9	78.3	79.6	74.9	74.5	-0.5%	-0.6%	1.8%
Malaysia	11.8	13.4	13.9	20.0	26.8	26.3	26.2	27.3	30.2	31.8	31.5	-0.9%	10.3%	0.7%
New Zealand	23.0	24.3	24.5	25.9	25.2	26.3	25.6	24.3	24.2	26.3	26.5	0.9%	1.4%	0.6%
Pakistan	31.5	32.4	32.8	34.6	30.2	29.5	36.1	40.0	37.6	34.5	37.4	8.4%	1.7%	0.9%
Philippines	10.0	9.1	8.7	8.1	9.6	9.4	8.0							



Renewable energy Renewable power primary energy input consumption (including hydro)*

Exajoules (input-equivalent)*												Growth rate per annum		Share
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2023	2013-23	2023
Canada	4.09	3.99	4.11	4.18	4.24	4.15	4.09	4.15	4.13	4.26	3.96	-7.1%	-0.3%	4.6%
Mexico	0.39	0.52	0.47	0.47	0.49	0.53	0.55	0.66	0.77	0.78	0.72	-8.3%	6.2%	0.8%
US	5.33	5.50	5.56	6.20	6.97	7.18	7.41	7.96	8.32	9.20	9.21	0.1%	5.6%	10.8%
Total North America	9.82	10.01	10.14	10.85	11.70	11.86	12.05	12.77	13.22	14.25	13.88	-2.5%	3.5%	16.2%
Argentina	0.34	0.34	0.34	0.31	0.33	0.34	0.33	0.35	0.35	0.40	0.47	17.6%	3.2%	0.6%
Brazil	4.37	4.30	4.27	4.58	4.58	4.82	5.00	5.06	4.90	5.69	6.02	5.9%	3.3%	7.0%
Chile	0.28	0.30	0.33	0.32	0.36	0.41	0.40	0.41	0.42	0.49	0.55	12.9%	7.1%	0.6%
Colombia	0.45	0.46	0.45	0.47	0.57	0.56	0.55	0.51	0.61	0.64	0.61	-5.4%	3.0%	0.7%
Ecuador	0.11	0.12	0.13	0.16	0.20	0.20	0.24	0.24	0.25	0.24	0.24	2.9%	8.0%	0.3%
Peru	0.23	0.24	0.25	0.25	0.30	0.32	0.33	0.32	0.33	0.31	0.31	-0.7%	2.9%	0.4%
Trinidad & Tobago	^	^	^	^	^	^	^	^	^	^	^	-0.4%	-0.4%	†
Venezuela	0.80	0.79	0.73	0.61	0.67	0.62	0.60	0.64	0.64	0.64	0.61	-4.6%	-2.6%	0.7%
Central America	0.30	0.31	0.34	0.35	0.39	0.41	0.37	0.42	0.45	0.46	0.41	-11.2%	3.0%	0.5%
Other Caribbean	^	^	^	^	0.06	0.06	0.06	0.07	0.07	0.08	0.08	2.3%	4.8%	0.1%
Other South America	0.73	0.70	0.71	0.78	0.75	0.75	0.68	0.61	0.58	0.60	0.67	11.0%	-0.9%	0.8%
Total S. & Cent. America	7.68	7.59	7.58	7.88	8.21	8.50	8.55	8.62	8.60	9.56	9.98	4.5%	2.7%	11.7%
Austria	0.50	0.50	0.47	0.50	0.50	0.49	0.53	0.53	0.51	0.48	0.54	13.2%	0.7%	0.6%
Belgium	0.12	0.13	0.15	0.15	0.16	0.17	0.20	0.23	0.22	0.24	0.26	7.9%	7.7%	0.3%
Bulgaria	0.07	0.07	0.09	0.07	0.06	0.09	0.07	0.07	0.10	0.10	0.10	2.8%	3.7%	0.1%
Croatia	0.09	0.10	0.07	0.08	0.07	0.09	0.08	0.08	0.10	0.09	0.11	32.1%	2.3%	0.1%
Cyprus	^	^	^	^	^	^	^	^	^	^	^	21.6%	12.0%	†
Czech Republic	0.10	0.10	0.10	0.10	0.10	0.10	0.11	0.11	0.11	0.11	0.11	-0.9%	1.0%	0.1%
Denmark	0.16	0.18	0.19	0.19	0.22	0.21	0.23	0.23	0.26	0.28	0.29	2.8%	5.9%	0.3%
Estonia	^	^	^	^	^	^	^	^	^	^	^	-1.6%	8.3%	†
Finland	0.27	0.28	0.32	0.31	0.32	0.33	0.33	0.36	0.39	0.39	0.41	6.4%	4.3%	0.5%
France	0.97	0.91	0.89	0.95	0.89	1.08	1.07	1.18	1.15	1.06	1.33	25.0%	3.2%	1.6%
Germany	1.57	1.66	1.91	1.92	2.16	2.22	2.39	2.48	2.31	2.50	2.65	6.2%	5.4%	3.1%
Greece	0.14	0.12	0.14	0.14	0.13	0.15	0.15	0.17	0.21	0.21	0.23	7.3%	4.9%	0.3%
Hungary	^	^	^	^	^	^	^	0.06	0.07	0.08	0.09	13.3%	11.0%	0.1%
Iceland	0.18	0.17	0.18	0.18	0.18	0.19	0.18	0.18	0.18	0.19	0.19	0.2%	0.6%	0.2%
Ireland	0.06	0.06	0.08	0.07	0.09	0.10	0.11	0.13	0.11	0.12	0.13	5.6%	8.9%	0.2%
Italy	1.13	1.21	1.09	1.07	1.03	1.13	1.14	1.14	1.13	0.98	1.10	12.0%	-0.3%	1.3%
Latvia	^	^	^	^	0.05	^	^	^	^	^	^	22.8%	2.5%	0.1%
Lithuania	^	^	^	^	^	^	^	^	^	^	^	22.2%	8.9%	†
Luxembourg	^	^	^	^	^	^	^	^	^	^	^	1.2%	10.6%	†
Netherlands	0.13	0.12	0.14	0.15	0.18	0.19	0.23	0.33	0.40	0.47	0.56	18.4%	15.8%	0.7%
North Macedonia	^	^	^	^	^	^	^	^	^	^	^	35.9%	2.6%	†
Norway	1.28	1.35	1.36	1.40	1.39	1.36	1.25	1.43	1.46	1.34	1.41	5.2%	1.0%	1.7%
Poland	0.18	0.21	0.24	0.23	0.24	0.22	0.26	0.28	0.30	0.37	0.45	22.2%	9.5%	0.5%
Portugal	0.29	0.31	0.24	0.32	0.22	0.29	0.27	0.29	0.31	0.27	0.33	22.3%	1.1%	0.4%
Romania	0.20	0.25	0.25	0.26	0.23	0.25	0.23	0.23	0.25	0.22	0.26	17.8%	2.9%	0.3%
Slovakia	0.06	0.06	0.06	0.07	0.07	0.06	0.07	0.07	0.07	0.06	0.07	24.4%	1.2%	0.1%
Slovenia	0.05	0.06	^	^	^	0.05	^	0.05	0.05	^	0.06	55.4%	1.8%	0.1%
Spain	1.10	1.08	0.95	1.02	0.85	1.00	0.93	1.09	1.20	1.17	1.34	14.7%	2.0%	1.6%
Sweden	0.83	0.85	1.01	0.88	0.93	0.89	0.96	1.08	1.12	1.13	1.10	-3.2%	2.8%	1.3%
Switzerland	0.40	0.40	0.40	0.37	0.37	0.37	0.40	0.40	0.40	0.34	0.43	26.2%	0.6%	0.5%
Türkiye	0.68	0.51	0.81	0.87	0.84	0.93	1.26	1.22	1.13	1.31	1.30	-0.2%	6.7%	1.5%
Ukraine	0.15	0.10	0.07	0.09	0.10	0.12	0.11	0.16	0.21	0.18	0.19	9.4%	2.7%	0.2%
United Kingdom	0.55	0.67	0.86	0.86	1.01	1.12	1.21	1.35	1.23	1.34	1.34	-0.6%	9.2%	1.6%
Other Europe	0.36	0.32	0.32	0.35	0.28	0.38	0.33	0.30	0.41	0.35	0.43	24.8%	2.0%	0.5%
Total Europe	11.74	11.91	12.56	12.78	12.84	13.74	14.29	15.38	15.51	15.54	16.96	9.2%	3.8%	19.8%
Azerbaijan	^	^	^	^	^	^	^	^	^	^	^	8.8%	2.1%	†
Belarus	^	^	^	^	^	^	^	^	^	^	^	-10.6%	17.2%	†
Kazakhstan	0.08	0.08	0.09	0.12	0.11	0.10	0.11	0.11	0.12	0.12	0.13	8.0%	5.9%	0.2%
Russian Federation	1.78	1.70	1.64	1.79	1.79	1.83	1.86	2.05	2.08	1.93	1.96	1.6%	0.9%	2.3%
Turkmenistan	^	^	^	^	^	^	^	^	^	^	^	-0.4%	6.8%	†
Uzbekistan	0.06	0.06	0.06	0.07	0.08	0.06	0.06	^	^	0.05	0.07	32.6%	1.1%	0.1%
Other CIS	0.32	0.31	0.29	0.30	0.33	0.34	0.34	0.32	0.33	0.33	0.33	1.1%	0.3%	0.4%
Total CIS	2.26	2.17	2.10	2.29	2.32	2.35	2.39	2.55	2.60	2.46	2.52	2.5%	1.1%	2.9%
Iran	0.15	0.14	0.13	0.15	0.17	0.10	0.33	0.24	0.15	0.15	0.23	54.5%	4.7%	0.3%
Iraq	^	^	^	^	^	0.05	^	^	^	^	^	23.5%	-2.5%	†
Israel	^	^	^	^	^	^	^	^	0.05	0.06	0.08	25.7%	29.8%	0.1%
Kuwait	^	^	^	^	^	^	^	^	^	^	^	-8.6%	96.5%	†
Oman	^	^	^	^	^	^	^	^	^	^	^	2.0%	104.3%	†
Qatar	^	^	^	^	^	^	^	^	^	^	^	239.6%	31.3%	†
Saudi Arabia	^	^	^	^	^	^	^	^	^	^	0.05	152.0%	62.6%	0.1%
United Arab Emirates	^	^	^	^	^	^	^	0.06	0.07	0.07	0.13	77.8%	65.2%	0.2%
Other Middle East	^	^	^	^	^	0.05	0.07	0.07	0.09	0.09	0.09	0.5%	7.7%	0.1%
Total Middle East	0.24	0.21	0.19	0.23	0.25	0.20	0.51	0.44	0.39	0.44	0.39	-12.3%	4.8%	0.5%
Algeria	^	^	^	^	^	^	^	^	^	^	^	7.4%	18.5%	†
Egypt	0.15	0.14	0.15	0.15	0.15	0.16	0.19	0.23	0.23	0.23	0.23	2.2%	4.8%	0.3%
Morocco	^	^	^	^	^	0.06	0.07	0.07	0.07	0.07	0.08	22.8%	7.7%	0.1%
South Africa	^	^	0.07	0.08	0.12	0.12	0.12	0.13	0.17	0.18	0.19	3.0%	25.8%	0.2%
Eastern Africa	0.65	0.70	0.71	0.67	0.69	0.74	0.75	0.79	0.83	0.86	0.89	4.0%	3.3%	1.0%
Middle Africa	0.19	0.20	0.20	0.21	0.24	0.27	0.28	0.31	0.31	0.31	0.32	2.9%	5.4%	0.4%
Western Africa	0.17	0.18	0.16	0.19	0.19	0.20	0.23	0.23	0.25	0.26	0.29	10.1%	5.3%	0.3%
Other Northern Africa	^	^	^	^	^	^	^	^	^	^	^	10.8%	4.8%	†
Other Southern Africa	^	^	^	^	^	^	^	^	^	^	^	26.8%	1.8%	†
Total Africa	1.24	1.33	1.36	1.38	1.47	1.58	1.68	1.80	1.90	1.95	2.05	5.3%	5.1%	2.4%
Australia	0.35	0.33	0.35	0.41	0.38	0.48	0.53	0.61	0.73	0.83	0.90	8.5%	9.7%	1.0%
Bangladesh	^	^	^	^	^	^	^	^	^	^	^	19.1%	7.3%	†
China	10.79	12.65	13.61	14.79	16.12	17.66								

Renewable energy Solar – Installed photovoltaic (PV) power and concentrated solar power (CSP)*

