KPMG

The disorderly energy transition

What the world's shifting energy demands could mean for business

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Insights from the Statistical Review of World Energy 2025

Drawing on the 2025 Statistical Review of World Energy, this briefing provides insights for leaders navigating today's complex energy trends. It covers evolving demand patterns and the shifting roles of oil, coal, gas, and renewables around the world, all set against rising geopolitical instability and economic pressures.

The year in 8 key themes:

1. Our energy hungry world

Global energy demand continues to rise at a pace that exceeds what renewables can deliver, endangering climate commitments

2. The renewables reality check in Europe

Renewables met over 80% of increased power demand in 2024, but is increasingly facing constraints that are limiting growth across key regions

3. The future is electric

Electricity demand grows twice as fast as overall energy demand, driven by rapid electrification in countries like China

4. Natural gas: More than a bridge fuel

Global gas consumption reached record levels in 2024 and gas demand continues to grow, suggesting a continued long-term role in the energy system

5. Peak oil or plateau oil?

Global oil demand growth rates are falling, peaking in the US and in Europe, suggesting that we may be approaching a plateau

6. Coal: The sleeping giant

Coal's global share of world energy is falling but coal demand continue to rise in most regions

7. Energy is flowing in new directions

Global geopolitics and conflict lead to major disruption of energy flows in recent years and the energy system seems to have stabilised around a new trade flow pattern

8. Commodity prices: Less volatile but uncertainty remains

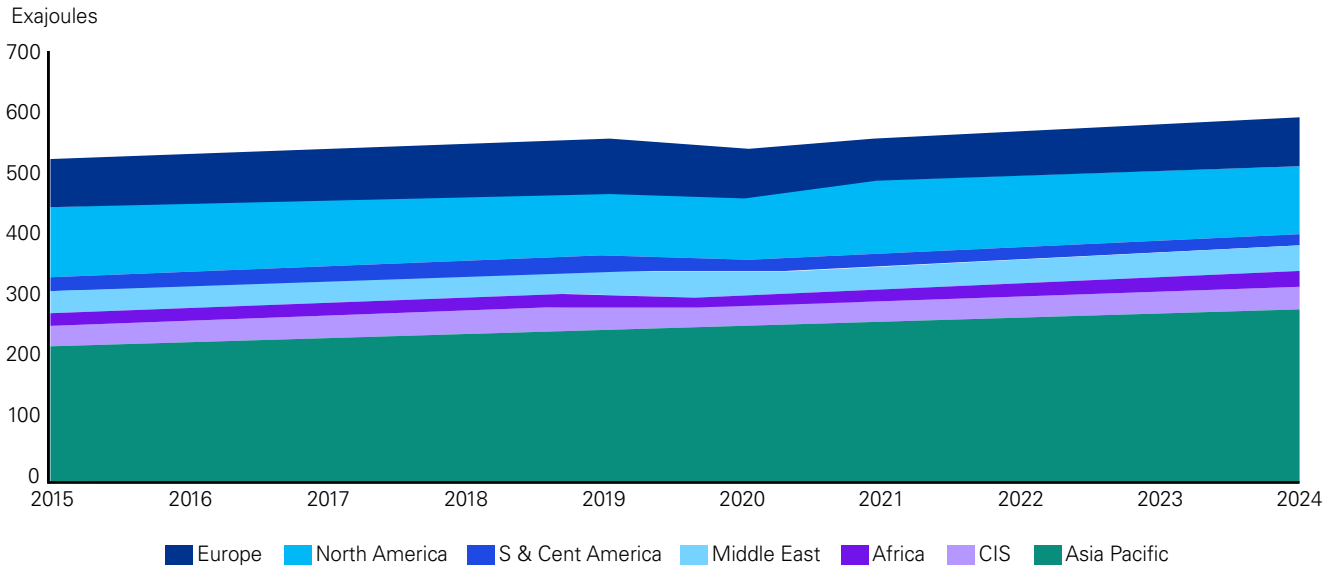
Stability in key commodity prices compared to the volatility of recent years

Theme 1

Our energy hungry world

We live in an energy-hungry world where global energy demand continues to rise (by 2% in 2024), driven by growing populations and economies—especially in India, China, and South East Asia. This is despite total energy demand staying broadly flat in Europe and North America. Renewable deployment hit record levels last year (Wind, solar, biofuels, geothermal and hydropower sources met ~8% of global energy demand in 2024, using the Review's updated methodology). But so did fossil fuels. In fact, 2024 saw growth across all energy sources. And in many cases, government policies are supportive of this growth: geopolitical instability has meant that national / energy security, energy resilience and affordability concerns appear to be increasingly taking precedence over efforts on decarbonization.

Global primary energy consumption by region

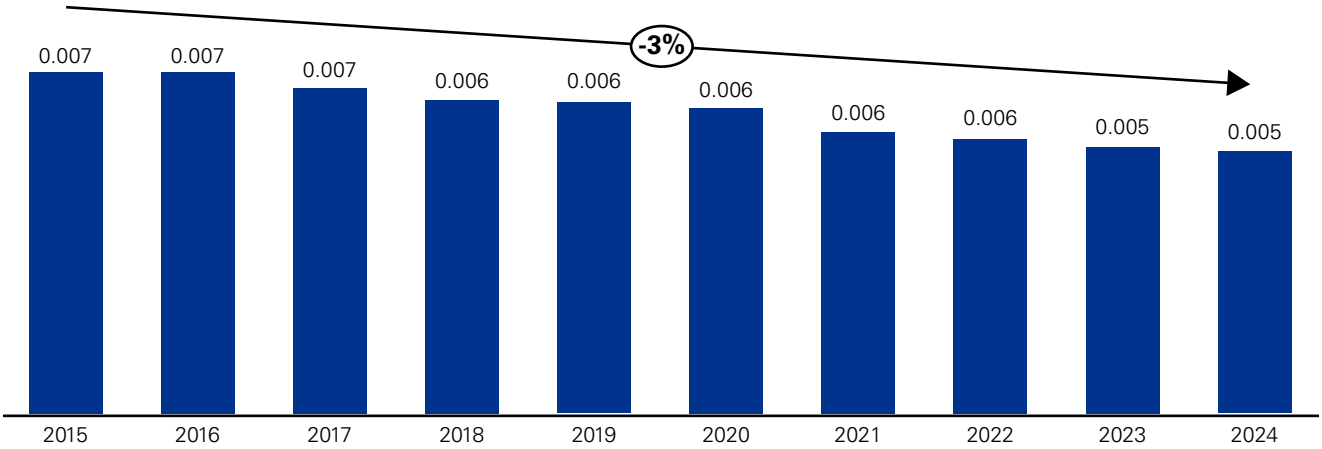


Source: Energy Institute, in association with KPMG International and Kearney. "2025 Statistical Review of World Energy."

