(Electric) Grid Is Good for European Utilities

Europe needs to accelerate grid investment to meet energy transition goals; SSE and E.On are the best positioned.

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Executive Summary

The electrical grid is the primary bottleneck of the energy transition. While global renewables energy investments have more than doubled over the last decade, grid investments have been flat. Consequently, costly congestion issues and connection queues for renewables plants and data centers are escalating, delaying the energy transition and weighing on economic growth. To address the issue, the European commission launched an action plan for grids in November 2023, calling for EUR 584 billion of investments by 2030, or EUR 83 billion annually, nearly double the average annual investments of the past five years. As a result, we expect European utilities with material exposure to the electricity grid will double their investments in the next five years. While increased grid investments won't fully resolve congestion issues or connection delays caused by years of underinvestment, they will drive earnings and dividend growth for utilities, positioning this as a key sector theme in the years ahead. Further, to incentivize investments and incorporate a higher interest rates environment, regulators are increasing allowed returns across Europe, benefiting utilities. Meanwhile, falling interest rates should underpin a favorable spread with grid allowed returns that has historically favored utilities.

Key Takeaways

- Out of the 20 European utilities we cover, five will have more than half of their midcycle earnings coming from the electricity grid: National Grid, Redeia, E.On, Iberdrola, and SSE.
- Their electric grids are chiefly located in the UK, Germany, and Spain. The former has the best regulatory backdrop, the latter has the poorest one, but we expect it to improve as of 2026.
- The regulation improvement will enable the massive investments step-up to be value-accretive for those five companies with a median return of 6.4%, above their 5.9% median WACC.
- Our two preferred names are no-moat SSE and narrow-moat E.On given their material undervaluations and favorable regulatory footprints. Both companies have a strong balance sheet, enabling them to organically fund their investments and dividend growth of 5.8% on average.

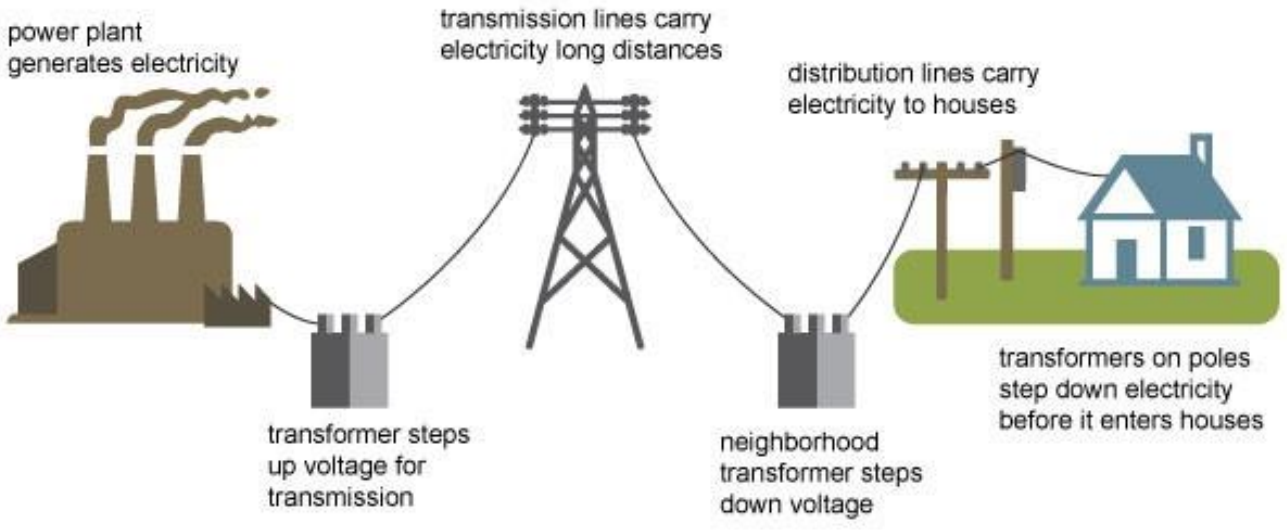
Companies Mentioned

Name/Ticker	Economic Moat	Currency	Fair Value Estimate	Current Price	Uncertainty Rating	Morningstar Rating	Market Cap (Bil)
SSE SSE	None	GBP	23.50	19.00	Medium	★★★★	21.00
E.On EOAN	Narrow	EUR	17.00	12.96	Medium	★★★★	34.00
Redeia RED	None	EUR	17.50	17.10	Low	★★★	9.00
Iberdrola IBE	None	EUR	12.70	14.05	Medium	★★	89.00
National Grid NG.	None	GBP	9.70	10.00	Medium	★★	51.00

Grid Investments Are Lagging Renewables Installations

Power grids are the highways and byways that carry electricity from power plants to homes and businesses (Exhibit 1). Electricity first travels through high-voltage transmission lines at a very high energy level necessary to move over long distances. Then at substations, the voltage is reduced (or "stepped down") to a lower, safer level. Finally, it's sent through smaller distribution lines to reach homes, offices, and factories. This process ensures that the electricity is safe and usable for residential, commercial, and industrial customers.

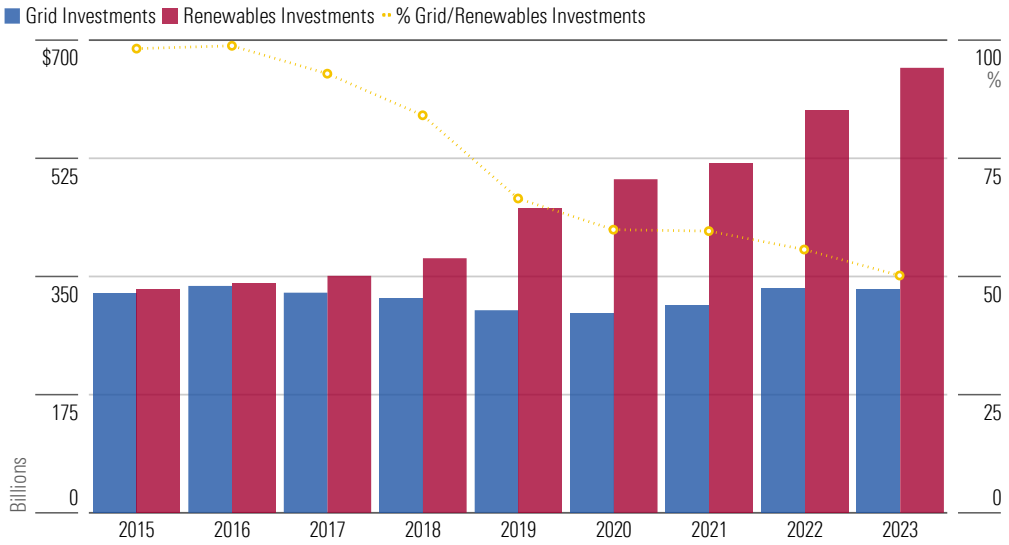
Exhibit 1 Transmission and Distribution Grid Transport Power From the Plant to the End User



Source: US Energy Information Administration.

Without sufficient grids, additional power capacity is stranded and ultimately useless, a situation Europe is facing as it rapidly adds renewable power generation capacity. Between 2018 and 2021, global renewables investment boomed in response to heightened decarbonization targets, improved technology, lower construction and installation costs, and low interest rates. Despite construction cost inflation and soaring interest rates in 2022-23, global renewable energy investment reached an all-time high of $659 billion in 2023, more than twice as high as 10 years before (Exhibit 2). In the meantime, global grid investments have stalled. Consequently, the ratio of grid investments on renewables investments deteriorated from nearly 1 in 2015 to 0.5 in 2023. According to the International Energy Agency, or IEA, a ratio of 0.73 is needed by 2030 given the current renewables ambitions.

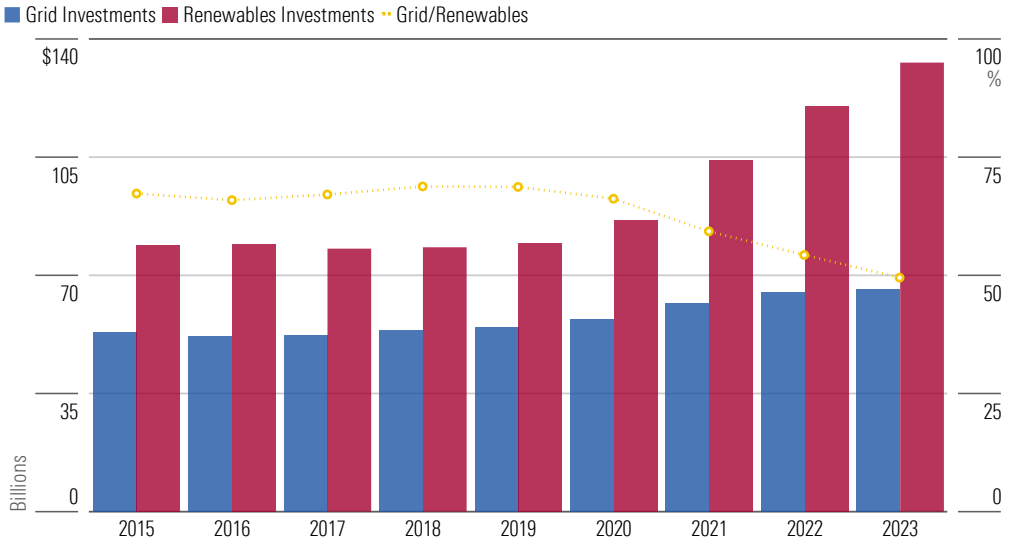
Exhibit 2 Global Grid Investments Have Been Subdued, While Renewables Investments Boomed



Source: IEA, Morningstar.

In Europe, renewable power investment grew by 6.7% annually since 2015 while electricity grid investments only grew by 2.7%, resulting in the grid/renewables investment ratio deteriorating from 0.67 in 2015 to 0.49 in 2023 (Exhibit 3).

Exhibit 3 European Renewables Power Investments Are Double Those in the Grid

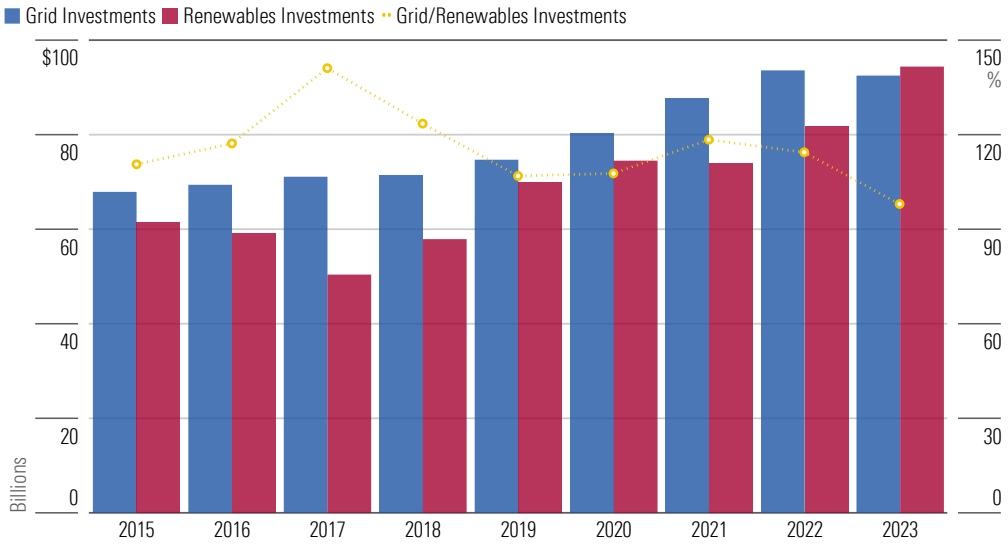


Source: IEA, Morningstar.

In North America, grid investment exceeded renewable investment until 2022 although it grew at a slower rate—3.9% versus 5.5%, respectively (Exhibit 4). Consequently, the grid/renewables investments ratio decreased from 1.11 in 2015 to 0.98 in 2023., remaining much higher than in Europe and globally.

North America's higher ratio is the result of an older grid, lower population density that requires greater grid investment, and slower renewable growth than in Europe.

Exhibit 4 In North America, Grid Investments Kept Pace Due to Slower Renewable Growth



Source: IEA, Morningstar.

Renewables roll-out requires massive grid expansion and reinforcement for several reasons. First, is the low load factor, or utilization rate, of wind and solar power. The global average load factors of wind and solar are 27% and 14%, respectively, versus 50%-80% for thermal and nuclear plants. In other words, it requires 2 to 4 times more wind and solar capacity to generate the same amount of power as thermal and nuclear plants. Second, is geographical constraint. Power plants are connected to the transmission network through a transmission node.[1] However, wind and solar plants are installed where the wind and sun conditions are the best, which are typically near the coasts or offshore and toward the equator, respectively. Also, wind and solar require much more land than thermal plants to generate comparable amounts of power. In most cases the locations that meet these requirements will be far away from the existing transmission network, requiring the construction of a new dedicated transmission line to connect the new plant.

