BERNSTEIN
SOCIETE GENERALE GROUP

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Americas Energy & Transition

Americas Power & Energy Transition: How much power will the US need - our power demand forecast through 2030



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Key takeaways: We launched on Power and Energy Transition in June with a view on power that was based off of a data center forecast from March/April 2026. Since then, a lot has happened, and numbers have only gone up. We've updated our model using the new compute numbers from our Infrastructure team, and have a higher forecast for US power than before. **We have raised our power demand forecast to a 4% CAGR through 2030 from 3% previously - mainly reflecting a significantly higher data center demand outlook**. The methodology is unchanged, and is detailed in the note. **Please reach out to your sales contact for a copy of the model.**

From the supply side, we see solar and gas growing the fastest to meet demand, and in reaction with coal retirements.

Our power supply and demand model forecasts demand by sub-sector (residential, commercial, industrial, and transport) and models key drivers of those sub-sectors. We forecast supply by fuel and consider the impact of renewable intermittency in the forecast as well.

Our power forecast implies ~1,000 TWh of incremental U.S. electricity demand between 2025 and 2030, with data centers accounting for more than half of that growth. The key investment question is not whether demand grows, but who can deliver power fastest into increasingly constrained markets.

We see the largest beneficiaries as companies exposed to natural gas generation additions, nuclear restarts and life extensions, grid equipment and transmission upgrades, behind-the-meter and dispatchable firm, reliable (and clean) power solutions, and those with high-quality power development pipelines.

The risk to this forecast remains the uncertainty in the timing of the data center build out. We have ~100GW of additional data center capacity (IT load) between now and 2030, but tracking the moratoriums by state and RTO/ ISO, we expect variability in the demand numbers on an annual basis.

BERNSTEIN TICKER TABLE

			2 Oct 2026		TTM		Reported EPS			Reported P/E (x)		
Ticker	Rating	Cur	Closing Price	Price Target	Rel. Perf.	Cur	2025A	2026E	2027E	2025A	2026E	2027E
BE (Bloom Energy)	M	USD	289.15	282.00	203.7%	USD	0.82	2.85	4.81	351.0	101.4	60.2
CEG (Constellation Energy)	O	USD	257.49	296.00	(40.9)%	USD	7.40	11.82	12.67	34.8	21.8	20.3
ENPH (Enphase Energy)	M	USD	33.47	56.00	(25.5)%	USD	1.29	0.58	1.22	26.0	57.2	27.5
FRVO (Fervo)	O	USD	14.45	47.00	NA	USD	(0.25)	(0.10)	(0.16)	(58.2)	(147.6)	(91.8)
FSLR (First Solar)	U	USD	174.61	197.00	(39.7)%	USD	14.21	16.26	19.96	12.3	10.7	8.7
GEV (GE Vernova)	O	USD	988.70	1,298.00	51.2%	USD	17.70	28.65	29.95	55.9	34.5	33.0
NEE (NextEra Energy)	O	USD	76.83	108.00	(20.3)%	USD	3.71	4.31	4.49	20.7	17.8	17.1
ORA (Ormat Technologies)	M	USD	92.86	112.00	(25.5)%	USD	2.02	2.19	2.35	46.0	42.4	39.5
TE (T1 Energy)	M	USD	3.92	9.00	29.9%	USD	(2.19)	(0.31)	(0.07)	(1.8)	(12.5)	(54.5)
VST (Vistra Corporation)	O	USD	140.02	181.00	(44.0)%	USD	2.18	10.39	11.45	64.4	13.5	12.2
SPX			7,773.95									

O - Outperform, M - Market-Perform, U - Underperform, NR - Not Rated, CS - Coverage Suspended

BE, NEE estimate is Adjusted EPS; BE, NEE valuation is Adjusted P/E (x);

Source: Bloomberg, Bernstein estimates and analysis.

INVESTMENT IMPLICATIONS

We rate GEV Outperform with a price target of $1298

We rate VST Outperform with a price target of $181

We rate CEG Outperform with a price target of $296

We rate NEE Outperform with a price target of $108

We rate FRVO Outperform with a price target of $47

We rate BE Market-Perform with a price target of $282

We rate ORA Market-Perform with a price target of $112

We rate T1 Market-Perform with a price target of $9

We rate ENPH Market-Perform with a price target of $56

We rate FSLR Underperform with a price target of $197

DETAILS

INVESTMENT IMPLICATIONS

Most levered beneficiaries of the AI build out, in the power space, are the companies that can provide grid equipment and transmission and the power companies that have existing gas and nuclear generation, along with ones that can provide a clean and firm power profile. Since interconnection queues are extensive, we see support for behind-the-meter solutions.