Key insight:

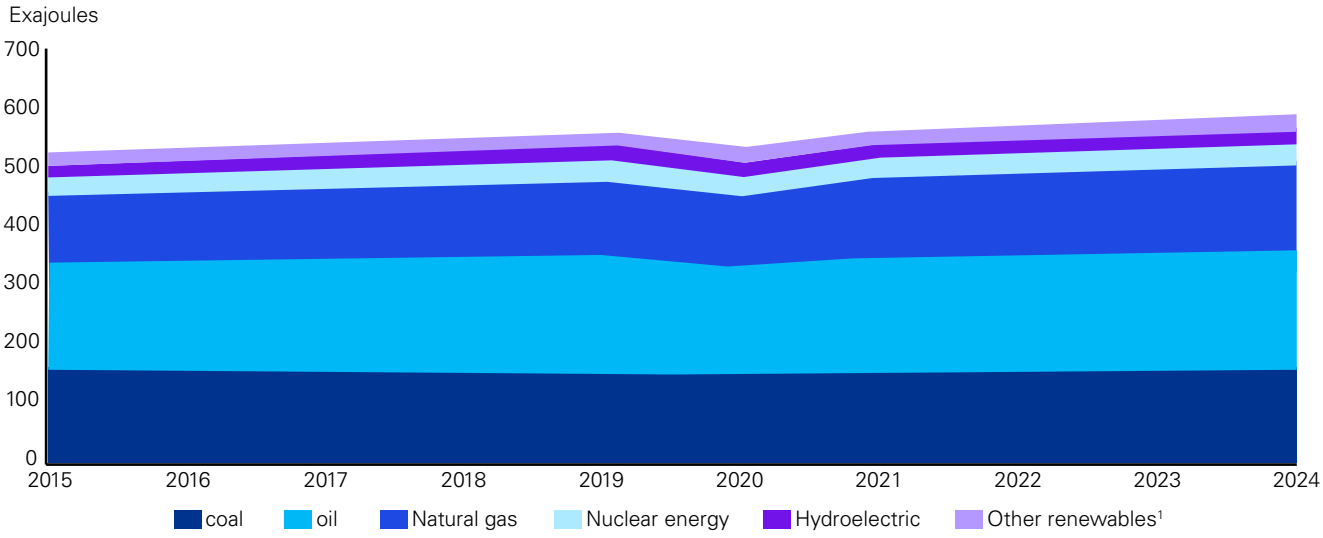
Energy demand globally continues to rise – by about 2% in 2024. And this growth is not being significantly restrained by increases in energy efficiency—the world's energy intensity has shown a long-term decreasing trend, but not at the pace and scale hoped for. Energy efficiency gains have stalled, with EJ/GDP ratios broadly flattening (rather than being on course to 'halve by 2030' as agreed at COP28, including the COP28 commitment to double energy efficiency installations by 2030).

Global energy intensity (EJ/USD; 2015-2024)



Source: Energy Institute, in association with KPMG International and Kearney. "2025 Statistical Review of World Energy."

Global primary energy consumption

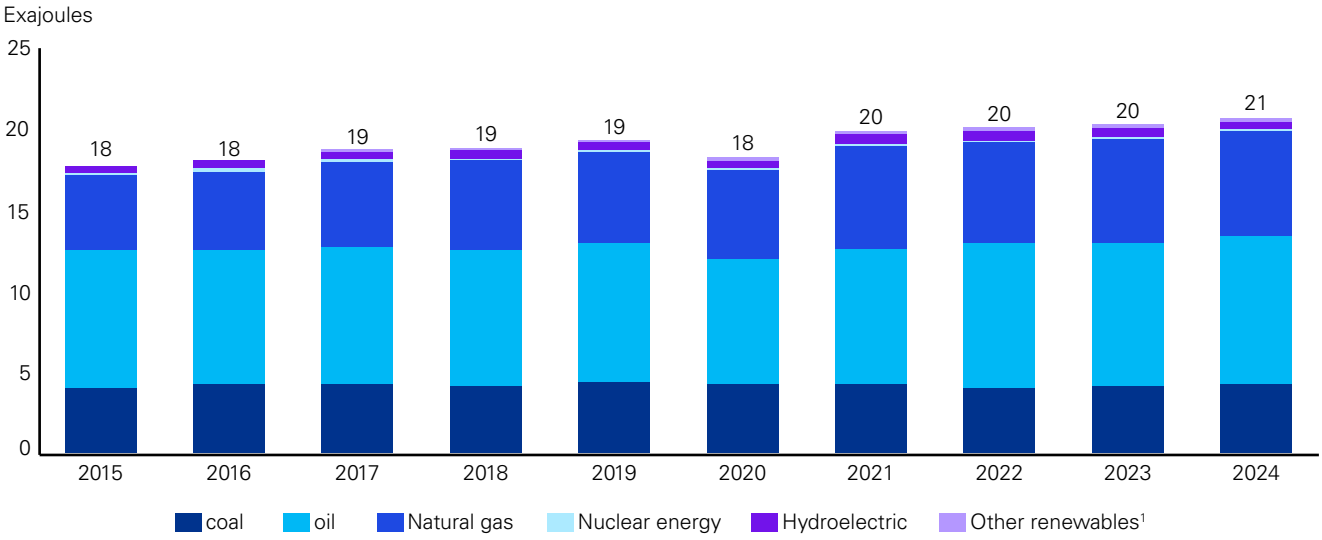


1. Includes Biofill, solar, wind, geothermal, biomass

Source: Energy Institute, in association with KPMG International and Kearney. "2025 Statistical Review of World Energy."

Energy demand growth also illustrates the ongoing challenges of economic development and sustainable growth in much of the world. China and India are outliers rather than representative of the broader picture. Africa as a whole comprised only 4% of global energy demand in the year, and total energy supply to the continent grew by only 1%. Africa is also not seeing the level of renewables growth observed in other regions. Renewables in Africa grew by 0.01 EJ (11%)% vs. oil growth of 0.25 EJ (3%) and coal growth of 0.1 EJ (1%).

African primary energy consumption



1. Includes Biofill, solar, wind, geothermal, biomass

Source: Energy Institute, in association with KPMG International and Kearney. "2025 Statistical Review of World Energy."

Implications for business:

- Massive and sustained investment will be needed across the energy sector to satisfy rising energy demand particularly in India, China and Southeast Asia.
- Increasing focus of renewable investments in technologies (predominantly wind and solar) and regions that don't require ongoing government policy support.
- A much greater focus on energy security and resilience given geopolitical uncertainty. Renewables increasing seen through this lens in many countries.
- Increasing need to adapt to the climate change impacts we are already seeing and which will only increase given the trajectory the world is on.
- A sharper focus on national supply chains and less reliance on global competition to drive down prices.

