

Power Politics: Energy Self-Sufficiency in a Modern Mercantilist World

Cheap, abundant electricity is critically important to the AI race and national competitiveness. We take stock of energy supply and security across the US, China, and Europe.

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KAREN KARNIOL-TAMBOUR
IAN SINGER
DANIEL HOCHMAN
JEREMY NG

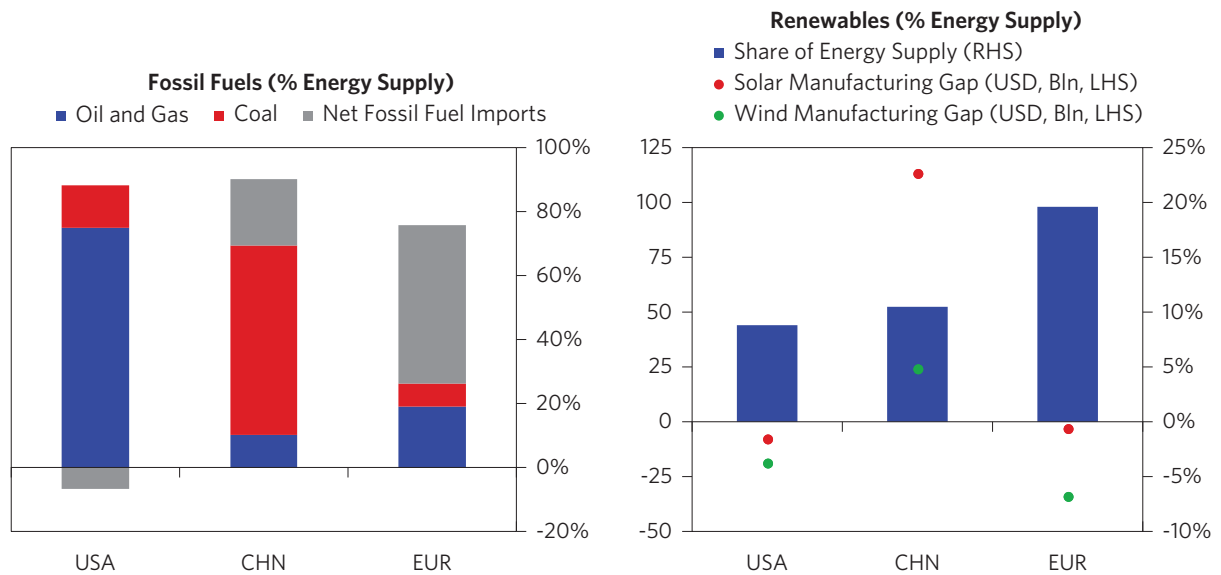
As we've been discussing in **previous research**, we believe that the world is shifting toward modern mercantilism, where governments are playing a larger role in steering the economy to maximize national wealth, strength, and self-sufficiency. **Energy is a critical part of this shift, as securing cheap and abundant energy has become an important part of maintaining national competitiveness, especially given the critical role of energy in the AI race** (as we have discussed for both the US and China). At the same time, governments are increasingly prioritizing self-sufficiency in their energy supply as new risks to supply chains emerge, such as China's recently announced export controls on rare-earth materials and technologies, which could disrupt production of solar generation components, electric vehicles, batteries, and gas and wind turbines, among other uses.

In this report, we examine the overall energy supply picture in the United States, Europe, and China, including the supply chain challenges they face with energy self-sufficiency, and how quickly they could scale up and deploy power to meet new sources of demand like AI.¹

- **The US is self-sufficient via oil and gas but faces constraints in electricity scale-up and deployment.** The United States' energy mix remains dominated by oil and gas, where it has significant advantages in resource base and cost structure that have allowed it to grow from a net importer to a net exporter of fossil fuels since 2019. Outside of fossil fuels, the United States has established a significant base of renewable generation and has a large development pipeline, but policy changes under the current administration have altered the trajectory of new projects (particularly those that were uneconomical without subsidies), and the US is likely vulnerable to potential trade restrictions on critical minerals-based products, such as rare-earth magnets, which it mostly imports from China. For some emerging energy technologies, such as small modular nuclear reactors (SMRs), commercial projects will also take many years to come online (although there is room for modest near-term capacity additions through uprating existing large-scale nuclear plants). However, the bottleneck in the US electricity landscape is primarily on deployment. The US faces long lead times for generation equipment such as gas turbines, and new capacity also faces long wait times before it can be connected to the grid. Behind-the-meter solutions (fuel cells, gas engines) will work to try to speed up the time to power, however, these solutions also have near- to medium-term capacity constraints that leave vulnerabilities over the next few years.
- **China is self-sufficient in electricity via coal and renewables and is much better at scale-up and deployment. Vulnerabilities remain on oil and gas, though China appears to be actively mitigating these risks.** China's energy mix combines electric generation from large amounts of domestically produced coal with some hydro power (including a newly announced mega project) and rapidly growing solar and wind generation. It has invested heavily across the full renewables supply chain, controlling significant portions of global production of solar components, rare-earth processing (including magnets), and advanced batteries. It is a leader in being able to rapidly scale up and deploy these technologies with a massive manufacturing base and having made investments in grid infrastructure, such as ultra-high-voltage (UHV) transmission lines. China installs more renewable power than the rest of the world combined and has a plan to double its nuclear capacity by 2040. At the same time, China imports large amounts of oil and gas, and while it is working to reduce demand through the promotion of new energy vehicles, or NEVs, (backstopped by a robust electric grid) and to blunt the effect of supply shocks through stockpiling and diversified import relationships, this remains an area where they lack desired self-sufficiency.

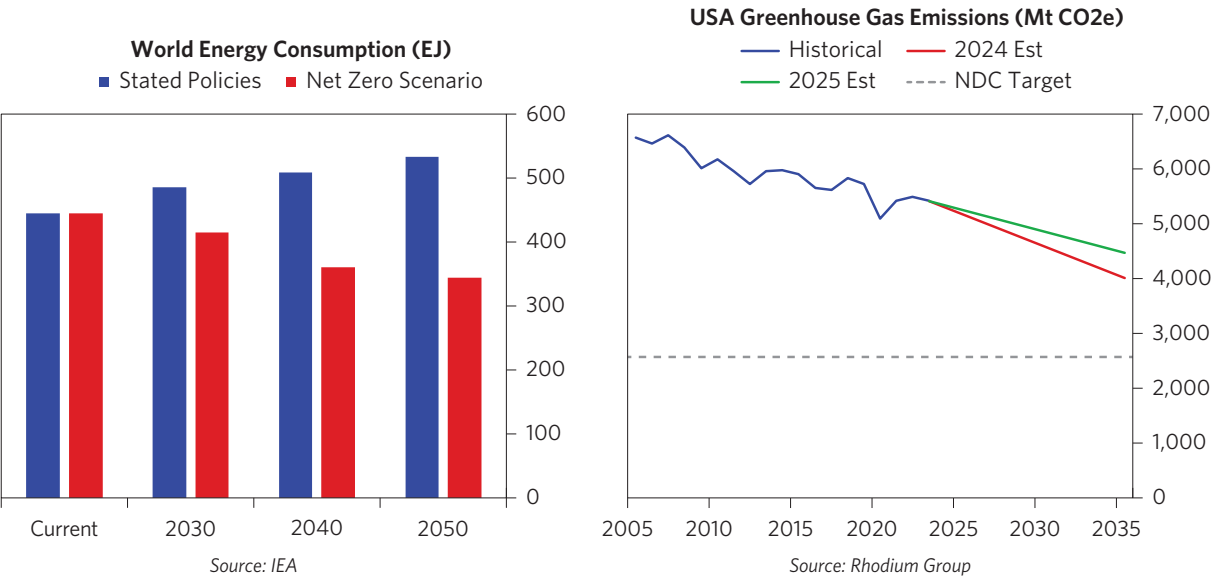
¹ Special thanks to Reed Blakemore at the Global Energy Center of the Atlantic Council, Ian Samuels at New System Ventures, and Pete Mathias at Reveille VC for their meaningful contributions to this report.