GE Vernova (GEV)

If our forecast is correct, gas becomes the balancing resource that closes the gap between demand growth and renewable deployment. Our model implies gas-fired generation continues to grow through 2030, creating demand for turbines, grid equipment, and services.

Constellation (CEG)

Data center customers increasingly value reliable, carbon-free baseload generation. Nuclear assets are difficult to replicate and increasingly scarce. The planned restart of Three Mile Island highlights the strategic value of existing nuclear generation in a tightening power market.

Vistra (VST)

As power markets tighten, merchant generators with flexible fleets and exposure to load growth regions are positioned to benefit from rising power prices and increasing capacity value.

Fervo (FRVO)

While natural gas is likely to be the primary marginal resource in our base case, firm geothermal generation offers an alternative source of dispatchable power for customers seeking low-carbon solutions with high reliability. Fervo has projects coming online within 2.5 years of first construction, and recently came online last week with their first 100MW project at Cape Station I.

Bloom Energy (BE)

Interconnection queues continue to lengthen while hyperscalers increasingly require power on accelerated timelines. These constraints support demand for behind-the-meter solutions that can be deployed faster than traditional grid connections.

US POWER MODEL

DEMAND

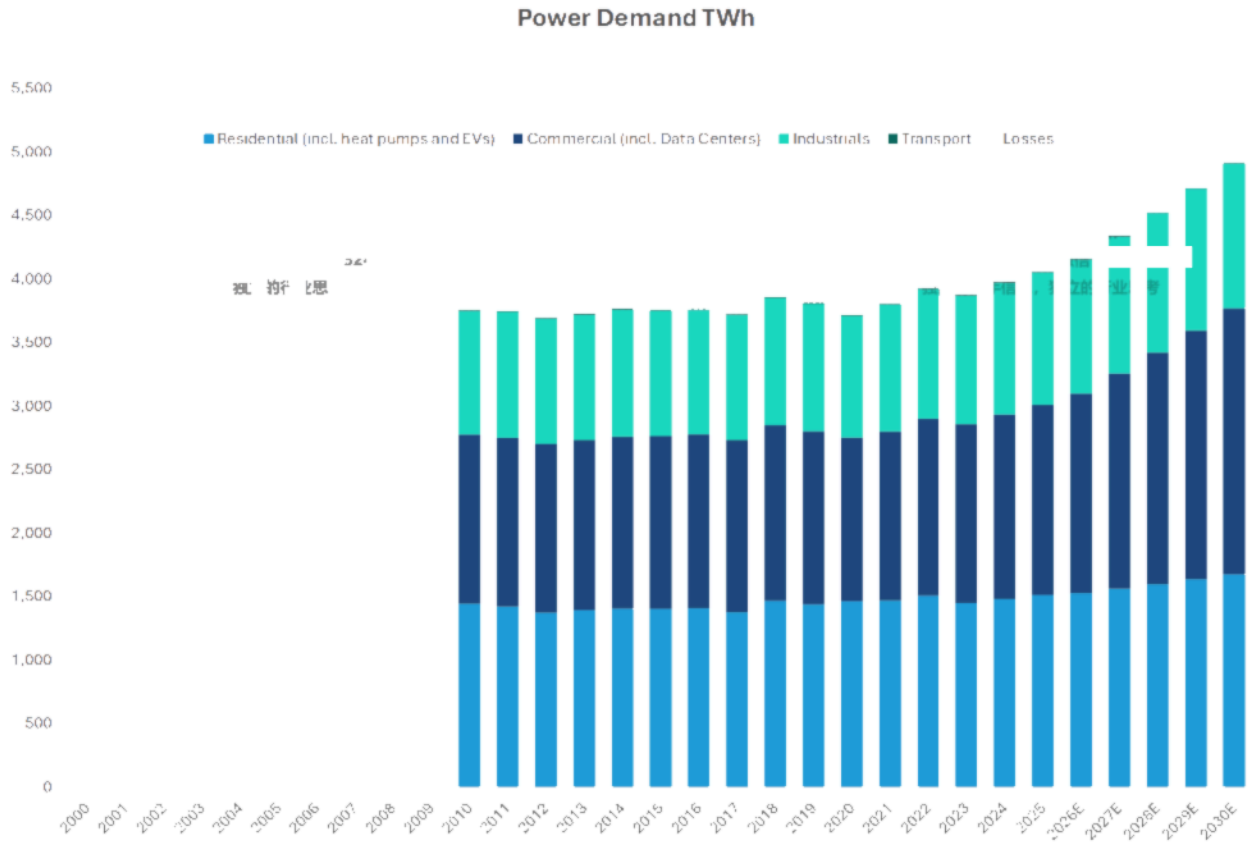
We start with the wise words of one of the best statisticians of all time, George Edward Pelham Box, “All models are wrong, some are useful”.