Megawatts												Growth rate per annum		Share
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2023	2013–23	2023
Canada	1210	1843	2519	2665	2932	3095	3327	3609	4554	5312	5757	8.4%	16.9%	0.4%
Mexico	109	174	287	633	1126	2583	4744	6712	8180	9364	10910	16.5%	58.5%	0.8%
US	13246	18112	24237	35434	43770	51987	61587	76441	95391	114361	139205	21.7%	26.5%	9.8%
Total North America	14565	20129	27043	38731	47828	57665	69658	86762	108125	129037	155873	20.8%	26.7%	11.0%
Argentina	16	16	16	16	16	198	447	769	1080	1116	1408	26.2%	57.0%	0.1%
Brazil	12	21	46	128	1207	2453	4698	8452	14499	25520	37449	46.7%	122.8%	2.6%
Chile	12	203	545	1050	1829	2294	2673	3229	4516	6525	8475	29.9%	93.1%	0.6%
Honduras	5	5	396	412	455	515	518	525	529	529	529	–	58.9%	^
The Dominican Republic	7	13	22	70	93	188	331	382	580	732	1073	46.7%	65.7%	0.1%
Other S. & Cent. America	405	506	882	1064	1666	1885	2415	2829	3494	4039	4669	15.6%	27.7%	0.3%
Total S. & Cent. America	457	764	1907	2739	5265	7531	11083	16186	24699	38462	53603	39.4%	61.1%	3.8%
Austria	626	785	937	1096	1269	1455	1702	2043	2783	3792	6832	80.2%	27.0%	0.5%
Belgium	2902	3015	3132	3329	3621	4000	4637	5573	6012	6756	8549	26.5%	11.4%	0.6%
Bulgaria	1039	1029	1028	1030	1031	1033	1044	1100	1275	1737	2937	69.1%	11.0%	0.2%
Czech Republic	2064	2067	2075	2068	2075	2081	2111	2172	2246	2420	2499	3.3%	1.9%	0.2%
Denmark	571	607	782	851	906	998	1080	1304	1704	3070	3529	15.0%	20.0%	0.2%
France	5277	6034	7138	7702	8610	9629	10738	11926	14612	17350	20551	18.4%	14.6%	1.4%
Germany	36710	37900	39224	40679	42293	45158	48914	53671	60038	67479	81739	21.1%	8.3%	5.8%
Greece	2579	2596	2604	2604	2606	2651	2834	3288	4277	5430	7030	29.5%	10.5%	0.5%
Hungary	35	89	172	235	344	728	1400	2131	2968	4235	5835	37.8%	66.8%	0.4%
Italy	18190	18600	18907	19289	19688	20114	20871	21656	22600	24561	29795	21.3%	5.1%	2.1%
Lithuania	68	69	69	70	74	82	103	164	255	572	1165	103.7%	32.9%	0.1%
Netherlands	650	1007	1526	2135	2911	4608	7228	11110	14823	19600	23904	22.0%	43.4%	1.7%
Poland	2	27	108	187	287	562	1539	3955	7416	12170	15809	29.9%	141.0%	1.1%
Portugal	296	415	447	513	579	667	901	1100	1646	2646	3876	46.5%	29.3%	0.3%
Romania	761	1293	1326	1372	1374	1386	1398	1383	1394	1809	1917	6.0%	9.7%	0.1%
Slovakia	533	533	533	533	528	471	590	535	537	549	631	15.0%	1.7%	^
Slovenia	187	224	239	232	247	247	278	370	461	626	1034	65.2%	18.7%	0.1%
Spain	6994	7001	7008	7017	7027	7068	11111	12440	16019	25615	31016	21.1%	16.1%	2.2%
Sweden	43	60	104	153	244	428	714	1107	1606	2388	3488	46.1%	55.2%	0.2%
Switzerland	756	1061	1394	1664	1906	2173	2498	2973	3655	4340	5840	34.6%	22.7%	0.4%
Türkiye	19	41	250	834	3422	5064	5996	6668	7817	9426	11293	19.8%	89.7%	0.8%
Ukraine	748	819	841	955	1200	2003	5936	7331	8062	8062	8062	–	26.8%	0.6%
United Kingdom	2937	5528	9601	11914	12760	13060	13345	13551	13915	14651	15657	6.9%	18.2%	1.1%
Other Europe	221	331	404	500	647	817	1217	1758	2479	3713	6211	67.3%	39.6%	0.4%
Total Europe	84208	91133	99849	109662	115649	126483	148184	169308	198600	242999	299200	23.1%	13.5%	21.1%
Russian Federation	1	5	61	76	225	535	1276	1428	1661	1816	2170	19.5%	110.7%	0.2%
Kazakhstan	^	5	57	57	59	209	542	912	1038	1146	1306	13.9%	119.6%	0.1%
Other CIS	2	8	12	75	114	210	212	250	461	812	1209	49.0%	89.7%	0.1%
Total CIS	4	18	130	209	398	954	2030	2589	3160	3774	4685	24.2%	104.0%	0.3%
Israel	446	656	796	906	1006	1346	2138	2652	3591	4411	4524	2.6%	26.1%	0.3%
Jordan	^	^	57	311	418	760	971	1541	1811	1966	1990	1.2%	160.0%	0.1%
Saudi Arabia	22	24	24	24	34	84	109	109	439	440	2285	419.5%	58.8%	0.2%
United Arab Emirates	126	130	132	135	353	600	1935	2333	3002	3588	5925	65.1%	47.0%	0.4%
Other Middle East	38	72	145	245	438	744	923	1172	1417	3579	3819	6.7%	58.4%	0.3%
Total Middle East	633	883	1154	1621	2250	3535	6077	7807	10261	13983	18543	32.6%	40.2%	1.3%
Algeria	25	28	61	261	354	366	366	366	366	451	451	–	33.5%	^
Egypt	35	35	36	59	180	764	1647	1643	1663	1724	1856	7.7%	48.7%	0.1%
Morocco	35	40	200	202	204	734	734	774	854	854	934	9.4%	38.8%	0.1%
South Africa	262	1164	1353	2176	3451	4805	4908	5994	6316	6326	6164	–2.6%	37.1%	0.4%
Tunisia	10	17	28	38	47	64	80	95	95	197	506	156.8%	48.8%	^
Other Africa	307	384	493	610	870	1290	1677	1883	2342	3150	3568	13.3%	27.8%	0.3%
Total Africa	674	1668	2171	3346	5106	8023	9412	10756	11635	12702	13479	6.1%	34.9%	0.9%
Australia	4568	5287	5946	6689	7291	11365	16147	20838	25757	29958	33683	12.4%	22.1%	2.4%
China	17759	28399	43549	77819	130832	175262	204971	253864	306973	393032	609921	55.2%	42.4%	43.0%
India	1603	3776	5697	9982	18257	27485	35250	39705	49950	63390	73109	15.3%	46.5%	5.2%
Japan	13599	23339	34150	42040	49500	56162	63192	71868	78413	83057	87068	4.8%	20.4%	6.1%
Malaysia	139	205	266	344	394	545	894	1483	1787	1933	1933	–	30.1%	0.1%
Pakistan	101	165	265	589	655	680	756	855	1078	1244	1244	–	28.6%	0.1%
Philippines	3	28	172	784	908	919	982	1058	1378	1625	1675	3.0%	87.9%	0.1%
South Korea	1555	2620	3845	4882	6435	8921	12717	17323	21264	24078	27046	12.3%	33.1%	1.9%
Taiwan	410	636	884	1245	1768	2738	4150	5817	7700	9724	12418	27.7%	40.6%	0.9%
Thailand	829	1304	1425	2451	2702	2967	2988	2984	3065	3185	3186	^	14.4%	0.2%
Vietnam	5	5	5	5	8	105	4994	16661	16661	16698	17077	2.3%	127.9%	1.2%
Other Asia Pacific	303	400	600	747	1070	1301	2007	2541	3352	4255	5226	22.8%	32.9%	0.4%
Total Asia Pacific	40872	66164	96805	147578	219821	288450	349048	434998	517378	632180	873586	38.2%	35.8%	61.6%
Total World	141412	180759	229058	301186	396316	492641	595492	728405	873858	1073136	1418969	32.2%	25.9%	100.0%

Source: IRENA (2024), Renewable Capacity Statistics 2024, The International Renewable Energy Agency, Abu Dhabi.

* End of year.

^ Less than 0.05.



Renewable energy Wind – Installed wind turbine capacity*

Megawatts												Growth rate per annum		Share
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2023	2013–23	2023
Canada	7801	9694	11214	11973	12250	12816	13220	13735	14259	15265	16989	11.3%	8.1%	1.7%
Mexico	2122	2569	3271	4051	4180	4180	6541	6995	7155	7318	7318	^	13.2%	0.7%
US	60198	64430	72767	81502	87831	94666	103836	118664	133019	141674	148020	4.5%	9.4%	14.6%
Total North America	70121	76693	87252	97526	104261	111662	123597	139394	154433	164257	172327	4.9%	9.4%	16.9%
Argentina	163	188	188	188	228	751	1609	2624	3292	3310	3706	12.0%	36.7%	0.4%
Brazil	2202	4888	7633	10129	12304	14843	15438	17198	21161	24163	29135	20.6%	29.5%	2.9%
Chile	295	732	907	1034	1305	1524	1620	2340	3137	3830	4510	17.8%	31.4%	0.4%
Costa Rica	148	196	278	319	378	408	411	394	390	390	408	4.5%	10.7%	^
Uruguay	59	481	857	1211	1513	1513	1516	1516	1516	1516	1516	^	38.3%	0.1%
Other S. & Cent. America	675	962	1346	1569	1635	1864	2080	2147	2275	2519	2742	8.9%	15.1%	0.3%
Total S. & Cent. America	3542	7448	11209	14451	17363	20903	22675	26220	31772	35729	42018	17.6%	28.1%	4.1%
Austria	1675	2110	2489	2730	2887	3133	3224	3226	3408	3579	3977	11.1%	9.0%	0.4%
Belgium	1769	1933	2181	2334	2779	3305	3864	4673	4948	5303	5504	3.8%	12.0%	0.5%
Bulgaria	683	699	699	699	698	699	703	703	704	702	702	-	0.3%	0.1%
Denmark	4819	4886	5077	5245	5489	6123	6111	6259	7004	7084	7482	5.6%	4.5%	0.7%
Finland	447	627	1005	1565	2044	2041	2284	2586	3257	5677	6957	22.5%	31.6%	0.7%
France	8160	9201	10298	11567	13499	14900	16427	17535	18511	20811	22196	6.7%	10.5%	2.2%
Germany	33477	38614	44580	49435	55580	58721	60742	62201	63711	66163	69459	5.0%	7.6%	6.8%
Greece	1809	1978	2091	2370	2624	2877	3589	4119	4649	4702	5220	11.0%	11.2%	0.5%
Ireland	1923	2283	2451	2802	3319	3674	4126	4307	4339	4536	4807	6.0%	9.6%	0.5%
Italy	8542	8683	9137	9384	9737	10230	10679	10871	11254	11821	12308	4.1%	3.7%	1.2%
Netherlands	2713	2865	3391	4257	4202	4393	4484	6648	7674	8755	10749	22.8%	14.8%	1.1%
Norway	818	859	867	883	1207	1710	2914	4030	5049	5062	5065	0.1%	20.0%	0.5%
Poland	3429	3836	4886	5747	5759	5766	5838	6298	6967	8150	9307	14.2%	10.5%	0.9%
Portugal	4610	4857	4937	5124	5124	5172	5223	5122	5427	5538	5617	1.4%	2.0%	0.6%
Romania	2773	3244	3130	3025	3030	3032	3038	3013	3015	3015	3087	2.4%	1.1%	0.3%
Spain	22958	22925	22943	22990	23124	23405	25590	26819	27908	30114	31028	3.0%	3.1%	3.1%
Sweden	4194	5088	5819	6435	6611	7300	8681	9976	12116	14279	16252	13.8%	14.5%	1.6%
Türkiye	2760	3630	4503	5751	6516	7005	7591	8832	10607	11396	11697	2.6%	15.5%	1.1%
Ukraine	362	514	514	526	553	621	1258	1402	1761	1761	1761	-	17.1%	0.2%
United Kingdom	11282	13074	14305	16126	19585	21606	23887	24458	25748	28762	30215	5.1%	10.4%	3.0%
Other Europe	1724	1913	2193	2442	2700	3007	3358	3560	3936	4365	5318	21.8%	11.9%	0.5%
Total Europe	120927	133819	147496	161436	177068	188721	203610	216638	232034	251575	268708	6.8%	8.3%	26.4%
Russian Federation	10	10	11	11	11	52	102	945	1955	2218	2518	13.5%	73.8%	0.2%
Other CIS	12	14	33	81	103	162	182	182	181	188	192	2.4%	31.6%	^
Total CIS	22	24	44	92	114	214	284	1127	2136	2406	2710	12.6%	61.6%	0.3%
Iran	108	149	153	191	259	282	305	308	310	342	365	6.7%	13.0%	^
Jordan	1	1	118	184	198	295	384	529	632	614	614	-	83.7%	0.1%
Other Middle East	13	14	14	34	37	47	97	97	97	608	892	46.6%	53.2%	0.1%
Total Middle East	122	165	286	409	494	623	786	934	1040	1564	1871	19.6%	31.4%	0.2%
Egypt	555	555	755	755	755	1130	1132	1380	1640	1643	1890	15.1%	13.0%	0.2%
Morocco	495	797	797	902	1022	1225	1225	1435	1471	1558	1858	19.3%	14.1%	0.2%
South Africa	257	569	1079	1473	2094	2094	2094	2516	2495	3163	3442	8.8%	29.6%	0.3%
Tunisia	200	233	240	240	240	245	245	245	245	245	245	-	2.1%	^
Other Africa	235	245	449	461	467	777	832	938	1058	1136	1219	7.2%	17.9%	0.1%
Total Africa	1742	2399	3320	3831	4578	5471	5528	6514	6909	7745	8654	11.7%	17.4%	0.9%
Australia	3221	3797	4181	4324	5407	6409	7881	10207	10555	10555	11327	7.3%	13.4%	1.1%
China	76731	96819	131048	148517	164374	184665	209582	281993	328973	365964	441895	20.7%	19.1%	43.4%
India	18420	22465	25088	28700	32848	35288	37505	38559	40067	41930	44736	6.7%	9.3%	4.4%
Japan	2646	2753	2809	3205	3483	3498	3952	4120	4262	4372	5232	19.7%	7.1%	0.5%
New Zealand	623	682	689	690	690	690	690	690	913	994	1059	6.5%	5.4%	0.1%
Pakistan	106	206	308	591	789	1186	1236	1236	1335	1845	1845	-	33.1%	0.2%
Philippines	33	337	427	427	427	427	443	443	443	443	443	-	29.7%	^
South Korea	576	612	847	1067	1215	1420	1494	1645	1724	1908	2167	13.6%	14.2%	0.2%
Taiwan	614	637	647	682	692	713	845	937	1033	1581	2674	69.1%	15.8%	0.3%
Thailand	223	225	234	507	628	1103	1507	1507	1545	1545	1545	-	21.4%	0.2%
Other Asia Pacific	245	336	450	501	611	847	1160	1556	5427	6818	7988	17.2%	41.7%	0.8%
Total Asia Pacific	103438	128868	166727	189211	211165	236246	266294	342892	396278	437956	520912	18.9%	17.5%	51.2%
Total World	299914	349417	416335	466956	515045	563840	622773	733719	824602	901231	1017199	12.9%	13.0%	100.0%

Source: IRENA (2024), Renewable Energy Statistics 2024, The International Renewable Energy Agency, Abu Dhabi.