- Europe continues to face material energy self-sufficiency challenges.** Europe's energy mix has important country-level differences, but overall, it remains reliant on imports across the supply chain, with notable gaps on fossil fuels. In recent years, it has replaced Russian gas imports with other sources such as American LNG, while experiencing declines in EU (and UK) energy production. Europe has rapidly built out solar and wind generation (which it remains interested in given its climate goals), but these are highly reliant on China for imports of solar panels, batteries, and other upstream cleantech. Nuclear, meanwhile, is politically fragmented and unlikely to see a meaningful scale-up without changes in public attitude or legislation. Finally, similar to the United States, deployment is challenging; many parts of Europe face long interconnection times for new grid capacity, and the lack of sufficient base-load generation in certain areas has resulted in grid instability, including the recent blackout in Spain. In all, energy self-sufficiency represents a material challenge to European competitiveness, as Europe already faces persistently high electricity prices even as it is deindustrializing and playing a limited role in the AI race.



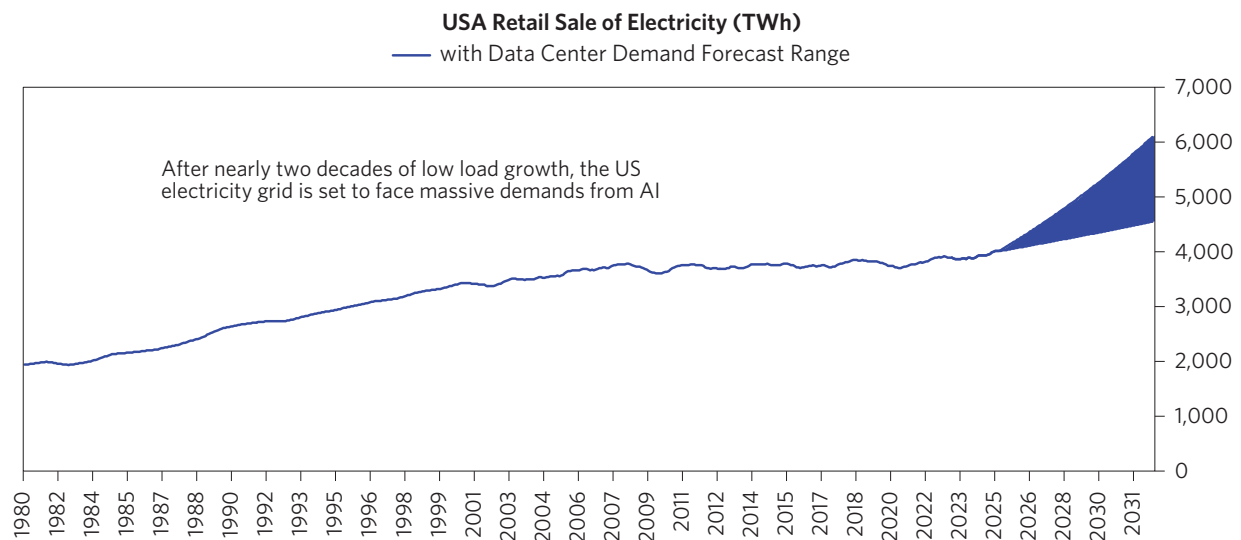
Source: IEA

In this environment of strategic competition and the race to secure power as rapidly as possible, **climate considerations** are quickly becoming less important in directly shaping energy and industrial policy. This dynamic lowers the probability that the world will achieve the massive systems overhaul that is needed for the world to decarbonize, with implications for climate risks and losses.



Governments Are Looking to Enable Access to Cheap and Abundant Energy—and Are Increasingly Prioritizing Self-Sufficiency

In many regions of the world, such as the United States, power demand is set to rise as broad forces toward electrification are now coinciding with significant demand from AI. This marks a massive change from the past two decades of low load growth, and means that companies, regulators, and governments are now wrestling with the challenges of how to enable the scale-up of energy production to meet demand.



As such, securing access to cheap and abundant energy as a means to enable AI deployment has become a strategic priority at the highest level, and a necessity to maintain competitiveness.

- **Chris Wright, US Energy Secretary:** ***“It’s critical that the United States is the leading nation in AI, and to do that we have to be the leading nation in growing our energy supply...AI is just an energy-intensive manufacturing industry. It takes the highest form and the most expensive form of energy, electricity, and turns it into intelligence.”***
- **Ursula von der Leyen, EU Commission President:** ***“[On competitiveness] we have two Achilles’ heels...one is the structural costs of energy that are too high...it is crucial that we reduce our dependency on the volatility of the global market and that we invest more in homegrown, cheaper energy sources from nuclear to renewable, because this is where we define the price.”***
- **President Xi Jinping:** ***“Based on China’s energy and resource endowment, we will advance initiatives to reach peak carbon emissions in a well-planned and phased way in line with the principle of building the new before discarding the old...We will strengthen our systems for energy production, supply, storage, and marketing to ensure energy security.”***

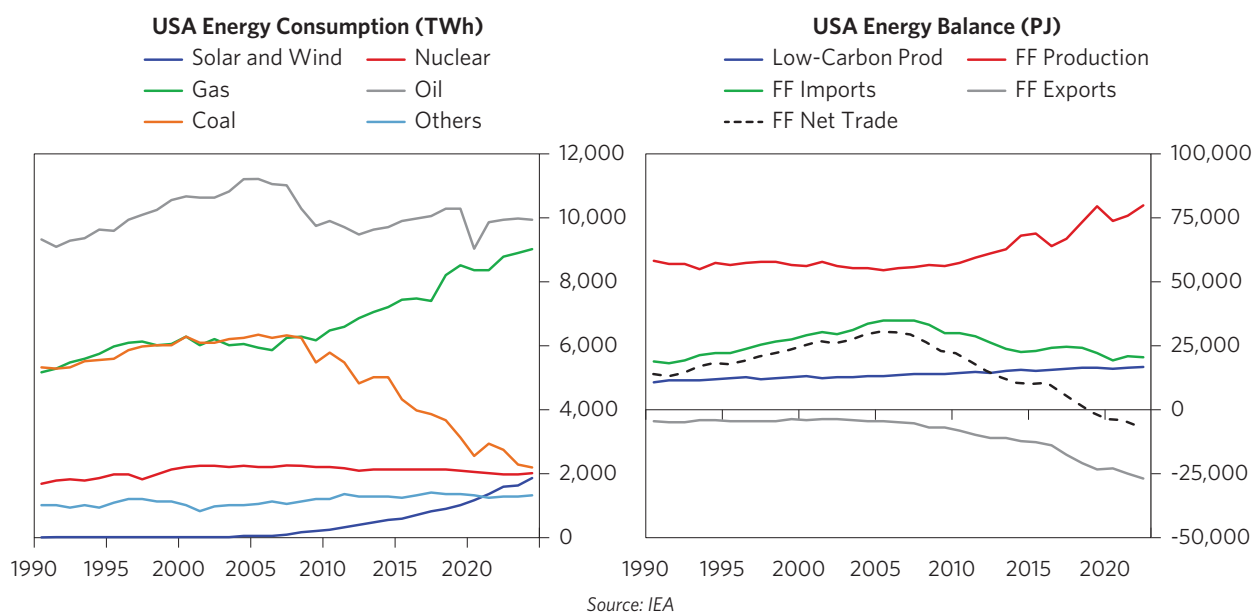
In the new modern mercantilist paradigm, relying on other countries for critical needs such as energy and raw materials is dangerous. As such, when looking to increase energy production and develop new industries, the United States and Europe have made statements indicating a strong preference toward increasing domestic/friend sourcing and reducing reliance on foreign players. Conversely, China has also shown an increased willingness to leverage its control over critical minerals and supply chains as a “deterrent capability” in a modern mercantilist world.

- **Wally Adeyemo, former US Deputy Treasury Secretary:** “[Countries around the world] are going to be even more reliant on Chinese technology to power their economies, to make the cars they drive. **It creates real chokepoints for China.**”
- **Ursula von der Leyen, EU Commission President:** “The imperative for security and control now trumps the logic of free markets and open trade...**We will also need more independence and diversity when it comes to the key inputs needed for our competitiveness.** We know this is an area where we rely on one single supplier—China—for 98% of our rare-earth supply, 93% of our magnesium, and 97% of our lithium—just to name a few...And **our demand for these materials will skyrocket as the digital and green transitions speed up.**”
- **President Xi Jinping:** “We must sustain and enhance our superiority across the entire production chain in sectors such as electric power equipment [and] new energy...**We must tighten international production chains’ dependence [on China] to counter and deter deliberate supply cutoffs by foreigners.**”

Below, we look across the world’s three largest economies—the US, China, and Europe—and assess their self-sufficiency in energy where they have limited reliance on others, as well as their ability to scale up and deploy that energy to meet national goals such as AI development.

