# Bloomberg Intelligence BI

# AI-Driven Energy Demand Outlook

## 2024

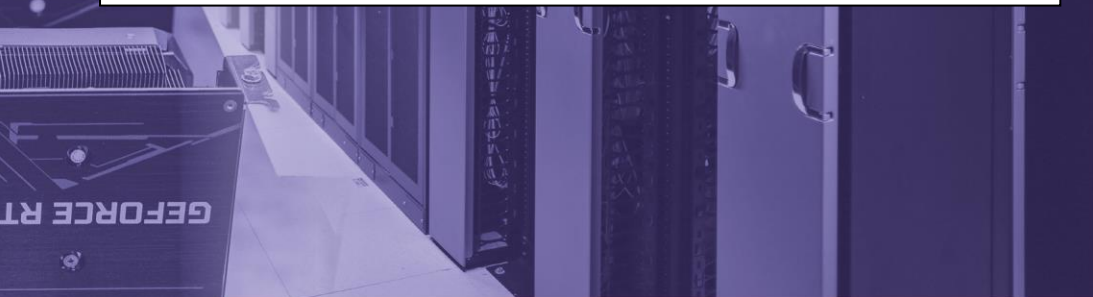## Solar, Gas and Batteries Race to Power AI Revolution

Propelled by spending on generative AI, data-center electricity use is poised to surge 4-10x by 2030, according to our calculations, and such growth could drive consensus-topping demand for solar and other renewables, battery storage and gas generation. **First Solar** will likely remain the fastest-growing company in our US peer group this year, with the potential for sales to climb 35%-plus annually through 2026, while upstream names like **EQT, Range, Southwestern** and **Chesapeake** should get an earnings boost as production volume rises to meet demand.

- **US Solar, Storage Uplift:** Combined sales for our US solar peer group could almost double to $40 billion by 2026, vs. consensus for 50% growth, based on accelerated demand for solar modules and batteries from data centers.

- **A Growth Opportunity for Utilities: RWE, EDP** and other electric utilities on both sides of the Atlantic may increase renewable-power capacity and segment earnings by 2-3x through 2030 as data-center energy consumption compounds electricity demand growth.

- **Continued Gas Surge:** Consensus appears to understate the scope of natural gas needs to fuel power generation for gen AI (to offset intermittent renewable energy) and the potential earnings benefit to upstream producers. US power-sector demand for gas may increase 10-30% (3-10 billion cubic feet a day) by 2030 vs. today's level.

**Featured in This Report:** Bloomberg Intelligence models data-center energy use through 2032 in the US and Europe using top-down and bottom-up approaches based on projected generative-AI spending, computing-efficiency assumptions, the number of GPUs deployed and power use per rack. Our interactive calculator is available on the Terminal **HERE**.

## Sept. 10, 2024

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**More detailed analysis and interactive graphics are available on the Bloomberg Terminal**

# Section 1.

# Executive Summary

**$40 Billion**
Potential 2026 revenue for US solar peers

**41%**
Compound annual growth in estimated generative AI spending from 2024-32

**4-10x**
Expected jump in AI-related power use by 2030

## AI Data Centers to Fuel Demand for Solar, Batteries, Gas

Spurred by spending on generative AI, data-center electricity use is poised to surge 4-10x by 2030, we calculate, likely driving demand for solar plus battery storage and natural gas generation, given the relatively short time frames to build such technologies vs. other power sources like nuclear. First Solar, Enphase, Sunnova and rivals could see sales accelerate due to AI spending, with our analysis showing combined 2026 revenue may approach $40 billion for US-listed solar peers, exceeding consensus of $30 billion. Kinder Morgan and Williams are among natural gas pipeline operators that may increase sales to generators. Gen-AI spending also could boost renewable capacity growth and earnings on both sides of the Atlantic for RWE, EDP and other European peers.

## Key Research Topics

- **Power Demand to Surge:** Nvidia's Blackwell GPU launch could drive a 1% gain in total US power consumption (or a 50% increase in data-center use) in the first year of its release, we calculate. After decades of stagnant demand, we believe data centers could spur significant growth in the coming years and consume up to 17% of total US electricity by 2030.

- **Clean Energy Likely Paves the Way:** US electric power-capacity additions are dominated by solar, wind and batteries (94% of the planned 2024 total), which will likely play a pivotal role in meeting new demand while offsetting declines in coal and other older technologies.

- **Utilities Set to Return to Growth:** The boom in data centers to power AI, along with growing demand from economic development and electrification, could produce higher margins for nonregulated power, including Constellation, Vistra and NextEra's renewables unit. Renewables' earnings for European peers, including Engie, Orsted and RWE, may expand by mid- to high-single digits in 2024-30.

- **Gas Expansion Opportunity:** Data centers could propel US natural gas demand by at least 3 billion cubic feet (bcf) a day, with upside potential for 10-plus bcf a day in 2030. Kinder Morgan, Energy Transfer, Williams and TC Energy may be the largest beneficiaries in the midstream sector given their vast networks near data-center hubs in Texas and Virginia.

- **Nuclear May Miss AI Revolution:** With an expected 10-year buildout, NuScale, TerraPower and other companies racing to build next-generation nuclear reactors likely won't be ready in time for the current wave of energy demand being driven by spending on generative AI.

## Performance and Valuation

First Solar's shares are up about 20% this year vs. a 33% drop for the median company in our global solar theme basket, with the outperformance linked to the Inflation Reduction Act and the emergent theme of AI-propelled energy demand. First Solar trades at an EV-to-Ebitda multiple of 8x, compared with the S&P 500's 14x, modest considering it's expected to boost sales and Ebitda by 35%-plus this year. Other US-listed companies exposed to AI energy demand include Canadian Solar (5x EV-to-Ebitda multiple), Sunnova (14x) and Enphase (21x). The median solar company trades for about 10x.

# Section 2.    Catalysts to Watch

## AI to Drive Notable Uptick in Clean Energy Projects

First Solar said on its 2Q earnings call that it signed a 620-megawatt module supply agreement with a US customer that will supply a hyperscaler. We believe such announcements from that company and peers will proliferate alongside spending on GPUs and data centers.

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### Critical Milestones:

- **3Q24:** First Solar to complete Alabama production facility with annual production capacity of 3.5 gigawatts (GW)

- **2H25:** Canadian Solar to complete a 5-GW Solar Cell manufacturing plant in Indiana

- **2H25:** First Solar to complete Louisiana production facility with annual production capacity of 3.5 GW

- **2026:** Enphase may triple battery shipments to nearly 1 GW-hours

- **2026:** Meyer Burger could ramp up production from its Arizona module production facility to 2 GW

- **2027:** SolarEdge may triple battery shipments to nearly 1.6 GW-hours

- **2027:** First Solar module production could exceed 24 GW vs. 12 GW in 2023

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# Section 3.   US Power Demand

## First Solar, Peers Eye Sales Lift in Race for AI Supremacy

Solar, battery storage and natural gas power plants will likely be the primary beneficiaries of AI-driven power demand over the next 10 years. First Solar, Meyer Burger, Canadian Solar and peers' sales could accelerate to a double-digit pace in 2024-30 as a result. After stabilizing for nearly a decade, US power demand is set to mount, with AI computer-systems use expected to soar 4-10x by 2030. Battery-storage needs are also poised to increase.

## 3.1   Power Demand Driven by AI, Data-Center Needs

Spending on generative AI – including hardware, software and other IT services – may climb at a compound annual rate of 41% over 2024-32, based on a **deep dive** published by Bloomberg Intelligence's global technology team. The build-out of data centers, cloud infrastructure and other IT resources to enable such growth will likely be accompanied by a surge in power demand – particularly in the US, a leader in such trends.

Assuming a linear relationship between energy use and generative AI spending, power consumption for this purpose would increase nearly 10-fold by 2030. Under that scenario, as seen in Figure 1, data centers could consume about 17% of US electric power generation, and US utilities may struggle to keep up. Nvidia's Blackwell GPU launch alone may drive a 1% gain in US power consumption in the first year of its release, we calculate, adding further strain to the power grid and driving demand for GE Vernova, Eaton, Vertiv and Hubbell's equipment.

Solar and battery technologies -- the fastest to build -- will be key to helping to meet the AI-driven growth in demand. If efficiencies improve as the industry scales up, AI-related power use could expand more than 4x to about 275 terawatt-hours in 2030, implying tremendous scope for growth for the likes of First Solar, Canadian Solar and Meyer Burger. The Energy Information Administration (EIA) expects US power demand to rise 3% in 2023-25, as seen in Figure 2.

Data centers aren't the only drivers. US electricity demand was roughly flat for most of the 2010s yet began accelerating following the pandemic, and the upward trend is set to continue. That's also due to a pickup in electric-vehicle sales and increased spending on manufacturing as a result of the Inflation Reduction Act, the CHIPS Act and other government-funded stimuli.

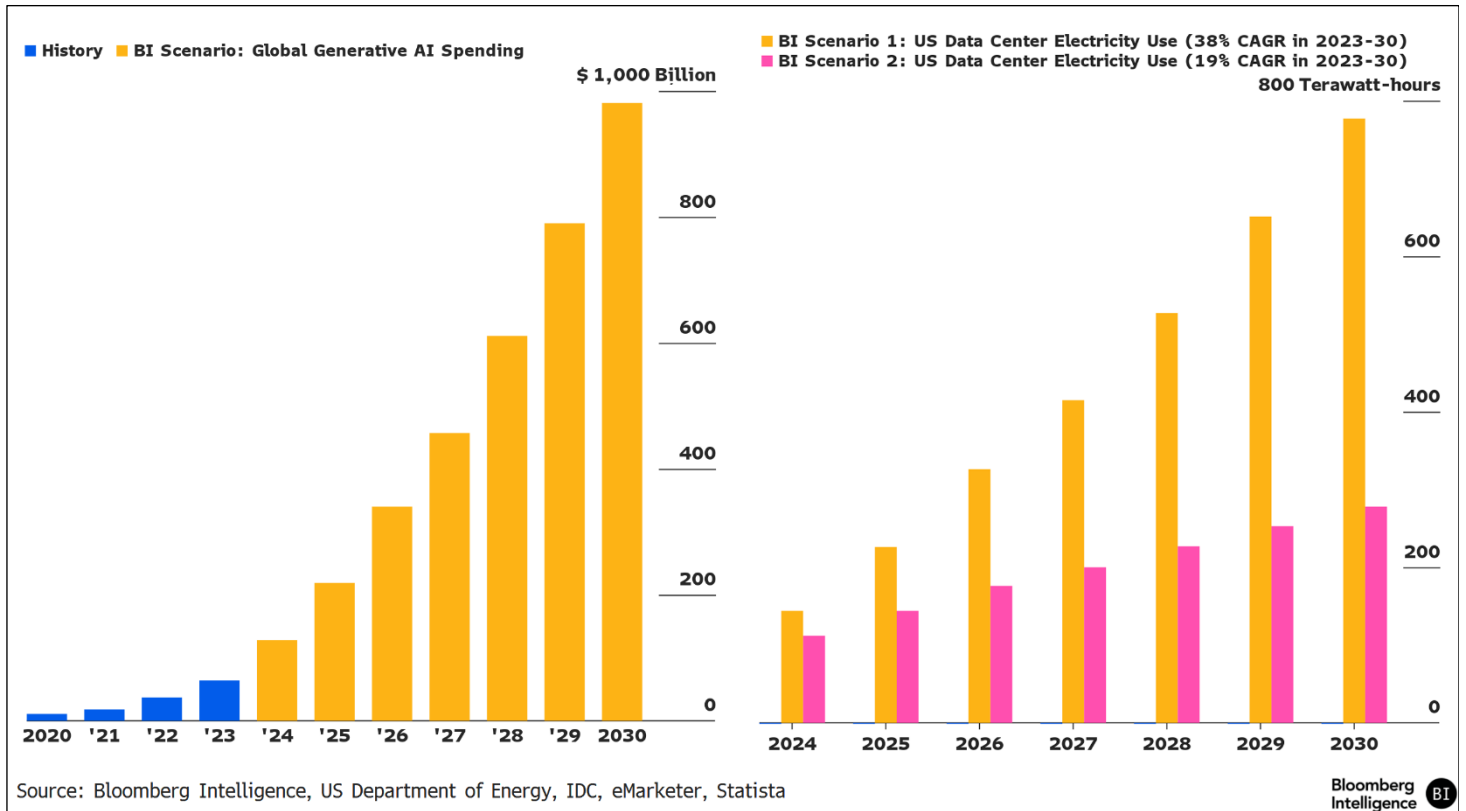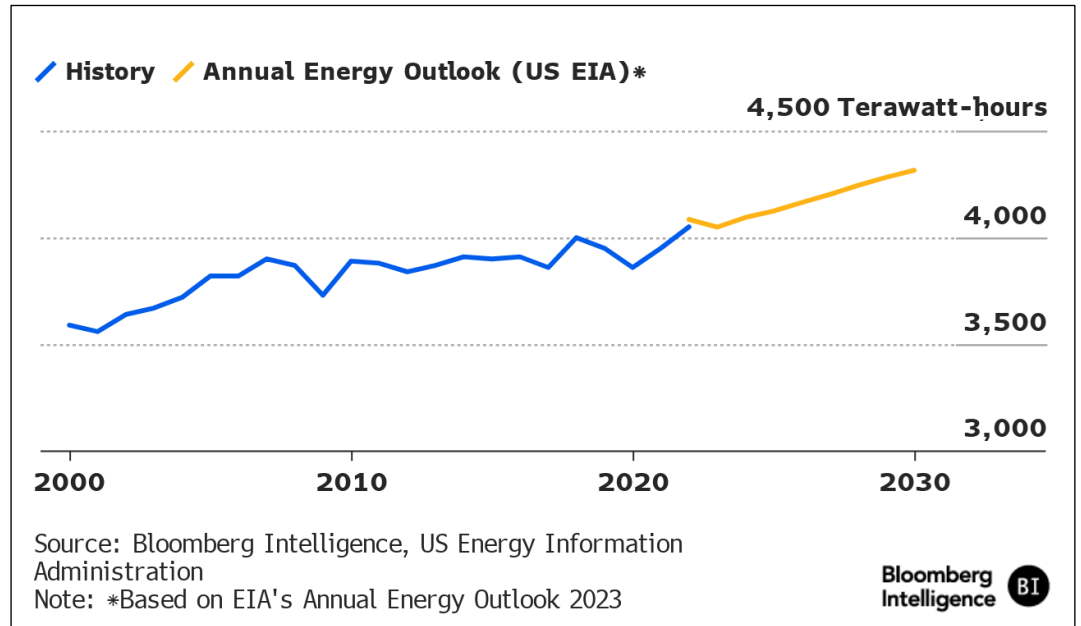**Figure 1: Generative AI Spending, US Data-Center Power Use**



■ History ■ BI Scenario: Global Generative AI Spending

$ 1,000 Billion

■ BI Scenario 1: US Data Center Electricity Use (38% CAGR in 2023-30)
■ BI Scenario 2: US Data Center Electricity Use (19% CAGR in 2023-30)

800 Terawatt-hours

Source: Bloomberg Intelligence, US Department of Energy, IDC, eMarketer, Statista

**Figure 2: US Electricity Demand**



✎ History ✎ Annual Energy Outlook (US EIA)∗

4,500 Terawatt-hours

Source: Bloomberg Intelligence, US Energy Information Administration
Note: ∗Based on EIA's Annual Energy Outlook 2023

## 3.2 US Solar Peers' Growth to Be Reinvigorated by AI

US electric power-capacity additions are dominated by solar, wind and batteries -- accounting for 94% of the planned 2024 total, according to the EIA – and those renewable techologies will likely to play a critical role in meeting new power demand while offsetting declines in coal and other older sources.