* End of year.

^ Less than 0.05.

Note: Capacity figures in this table include both onshore and offshore wind and are on an AC basis.



Renewable energy Solar & Wind – Installed capacity by type*

Megawatts	2022			2023			Megawatts	2022			2023		
	Solar PV	CSP	Total	Solar PV	CSP	Total		Onshore	Offshore	Total	Onshore	Offshore	Total
Canada	5312	–	5312	5757	–	5757	Canada	15265	–	15265	16989	–	16989
Mexico	9347	17	9364	10893	17	10910	Mexico	7318	–	7318	7318	–	7318
US	112881	1480	114361	137725	1480	139205	US	141633	41	141674	147979	41	148020
Total North America	127540	1497	129037	154376	1497	155873	Total North America	164215	41	164257	172286	41	172327
Argentina	1116	–	1116	1408	–	1408	Argentina	3310	–	3310	3706	–	3706
Brazil	25520	–	25520	37449	–	37449	Brazil	24163	–	24163	29135	–	29135
Chile	6417	108	6525	8366	108	8475	Chile	3830	–	3830	4510	–	4510
Honduras	529	–	529	529	–	529	Costa Rica	390	–	390	408	–	408
The Dominican Republic	732	–	732	1073	–	1073	Uruguay	1516	–	1516	1516	–	1516
Other S. & Cent. America	4039	–	4039	4669	–	4669	Other S. & Cent. America	2519	–	2519	2742	–	2742
Total S. & Cent. America	38354	108	38462	53495	108	53603	Total S. & Cent. America	35729	–	35729	42018	–	42018
Austria	3792	–	3792	6832	–	6832	Austria	3579	–	3579	3977	–	3977
Belgium	6756	–	6756	8549	–	8549	Belgium	3042	2262	5303	3242	2262	5504
Bulgaria	1737	–	1737	2937	–	2937	Bulgaria	702	–	702	702	–	702
Czech Republic	2420	–	2420	2499	–	2499	Denmark	4778	2306	7084	4832	2650	7482
Denmark	3070	–	3070	3529	–	3529	Finland	5604	73	5677	6884	73	6957
France	17341	9	17350	20542	9	20551	France	20809	2	20811	22194	2	22196
Germany	67477	2	67479	81737	2	81739	Germany	58014	8149	66163	61052	8407	69459
Greece	5430	–	5430	7030	–	7030	Greece	4702	–	4702	5220	–	5220
Hungary	4235	–	4235	5835	–	5835	Ireland	4511	25	4536	4782	25	4807
Italy	24555	6	24561	29789	6	29795	Italy	11821	–	11821	12308	–	12308
Lithuania	572	–	572	1165	–	1165	Netherlands	6185	2570	8755	6771	3978	10749
Netherlands	19600	–	19600	23904	–	23904	Norway	5060	2	5062	5063	2	5065
Poland	12170	–	12170	15809	–	15809	Poland	8150	–	8150	9307	–	9307
Portugal	2646	–	2646	3876	–	3876	Portugal	5513	25	5538	5592	25	5617
Romania	1809	^	1809	1917	^	1917	Romania	3015	–	3015	3087	–	3087
Slovakia	549	–	549	631	–	631	Spain	30109	5	30114	31021	7	31028
Slovenia	626	–	626	1034	–	1034	Sweden	14086	193	14279	16059	193	16252
Spain	23311	2304	25615	28712	2304	31016	Türkiye	11396	–	11396	11697	–	11697
Sweden	2388	–	2388	3488	–	3488	Ukraine	1761	–	1761	1761	–	1761
Switzerland	4340	–	4340	5840	–	5840	United Kingdom	14835	13928	28763	15470	14746	30215
Türkiye	9425	1	9426	11292	1	11293	Other Europe	4365	–	4365	5318	–	5318
Ukraine	8062	–	8062	8062	–	8062	Total Europe	222036	29539	251575	236338	32369	268708
United Kingdom	14651	–	14651	15657	–	15657	Russian Federation	2218	–	2218	2518	–	2518
Other Europe	3713	–	3713	6211	–	6211	Other CIS	188	–	188	192	–	192
Total Europe	240676	2322	242999	296878	2322	299200	Total CIS	2406	–	2406	2710	–	2710
Russian Federation	1816	–	1816	2170	–	2170	Iran	342	–	342	365	–	365
Kazakhstan	1146	–	1146	1306	–	1306	Jordan	614	–	614	614	–	614
Other CIS	812	–	812	1209	–	1209	Other Middle East	608	–	608	892	–	892
Total CIS	3774	–	3774	4685	–	4685	Total Middle East	1564	–	1564	1871	–	1871
Israel	4169	242	4411	4282	242	4524	Egypt	1643	–	1643	1890	–	1890
Jordan	1966	–	1966	1990	–	1990	Morocco	1558	–	1558	1858	–	1858
Saudi Arabia	390	50	440	2235	50	2285	South Africa	3163	–	3163	3442	–	3442
United Arab Emirates	3288	300	3588	5325	600	5925	Tunisia	245	–	245	245	–	245
Other Middle East	3527	52	3579	3767	52	3819	Other Africa	1136	–	1136	1219	–	1219
Total Middle East	13340	644	13983	17599	944	18543	Total Africa	7745	–	7745	8654	–	8654
Algeria	426	25	451	426	25	451	Australia	10555	–	10555	11327	–	11327
Egypt	1704	20	1724	1836	20	1856	China	335504	30460	365964	404605	37290	441895
Morocco	314	540	854	394	540	934	India	41930	–	41930	44736	–	44736
South Africa	5826	500	6326	5664	500	6164	Japan	4320	52	4372	5079	154	5232
Tunisia	197	–	197	506	–	506	New Zealand	994	–	994	1059	–	1059
Other Africa	3150	–	3150	3568	–	3568	Pakistan	1845	–	1845	1845	–	1845
Total Africa	11617	1085	12702	12394	1085	13479	Philippines	443	–	443	443	–	443
Australia	29955	3	29958	33680	3	33683	South Korea	1772	136	1908	2031	136	2167
China	392462	570	393032	609351	570	609921	Taiwan	836	745	1581	1105	1569	2674
India	63048	343	63390	72767	343	73109	Thailand	1545	–	1545	1545	–	1545
Japan	83057	–	83057	87068	–	87068	Other Asia Pacific	5824	994	6818	6884	1104	7988
Malaysia	1933	–	1933	1933	–	1933	Total Asia Pacific	405569	32387	437956	480659	40253	520912
Pakistan	1244	–	1244	1244	–	1244	Total World	839263	61967	901231	944536	72663	1017199
Philippines	1625	–	1625	1675	–	1675							
South Korea	24078	–	24078	27046	–	27046							
Taiwan	9724	–	9724	12418	–	12418							
Thailand	3180	5	3185	3181	5	3186							
Vietnam	16698	–	16698	17077	–	17077							
Other Asia Pacific	4255	–	4255	5226	–	5226							
Total Asia Pacific	631259	921	632180	872665	921	873586							
Total World	1066559	6576	1073136	1412093	6876	1418969							

Source: IRENA (2024), Renewable Capacity Statistics 2024, The International Renewable Energy Agency, Abu Dhabi.

* End of year.

^ Less than 0.05.

Note: Capacity figures in this table for both onshore and offshore wind are on an AC basis.