Power demand in the U.S. has grown at a 1.2% CAGR since 2019, and 0.3% CAGR since 2000, significantly lagging overall GDP growth, as electricity use per kWh of GDP has declined by 3.7% in that time. However, we are now witnessing a once-in-a-generation increase in power demand driven primarily from growth of data centers in the US. We forecast power demand by four sectors: i) Residential demand; ii) Commercial demand from office spaces, warehouses, and other places of business (including data centers); iii) Industrial demand from manufacturing; and iv) Transportation demand from the operation of public transport systems (which is a much smaller slice than the other three). Electric vehicles are considered in the residential sector, and not in transport.

While there is probably no debate that power consumption is set to increase in the US, the extent of this growth is widely debated. The main tension here is that demand could materialize before supply can be connected. Power forecasting is driven by weather, seasonality, economic activity, and large technological changes. There is short (months - 2 years), medium (3-5 years) and long term (6+ years) power forecasting - the short term is still based on weather and seasonality and this is a mature science. The long term forecasting is based on large technology shifts and has been more scenario analysis than “forecasting”. Medium term power demand is driven by economic activity and industrial capacity additions - this used to be relatively predictable and slow moving - but now with AI and data centers, this medium term piece is difficult to predict, which is why there are widely varying numbers our there. The current projection of increased load from data centers would have seemed

ludicrous a decade ago, and interconnection requests continue to include a large share of speculative projects.

EXHIBIT 1: **We expect Power Demand in the US to increase at 4% till 2030**



Source: Bernstein US Power Model, Bernstein Analysis and Estimates, EIA

EXHIBIT 2: **US Power Demand historicals and forecast**

Demand (TWh)	2021	2022	2023	2024	2025	2026E	2027E	2028E	2029E	2030E
Residential	1,470	1,509	1,450	1,483	1,515	1,528	1,563	1,600	1,638	1,676
Commercial	1,328	1,391	1,408	1,451	1,493	1,571	1,694	1,822	1,957	2,093
Of which data centers	*125*	*150*	*180*	*154*	*164*	*228*	*323*	*445*	*581*	*719*
Industrial	1,001	1,020	1,009	1,035	1,042	1,054	1,074	1,096	1,118	1,141
Transport	6	7	7	7	7	7	7	7	7	7
Losses	304	345	328	347	383	411	429	447	467	486
Total	**4,110**	**4,272**	**4,202**	**4,322**	**4,441**	**4,571**	**4,767**	**4,972**	**5,187**	**5,403**
Total w/o losses	**3,806**	**3,927**	**3,874**	**3,975**	**4,058**	**4,161**	**4,338**	**4,525**	**4,720**	**4,917**
Demand Growth (%)	**2.5%**	**3.9%**	**-1.6%**	**2.9%**	**2.7%**	**2.9%**	**4.3%**	**4.3%**	**4.3%**	**4.2%**
U.S. Population (millions)	340	341	342	344	346	348	350	352	353	355
MWh demand per capita	11.2	11.5	11.3	11.5	12.2	12.6	13.3	14.1	15.0	15.9
U.S. GDP (current $tr)	23.7	26.0	27.7	28.3	28.8	29.4	30.0	30.6	31.2	31.8
kWh per $ GDP	0.16	0.15	0.14	0.15	0.15	0.15	0.16	0.16	0.17	0.18

Source: Bernstein US Power Model, EIA for historicals

Our power model is helpful in framing the potential load growth from macro trends in data center development, re-shoring of manufacturing, EV adoption, and broader electrification. We forecast the losses in the system using the historical average of the percentage of overall demand and assume 8-9% losses over the forecast period. For Supply, we sum the monthly generation adds of late stage projects using publicly available sources, and manually add restarts. We also think solar capacity is underestimated historically, and gross up 3 years out to account for the underestimation. We model coal retirements based on

announcements and expectations. Using this methodology, growth is facilitated largely by solar and gas.