Companies leading the AI revolution – Meta, Microsoft, Amazon.com, Alphabet and other hyperscalers – will likely prefer emissions-free electricity as they seek to adhere to sustainability goals. Solar plus battery storage is practical for data-center applications, since such projects can be constructed in less than 12 months vs. wind or gas-power plants (a year or more) and nuclear (a decade-plus). Regardless of the technology, many power projects have multiyear permitting and development timelines.

The combination of higher interest rates and a steep decline in solar-module prices led to stagnating sales in 2H23 for most US solar-exposed companies (with First Solar, Sunnova and a few others the exceptions). Yet as Figure 3 shows, a turnaround could begin in 2H, partly propelled by emergent demand from AI and data centers.

First Solar will likely remain the fastest-growing company in our US solar peer group this year – with the potential for sales to surge 35% -- while peers should achieve strong double-digit sales gains over 2025-30.

Natural gas backup generation and combined-cycle power plants could also benefit from the expected power-generation boost, given these technologies pair well with intermittent ones.

**Figure 3: Solar Peer Group Sales Growth**

|  | 2022 | 2023 | 2024* | 2025* | 2026* |
|---|---|---|---|---|---|
| **Array Technologies** | 92% | -4% | -39% | 31% | 15% |
| **Canadian Solar** | 42% | 2% | -6% | 19% | 14% |
| **Enphase** | 69% | -2% | -39% | 44% | 16% |
| **First Solar** | -10% | 27% | 35% | 26% | 19% |
| **Maxeon** | 35% | 6% | -36% | 21% | 21% |
| **Shoals Technologies** | 53% | 50% | -21% | 24% | 12% |
| **SolarEdge** | 58% | -4% | -64% | 73% | 21% |
| **Sunnova** | 131% | 29% | 19% | 26% | 19% |
| **Sunrun** | 44% | -3% | -6% | 15% | 15% |
| **Median** | 53% | 2% | -21% | 26% | 16% |

Note: *Based on MODL Consensus as of Sept. 6, 2024

Source: MODL <GO>, Bloomberg Intelligence

**SolarEdge, Enphase, Array expected to lead solar sales growth**

## 3.3 European Generators Turn to AI for US Lift

Engie, Orsted, RWE and European renewable peers' earnings may expand by mid- to high-single digits in 2024-30 as the pickup in data-center and AI energy use stokes US power demand after

years of stagnation. The group's US capacity could double to 94 gigawatts by 2030, driven by faster solar and battery growth and a back-loaded offshore scale-up.
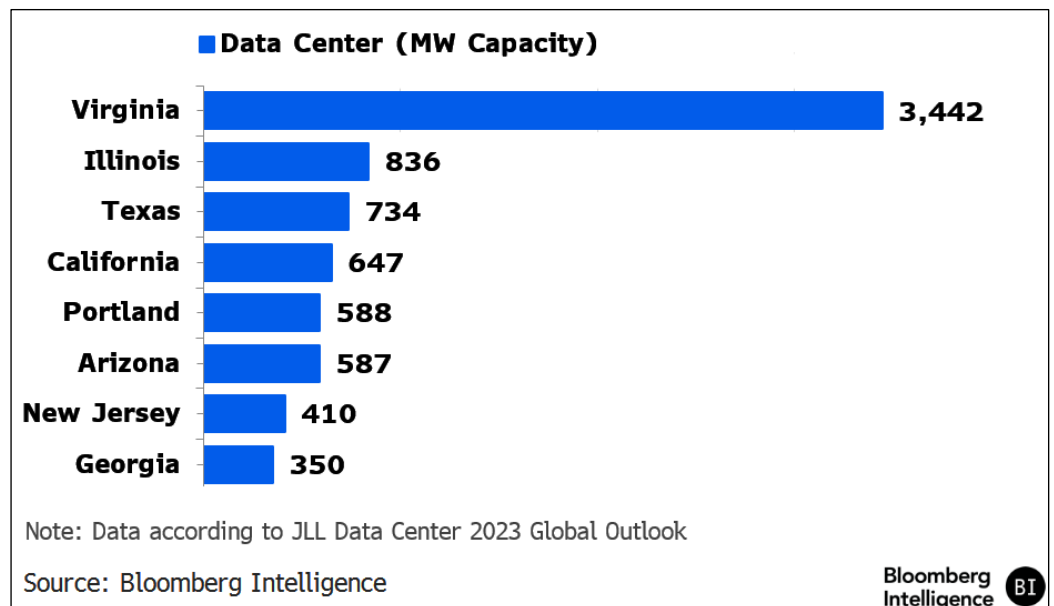
The US hosts one-third of data centers globally, according to the EIA, with proximity to corporate headquarters and customer concentration tending to decide their location. Figure 4 breaks down the capacity total by state. Virginia, where data-center power use has climbed by more than 500% over the past decade, is set to remain the top market worldwide, with capacity forecast to increase about 3x by 2035.

Given the time it takes to connect these facilities to local networks, off-grid solutions -- including wind, solar and batteries -- are poised to gain market share as climate pledges impede the scaling up of fossil-fuel plants in the long term.

European developers (Orsted, Engie, Enel, EDP, Iberdrola and RWE) have assets in states exposed to mounting data-center demand – highlighted in Figure 5 – potentially boosting their sales via long-term power-purchase agreements (PPAs). Given Amazon.com, Google and other data-center demand drivers have ambitious net-zero goals, the appetite for renewable power sales via PPAs could increase, lifting the earnings prospects of European developers in the US.
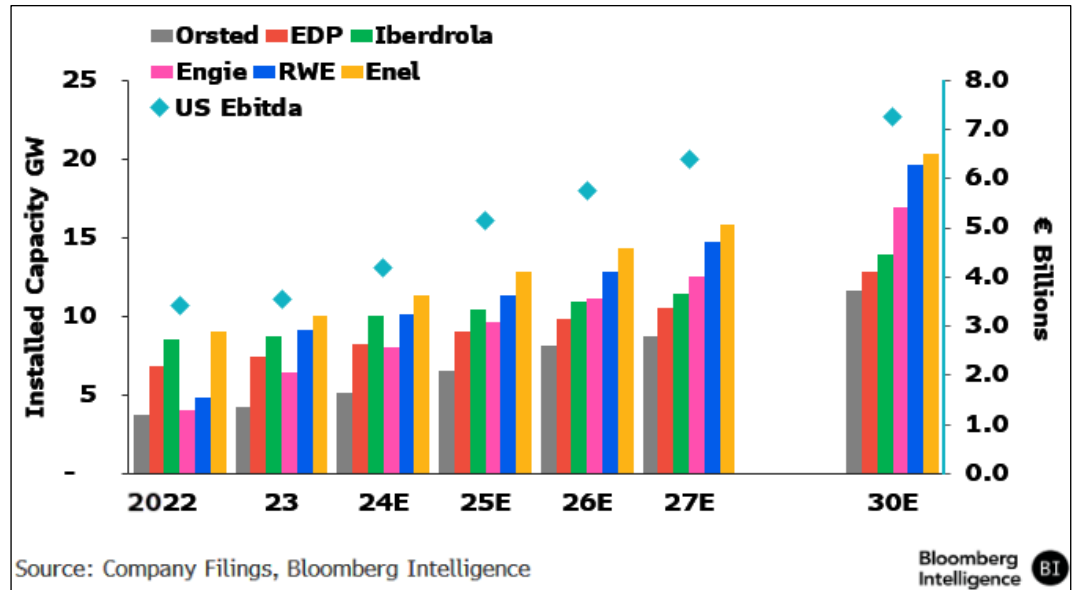
Mounting power demand and US tax credits may fuel capacity gains from 2025 after rising interest rates and easing power prices stunted growth. Long-term policy tailwinds include Europe's stated aim to lift its share of renewables to 42.5% of energy consumption by 2030 and the US Inflation Reduction Act.

**Figure 4: US Data-Center Capacity**

| Data Center (MW Capacity) | |
|---|---|
| Virginia | 3,442 |
| Illinois | 836 |
| Texas | 734 |
| California | 647 |
| Portland | 588 |
| Arizona | 587 |
| New Jersey | 410 |
| Georgia | 350 |

Note: Data according to JLL Data Center 2023 Global Outlook

Source: Bloomberg Intelligence

**Figure 5: EU Utilities' Green Capacity, Ebitda in the US**

Source: Company Filings, Bloomberg Intelligence

Orsted, Engie and RWE are leading EU peers' expansion in the US, aiming to broaden their green assets by mid-single digits annually in 2023-30. Together with EDP, Enel and Iberdrola, the group's installed base could top 95 gigawatts in 2030 (more than doubling from 46 GW in 2023), supporting a 1.5-2x step-up in US-based Ebitda from renewables.

Solar and batteries may comprise 55% of those additions, followed by onshore (35%) and offshore wind (10%). Shorter lead times, lower build costs and less exposure to execution delays make solar European utilities' growth avenue of choice. RWE, Iberdrola, EDP, Orsted and Enel aim to scale up their US solar assets by 3-5x in 2023-30.

Solar and battery storage are set to comprise 81% of new US power capacity in 2024, while states like California seek to increase capacity fivefold by 2045 vs. 2023. Improving battery capacity may help ease the grid's solar power "duck curve" by storing daytime excess and redeploying it in evening hours, buoying battery owners' intraday margin capture.

Though expansion is slowing amid rising capital costs and easing power prices, the peer group's solar capacity may still climb at a median CAGR of 30% in 2023-26 vs. the 40% implied by previous guidance, as seen in Figure 7. RWE and Engie haven't yet revised their targets, while Iberdrola and Enel have curbed renewable-growth plans, given their larger scale vs. pure-play developers. EDP trimmed its proposal due to mounting funding pressure.

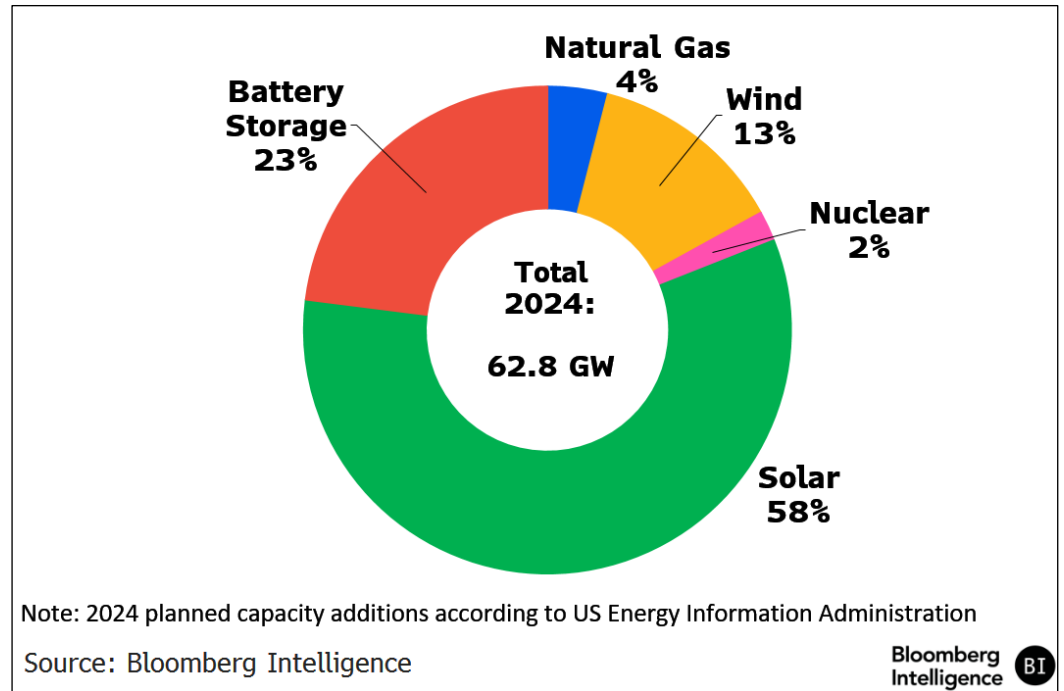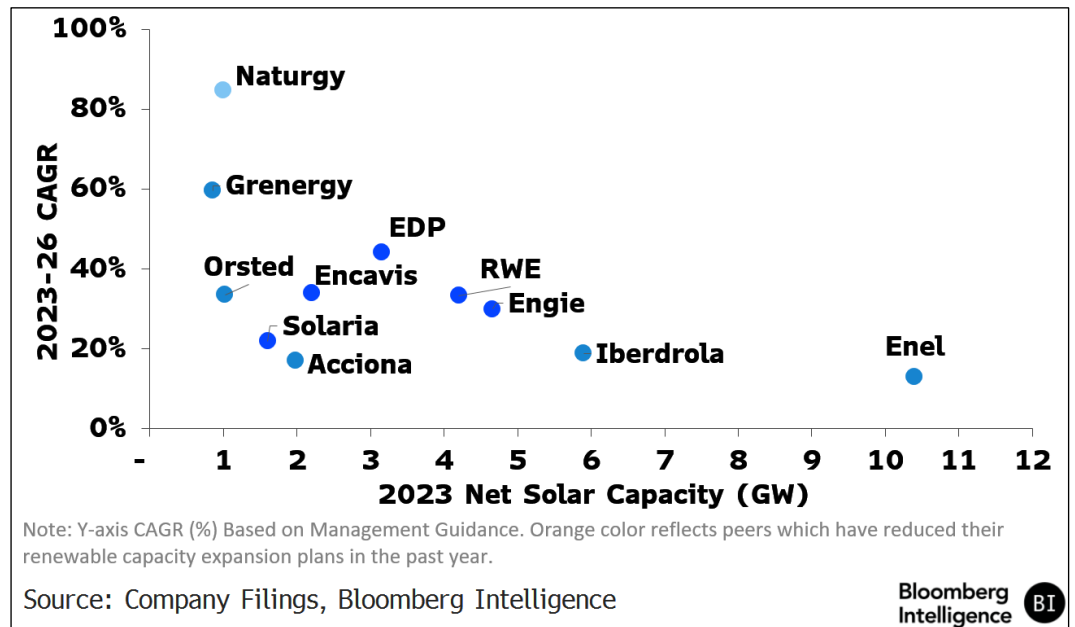**Figure 6: US Planned Power-Capacity Additions, 2024**