Renewable energy Generation by source*

Terawatt-hours	2022					2023					2023 Growth rate				
	Wind	Solar	Hydro	Other renewables†	Total	Wind	Solar	Hydro	Other renewables†	Total	Wind	Solar	Hydro	Other renewables†	Total
Canada	38.4	7.1	397.7	9.1	452.3	38.9	7.6	364.2	10.4	421.2	1.5%	8.4%	-8.4%	13.8%	-6.9%
Mexico	20.5	20.3	35.6	6.7	83.1	21.7	27.1	20.4	7.1	76.3	5.5%	33.4%	-42.6%	6.0%	-8.2%
US	438.7	207.2	251.3	71.5	968.6	429.5	240.5	236.3	67.3	973.7	-2.1%	16.1%	-6.0%	-5.9%	0.5%
Total North America	497.6	234.5	684.6	87.3	1504.0	490.1	275.3	620.9	84.8	1471.1	-1.5%	17.4%	-9.3%	-2.9%	-2.2%
Argentina	14.2	2.9	22.8	2.4	42.2	14.5	3.3	29.9	2.3	49.9	2.2%	11.3%	31.3%	-3.3%	18.2%
Brazil	81.6	30.1	427.1	55.0	593.9	95.5	51.5	428.7	55.8	631.5	17.0%	70.9%	0.4%	1.5%	6.3%
Chile	8.9	15.7	20.4	6.1	51.1	9.8	18.2	24.0	6.0	58.0	9.6%	15.7%	17.9%	-0.7%	13.5%
Colombia	0.1	0.5	64.3	2.9	67.8	0.2	1.2	59.8	3.1	64.3	171.9%	138.7%	-7.0%	6.3%	-5.2%
Ecuador	0.1	^	24.6	0.4	25.1	0.2	^	25.3	0.4	26.0	244.2%	-0.4%	2.9%	-8.0%	3.3%
Peru	1.9	0.9	29.7	0.5	33.1	2.4	1.1	29.1	0.5	33.0	21.9%	16.5%	-2.3%	2.5%	-0.3%
Trinidad & Tobago	^	^	-	-	^	^	^	-	-	^	-	-	-	-	-
Venezuela	^	^	68.5	-	68.5	^	^	65.6	-	65.6	-	14.8%	-4.3%	-	-4.3%
Central America	3.6	3.2	31.4	9.8	48.0	4.3	3.3	25.4	9.7	42.7	18.0%	4.8%	-19.3%	-0.8%	-11.1%
Other Caribbean	2.2	2.4	2.0	1.2	7.8	2.1	3.0	1.6	1.2	8.0	-4.8%	29.0%	-17.2%	-1.9%	2.8%
Other South America	5.2	0.9	54.2	3.3	63.6	5.2	1.0	60.5	4.0	70.8	0.4%	1.8%	11.7%	24.0%	11.2%
Total S. & Cent. America	117.9	56.7	745.1	81.5	1001.1	134.2	82.6	749.9	83.0	1049.7	13.8%	45.6%	0.6%	1.9%	4.8%
Austria	7.2	3.8	34.0	4.7	49.7	8.0	5.2	38.9	4.6	56.6	10.9%	36.2%	14.4%	-3.0%	13.9%
Belgium	12.4	6.9	0.3	4.9	24.4	15.7	7.3	0.4	3.5	26.9	26.9%	6.6%	44.7%	-29.6%	10.0%
Bulgaria	1.5	2.1	3.8	2.2	9.6	1.6	3.4	3.1	1.9	10.0	5.7%	63.8%	-17.7%	-15.8%	4.1%
Croatia	2.1	0.2	5.5	1.2	9.0	2.3	0.4	8.2	1.1	12.0	9.9%	148.1%	49.7%	-11.6%	33.6%
Cyprus	0.2	0.6	-	0.1	0.9	0.2	0.8	-	^	1.1	-7.0%	37.2%	-	-14.9%	22.6%
Czech Republic	0.6	2.3	2.1	5.4	10.4	0.7	2.2	2.3	5.2	10.4	9.4%	-4.6%	11.9%	-4.5%	-0.4%
Denmark	19.0	2.2	^	7.3	28.5	19.4	3.5	^	6.7	29.6	1.9%	57.9%	31.7%	-8.1%	3.7%
Estonia	0.7	0.6	^	1.6	2.9	0.7	0.7	^	1.4	2.9	4.2%	22.8%	15.5%	-10.9%	-0.2%
Finland	12.0	0.4	13.5	12.8	38.7	15.0	0.7	15.2	11.0	41.9	25.1%	69.6%	12.5%	-13.9%	8.2%
France	37.9	19.1	44.3	9.7	111.0	52.3	22.2	55.5	9.7	139.8	38.0%	16.2%	25.4%	-0.3%	25.9%
Germany	124.8	60.3	17.6	51.9	254.6	142.1	61.2	19.6	49.5	272.4	13.8%	1.5%	11.4%	-4.6%	7.0%
Greece	10.9	7.1	3.9	0.6	22.4	11.0	8.5	3.9	0.7	24.2	1.2%	19.0%	2.4%	23.2%	7.6%
Hungary	0.6	4.7	0.2	2.1	7.7	0.6	6.5	0.2	1.5	8.9	5.6%	38.1%	24.7%	-29.3%	16.4%
Iceland	^	^	14.2	5.9	20.1	^	^	14.2	6.0	20.2	26.3%	374.3%	0.2%	1.5%	0.6%
Ireland	11.2	0.1	0.7	1.0	13.1	11.6	0.4	0.9	0.9	13.9	3.4%	180.0%	33.2%	-7.2%	6.2%
Italy	20.5	28.1	28.4	23.5	100.5	23.5	31.2	38.9	20.3	114.0	14.8%	11.0%	37.1%	-13.4%	13.5%
Latvia	0.2	^	2.7	0.8	3.8	0.3	^	3.8	0.6	4.7	40.5%	13.9%	38.2%	-22.0%	25.3%
Lithuania	1.5	0.3	0.5	0.7	3.0	2.5	0.4	0.5	0.5	3.8	65.8%	4.7%	-3.0%	-31.8%	25.5%
Luxembourg	0.3	0.3	0.1	0.4	1.0	0.5	0.3	0.1	0.2	1.1	48.9%	9.3%	40.9%	-43.0%	5.0%
Netherlands	21.4	17.1	^	9.8	48.3	28.9	21.2	0.1	8.0	58.2	35.0%	24.0%	36.0%	-17.9%	20.4%
North Macedonia	0.1	0.1	1.3	^	1.6	0.2	0.3	1.6	0.1	2.2	46.4%	234.6%	20.6%	80.2%	36.2%
Norway	14.8	0.3	127.6	0.2	143.0	14.0	0.5	136.1	0.3	150.9	-5.7%	72.0%	6.6%	42.0%	5.6%
Poland	19.8	8.3	2.0	7.6	37.7	24.1	11.7	2.4	8.2	46.4	22.0%	40.4%	21.8%	8.2%	23.2%
Portugal	13.2	3.5	6.5	4.3	27.6	13.2	5.5	12.1	3.5	34.3	-0.7%	55.6%	84.8%	-17.7%	24.1%
Romania	7.0	2.0	14.0	0.6	23.6	7.6	1.9	18.2	0.3	28.0	9.0%	-6.3%	30.5%	-55.6%	18.7%
Slovakia	^	0.7	3.7	1.5	5.8	^	0.6	4.7	1.9	7.2	-	-7.1%	29.0%	2.7%	24.5%
Slovenia	^	0.6	3.1	0.3	4.1	^	1.1	5.0	0.3	6.4	12.1%	67.2%	57.9%	15.67%	56.5%
Spain	62.8	35.7	17.6	6.8	122.8	64.2	46.8	25.5	5.4	142.0	2.3%	31.1%	44.8%	-19.9%	15.6%
Sweden	33.1	2.0	69.8	13.1	117.9	34.3	3.1	66.0	11.3	114.8	3.8%	57.8%	-5.4%	-13.4%	-2.7%
Switzerland	0.2	3.9	29.6	2.0	35.6	0.2	6.0	37.0	2.0	45.2	12.0%	56.7%	25.1%	-1.2%	27.0%
Türkiye	34.9	16.9	66.8	19.2	137.8	34.1	20.5	63.9	19.5	137.9	-2.5%	21.5%	-4.4%	1.5%	0.1%
Ukraine	1.6	5.2	11.1	0.8	18.6	0.9	5.7	12.7	1.0	20.4	-39.2%	9.8%	14.6%	34.5%	9.6%
United Kingdom	80.3	13.3	5.6	35.8	135.0	82.0	13.8	5.2	34.0	135.0	2.2%	4.1%	-7.9%	-5.1%	^
Other Europe	2.2	0.6	33.6	0.4	36.9	2.4	1.1	42.4	0.4	46.2	5.9%	72.2%	26.0%	-1.1%	25.3%
Total Europe	555.1	249.4	564.1	239.2	1607.8	614.1	294.9	638.7	221.6	1769.3	10.6%	18.2%	13.2%	-7.4%	10.0%
Azerbaijan	0.1	0.1	1.6	0.1	1.8	0.1	0.1	1.8	0.1	2.0	-32.1%	30.4%	10.5%	8.6%	9.1%
Belarus	0.2	0.2	0.4	0.5	1.3	0.2	0.2	0.3	0.5	1.1	-1.7%	-26.5%	-18.9%	-2.6%	-11.1%
Kazakhstan	2.3	1.8	9.2	^	13.3	3.7	2.0	8.8	^	14.4	58.0%	10.4%	-4.4%	52.6%	8.4%
Russian Federation	4.2	2.4	197.7	0.8	205.1	4.7	2.6	200.9	0.8	209.1	13.0%	9.8%	1.6%	0.9%	1.9%
Turkmenistan	-	^	^	-	^	-	^	^	-	^	-	-	-	-	-
Uzbekistan	-	0.2	5.3	-	5.5	-	0.3	7.0	-	7.3	-	73.4%	31.7%	-	33.1%
Other CIS	0.1	0.6	34.1	^	34.8	0.2	0.8	34.3	^	35.3	22.8%	46.7%	0.6%	-	1.5%
Total CIS	6.9	5.2	248.2	1.5	261.8	8.8	6.0	253.0	1.5	269.3	27.3%	15.1%	1.9%	0.3%	2.9%
Iran	1.2	0.7	14.0	^	16.0	1.3	0.8	22.7	^	24.8	6.7%	10.3%	61.8%	-	55.1%
Iraq	-	0.4	2.7	-	3.1	-	0.4	3.4	-	3.8	-	-	27.8%	-	24.0%
Israel	0.2	6.1	^	0.1	6.4	0.4	7.5	^	0.1	8.1	132.1%	23.5%	-1.0%	-	26.2%
Kuwait	^	0.1	-	-	0.2	^	0.1	-	-	0.2	-	-10.3%	-	-	-8.3%
Oman	0.1	1.4	-	-	1.6	0.1	1.5	-	-	1.6	-	2.6%	-	-	2.4%
Qatar	-	0.3	-	0.1	0.4	-	1.3	-	0.1	1.5	-	386.7%	-	-	258.6%
Saudi Arabia	1.5	0.8	-	-	2.3	1.5	4.3	-	-	5.8	-	419.5%	-	-	152.9%
United Arab Emirates	^	7.7	-	^	7.8	0.1	13.7	-	^	13.8	100.0%	77.6%	-	159.6%	78.4%
Other Middle East	1.8	6.1	1.5	^	9.3	1.7	6.2	1.5	^	9.4	-4.4%	1.9%	2.9%	^	0.9%
Total Middle East	4.8	23.7	18.2	0.3	47.0	5.1	35.9	27.6	0.3	68.9	6.5%	51.3%	51.9%	6.8%	46.7%
Algeria	^	0.6	^	-	0.7	^	0.6	0.1	-	0.7	-	-	329.9%	-	7.8%
Egypt	5.5	5.4	13.3	-	24.2	5.7	5.2	13.8	-	24.8	4.1%	-2.6%	4.0%	-	2.6%
Morocco	5.4	1.4	0.4	-	7.2	6.5	2.1	0.2	-	8.8	22.2%	45.8%	-53.5%	-	23.3%
South Africa	9.7	6.2	3.1	0.4	19.4	11.6	6.4	1.7	0.4	20.1	19.3%	3.3%	-45.6%	-	3.4%
Eastern Africa	2.8	1.7	79.6	7.3	91.3	2.6	1.9	82.1	8.5	95.2	-7.6%	14.8%	3.2%	17.4%	4.2%
Middle Africa	^	0.5	32.8	0.1	33.3	^	0.6	33.7	0.1	34.4	-	30.2%	2.9%	-5.1%	3.3%
Western Africa	0.6	1.2	25.6	0.3	27.7	1.0	1.4	28.0	0.3	30.7	64.8%	13.0%	9.3%	0.2%	10.5%
Other Northern Africa	0.3	0.3	^	-	0.7	0.3	0.4	^	-	0.7	5.0%	19.6%	-38.3%	-	11.2%
Other Southern Africa	-	0.4	1.5	0.3	2.3	-	0.5</								

Thousand barrels of oil equivalent per day												Growth rate per annum		Share
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2023	2013–23	2023
Canada	19	22	22	23	22	21	23	22	22	22	23	8.8%	2.3%	1.1%
Mexico	–	–	–	0	0	0	0	0	1	1	1	–	–	†
US	562	597	614	655	678	701	693	632	685	729	804	10.3%	3.6%	38.8%
Total North America	580	618	637	679	701	723	717	655	708	751	828	10.2%	3.6%	40.0%
Argentina	38	49	38	53	58	51	46	27	38	43	25	-42.0%	-4.3%	1.2%
Brazil	313	329	353	331	334	401	429	411	391	390	455	16.6%	3.8%	21.9%
Colombia	12	13	13	13	12	14	13	12	15	14	16	8.0%	2.5%	0.8%
Other S. & Cent. America	6	7	7	8	7	8	10	9	11	11	11	0.8%	6.4%	0.5%
Total S. & Cent. America	369	398	410	404	411	475	498	459	456	458	506	10.5%	3.2%	24.4%
Austria	6	7	8	7	7	7	7	7	7	8	7	-7.7%	2.2%	0.3%
Belgium	8	11	7	7	8	8	8	9	8	8	8	1.6%	-0.5%	0.4%
Finland	6	7	11	4	4	11	13	13	14	15	17	13.3%	10.4%	0.8%
France	46	47	49	45	44	50	47	43	36	35	34	-3.2%	-3.0%	1.6%
Germany	58	64	59	60	61	63	66	63	66	67	72	7.5%	2.2%	3.5%
Italy	9	10	10	10	12	13	15	17	21	20	23	14.7%	10.2%	1.1%
Netherlands	28	33	32	28	37	35	38	37	39	37	37	0.2%	3.0%	1.8%
Poland	13	14	15	17	17	17	18	18	19	20	20	0.6%	4.5%	1.0%
Portugal	5	6	6	6	6	6	7	6	5	6	6	-7.2%	0.7%	0.3%
Spain	14	19	21	22	35	40	39	33	31	31	28	-9.4%	7.3%	1.4%
Sweden	4	4	4	4	3	7	8	8	9	9	7	-22.8%	5.1%	0.3%
United Kingdom	9	7	6	10	14	13	11	12	12	13	14	4.0%	3.6%	0.7%
Other Europe	26	26	28	30	32	35	40	39	39	40	41	2.8%	4.8%	2.0%
Total Europe	232	255	256	250	281	305	316	305	307	308	313	1.5%	3.0%	15.1%
Total CIS	0	0	0	0	0	0	0	^	^	^	^	29.0%	-10.6%	†
Total Middle East	0	0	0	0	0	0	0	0	1	1	2	44.3%	17.9%	0.1%
Total Africa	2	2	2	2	2	1	2	2	2	2	2	14.0%	-1.0%	0.1%
Australia	5	5	4	2	2	2	3	2	2	2	2	4.4%	-6.7%	0.1%
China	42	47	40	39	31	44	53	56	58	72	78	8.5%	6.3%	3.8%
India	5	5	10	12	11	19	21	23	35	44	49	9.9%	26.9%	2.4%
Indonesia	41	59	24	54	50	91	124	126	151	174	194	11.1%	16.7%	9.4%
South Korea	7	7	8	8	8	13	13	13	11	13	13	-2.2%	6.1%	0.6%
Thailand	30	34	36	33	36	40	44	44	39	36	39	9.3%	2.7%	1.9%
Other Asia Pacific	28	33	37	33	31	35	53	45	46	46	47	2.8%	5.3%	2.3%
Total Asia Pacific	158	189	159	180	170	243	311	310	342	388	422	8.9%	10.3%	20.4%
Total World	1342	1463	1465	1516	1564	1748	1844	1731	1815	1907	2072	8.6%	4.4%	100.0%
of which: OECD	832	895	914	948	998	1053	1054	980	1036	1079	1163	7.7%	3.4%	56.1%
Non-OECD	510	569	551	568	566	695	790	751	780	828	909	9.8%	5.9%	43.9%
European Union	220	246	248	237	262	288	300	290	291	291	295	1.4%	3.0%	14.2%

Biofuels production by fuel type

Thousand barrels of oil equivalent per day	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2023	2013–23	2023
Biogasoline														
Canada & Mexico	16	17	16	17	17	17	18	16	16	17	17	1.4%	0.4%	1.5%
US	479	516	534	554	575	580	569	501	542	554	563	1.7%	1.6%	50.7%
Brazil	269	278	294	275	270	322	341	315	291	297	343	15.5%	2.4%	30.8%
Other S. & Cent. America	13	16	18	19	20	22	22	18	22	22	23	4.7%	5.7%	2.1%
Europe	52	51	52	52	55	56	55	52	57	59	61	2.8%	1.6%	5.5%
CIS	^	^	^	^	^	^	^	^	^	0	0	29.0%	61.7%	†
Middle East	0	0	0	0	–	–	–	–	–	–	–	–	-100.0%	–
Africa	2	2	2	2	2	1	2	2	2	2	2	14.0%	-0.9%	0.2%
Asia Pacific	47	53	57	52	58	69	80	76	86	98	102	4.3%	8.1%	9.2%
Total World	879	934	974	971	997	1067	1087	980	1015	1049	1112	6.0%	2.4%	100.0%
of which: OECD	554	591	608	628	652	661	647	575	620	634	647	1.9%	1.6%	58.2%
Non-OECD	326	343	365	343	345	407	439	405	395	415	465	12.2%	3.6%	41.8%
European Union	46	45	48	46	48	50	50	48	52	54	55	1.7%	1.8%	4.9%
Biodiesel														
Canada & Mexico	2	5	6	7	6	5	5	7	6	5	7	30.4%	11.7%	0.7%
US	82	80	80	101	104	121	124	131	144	175	240	37.6%	11.3%	25.0%
Brazil	43	51	58	56	64	79	88	95	100	93	112	20.4%	9.9%	11.6%
Other S. & Cent. America	43	53	40	54	57	52	47	30	43	46	28	-38.8%	-4.2%	2.9%
Europe	180	204	204	199	225	249	262	253	250	249	252	1.2%	3.4%	26.2%
CIS	0	0	0	0	0	0	0	–	–	–	–	–	-100.0%	–
Middle East	^	^	0	0	0	0	0	0	1	1	2	44.3%	48.5%	0.2%
Africa	^	^	0	0	^	^	^	^	^	^	^	–	-19.0%	†
Asia Pacific	111	136	102	128	112	174	231	235	256	290	320	10.4%	11.1%	33.3%
Total World	463	529	491	545	567	681	758	751	800	858	960	11.9%	7.6%	100.0%
of which: OECD	278	304	306	320	347	392	407	406	416	445	516	16.0%	6.4%	53.7%
Non-OECD	185	225	186	225	221	289	351	346	384	413	444	7.5%	9.2%	46.3%
European Union	174	201	200	191	214	238	250	242	239	237	240	1.4%	3.3%	25.0%

Source: Includes data from S&P Global Commodity Insights; US Energy Information Administration.