EXHIBIT 3: **Our in-house model allows us to sensitize demand and supply on various fronts**

DEMAND

Forecasts future monthly **demand** by estimating major growth drivers, and using base growth at 2010-2019 CAGR:

- Residential: EV sales, heat pump sales
- Commercial: data center and AI power demand
- Industrial: Reshoring of manufacturing gross domestic output
- Transportation flat

Adds 8% transmission losses based on historical data from EIA

SUPPLY

Supply (plus imports) available to meet demand plus transmission losses. Imports negligible

By fuel source:

- We sum monthly generation capacity adds of late-stage projects
- We add monthly additions to current capacity to get future monthly capacity by generation, assuming a capacity factor
- We gross up solar capacity 3 years out to account for continuous underestimation
- Manually add nuclear restarts

Delta between demand and supply met by gas

INPUTS

Inputs:

- Generation fleet
- Outages
- Renewable profiles
- Import/ Exports
- Transmission losses
- Historical data from EIA

SOURCES

Sources:

- Edison Electric Institute
- Department of Energy
- AHRI – Heat pump sales
- International Energy Institute
- Federal Reserve Bank
- Bloomberg

Built in excel with scenario modeling approach

COMMERCIAL DEMAND (INCL. DATA CENTERS)

The biggest driver of demand growth is the addition of data centers in the US. Currently, 45% of global data centers are in the United States (more than 10X data centers in the US as compared to China!). By 2030, we expect ~50% of global data centers to be in the US. Our initiation model was based on our Infrastructure team's data center numbers from March/ April and the IT load numbers in the US have increased since then. We've updated our model with the latest forecast from the Bernstein Infrastructure team which incorporates more announcements of data centers. The proliferation of AI is meaningfully adding to the energy required to support data centers.

We forecast a low, base, and high case for the data centers power forecast, however, the base case assumes a 1.25x Power Usage Effectiveness (PUE). Typically, hyperscalers are more efficient users of power than the smaller players; we use an average PUE for the forecast period till 2030.

Total Facility Energy includes all energy consumed by the data center, such as cooling, lighting, power distribution, and IT hardware.

IT Equipment Energy refers specifically to servers, storage devices, and networking equipment

Power Use Effectiveness (PUE) = Total Facility Energy/ IT Equipment Energy

Ideally, PUE of **1.0** means that all energy is used for computing with no overhead. Practically, we don't see that ir
period. Older, less optimized facilities have a higher PUE of 1.5 - 2x. Newer facilities are aiming for 1.1x. This info
average 1.25x PUE for the base case of our forecast period.

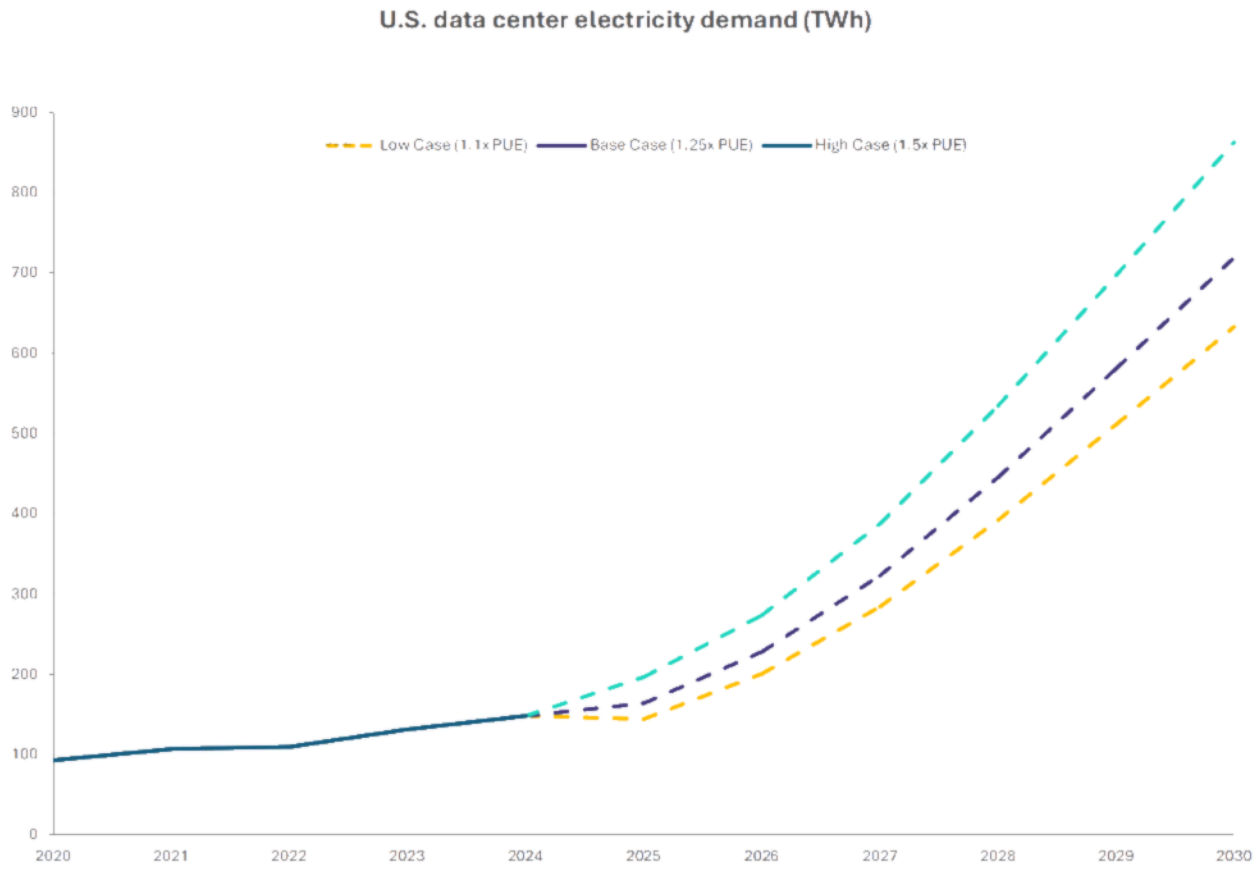
Data centers do not run at 100% utilization either with utilization depending on a variety of factors including type
(training vs. inference). Today, data centers consume <200 TWh of power, and in our base case we expect to ad