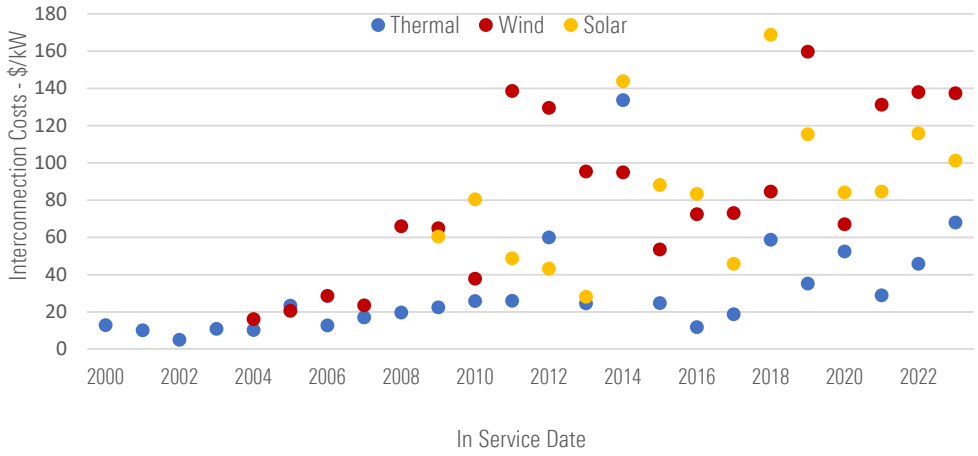
Even if a renewable plant is built near the grid and connected to an existing distribution node, both the node and the grid would still need upgrades to handle the additional power. These upgrades typically include increasing capacity, installing devices to stabilize voltage due to fluctuations caused by renewables, and enhancing protection systems to prevent overloads or short circuits. Otherwise, renewable output would have to be curtailed on windy or sunny days.

1 Before this electricity can be transmitted over long distances, it needs to be "stepped up" to a high voltage. A substation or transmission node at the power plant site contains transformers that increase the voltage to the necessary level.

Connection Queues Are Growing Given Lack of Investment

Due to renewables' specificities explained above, connecting them to the grid is quite costly. In 2023, connecting a wind plan in the US cost about $140,000 per megawatt, twice as much as thermal plants (Exhibit 5). Solar PV's connection cost stood 50% higher than thermal plants. While specific data for Europe is unavailable, the situation is likely comparable due to the shared challenges in connecting both solar and wind projects to the grid. Wind plants are typically connected to the transmission lines, while solar PV plants are more often connected to the distribution grid. As a result, renewables expansion requires massive investments both in transmission and the distribution grid, and these costs have soared during the last two decades (Exhibit 5).

Exhibit 5 Connection Costs Have Surged Since 2000, Wind and Solar Costs Are Almost Twice as High as Those of Thermal Plants



Source: LBNL, TSE.

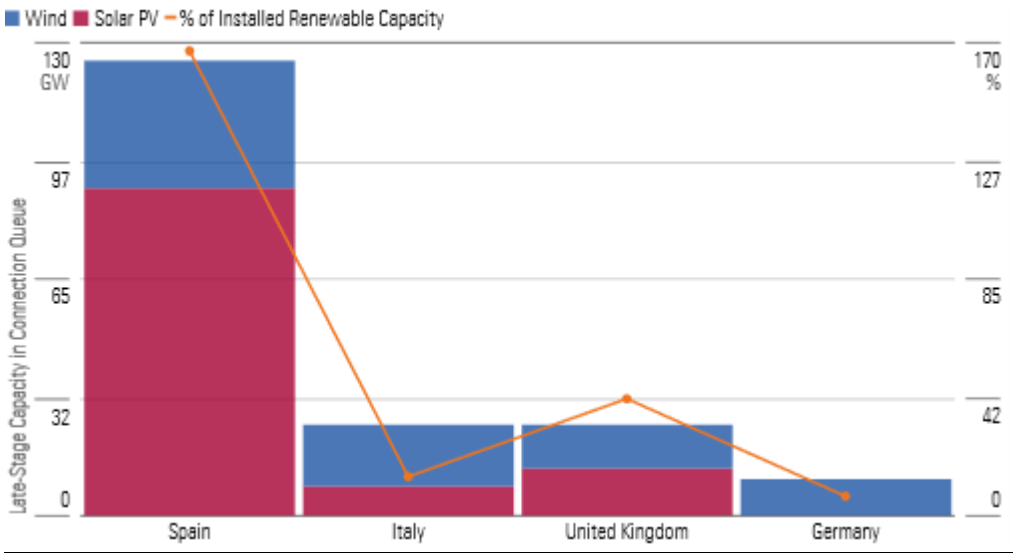
In most of Western Europe, there is a "first come, first served" principle, meaning that any developer can request a connection from anywhere without considering the specifics of each technology and their permitting length. This prevents regulators from proactively managing grid expansions and reinforcements. There is also a lack of incentives for countries to minimize the grid connection process and a lack of information on grid saturation per area preventing developers to request connection in less saturated places.

All in all, renewables projects remaining on the sidelines pending their connection to the grid are ballooning. According to the IEA, at least 3,000 gigawatts of renewable power projects across the globe are waiting in grid connection queues—equivalent to 5 times the amount of solar PV and wind capacity added in 2022. Of those, 1,500 GW are in advanced stages of the connection process.

In Spain, Italy, the UK, and Germany, nearly 200 GW of late-stage projects were in connection queues at the end of 2022 (Exhibit 6). Late-stage projects have either secured connection agreements or are

nearing the final stages of this process. These projects have a strong likelihood of achieving grid connection within the next five years, if developers continue their financial commitment. They account for 39% of the installed renewable capacity in those countries and will further strain the grids.

Exhibit 6 Renewables Capacity in Connection Queue Is Very High in Western Europe



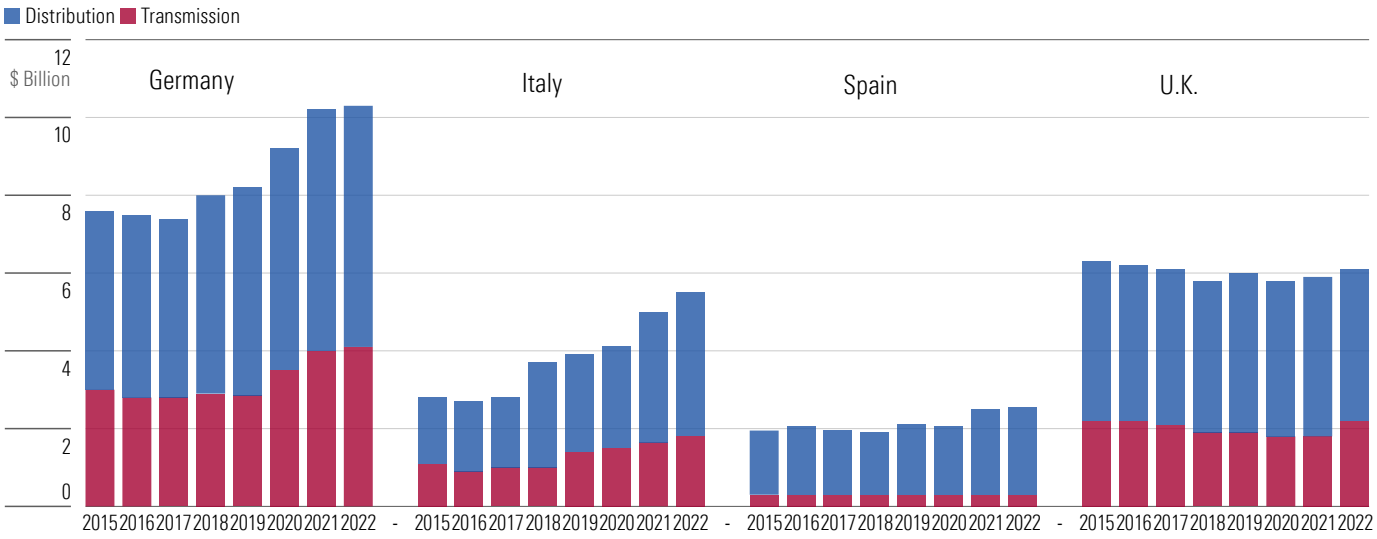
Source: IEA, Morningstar.

Spain holds the highest proportion of late-stage renewable projects in connection queue to installed capacity at 170%. This reflects grid investments that have been subdued for years (Exhibit 7) due to poor regulation.

In the UK, it took renewable projects four years to connect to the grid in 2022 on average. A developer requesting a grid connection today would be able to connect only between 2030 and 2038.

Rising grid investments in Italy and Germany have enabled the connection queue to remain well below Spain and the UK.

Exhibit 7 Grid Investments Are Rising in Germany and Italy, Remain Subdued in Spain



Source: IEA.

Insufficient Transmissions Drive Increase in Costly Congestion Issues

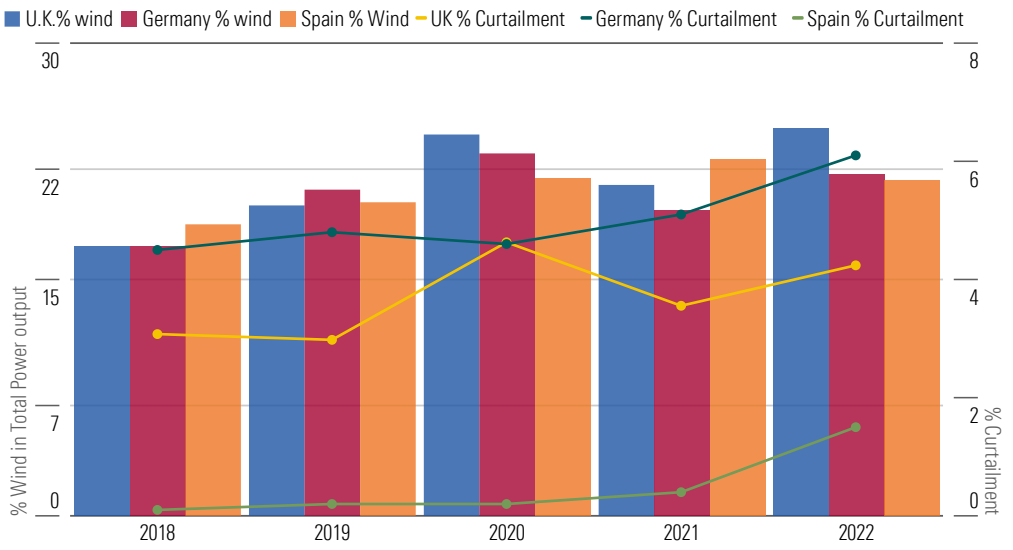
A consequence of grid underinvestment is congestion, which is resulting in significant additional costs for consumers each year. Electricity systems are based on a merit order system under which the cheapest available source of power—typically renewables—has priority access to the grid. When this cheapest source of power is not available or fully utilized, the second cheapest source of power is called on by the grid operator, and so on. However, if the grid capacity is too limited to transport all the available power from the cheapest available source, in case of high wind speeds for instance, there is congestion. The grid can then become overloaded, which might ultimately lead to overheating or failure of equipment, blackouts, or damage to the grid.

In this case, more expensive power, typically from a combined-cycle gas turbine, or CCGT, is needed. This is congestion management, and it is very costly because: 1) a more expensive source of power is used, 2) those more expensive plants also charge the grid operator for their contribution to the grid stability or ancillary services, and 3) in the European Union and in the UK, owners of solar PV (solar photovoltaic) and wind plants are supposed to be fully compensated by the grid operator for their curtailed output. Ultimately, all these incremental costs are passed on to consumers.

In Europe, a growing share of renewable power is being curtailed (Exhibit 8) as the renewables roll-out outpaces grid investments. Globally, the amount of renewable output curtailed because of transmission congestion amounts to 5%.

Conversely, massive roll-out of the transmission grid in China since 2013 enabled the country to reduce its renewable curtailment rates from more than 15% in 2012 to less than 5% in 2022 in spite of the massive renewables roll-out in the meantime.

Exhibit 8 Rising Wind Generation Increased Curtailment Across Europe

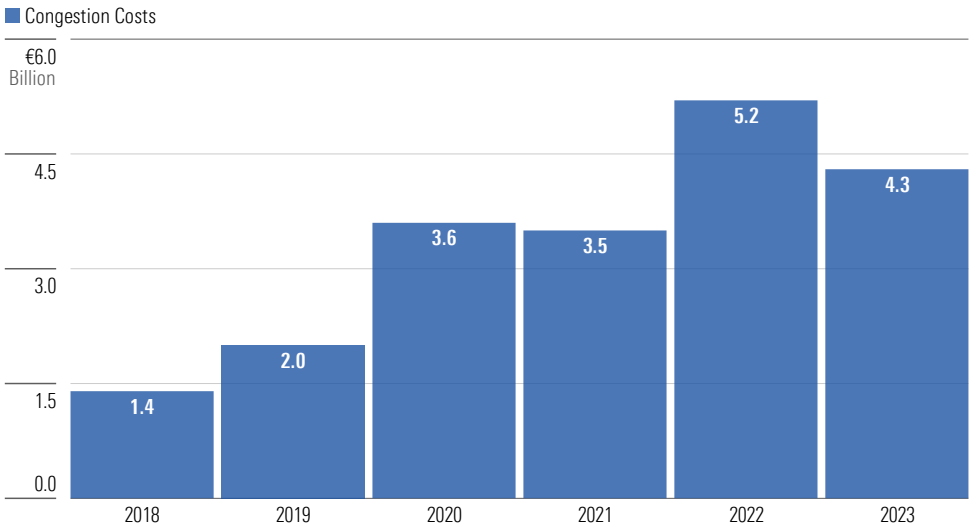


Source: LBNL, TSE.