* Includes biogasoline (such as ethanol) and biodiesel. Volumes have been adjusted for energy content.

^ Less than 0.5.

† Less than 0.05%.

Note: Annual changes and shares of total are calculated using thousand barrels a day oil equivalent figures.

Renewable energy Biofuels consumption*

Thousand barrels of oil equivalent per day												Growth rate per annum		Share
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2023	2013–23	2023
Canada	35	36	34	32	38	39	40	37	39	47	54	14.7%	4.6%	2.6%
Mexico	2	3	3	3	4	4	4	5	4	4	4	2.0%	8.9%	0.2%
US	573	581	608	658	661	652	670	608	670	705	799	13.2%	3.4%	37.6%
Total North America	609	620	645	693	703	695	715	650	714	757	857	13.2%	3.5%	40.4%
Argentina	19	22	24	26	30	28	29	16	17	23	21	-8.8%	0.7%	1.0%
Brazil	278	305	357	324	332	385	426	396	392	390	429	10.0%	4.4%	20.2%
Colombia	12	13	13	13	12	15	16	13	15	16	20	20.5%	4.9%	0.9%
Other S. & Cent. America	15	15	17	18	19	18	19	18	20	18	18	0.8%	1.9%	0.8%
Total S. & Cent. America	324	356	411	380	393	447	489	442	444	446	487	9.0%	4.1%	22.9%
Austria	8	8	9	9	9	8	8	7	8	7	7	-3.3%	-1.6%	0.3%
Belgium	6	8	5	8	9	9	9	12	13	14	14	-0.8%	7.9%	0.6%
Finland	4	8	8	3	7	6	7	7	12	10	7	-33.4%	5.7%	0.3%
France	49	52	53	53	54	53	55	50	56	65	63	-3.4%	2.6%	2.9%
Germany	50	53	50	50	51	53	52	63	56	56	58	3.5%	1.5%	2.7%
Italy	24	20	25	25	25	26	15	21	22	20	23	14.9%	-0.3%	1.1%
Netherlands	6	7	6	5	6	10	13	15	15	19	22	17.3%	14.2%	1.1%
Poland	14	13	12	8	11	17	18	19	20	21	22	3.0%	4.7%	1.0%
Portugal	5	5	7	5	5	5	5	5	6	5	6	21.1%	2.2%	0.3%
Spain	22	23	24	27	31	41	40	36	36	35	32	-8.3%	3.9%	1.5%
Sweden	10	12	14	18	17	20	20	21	23	28	27	-2.3%	10.3%	1.3%
United Kingdom	19	22	17	18	17	24	31	29	29	37	41	9.8%	7.9%	1.9%
Other Europe	38	37	38	42	50	51	60	62	62	61	68	11.3%	5.9%	3.2%
Total Europe	256	269	267	270	291	324	334	346	358	379	390	2.9%	4.3%	18.4%
Total CIS	^	^	^	1	2	2	3	3	5	6	8	27.3%	33.7%	0.4%
Total Middle East	^	^	^	^	1	1	1	1	1	1	1	9.9%	24.0%	0.1%
Total Africa	1	1	1	1	1	2	1	1	2	1	1	1.0%	3.4%	0.1%
Australia	5	5	4	3	3	3	2	2	2	2	2	-4.2%	-7.8%	0.1%
China	57	60	44	45	42	54	58	44	46	47	50	5.6%	-1.4%	2.3%
India	6	5	6	12	9	17	21	20	32	45	55	22.6%	25.9%	2.6%
Indonesia	15	27	13	44	38	55	94	123	137	154	181	17.6%	27.9%	8.5%
South Korea	10	9	8	8	8	13	13	13	11	13	14	11.2%	3.3%	0.7%
Thailand	23	28	30	31	34	37	42	42	38	34	38	10.4%	5.0%	1.8%
Other Asia Pacific	16	18	22	24	25	27	31	33	34	37	39	5.5%	9.4%	1.8%
Total Asia Pacific	132	151	127	167	158	206	261	276	300	332	379	14.1%	11.1%	17.8%
Total World	1323	1397	1451	1513	1547	1676	1805	1720	1823	1923	2124	10.4%	4.8%	100.0%
of which: OECD	890	914	936	987	1015	1048	1075	1019	1095	1163	1279	10.0%	3.7%	60.2%
Non-OECD	433	483	515	526	532	628	729	701	728	760	845	11.1%	6.9%	39.8%
European Union	226	241	243	242	258	286	287	304	316	329	332	0.9%	3.9%	15.6%

Biofuels consumption by fuel type

Thousand barrels of oil equivalent per day	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2023	2013–23	2023
Biogasoline														
Canada & Mexico	477	485	503	516	522	520	525	456	503	506	514	1.6%	0.8%	46.3%
US	28	30	30	30	32	34	34	30	32	36	42	16.2%	4.0%	3.8%
Brazil	236	255	299	268	269	305	339	301	291	296	317	6.9%	3.0%	28.5%
Other S. & Cent. America	18	20	23	25	26	28	29	24	27	28	32	14.4%	5.9%	2.9%
Europe	51	52	53	51	53	56	60	59	70	78	80	1.6%	4.5%	7.2%
CIS	-	-	-	^	1	1	2	2	3	4	5	25.9%	-	0.5%
Middle East	^	^	^	^	^	^	^	^	^	0	0	1.5%	1.2%	^
Africa	1	1	1	1	1	2	1	1	2	1	1	1.0%	3.4%	0.1%
Asia Pacific	51	54	61	70	65	80	91	84	96	109	120	9.4%	8.9%	10.8%
Total World	862	897	970	962	970	1026	1082	957	1024	1060	1111	4.8%	2.6%	100.0%
of which: OECD	565	577	596	608	619	623	632	557	616	631	650	3.0%	1.4%	58.5%
Non-OECD	297	321	373	353	351	403	450	400	408	428	461	7.6%	4.5%	41.5%
European Union	42	42	43	41	43	46	49	50	57	62	63	0.7%	4.1%	5.6%
Biodiesel														
Canada & Mexico	96	96	105	141	138	132	145	152	167	199	285	42.7%	11.5%	28.1%
US	8	8	7	6	9	10	10	11	12	16	17	7.7%	7.6%	1.6%
Brazil	43	50	59	56	63	80	88	95	101	94	112	19.5%	10.1%	11.0%
Other S. & Cent. America	28	30	31	32	34	34	34	23	25	29	26	-8.6%	-0.7%	2.6%
Europe	204	217	215	219	237	268	274	288	288	300	310	3.3%	4.3%	30.6%
CIS	^	^	^	1	1	1	1	1	2	2	3	30.0%	20.6%	0.3%
Middle East	-	-	-	^	^	1	1	1	1	1	1	11.3%	-	0.1%
Africa	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asia Pacific	81	97	66	97	94	126	170	193	204	223	259	16.4%	12.3%	25.6%
Total World	461	500	482	551	577	650	723	763	799	864	1013	17.3%	8.2%	100.0%
of which: OECD	325	337	340	378	397	425	443	462	480	532	629	18.2%	6.8%	62.1%
Non-OECD	136	163	142	173	181	225	280	301	319	332	384	15.8%	10.9%	37.9%
European Union	184	198	200	201	215	240	237	254	259	266	269	0.9%	3.9%	26.5%

* Includes biogasoline (such as ethanol) and biodiesel. Volumes have been adjusted for energy content.

^ Less than 0.5.

† Less than 0.05%.

Note: Annual changes and shares of total are calculated using thousand barrels a day oil equivalent figures.

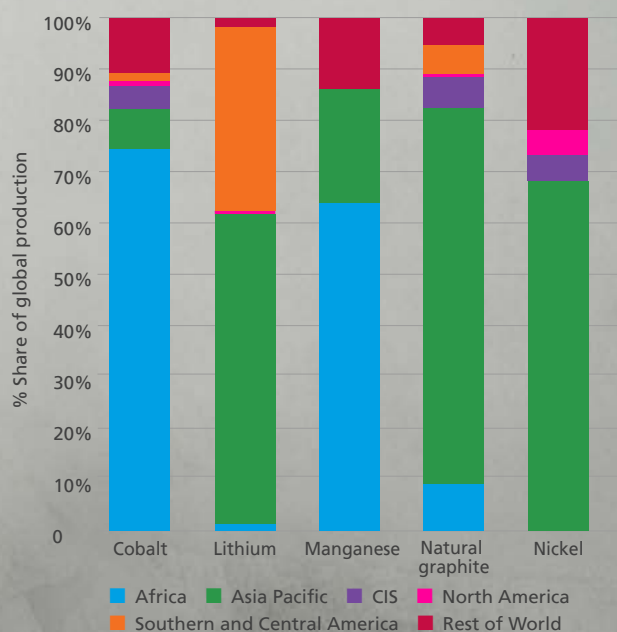
Key minerals

Whilst production of copper has grown at an average rate of just under 2% over the past ten years (it dropped by 1.6% in 2023), production of other minerals critical to the global energy system, continued to grow on average at around 4% per annum. The Asia Pacific region produced nearly 70% of the metals and materials critical to the manufacture of Li-ion batteries. Within this, China was both the world's leading producer of refined cobalt and the world's leading consumer of it, with nearly 87% of consumption used by the lithium-ion battery industry. As well as producing nearly 20% of the world's lithium production, China also produced around 74% of its graphite supply.

Portugal holds the largest lithium reserve in Europe (around 60,000 metric tons). Whilst historically it has primarily focused on ceramics for glassware production, it is increasingly looking to enter the lithium market.

Although prices for metals and materials have fallen across the board from their 2022 highs, lithium carbonate prices sat at around 400% higher than their 2019 pre-COVID levels and copper some 140% above its.

In 2023, the Asia Pacific region produced nearly 70% of the metals and materials critical to the manufacture of Li-ion batteries



Global production and prices of key metals and minerals now sit above their 2019 pre-COVID levels

Key minerals Production and reserves

Cobalt production and reserves

Mine production

Thousand tonnes												Reserves					
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Growth rate per annum	Share	at end of		R/P ratio	
	2023	2013–23	2023	2023	Share	R/P ratio											
Australia	6.4	6.2	6.0	5.5	5.8	4.9	5.7	5.6	5.3	5.8	4.6	-20.6%	-3.2%	2.3%	1700	16.0%	370
Canada	4.0	3.9	4.3	4.2	3.7	3.5	3.3	4.5	4.4	3.1	2.1	-31.4%	-6.3%	1.1%	230	2.2%	110
China	2.6	2.8	2.6	2.3	2.5	2.0	2.5	2.2	2.2	1.8	1.8	0.0%	-3.9%	0.9%	140	1.3%	80
DR Congo	76.6	76.5	84.4	69.0	90.3	109.4	78.0	86.6	93.1	115.4	139.8	21.2%	6.2%	71.0%	6000	56.4%	43
Cuba	4.0	3.7	4.0	3.9	3.9	3.5	3.8	3.8	4.0	3.8	3.2	-14.6%	-2.1%	1.6%	500	4.7%	154
Madagascar	2.4	3.4	4.0	3.8	3.1	2.9	2.9	0.8	2.0	3.3	3.6	9.1%	4.1%	1.8%	100	0.9%	28
Morocco	2.0	2.2	2.3	2.7	2.5	1.8	2.4	2.4	1.8	1.7	1.7	0.0%	-1.7%	0.9%	13	0.1%	8
New Caledonia	3.2	4.0	3.6	3.2	2.8	2.1	1.7	2.2	1.5	1.8	1.8	0.0%	-5.7%	0.9%	56	0.5%	32
Papua New Guinea	1.0	2.1	2.5	2.2	3.3	3.3	2.9	2.9	3.0	3.0	2.9	-3.0%	11.1%	1.5%	49	0.5%	17
Philippines	2.8	4.6	4.3	4.0	4.6	4.8	5.1	4.9	4.3	4.7	4.5	-3.8%	4.8%	2.3%	260	2.4%	58
Russian Federation	6.3	6.3	6.2	5.5	5.9	6.1	6.3	9.7	8.0	9.2	8.8	-4.3%	3.4%	4.5%	250	2.3%	28
South Africa	3.0	3.0	2.9	2.3	2.3	2.3	2.1	1.8	1.2	1.0	1.0	0.0%	-10.4%	0.5%	37	0.3%	37
Zambia	5.9	4.6	3.0	5.0	2.6	1.6	0.4	0.3	0.2	0.3	0.3	0.0%	-27.1%	0.1%	270	2.5%	1071
Rest of World	11.4	7.5	7.1	4.8	4.0	2.8	3.0	3.7	6.5	13.7	20.9	52.8%	6.3%	10.6%	1037	9.7%	50
Total World	131.6	130.7	137.2	118.4	137.3	150.9	120.0	131.5	137.5	168.3	196.9	17.0%	4.1%	100.0%	10642	100.0%	54

Sources: includes data from US Geological Survey, British Geological Survey ©UKRI and World Mining Data.

^ less than 0.05%. Rest of World is the sum of only recorded reserves.