Theme 2

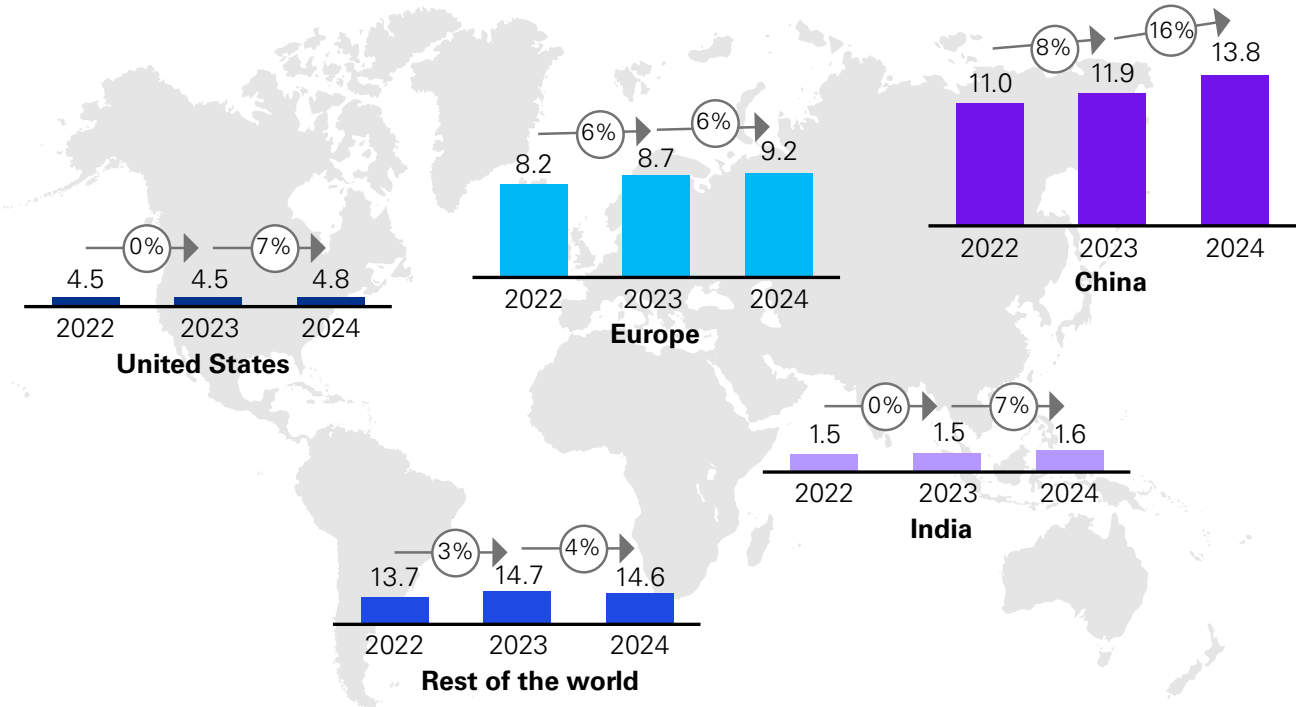
The renewables reality check in Europe

Renewables growth remains uneven globally, and accelerating progress is likely to become increasingly challenging amid rising economic headwinds and diverging regional policies.

Key insight:

Over 80% of the increase in power demand in 2024 was met by renewables, but renewable energy expansion varied widely across regions. 57% of these global additions to renewables were in China. So, for the second year running, China added more renewables than the rest of the world combined. Moreover, over half of all new car sales in China are now EVs. Renewables deployment grew by 7% in the US in 2024, stimulated by the Inflation Reduction Act, though more recent policy changes may slow progress going forwards. In Europe, renewables growth was 6% last year, less than half the rate in China, and lower than the year before. Renewables growth outside of China, India, Europe and the US was only 4%. In aggregate, non-fossil fuels sources now supply about 13% of total energy globally, based on the updated methodology used by the Review to align better with other data sources like the IEA.

Renewable generation by region (Exajoules)



Source: Energy Institute, in association with KPMG International and Kearney. "2025 Statistical Review of World Energy."

Renewables electricity faces significant challenges that are standing in the way of continued growth. In 2023, KPMG International produced a report on 'Scaling Renewables'[1] identifying the barriers to 'trebling' the deployment of renewables by 2030, as agreed at COP28. This included tackling grid capacity, speeding up planning and expanding supply chain capacity. Since then, whilst renewables have grown at between 10-15% pa globally, there has not been sufficient progress on these issues to keep the world on track with the targets agreed at COP28. In addition, renewables growth in Europe has faced increasing challenges from macroeconomic headwinds: rising interest rates, supply chain and general inflation have pushed up project costs, squeezing returns and profitability. More recently, the current US administration has proposed curtailing the support afforded under the Inflation Reduction Act, which has further added to the financial pressures on investors in the sector.

Furthermore, the global biofuel demand hit a record 2.2 million barrels of oil equivalent per day in 2024, driven mainly by strong growth in the Asia Pacific region, with India and Indonesia leading consumption. While demand surged nearly 3% worldwide, the EU saw a 11% drop, primarily in biodiesel, contrasting with a modest rise in bio-gasoline amid increasing gasoline use despite EV adoption.

> **"Whilst renewables have grown at between 10-15% pa globally, we have not seen sufficient progress on these issues to keep the world on track with the targets agreed at COP28."**

Implications for business:

- Investment opportunities in renewables and conventional energy will continue to diverge by region, reflecting different economic conditions, policy environments and cost pressures.
- Companies must adapt strategies to address rising supply chain and project costs and tighter returns, as higher financing costs and inflation are squeezing profit margins on renewables investments.
- The shift away from ultra-low interest rates prior to 2022 means that proving strong ROI on renewables is increasingly difficult, requiring sharper financial discipline and innovation in procurement strategies.
- Regional policy divergence—such as China's economies of scale versus slower progress elsewhere—will create uneven competitive dynamics and risk profiles.
- Limiting exposures to investments that are heavily dependent on government policy support, given the severe fiscal constraints in many geographies.
- Rising biofuel demand in Asia Pacific offers strong growth opportunities, especially in Asia. Meanwhile, declining EU biodiesel demand signals the need for businesses to diversify and adapt to changing markets.

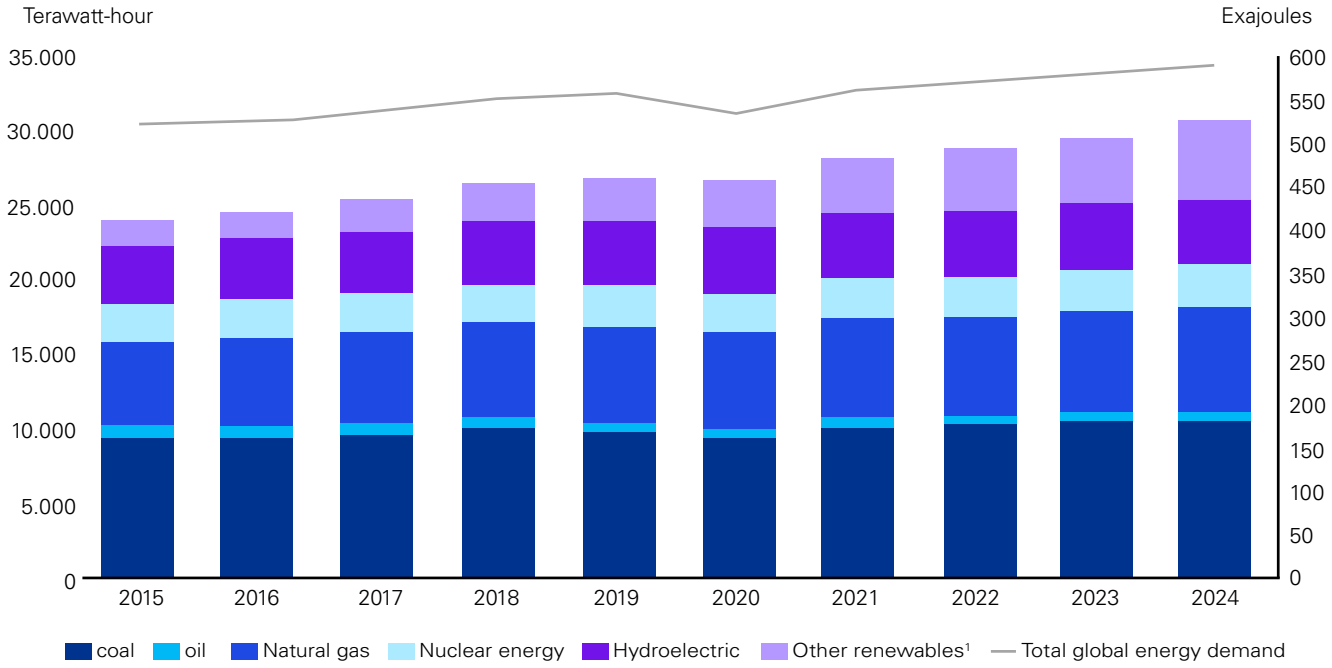
1 'Turning the tide in scaling renewables: Addressing the barriers and opportunities to accelerate the global energy transition," KPMG Report, 2023