Despite more pronounced grid underinvestment, Spain has fared better than Germany and the UK because it benefits from favorable wind conditions across much of the country, which helps avoid over-reliance on specific high-wind areas. This geographic spread reduces the likelihood of localized grid congestion. In Germany and the UK, high-quality wind resources are often concentrated in specific regions, such as northern Germany and offshore areas or Scotland in the UK. These regions are far from major demand centers, like southern Germany or London. This mismatch between generation and demand locations creates transmission bottlenecks, leading to higher curtailment rates.

This rising share of curtailed renewable output is increasing congestion costs (Exhibit 9) from EUR 1.4 billion in 2018 to EUR 5.2 billion in 2022. Costs fell in 2023 because of lower wholesale power prices in the wake of the easing energy crisis.

Exhibit 9 Congestion Costs Are Increasing in the EU



Source: ENTSO-E, Morningstar.

Germany has the highest congestion costs in Europe at EUR 2.5 billion in 2023, which is 25% of the annual electricity grid investments in the country that year. Congestion costs more than tripled since 2018 due to the increasing wind penetration and soaring wholesale power prices. In 2022, Germany curtailed 4% of its renewable output and 6% of the wind output. For offshore wind alone, 17% of the output was curtailed due to the lack of transmission capacity between the North Sea where it is generated and the industrial south of the country where the demand is concentrated. The country also abides by the EU rule of fully compensating curtailed renewable output, unlike Spain, inflating its costs.

In the UK, the bulk of congestion is driven by the lack of transmission capacity to transport power from Scotland to England. The former has 10 gigawatts of wind capacity or 37% of the UK's total wind capacity but accounts for only 10% of the demand. The grid between Scotland and England has a capacity of only 6 GW. Consequently, on windy days, production must be curtailed and CCGTs in England are called on by the grid operator to offset the curtailed wind power.

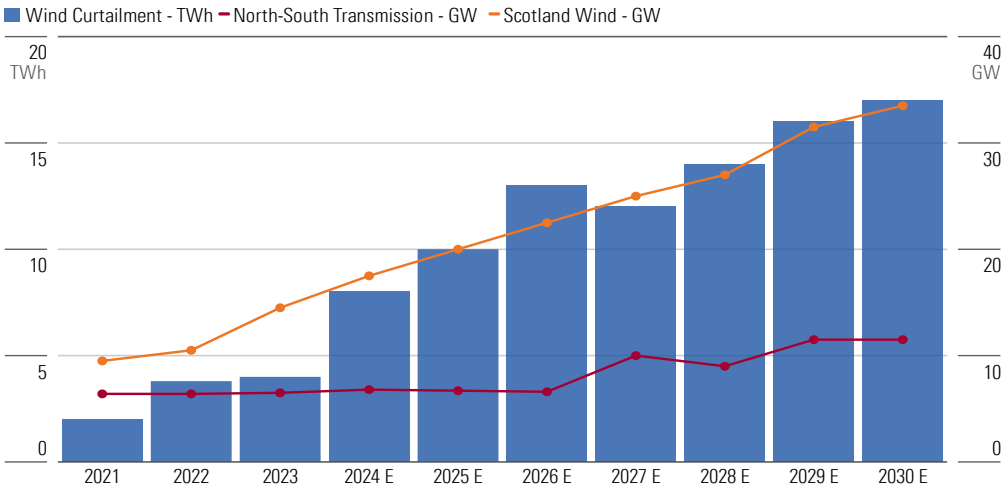
In 2022, UK congestion costs alone amounted to GBP 800 million, or 13% of the annual grid investments, and increased greenhouse gas emissions by 1.3 metric tons of carbon dioxide equivalent, or MTCO2e, according to Carbon Tracker. The bulk of congestion costs consisted of payments to CCGTs.

We expect these costs to escalate in coming years as the renewables roll-out continues to outpace grid expansion. By 2030, Scotland could have nearly 20 GW of additional wind power based on the current pipelines of projects, increasing curtailment. Consequently, regulator Ofgem approved accelerated strategic investments to reinforce the UK East Coast onshore electricity network. These ASTI consist of 17 transmission lines, of which four of 2 GW capacity each will reinforce the capacity transmission between Scotland and England. However, only two of them, Eastern Green Link 1& 2, will be completed

by 2030, adding only 4 GW of capacity, far too short to cover the 20 GW of additional wind capacity added in the meantime.

For the UK, we derive an average load factor of 9% based on curtailed power output in 2021-22 and the transmission capacity shortfall. Applying it to the capacity shortfall that we project until 2030 implies 91 TWh of curtailed volumes or 13 TWh per year on average (Exhibit 10).

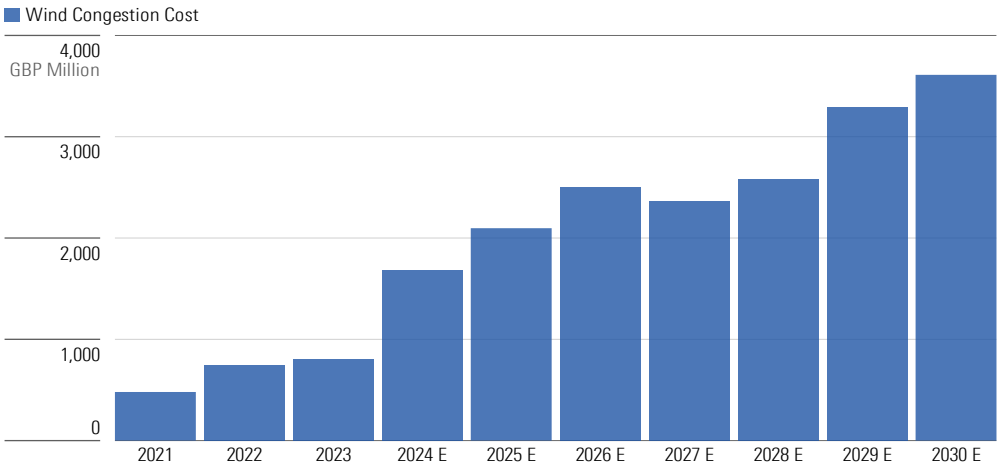
Exhibit 10 UK Curtailed Volumes Will Continue to Soar as Wind Development Outpaces Grid Expansion



Source: Morningstar, Carbon Tracker Initiative for historical data.

Applying the unit congestion costs of 2021-22 points to total congestion costs of GBP 13.6 billion by 2030 in the UK or EUR 1.95 billion per year on average (Exhibit 11), that is 40% of the total electric grid investments of the country in 2022. Assuming that all the curtailed output is replaced by CCGTs implies 36 million metric tons of C02 emissions driven by curtailment.

Exhibit 11 UK Curtailment Costs Will Quadruple as a Result



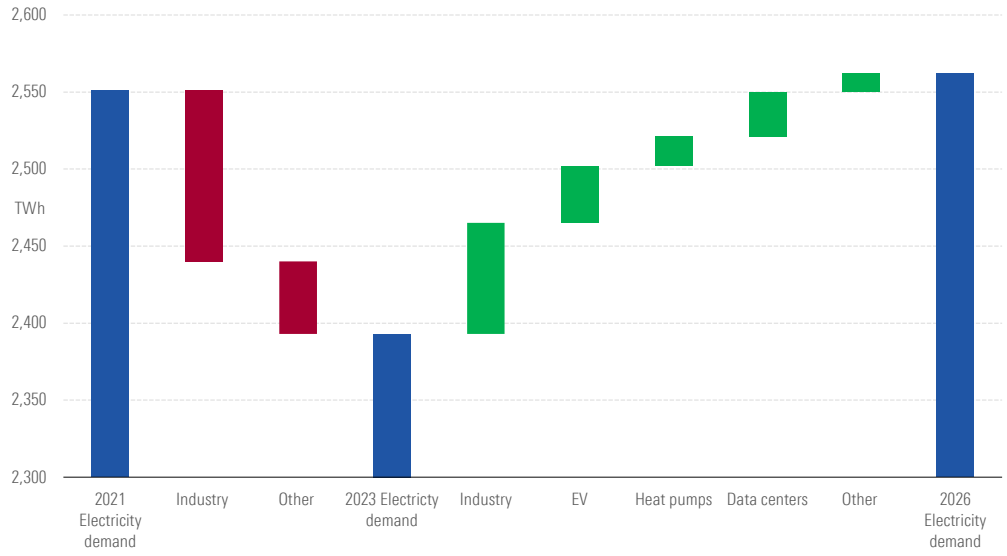
Source: Morningstar, Carbon Tracker Initiative for historical data.

Data Centers Could Further Strain the Grid

Adding a new source of power requires reinforcement of the grid. Likewise, adding a big source of demand to the grid like a data center can require increasing capacity all the way from the last distribution line to the transmission grid and all substations in between.

There are currently more than 8,000 data centers globally, with one third located in the United States, 16% in Europe, and about 10% in China. In the EU, data centers' electricity demand amounted to 100 TWh in 2022, or 4% of the total demand, in line with the US. The IEA estimates that data centers' electricity consumption in the EU will jump by 50% by 2026, accounting for 17% of the recovery in the EU's electricity consumption expected by 2026 (Exhibit 12) and 6% of total demand.

Exhibit 12 Data Centers Will Account for 17% of the EU Electricity Demand Recovery by 2026



Source: IEA.

Growth could be much higher without the permit delays caused by grid bottleneck in the main hubs where the majority of the 1,240 data centers in Europe are concentrated: Frankfurt, London, Amsterdam, Paris, and Dublin, also known as FLAP-D. In 2023, a law that prohibited any new data center around Amsterdam unless it can prove its benefit to the city was enforced. In London and Frankfurt, there will be no power supply available for data centers until 2026-27. In Ireland, where data centers account for about 20% of the electricity demand, the grid operator Eirgrid will not provide any new connections to data centers until at least 2028. Overall, due to restrictions in the FLAP-D postponing developments to the end of this decade, data center developers are looking at other areas with more grid capacity and cheap renewable power like Northern European countries.

Iberdrola claims that Spain could capitalize on the saturation of the FLAP-D market, projecting that its data center capacity could increase by up to 40% annually through 2030. The company points to Spain's

abundant cheap renewable power and vast available land as key advantages. However, we believe that achieving this growth will require a significant increase in grid investments that have been subdued for years. For this to happen, regulatory improvements will be crucial in the next regulatory period starting in 2026.

E.On plans to connect 6 GW of data centers to its distribution grid around 2030 in the Frankfurt area, which should boost its earnings. The group has further requests of mid-single-digits GW capacity that it will not be able to connect before 2030 because it also requires extension of the transmission grid.

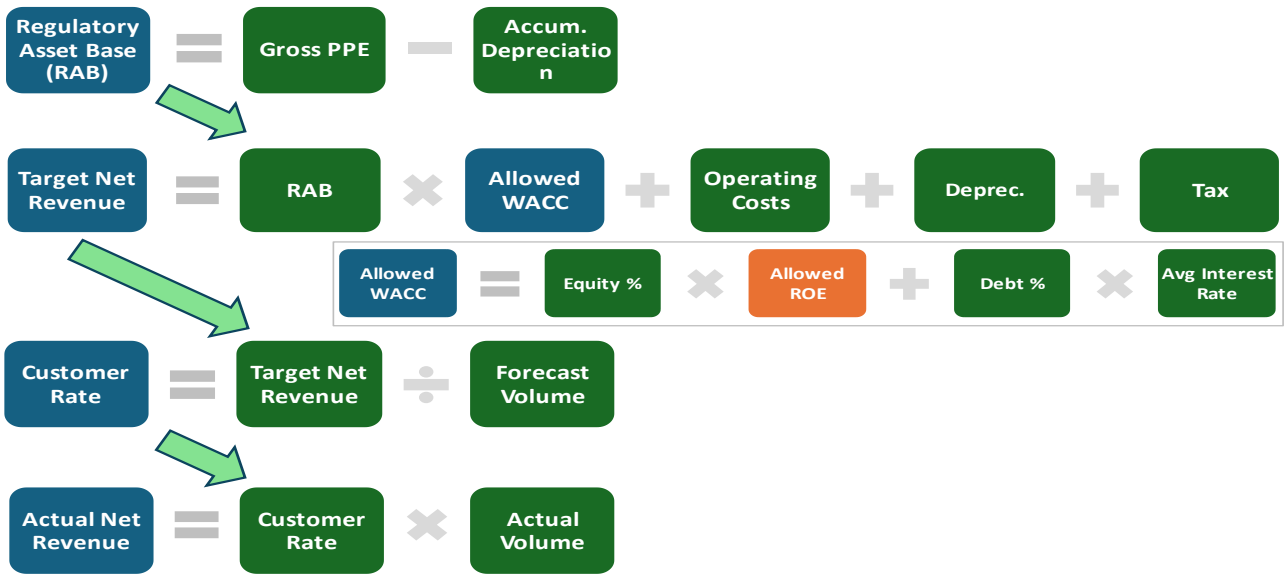
Electric Grid Operators' Massive Investments Step-Up Will Be Value-Accretive

UK Boasts the Most Favorable Regulation for Energy Grid

As electricity grid investments soar across Europe, returns on these investments are crucial for grid operators and their shareholders. These returns, determined by national regulators, differ between European countries. As a result, utilities' geographical footprints become important drivers of their equity stories.