Lithium production and reserves

Mine production

Thousand tonnes of Lithium content												Reserves					
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Growth rate per annum	Share	at end of		R/P ratio	
	2023	2013–23	2023	2023	Share	R/P ratio											
Argentina	2.5	3.2	3.6	5.8	5.7	6.4	6.3	5.9	6.0	6.4	9.6	50.5%	14.4%	4.8%	3600	13.8%	375
Australia	10.1	12.4	11.9	14.0	21.3	57.0	45.0	39.7	55.3	74.7	86.0	15.1%	23.9%	43.4%	6200	23.8%	72
Brazil	0.4	0.2	0.1	0.2	0.3	1.0	2.2	1.4	1.7	2.6	4.9	86.3%	28.5%	2.5%	390	1.5%	80
Chile	10.5	10.8	9.8	13.6	14.2	17.0	19.2	21.6	28.2	48.8	56.5	15.8%	18.3%	28.5%	9300	35.7%	165
China	4.7	2.3	2.0	2.3	6.8	7.1	10.8	13.3	14.0	22.6	33.0	46.0%	21.5%	16.7%	3000	11.5%	91
Portugal	0.3	0.3	0.3	0.4	0.8	1.2	0.9	0.3	0.9	0.4	0.4	0.0%	2.4%	0.2%	60	0.2%	158
US	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.6	0.6	0.0%	-3.4%	0.3%	1100	4.2%	1789
Zimbabwe	1.0	0.9	0.9	1.0	0.8	1.6	1.2	0.4	0.7	1.0	3.4	230.1%	13.0%	1.7%	310	1.2%	91
Rest of World	-	^	-	^	0.1	3.0	0.4	0.1	0.1	0.7	3.6	447.1%	-	1.8%	2068	7.9%	576
Total World	30.4	31.0	29.5	38.2	50.9	95.1	86.9	83.7	107.9	157.8	198.0	25.5%	20.6%	100.0%	26028	100.0%	131

Sources: includes data from US Geological Survey, British Geological Survey ©UKRI and World Mining Data.

^ less than 0.05%. Rest of World is the sum of only recorded reserves.

Natural Graphite production and reserves

Mine production

Thousand tonnes												Reserves					
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Growth rate per annum	Share	at end of		R/P ratio	
	2023	2013–23	2023	2023	Share	R/P ratio											
Brazil ¹	91.9	87.0	75.1	61.7	79.8	95.0	96.0	95.0	95.0	96.0	96.0	0.0%	0.4%	5.8%	74000	20.3%	771
Canada	20.0	30.0	30.0	21.0	14.0	11.0	11.0	7.6	12.0	13.0	3.5	-73.1%	-16.0%	0.2%	5700	1.6%	1629
China	750.0	780.0	725.0	625.0	625.0	693.0	700.0	762.0	820.0	1210.0	1230.0	1.7%	5.1%	73.7%	78000	21.4%	63
India ²	146.4	116.7	134.6	137.3	46.4	44.5	30.5	31.8	57.3	82.4	82.4	0.0%	-5.6%	4.9%	8600	2.4%	104
Madagascar	4.3	5.3	8.1	9.2	13.3	48.1	53.4	48.5	91.1	116.7	55.2	-52.7%	29.1%	3.3%	24000	6.6%	435
Mexico	7.0	9.2	6.5	3.8	1.7	4.1	1.6	1.5	1.8	1.7	2.0	16.8%	-11.7%	0.1%	3100	0.9%	1538
Mozambique	-	-	-	-	0.3	104.0	153.0	12.0	72.0	163.0	94.0	-42.3%	-	5.6%	25000	6.9%	266
Norway	6.2	8.3	9.2	9.6	9.6	12.0	9.8	5.5	6.3	10.4	6.5	-37.5%	0.4%	0.4%	600	0.2%	93
Russian Federation	20.2	17.6	15.9	19.4	19.5	11.9	17.5	12.9	15.3	14.3	16.0	11.7%	-2.3%	1.0%	25645	7.0%	1603
Sri Lanka	3.1	4.0	4.2	4.0	3.5	4.0	4.0	4.0	3.0	2.6	2.2	-15.4%	-3.5%	0.1%	1500	0.4%	682
Türkiye	28.7	3.9	-	-	-	16.8	10.0	15.2	28.3	27.7	27.7	0.0%	-0.4%	1.7%	69000	18.9%	2490
Ukraine	2.0	8.0	7.9	6.1	13.9	12.2	1.5	4.1	3.2	1.0	2.0	100.0%	0.0%	0.1%	13750	3.8%	6875
Rest of World ³	45.7	57.8	56.5	59.0	59.4	56.6	51.1	53.5	53.9	50.9	50.8	-0.2%	1.1%	3.0%	35500	9.7%	699
Total World	1125.6	1127.8	1073.0	956.2	886.4	1113.1	1139.4	1053.6	1259.1	1789.8	1668.3	-6.8%	4.0%	100.0%	364395	100.0%	218

Sources: includes data from US Geological Survey, British Geological Survey ©UKRI and World Mining Data.

^ less than 0.05. ¹Including beneficiated and directly shipped material. ²Run of the mine. ³Rest of World is the sum of only recorded reserves.

Rare Earth metals production and reserves

Mine production

Thousand tonnes ¹												Reserves					
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Growth rate per annum	Share	at end of		R/P ratio	
	2023	2013–23	2023	2023	Share	R/P ratio											
Australia	1.3	6.2	11.9	13.9	17.3	18.6	17.6	21.1	22.5	16.0	16.8	5.1%	29.5%	4.7%	5700	4.9%	340
Brazil	0.3	-	0.9	2.7	1.7	1.2	0.7	0.6	0.5	0.1	0.1	0.0%	-13.2%	0.0%	21000	18.2%	262500
China	93.8	105.0	105.0	105.0	105.0	120.0	132.0	140.0	168.0	210.0	240.0	14.3%	9.9%	67.9%	44000	38.1%	183
India	0.3	1.7	1.0	1.1	1.4	2.1	2.5	2.5	2.6	2.6	2.6	0.0%	24.3%	0.7%	6900	6.0%	2654
Madagascar	-	-	-	-	-	2.0	4.0	2.8	3.9	2.6	2.6	0.0%	-	0.7%	162	0.1%	62
Russian Federation	1.4	2.1	2.3	3.1	2.5	2.6	2.6	2.6	2.6	2.6	2.6	0.0%	6.1%	0.7%	10000	8.7%	3846
Thailand	0.1	1.9	0.8	1.6	1.3	1.0	1.9	3.6	8.2	7.1	7.1	0.0%	49.2%	2.0%	-	0.0%	-
US	5.5	5.4	5.9	-	-	18.0	28.0	39.0	42.0	42.0	43.0	2.4%	22.8%	12.2%	1800	1.6%	42
Rest of World ²	0.3	0.2	0.9	4.8	15.4	25.5	26.6	32.1	35.6	13.5	38.9	188.0%	63.8%	11.0%	26040	22.5%	669
Total World	103.0	122.6	128.6	132.2	144.6	191.0	215.9	244.3	286.0	296.5	353.7	19.3%	13.1%	100.0%	115602	100.0%	327

Sources: includes data from US Geological Survey, British Geological Survey ©UKRI and World Mining Data.

^ less than 0.05. ¹Thousand tonnes of rare earth oxide equivalent. ²Rest of World is the sum of only recorded reserves.

Copper production and reserves

Mine production

Thousand tonnes												Reserves					
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Growth rate per annum	Share	at end of		R/P ratio	
	2023	2013–23	2023	2023	Share	R/P ratio											
Australia	990	1000.0	971.0	970.0	860.0	950.0	934.0	885.0	900.0	819.0	810.0	-1.1%	-2.0%	3.8%	100000	10.0%	123
Chile	5780	5800.0	5760.0	5500.0	5500.0	5800.0	5790.0	5730.0	5600.0	5330.0	5000.0	-6.2%	-1.4%	23.2%	190000	19.0%	38
China	1600	1620.0	1710.0	1740.0	1710.0	1600.0	1680.0	1720.0	1800.0	1940.0	1700.0	-12.4%	0.6%	7.9%	41000	4.1%	24
Democratic Republic of Congo	970	1100.0	1020.0	910.0	1090.0	1200.0	1290.0	1600.0	1800.0	2350.0	2500.0	6.4%	9.9%	11.6%	80000	8.0%	32
Indonesia	504	400.0	474.0	548.0	622.0	780.0	642.5	505.0	810.0	941.0	840.0	-10.7%	5.2%	3.9%	24000	2.4%	29
Peru	1380	1400.0	1700.0	2300.0	2450.0	2400.0	2460.0	2150.0	2200.0	2450.0	2600.0	6.1%	6.5%	12.1%	120000	12.0%	46
United States	1250	1370.0	1380.0	1410.0	1260.0	1200.0	1260.0	1200.0	1200.0	1230.0	1100.0	-10.6%	-1.3%	5.1%	50000	5.0%	45
Rest of World	5780	6035.0	7793.1	7826.1	8277.5	8400.3	6947.0	6766.0	6670.0	6843.0	7000.0	2.3%	1.9%	32.5%	395600	39.5%	57
Total World	18254.0	18725.0	20808.1	21204.1	21769.5	22330.3	21003.5	20556.0	2								

Key minerals Production and reserves

Platinum group metals production and reserves*

Mine production

Thousand tonnes												Reserves							
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Growth rate per annum		at end of		Share		R/P ratio	
	2023	2013-23	2023	2023	Share	R/P ratio													
Canada	23.5	28.5	28.6	33.6	26.5	26.5	27.8	27.0	21.0	21.5	21.5	0.0%	-0.9%	5.6%	310	0.4%	14		
Russia	105.5	106.0	103.0	102.4	107.0	106.0	122.0	116.0	107.0	107.0	115.0	7.5%	0.9%	30.1%	5500	7.7%	48		
South Africa	206.0	152.4	222.0	209.3	229.8	178.0	213.7	185.5	226.3	197.1	191.0	-3.1%	-0.8%	50.1%	63000	88.0%	330		
United States	16.3	16.1	16.2	17.0	17.6	18.1	18.5	18.8	17.7	13.1	12.7	-3.1%	-2.5%	3.3%	820	1.1%	65		
Zimbabwe	22.0	22.6	22.6	26.9	26.0	26.0	24.9	27.9	27.1	31.3	34.0	8.6%	4.4%	8.9%	1200	1.7%	35		
Rest of World	12.7	14.8	12.3	11.5	17.3	17.1	6.2	7.0	6.8	7.3	7.3	0.3%	-5.4%	1.9%	800	1.1%	110		
Total World	386.0	340.4	404.7	400.7	424.2	371.7	413.0	382.2	405.9	377.3	381.5	1.1%	-0.1%	100.0%	71630	100.0%	188		

Sources: includes data from US Geological Survey and Kearney Energy Transition Institute.

* Platinum and Palladium. ^ less than 0.05. Rest of World is the sum of only recorded reserves.

Manganese production and reserves

Mine production

Thousand tonnes												Reserves							
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Growth rate per annum		at end of		Share		R/P ratio	
	2023	2013-23	2023	2023	Share	R/P ratio													
Australia	3.0	3.1	2.5	2.2	2.8	3.5	3.2	3.3	3.3	3.0	3.0	-1.3%	0.1%	15.1%	500	26.2%	167		
China	3.0	3.0	3.0	2.3	1.7	1.2	1.3	1.0	1.0	0.7	0.7	-0.4%	-13.1%	3.7%	280	14.7%	378		
Gabon	2.0	1.9	2.0	1.6	2.2	2.3	2.5	4.3	4.6	4.7	4.6	-1.5%	8.9%	23.2%	61	3.2%	13		
Ghana	0.5	0.4	0.4	0.6	0.8	1.4	1.6	0.9	0.9	0.8	0.8	-0.5%	4.7%	4.2%	13	0.7%	15		
India	0.9	0.9	0.9	0.7	0.7	1.0	0.8	0.5	0.5	0.7	0.7	-0.1%	-2.4%	3.6%	34	1.8%	47		
South Africa	4.3	5.2	5.9	5.3	5.4	5.8	5.8	7.2	7.2	7.3	7.2	-1.4%	5.3%	36.3%	600	31.4%	83		
Rest of World	4.0	4.1	3.7	3.8	4.6	3.9	4.2	2.9	2.5	2.7	2.7	-0.1%	-3.6%	13.8%	420	22.0%	153		
Total World	17.7	18.6	18.4	16.6	18.2	19.0	19.3	20.0	20.0	20.1	19.8	-1.1%	1.2%	100.0%	1908	100.0%	96		

Sources: includes data from US Geological Survey and Kearney Energy Transition Institute.

^ less than 0.05. Rest of World is the sum of only recorded reserves.

Nickel production and reserves

Mine production

Thousand tonnes												Reserves							
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Growth rate per annum		at end of		Share		R/P ratio	
	2023	2013-23	2023	2023	Share	R/P ratio													
Australia	234.0	245.0	234.0	204.0	190.0	170.0	180.0	160.0	151.0	155.0	160.0	3.2%	-3.7%	4.2%	24000	16.6%	150		
Canada	223.0	235.0	240.0	236.0	210.0	176.0	180.0	130.0	134.0	143.0	180.0	25.9%	-2.1%	4.7%	2200	1.5%	12		
Indonesia	440.0	177.0	170.0	199.0	400.0	606.0	800.0	1000.0	1040.0	1580.0	1800.0	13.9%	15.1%	47.3%	55000	38.0%	31		
New Caledonia	164.0	178.0	190.0	207.0	210.0	216.0	220.0	190.0	186.0	200.0	230.0	15.0%	3.4%	6.0%	7100	4.9%	31		
Philippines	446.0	523.0	530.0	347.0	230.0	345.0	420.0	370.0	387.0	345.0	400.0	15.9%	-1.1%	10.5%	4800	3.3%	12		
Russia	275.0	239.0	240.0	222.0	180.0	272.0	270.0	250.0	205.0	222.0	200.0	-9.9%	-3.1%	5.3%	8300	5.7%	42		
Rest of World	885.6	900.2	974.2	671.0	686.6	871.8	873.8	892.5	924.2	910.3	836.9	-8.1%	-0.6%	22.0%	43470	30.0%	52		
Total World	2667.6	2497.2	2578.2	2086.0	2106.6	2656.8	2943.8	2992.5	3027.2	3555.3	3806.9	7.1%	3.6%	100.0%	144870	100.0%	38		

Sources: includes data from US Geological Survey and Kearney Energy Transition Institute.