Theme 3

The future is electric

Electricity demand is growing twice as fast as overall energy demand, driven by rapid electrification in countries like China—where it's a key part of the strategy for energy security and competitiveness—and fuelled by renewables, EVs, and (more recently) growing demand from data centres. This rapid electrification of many economies is placing increasing strain on the build out of electricity grids, on supply chains and critical mineral supplies.

Global electricity generation (Terawatt-hour) by region and total global energy demand (Exajoules)

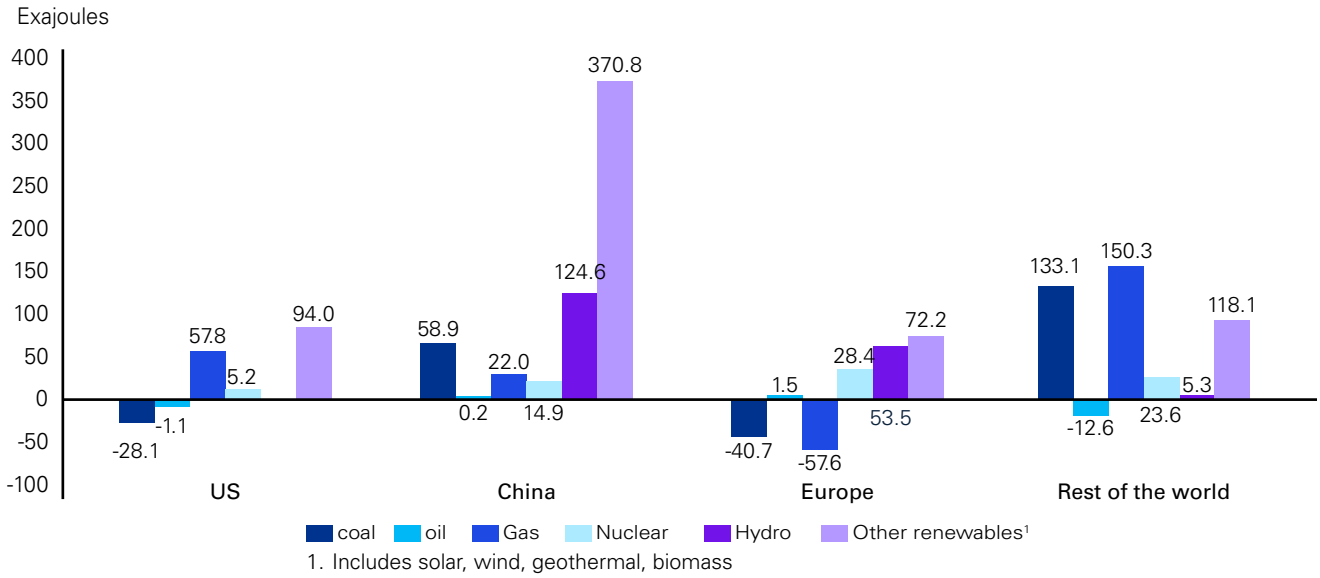


1. Includes solar, wind, geothermal, biomass
Source: Energy Institute, in association with KPMG International and Kearney. "2025 Statistical Review of World Energy."

Key insight:

To date, the energy transition has involved the rapid electrification of economies. China exemplifies this trend, deploying record amounts of renewables, electric vehicles and nuclear power as part of a strategic push toward energy security and industrial competitiveness—an approach that also benefits the climate through emissions reductions. But electricity growth is not just a renewables story. Coal and gas fired electricity supply grew by 2.5% in 2024, and almost all of US growth was driven by gas, which now accounts for 43% of electrical power supply.

Regional changes in electricity generation by source (2023-vs-2024)



1. Includes solar, wind, geothermal, biomass

Source: Energy Institute, in association with KPMG International and Kearney. "2025 Statistical Review of World Energy."

Sustaining this rapid expansion is proving difficult. Grid infrastructure expansion faces bottlenecks, and recent outages like those in Iberia spotlight challenges around storage, interconnection, and system inertia in renewables dominated power systems. Both the UK and key regions in the US have seen multi-year queues for grid connections from offshore and onshore renewables projects. Beyond infrastructure, the global race to electrify economies is driving fierce competition for resources from critical supply chain essentials to grids and renewables. Meanwhile, skills shortages—such as a lack of qualified electrical engineers—are a widespread issue affecting many jurisdictions, impeding the pace of delivery.

"Beyond infrastructure, the global race to electrify economies is driving fierce competition for resources from critical supply chain essentials to grids and renewables."

Implications for business:

- Investment opportunities exist in electrification-related assets including grid expansion/upgrades, energy storage, and demand flexibility solutions to complement the growth in renewables.
- Overcoming delivery challenges will require navigating capital constraints, supply chain competition, and critical skills shortages, all which risk slowing infrastructure deployment.
- The battle for supply chains and talent means businesses must develop long-term, resilient procurement strategies and invest in workforce development to meet escalating demand.
- Growing demand for 'private wire' or self-sufficiency by data centres to meet their own power needs given very high reliability requirements and need for early grid connections.