Utilities ratemaking typically begins with regulators setting a target or allowed return on a utility's regulatory net asset base. Regulators then add back taxes, depreciation, and approved operating costs to determine net revenue. Customer rates are set so that a utility collects that net revenue based on a utility's demand forecast that regulators approve (Exhibit 13).

Exhibit 13 Utilities Regulatory Rate-Setting Model Recognizes Need for Investors to Earn Fair Return of Capital



Source: Morningstar.

If the actual demand is lower than the forecast volume, utilities will be able to recoup the shortfall in future years across all regulatory regimes in Western Europe. However, allowed returns and indexation to inflation diverge across countries (Exhibit 14).

Exhibit 14 UK and Germany Have Strong Regulatory Frameworks

	U.K.	Germany	Spain
Cost pass-through	Full pass-through with one-year time lag	Yes, annual adjustments for volatile cost inputs like fuel gas.	Full pass-through of energy costs.
Inflation-linked	Both regulated revenue and RAV are indexed	Yes. The cost base that flows into the revenue cap is adjusted annually fo inflation and recovered through allowed revenue	No. Tariffs not indexed to inflation
Regulatory period			
- Distribution	2023-28	2024-28	2021-26
- Transmission	2021-26	2024-28	2021-26
Current period's allowed returns			
- Distribution	Real return on equity of 5.5% Real cost of debt of 3.2% Gearing: 60% Real WACC: 4.1% **Nominal WACC: 6.1%**	Nominal cost of equity 7.09% Nominal cost of debt: 4.17% Gearing 60% **Nominal WACC: 4.7%**	Pre-tax WACC: 5.58% **Post-tax WACC: 5%**
- Transmission	Real return on equity of 4.76% Real cost of debt of 2.05% Gearing: 55% Real WACC: 3.3% **Nominal WACC: 5.3%**	Nominal cost of equity 7.09% Nominal cost of debt: 4.17% Gearing 60% **Nominal WACC: 4.7%**	Pre-tax WACC: 5.58% **Post-tax WACC: 5%**
Morningstar assessment of current period	+	+	-
Next period's forecasted allowed returns			
- Transmission	Real return on equity of 5.5% Real cost of debt of 3.2% Gearing: 60% Real WACC: 4.1% Nominal WACC: 6.1%		Pre-tax WACC: 6.6% Post-tax WACC: 6%
- Distribution			Pre-tax WACC: 6.6% Post-tax WACC: 6%

Source: Morningstar, S&P. Note: we assume a 2% inflation rate to calculate the nominal WACC in the UK.

We view the UK as the most favorable regime due to:

1. Its total expenditure model that guarantees full cost recovery for grid operators and offered stability for investors. (Blue box)
2. The annual indexation of revenue and regulated asset base to consumer price index including owner occupiers' housing costs (CPIH). (Blue box)
3. The high returns of distribution grid to which we expect the transmission grid to be aligned in the next period—RIIO3—starting in April 2026. In its draft proposal released in July 2024, the regulator Ofgem proposed to set the allowed real return on equity at the midpoint of a 4.57% to 6.35% range that is 5.46%, in line with the distribution grid's 5.6% (Exhibit 14). (Yellow box)

Germany also has a supportive regulatory framework for the energy grid, though it is slightly less favorable than that of the UK. It offers a good protection against inflation (Green box) and there is the possibility to outperform allowed returns thanks to incentive schemes for operational outperformance, meaning that the utilities can keep part of the benefits if they achieve lower operating costs than what is planned.

We rate Spain as negative due to low base returns and limited incentives for outperformance. Further, it is the only regulatory regime in Western Europe that does not allow for inflation indexation (Red box). Because of this, investments have been subdued over the past several years (Exhibit 7). As a result, the next regulatory framework, set to begin in 2026, could include enhancements to better incentivize the necessary increase in grid investments, badly needed to reduce the ballooning renewables connection queue (Exhibit 6) and lure data centers. Further, we expect the allowed return to be raised by 100 basis points due to the rise in interest rates since 2021 (Black box).

Electric Grid Operators Will Achieve a 6.4% Median Return on Their Investments

Given the issue we discussed above, it's apparent more grid investment is needed. Governments are clearing the way with improved regulatory environments, and utilities are responding. However, this will not be enough to solve all the curtailment issues, as explained before for the UK, and eliminate the huge connection queues. Still, these investments will be value-accretive and support earnings and dividend growth for companies. That said, the returns achieved will differ depending on each company's regulatory environment exposure.

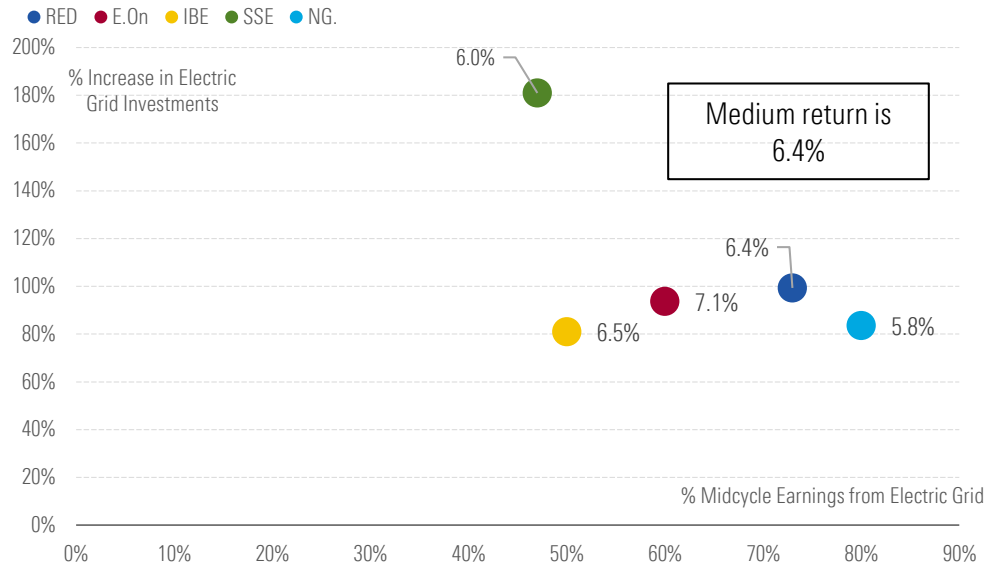
Exhibit 15 E.On and SSE Boast the Best Regulatory Footprints

		Germany	UK	Spain	Latam	U.S. North East	CEE
	Country Regulatory Rating	+	+	-	+	-	+
	Company Regulatory Outlook						
E.On	+	◕					◔
SSE	+		●				
NG.	=		◕			◔	
IBE	=		◔	◔	◔	◔	
RED	-			●			

Source: Morningstar. Note: the circle represents the degree of companies' electricity grid earnings exposure to a country.

Of the 20 European utilities we cover, five will have more than 45% of their midcycle earnings coming from the electricity grid: National Grid, Redeia, E.On, Iberdrola, and SSE. SSE and E.On are our preferred plays due to their favorable regulatory footprints, high earnings and dividend growth, and undervaluation.

Exhibit 16 SSE Will Increase Its Grid Investments the Most Among Peers During the Next Five Years



Source: Morningstar. Note: Figures next to the dots indicate the electric grid investments' returns.

On a median basis, we expect these five companies' investments in the electricity grid to nearly double over the next five years compared with the previous five (Exhibit 16). These investments will be value-accretive as we expect them to generate a median return of 6.4%, above the group's 5.9% median WACC.

SSE stands apart as we forecast its electricity grid investments to surge by 181% over the next five years due to its involvement in the accelerated strategic investments in the UK. We expect the firm to achieve a 6% return from its grid investments, in line with our expectation of the allowed WACC of the UK transmission grid in the next regulatory regime starting in April 2026 (Exhibit 14).

We expect Redeia's investments to double over the next five years, marking the second-largest increase among its peers. This large increase is driven by: 1) its involvement in interconnection projects between Spain and France and the construction of transmission lines between some Spanish islands; 2) subdued investments over the past five years due to permitting issues and poor regulation in Spain. We project the firm to achieve a 6.4% return on its investments, assuming that allowed returns will be raised to 6.6% in the next Spanish regulatory regime starting in 2026 from the current 5.58% (Exhibit 14).

Due to the rapid expansion of solar PV in Germany, we expect operators of electricity distribution grids, including E.On, to further raise their investments. Accordingly, we expect the latter to raise its investments guidance by nearly 50% for German electricity grid, pointing to grid investments that would almost double over the next five years. E.On boasts the highest ROI at 7.1% due to high incentives to outperform returns in Germany and exposure to Central and Eastern European countries where allowed

returns are increasing. This buttressed our recent economic moat rating upgrade of the company to narrow.

We forecast National Grid to increase its investments by 84% over the next five years, chiefly due to its involvement in the ASTI. We project these investments to deliver a 5.8% return.

With an 81% increase in grid investments over the next five years, Iberdrola lags the pack. We expect it to achieve a decent return of 6.5% as high returns in Brazil will offset the poor ones in the US Northeast (Exhibit 14).

SSE and E.On Best Way to Play Grid Investment While Offering Greatest Total Shareholder Return

Of the group, we prefer SSE and E.On as they are best positioned to capitalize on increased grid investment, which should generate the greatest shareholder return. Their undervaluation reflects that the market underestimates their long-term earnings growth potential stemming from their upcoming massive electric grid investment step-up.

Exhibit 17 SSE and E.On Are the Only Undervalued Utilities With High Exposure to Electricity Grid

Companies	Moat	5-year EPS Growth	5-Year Dividend CAGR	% Dividend Yield	P/FV	% TSR
E.On	Narrow	3.6%	4.0%	4.4%	77%	35%
SSE	None	6.9%	7.5%	4.1%	81%	27%
RED	None	-1.4%	0%	4.7%	98%	6%
NG.	None	1.8%	-2.7%	5.4%	106%	0%
IBE	None	5.4%	5.2%	4.5%	110%	-5%
Median		**3.6%**	**4.0%**	**4.5%**	**98%**	**6.5%**

Source: Morningstar. Based on share prices of Oct. 18, 2024. Note: TSR stands for total shareholder return. It is the sum of dividend yield and valuation upside or downside.

On the back of hefty investments, we project SSE to achieve the higher EPS growth (Exhibit 17), buttressing the highest dividend growth with the caveat that the fiscal 2024 dividend was rebased.

Our higher investment forecasts than what E.On is guiding underpin a 12% upside to the group's 2028 net income guidance. Its earnings CAGR of 3.6% is hampered by material positive one-offs of 2023. Restated from those, the EPS CAGR stands at 8.1%. We expect the firm to grow its dividend by 4% through 2029.

We project Iberdrola to deliver a 5.4% EPS CAGR, the second-highest growth among peers, underpinning a 5.2% dividend CAGR.

Despite the 84% increase in its investments, we foresee National Grid to achieve an EPS CAGR of only 1.8% due to the highly dilutive rights issue of June 2024. Meanwhile, the dividend should decline annually by 2.7% due to the rebase of 2025.

Redeia lags the pack with an average annual EPS decline of 1.4% by 2028 due to the end (in 2024) of the remuneration of assets commissioned before 1998. Further, the dividend policy is unattractive without any commitment for growth.

E.On: German High Renewables Ambitions Involve Upside to the Earnings Guidance

Improving Regulatory Backdrop Drove an Economic Moat Rating Upgrade

About 75% of E.On's earnings come from electricity grid, the bulk of which are from the electricity distribution grid in Germany, and 25% of earnings come from customer solutions.