The United States: Self-Sufficient via Oil and Gas but Faces Constraints in Electricity Scale-Up and Deployment

The United States’ energy mix is dominated by oil and gas, of which it has large domestic reserves, and is on a path toward broad self-sufficiency (the US is now a net exporter of oil and gas). The growth in gas production has coincided with a secular decline in coal, which has historically been cheap to produce in the United States, but the cost gap with other sources of energy has narrowed due to factors such as aging infrastructure, the rise of shale, and stricter environmental regulations. More recently, the share of renewables in the energy mix has been rising due to improving economics that were also supported by favorable policies like the Inflation Reduction Act (IRA).



Below, we discuss the United States' energy self-sufficiency picture in more detail by energy type:

- **Solar and Wind: *Not self-sufficient*.** Despite growth in renewables manufacturing and deployment catalyzed by the IRA, the United States is still reliant on China (and Chinese-owned factories) for many upstream components such as solar cells or rare-earth magnets. In today's environment in particular, the US is likely to feel that this reliance on China is a notable vulnerability—which is also creating action by companies and the US government to reduce these vulnerabilities over time.
- **Nuclear: *Somewhat self-sufficient*.** The United States has historically been a leader in nuclear technology and has a large existing fleet, but its capabilities have atrophied as it hasn't built up much new capacity in recent decades. Projects in the United States have also seen massive cost and timeline overruns in the limited recent sample, and the US trails China in implementation. Although the US has decent-size uranium resource bases in Texas and Wyoming, its current domestic capacity for uranium enrichment is more limited. However, efforts to expand enrichment capacity combined with the long nuclear fuel cycle and utility inventories provide some insulation.
- **Oil and Gas: *Self-sufficient*.** The United States has significant advantages in resource base and cost structure that have allowed it to grow from a net importer to a net exporter of fossil fuels since 2019, primarily through the extraction of shale (which became commercially feasible through a combination of technology, policy, and economic factors). While this has helped to increase its self-sufficiency in oil and gas, the US still needs to import several types of heavier crude oils for its refineries (though largely from Canada). Overall, the oil and gas sector is a large contributor to the economy (8% of GDP and 10.3 million jobs), making it an area of strategic importance to the US.
- **Coal: *Self-sufficient*.** The United States has large domestic coal reserves, but its generation fleet is aging, inefficient, and actively being wound down across much of the country. While some plants may see extensions in areas that have limited alternative resources, the transition to gas and/or renewables looks set to continue, likely leaving US thermal coal as a stranded or export commodity.

US Energy Security Map

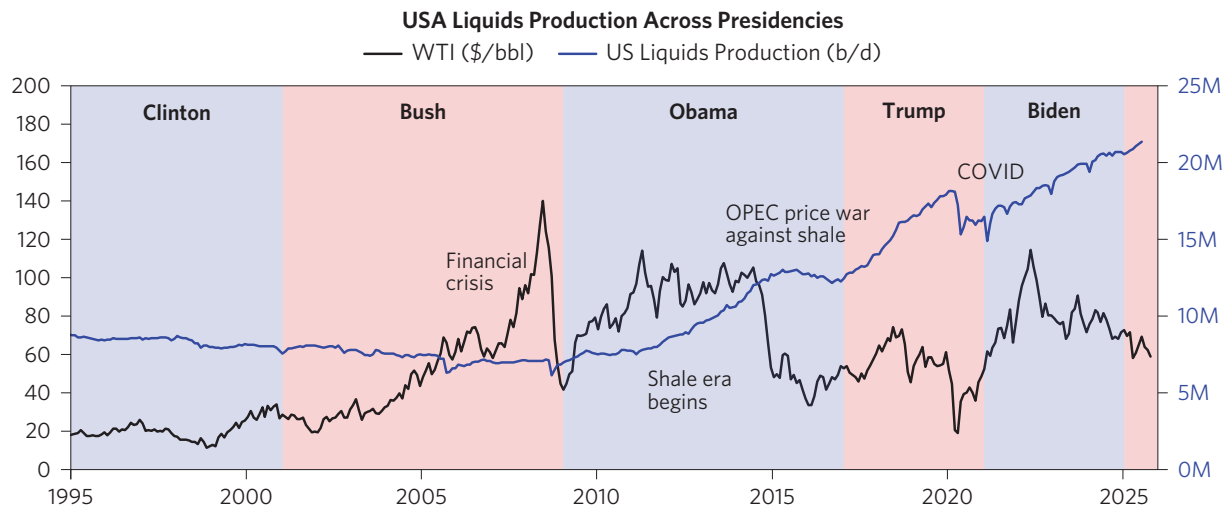
	Overall	How Much Do They Control?			How Easily Can It Move?		
		Raw Materials	Processing	Manufacturing	Technology	Costs	Time to Power
Solar	Not Self-Sufficient	30% of global silica sands reserves, but polysilicon mostly goes toward semi-conductors	Highly dependent on China for solar ingots, wafers, and cells	Solar module production growing as a result of IRA subsidies	China restricts exports of ingot casting and wafer technologies	Some subsidies from IRA, but still more expensive due to higher labor and raw material costs	New manufacturing projects announced but will take 3-5 years to build out
Wind	Not Self-Sufficient	No domestic source of rare earths (e.g., dysprosium) needed for wind turbine magnets	China controls >90% of rare-earth processing capacity	Produces ~20% of wind turbines through companies like GE Vernova	China restricts exports of rare earths and related technologies	Some subsidies from IRA, but still more expensive due to higher labor and raw material costs	Rare-earth supply chains will take 5-10 years to build out
Nuclear	Somewhat Self-Sufficient	1% of global uranium reserves, but has significant depleted uranium inventories	5% of global uranium enrichment capacity	Has focused on extending lifespan of existing nuclear plants instead of building new ones	Actively developing Gen IV nuclear technologies and small modular reactors (SMRs)	Fewer subsidies to cover high capex costs, but could fall with SMRs	New reactors take 5-10 years to build and permitting can be slow, but could fall with SMRs
Gas	Self-Sufficient	Largest natural gas producer (25%) but smaller reserves (5%)	N/A	N/A	Technological advancement has enabled access to new reserves (e.g., shale)	Lower end of cost curve compared to most countries	Waiting times for gas turbines have increased due to increased power demand
Oil	Self-Sufficient	Largest crude oil producer (15%) but smaller reserves (2%)	20% of global crude oil refining capacity	N/A	Technological advancement has enabled access to new reserves (e.g., shale)	Lower end of cost curve compared to most countries	Not a major source of power (mostly used as a fuel)
Coal	Self-Sufficient	20% of global coal reserves	N/A	N/A	Similar technology to China, although coal plants are older and thus less efficient	Favorable geography enables cheaper extraction costs even without coal subsidies	Coal plants are mostly being phased out

The US is likely to take steps to secure the renewables supply chain in the context of China's pressuring of the rare-earth pipeline. The US Department of Commerce identified rare earths as a national security priority in 2019, and the US has made active and bipartisan use of industrial policy to support the expansion of domestic and allied production of critical minerals and magnets. While today the US is focused on securing the supply chain for advanced defense technologies like missile and guidance systems, some of these moves—such as the US Department of Defense's \$400 million investment in MP Materials and establishment of a price floor—could in the future also benefit clean technologies like electric vehicles and wind turbines that utilize similar inputs. Private-public and cross-border partnerships are likely to add to the initiatives to reclaim this thread of the supply chain, with developers in the US and Australia discussing pathways to increase production against price floors and guaranteed offtake.