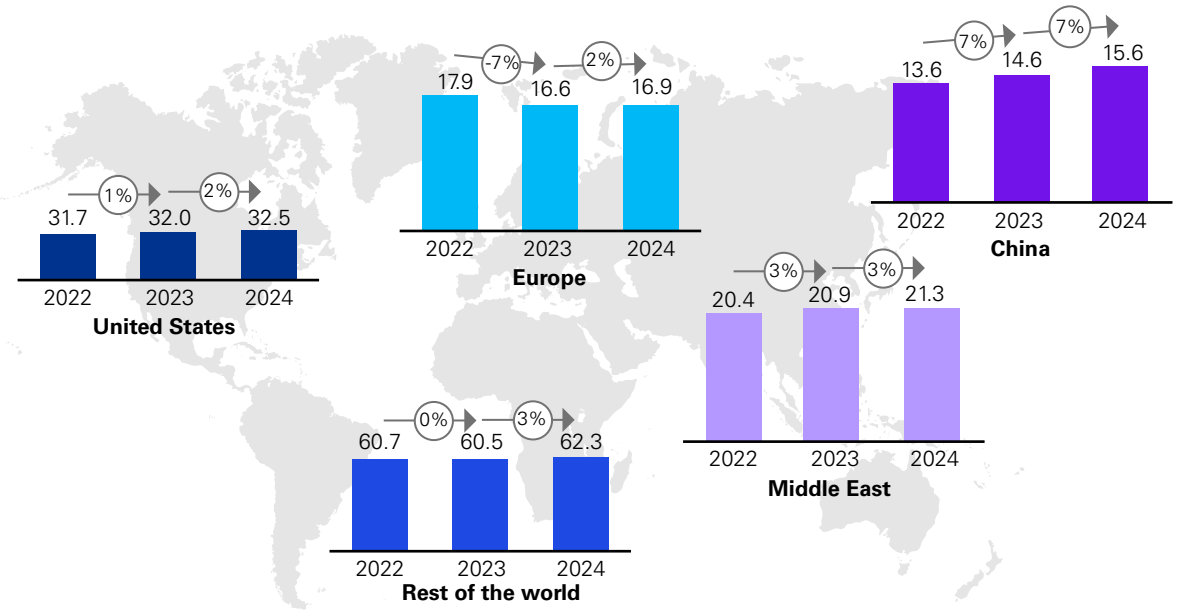
Theme 4

Natural gas: More than a bridge fuel

Global gas consumption reached record levels in 2024, despite extensive efforts in Europe to reduce dependency on gas in light of Russia's invasion of Ukraine. Indeed, gas demand in Europe rose slightly in 2024, although this was largely supplied by LNG imports rather than piped Russian gas. There was also rapid growth in China, the US, and the Mideast. This represents a return to growth in natural gas supply, after two years when global gas consumption was broadly flat.

This growth underscores the shifting role of gas in global energy systems. No longer just a "transition fuel," gas is increasingly seen as a flexible, lower-carbon, relative to coal, complement to renewables; particularly in regions focused on energy security and reliability.

Gas consumption by region (Exajoules)

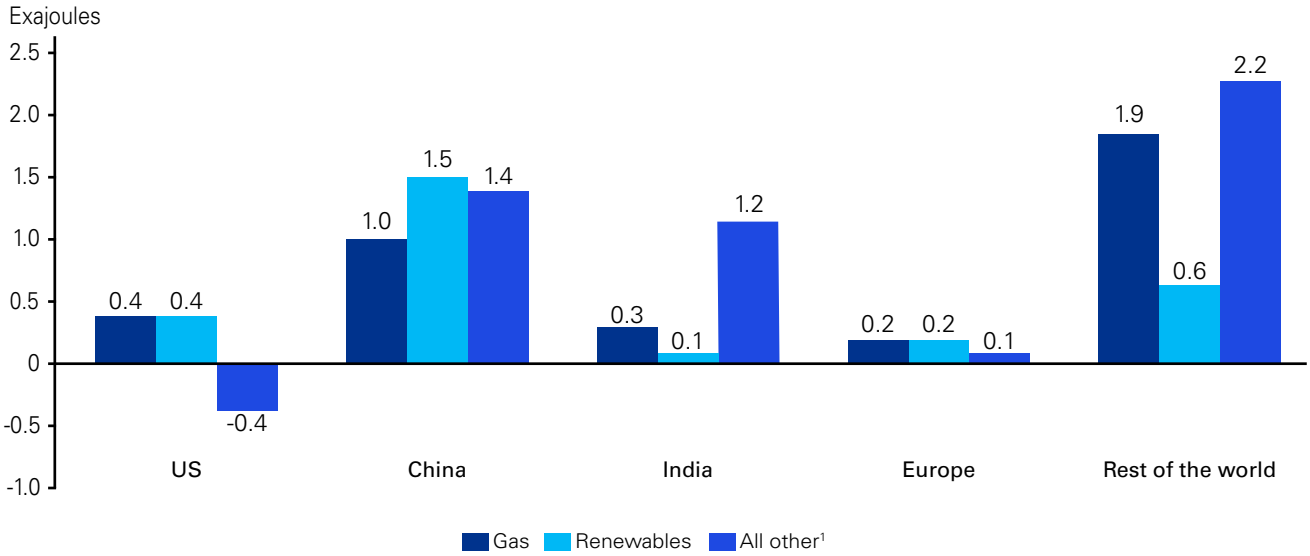


Source: Energy Institute, in association with KPMG International and Kearney. "2025 Statistical Review of World Energy."

Key insight:

Gas supply growth rivals renewables, and its share of the global energy mix continues to expand, especially as countries like China increase their gas consumption (although coal supply also grew in China). The global gas market is now highly liquid and diversified, with U.S. LNG exports continuing to stabilize supply and reduce security concerns in Europe following the disruption to gas flows caused by Russia's war against Ukraine. Recent power disruptions in Spain and Portugal, potentially linked to extreme weather, underscore the need for storage, interconnection and system inertia and the complementary role gas plays in power systems —not as an alternative but alongside renewables—to enhance resilience and energy security.

Regional changes in energy demand by source (2023 vs 2024)



1. Includes oil, coal, nuclear, hydro

Source: Energy Institute, in association with KPMG International and Kearney. "2025 Statistical Review of World Energy."

The rapid growth in total energy demand and gas-fired generation is likely to support the long-term growth and role of gas, which is reflected in the continuing investments being made in both upstream supply and LNG liquefaction capacity. The growth of LNG spot markets and increased destination flexibility is also strengthening the role of gas in contributing to security of supply.

Implications for business:

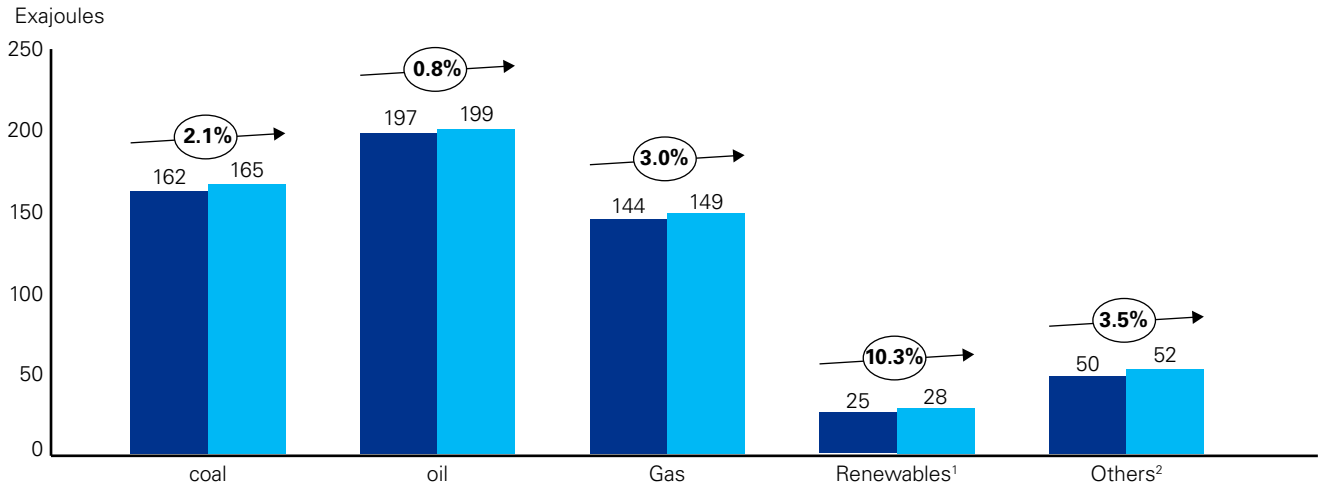
- Gas and LNG will remain plentiful and cost-competitive, contributing to resilient power systems and complementing renewables.
- Increasing US LNG supply and increased LNG capacity in Europe are helping reduce gas prices in Europe following the peaks of 2022 and 2023.
- Energy companies and utilities should factor gas into their planning not as a temporary bridge, but as part of a diversified and resilient fuel mix. Many countries are adopting the approach of gas AND renewables, rather than focussing on renewables alone. In those geographies where gas is supported there may be investment opportunities to expand gas supply and infrastructure.
- The long-term role of gas is increasingly tied to the success of decarbonization levers such as CCS, low-carbon hydrogen, and methane abatement. Expect growing investor and regulatory scrutiny.
- The growth of U.S. exports and flexible contract terms is creating new trading opportunities, but also requiring more active portfolio and risk management.
- The evolving global gas market offers long-term investment opportunities but requires managing volatility amid shifting supply and demand dynamics caused by geopolitical developments.