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power demand in the forecast period through 2030.

Data center power demand is the fastest growing component of our forecast, growing at >30% a year based on our current forecast of IT load. As data centers are classified within the overall commercial sector, we forecast a commercial sector CAGR of ~7% through 2030.

EXHIBIT 4: **US Electricity Forecasts from Data Center Demand**



Source: Bernstein US Power Model, Bernstein Analysis and Estimates

EXHIBIT 5: **Data Centers are the biggest driver of power demand growth in the US. We add 100GW of IT Equipment Energy in GW over the forecast period between now-2030.**

Data Center Demand		
2025 U.S. data center capacity GW	GW	34
2030 U.S. data center capacity GW	GW	149
Total GW added	GW	115
Power Use Efficiency	%	1.25x
Utilization	%	44%
Utilization improvement	%	0%
Power demand added GW	GW	63
Power Demand from Datacenters	**TWh**	**555**

Source: US Infrastructure team, Bernstein US Power Model

MANUFACTURING "RE-SHORING" AND INDUSTRIAL DEMAND

Prior to the rapid globalization of supply chains, domestic manufacturing represented a substantially larger share of overall supply. Our machinery team estimated this share was ~84% in the late 90s and has fallen to ~72% today. There has been a recent push to move some manufacturing back on-shore to reduce reliance on imports and exposure to global supply chain risks. While we think it would be difficult to reach a pre-globalization share of domestic manufacturing in a short time frame, we believe there is no debate on the US wanting to reinvigorate domestic manufacturing. We believe that will drive meaningful industrial power demand growth to the end of the decade. Teaxs is set to realize almost half of this industrial demand with manufacturing investment growing for batteries and electric vehicle supply chain.

U.S. gross domestic output (GDO) stands at ~$7Tr. If we assume GDO grows roughly with GDP growth expectations in the low single digits, and that domestic manufacturing grows share modestly to 75% by 2030, electricity demand from the U.S. industrial sector would grow by ~100TWh.

This reflects an overall industrial demand growth CAGR of ~2% over the next 5 years (vs. <1% over the prior 5 years) from ~1,000TWh today to ~1,100TWh in 2030.

EXHIBIT 6: **Industrial Reshoring Assumptions**

Industrial Assumptions		
Est. 2025 manufacturing GDO ($bn)	$Billion	7,321
2025 Power use from manufacturing	TWh	1,042
2030 GDO at 2%/yr growth ($bn)	$Billion	8,083
2025 Domestic Manufacturing	%	73%
2030 Domestic Manufacturing	%	75%
Electric intensity	GWh/$GDO	142
2030 Industrial power demand	TWh	863
2025 implied manufacturing power demand	TWh	761
Power Demand from Reshoring	**TWh**	**102**

Source: Bernstein US Power Model

ELECTRIC VEHICLES, HEAT PUMPS AND RESIDENTIAL DEMAND

Electric Vehicles (EVs)