Note: 2024 planned capacity additions according to US Energy Information Administration

Source: Bloomberg Intelligence

**Figure 7: Global 2023 Net Solar Capacity (GW), 2023-25 CAGR (%)**

**Enel, Iberdrola top global solar capacity, lag in growth**

Note: Y-axis CAGR (%) Based on Management Guidance. Orange color reflects peers which have reduced their renewable capacity expansion plans in the past year.

Source: Company Filings, Bloomberg Intelligence

## 3.4  Offshore Wind, Gas Could Get a Boost

The outlook for offshore-wind development in the US also may improve beyond 2025 as demand for renewable power accelerates. Rising consumption from data centers might aid this trend, driving electrification alongside the reshoring of clean-tech supply chains and the rollout of

electric vehicles. Offshore wind could be primed to expand (notably on the Northeast coast), given its relatively high load factors and scale.

Denmark-based Orsted halted two projects off New Jersey in 2023 amid cost dislocations due to fixed-price off-take contracts, but its US portfolio still comprises more than 25% of its planned expansion to 2030. Iberdrola intends to add almost 1 gigawatt in the US by 2026 and has over 2 GW in secured pipelines. RWE has 6 GW-plus of seabed rights across New York, California and the Gulf of Mexico.

Though renewable power generation is well placed to capture mounting demand from data centers and AI in the long term, time constraints and intermittency concerns could support natural gas-fired output. Balancing the grid amid rising consumption from IT infrastructure will become increasingly challenging as battery-storage capacity gradually ramps up, leaving gas-fired production as the primary option to plug intraday demand peaks.

Natural gas demand in the US rose 3% in 2023, largely driven by consumption for electricity generation, contrasting with the sustained decline in Europe, where rising renewable output tempered its use.

**Figure 8: Annual Gas Demand (Bcm)**



Source: Our World in Data, Bloomberg Intelligence
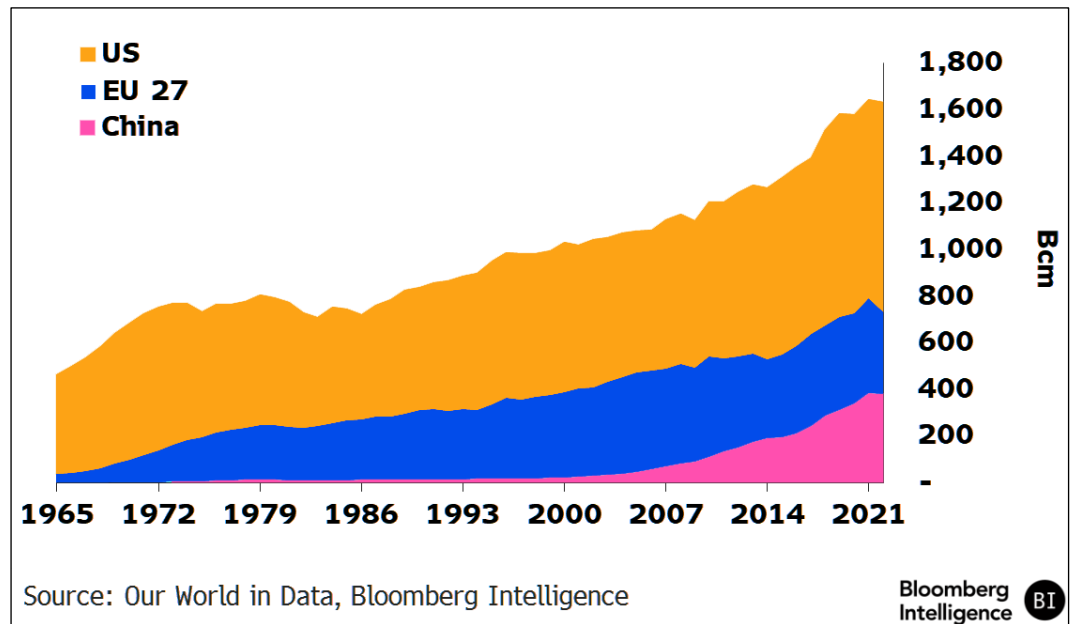
## 3.5  Blackwell GPUs Show Power Needs

If Nvidia ships about 60,000 of its new Blackwell GPUs in the first year, AI data servers could boost US power consumption by almost 40 million megawatt-hours, or about 1% of total power generated. With the first batch of deliveries set for the next 6-12 months, it's feasible that a majority of the new servers based on the Blackwell architecture will use 72 GPUs/36 CPUs or 36 GPUs/18 CPUs in one rack, or about 67-120 kilowatts of power use per rack.

Our calculation is based on 60,000 GPUs and the latest available power statistics and assumes the servers will run at full power 24 hours a day, seven days a week, with all of them in the US. These assumptions might prove conservative, given we're only looking at the servers' power consumption and not including any effect from AMD's fewer shipments.

Texas' grid has the flexibility and enough power generation and storage projects in the pipeline to become a hub for AI data centers. In August, the Electric Reliability Council of Texas (ERCOT) navigated a persistent heat wave that set new peak power-demand records without issuing power-conservation requests. This compares with 11 in the summer of 2023. Texas and California will account for 82% of new battery storage capacity in 2024, according to the EIA, with the majority from Texas (6.4 GW) vs. California's 5.2 GW.
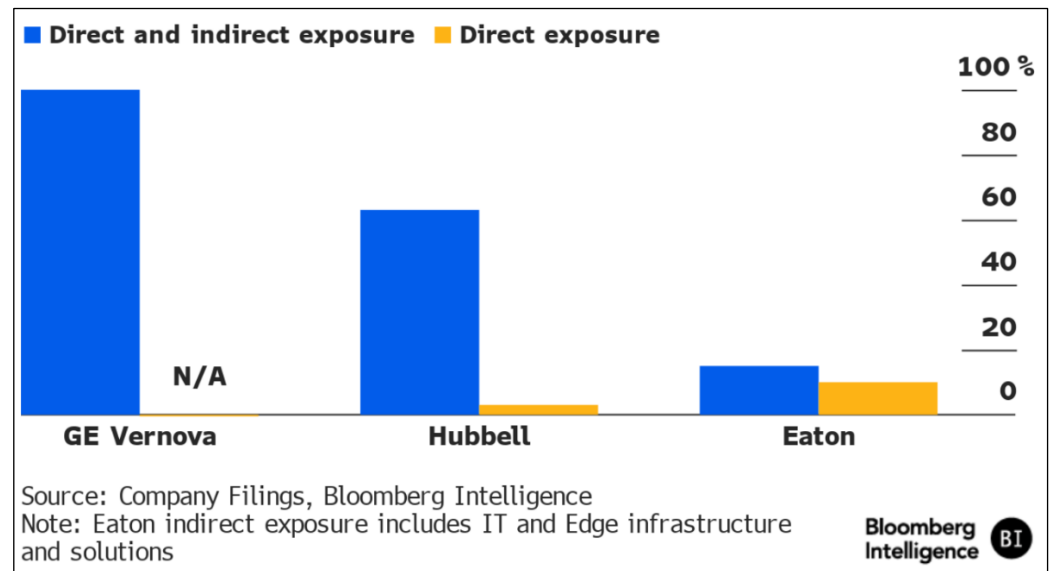
Texas is anticipated to have the second-biggest growth in power generation from 2023-25, at 11%, just behind New England (ISO-NE) 11.3%.

GE Vernova could be considered a pure play among US electrical-equipment makers with exposure to electric utilities as well as the grid, where the secondary effect of data-center power consumption is driving demand. Eaton, Hubbell and their global peers might benefit, too, with Eaton's Americas segment seeing demand stretching into 2028. The company is adding capacity to meet demand, particularly for transformers -- key equipment needed to handle voltage changes in the grid.

Hubbell's direct exposure to data centers is small, just 3% of 2023 revenue, but more than 60% of its sales that year stemmed from grid infrastructure and automation.

**Figure 9: Sales Exposure to Electric Utilities and the Grid**

**GE Vernova most exposed to grid-equipment sales among peers**



Source: Company Filings, Bloomberg Intelligence
Note: Eaton indirect exposure includes IT and Edge infrastructure and solutions

# Section 4.    Solar, Batteries

## AI, Data Centers Ready to Propel Demand, Sales

Enphase, SolarEdge, Sunrun and other US-listed solar and battery suppliers appear poised for a jump in demand as power-hungry AI queries and data centers propel electricity consumption. Consensus expects sales for the group to climb about 50% to $30 billion by 2026, and our analysis shows $40 billion-plus is possible.

## 4.1    Rise of AI Could Drive Energy Demand Higher

The projected 4-10x surge in US data centers' center electricity by 2030 will likely drive demand for solar plus battery storage and gas generation, given the relatively short time frames for building such technologies vs. other sources of power.

AI-powered queries require about 10x the energy (and cost) of a standard Google search, and the high end of our power estimate (10x) assumes a near-linear relationship in AI spending and electricity demand. The lower figure (4x) assumes significant efficiency improvements.

As Figure 10 shows, combined sales for our US solar peer group may jump 50% to $30 billion in 2026, based on consensus, and we believe $40 billion-plus may be within reach based on accelerated demand for solar and battery storage. Most US-listed solar-equipment suppliers, including Canadian Solar, Enphase, SolarEdge, Sunnova and Sunrun, either manufacture batteries or have contracts with battery providers.

A notable exception is First Solar, which doesn't yet have a storage offering. Tesla has a solar and battery-storage unit and is expected to boost sales from this segment 70% in 2024, based on Bloomberg consensus. First Solar announced on its 2Q earnings call a 620-megawatt agreement to supply modules for an unspecified hyperscaler project. Such projects could help drive modest upside to 2025-26 consensus for First Solar, with double-digit sales growth likely in 2027-30, based on our scenario analysis.

Enphase is expected to boost battery shipments at a CAGR of 40% in 2024-26, according to analysts, and estimates could be revised up due to the proliferation of AI and data centers. SolarEdge, Sunrun and other US-listed solar and battery suppliers are also exposed to this theme, bolstered further by the higher spending on US construction projects.

**Figure 10: US Solar Peers: Revenue Expectations**

**Canadian Solar, First Solar revenue expectations are highest in US**



*Based on MODL consensus as of Sept. 6, 2024.

Source: MODL <GO>, Bloomberg Intelligence
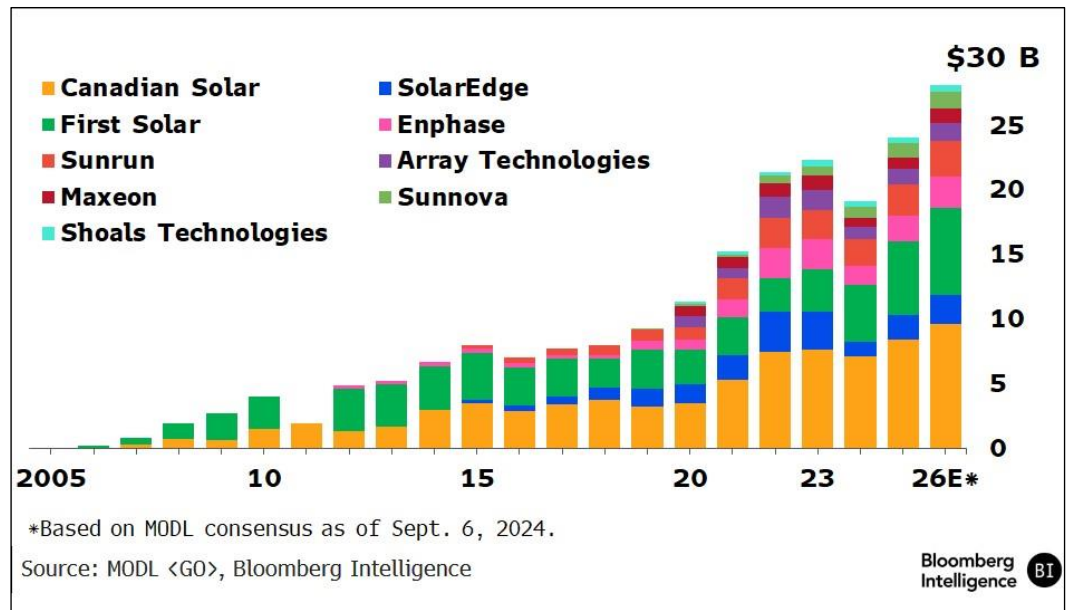
Given their focus on ESG and sustainability goals, Meta, Microsoft, Amazon, Alphabet and other AI hyperscalers are likely to have a strong preference for lower-emitting sources of power -- especially solar, wind and storage facilities. Microsoft and Brookfield Asset Management, for example, on May 1 signed the biggest corporate clean-energy purchase agreement ever to develop 10.5 GW of renewable power projects. (Disclaimer: Mark Carney, Brookfield's chair, is also the chair of Bloomberg LP.)