Theme 5

Peak oil or plateau oil?

Oil demand may now have peaked in the US and in Europe. Global oil demand rose in 2024, but the growth rate is slowed to 0.8%, and its contribution to total energy demand growth vs. 2023 is lower than renewables, gas and coal. Oil demand in China actually fell vs. the prior year, reflecting the increased electrification of the economy. We may not have reached peak oil globally as yet, but oil demand appears to be gradually heading towards a future plateau, with growth rates declining post the COVID recovery.

Growth in energy demand by source (2023-v-2024)



1. Includes solar, wind, geothermal; 2. Includes nuclear, biofuels, hydro
Source: Energy Institute, in association with KPMG International and Kearney. "2025 Statistical Review of World Energy."

Key insight:

The US is now the world's largest producer of oil and gas. Growing US supply places constraints on the ability of OPEC to influence oil pricing, given that US unconventional oil production can rapidly ramp up and down in response to price signals. Europe is less reliant on oil than in the past, and we have seen reductions in both oil production and consumption. Meanwhile, the refining sector continues to consolidate and shift, with the continued growth of scaled refining capacity in the Mideast and Asia putting marginal refineries in many regions under pressure. European refining capacity is falling, and unlikely to recover.

> **"Growing US supply places constraints on the ability of OPEC to influence oil pricing, given that US unconventional oil production can rapidly ramp up and down in response to price signals."**

Change in refinery capacity by region (Kbd, 2020-v-2024)							
Region	**2020**	**2021**	**2022**	**2023**	**2024**	**5 year CAGR**	**2023-2024 CAGR**
US	18,143	17,941	18,061	184,429	18,416	0.4%	0.1%
Europe	15,787	15,388	15,213	15,046	15,015	-1.2%	-0.2%
Middle East	10,262	10,155	10,675	11,412	11,719	3.4%	2.7%
Asia	35,917	36,340	36,274	37,397	37,690	1.2%	0.8%
Rest of the world	21,715	21,321	21,099	21,086	21,683	0.0%	2.8%

In developing countries, there continues to be growth in transport fuel demand, which in the absence of high growth rates in electric vehicle and alternative-fuelled HGV transport has translated into continued demand for oil products. China itself is an exception, as its passenger vehicle and commercial transport fleets are moving away from conventional fuels at pace.

Implications for business:

- Mid-term investment opportunities in oil and gas remain, but focus will shift toward lower-cost, less complex developments and away from high-cost / high tax regions.
- Refining and petrochemicals growth opportunities will diminish in many regions, with market power concentrating among fewer global suppliers, especially in the Middle East.
- Businesses should prepare for a more concentrated oil supply landscape, adapting portfolios to navigate regional shifts in refining capacity and trade flows.

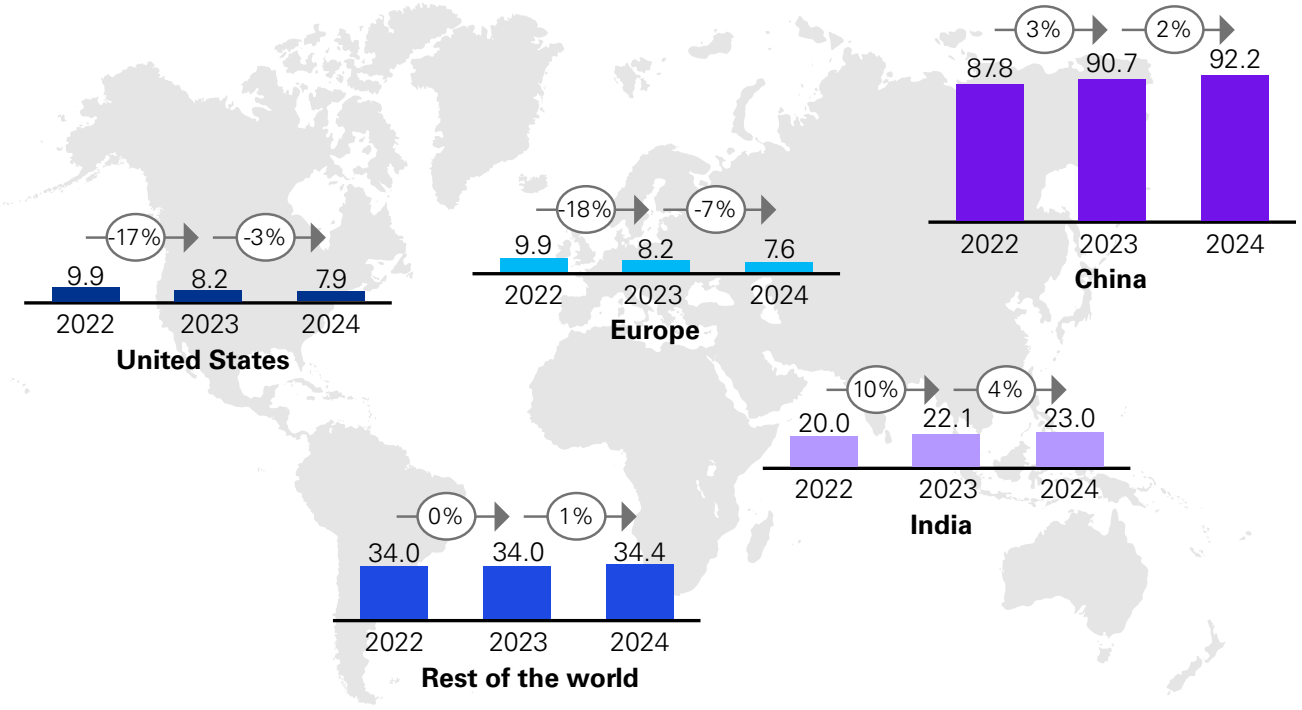
Theme 6

Coal: The sleeping giant

In some parts of the world, coal is seen as a declining energy source. But the data tells a different story about the role of coal in global energy supply. Use of coal remains remarkably resilient, broadly at the same level globally as a decade ago, reflecting its cost advantages and readily available supply in many parts of the world. Coal consumption grew strongly in China and India, which added 1.5 and 0.9 EJ respectively to coal generation in 2024.