Global light vehicle sales are estimated to reach over 100MM by 2030. We assume the share of U.S. sales remains at ~20%. U.S. light vehicle sales are estimated at ~16MM units in 2025 (15-20% of global sales) and we estimate EV sales (comprising BEVs and PHEVs that primarily use electric power) account for ~10% of these sales. After a slow-down of EV adoption in 2024/2025, the recent geopolitical strife in the Straight of Hormuz could give customers pause at the pump. We assume EV sales grow share of total light vehicle sales by ~2%/yr (similar to prior years) and account for 20% of U.S. light vehicle sales in 2030. This implies ~16MM EV units added over the next 5 years.

Using data from the DOE, we estimate average miles driven per vehicle in the U.S. is ~14,000 miles and that fuel consumption for light EVs is ~0.3 kWh per mile. We keep these assumptions flat to 2030 and estimate ~70 TWh of demand growth from EV adoption by 2030.

EXHIBIT 7: **Power Demand from EVs assumptions**

EV Power Demand		
Total VMT	Million Miles	**3,280,149**
Total drivers	Million Cars	**240**
Average vehicle use	Miles/yr	**13,667**
Electrical usage of EV	KWh/ mile	**0.3**
Vehicle Units added to 2030	Millions	**16**
Demand from Electrical Vehicles	**TWh**	**66**

Source: Bernstein US Power Model

Heat Pumps

Heat pumps use electricity to transfer heat into and out of residences for space heating or cooling. Heat pumps are a low carbon substitute for natural gas based space heating. Shipments of air source heat pumps have reached ~4MM/ year in the U.S. and have overtaken sales of gas air furnaces.

We assume a continued pace of 4MM heat pump units added per year to 2030 or 20MM total over the next five years. Using data from the EIA residential energy consumption survey (RECS) we estimate power consumption per heat pump of ~12 mmbtu or ~3.4 MWh. Assuming this power use per unit remains constant, adding 20MM heat pump through units adds ~70 TWh of electricity demand by 2030.

EXHIBIT 8: **Heat Pump Power Demand Additions**

Heat Pumps		
2020 housing units with heat pumps	Millions	16.3
2025 housing unit with heat pumps	Millions	24.0
Heat pumps added in 5 years	Millions	7.7
CAGR	%	8%
Electricity consumption per house (mmbtu)	MMBTU	11.7
Energy used	KWh	**3,428.1**
Heat pumps added to 2030	Millions	20.0
Power Demand from Heatpumps	**TWh**	**69**

Source: Bernstein US Power Model

We consider demand from EV adoption and heat pump sales to be incremental. Residential demand for power grew at a 0.5% CAGR from 2010-2019. We continue to grow "base" residential demand at this CAGR. We do not use the last 5 years that have a higher CAGR as we believe this might already include the effect of recent EV and heat pump adds (as well as noise from temporary COVID-19 related moves).

We see residential demand overall growing at a 2% CAGR over the next five years, from ~1,500TWh today to ~1,700TWh in 2030.

TRANSPORTATION DEMAND AND TRANSMISSION LOSSES

Transportation demand is the smallest end use sector at only ~7 TWh today and primarily accounts for electricity supplied to public transport systems. We model this staying flat to 2030 (EVs are included as residential demand source).

Historically ~8% of energy generation is lost during transmission as a result of the heating of wires and other inefficiencies. This creates ~400TWh of additional "demand" that needs to be accounted for.

SUPPLY

Electricity is generated in the U.S. primarily using natural gas, renewable energy sources like solar and wind, coal, and nuclear. Natural gas is the largest single source supplying ~40% of the grid. Solar is the fastest growing source with a CAGR of ~20%

between 2019-24. The share of coal in the fuel stack has been declining as renewable and natural gas cannibalize it, a trend that we expect will continue to the end of the decade.

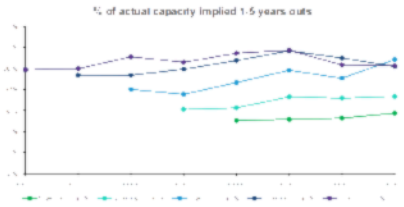
METHODOLOGY

We model the mix of power supply in the U.S. grid using the EIA's database of late stage planned generation projects. We net out planned retirements (primarily of coal-fired capacity) to calculate expected net capacity added each month. We use assumptions of capacity factor for each source based on historical data, and calculate expected net generation.