There are 1,086 gigawatts of proposed solar projects in the US pipeline, according the Lawrence Berkeley National Laboratory. Such projects would cost about $1 trillion to build (assuming a cost of $1 a watt), which we believe leaves plenty of upside for our $40 billion-plus sales scenario in 2026.

That expansion, coupled with rising demand from AI data centers, could further boost natural gas consumption. As seen in Figure 12, gas-fueled generation has risen steadily in the US over the past couple of decades and should climb further. Gas power plants can be used as backup power and quickly cycled to match the variability of wind and solar.

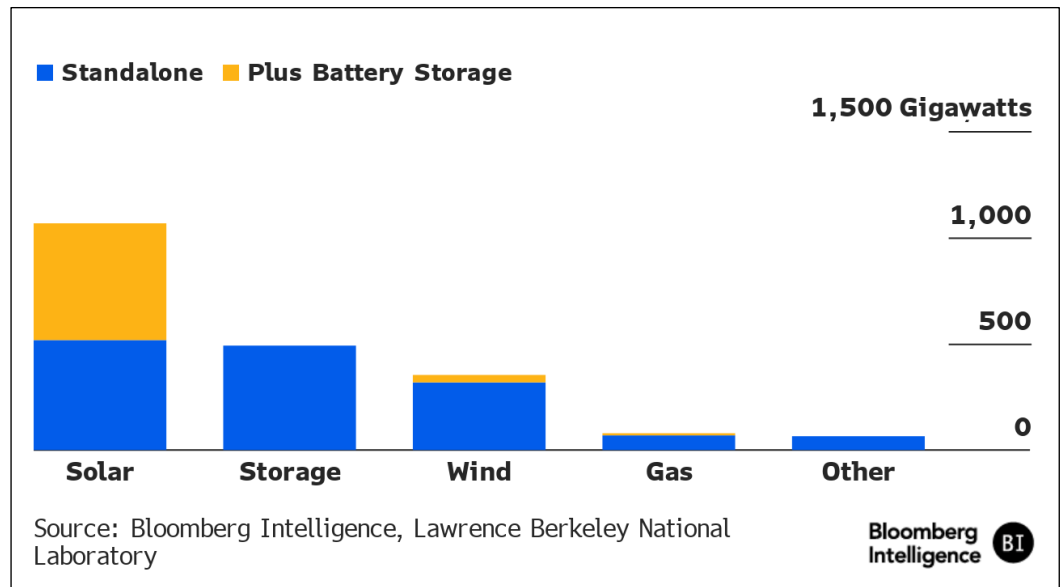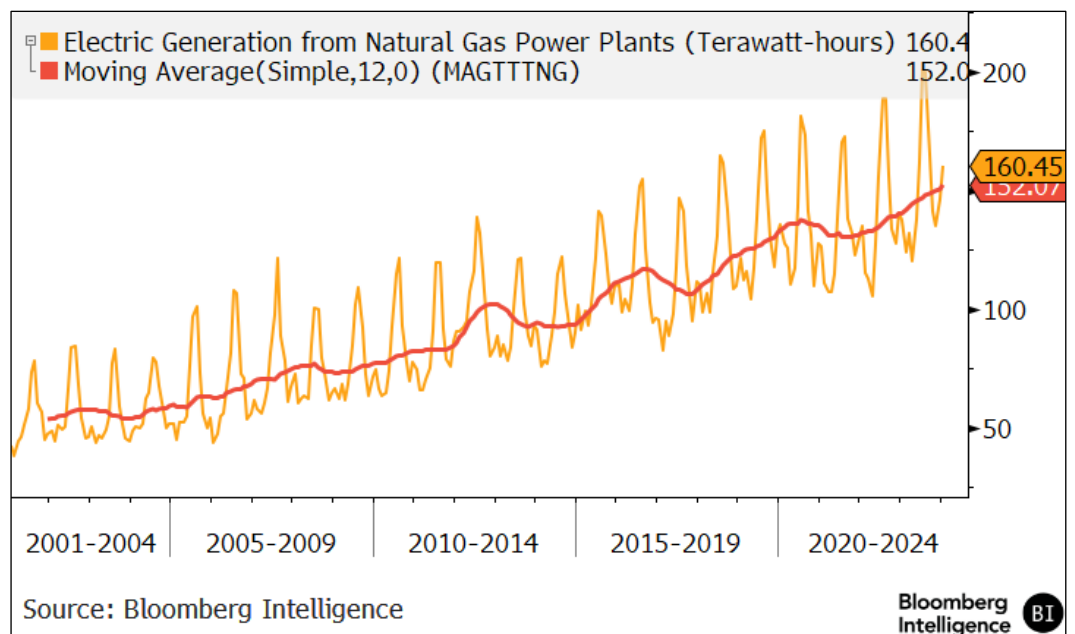**Figure 11: Power Plants Seeking Transmission Interconnection**



Source: Bloomberg Intelligence, Lawrence Berkeley National Laboratory

Bloomberg Intelligence **BI**

**Figure 12: US Generation From Natural Gas Power Plants**



Source: Bloomberg Intelligence

Bloomberg Intelligence **BI**

# Section 5. Natural Gas

## AI Reliance on Gas to Power Data Centers Overlooked

Consensus seems to understate both natural gas' scope in power generation for generative AI and the potential earnings boost to upstream producers like EQT, Range, Southwestern and Chesapeake. US power-sector demand may surge 10-30% by 2030 vs. today's level.

## 5.1 Demand Could Rise 3-10 Billion Cubic Feet/Day by 2030

The extra US gas demand to run AI data centers could reach 3-10 billion cubic feet a day (bcfd) by 2030, according to Kinder Morgan, equivalent to roughly 10-30% of current US demand for gas-fired power generation, as the buildout of data centers and cloud infrastructure spurs power use. Total US domestic gas consumption is about 90 bcfd.

Even at the low end of our scenario range, as illustrated in Figure 13, adding 3 bcfd of demand would likely reshape the gas landscape. Upstream producers like EQT, Range, Southwestern and Chesapeake appear well positioned to help meet AI-workload needs. Midstream providers such as Kinder Morgan, Energy Transfer, Williams and TC Energy would also play a key role in connections given their vast gas-pipeline networks near data-center hubs in Texas and Virginia.

AI data centers require effective 100% uptime – 24 hours a day, 365 days a year – with fault tolerance and redundancy measures to ensure near total reliability. That underscores the critical role that natural gas must play in the power mix to help offset the intermittency of renewable sources. We've modeled a 40-60% gas share of power demand in our data-center scenario analysis, with the remainder provided via renewables.

Substantial load growth from data centers could drive higher capacity factors (utilization) for existing gas plants and more gas new builds to ensure reliability. Data centers might consider existing combined-cycle gas-turbine plants (CCGTs) because of their baseload power and competitive costs. Companies with decarbonization goals that seek reliable power might back up renewables with gas-peaking units, which generate power when needed, given the limited nuclear supply and batteries' high costs and short duration.

This could spur gas burns for power, reinforcing our view that gas may remain the dominant fuel for US generation for years. The Environmental Protection Agency's new rule requiring expensive carbon capture for new gas plants with over 40% utilization may curtail new CCGTs. Solar's estimated load factor is only about 24%.

**Figure 13: Generative AI Scenarios, Gas-Demand Forecasts**

Chart 1 legend:
- Global Spending on Generative AI1
- US Power Demand from AI and Data Centers (Scenario 1)
- US Power Demand from AI and Data Centers (Scenario 2)

Y-axis (left): Billion USD — 0, 200, 400, 600, 800, 1,000, 1,200
Y-axis (right): Terrawatt-hours — 0, 100, 200, 300, 400, 500, 600, 700, 800, 900
X-axis: 2020, 2021, 2022, 2023, 2024S, 2025S, 2026S, 2027S, 2028S, 2029S, 2030S

Chart 2 legend:
- US Gas Demand from AI and Data Centers Scenario 1 (60% Gas Share)
- US Gas Demand from AI and Data Centers Scenario 1 (40% Gas Share)
- US Gas Demand from AI and Data Centers Scenario 2 (60% Gas Share)
- US Gas Demand from AI and Data Centers Scenario 2 (40% Gas Share)
- US Natural Gas Consumption

Y-axis (left): Bcfd — 80, 85, 90, 95, 100, 105
X-axis: 2020, 2021, 2022, 2023, 2024S, 2025S, 2026S, 2027S, 2028S, 2029S, 2030S

Source: Company Filings, Bloomberg Intelligence

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**Figure 14: Gas Burn for Power vs. Prices**



Source: Bloomberg Intelligence
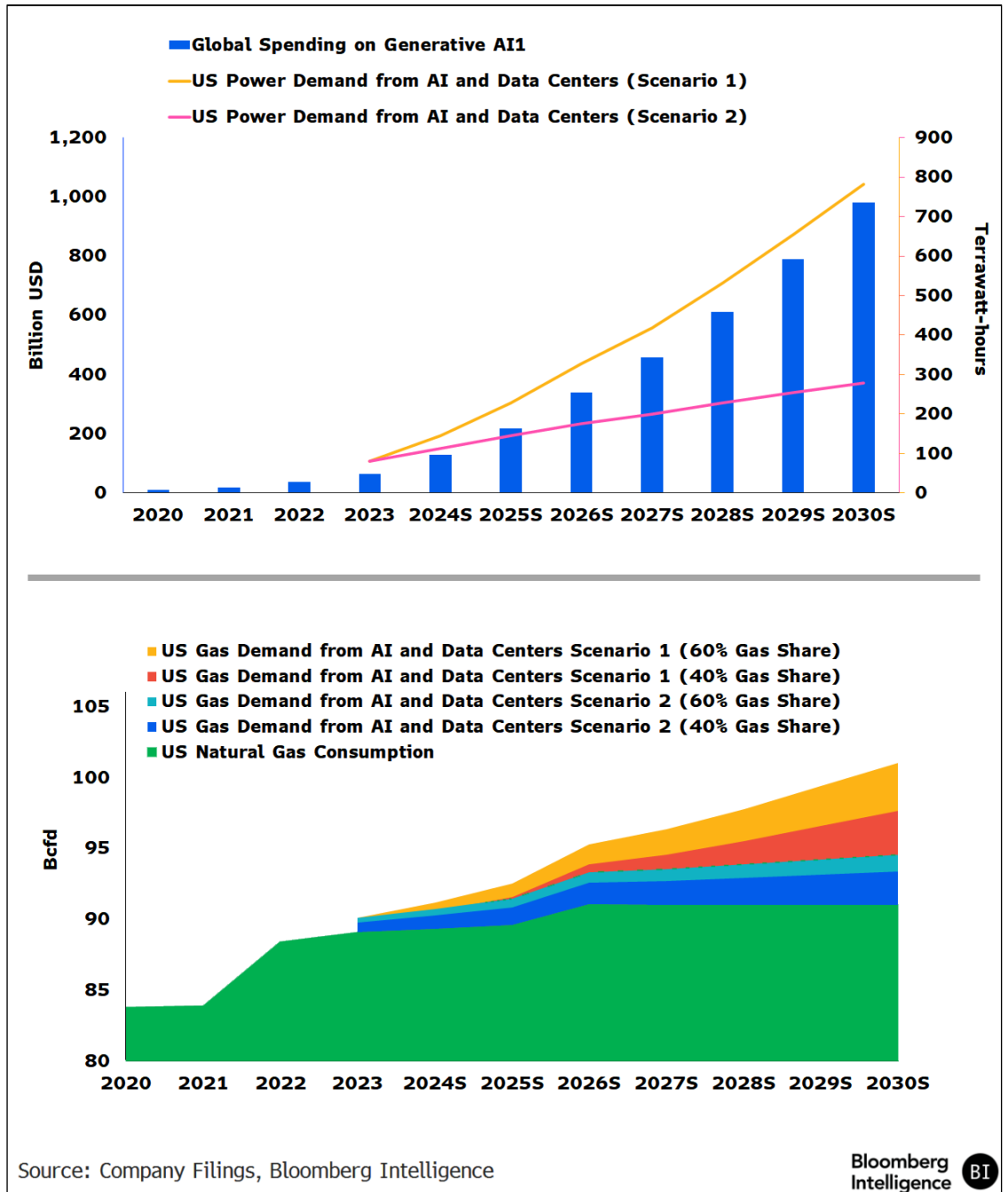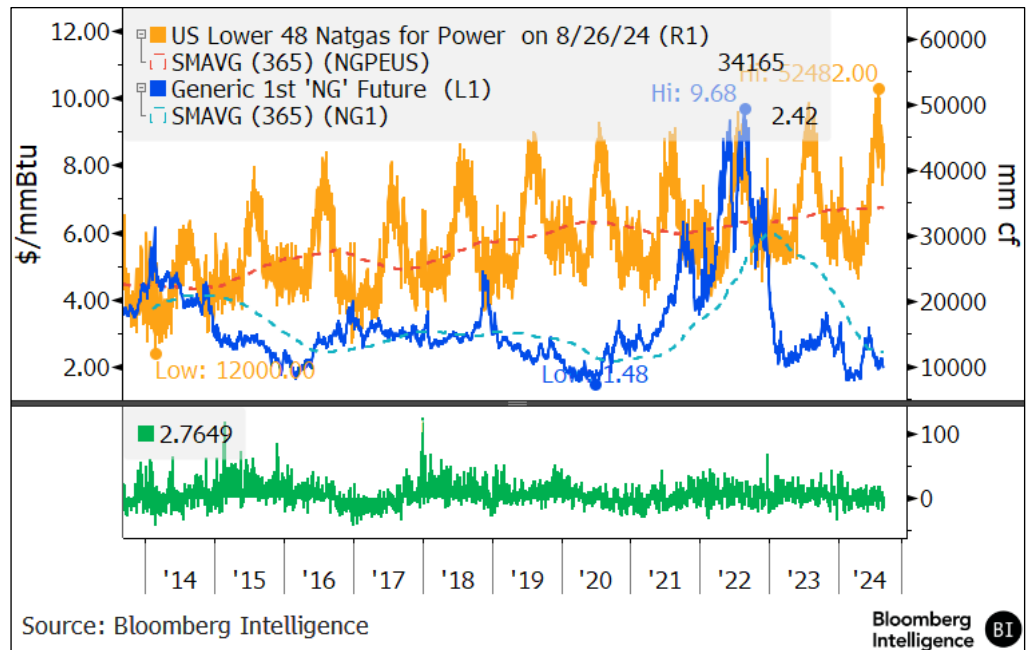
## 5.2 Virginia, Texas Data Centers Fuel Midstream

Northern Virginia and Dallas are two primary data center hubs in the US that could see a sizable increase in power requirements to fuel AI and machine learning, likely bolstering demand for midstream operators in the regions by 2030. Williams and TC Energy operate natural gas pipeline networks in northern Virginia, while Kinder Morgan and Energy Transfer have extensive asset bases in Texas. Data-center developers will probably seek renewables for some of the power, but a reliable, affordable and non-intermittent fuel source such as natural gas will be crucial. Kinder Morgan projects 3-10 bcfpd of gas demand by 2030 to power data centers. TC Energy already has a deal to supply a Microsoft data center in Wisconsin.