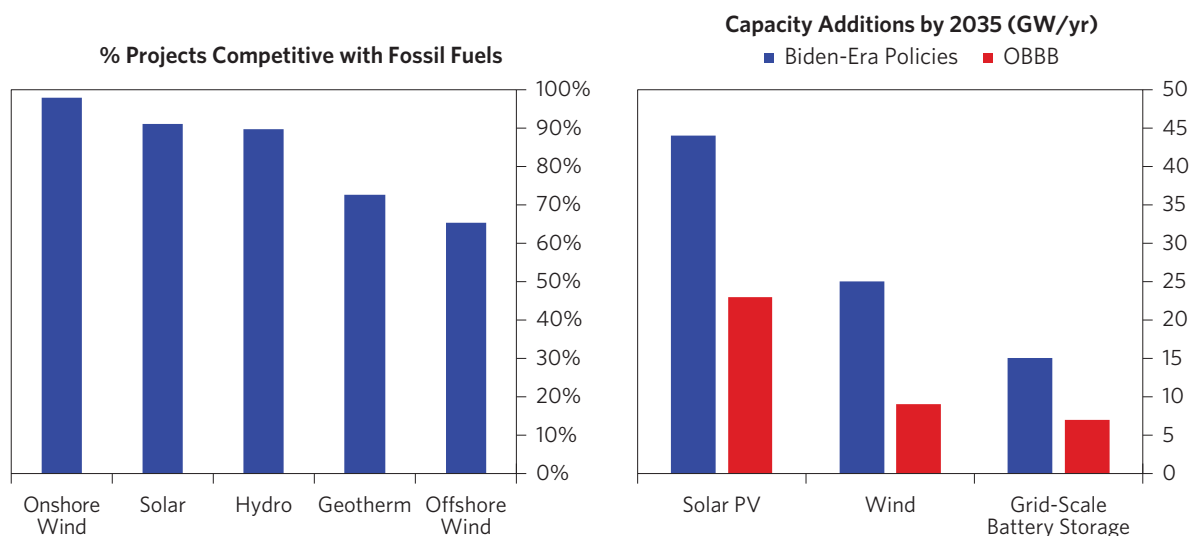
- Peter Navarro, Senior Counselor for Trade and Manufacturing:** *“Our goal is to build out our supply chains from mines to end-use products across the entire critical mineral spectrum.”*

- **Chris Wright, US Energy Secretary:** “For too long, the United States has relied on foreign actors to supply and process the critical materials that are essential to modern life and our national security. Thanks to President Trump’s leadership, the Energy Department will play a leading role in reshoring the processing of critical materials and expanding our domestic supply of these indispensable resources.”

Looking at the US’s energy mix, oil and gas accounts for the majority of the United States’ current energy consumption. The Trump administration has been vocal about its promises to “unleash American energy” and further increase supply and has already introduced several concrete measures to fast-track oil and gas permitting, expand federal leasing, and repeal EPA fees on methane emissions. The amount of future oil production will be driven primarily by global supply/demand and not government policy. That said, the US can clearly access abundant and cheap energy through its own resources.



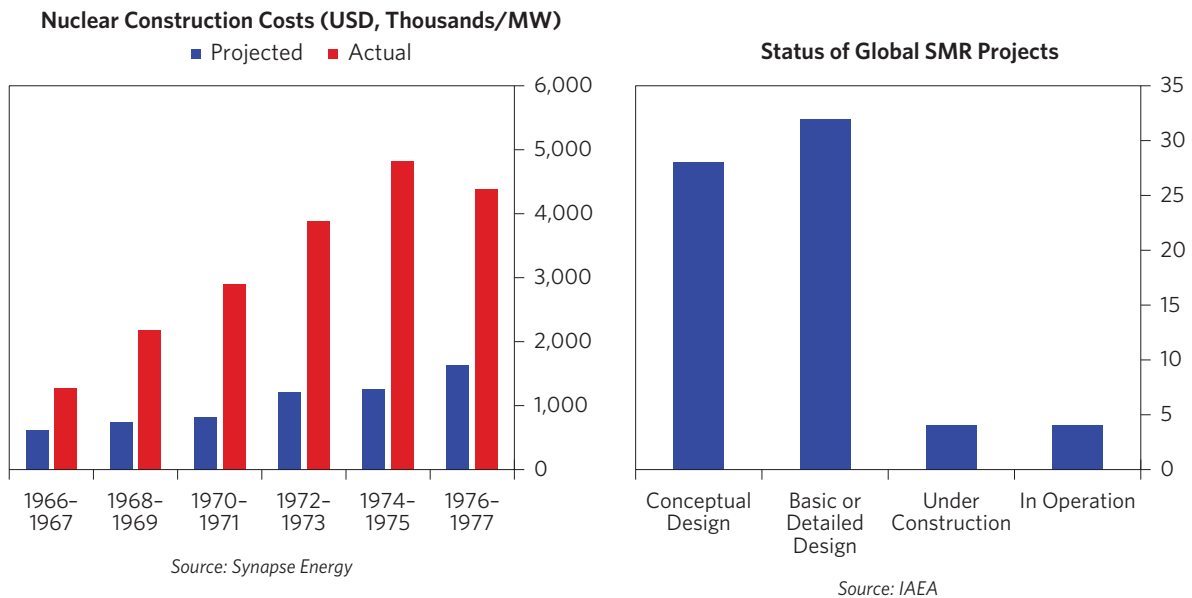
Renewables will keep growing, but more slowly. The United States has a large pipeline of renewables projects, many of which had looked to take advantage of subsidies and tax credits under the Inflation Reduction Act, which incentivized more than \$120 billion in manufacturing investments and helped domestic solar module capacity to grow from 7 GW to 55 GW. However, future renewables investments will need to be driven most **fundamentally by costs and economics**, and we are already starting to see projects be canceled or delayed following changes to tax policy under the “One, Big, Beautiful Bill.”



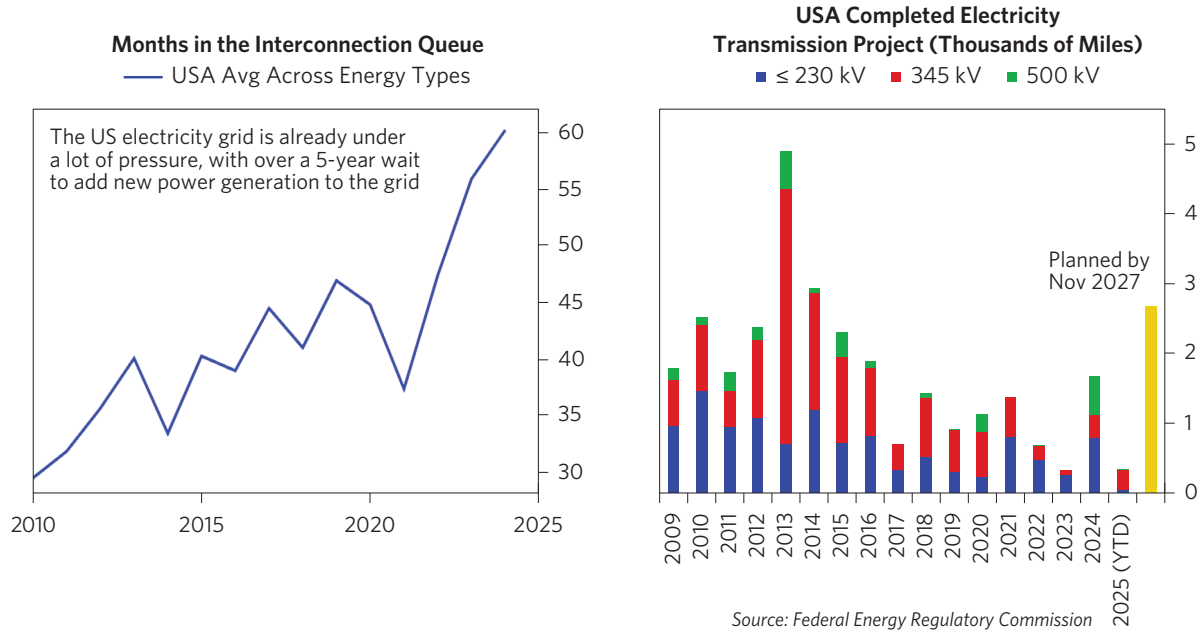
Source: IRENA (2024); renewable power generation costs in 2023, International Renewable Energy Agency, Abu Dhabi

Source: Princeton University

Nuclear is also gradually being added. While there has been increased support from both sides of the political spectrum for nuclear, investments still face considerable operational and administrative hurdles. Due to strict safety regulations and lengthy permitting requirements, large-scale nuclear projects in the United States have typically run over budget and timeline (throughout the US's nuclear buildout in the 1970s, as well as more recent projects such as Vogtle Units 3 and 4 in Georgia, which took double the budgeted cost and time to build). As such, operators and developers in the United States have more recently focused on uprating existing nuclear plants to increase power output of existing assets, while exploring or increasing investment in new nuclear, including SMRs and micro reactors. While uprating could provide some modest capacity increases in the short run, the timeline for a large reactor project or SMR deployment is more uncertain, with questions on economics and execution risks, in addition to the risk that most SMR projects are still in the design or pilot phase.