We have recently upgraded E.On's economic moat rating from none to narrow on:

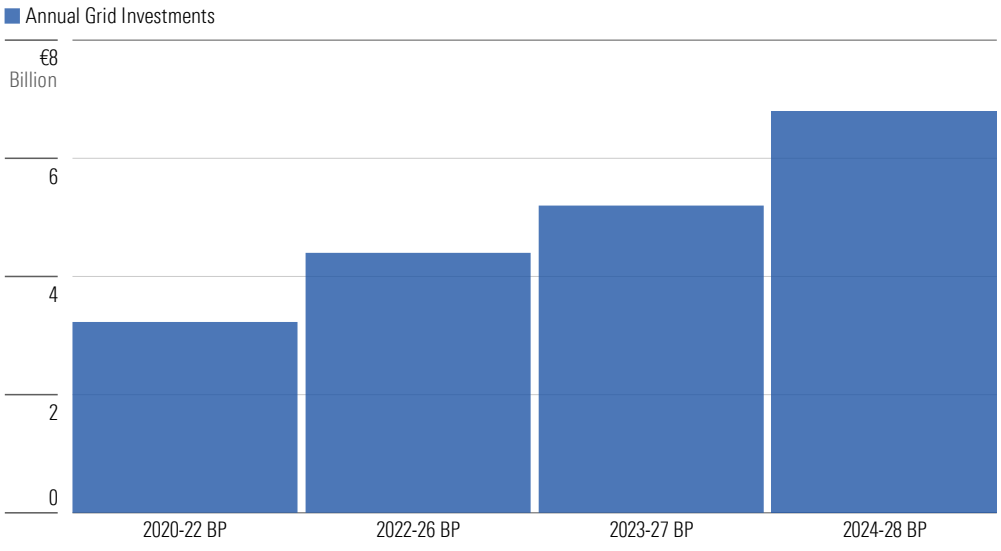
- The raise in allowed returns in 2024 for German grid's new grid investments, Swedish and Polish grids.
- Our expectation of a hike in allowed returns in the next regulatory periods in 2025 for Romania and Hungary and in 2026 for Czech Republic due to higher interest rates.
- The cost of debt component of the WACC is updated annually preventing a mismatch with E.On's actual cost of debt.
- The fact that German grid earnings (75% of grid earnings) are boosted by: 1) efficiencies stemming from standardization, digitalization, automatization, and synergies from Innogy's grid; 2) adjacent nonregulated businesses like smart meters, broadband, or water businesses.

We project a return on grid growth investments of 7.1%.

We See Upside to E.On's Grid Investments Plan

E.On plans to invest EUR 42 billion over the next five years, 70% more than in the past five years and almost equivalent to its long-term tangible assets at the end of 2023. Out of the EUR 42 billion of planned investments over 2024-28, EUR 34 billion will be dedicated to grid—that is EUR 6.8 billion annually, more than twice as much as the EUR 3.2 billion planned in the 2020-22 business plan. E.On has increased its grid investment guidance every year since 2020 (Exhibit 18).

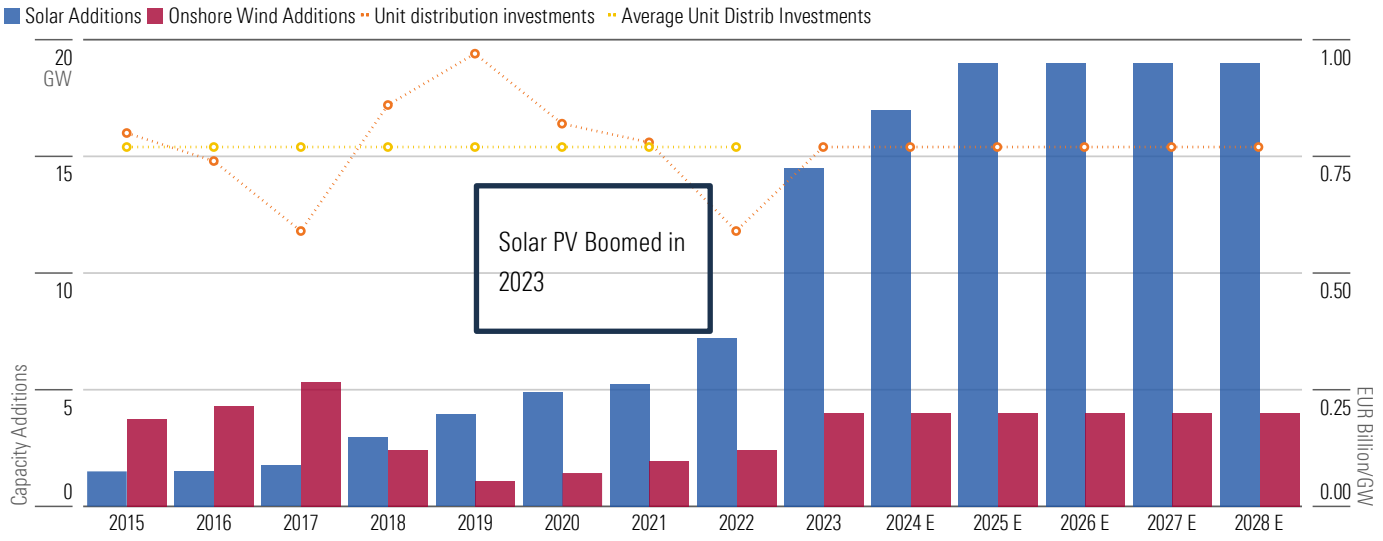
Exhibit 18 E.On Has More Than Doubled Its Planned Annual Grid Investments Since 2020



Source: Morningstar.

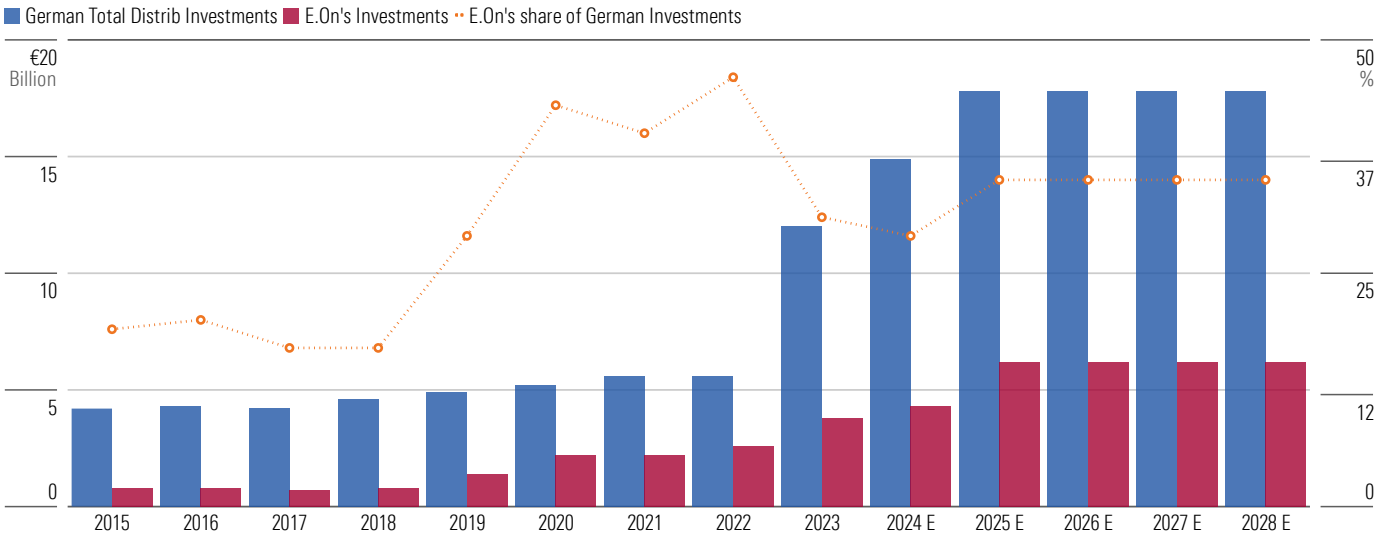
Why? Because renewables capacity additions in Germany have soared and will continue to do so, requiring upgrades and reinforcements of the distribution grid. Annual renewable capacity additions have increased by 35% between 2018 and 2022 (Exhibit 19), driving a 36% increase in German distribution investments (Exhibit 19). In the meantime, E.On investments in its German distribution grid have jumped by almost 250% partly due to a scope effect since E.On acquired Innogy's German grid in 2020. Over 2020-22, E.On's grid investments accounted for 43% of total electricity German distribution grid investments. Since 2018, the bulk of renewable capacity additions in Germany come from solar PV plants that tend to be connected to a distribution grid, unlike wind plants that are typically connected to the transmission network.

Exhibit 19 German Solar Capacity Additions Are Surging …



Source: Source: Morningstar, IEA, Fraunhofer ISE, Bundesnetzagentur.

Exhibit 20 … Driving a Step-Up in German Electricity Distribution Investments



Source: Source: Morningstar, IEA, Fraunhofer ISE, Bundesnetzagentur,

German electricity distribution operators told the national grid regulator that they need to invest EUR 110 billion over 2024-33, plus EUR 10 billion to replace existing power lines in the meantime, involving EUR 12 billion of annual investments.

E.On currently plans to invest EUR 4.2 billion for its German electricity grid or 35% of the EUR 12 billion planned by all the German electricity distribution operators. This is below the 43% over 2020-22 but close to its market share of 32% in 2023.

We estimate that there is upside to electricity distributors' investment estimates due to Germany's high renewables ambitions. We calculate that each gigawatt of solar and onshore wind capacity added in Germany between 2015 and 2022 drove an average of EUR 0.77 billion of distribution grid investments (Exhibit 19). Applying this ratio to the EUR 12 billion of annual investments planned by grid operators involves 16 GW of annual onshore wind and solar capacity additions. This looks too low compared with the outlook of solar and wind capacity additions in coming years.

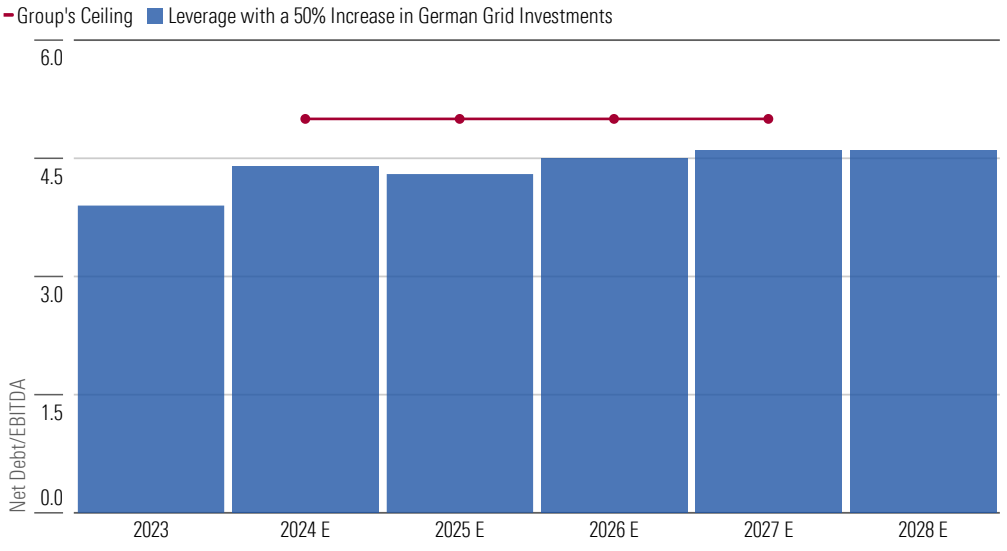
Germany targets to raise the share of renewables in electricity consumption from 60% in 2023 to 80% in 2030 and a full decarbonization targeted by 2035. The latter seems unachievable, as it would require a massive deployment of green hydrogen, which we believe is not feasible given that the technology is still far from being commercially competitive. On the other hand, we reckon that the 2030 goal requires annual capacity additions of wind and solar of 19 GW and 4 GW, respectively, while CCGTs continue to serve as a back-up source of power. This looks within reach due to the high upcoming auctions and the recent massive acceleration in solar capacity additions that reached 14.5 GW in 2023 (Exhibit 19), helped by falling costs due to Chinese overcapacity.

Applying the EUR 0.77 billion/GW of distribution grid investments to the 23 GW of annual wind and solar capacity addition points to EUR 17.8 billion of annual distribution investments (Exhibit 20). Assuming E.On's share remains at 35% points to annual investments in its German distribution grid of EUR 6.2 billion, 49% above the current plan. Assuming that other investments are unchanged, the increase in German electricity distribution grid investments would increase E.On's total investments by 23% annually as of 2025 .

The Greater Investment Can Be Organically Funded, Leading to Higher Earnings

With a 49% increase in the German electricity distribution grid investments, we calculate that the average economic net debt/EBITDA would average 4.4 between 2024 and 2028, ending at 4.6 in 2028, below the group's ceiling of 5.0 that is consistent with the current BBB credit rating from S&P (Exhibit 21).

Exhibit 21 E.On Can Bear an Incremental Investments Step-Up



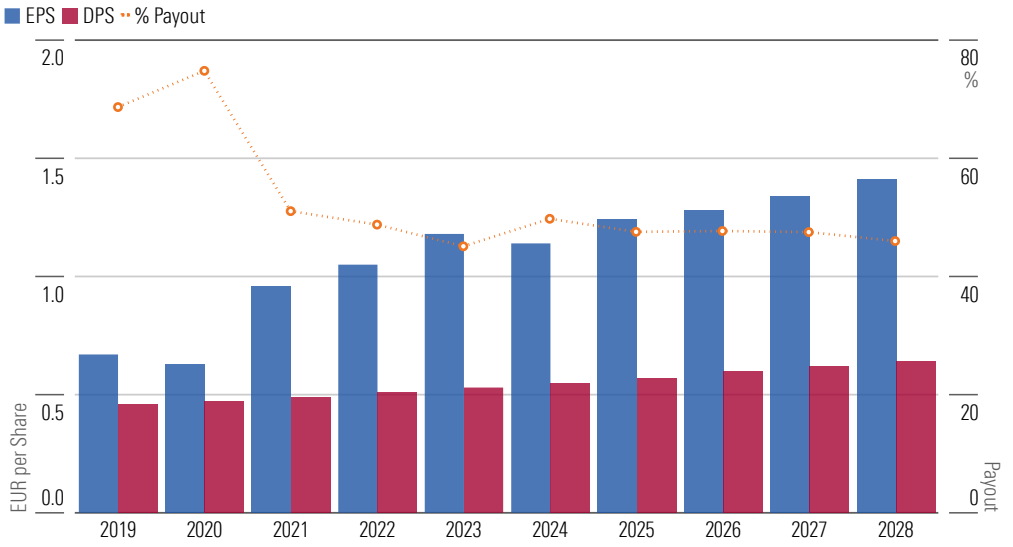
Source: Morningstar, E.On.