European integrated energy majors' upstream portfolios are skewed toward natural gas in their overall production mix. We expect the share to reach at least 50% by 2030, reflecting robust long-term demand growth – largely led by China and South Asia – alongside gas' crucial role in reducing overall energy-sector emissions. AI data centers' expansion could hasten this trend.

Rising concerns about global emissions, climate change and air quality have driven a switch to gas-power generation from coal, complemented by increasing electrification of the global energy infrastructure and Europe's newfound reliance on LNG. Together, these factors will help gas become the largest component of global energy demand growth by 2040.

EQT, Range, Southwestern, Chesapeake and gas E&Ps in Appalachia and along the Gulf Coast are well positioned to satisfy AI workload needs. Yet there's a chance electricity demand from data centers powering AI platforms will grow more slowly than elevated expectations. Though land for facilities is plentiful in rural and remote regions, building infrastructure to transport molecules is more difficult and costly due to less friendly jurisdictions.

Data centers in Virginia, Pennsylvania and Georgia account for the most electricity consumption in the East. Though data-center power usage is about 2% of domestic electricity consumption, reaching 7.5% might take longer than 2030.

# Section 6.    Nuclear

## Nuclear Power Too Slow to Meet AI's Hunger for Energy

NuScale, TerraPower and other companies racing to build next-generation nuclear reactors likely won't be ready in time for the surge of energy demand driven by spending on generative AI. With construction timelines often stretching for a decade or more in the US and Europe, output from new reactors isn't likely to play much of a role in supplying data centers before 2035.

## 6.1    Suited to Data Centers But Slow to Implement

In theory, nuclear power could dovetail well with the boom in spending on generative AI by providing reliable baseload electricity. Since nuclear power plants don't emit greenhouse gases, they also could help meet the carbon-reduction pledges of Meta, Microsoft, Amazon.com, Alphabet and other hyperscalers.

Many AI companies have touted nuclear power as a potential solution for their growing energy needs despite long lead times. Amazon, for example, in March purchased a data center that's powered by an adjacent nuclear plant – the Susquehanna generation station in Pennsylvania (partly owned by Talen Energy). Yet any similar deals with existing nuclear plants will likely be limited given such plants already run at high capacity factors. Output growth would require investments in new nuclear facilities.

Despite promising developments on the nuclear front -- such as NuScale receiving its design certification from the Nuclear Regulator Commission in 2023 -- the uptake of small modular reactors and other novel nuclear plants could be very slow if the history of conventional nuclear is a guide. Southern Co.'s Vogtle reactors, completed in 2023-24, took over 11 years to build. Nuclear also can cost more than competing power sources, as Figure 16 makes clear.

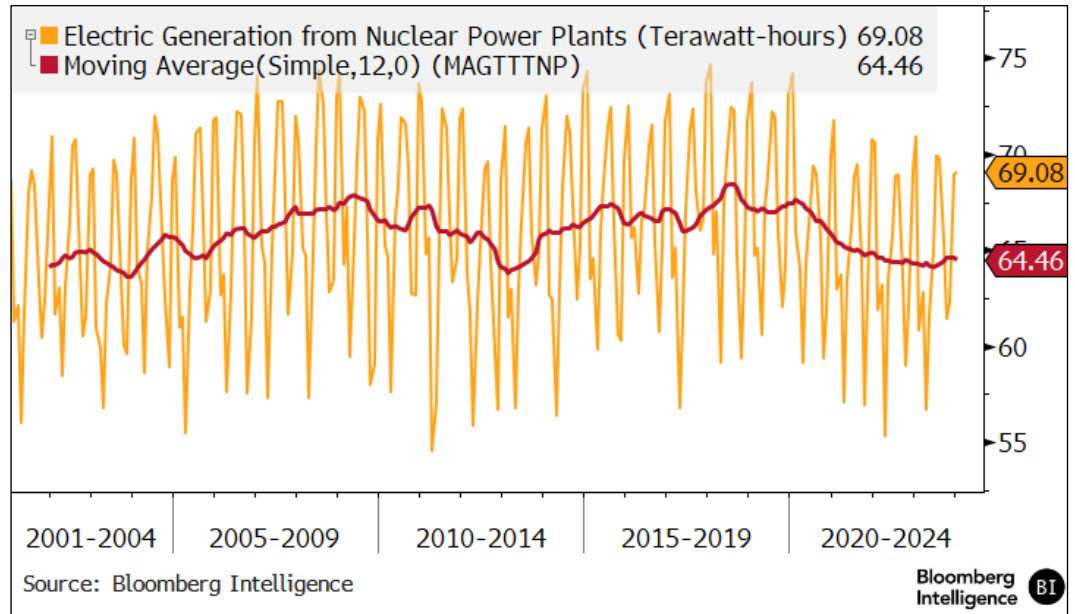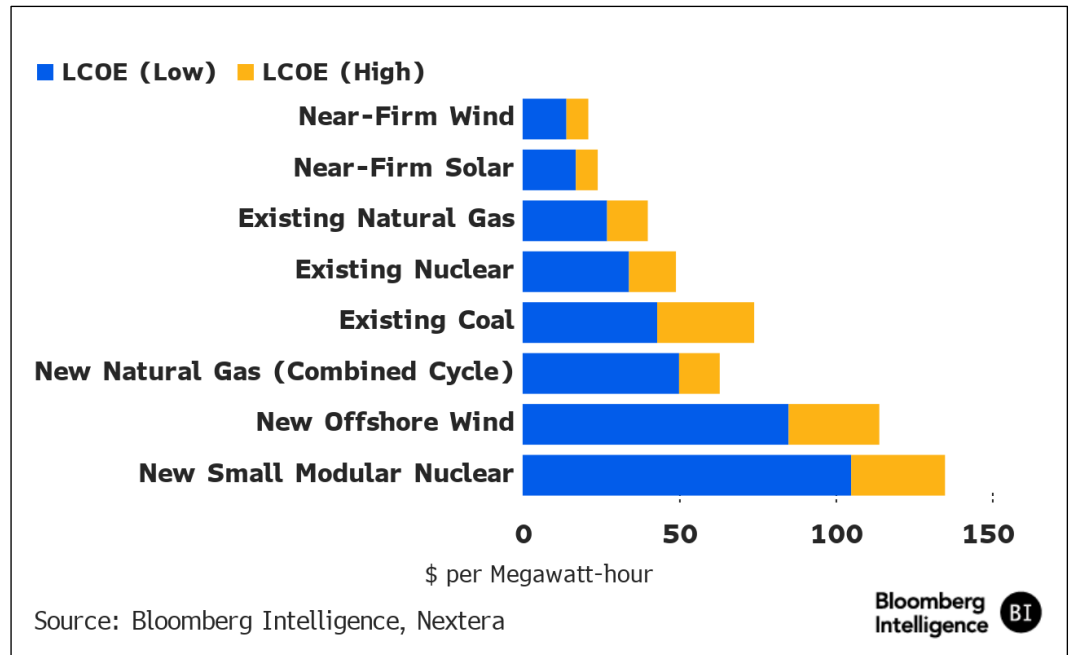**Figure 15: US Generation From Nuclear Power Plants**



Electric Generation from Nuclear Power Plants (Terawatt-hours) 69.08
Moving Average(Simple,12,0) (MAGTTTNP)                          64.46

Source: Bloomberg Intelligence

**Figure 16: NextEra: Estimated Cost of Electricity Resources**

**Nuclear's cost is higher than wind, solar or gas, NextEra estimates**



■ LCOE (Low)  ■ LCOE (High)

$ per Megawatt-hour

Source: Bloomberg Intelligence, Nextera

# Section 7.   US Utilities, Power Producers

## Cheap Utilities Await Clarity to Join AI Frenzy as IPPs Soar

The ability of US utilities to profit from rising AI-driven power demand will hinge on regulators' decisions on returns on equity and capital spending. Unlike unregulated power producers Constellation, Vistra and NextEra's renewables developer NEER, utilities haven't participated in the AI frenzy. Expectations of rate cuts and a slowing economy, cheaper valuations and growing demand are tailwinds vs. election risks. Low electricity rates and available generation capacity are among the key factors for deciding where such demand occurs and at what scale.

## 7.1   Regulatory Uncertainties May Weigh on Prospects

The 1H surge in share prices of independent power producers (IPPs) Constellation (71%), NRG (51%) and Vistra (123%), highlighted in Figure 17, reflected investors' expectations of rising electricity demand and margins, partly due to projected AI data-center growth. (Shares have cooled some in 2H.) Growing power demand also could spur higher utility spending on infrastructure, which drives earnings. Yet the group has largely stayed on the sidelines of the AI revolution, likely because of concerns that regulators might limit utilities' earnings by cutting ROEs to lessen customer bill increases.

Of the 25 S&P 500 electric utilities, only Public Service Enterprise and NextEra outperformed the broader market in 1H, fueled by their nonregulated units -- nuclear power for the former and renewables for the latter. The S&P 500 utilities index trailed the broader market by almost 7 percentage points following 2023's 34-point underperformance.

The sector index gained 7.6%, largely fueled by nonregulated IPPs that benefited from the AI frenzy. Of the 31 members, 22 (70%) trailed the index, and 10 had negative returns. Looking ahead, regulated utilities probably face more tailwinds than headwinds, given concerns about a slowing economy raise their defensive appeal and expectations of rate cuts.

Cheaper valuations -- discounts of about 1x to the sector index's average 10-year blended forward P/E multiple of 17.5x and 5x to the S&P 500 Index (vs. the average of less than 1x) -- also support the group. So does estimated EPS growth of over 7% for 2024-25, the highest since 2019.

**Figure 17: Member Ranked Returns for S&P 500 Utilities**

| Members (31) | Ticker | | Last Price | Cust ↑ | YTD | -4Q |
|---|---|---|---|---|---|---|
| S&P 500 UTILITIES INDEX | S5UTIL | | 346.36 | 7.58% | 7.59% | -10.10% |
| All Members | | | | | | |
| 1) VISTRA CORP | VST | UN | 87.37 | 123.21% | 126.82% | 26.40% |
| 2) CONSTELLATION ENERGY | CEG | UW | 204.71 | 71.33% | 75.13% | 19.15% |
| 3) NRG ENERGY INC | NRG | UN | 77.89 | 50.60% | 50.66% | 3.02% |
| 4) PUBLIC SERVICE ENTERPRISE ... | PEG | UN | 74.21 | 20.52% | 21.32% | -9.10% |
| 5) NEXTERA ENERGY INC | NEE | UN | 70.76 | 16.58% | 16.50% | -22.79% |
| 6) SOUTHERN CO/THE | SO | UN | 77.75 | 10.62% | 10.85% | -7.87% |
| 7) NISOURCE INC | NI | UN | 28.84 | 8.51% | 8.61% | -9.76% |
| 8) CENTERPOINT ENERGY INC | CNP | UN | 30.81 | 8.44% | 7.84% | -7.89% |
| 9) AMERICAN ELECTRIC POWER | AEP | UW | 87.94 | 8.03% | 8.27% | -10.67% |
| 10) PINNACLE WEST CAPITAL | PNW | UN | 76.21 | 6.32% | 6.08% | -9.55% |
| 11) ENTERGY CORP | ETR | UN | 106.35 | 5.74% | 5.10% | -5.00% |
| 12) FIRSTENERGY CORP | FE | UN | 38.35 | 4.39% | 4.61% | -12.09% |
| 13) DOMINION ENERGY INC | D | UN | 48.65 | 4.26% | 3.51% | -13.75% |
| 14) DUKE ENERGY CORP | DUK | UN | 99.97 | 3.29% | 3.02% | -1.65% |
| 15) CMS ENERGY CORP | CMS | UN | 59.37 | 2.51% | 2.24% | -9.60% |
| 16) PPL CORP | PPL | UN | 27.63 | 2.03% | 1.90% | -10.96% |
| 17) SEMPRA | SRE | UN | 75.43 | 1.78% | 0.94% | -6.55% |
| 18) EVERGY INC | EVRG | UW | 52.98 | 1.48% | 1.49% | -13.21% |
| 19) DTE ENERGY COMPANY | DTE | UN | 110.58 | 0.68% | 0.29% | -9.76% |
| 20) ATMOS ENERGY CORP | ATO | UN | 116.43 | 0.65% | 0.46% | -8.95% |
| 21) EDISON INTERNATIONAL | EIX | UN | 71.26 | 0.45% | -0.32% | -8.87% |

Period Cust ▾  12/29/23 - 06/28/24

Movers | All

Source: Bloomberg Intelligence

Bloomberg Intelligence BI

## 7.2   Constellation, NextEra, Vistra Ride AI Wave

Nonregulated nuclear generators Constellation and Vistra, respectively accounting for over 20% and 5% of US nuclear capacity, are well-positioned to capture higher margins from data centers willing to pay more for reliable carbon-free power, since most large tech companies have aggressive decarbonization goals. Renewables developer NextEra, with over 20% of US market share, could accelerate solar, wind and battery buildouts to meet increasing demand since advanced nuclear isn't expected to enter commercial service this decade and nuclear capacity additions are limited to small uprates only.