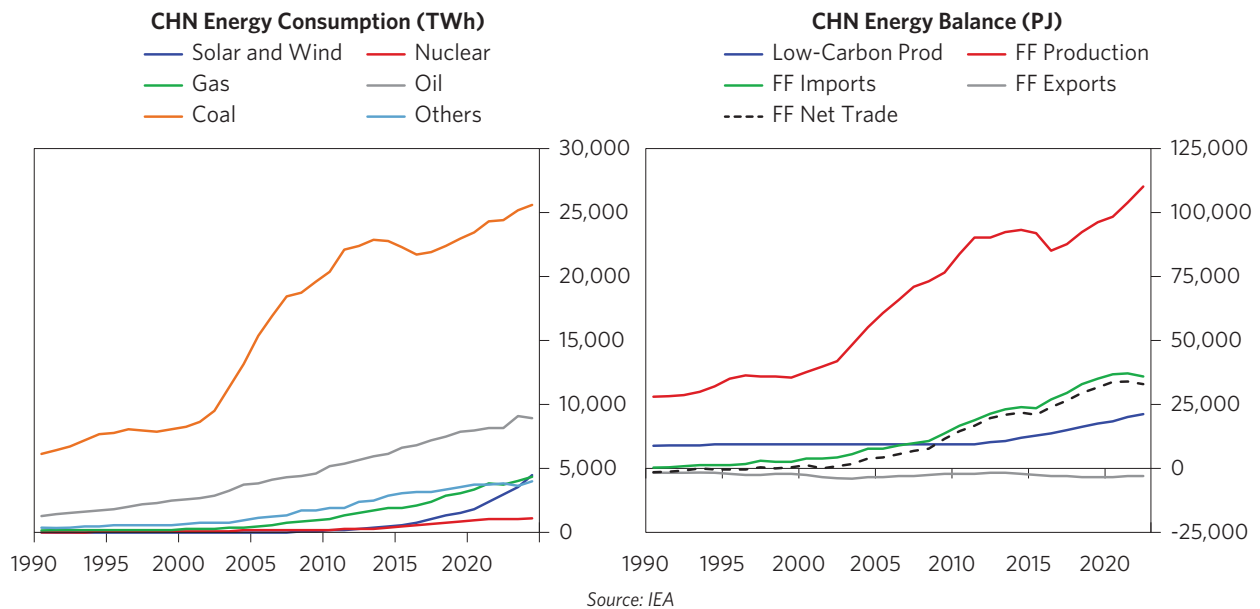


The most meaningful US constraints are in grid deployment. Any new generation capacity is likely to face long interconnection times to be added to the grid, with large variations across regions, which adds an additional layer of risk that spans both supply chains and interstate regulation and politics. The US aims to increase its transmission project work over the next few years, but if grid congestion continues, there is a higher likelihood of more material constraints to demand growth or a requirement to stand up more off-grid (behind-the-meter) generation such as fuel cells and gas engines. These solutions, however, are likely to have near- to medium-term capacity constraints.



China: Self-Sufficient in Electricity via Coal and Renewables with Advantages in Scale-Up and Deployment

China has invested heavily in renewables as a complement to its large domestic coal reserves, which has helped to diversify its energy mix while also meeting the country's massive increase in power needs from industrialization and electrification over the past few decades. While it remains dependent on fossil fuel imports to meet its broad energy requirements today, rapid scale-up of electrification of both the supply and demand side of the economy is driving this dependency lower—a trend likely to continue.



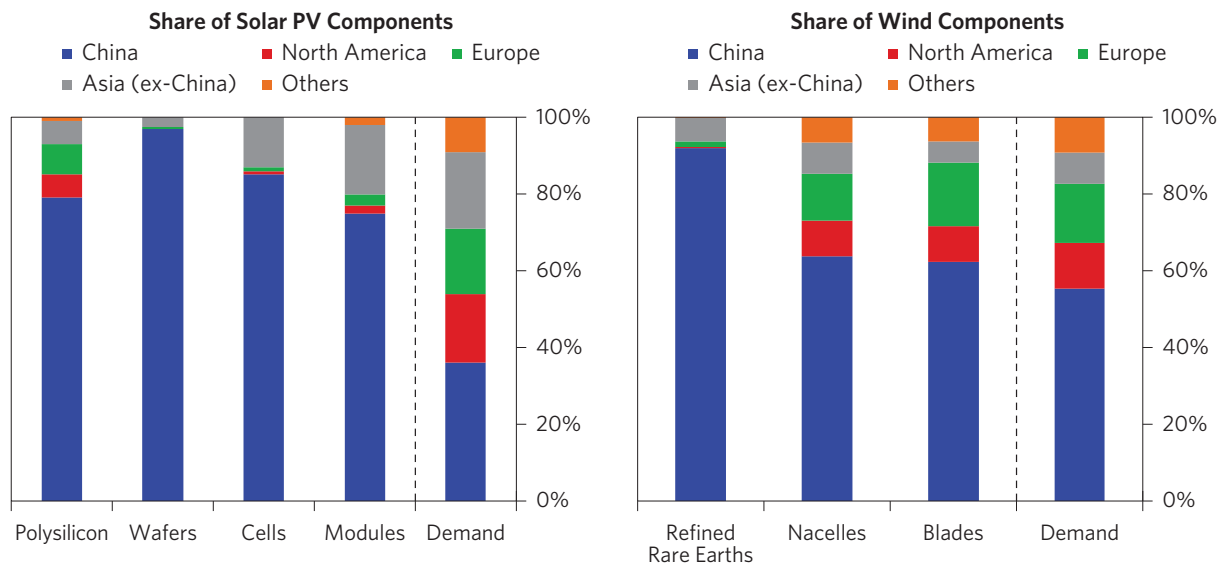
Below, we go through China's energy self-sufficiency picture in more detail by energy type:

- **Solar and Wind: Self-sufficient.** China has extensive control over the full solar and wind supply chain—with a dominant position in processing for rare earths, graphite, and other critical minerals—and is investing heavily in areas where it perceives gaps, such as long-term supply contracts for cobalt or lithium.
- **Nuclear: Somewhat self-sufficient.** China is making a large push on nuclear, supported by cheap state financing and efficient permitting, and is aiming to double its nuclear capacity by 2040. While China has reasonably large uranium enrichment capacity, its domestic ore reserves are smaller, and China relies on imports from countries like Namibia (where Chinese companies directly own mines) and Kazakhstan.
- **Oil and Gas: Not self-sufficient.** China has limited domestic oil and gas resources, while also being one of the world's largest oil consumers. However, it has made a concerted effort to reduce supply-chain vulnerabilities by very directly attempting to secure supply (e.g., Power of Siberia pipeline), while aiding the advancement of NEVs to lower demand.
- **Coal: Self-sufficient.** China is the world's largest producer and consumer of coal. Despite China's stated emissions-reduction goals, coal remains an important part of its energy security strategy and continues to be supported by significant state subsidies.