In Europe, coal consumption fell 7% and the UK closed its last coal-fired power station. Turkey was the largest consumer in the region, with consumption rising by 7%. For the first time ever, coal's contribution to meeting Europe's total energy demand fell below that of nuclear.

Coal consumption by region (Exajoules)



Source: Energy Institute, in association with KPMG International and Kearney. "2025 Statistical Review of World Energy."

Key insight:

While the longer-term trend shows coal's global share of world energy is falling, its competitive pricing and dependable supply continue to support growing demand, especially as energy becomes a key element of national security and industrial competitiveness. The world appears to have entered an era defined more by geopolitical confrontation than multilateral cooperation, with great powers prioritizing energy sovereignty and resilience over climate goals. In this context, coal remains central to many countries' energy strategies—particularly in China, India, and the U.S.—where energy security and electrification efforts are closely tied to national security interests.

"The world appears to have entered an era defined more by geopolitical confrontation than multilateral cooperation, with great powers prioritizing energy sovereignty and resilience over climate goals."

Implications for business:

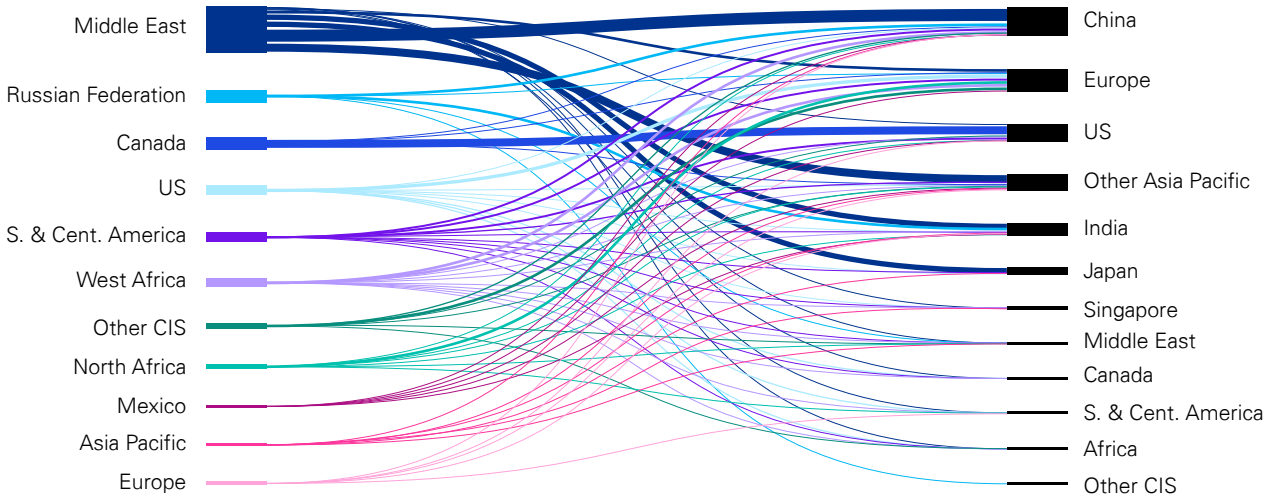
- Renewables and other clean energy investments are likely to be moderated by continued reliance on coal in many regions, as many nations emphasize energy security and affordability over rapid decarbonization.
- Traditional fossil fuels may persist longer than expected, requiring businesses to navigate a complex landscape where energy policy is driven by national security concerns and industrial strategy.
- This dynamic raises demand for carbon mitigation technologies like Carbon Capture and Storage and Direct Air Capture as coal use continues.
- Companies should stay alert to shifting geopolitical priorities and regional policy shifts, particularly as energy security becomes inseparable from national security agendas.

Theme 7

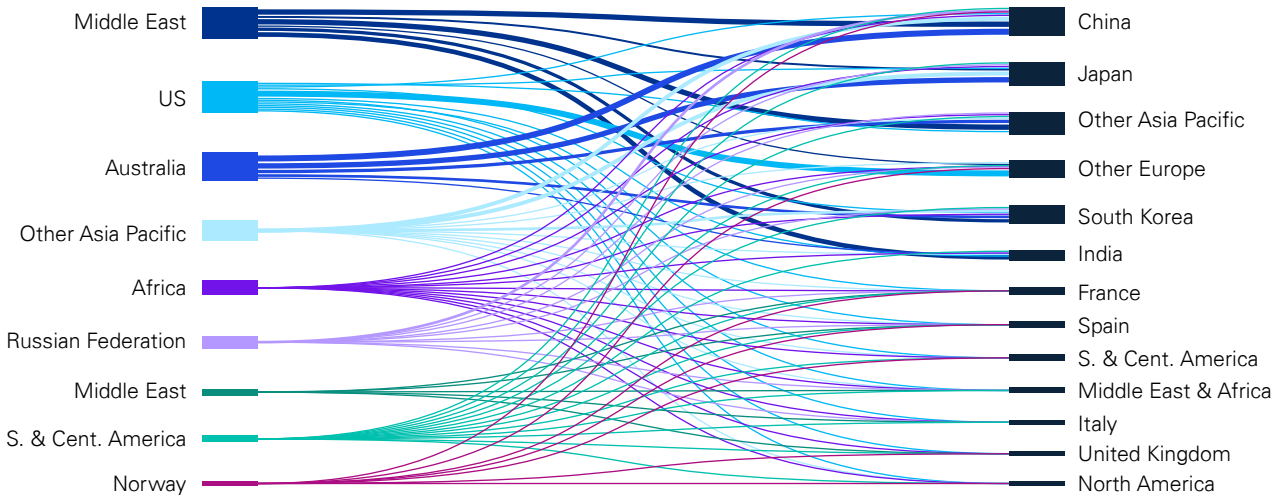
Energy is flowing in new directions

Geopolitical tensions have reshaped trade flows and demonstrated the limits of sanctions. Russian oil is being redirected eastward, and apparent changes to interregional flows in other regions may in fact reflect mechanisms for reselling Russian crude. Russian gas has not yet established eastward routes to fully compensate for lost European exports, but pipeline capacity to the China market is increasing and multiple projects are in development. Overall, evolving trade flows have continued to demonstrate the limitations of sanctions regimes, even as they prove their value in assuring security of supply and reducing pricing differentials across markets.

Liquified natural gas major trade movements (2024)



Crude oil inter-area movement (2024)



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

Source: Energy Institute, in association with KPMG International and Kearney. "2025 Statistical Review of World Energy."

Key insight:

There has been major disruption to energy flows in recent years. Russia's invasion of Ukraine led to efforts by the European Union to reduce dependency on Russian gas. Russian pipeline gas to Europe has reduced significantly, although LNG exports have continued. Gas supplies have increased from the US, the Middle East and Norway to make up the shortfall. Europe has also managed to reduce overall demand for gas over the last five years through greater efforts on energy efficiency and continued growth in renewables. At the same time, countries like India and China that did not impose sanctions were able to benefit —buying Russian crudes at advantageous terms.

Overall, this means an evolution in trade flows that breaks the historic pattern can be seen. Russian energy is moving east rather than west, and both oil and gas markets have adapted with remarkable speed and agility to balance supply into Europe, with the US playing a critical role in meeting European needs as supply from Australia and southeast Asia regains its traditional east Asian focus.