Data-center demand could spur more gas burns for power, reinforcing our view that it might remain the dominant fuel in US generation well beyond the Energy Information Administration's 2023 Annual Energy Outlook reference-case projection of 2026. The agency also expects natural gas to be used for more than 20% of annual power production through 2050. Demand growth, driven by electrification, economic development and data centers, may delay the retirement of some fossil-fuel generation and spur new gas builds to ensure reliability. We expect EIA to incorporate data-center demands in its next annual outlook report, to be published in 2025.

Gas is needed to back up renewables, given battery's high costs and short duration. Vistra could benefit from higher capacity factors for its existing gas plants and potential new gas-peaking units. NRG has a smaller fleet.

**Figure 18: EIA 2023 Annual Energy Outlook Reference Case**



Source: Bloomberg Intelligence
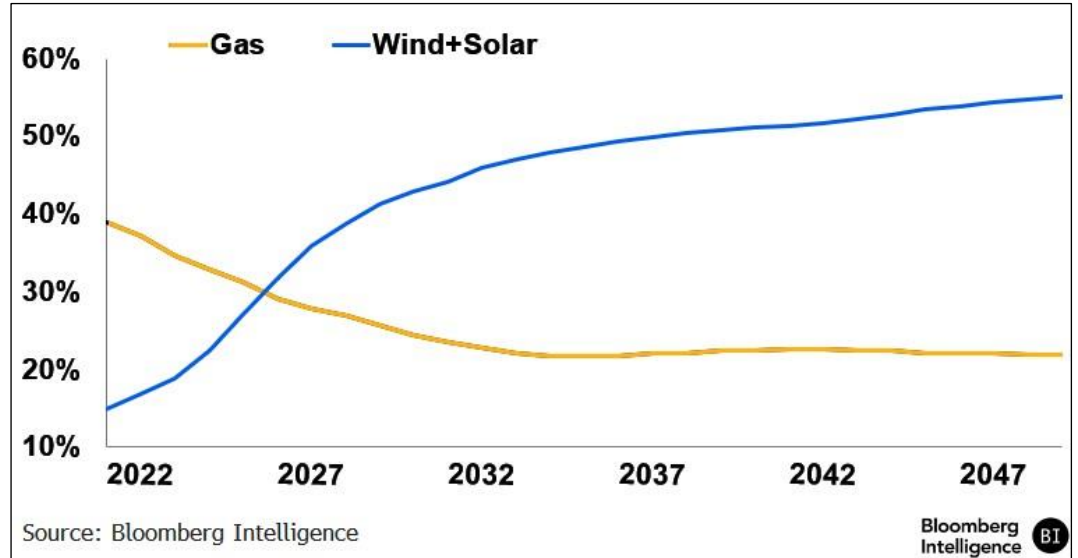
# Section 8.     European Utilities

### SSE, RWE See Earnings Boost From Europe AI Demand

SSE, RWE and renewable-power peers' earnings could grow by high-single to low-double digits annually in 2024-30 as a surge in AI and cloud investment might reignite European power demand. Ramping up solar and battery storage and scaling up offshore-wind projects may propel the group's capacity in Europe past 135 GW by 2030 (2.5x vs. 2023).

## 8.1   AI Needs May Boost European Power Use, Electrification

Rising AI spending and the electrification of Europe's energy mix in 2024-30 could revive the region's power demand, which declined at a compound annual rate of 0.8% in the past decade. That might boost electricity use in Europe, where 10-20% of AI and data-center investment could take place, led by a proliferation of cloud facilities by Microsoft, Google and others.

Power use for data centers may increase 2-3.5x by 2030, assuming a linear correlation between AI spending and energy demand. Data centers make up about 2% of European power demand, which sits at about 3,000 terawatt-hours. The REPower EU plan expects demand to rise 30% in 2022-30.

Europe hosts 18% of global data-center capacity, driven by proximity to customer hubs, with a partial breakdown in Figure 19. The UK, where such centers make up 3% of power demand, may remain a top market, with their energy use rising sixfold by 2035, according to National Grid. Data-center supply in the FLAPD markets – Frankfurt, London, Amsterdam, Paris and Dublin – is expected to grow 16% in 2024, while Madrid, the Nordics and other secondary hubs may expand even faster, aided by access to power supply and available land.

Demand for off-grid projects – wind, solar and batteries – may gain in the region as climate goals deter the scale-up of gas-fired plants, given that linking new sites to the grid can take years. Consequently, SSE, RWE and other European utilities could get a boost in retail power sales from rising data-center energy use.

**Figure 19: Europe Data-Center Capacity**



Figure shows Europe Core Markets: FLAPD — Data Center (MW Capacity) and Under Construction (MW): London 906, Frankfurt 588, Amsterdam 448, Paris 349, Dublin 187, Madrid 84.

Note: Data according to JLL Data Center 2023 Global Outlook

Source: Bloomberg Intelligence
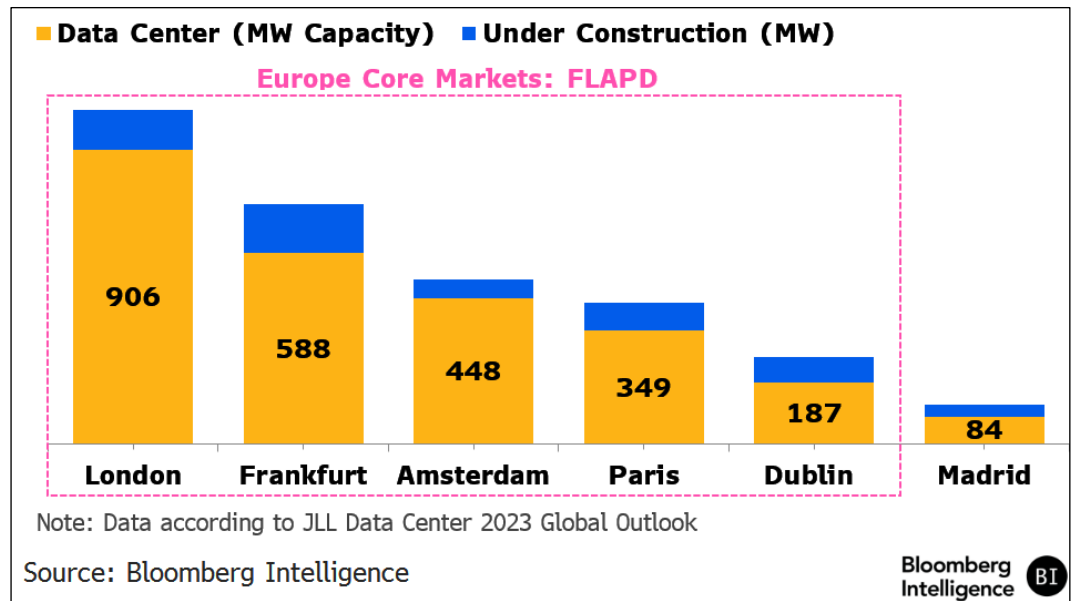
As in the US, solar and battery-project demand in Europe could rise as AI power consumption mounts. Demand for renewable-power purchase agreements (PPA) may grow as a result, potentially boosting European developers' earnings, particularly in Germany, the UK and other data-center hubs. Though rising interest rates and easing power prices have slowed investment plans, sustained policy support (REPower EU) and improving electrification trends may propel capacity growth from 2025.

SSE, RWE and Engie lead peers' expansion plans, as shown in Figure 20. The three companies aim to widen their wind and solar bases at a 17-20% CAGR, backed by offshore scale-ups.

Coupled with Enel, EDP, Orsted and Iberdrola, the group's installed capacity may more than double in 2023-30 to 135 GW from 53 GW, driving a 70-80% boost in Ebitda from renewables in 2024-30. Solar and batteries may comprise 46% of additions.

Enel and RWE are set to contribute a third of European utilities' 4x increase in solar capacity to 2030, followed by EDP, Engie and Iberdrola. The levelized cost of electricity for wind and solar tends to be lower than for nuclear and natural gas, improving the cost profile of long-term renewable PPAs.

European offshore wind uptake also may get a boost in select hubs, given its scale and relatively higher load factor vs. onshore, albeit likely beyond 2027.

**Figure 20: EU Utilities Renewables Capacity Expansion Plans**

**SSE and RWE planning for fastest renewables growth among EU peers**



Source: Company Filings, Bloomberg Intelligence
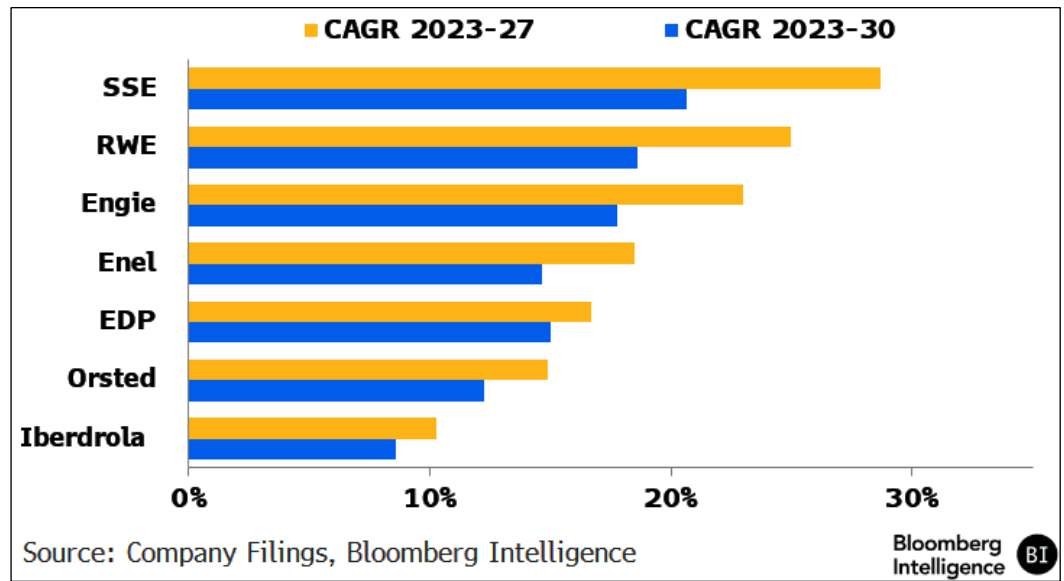
By contrast with the US, the surge in power demand from AI and data centers is unlikely to increase gas-fired generation in Europe, given fuel input costs are 2-3x those of the US and other global hubs.

Natural gas consumption in the region has fallen almost 20% since the 2022 energy crisis, as the curtailment of Russian pipeline flows was plugged with more expensive LNG imports and cost-driven demand destruction. As a net gas importer, Europe must compete for spare supply with other regions, partly explaining the divergence from prices in the US, which is a major LNG exporter.

In the UK and Germany – Europe's largest data-center markets – the levelized cost of gas-fired electricity stood at €125-€134 a megawatt-hour, based on BNEF's LCOE 2H23 Study, compared with just €38/MWh in the US.

Incremental demand from data centers could have a positive earnings read-across for renewable generators such as RWE and Iberdrola, as customers may be enticed to enter long-term renewable PPAs. These tend to last 15 years or more, at fixed prices, offering wind and solar developers good visibility over project returns, with relatively low marginal generation costs. Wholesale power prices may increasingly set PPA rates and could become more important in deciding the locations of new data centers.

Germany and the UK may remain Europe's core data-center markets, given their proximity to customer hubs, despite having higher wholesale-power costs. Spain and the Nordics, where greater hydro, solar and wind availability drives electricity prices down, could gain prominence as data-center hubs.

**Figure 21: Global Natural Gas Benchmarks (€ MWh)**



Source: Bloomberg Intelligence
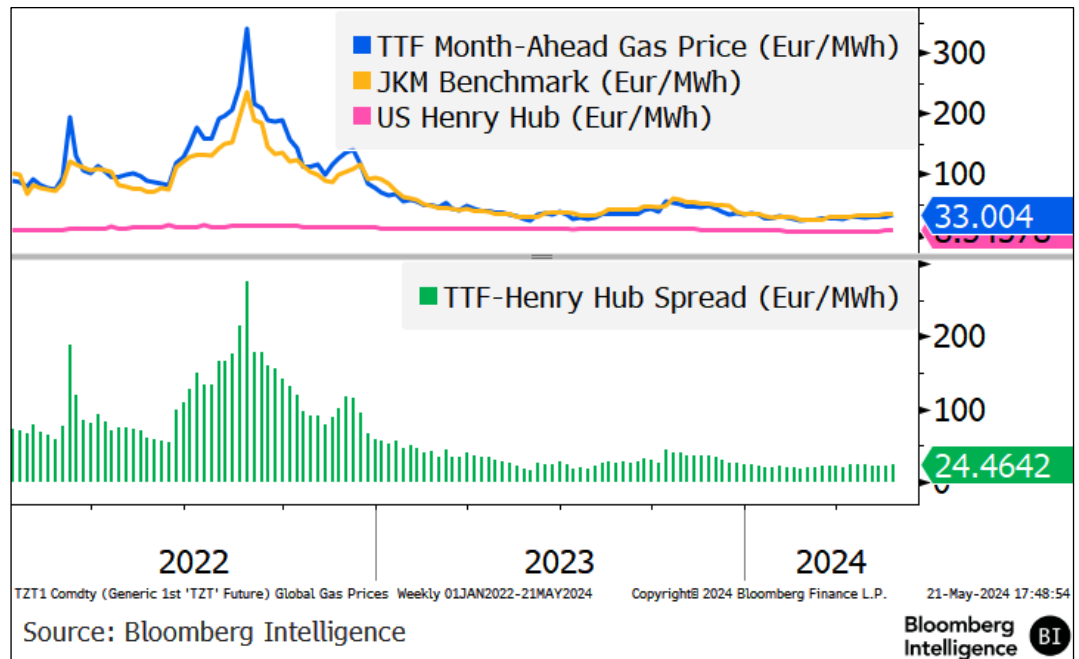
## 8.2  Grids Primed for Europe's AI Energy Surge

Data-center scale-ups are likely to boost the asset bases and EPS growth of EON, Terna and other European utilities, emphasizing the need for more grid investment in the region – which we expect to almost double through 2030. Regulatory pushback and balance-sheet constraints will dictate the winners and laggards, with potential allowed-rate upgrades the key catalysts.