China Energy Security Map

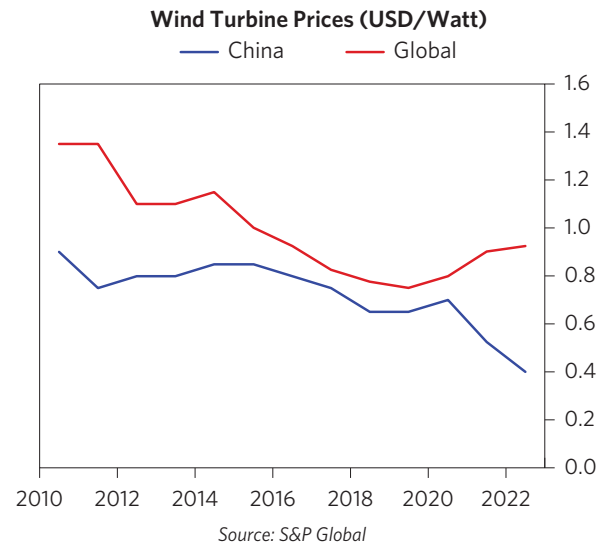
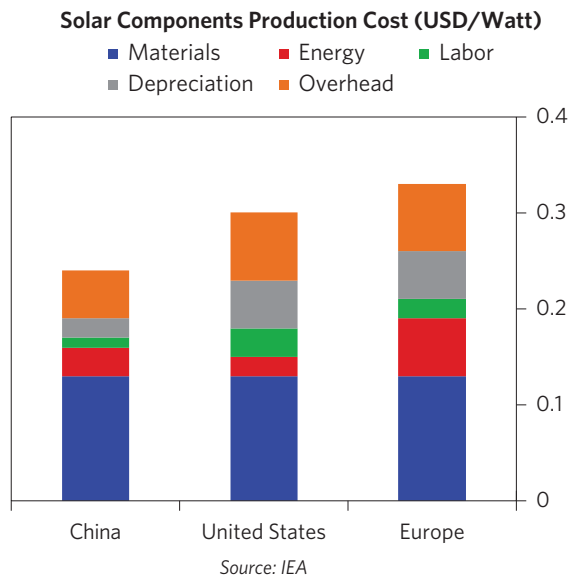
	Overall	How Much Do They Control?			How Easily Can It Move?		
		Raw Materials	Processing	Manufacturing	Technology	Costs	Time to Power
Solar	Self-Sufficient	Produces 20% of the world's silica sands and 90% of polysilicon	Produces 95% of the world's solar ingots and wafers	Produces 75% of the world's solar cells and modules, and controls factories in Southeast Asia	Specific expertise on ingot casting and wafer technologies	Benefits from government subsidies and lower raw material, labor, and electricity costs	Consistent pipeline of new manufacturing facilities
Wind	Self-Sufficient	Produces 60% of rare earths needed for wind turbine magnets	Controls more than 90% of rare-earth processing, including 99% for certain metals like dysprosium	Produces 60% of the world's wind turbines, including the four largest manufacturers	Specific expertise on rare-earth processing, turbine models are newer and more efficient	Benefits from government subsidies and cheap manufacturing loans	Consistent pipeline of new manufacturing facilities
Nuclear	Somewhat Self-Sufficient	4% of global uranium reserves, but new sources continue to be discovered (e.g., Ordos Basin)	25% of global uranium enrichment capacity	60% of all new reactors built since 2020 have used Chinese designs	Similar technology but far more efficient on organization, scaling, and permitting	Benefits from cheap state financing covering 70% of reactor costs to offset high capex needs	Has rolled out Gen IV nuclear reactors 10-15 years quicker than other countries
Gas	Not Self-Sufficient	Limited natural gas reserves (2.5% of global), which are far outweighed by demand	N/A	N/A	Infrastructure for transport and storage of natural gas is less developed	Natural gas is more expensive than coal and renewables and receives fewer subsidies	Domestic production growing steadily but not keeping pace with demand
Oil	Not Self-Sufficient	5% of global oil production but still highly reliant on imports	17% of global crude oil refining capacity	N/A	Technological advancement has enabled access to new reserves (e.g., thermal recovery)	More expensive due to the type of reserves and need for enhanced oil recovery	Not a major source of power (mostly used as a fuel)
Coal	Self-Sufficient	15% of global coal reserves and is the world's largest producer and consumer	N/A	N/A	Coal plants tend to be newer and more efficient	Significant subsidies and tax breaks for coal projects, and weaker environmental regulations	New coal plants will continue to be built at least through 2027

China has grown its self-sufficiency on renewables over the last few decades by directing massive investments and subsidies across the full renewables supply chain, while also benefiting from the low costs that have supported the broader manufacturing sector. As a result, China now dominates global production of solar components, as well as other inputs such as rare-earth magnets (which are needed for wind turbines, EVs, and other non-energy industries like defense). For example, Europe imports more than 90% of its solar panels (mostly from China), and the United States imports more than 80% (mostly from Chinese-owned factories in Southeast Asia). Similarly, while there are large wind turbine manufacturers incorporated in the United States and Europe, many of them are still 100% reliant on China for the refined rare earths needed for wind turbine magnets.

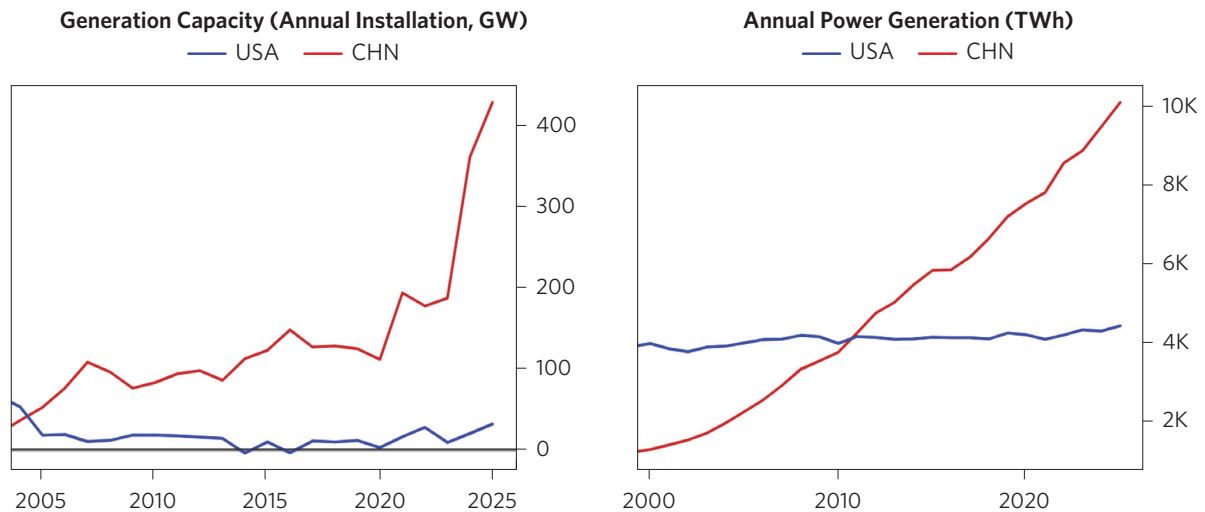


Source: IEA

China's strategic advantage on cleantech manufacturing has been supported by its lower production costs, which are driven by both market and non-market factors. China has directed hundreds of billions of dollars in subsidies to solar and wind energy, although it is starting to pull back as the market matures and policy priorities shift toward “anti-involution” and the elimination of excess production. Similar to other forms of manufacturing, China also benefits from low labor and electricity costs (electricity accounts for 40% of polysilicon production costs and 20% of solar wafer and ingot production costs, making it a significant input). Finally, costs in China have been brought down even further by economies of scale, as well as technological advancements in certain stages of minerals processing (e.g., high-pressure acid leaching for nickel) or equipment and tooling (e.g., solar CZ pullers).