There are three main adjustments we make to this database to arrive at our final forecast:

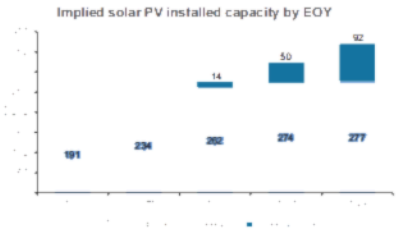
1 - Planned solar capacity has a reliable line of sight 1-2 years out. However, we have found that using the EIA database has historically underestimated grid connected solar capacity 3-5 years in the future by up to 50% in year 5. Therefore, in our model, we gross up solar capacity that is implied by the EIA database by 6% three years out, ~20% four years out, and by ~35% five years out. This is a more modest increase than prior build out would imply because we believe that headwinds to the solar market in the next five years from policy changes warrant a more cautious view. We grow solar over the next five years, but at a slower pace than the 2022–2025 period, where solar growth was turbocharged by the Inflation Reduction Act.

EXHIBIT 9: **The EIA database includes only advanced stage projects. We find that this data has historically underestimated solar buildout by up to 50% 5 years out**



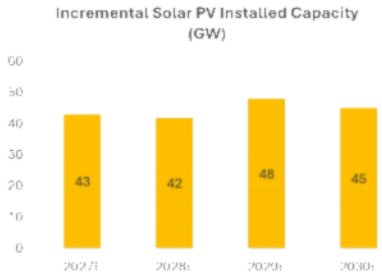
Source: EIA, Bernstein analysis

EXHIBIT 10: **We gross up solar capacity that is implied by the EIA database, but at a more cautious pace than historical data implies to account for macro headwinds**



Source: EIA, Bernstein analysis and estimates

EXHIBIT 11: **Incremental Utility Scale Solar PV Additions**



Source: Bernstein Analysis, EIA

2 - We manually add planned restarts to existing nuclear capacity that have been announced. Namely, the Holtec 800MW Palisades plant in late 2025, CEG's 835MW 3 mile island plant in early 2028, and NEE's 615MW Duane Arnold plant in late 2028.

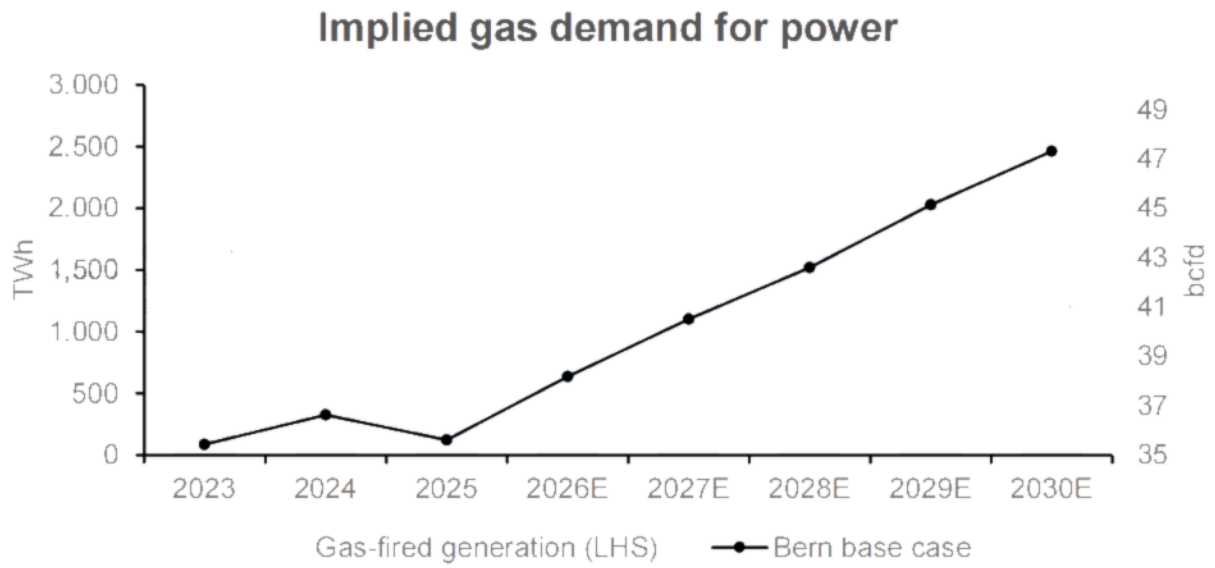
EXHIBIT 12: **We manually add planned restarts to existing nuclear capacity that have been announced**

Plant	Operator	Capacity (MW)	State	In-service
Palisades	Holtec	**800**	MI	4Q25
Crane/ 3 Mile Island	Constellation	**835**	PA	1Q28
Duane Arnold	NextEra	**615**	IA	4Q28
2030 Total		2,250		

Source: Company and news reports, Bernstein analysis and estimates

3 - Power supply has to match power demand. We assume that any gap remaining between our estimated demand for power and our estimated supply of power from the EIA database is met by natural gas. In our base case, the demand for gas in electricity generation grows by ~2bcfd per year to 2030.