The potential surge in power demand underpinned by AI could fuel the regulated-asset bases (RABs) and EPS growth of utilities such as EON, National Grid and Elia. Power-network utilities' earnings are driven by allowed returns and the size of their RABs, which suggests they could gain from investments to accommodate greater data-center and electricity demand.

Scaling up Europe's grids to cope with more power demand and renewables may require a 1.5-2x boost in annual capital spending through 2030, based on the EU's Grid Action Plan and BNEF's UK NTZ forecast. Investment in the EU-27 and UK grids may reach €670 billion in 2023-30, our analysis shows, suggesting a near-doubling of the annual rate (€52 billion in 2022) to €95 billion.

Though Europe's electricity use is down over the past two decades, mounting data-center demand – potentially 1.5-2x higher by 2030 – and electrification may help stoke consumption. Transmission and distribution spending, overseen by country-level regulators, is needed to connect energy-intensive consumers to the grid, a process that can take several years and faces pushback from watchdogs trying to contain residential ratepayers' bills.

About 80% of European utilities' investment is targeted for distribution grids, given 40% are more than 40 years old, as indicated in Figure 23. That implies RAB upside for Iberdrola, EON, Enel and

other operators. Transmission peers like National Grid, Elia and Terna may gain from the expected doubling of cross-border transmission and new offshore tie-ins.

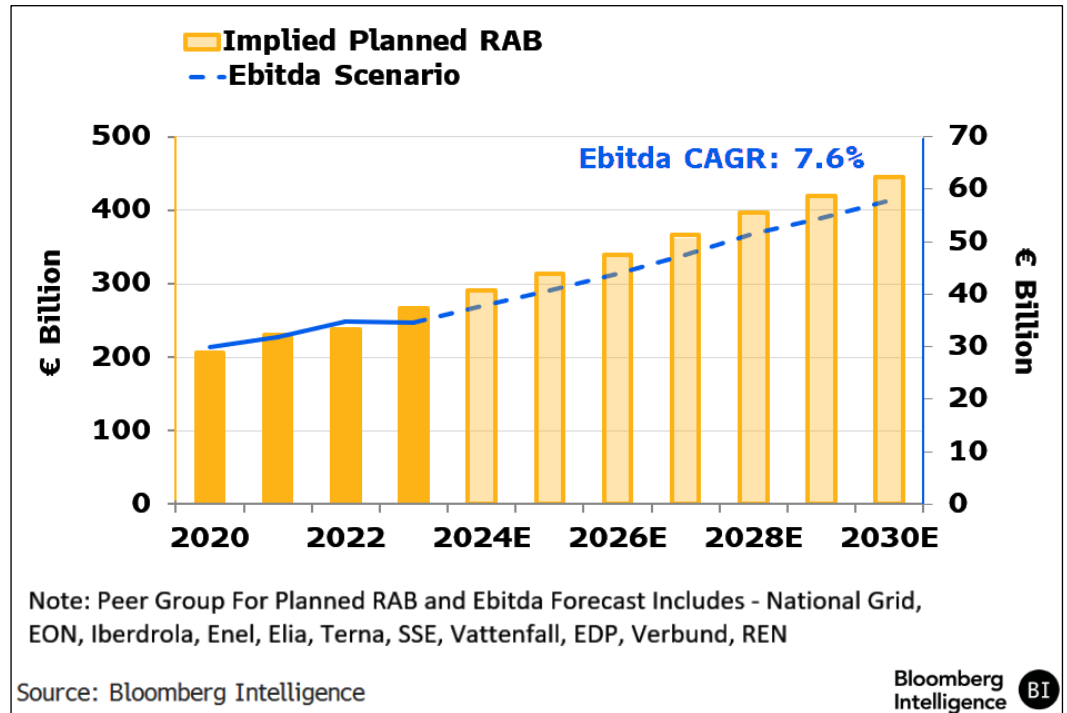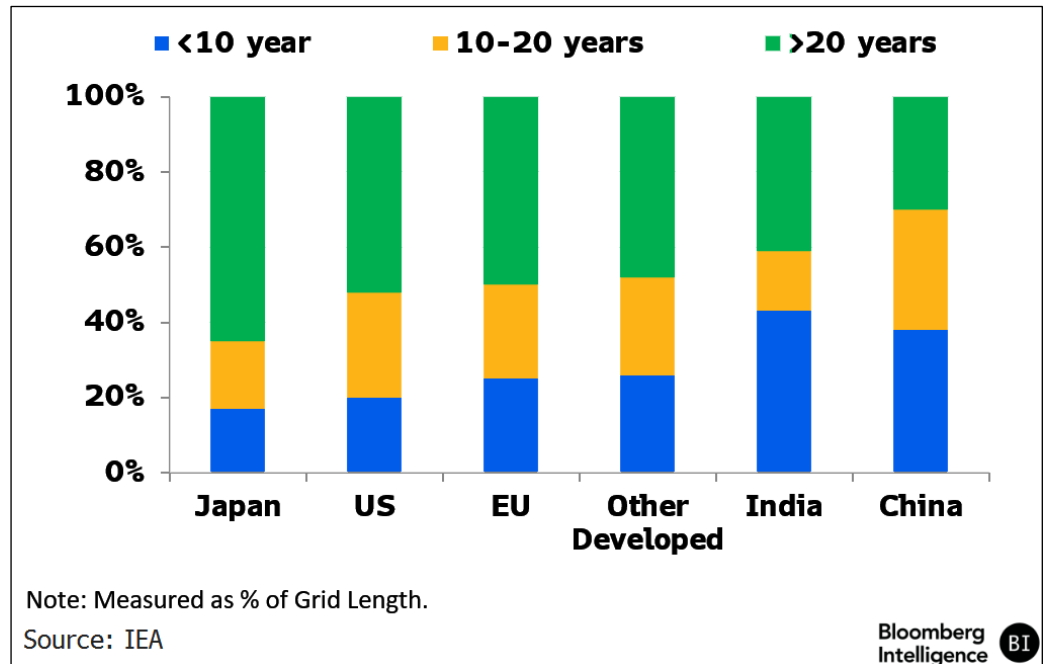**Figure 22: European Utilities' Network Ebitda/RAB 2023-30**



Note: Peer Group For Planned RAB and Ebitda Forecast Includes - National Grid, EON, Iberdrola, Enel, Elia, Terna, SSE, Vattenfall, EDP, Verbund, REN

Source: Bloomberg Intelligence

**Figure 23: Power Grids' Age Distribution**



Note: Measured as % of Grid Length.

Source: IEA

European grid peers are poised to expand their RABs at a median CAGR of about 7% in 2024-30, supported by the companies' lower risk profiles and solid structural growth prospects. National Grid, Iberdrola and SSE (in the UK) and EON (Germany) appear best-placed to benefit from rising power demand, with our analysis – highlighted in Figure 24 – signaling their RABs could expand at an 8-12% CAGR through 2030.

European utilities' network-spending push can be explained by regulated-grid companies' lower capital costs vs. power generators and exposure to long-term electrification trends, with 3-5-year-budgets soaring 78% since 2021. Network operator Elia's budget quadrupled over the past three years, followed by integrated peers Verbund and SSE, whose cash piles were buoyed by lofty power prices. Boosting the size of regulated assets via spending is a key EPS driver for utilities, as allowed returns are tied to strict cost controls.

Aside from National Grid (which resorted to an equity raise to fund its higher spending) EON and Terna might still have room boost investment (contingent on potential upside revisions to their allowed ROEs). All these companies have almost doubled planned spending since 2021.

**National Grid's planned grid spending far exceeds EU peers**

**Figure 24: EU Utilities' Global RAB, Planned 2024-28 CAGR**



Source: Bloomberg Intelligence
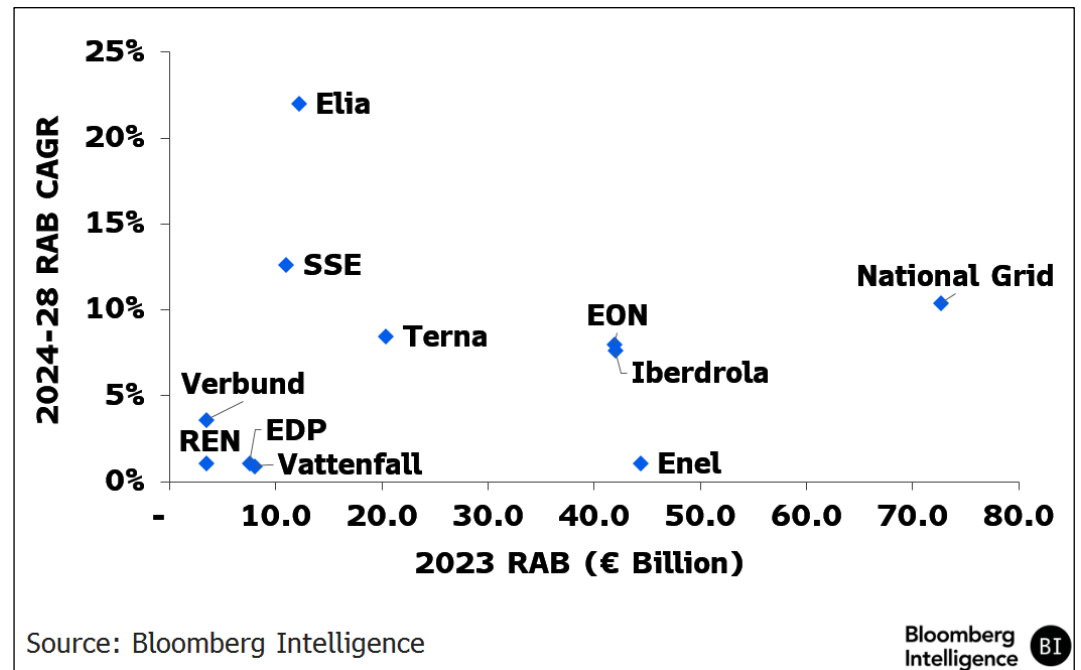
**Figure 25: Planned Annualized Grid Capital Spending**



Source: Bloomberg Intelligence
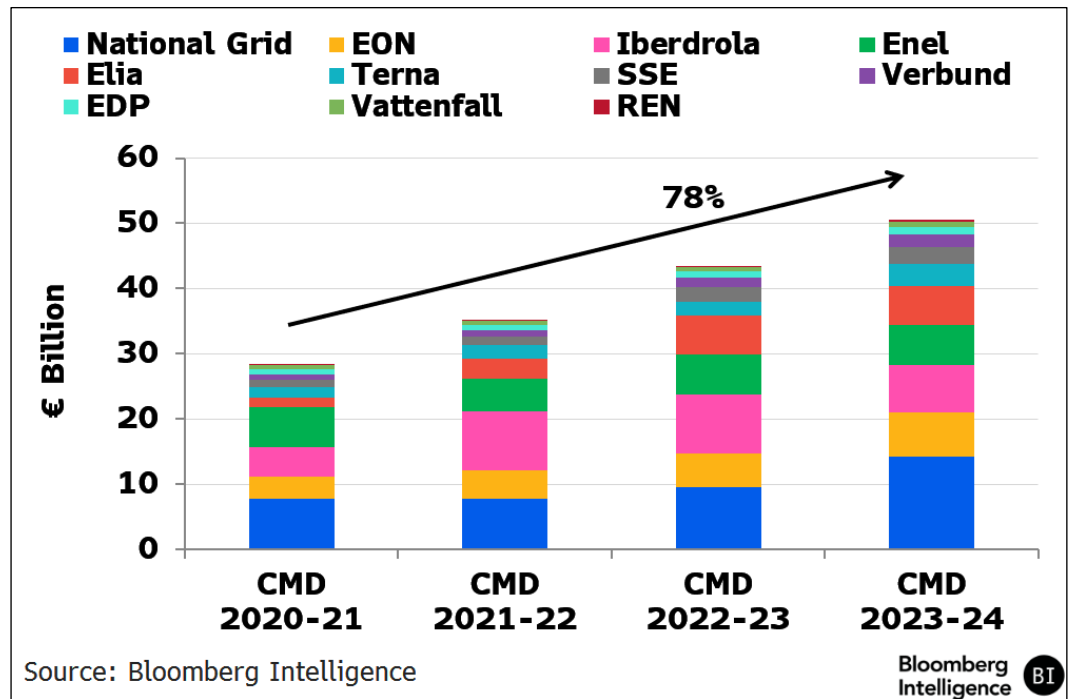
## 8.3   Tariff Adjustments Needed to Spur Investment

Higher-for-longer interest rates and narrow levels of allowed returns pose balance-sheet risk for European utilities seeking to boost their regulated spending. National Grid's plan to invest £60 billion over 2024-29 (close to double that of the prior five years) supports its 10%-a-year RAB growth profile but entailed a £7 billion equity increase, reflecting the long-dated payback and capital-intensive nature of these projects.

Network peers Terna and EON have similar RAB-expansion profiles but healthier net debt-to-Ebitda ratios, as shown in Figure 26. Integrated utilities Iberdrola's and SSE's exposure to energy prices and demand offers greater funding buffers. The peer group's debt is set to climb in 2024-26, and upside revisions to allowed ROEs might spur more spending for those with balance-sheet capacity.