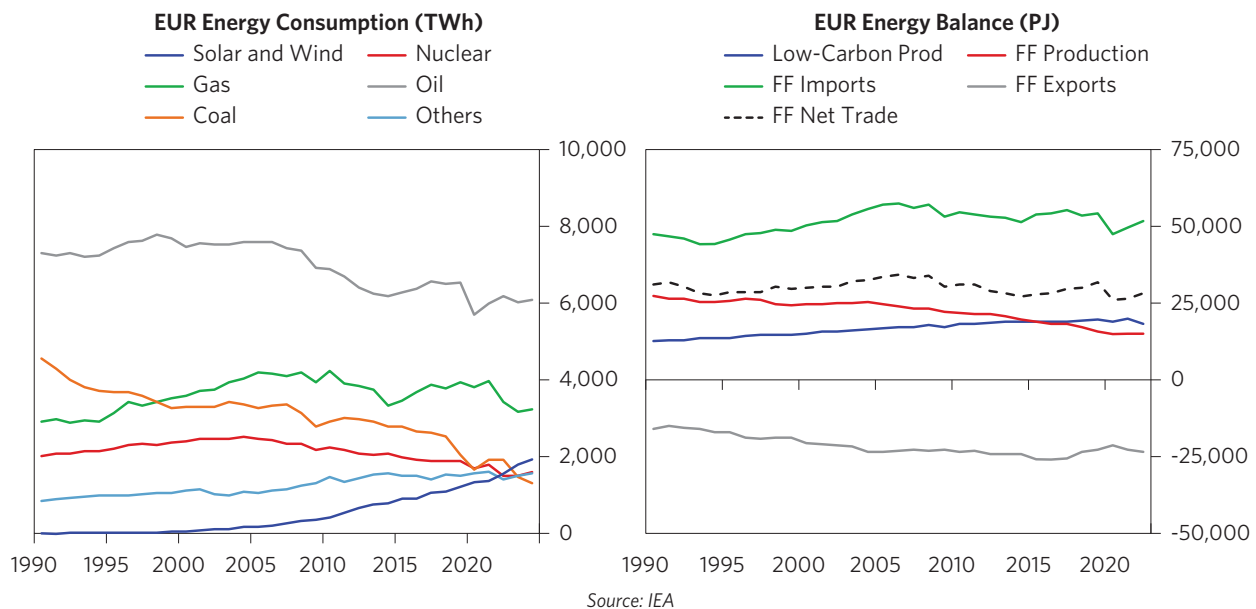


China is also a leader in scaling up and deploying power to the grid. China has invested massively in grid infrastructure to accommodate the increase in renewables generation capacity and is far more efficient on permitting and local regulations. China has more than 30,000 miles of UHV transmission lines that have much higher capacity and efficiency than traditional transmission; the US currently has zero. Large transformers, which are necessary for transmitting power between generation and end users, are available with a lead time of 48 weeks in China, about one-third the US average of 143 weeks. This has allowed China to build out its generation capacity to meet rising power needs, which have grown rapidly over the past few decades as a result of industrialization and electrification. And it has done so far more quickly than other regions like the United States, which puts it in a strong position to accommodate new sources of demand like AI.



Europe: Continuing to Face Material Energy Self-Sufficiency Challenges

Despite steady renewables growth over the last decade in line with the region's ambitious climate policies, Europe continues to rely heavily on fossil fuel imports to meet its energy needs due to its limited domestic reserves in most member states (with some exceptions, such as gas fields in the Netherlands and imports from the UK and Norway). Although Europe has successfully reduced its reliance on Russian gas, this has been replaced by other imports such as LNG from the United States (as part of a broader pledge to purchase \$750 billion of energy under the EU-US trade deal) and oil and gas from Norway.



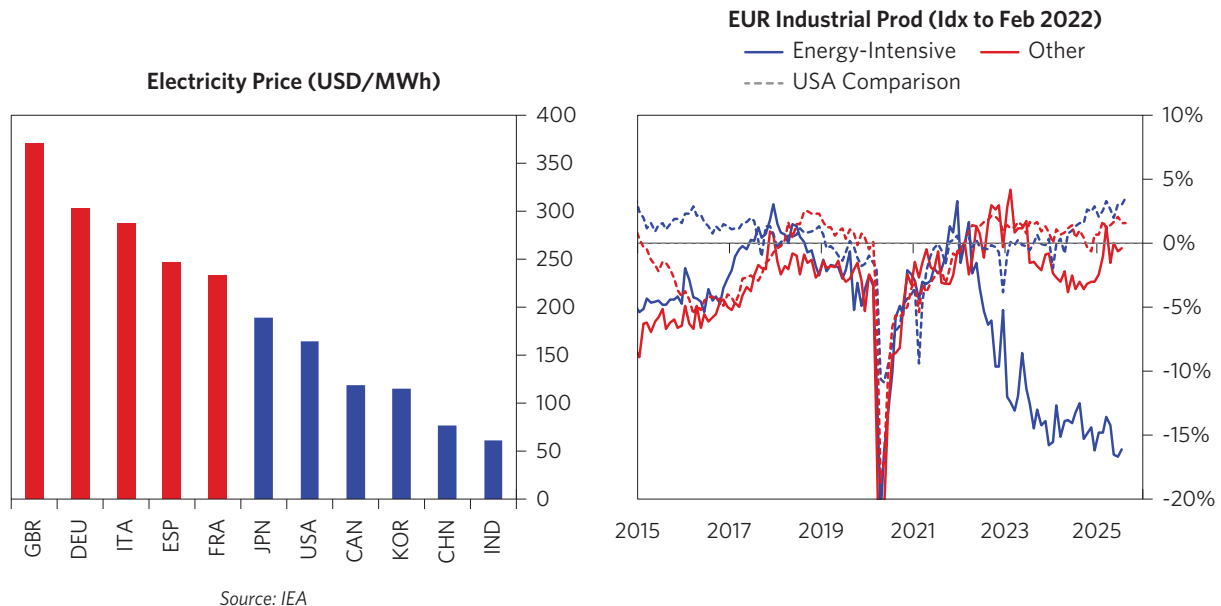
Below, we go through Europe's energy self-sufficiency picture in more detail by energy type:

- **Solar and Wind: Not self-sufficient.** Europe shares a similar supply chain vulnerability to China as the US, relying heavily on Chinese imports of solar components such as solar ingots, wafers, and cells. It also lacks much solar manufacturing capacity (more so than the United States), although it is relatively self-sufficient in certain elements of large wind turbine manufacturing.
- **Nuclear: Somewhat self-sufficient.** Some countries, particularly France, have large nuclear fleets and significant enrichment capacity, but nuclear is a politically fractured issue in Europe, and other member states have banned nuclear or plan to phase it out.
- **Oil and Gas: Not self-sufficient.** Europe has limited domestic oil and gas resources (with the largest reserves in the UK and Norway, which are non-EU), and have closed some of their largest production sites such as the Groningen gas field in the Netherlands. While Europe's fossil fuel supply has switched from Russia to other sources like American LNG, it still relies heavily on imports to meet its oil and gas needs.
- **Coal: Somewhat self-sufficient.** Europe has opted to reduce coal use due to climate considerations. Most European countries are phasing out coal plants but have retained the option of turning them back on temporarily during crises such as the Russia-Ukraine war.

Europe Energy Security Map

	Overall	How Much Do They Control?			How Easily Can It Move?		
		Raw Materials	Processing	Manufacturing	Technology	Costs	Time to Power
Solar	Not Self-Sufficient	Silica sands reserves in Netherlands (15%) and Italy (7.5%), but polysilicon mostly goes toward semi-conductors	Highly dependent on China for solar ingots, wafers, and cells	Supportive policy measures, but growth has been slow	China restricts exports of ingot casting and wafer technologies	Up to 50% more expensive than China due to lower subsidies and higher raw material, labor, and electricity costs	New factories take 3–5 years to build out, and few projects are in the pipeline
Wind	Not Self-Sufficient	No domestic source of rare earths (e.g., dysprosium) needed for wind turbine magnets	China controls >90% of rare-earth processing capacity	Domestic wind turbine production is enough to meet 85% of demand	China restricts exports of rare earths and related technologies	Up to 40% more expensive than China due to lower subsidies and higher raw material, labor, and electricity costs	Rare-earth supply chains will take 5–10 years to build out
Nuclear	Somewhat Self-Sufficient	Limited uranium reserves (~1%) in Czechia, but has significant depleted uranium inventories	25% of global uranium enrichment capacity, mostly in France but expanding in Netherlands and Germany	Has focused on extending lifespan of existing nuclear plants instead of building new ones	Actively developing Gen IV nuclear technologies and small modular reactors (SMRs)	Fewer subsidies to cover high capex costs of new large-scale nuclear projects	New reactors take 5–10 years to build, and permitting can be slow
Gas	Not Self-Sufficient	No significant domestic gas reserves (85% of gas is imported)	N/A	N/A	N/A	N/A	N/A
Oil	Not Self-Sufficient	No significant domestic oil reserves (95% of oil is imported)	15% of global crude oil refining capacity	N/A	N/A	N/A	N/A
Coal	Somewhat Self-Sufficient	Limited reserves in Germany (3%) and Poland (3%)	N/A	N/A	Similar technology to China, although coal plants are older and thus less efficient	Lignite extraction is cheap, but high labor costs for hard coal	Coal plants are mostly being phased out (but have been reactivated temporarily)

Energy is already an acute competitiveness issue for Europe. Europe's continued reliance on fossil fuel imports has contributed to persistently high electricity prices, alongside other factors such as electricity market design, carbon prices, or high taxes and network charges. When combined with other structural barriers to productivity, this has contributed to the region's secular decline in industrial competitiveness. Energy-intensive production is falling rapidly amid input cost pressure and regulation (and was exacerbated by a spike in energy prices after the start of the Russia-Ukraine war), which is also limiting Europe's ability to play a material role in the AI race.