The 23% raise in annual investments between 2025 and 2028 drives an increase of 15% in our 2028 net income estimate to EUR 3.69 billion, implying a 12% upside to the guidance that year. It also drives a 6% increase in our fair value estimate to EUR 17. Our new fair value estimate implies an EV/EBITDA of 9 and P/E of 14.9. It offers a 31% upside to the current share price.

E.On aims to increase its dividend by up to 5% per year through 2028. This commitment is the longest among European utilities we cover. The firm has extended this commitment every year since 2020 when rolling over its business plan.

Since 2020, the dividend CAGR stands at 4.1%. We assume that dividend will increase by 4% annually through 2028 while EPS will grow by 3.7% annually in the meantime. The payout ratio will average 46% by 2028, below peers and reflecting the maintainability of the dividend policy.

Exhibit 22 E.On's Dividend Growth Is Maintainable



Source: Morningstar, E.On.

SSE: High Earnings Growth Underpinned by High Investments and Supportive Regulation

We expect SSE's electricity transmission and distribution grid to contribute close to 50% of the group's profits on a midcycle basis, up from 28% in fiscal 2024 due to high investments and a low base since distribution grids were hit by a negative timing effect in 2024 while profits of CCGTs were boosted by the energy crisis. SSE is the only European utility with all its electricity grid located in the UK, where we see the energy grid regulation as the most favorable in Europe.

However, close to half of profits come from businesses like renewables and thermal power output that have no moat due to the absence of barriers to entry and exposure to volatile commodity prices. All in all, we ascribe no moat to the company.

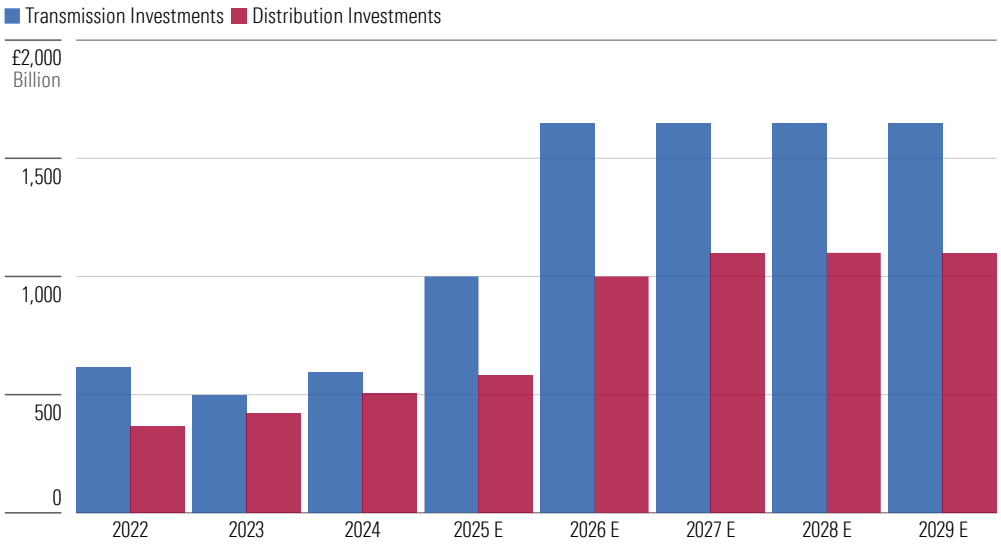
SSE's Grid Investments Are Surging

SSE intends to invest GBP 20.5 billion over fiscal 2023-27, implying annual investments of GBP 5.1 billion for the remaining three years of the plan—56% of these investments will be dedicated to electricity grid, of which 39% goes to transmission grid and 18% goes to distribution grid. The bulk of the rest will be for renewables investments.

In May 2023, the firm raised its investments guidance by 44%, chiefly due to grid while the share of investments allocated to renewables was reduced from 50% to 40%, aligning with the strategies adopted by other diversified utilities. In November 2024, the company increased its transmission investments by GBP 2.5 billion, or 14%, driven by its involvement in the ASTI transmission lines that will be commissioned in phases before and after 2030. Therefore, we expect the grid investments pace by fiscal 2027 to persist beyond. In total, we project SSE to invest 181% more in its transmission and distribution grid in the next five years than it did in the previous five years.

Unlike E.On, we think there is less upside for distribution investments as solar PV capacity additions (which tend to be more connected to the distribution grid) are much less predominant in the UK than in Germany. In any case, SSE already plans an increase of 120% of its distribution investments.

Exhibit 23 SSE's Contribution to ASTI Will Drive a Surge in Transmission Investments



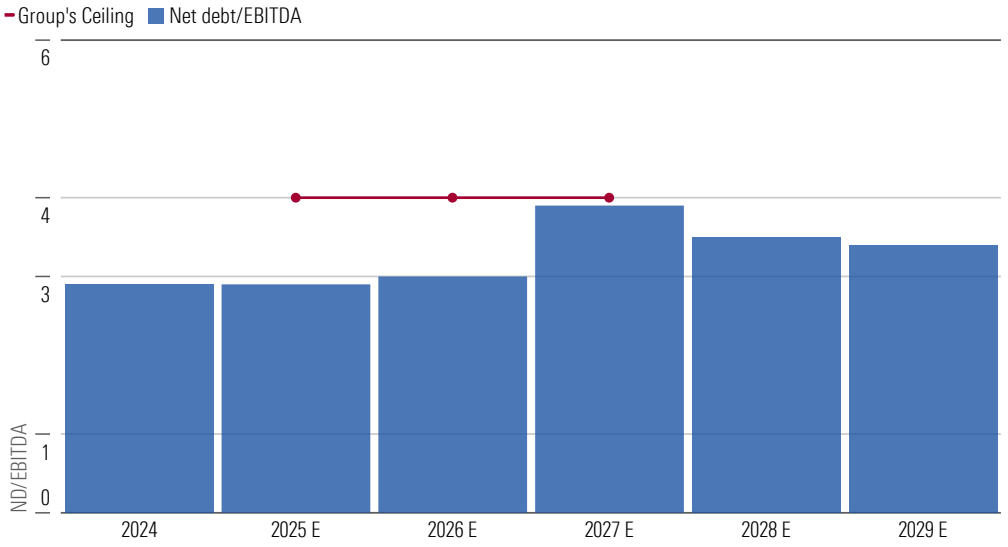
Source: Morningstar, SSE.

On the other hand, there is more upside in transmission investment since the ASTI transmission lines will bring only 11 GW of additional capacity out of 28 GW of offshore wind to be commissioned in Scotland by 2030. Since it will be impossible to cover the shortfall by 2030 due to the long construction time of those lines and limited capacity, the upside is more after 2030.

SSE's Balance Sheet Can Absorb the Upcoming Investments Ramp-Up

With the ramp-up of investments due to the construction of the ASTI transmission lines, we project that the net debt/EBITDA ratio will reach 3.9 in 2027, below the company's ceiling of 4 times.

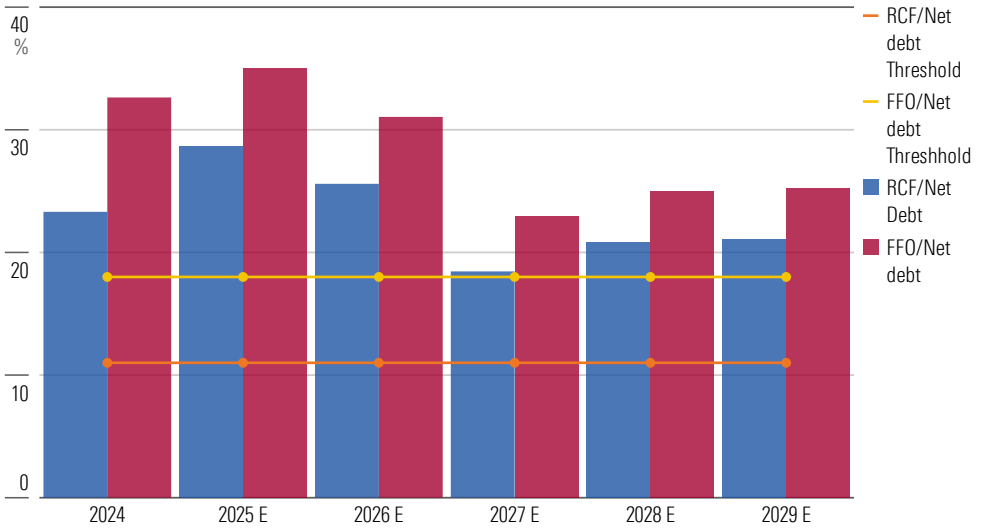
Exhibit 24 Leverage Ratio Will Remain Below the Company's Ceiling



Source: Morningstar, SSE.

Likewise, we reckon the company will exceed the thresholds required by Moody's and S&P to maintain the current credit ratings of Baa1 and BBB+, respectively (Exhibit 25).

Exhibit 25 SSE Should Continue to Exceed Its Credit Rating Thresholds

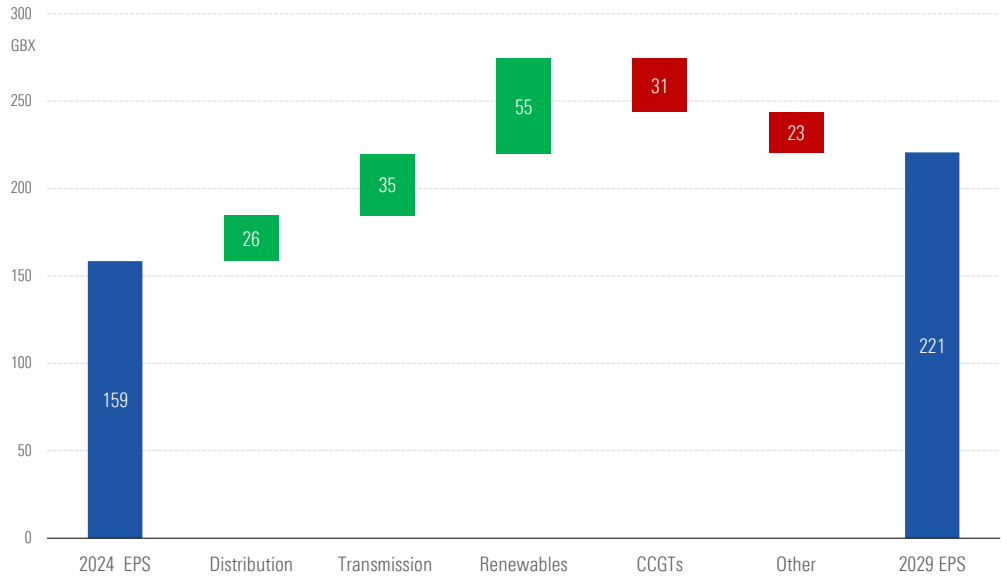


Source: Morningstar, SSE. Note: RCF stands for retained cash flow that equals FCF minus dividends, FFO for funds from operations that equates operating cash flow.

Grid Will Be Main Growth Driver

Extending the pace of investments of the latter years of the 2023-27 plan beyond 2027 drives a 14% increase in our long-term estimates. We now project a 6.9% EPS CAGR by 2029. Grid will be the main growth driver ahead of renewables.

Exhibit 26 We Project a 6.9% EPS CAGR From 2024 Through 2029



Source: Morningstar, SSE.

In 2027, our GBX 172 EPS estimate is short of the GBX 175-GBX 200 guidance range due to our power price assumption of GBP 60/MWh versus the group's GBP 65/MWh.