EXHIBIT 13: **We estimate ~2bcfd/year of growth in overall gas demand for power through 2030 in the U.S. in our base case view of data center power demand growth**

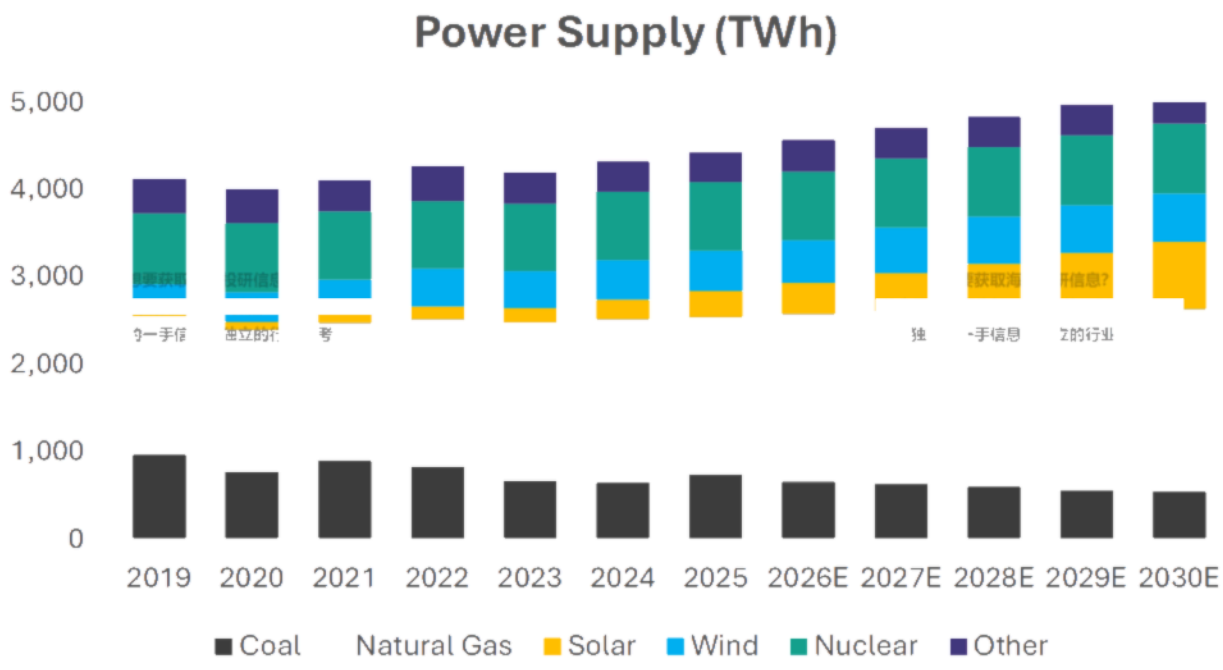


Source: Bernstein US Power Model

SUPPLY FORECAST

We believe that solar will continue to be the fastest growing generation source with a ~21% CAGR from 2025-30. We expect for wind to grow at a ~3.6% CAGR, renewables to grow at a ~9% CAGR, gas-fired generation to grow at a ~2.9% CAGR and coal to decline at a ~6% CAGR over the next five years.

EXHIBIT 14: **Bernstein power supply outlook**



Source: EIA, Bernstein analysis and estimates

Our coverage companies represent the future sources of power supply and power equipment in a rapidly evolving U.S. grid where the simultaneous forces of unprecedented demand growth, infrastructure constraints and decarbonization concerns are creating opportunities for all forms of energy providers to play to their strengths and capture upside. This is not only limited to large-scale, grid connected power. Hyperscalers need new power supply in under 3 years, while interconnections queues are stretching far longer. The resulting constraints mean providers of "behind-the-meter" power are seeing growing demand as well. Providers of grid equipment and solutions are seeing a growth runway in addressing these bottlenecks. As power consumers seek to balance speed, reliability, affordability and sustainability, they are looking to a mix of solutions to meet their needs.