^ less than 0.05. Rest of World is the sum of only recorded reserves.

Key minerals Prices

Minerals, materials, and battery prices

Year	USD\$1000/te						USD\$1000/te		
	Cobalt ¹	Lithium carbonate ²	Nickel Sulphate ³	Pet Needle Coke ⁴	Natural Graphite ⁵	Copper ⁶	Lithium Iron Phosphate Cells ⁷	Lithium Nickel Manganese Cobalt Oxide Cells ⁸	
2000	33.42	4.47				1.81			
2001	23.26	1.49				1.58			
2002	15.23	1.59				1.56			
2003	23.37	1.55				1.78			
2004	52.76	1.72				2.86			
2005	35.19	1.46				3.68			
2006	37.96	2.32				6.73			
2007	67.35	3.53				7.13			
2008	86.00	4.44				6.96			
2009	39.38	5.94			0.91	5.16			
2010	45.97	5.19			1.08	7.54			
2011	39.66	5.10			1.35	8.82			
2012	31.02	5.42			1.43	7.96			
2013	27.07	5.70			0.99	7.33			
2014	30.79	5.72			0.92	6.86			
2015	28.46	6.55			0.69	5.51			
2016	25.47	12.02			0.58	4.87			
2017	55.79	17.04			0.65	6.17			
2018	81.17	13.04			0.78	6.53			
2019	35.91	10.29	17.47		0.67	6.01			
2020	33.95	6.49	16.63		0.53	6.17			
2021	52.93	15.17	24.42	1.02	0.56	9.32	0.07		0.10
2022	67.06	59.43	27.11	1.38	0.76	8.83	0.10		0.14
2023	35.44	40.30	20.39	0.89	0.65	8.49	0.09		0.10

¹ 2000-2012 spot grade for cathodes, source US Geological Survey. 2013-2017 source London Metal Exchange. Data from 2018 onwards: min purity 99.8%, Cobalt metal EXW Europe, min. 99.8% purity, source Benchmark Mineral Intelligence.

² 2000-2008 unit value, data series 140, source US Geological Survey. Data from 2009 onwards: Lithium carbonate global weighted average, min 99% purity, source Benchmark Mineral Intelligence.

³ Nickel sulphate CIF Asia, min 22% (100% Nickel contained basis), source Benchmark Mineral Intelligence.

⁴ Pre-calcined pet needle coke DDP China, sulphur <0.5%, source Benchmark Mineral Intelligence.

⁵ Flake graphite FOB China, -194 mesh, source Benchmark Mineral Intelligence

⁶ Copper, grade A cathode, LME spot price, CIF European ports, source International Monetary Fund (IMF)

⁷ Global weighted LFP cell, source Benchmark Mineral Intelligence.

⁸ Global weighted NCM cell, source Benchmark Mineral Intelligence

Methodology

The Statistical Review provides a globally consistent data time series. Here we outline the definitions, conversion factors and calculations we use to produce the report.

Primary energy

Traditionally, in the Statistical Review of World Energy, the primary energy of non-fossil based electricity (nuclear, hydro, wind, solar, geothermal, biomass in power and other renewables sources) has been calculated on an 'input-equivalent' basis – i.e. based on the equivalent amount of fossil fuel input required to generate that amount of electricity in a standard thermal power plant. For example, if nuclear power output for a country was 100 TWh, and the efficiency of a standard thermal power plant was 38%, the input equivalent primary energy would be $100/0.38 = 263$ TWh or about 0.95 EJ.

For many years, the efficiency of this standard power plant has been assumed to be 38%. However, in reality, the world average efficiency of fossil fuel-based power changes over time and has risen from around 36% in 2000 to over 40% today. Moreover, given the much higher efficiency of the most modern power plant (e.g. the thermal efficiency of a modern gas turbine plant is above 55%), the global average is expected to increase in the future.

Therefore, to better assess primary energy trends, we use a time-dependent thermal equivalence model. The conversion factor used each year to calculate the 'input-equivalent' consumption for a given level of generation is based on a simplified representation of measured average efficiency levels:

1965-2000: assumed constant efficiency of 36%

2000-2017: a linear increase from 36% to 40% based on observed data

2018 onwards: the annual rate of efficiency improvement is based on the simplified assumption that efficiency will increase linearly to 45% by 2050.

The table below quantifies these assumptions (rounded to 1 decimal place):

Thermal equivalent efficiency factors used to convert non-fossil electricity (excluding biomass powered electricity) to primary energy.

Thermal equivalent efficiency factors used to convert non-fossil electricity to primary energy

Year(s)	Efficiency factor	Year(s)	Efficiency factor
2001	36.2%	2013	39.1%
2002	36.5%	2014	39.3%
2003	36.7%	2015	39.5%
2004	36.9%	2016	39.8%
2005	37.2%	2017	40.0%
2006	37.4%	2018	40.2%
2007	37.6%	2019	40.4%
2008	37.9%	2020	40.5%
2009	38.1%	2021	40.7%
2010	38.4%	2022	40.8%
2011	38.6%	2023	41.0%
2012	38.8%		

*1965-2000 = 36.0%

In this year's Statistical Review, we use the updated thermal equivalent efficiency factor to convert electricity generation from biomass to primary energy equivalent. Prior to 2022, the same factor was used for biomass as for all non-fossil electricity. From 2022 onwards, we assume a constant efficiency of 32% for biomass power to better reflect the actual efficiency of biomass power plants.

Primary energy consumption is reported in net terms. The gross calorific value to net calorific value adjustment is fuel-specific.

Fuels used as inputs for conversion technologies (gas-to-liquids, coal-to-liquids and coal-to-gas) are counted as production for the source fuel and the outputs are counted as consumption for the converted fuel.

Oil

Oil reserves

Total proved reserves of oil are generally taken to be those quantities that geological and engineering information indicates with reasonable certainty can be recovered in the future from known reservoirs under existing economic and geological conditions.

The data series for proved oil reserves in this year's review does not necessarily meet the definitions, guidelines and practices used for determining proved reserves at company level, for instance as published by the US Securities and Exchange Commission nor does it necessarily represent the EI's view of proved reserves by country. Rather the data series has been compiled using a combination of primary official sources and third-party data.

Oil reserves include field condensate and natural gas liquids as well as crude oil. This inclusive approach helps to develop consistency with the oil production numbers published in the Review, which also include these categories of oil. The reserves and R/P ratio for Canada includes Canadian oil sands and the reserves and R/P ratio for Venezuela includes the Orinoco Belt.

Liquid hydrocarbon fuels from non-hydrocarbon sources, such as ethanol from corn or sugar or synthetic oil derived from natural gas (so-called GTL or gas-to-liquids), are not included in either the reserves or production series.

We have provided a detailed explanatory note on reserves clarifying current definitions and terminology.

R/P ratios represent the length of time that those remaining reserves would last if production were to continue at the previous year's rate. They are calculated by dividing remaining reserves at the end of the year by the production in that year.

Reserves-to-production (R/P) ratios are available by country and feature in the table of oil reserves. There is a time series of crude oil reserves from 1980, which can be found in the Excel workbook. Data are measured in thousand million barrels.

Please note that these reserves tables have not been updated this year.

Oil production

Oil production data includes crude oil, shale oil, oil sands, condensates (lease condensate or gas condensates that require further refining) and NGLs (natural gas liquids – ethane, LPG and naphtha separated from the production of natural gas). Excludes liquid fuels from other sources such as biofuels and synthetic derivatives of coal and natural gas. This also excludes liquid fuel adjustment factors such as refinery processing gain. Excludes oil shales/kerogen extracted in solid form.

The split of crude/condensate and natural gas liquids figures are available. The crude condensate table includes crude oil, shale/tight oil, oil sands, lease condensate or gas condensates that require further refining. Excludes liquid fuels from other sources such as biomass and synthetic derivatives of coal and natural gas. The NGL's table includes ethane, LPG and naphtha separated from the production of natural gas. Excludes condensates.

World oil production tables are available in both thousand barrels daily and million tonnes.

Liquids, oil and oil product consumption

Oil consumption as defined in previous Statistical Reviews (i.e. including biofuels) has been renamed 'liquids' consumption and a table is still included on this original basis. In addition, more granularity has been included on the product split of both oil products and biofuels (breaking out ethane & LPG and naphtha in oil products and the ethanol/biodiesel split of biofuels).

Total liquids consumption comprises inland demand plus international aviation and marine bunkers and refinery fuel and loss. Consumption of biogasoline (such as ethanol), biodiesel and derivatives of coal and natural gas are also included.

Oil consumption figures include inland demand plus international aviation and marine bunkers and refinery fuel and loss. Consumption of biogasoline (such as ethanol), biodiesel and derivatives of coal and natural gas are excluded. Derivatives of coal and natural gas are included.

Oil product consumption – Gasoline includes motor and aviation gasoline, gasolines and light distillate feedstock (LDF). Diesel/gasoil includes marine gasoil. 'Fuel oil' includes marine bunkers and crude oil used directly for fuel. 'Others' consists of refinery gas, solvents, petroleum coke, lubricants, bitumen, wax, other refined products and refinery fuel and loss.

Data are supplied in both exajoules and thousand barrels daily figures.

Oil prices

The key crudes quoted are Brent, West Texas Intermediate (WTI), Nigerian Focados and Dubai in US\$ per barrel.

The spot crude price history from 1972 and annual crude price history from 1861 are available in the historical data Excel workbook.

Using S&P Global Platts data

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Refining

The refinery capacity data presented in this Review represents the sum of reported atmospheric crude distillation and condensate splitting capacity. Capacity should comprise the amount of input that a distillation facility can process under usual operating conditions, taking into account scheduled downtime. Figures are in thousand barrels daily at year end per calendar day.

Refinery throughputs are based on the quantity of crude and condensate processed in atmospheric distillation units and condensate splitters. Figures are in thousands of barrels per day.

The refining margins presented are benchmark margins for three major global refining centres: US Gulf Coast (USGC), North West Europe (NWE – Rotterdam) and Singapore. In each case they are based on a single crude oil appropriate for that region and have optimised product yields based on a generic refinery configuration (cracking, hydrocracking or coking), again appropriate for that region. The margins are on a semi-variable basis, i.e. the margin after all variable costs and fixed energy costs.

Methodology

Oil trade movements

The tables exclude the intra-area movements of oil (for example, crude oil and products moving between countries within Europe). They do not include biofuels. Bunkers fuel is not included as exports. Crude imports and exports include condensates. Saudi Arabian exports from 1980 are also available in the oil trade movements table in the Excel workbook. The split of crude oil and products are detailed. Data in the tables are in million tonnes and thousand barrels per day.

Natural gas

Natural gas reserves

Total proved reserves of natural gas are generally taken to be those quantities that geological and engineering information indicates with reasonable certainty can be recovered in the future from known reservoirs under existing economic and operating conditions.

The data series for proved natural gas reserves in this year's Review does not necessarily meet the definitions, guidelines and practices used for determining proved reserves at company level, for instance as published by the US Securities and Exchange Commission nor does it necessarily represent the EI's view of proved reserves by country. Rather, the data series has been compiled using a combination of primary official sources and third-party data.

Although every effort is made to come up with a consistent series for reserves based on a common definition, different countries use different methodologies and the data have varying levels of reliability.

R/P ratios represent the length of time that those remaining reserves would last if production were to continue at the previous year's rate. They are calculated by dividing remaining reserves at the end of the year by the production in that year.

As far as possible, the data represents standard cubic metres (measured at 15°C and 1013 mbar) and have been standardised using a gross calorific value (GCV) of 40 MJ/m³.

There is a time series of natural gas reserves, which can be found in the Excel workbook. Data are measured in billion cubic metres.

Please note that these reserves tables have not been updated this year.

Natural gas production

Gas production comprises marketed production and excludes gas flared or recycled gas. Includes natural gas produced for gas-to-liquids transformation.

As far as possible, the data above represents standard cubic metres (measured at 15°C and 1013 mbar); as they are derived directly from tonnes of oil equivalent using an average conversion factor and have been standardised using a gross calorific value (GCV) of 40 MJ/m³, they do not necessarily equate with gas volumes expressed in specific national terms.

Natural gas production is provided in three different units of measurement to accommodate regional customary usage. World natural gas production PDF tables are in both billion cubic metres, and exajoules. Data in the Excel workbook are also in billion cubic feet per day (bcf/d).

Natural gas consumption

Natural gas consumption excludes natural gas converted to liquid fuels but includes derivatives

of coal as well as natural gas consumed in gas-to-liquids transformation.

As far as possible, the data above represents standard cubic metres (measured at 15°C and 1013 mbar); as they are derived directly from tonnes of oil equivalent using an average conversion factor and have been standardised using a gross calorific value (GCV) of 40 MJ/m³ they do not necessarily equate with gas volumes expressed in specific national terms. The difference between these world consumption figures and the world production statistics is due to variations in stocks at storage facilities and liquefaction plants, together with unavoidable disparities in the definition, measurement or conversion of gas supply and demand data.

Consumption data in the PDF data table is in billion cubic meters (bcm) and exajoules, data in billion cubic feet per day (bcf/d) can be found in the Excel workbook.

Natural gas prices

Annual prices are given for benchmark natural gas hubs together with contracted pipeline and LNG imports. The benchmark hub prices incorporate US (Henry Hub), Canada (Alberta), Netherlands TTF index and the UK (NBP).

Contract prices are represented by LNG imports into Japan, the Japan Korea Marker (JKM) and Average German Import Prices.

The prices for LNG and European border are calculated as CIF prices, where CIF = cost + insurance + freight (average freight prices) in US dollars per million British thermal units (Btu).

Natural gas trade movements

Trade flows are on a contractual basis and may not correspond to physical gas flows in all cases. The data illustrates the flow of pipeline natural gas and LNG between sources of production and the regions of consumption. LNG trade. As far as possible, the data represents standard cubic metres (measured at 15°C and 1013 mbar) and has been standardised using a gross calorific value (GCV) of 40 MJ/m³.