Our Fair Value Estimate Offers 30% Upside to the Current Share Price

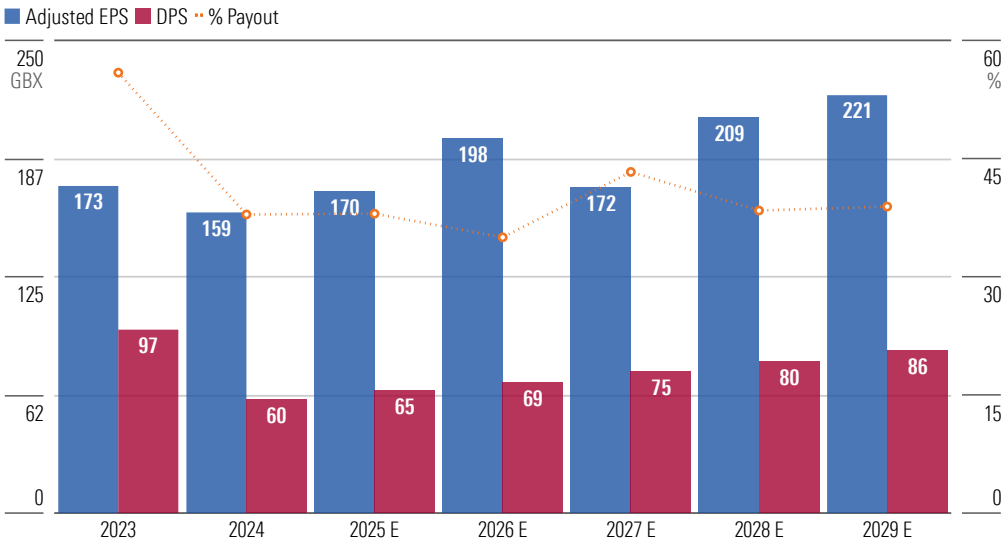
Our new EPS estimates drive an increase in our fair value estimate from GBX 2,250 to GBX 2,350. Our fair value estimate offers a 30% upside to the current share price and implies a fiscal 2025 P/E of 13.8 and EV/EBITDA of 11.7.

Dividend Guidance Looks Safe After the 2024 Rebase

SSE offers a dividend yield of 4.1%. In November 2021, the firm announced that it would rebase its dividend as of fiscal 2024 to GBX 60 per share to solve the capital allocation trade-off between high renewables and grid investments and dividend payments that it had previously grown in line with inflation every year. Consequently, dividend per share was cut by 38% in fiscal 2024. We commend this decision given the value-creative investment opportunities in renewables and grid. It is a much better capital allocation policy than National Grid, which kept increasing its dividend in line with inflation, ultimately leading to a highly dilutive rights issue in May 2024.

In November 2021, SSE said that after the rebase that the dividend would grow annually by at least 5%. Thanks to incremental financial headroom given by the energy crisis' material profits, in May 2023 SSE upgraded its annual dividend growth target until 2027 to a 5% to 10% range. We expect a 7.5% annual dividend growth until 2029, involving a GBX 86 per share dividend that year. This will be largely covered by a 6.9% earnings growth in the meantime. The 39% average payout by 2029 reflects the dividend's maintainability.

Exhibit 27 We Project a 7.5% Dividend CAGR Between 2024 and 2029



Source: Morningstar, SSE.

Appendix

Exhibit 28 SSE Valuation Model

SSE (LON:SSE)

MORNINGSTAR

Star Rating	Fair Value	Last Price	Uncertainty	Capital Allocation	Economic Moat	Last Modified
★★★★	23.5 GBP	18.2 GBP	Medium	Standard	None	October 22 2024

Tancrede Fulop		Five-Star Price	16.46	Estimated COE	7.5%	Adjusted P / E	10.73	13.84
0		Fair Value Estimate	23.51	Pre-Tax Cost of Debt	5.8%	EV / Adjusted EBITDA	8.23	9.66
tancreed.fulop@morningstar.com		One-Star Price	31.74	Estimated WACC	6.0%	EV / Sales	2.64	3.10
Energy		Market Price	18.23	ROIC *	8.5%	Price / Book	1.53	1.97
Utilities		P / FVE	0.78	Adjusted ROIC *	7.7%	FCF Yield	-1.1%	-0.9%
				* 5-Yr Projected Average		Dividend Yield	3.5%	2.7%
						(2025 Estimates)	(Price)	(Fair Value)

				Forecast					Historical CAGR/AVG		Projected CAGR/AVG	
Income Statement	**2022**	**2023**	**2024**	**2025E**	**2026E**	**2027E**	**2028E**	**2029E**	**3-Year**	**5-Year**	**3-Year**	**5-Year**
Revenue	8,608	12,491	10,457	10,666	10,880	11,097	11,319	11,546				
Gross Profit	4,395	(160)	4,350	3,716	4,211	4,029	4,735	5,009				
Operating Income	3,646	(809)	2,494	2,391	2,843	2,619	3,284	3,518				
Net Income	3,031	(123)	1,711	1,792	2,122	1,845	2,274	2,434				
Adjusted Income	1,006	1,786	1,731	1,866	2,195	1,919	2,348	2,508				
Adjusted EPS	0.98	1.73	1.59	1.70	1.98	1.72	2.09	2.21				
Adjusted EBITDA	3,646	(809)	3,296	3,424	3,966	3,774	4,470	4,733				
Growth (% YoY)												
Revenue	26.1%	45.1%	-16.3%	2.0%	2.0%	2.0%	2.0%	2.0%	18.3%		2.0%	2.0%
Gross Profit	63.3%	-103.6%	-2824.0%	-14.6%	13.3%	-4.3%	17.5%	5.8%	-954.8%		-1.9%	3.5%
Operating Income	39.6%	-122.2%	-408.4%	-4.1%	18.9%	-7.9%	25.4%	7.1%	-163.7%		2.3%	7.9%
Net Income	33.2%	-104.1%	-1490.7%	4.7%	18.4%	-13.0%	23.2%	7.0%	-520.5%		3.4%	8.1%
Adjusted EPS	8.1%	75.7%	-8.4%	7.2%	16.7%	-13.3%	21.4%	6.0%	25.1%		3.5%	7.6%
Adjusted EBITDA	39.6%	-122.2%	-507.6%	3.9%	15.9%	-4.8%	18.4%	5.9%				
Profitability (%)												
Gross Margin	51.1%	-1.3%	41.6%	34.8%	38.7%	36.3%	41.8%	43.4%	30.5%		36.6%	39.0%
Operating Margin	42.4%	-6.5%	23.9%	22.4%	26.1%	23.6%	29.0%	30.5%	19.9%		24.1%	26.3%
Net Margin	35.2%	-1.0%	16.4%	16.8%	19.5%	16.6%	20.1%	21.1%	16.9%		17.6%	18.8%
Adjusted EBITDA Margin	42.4%	-6.5%	31.5%	32.1%	36.5%	34.0%	39.5%	41.0%	22.5%		34.2%	36.6%
Return on Equity	38.2%	-1.2%	14.9%	14.4%	15.2%	12.0%	13.5%	13.1%	17.3%		13.9%	13.6%
Adjusted ROIC	7.4%	10.5%	9.0%	8.4%	8.7%	6.8%	7.5%	7.3%	9.0%		8.0%	7.7%
Leverage												
Debt / Capital	0.5x	0.5x	0.5x	0.5x	0.5x	0.5x	0.5x	0.4x				
Debt / EBITDA	2.5x	-11.2x	2.9x	3.3x	3.6x	3.8x	3.2x	3.0x				
EBITDA / Interest Expense	22.3x	1.3x	-2838.8x	12.1x	10.8x	8.1x	8.7x	8.5x				
Cash Flow												
Dividends per Share	0.86	0.97	0.60	0.65	0.69	0.75	0.80	0.86				
Free Cash Flow to the Firm	1,044	2,935	2,391	(231)	(1,929)	(2,195)	(654)	(428)				
Dividend Franking	-	-	-	-	-	-	-	-				
Dividend Payout Ratio	87.0%	55.9%	37.9%	38.0%	35.0%	43.3%	38.4%	38.9%				

Source: Morningstar. Share price of Oct. 18, 2024.

Exhibit 29 E.On Valuation Model

E.ON (FRA:EOAN)

MORNINGSTAR

Star Rating	Fair Value	Last Price	Uncertainty	Capital Allocation	Economic Moat	Last Modified
★★★★	17 EUR	13 EUR	Medium	Standard	Narrow	October 22 2024

Tancrede Fulop		Five-Star Price	11.89	Estimated COE	7.5%	Adjusted P / E	11.37	14.88
0		Fair Value Estimate	16.99	Pre-Tax Cost of Debt	5.5%	EV / Adjusted EBITDA	6.74	7.38
tancrede.fulop@morningstar.com		One-Star Price	22.94	Estimated WACC	5.8%	EV / Sales	1.00	1.09
Energy		Market Price	12.99	ROIC *	9.2%	Price / Book	1.55	2.03
Utilities		P / FVE	0.76	Adjusted ROIC *	7.0%	FCF Yield	-3.7%	-2.8%
				* 5-Yr Projected Average		Dividend Yield	4.2%	3.2%
						(2024 Estimates)	(Price)	(Fair Value)

				Forecast					Historical CAGR/AVG		Projected CAGR/AVG	
Income Statement	**2021**	**2022**	**2023**	2024E	2025E	2026E	2027E	2028E	**3-Year**	**5-Year**	3-Year	5-Year
Revenue	77,358	115,660	93,686	62,062	62,683	63,310	63,943	64,582				
Gross Profit	45	8,156	30,871	14,466	15,285	15,934	16,592	17,301				
Operating Income	6,676	1,070	1,195	6,036	6,568	6,937	7,323	7,766				
Net Income	4,691	1,831	517	2,982	3,237	3,352	3,495	3,686				
Adjusted Income	2,503	2,728	3,068	2,982	3,237	3,352	3,495	3,686				
Adjusted EPS	0.96	1.05	1.18	1.14	1.24	1.28	1.34	1.41				
Adjusted EBITDA	10,598	4,448	9,370	9,196	9,962	10,558	11,162	11,816				
Growth (% YoY)												
Revenue	26.9%	49.5%	-19.0%	-33.8%	1.0%	1.0%	1.0%	1.0%	19.1%		-10.6%	-6.0%
Gross Profit	-99.7%	18024.4%	278.5%	-53.1%	5.7%	4.2%	4.1%	4.3%	6067.8%		-14.4%	-7.0%
Operating Income	130.1%	-84.0%	11.7%	405.1%	8.8%	5.6%	5.6%	6.0%	19.3%		139.8%	86.2%
Net Income	361.3%	-61.0%	-71.8%	476.8%	8.5%	3.6%	4.3%	5.5%	76.2%		163.0%	99.7%
Adjusted EPS	52.7%	8.9%	12.4%	-2.8%	8.5%	3.6%	4.3%	5.5%	24.7%		3.1%	3.8%
Adjusted EBITDA	50.0%	-58.0%	110.7%	-1.9%	8.3%	6.0%	5.7%	5.9%				
Profitability (%)												
Gross Margin	0.1%	7.1%	33.0%	23.3%	24.4%	25.2%	25.9%	26.8%	13.4%		24.3%	25.1%
Operating Margin	8.6%	0.9%	1.3%	9.7%	10.5%	11.0%	11.5%	12.0%	3.6%		10.4%	10.9%
Net Margin	6.1%	1.6%	0.6%	4.8%	5.2%	5.3%	5.5%	5.7%	2.7%		5.1%	5.3%
Adjusted EBITDA Margin	13.7%	3.8%	10.0%	14.8%	15.9%	16.7%	17.5%	18.3%	9.2%		15.8%	16.6%
Return on Equity	34.8%	9.2%	2.5%	14.3%	14.1%	13.4%	12.8%	12.4%	15.5%		13.9%	13.4%
Adjusted ROIC	5.7%	6.3%	7.8%	7.3%	7.3%	7.0%	6.8%	6.7%	6.6%		7.2%	7.0%
Leverage												
Debt / Capital	0.7x	0.7x	0.7x	0.7x	0.7x	0.7x	0.7x	0.7x				
Debt / EBITDA	3.3x	7.7x	7.5x	4.2x	4.3x	4.4x	4.6x	4.7x				
EBITDA / Interest Expense	19.2x	-4.8x	4.3x	7.8x	7.9x	7.6x	7.4x	7.3x				
Cash Flow												
Dividends per Share	0.49	0.51	0.53	0.55	0.57	0.60	0.62	0.64				
Free Cash Flow to the Firm	7,139	8,295	23,246	(1,240)	(574)	(2,131)	(1,674)	(1,187)				
Dividend Franking	-	-	-	-	-	-	-	-				
Dividend Payout Ratio	51.1%	48.8%	45.1%	48.3%	46.2%	46.4%	46.3%	45.7%				

Source: Morningstar. Share price of Oct. 18, 2024.