Some things haven't changed on the trade front: China continues to be a centre of demand for both energy and minerals, with southeast Asian and Australian supplies weighted towards the Chinese market, and a substantial proportion of new LNG capacity from Qatar and other regions locked into long-term Chinese contracts.

"Russian energy is moving east rather than west, and both oil and gas markets have adapted with remarkable speed and agility to balance supply into Europe, with the US playing a critical role in meeting European needs as supply from Australia and southeast Asia regains its traditional east Asian focus."

Implications for business:

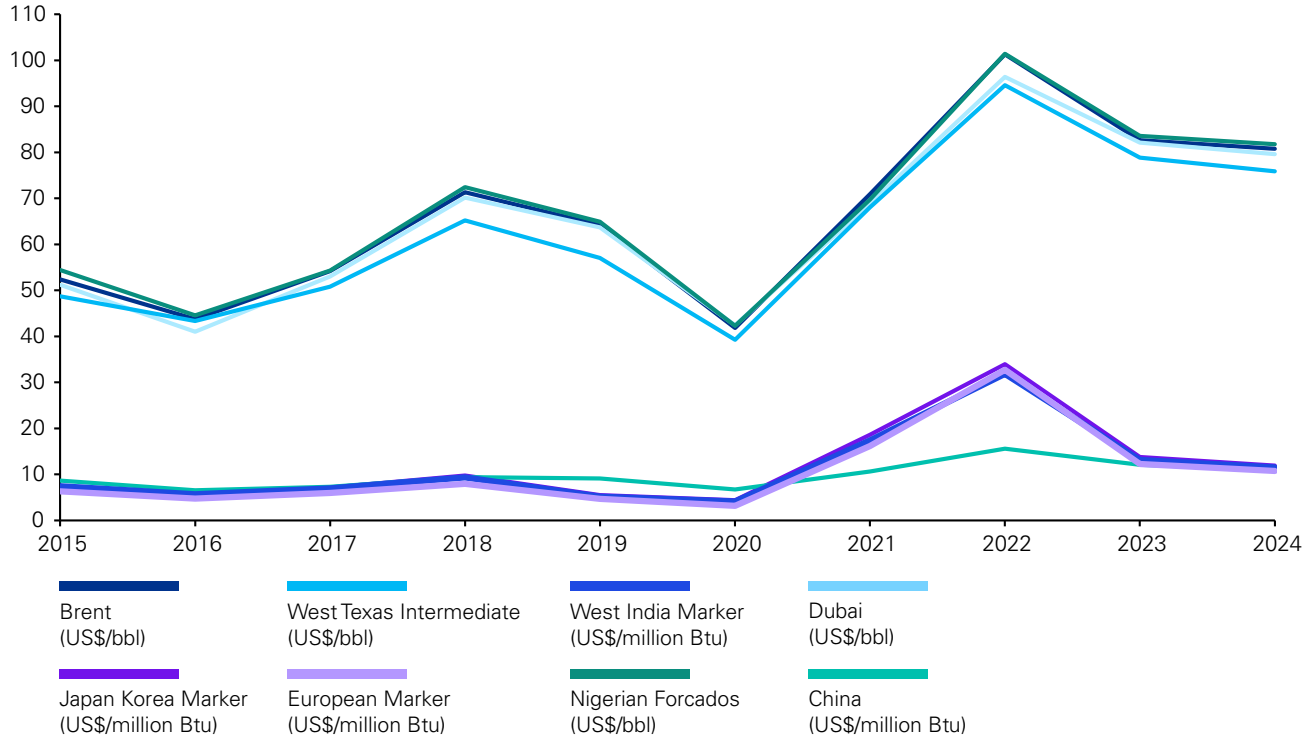
- Trade in energy is likely to continue to be shaped by geopolitical developments, with:
  - The US is expanding LNG capacity and an increasingly important supplier to Europe
  - Many countries and jurisdictions are increasingly focussed on energy independence and trying to reduce dependence on vulnerable energy supply chains

Theme 8

Commodity prices: Less volatile but uncertainty remains

Prices of key energy commodities were especially volatile over the COVID recovery period and following Russia's invasion of Ukraine. In 2024, prices were less volatile, although in many cases prices remains above their pre-2022 levels. This has added to concerns about cost of living and the competitiveness of industry in different parts of the world. In Europe, for example, the Draghi Report highlighted the need for further action to reduce energy prices and improve the competitiveness of industry. In some cases, pricing differences are stark. For example, average industrial electricity prices in the US are less than half those in Europe.

Change in oil and liquefied natural gas price (US$/bbl and US$/million Btu, 2015-2024)



Source: Energy Institute, in association with KPMG International and Kearney. "2025 Statistical Review of World Energy."

Key insight:

Compared to the volatility of 2022 and 2023, oil and gas prices were relatively stable in 2024. However, OPEC+ members have been phasing in increased production quotas. These increases in oil supply could lead to future price falls, even if members follow through on their pledges to adhere to their agreed quota levels.

Implications for business:

- Growing LNG supply from the US and other regions coupled with more moderate demand growth could lead to lower gas prices over time, all other things being equal.
- Oil supply and demand movements may put downward pressure on prices, creating challenges for the economics of upcoming field development projects and marginal unconventional production. Companies should prepare for the potential for increased near-term price volatility.
- With higher interest rates and rising supply chain costs, growing renewables supply will not necessarily translate into reduced power prices.

Source: https://www.opec.org/pr-detail/244569-05-july-2025.html. July 2025.

Conclusion

The world is experiencing a 'Disorderly Energy Transition'. Progress is not linear, or even, across the globe. The world's growing hunger for energy, coupled with financial and geopolitical realities, creates uncertainty, but also opportunity. Leaders should embrace the complexity, revisit assumptions, and align their strategies with the hard data captured in the Statistical Review —not just the headlines.

How KPMG can help

KPMG firms act as advisors to companies, policymakers and institutions across a range of energy-related questions. Helping companies to understand and address the risks associated with a volatile and rapidly changing energy environment, whether in identifying and assessing potential investments or acquisitions in the sector, developing more robust means for mitigating uncertainties, or driving increases in operational efficiency and capital delivery that can help to ensure greater competitiveness and protect profitability. KPMG firms can also assist governments and regulators to shape effective policies across different sectors, with pragmatic and industry-informed perspectives that help to balance and optimize competing priorities.

Meet the authors

Wafa Jafri

Partner and UK Lead for Energy and Natural Resources Strategy
KPMG in the UK
wafa.jafri@kpmg.co.uk

Simon Virley CB FEI

Vice Chair and Head of Energy and Natural Resources
KPMG in the UK
simon.virley@kpmg.co.uk

Chris Young

Managing Director, Energy Strategy & Performance Transformation
KPMG in the UK
chris.young@kpmg.co.uk

Contacts

Daniel Pairon

Partner, Head of Energy & Natural Resources and Managed Services | Advisory
KPMG Belgium
dpairon1@kpmg.com

Jorn De Neve

Head of Advisory
KPMG Belgium
jdeneve@kpmg.com

Magali Vercammen

Sr. Manager | Advisory
KPMG Belgium
mvercammen@kpmg.comcom

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