Coal

Coal reserves

Total proved reserves of coal are generally taken to be those quantities that geological and engineering information indicates with reasonable certainty can be recovered in the future from known deposits under existing economic and operating conditions.

Total proved coal reserves are shown for anthracite and bituminous (including brown coal) and sub-bituminous and lignite.

Reserves-to-production (R/P) ratios represent the length of time that those remaining reserves would last if production were to continue at the previous year's rate. They are calculated by dividing remaining reserves at the end of the year by the production in that year. The R/P ratios are calculated excluding other solid fuels in reserves and production.

R/P ratios are available by country and feature in the table of coal reserves. R/P ratios for the region and the world are depicted in the chart above and the Energy charting tool.

Coal reserve data is in million tonnes.

Please note that these reserves tables have not been updated this year.

Coal production

Coal production includes data for commercial solid fuels only. Included in the hard coal

category are bituminous and anthracite (hard coal). The sub-bituminous coal includes lignite and brown coal. Other commercial solid fuels are also included. The data includes coal produced for coal-to-liquids and coal-to-gas transformations.

In the coal production PDF table, the units are in exajoules. The data can also be downloaded from the Excel workbook in million tonnes.

Coal consumption

Coal consumption includes data for solid fuels only. Included in the hard coal category are bituminous and anthracite. The sub-bituminous coal includes lignite and brown coal. Other commercial solid fuels are also included. The figures exclude coal converted to liquid or gaseous fuels, but includes coal consumed in transformation processes.

Differences between world consumption figures and the world production statistics are accounted for by stock changes, and unavoidable disparities in the definition, measurement or conversion of coal supply and demand data.

Coal prices

Annual prices quoted include the Northwest Europe marker price, Japan steam spot CIF price, China Qinhuangdao spot price and the US Central Appalachian coal spot price index. Coal prices except for the US Central Appalachian price are calculated as CIF prices, where CIF = cost + insurance + freight (average freight prices). The US Central Appalachian price is FOB = free on board. All prices are quoted in US dollars per tonne.

IHS Northwest Europe prices for 1996-2000 are the average of the monthly marker, 2001-2017 the average of weekly prices. IHS Japan prices basis = 6,000 kilocalories per kilogram NAR CIF. Chinese prices are the average monthly price for 2000-2005, weekly prices 2006-2017, 5,500 kilocalories per kilogram NAR, including cost and freight (CFR).

Coal trade movements

Commercial solid fuels only, i.e. bituminous coal and anthracite (hard coal), and lignite and brown (sub-bituminous) coal, and other commercial solid fuels. Intra-area movements (for example, between countries in Europe, Other CIS, Other Africa, Other Asia Pacific) are excluded.

Nuclear energy

The data are based on gross generation and not accounting for cross-border electricity supply. 'Input-equivalent' energy is the amount of fuel that would be required by thermal power stations to generate the reported electricity output. Details on thermal efficiency assumptions are available online.

Data for the units are in exajoules in the PDF. The data are available in the Excel workbook in terawatt-hours (TWh).

Hydroelectricity

The data are based on gross generation and not accounting for cross-border electricity supply. 'Input-equivalent' energy is the amount of fuel that would be required by thermal power stations to generate the reported electricity output.

Details on thermal efficiency assumptions are available online.

In the hydroelectricity consumption PDF table, the units are in exajoules. The data are available in the Excel workbook in terawatt-hours (TWh).

Methodology

Renewable energy

The data are based on gross generation and not accounting for cross-border electricity supply. 'Input-equivalent' energy is the amount of fuel that would be required by thermal power stations to generate the reported electricity output. Details on thermal efficiency assumptions are available online.

Renewable power is based on gross generation from renewable sources including wind, geothermal, solar, biomass and waste, and not accounting for cross-border electricity supply.

Biofuels production and consumption

The data includes biogasoline (such as ethanol) and biodiesel. Volumes have been adjusted for energy content.

The biofuels PDF tables are in thousand barrels of oil equivalent per day figures. The data are available in additional units in the Excel workbook.

Electricity

Electricity generation is based on gross output.

Carbon

Carbon emissions from primary energy use are estimated by applying the Default CO₂ Emission Factors for Combustion to the consumption of each energy product type (coal, natural gas and various oil products) from the list of IPCC emission factors. Biofuels are considered as not emitting CO₂, consistent with the practice of the IEA. Second, the revised method takes account of fuel consumption used for non-combustion purposes, such as the use of oil products and natural gas in the petrochemicals industry or of oil to produce bitumen for road construction. Estimates of the share of non-combusted fossil

fuels taken from the IEA's energy balances are subtracted from the total consumption of fossil fuels before applying the relevant emission factors.

Carbon emissions from flared natural gas are calculated using data series on volumes of gas flared from two sources: Cedigaz up to 2012, and the Payne Institute for Public Policy, Colorado School of Mines, from 2013 onward. Payne Institute's data include flaring from upstream, downstream oil and gas, while Cedigaz include flaring from upstream only. Volumes of gas flared have been standardised using a Gross Calorific Value (GCV) of 40 MJ/m³. The IPCC Default CO₂ Emission Factor for Combustion for natural gas (56,100 kg CO₂ per TJ) is used and perfect combustion has been assumed. These emissions represent around 1% of total CO₂ emissions.

Data for methane emissions associated with the production, transportation and distribution of fossil fuels for 1990-2020 are sourced, where available, from IEA (2023) Greenhouse Gas Emissions from Energy (all rights reserved). For countries not covered by the IEA, additional data has been sourced from Kayrros. For a selected number of fossil fuel producing countries where methane emission data is not currently available through either provider, an estimate of historical methane emissions has been derived using regional average methane intensity of production. For 2023, methane emission estimates are derived for all countries using methane intensity of fossil fuel production in 2022. Total methane emissions at a global and regional level show a discrepancy with IEA data due to non-inclusion of residual emissions i.e. emissions which have not been allocated to named countries. There is a wide range

of uncertainty with respect to both current estimates of methane emissions and the global warming potential of methane emissions. To ensure alignment with financial and government reporting standards, the methane to CO₂e factor is a 100-year Global Warming Potential (GWP) of 25, recommended by the IPCC in AR4. Carbon emissions from industrial processes refer only to non-energy CO₂ emissions from cement production and are sourced for 1990-2023 from Andrew, R. M. (2019) Global CO₂ emissions from cement production, 1928-2018. Earth System Science Data 11, 1675-1710, (updated dataset May 2023).

Minerals

Total proved reserves of minerals are generally taken to be those quantities that geological and engineering information indicates with reasonable certainty can be recovered in the future from known resources under existing economic and geological conditions.

The data series for mineral reserves in this year's review does not necessarily meet the definitions, guidelines and practices used for determining proved reserves at company level nor does it necessarily represent the EI's view of proved reserves by country. Rather the data series has been compiled using a combination of primary official sources and third-party data.

Revisions and corrections

Each year revisions are made to historical data when updated or more reliable data sources become available. Corrections are also made when errors are identified in data. In this Statistical Review corrections have been made to the emissions, biofuels, historic oil prices and oil refinery throughput tables.

Appendices Approximate conversion factors

Crude oil*

From	To				
	tonnes (metric)	kilolitres	barrels	US gallons	tonnes per year
	Multiply by				
Tonnes (metric)	1	1.165	7.33	307.86	–
Kilolitres	0.8581	1	6.2898	264.17	–
Barrels	0.1364	0.159	1	42	–
US gallons	0.00325	0.0038	0.0238	1	–
Barrels/day	–	–	–	–	49.8

*Based on worldwide average gravity.

Oil products

From	To convert					
	barrels to tonnes	tonnes to barrels	kilolitres to tonnes	tonnes to kilolitres	tonnes to gigajoules	tonnes to barrels oil equivalent
	Multiply by					
Ethane	0.059	16.850	0.373	2.679	49.400	8.073
Liquefied petroleum gas (LPG)	0.086	11.600	0.541	1.849	46.150	7.542
Gasoline	0.120	8.350	0.753	1.328	44.750	7.313
Kerosene	0.127	7.880	0.798	1.253	43.920	7.177
Gas oil/diesel	0.134	7.460	0.843	1.186	43.380	7.089
Residual fuel oil	0.157	6.350	0.991	1.010	41.570	6.793
Product basket	0.124	8.058	0.781	1.281	43.076	7.039

*Based on worldwide average gravity.

Natural gas (NG) and liquefied natural gas (LNG)

From	To convert						
	billion cubic metres NG	billion cubic feet NG	petajoules NG	million toe	million tonnes LNG	tonnes to gigajoules	tonnes to barrels oil equivalent
	Multiply by						
1 billion m ³ NG	1.000	35.315	36.000	0.860	0.735	34.121	5.883
1 billion ft ³ NG	0.028	1.000	1.019	0.024	0.021	0.966	0.167
1 petajoule NG	0.028	0.981	1.000	0.024	0.021	0.952	0.164
1 million toe	1.163	41.071	41.868	1.000	0.855	39.683	6.842
1 million tonnes LNG	1.360	48.028	48.747	1.169	1.000	46.405	8.001
1 trillion Btu	0.029	1.035	1.050	0.025	0.022	1.000	0.172
1 million boe	0.170	6.003	6.093	0.146	0.125	5.800	1.000

Units

1 metric tonne	= 2204.62 lb.
	= 1.1023 short tons
1 kilolitre	= 6.2898 barrels
1 kilolitre	= 1 cubic metre
1 kilocalorie (kcal)	= 4.1868 kJ
	= 3.968 Btu
1 kilojoule (kJ)	= 1,000 joules
	= 0.239 kcal
	= 0.948 Btu
1 petajoule (PJ)	= 1 quadrillion joules (1 x 10 ¹⁵)
1 exajoule (EJ)	= 1 quintillion joules (1 x 10 ¹⁸)
1 British thermal unit (Btu)	= 0.252 kcal
	= 1.055 kJ
1 barrel of oil equivalent (boe)	= 5.8 million Btu
	= 6.119 million kJ
1 kilowatt-hour (kWh)	= 860 kcal
	= 3600 kJ
	= 3412 Btu

Calorific equivalents

One exajoule equals approximately:

Heat units	239 trillion kilocalories
	948 trillion Btu
Solid fuels	40 million tonnes of hard coal
	95 million tonnes of lignite and sub-bituminous coal
Gaseous fuels	See Natural gas and LNG table
Electricity	278 terawatt-hours

All fuel energy content is net or lower heating value (i.e., net of heat of vapourisation of water generated from combustion).

1 barrel of ethanol = 0.58 barrels of oil equivalent
 1 barrel of biodiesel = 0.86 barrels of oil equivalent
 1 tonne of ethanol = 0.68 tonne of oil equivalent
 1 tonne of biodiesel = 0.88 tonne of oil equivalent

Other terms

Tonnes: Metric equivalent of tons

Percentages

Calculated before rounding of actuals.

Rounding differences

Because of rounding, some totals may not agree exactly with the sum of their component parts.

Definitions

Regional definitions

Country groupings are made purely for statistical purposes and are not intended to imply any judgment about political or economic standings.

North America

US (excluding US territories), Canada, Mexico.

Caribbean

Atlantic islands between the US Gulf Coast and South America, including Puerto Rico, US Virgin Islands and Bermuda.

Central America

Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panama.

South and Central America

Caribbean (including Puerto Rico and US Virgin Islands), Bermuda, Central and South America.

Europe

European members of the OECD plus Albania, Bosnia-Herzegovina, Bulgaria, Croatia, Cyprus, Georgia, Gibraltar, Latvia, Lithuania, Malta, Montenegro, North Macedonia, Romania, Serbia and Ukraine.

Commonwealth of Independent States (CIS)

Armenia, Azerbaijan, Belarus, Kazakhstan, Kyrgyzstan, Moldova, Russian Federation, Tajikistan, Turkmenistan, Uzbekistan.

Middle East

Arabian Peninsula, Iran, Iraq, Israel, Jordan, Lebanon, Syria.

Northern Africa

Territories on the north coast of Africa from Egypt to Western Sahara.

Eastern Africa

Territories on the east coast of Africa from Sudan to Mozambique. Also Madagascar, Malawi, Uganda, Zambia, Zimbabwe.

Middle Africa

Angola, Cameroon, Central African Republic, Chad, Democratic Republic of Congo, Republic of Congo, Equatorial Guinea, Gabon, Sao Tome & Principe.

Western Africa

Territories on the west coast of Africa from Mauritania to Nigeria, including Burkina Faso, Cape Verde, Mali and Niger.

Southern Africa

Botswana, Eswatini, Lesotho, Namibia, South Africa.

Asia Pacific

Brunei, Cambodia, China[†], China Hong Kong SAR*, China Macau SAR*, Indonesia, Japan, Laos, Malaysia, Mongolia, North Korea, Philippines, Singapore, South Asia (Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka), Myanmar, South Korea, Taiwan, Thailand, Vietnam, Australia, New Zealand, Papua New Guinea and Oceania.

[†] Mainland China

* Special Administrative Region

Australasia

Australia, New Zealand.

OECD members (Organization For Economic Co-operation and Development)

Europe: Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye, UK.

Other member countries: Australia, Canada, Chile, Colombia, Costa Rica, Israel, Japan, Mexico, New Zealand, South Korea, US.

OPEC members (Organization of the Petroleum Exporting Countries)

Middle East: Iran, Iraq, Kuwait, Saudi Arabia, United Arab Emirates.

North Africa: Algeria, Libya.

West Africa: Angola, Equatorial Guinea, Gabon, Nigeria, Republic of Congo.

South America: Venezuela.

European Union members

Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Republic of Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden.

Non-OECD (Organization for Economic Co-operation and Development)

All countries that are not members of the OECD.

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