Rising equity-risk premiums and bond yields meant the weighted average cost of capital (WACC) rose to 6-7% at National Grid, EON and other regulated utilities over 2020-23. Given allowed returns on peers' RABs trail -- with a median regulatory WACC of 4-5% for power grids in the UK and Europe -- the main EPS drivers are expanding RAB and cutting costs.

Annual grid investment in Europe may need to double to meet rising electricity demand, but rate visibility is clouded by regulators trying to contain customers' bills. Potential upgrades to allowed returns in Germany, Spain and Italy are catalysts to watch in 2024-25, as are capital-spending allowances.

Power-grid constraints might be offset by the proliferation of off-grid renewable projects, a trend that could widen the earnings runways of Orsted, RWE and other developers.

**Figure 26: EU Utilities Consensus Net Debt-to-Ebitda Ratios**

| | 2023A | 2024E | 2025E | 2026E |
|---|---|---|---|---|
| Elia | 7.0x | 8.6x | 8.0x | 8.4x |
| National Grid | 6.5x | 6.1x | 6.4x | 6.1x |
| Terna | 4.8x | 4.8x | 5.5x | 5.7x |
| REN | 4.7x | 5.2x | 5.1x | 5.1x |
| EON | 4.0x | 4.3x | 4.6x | 4.7x |
| SSE | 2.9x | 2.9x | 3.3x | 4.2x |
| EDP | 3.1x | 3.4x | 3.5x | 3.5x |
| Iberdrola | 3.3x | 3.1x | 3.2x | 3.3x |
| Enel | 2.7x | 2.4x | 2.4x | 2.4x |
| Verbund | 0.4x | 0.7x | 1.1x | 1.6x |
| **Aggregate** | **3.5x** | **3.5x** | **3.7x** | **3.8x** |

Source: Bloomberg Intelligence

**Elia and National Grid valuations are highest among EU utilities**

# Section 9. Company Impacts

## AI to Deliver Across the Energy Spectrum

Wind, solar and natural gas, along with battery storage, are likely to get top- and bottom-line support from the burgeoning demand to power AI data centers. Bloomberg Intelligence analysts have highlighted some of the companies that will be most affected by this growth spurt.

## 9.1 First Solar's Speedy Startups Give It an Edge

| FSLR US | |
|---|---|
| Market Cap (USD Bn) | 22.34 |
| Share Price (USD) | 215.40 |
| Earnings Per Share* (USD) | P/E |
| 2023A 7.74 | 27.83 |
| 2024E 13.57 | 15.87 |
| 2025E 21.38 | 10.08 |
| * Bloomberg Consensus | |

**35%**
Potential sales growth per year through 2026

**20%**
Roughly the share-price gain so far in 2024, vs. a median 33% decline for the BI solar theme basket peers

**Company Outlook:** The US Inflation Reduction Act and manufacturing expansions in Ohio, Alabama and Louisiana should fuel First Solar's growth for several years, potentially boosting sales at a compound annual rate exceeding 30% from 2024-27. The rapid expansion of energy demand associated with AI and data centers could also fuel top-line growth. Ebitda appears set to expand in 2024, with margin exceeding 40%, based on our scenario analysis, which accounts for manufacturing subsidies and favorable prices that are locked in. Unlike most competitors, First Solar doesn't rely on production facilities in China.

**AI Demand Impact:** As the largest US solar module manufacturer, with several new factories under construction, First Solar is well positioned to deliver consensus-topping sales growth in 2024-28, based on rapidly rising energy consumption from data centers. Solar projects tend to have the shortest development and construction timelines compared with wind, natural gas and other competing sources of electricity, suggesting the company can deliver on new projects within months or quarters, not the several years it takes for most other fuels. First Solar emphasized the theme of AI-driven power demand on its 2Q earnings call – highlighting a new 620-megawatt agreement to supply modules for a hyperscaler – and we believe additional projects will likely be announced over the next several quarters.

## 9.2    Canadian Solar Has Battery Storage as Added Lever



| CSIQ US | |
|---|---|
| Market Cap (USD Bn) | 0.77 |
| Share Price (USD) | 12.46 |
| Earnings Per Share* (USD) | P/E |
| 2023A    3.87 | 3.22 |
| 2024E    1.57 | 7.96 |
| 2025E    3.73 | 3.34 |
| * Bloomberg Consensus | |

**5x**
EV-to-Ebitda in 2024 vs. median 10x for solar companies

**5-10%**
Potential sales decline in 2024 vs. slowdowns for most peers

**Company Outlook:** Canadian Solar's sales may decrease about 5-10% in 2023, compared with a 21% pullback for the median company in our US-listed peer group, yet we believe the equipment supplier can return to double-digit growth in 2025. Mounting production volume and elevated module shipments – which could climb 20%-plus, based on our scenario analysis – might be the key drivers, assuming demand remains robust. Canadian Solar faces several US trade-related policy risks, possibly explaining its steep valuation discount – an EV-to-Ebitda multiple of about 5.1x vs. around 10x for the BI global solar-peer group.

**AI Demand Impact:** Like most peers, Canadian Solar has highlighted AI-driven data-center expansions as key drivers of solar demand. Guidance suggests data-center power use could surge to 7.5% of total US electricity demand by 2030 – equivalent to about 40 million homes. In addition to solar modules, the company has a budding battery-storage division, with a project pipeline of 66 gigawatt-hours, and we expect many AI-driven projects to leverage solar plus battery storage.

## 9.3    Vestas Sees Hyperscalers as Growth Opportunity



| VWS DC | |
|---|---|
| Market Cap (DKK Bn) | 148.50 |
| Share Price (DKK) | 153.25 |
| Earnings Per Share* (EUR) | P/E |
| 2023A    0.08 | 246.33 |
| 2024E    0.48 | 41.31 |
| 2025E    1.17 | 16.82 |
| * Bloomberg Consensus | |

**20%-Plus**
Potential revenue growth over 2025-26

**€1 Billion**
2024-26 annual capital spending

**Company Outlook:** Medium-term prospects look set to brighten for Vestas, amid lower steel costs and higher turbine prices, with peer-leading 2024-26 Ebitda margin in its sights. Higher profitability will likely be accompanied by rising sales despite temporary Service business headwinds. Top-line growth could accelerate past consensus to 20%-plus in 2025-26, powered by net-zero goals and strong policy support such as REPowerEU and the US Inflation Reduction Act. Later this decade and into the 2030s, a burgeoning offshore market could become an important sales driver.

**AI Demand Impact:** In May, Microsoft announced a deal with Brookfield to develop 10.5 gigawatts of wind, solar and other renewable capacity by 2030; the deal is intended to help Microsoft meet 100% of its electricity needs with zero-carbon energy sources. We believe such agreements could sustain strong top-line growth at Vestas and peers in 2026-30. Vestas' CEO cited AI-driven energy demand as a key driver for wind projects even if former President Donald Trump is re-elected in November and makes changes to the IRA.

## 9.4  RWE's Timely Con Ed Deal Beefs Up Capacity



| Market Cap (EUR Bn) | | 24.41 |
| Share Price (EUR) | | 32.31 |
| Earnings Per Share*(EUR) | | P/E |
| 2023A | 1.95 | 16.57 |
| 2024E | 3.09 | 10.44 |
| 2025E | 2.17 | 14.87 |

* Bloomberg Consensus

### 6
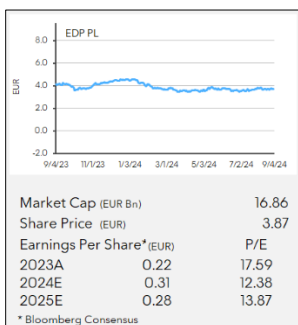Gigawatts of seabed rights in New York, California and Gulf of Mexico

### 17-20%
Targeted CAGR for wind and solar base

**Company Outlook:** RWE's mounting green investment may drive secular earnings gains beyond the normalization of commodity trading and generation margins in the wake of Europe's energy crisis. A deep project backlog in the US and back-loaded offshore deployments in Europe support the company's plan to increase capacity by 2.5x in 2023-30, with UK tenders and M&A possibly unlocking further upside. Coal- and lignite-asset cash flows are set to dwindle ahead of their 2030 phaseout, explaining RWE's EV-to-Ebitda discount to renewable pure plays, which seems at odds with its peer-leading capacity growth and balance-sheet profile.

**AI Demand Impact:** Ranking among the largest European wind and solar developers in the US, RWE is poised to capture mounting demand for renewable electricity tied to the proliferation of AI and cloud spending. The company's well-timed acquisition of Con Ed's solar-weighted assets in 2023 widened the platform to accelerate capacity deployments. RWE has signed several power-purchase agreements with technology companies in the US and Europe, and in April sold a lignite mining site in Germany to Microsoft for the construction of a data center, helping advance its plan to phase out coal by 2030.

## 9.5  EDP Sees Tax Credits, Regulations as Drivers



| Market Cap (EUR Bn) | | 16.86 |
| Share Price (EUR) | | 3.87 |
| Earnings Per Share*(EUR) | | P/E |
| 2023A | 0.22 | 17.59 |
| 2024E | 0.31 | 12.38 |
| 2025E | 0.28 | 13.87 |

* Bloomberg Consensus

### 11%
Wind and solar growth in 2023-26, down from 16% previously

### 3.4x
Net debt-to Ebitda in 2024-26, above peers

**Company Outlook:** Energias de Portugal has surrendered its peer-leading renewable-expansion pace, as tighter funding capacity means wind and solar-capacity growth will slow to 11% a year in 2023-26 vs. 16% in its prior plan. Guidance and consensus for flat net profit reflect normalizing energy prices but set a baseline for improvement on robust – albeit plateauing – hydropower loads and a recent stabilization of spot power rates. EDP's EV-to-Ebitda ratio sits below its five-year norm, contrasting with a streamlined renewable-investment plan, supported by a deep backlog of higher-return and lower-risk projects in the US and Europe.

**AI Demand Impact:** EDP's earnings story and renewable capacity ramp-up in the US and Europe could get a boost from the expected surge in data-center and AI-driven power demand. EDP's CEO said price competition for renewable power-purchase agreements in the US is rising, driven by off-taker's sustainability targets, but demand in Europe is also picking up, stoked by the EU Code of Conduct for Data Centres. The transferability of tax credits set out by the Inflation Reduction Act may help unlock funding and temper EDP's relatively elevated balance-sheet leverage.

## 9.6 Kinder Morgan: 3-10 Billion Cubic Feet a Day From AI

| | |
|---|---|
| **Market Cap** (USD Bn) | 46.90 |
| **Share Price** (USD) | 21.41 |
| **Earnings Per Share***(USD) | P/E |
| 2023A | 1.06 | 20.20 |
| 2024E | 1.21 | 17.70 |
| 2025E | 1.26 | 16.98 |
| *Bloomberg Consensus | |

**1.5-3%**

Annual dividend growth

**4x**

Potential improvement in net leverage this year, vs long-term target of 4.5x or below

**Company Outlook:** Kinder Morgan's 1.5-3% annual dividend growth appears sustainable, supported by a coverage ratio of about 1.9x, earnings backed by long-term contracts and a healthy balance sheet. Strong market share of Gulf Coast LNG feedgas and Mexican gas-export markets – bolstered by the STX acquisition – could combine with increased power-generation demand to support modest Ebitda growth in the medium term. Post-dividend free cash flow might slip this year, and buybacks will likely slow. FCF may improve in 2025-26 yet stay limited amid elevated spending requirements to deliver on a growing project backlog.

**AI Demand Impact:** Kinder Morgan's 2023 sustainability report (published on July 18, 2024) noted that data-center demand wasn't yet captured in most natural gas projections and indicated gas demand could rise 3-10 billion cubic feet a day by 2030, based on AI-driven activity. Such growth will require the services of midstream operators with extensive gas pipeline networks, such as Kinder Morgan, and could propel the company's earnings in the years ahead, with gas well-positioned to meet the "must-run" requirements of data centers.

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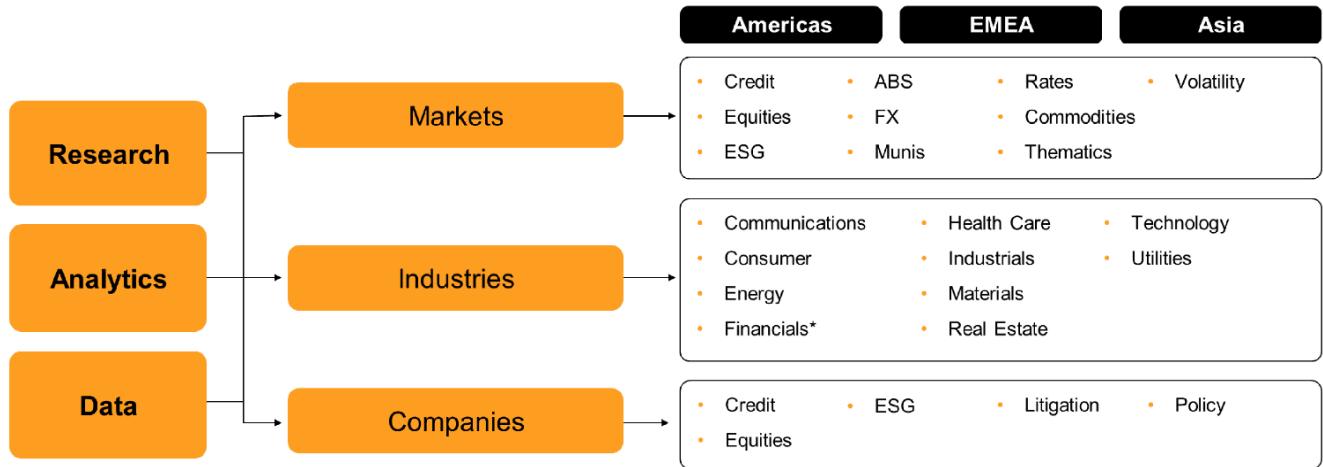
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