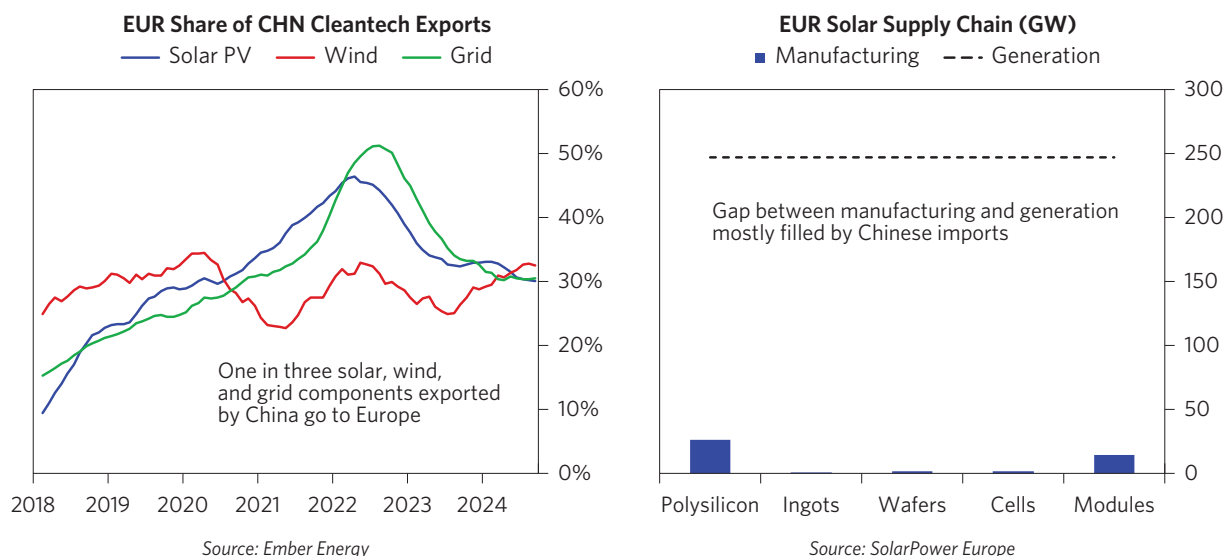


We have seen companies reduce their capital allocations in Europe or exit operations completely based on the regulatory and energy backdrop, particularly those in energy/carbon-intensive sectors (e.g., chemicals, oil, and gas). According to a German Chamber of Commerce and Industry survey, around 25% of firms surveyed have considered cutting or relocating production as a result of high energy prices, and around 60% have considered postponing some form of planned investment—with even higher shares in industrials and energy-intensive sectors.

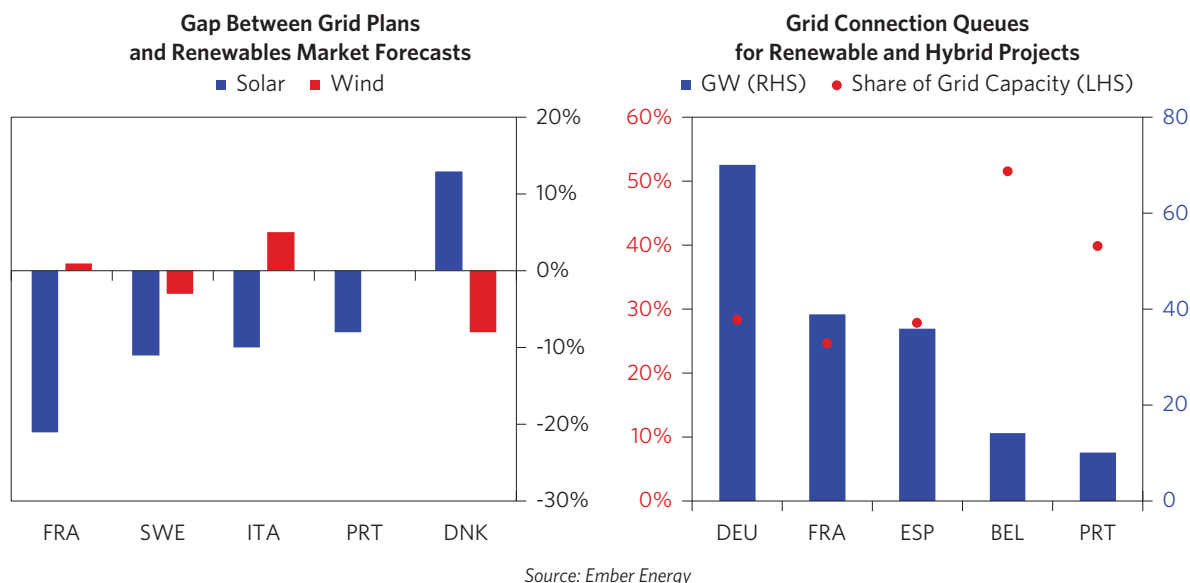
- **Martin Brudermüller, former BASF CEO:** “Europe’s competitiveness is increasingly suffering from overregulation, slow and bureaucratic permitting processes, and, in particular, high costs for most production input factors...High energy prices are now putting an additional burden on profitability and competitiveness in Europe.”
- **Jim Fitterling, Dow CEO:** “Our industry in Europe continues to face difficult market dynamics, as well as an ongoing challenging cost and demand landscape...The shutdown of upstream assets in Europe will right-size regional capacity...and remove higher-cost, energy-intensive portions of Dow’s portfolio in the region.”
- **Darren Woods, ExxonMobil CEO:** “Europe is trying to build this green economy that turns out frankly isn’t working. Rather than fix what they’ve created, they’re trying to drag American companies that do business in Europe into their mess.”

While renewables were previously seen as the main solution for energy self-sufficiency, concerns are rising with the recognition that this creates new reliance on China for imported components. The European Commission has launched an investigation into whether Chinese wind, solar, and EV imports benefit from unfair state subsidies and unfairly threaten the competitiveness of European firms, and the Net-Zero Industry Act also establishes targets for domestic manufacturing of cleantech equipment such as solar panels, wind turbines, and heat pumps by 2030. However, Europe continues to be one of the largest buyers of

Chinese cleantech exports, which it has used to bridge the gap between its limited manufacturing capacity and rising renewable generation needs.



Power deployment in Europe also presents a challenge, as Europe’s investment in solar and wind generation has not been matched by a similar investment in grid infrastructure, which has increased interconnection times for new projects and raised questions on Europe’s ability to handle new capacity additions. Regional imbalances between base load and intermittent generation have led to load fluctuations that have resulted in higher power price volatility as well as instances of grid instability (e.g., the Spain blackouts).



So far, Europe has lacked a sustained policy response to these acute challenges. Some of these vulnerabilities can be solved with sufficient policy focus, which Europe is trying to develop through more cohesive industrial policies such as the EU Clean Industrial Deal, which states that “affordable energy is the foundation of competitiveness.” So far, however, these policies seem unlikely to turn the corner in improving the region’s access to cheap and abundant energy (the Eurasia Group describes progress to date as “low to moderate” and notes that “overcoming infrastructure and refining bottlenecks will take many years”).

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