Exhibit 30 Redeia Valuation Model

Redeia (MAD:RED)

MORNINGSTAR

Star Rating	Fair Value	Last Price	Uncertainty	Capital Allocation	Economic Moat	Last Modified
★★★	17.5 EUR	17.3 EUR	Low	Standard	None	October 21 2024

Tancrede Fulop
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tancrede.fulop@morningstar.com
Energy
Utilities

Five-Star Price	13.97
Fair Value Estimate	17.46
One-Star Price	21.83
Market Price	17.34
P / FVE	0.99

Estimated COE	7.5%
Pre-Tax Cost of Debt	5.5%
Estimated WACC	5.4%
ROIC *	4.9%
Adjusted ROIC *	4.9%

* 5-Yr Projected Average

Adjusted P / E	18.83	18.97
EV / Adjusted EBITDA	11.49	9.74
EV / Sales	8.31	7.04
Price / Book	6.03	6.07
FCF Yield	-1.0%	-1.0%
Dividend Yield	5.8%	5.7%
(2024 Estimates)	(Price)	(Fair Value)

				Forecast					Historical CAGR/AVG		Projected CAGR/AVG	
Income Statement	**2021**	**2022**	**2023**	**2024E**	**2025E**	**2026E**	**2027E**	**2028E**	**3-Year**	**5-Year**	**3-Year**	**5-Year**
Revenue	2,009	2,078	2,122	1,850	1,927	2,046	2,130	2,213				
Gross Profit	1,990	2,041	2,077	1,805	1,881	2,000	2,085	2,168				
Operating Income	992	962	990	792	838	915	980	1,042				
Net Income	680	665	691	481	501	553	599	645				
Adjusted Income	680	665	691	499	519	572	617	663				
Adjusted EPS	1.26	1.23	1.27	0.92	0.96	1.05	1.14	1.22				
Adjusted EBITDA	1,570	1,650	1,680	1,337	1,401	1,491	1,569	1,644				
Growth (% YoY)												
Revenue	-1.7%	3.4%	2.1%	-12.8%	4.2%	6.1%	4.1%	3.9%	1.3%		-0.8%	1.1%
Gross Profit	-1.3%	2.6%	1.7%	-13.1%	4.3%	6.3%	4.2%	4.0%	1.0%		-0.8%	1.1%
Operating Income	6.8%	-3.1%	2.9%	-20.0%	5.9%	9.2%	7.1%	6.4%	2.2%		-1.6%	1.7%
Net Income	9.4%	-2.2%	3.9%	-30.4%	4.2%	10.4%	8.2%	7.8%	3.7%		-5.2%	0.0%
Adjusted EPS	9.4%	-2.2%	3.7%	-27.7%	4.1%	10.1%	7.9%	7.5%	3.6%		-4.5%	0.4%
Adjusted EBITDA	9.7%	5.1%	1.8%	-20.4%	4.8%	6.4%	5.2%	4.8%				
Profitability (%)												
Gross Margin	99.1%	98.2%	97.8%	97.5%	97.6%	97.8%	97.9%	97.9%	98.4%		97.6%	97.7%
Operating Margin	49.4%	46.3%	46.6%	42.8%	43.5%	44.7%	46.0%	47.1%	47.4%		43.7%	44.8%
Net Margin	33.8%	32.0%	32.5%	26.0%	26.0%	27.0%	28.1%	29.1%	32.8%		26.3%	27.3%
Adjusted EBITDA Margin	78.1%	79.4%	79.1%	72.3%	72.7%	72.9%	73.6%	74.3%	78.9%		72.6%	73.2%
Return on Equity	34.6%	32.7%	37.2%	30.3%	32.6%	36.2%	38.3%	39.2%	34.8%		33.0%	35.3%
Adjusted ROIC	6.4%	5.5%	5.3%	4.6%	4.7%	4.9%	5.1%	5.2%	5.7%		4.7%	4.9%
Leverage												
Debt / Capital	0.8x	0.8x	0.8x	0.8x	0.9x	0.9x	0.9x	0.9x				
Debt / EBITDA	5.3x	4.8x	4.4x	5.8x	6.4x	6.8x	7.1x	7.5x				
EBITDA / Interest Expense	14.4x	16.4x	19.4x	13.4x	11.7x	11.6x	11.7x	12.1x				
Cash Flow												
Dividends per Share	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00				
Free Cash Flow to the Firm	1,209	499	(226)	(94)	(40)	140	203	264				
Dividend Franking	-	-	-	-	-	-	-	-				
Dividend Payout Ratio	79.6%	81.4%	78.5%	108.6%	104.4%	94.8%	87.9%	81.7%				

Source: Morningstar. Share price of Oct. 18, 2024.

Exhibit 31 Iberdrola Valuation Model

Iberdrola (MAD:IBE)

MORNINGSTAR

Star Rating	Fair Value	Last Price	Uncertainty	Capital Allocation	Economic Moat	Last Modified
★★	12.7 EUR	14.1 EUR	Medium	Standard	Narrow	October 17 2024

Tancrede Fulop		Five-Star Price	8.91	Estimated COE	9.0%	Adjusted P / E	16.35	14.78
0		Fair Value Estimate	12.72	Pre-Tax Cost of Debt	5.3%	EV / Adjusted EBITDA	9.68	7.08
tancrede.fulop@morningstar.com		One-Star Price	17.18	Estimated WACC	6.4%	EV / Sales	2.37	1.73
Energy		Market Price	14.07	ROIC *	7.5%	Price / Book	1.52	1.37
Utilities		P / FVE	1.11	Adjusted ROIC *	7.0%	FCF Yield	3.3%	3.6%
				* 5-Yr Projected Average		Dividend Yield	4.5%	4.9%
						(2024 Estimates)	(Price)	(Fair Value)

				Forecast					Historical CAGR/AVG		Projected CAGR/AVG	
Income Statement	**2021**	**2022**	**2023**	**2024E**	**2025E**	**2026E**	**2027E**	**2028E**	**3-Year**	**5-Year**	**3-Year**	**5-Year**
Revenue	39,114	53,949	49,335	62,651	64,973	67,304	69,584	71,727				
Gross Profit	17,062	20,199	23,302	26,100	27,493	29,185	30,317	31,398				
Operating Income	7,304	7,660	9,212	9,631	10,220	11,106	11,426	11,749				
Net Income	3,730	3,700	4,600	5,272	5,301	5,818	5,888	5,997				
Adjusted Income	3,885	3,869	4,803	5,475	5,504	6,021	6,091	6,200				
Adjusted EPS	0.60	0.60	0.75	0.86	0.86	0.94	0.95	0.96				
Adjusted EBITDA	7,304	7,660	14,417	15,304	16,303	17,599	18,345	19,063				
Growth (% YoY)												
Revenue	18.0%	37.9%	-8.6%	27.0%	3.7%	3.6%	3.4%	3.1%	15.8%		11.4%	8.2%
Gross Profit	5.7%	18.4%	15.4%	12.0%	5.3%	6.2%	3.9%	3.6%	13.1%		7.8%	6.2%
Operating Income	20.8%	4.9%	20.3%	4.5%	6.1%	8.7%	2.9%	2.8%	15.3%		6.4%	5.0%
Net Income	5.5%	-0.8%	24.3%	14.6%	0.6%	9.7%	1.2%	1.8%	9.7%		8.3%	5.6%
Adjusted EPS	7.3%	-1.0%	25.2%	15.2%	-0.6%	9.4%	1.2%	1.8%	10.5%		8.0%	5.4%
Adjusted EBITDA	20.8%	4.9%	88.2%	6.2%	6.5%	8.0%	4.2%	3.9%				
Profitability (%)												
Gross Margin	43.6%	37.4%	47.2%	41.7%	42.3%	43.4%	43.6%	43.8%	42.8%		42.4%	42.9%
Operating Margin	18.7%	14.2%	18.7%	15.4%	15.7%	16.5%	16.4%	16.4%	17.2%		15.9%	16.1%
Net Margin	9.5%	6.9%	9.3%	8.4%	8.2%	8.6%	8.5%	8.4%	8.6%		8.4%	8.4%
Adjusted EBITDA Margin	18.7%	14.2%	29.2%	24.4%	25.1%	26.1%	26.4%	26.6%	20.7%		25.2%	25.7%
Return on Equity	7.2%	6.5%	7.7%	8.8%	8.9%	9.4%	9.2%	9.0%	7.1%		9.0%	9.1%
Adjusted ROIC	6.3%	6.2%	6.7%	7.0%	7.0%	7.2%	7.0%	6.9%	6.4%		7.0%	7.0%
Leverage												
Debt / Capital	0.5x	0.6x	0.5x	0.6x	0.6x	0.6x	0.6x	0.6x				
Debt / EBITDA	7.6x	8.4x	6.7x	4.4x	4.5x	4.6x	4.7x	4.8x				
EBITDA / Interest Expense	7.3x	4.2x	4.2x	8.0x	6.9x	7.1x	6.9x	6.9x				
Cash Flow												
Dividends per Share	0.44	0.49	0.55	0.63	0.63	0.69	0.70	0.71				
Free Cash Flow to the Firm	4,428	5,641	7,002	2,991	(4,906)	1,108	1,986	3,464				
Dividend Franking	-	-	-	-	-	-	-	-				
Dividend Payout Ratio	73.1%	82.2%	73.6%	73.6%	73.6%	73.6%	73.6%	73.6%				

Source: Morningstar. Share price of Oct. 18, 2024.

Exhibit 32 National Grid Valuation Model

National Grid (LON:NG.)

MORNINGSTAR

Star Rating	Fair Value	Last Price	Uncertainty	Capital Allocation	Economic Moat	Last Modified
★★★	9.8 gbp	10.4 gbp	Medium	Standard	None	September 15 2024

Tancrede Fulop		Five-Star Price	6.87	Estimated COE	7.5%	Adjusted P / E	15.68	14.76
0		Fair Value Estimate	9.82	Pre-Tax Cost of Debt	5.3%	EV / Adjusted EBITDA	12.85	12.20
tancrede.fulop@morningstar.com		One-Star Price	13.26	Estimated WACC	5.4%	EV / Sales	7.68	7.29
Energy		Market Price	10.44	ROIC *	5.1%	Price / Book	1.32	1.25
Utilities		P / FVE	1.06	Adjusted ROIC *	4.6%	FCF Yield	2.3%	2.4%
				* 5-Yr Projected Average		Dividend Yield	4.5%	4.7%
						(2025 Estimates)	(Price)	(Fair Value)

				Forecast					Historical CAGR/AVG		Projected CAGR/AVG	
Income Statement	**2022**	**2023**	**2024**	**2025E**	**2026E**	**2027E**	**2028E**	**2029E**	**3-Year**	**5-Year**	**3-Year**	**5-Year**
Revenue	18,449	22,648	19,862	12,582	13,067	14,043	14,640	15,275				
Gross Profit	15,503	19,702	17,076	8,752	9,153	10,035	10,538	11,074				
Operating Income	4,371	4,879	4,475	5,201	5,466	6,462	7,297	8,015				
Net Income	2,261	7,797	2,290	3,249	3,289	3,949	4,463	4,857				
Adjusted Income	2,258	4,533	2,879	3,249	3,289	3,949	4,463	4,857				
Adjusted EPS	0.62	1.24	0.78	0.67	0.63	0.75	0.83	0.90				
Adjusted EBITDA	4,371	4,879	4,475	7,522	8,029	9,321	10,477	11,539				
Growth (% YoY)												
Revenue	24.8%	22.8%	-12.3%	-36.7%	3.9%	7.5%	4.2%	4.3%	11.8%		-8.4%	-3.3%
Gross Profit	25.0%	27.1%	-13.3%	-48.7%	4.6%	9.6%	5.0%	5.1%	12.9%		-11.5%	-4.9%
Operating Income	51.0%	11.6%	-8.3%	16.2%	5.1%	18.2%	12.9%	9.8%	18.1%		13.2%	12.5%
Net Income	37.9%	244.8%	-70.6%	41.9%	1.2%	20.1%	13.0%	8.8%	70.7%		21.1%	17.0%
Adjusted EPS	15.7%	98.4%	-37.1%	-14.7%	-5.0%	18.4%	11.4%	7.4%	25.7%		-0.4%	3.5%
Adjusted EBITDA	51.0%	11.6%	-8.3%	68.1%	6.7%	16.1%	12.4%	10.1%				
Profitability (%)												
Gross Margin	84.0%	87.0%	86.0%	69.6%	70.0%	71.5%	72.0%	72.5%	85.7%		70.4%	71.1%
Operating Margin	23.7%	21.5%	22.5%	41.3%	41.8%	46.0%	49.8%	52.5%	22.6%		43.1%	46.3%
Net Margin	12.3%	34.4%	11.5%	25.8%	25.2%	28.1%	30.5%	31.8%	19.4%		26.4%	28.3%
Adjusted EBITDA Margin	23.7%	21.5%	22.5%	59.8%	61.4%	66.4%	71.6%	75.5%	22.6%		62.5%	66.9%
Return on Equity	10.3%	29.2%	7.7%	9.6%	8.6%	10.0%	10.9%	11.3%	15.7%		9.4%	10.1%
Adjusted ROIC	4.9%	4.6%	4.5%	4.4%	4.3%	4.6%	4.8%	4.8%	4.7%		4.4%	4.6%
Leverage												
Debt / Capital	0.7x	0.6x	0.6x	0.6x	0.6x	0.6x	0.6x	0.6x				
Debt / EBITDA	10.4x	8.8x	10.5x	6.9x	7.2x	6.8x	6.1x	5.5x				
EBITDA / Interest Expense	4.3x	3.8x	3.1x	5.5x	5.0x	5.1x	5.1x	5.0x				
Cash Flow												
Dividends per Share	0.51	0.55	0.59	0.47	0.48	0.49	0.50	0.51				
Free Cash Flow to the Firm	2,520	8,474	3,575	1,170	(3,783)	(3,609)	(3,637)	(3,711)				
Dividend Franking	-	-	-	-	-	-	-	-				
Dividend Payout Ratio	81.6%	44.8%	75.0%	70.1%	76.0%	65.5%	60.0%	56.9%				

Source: Morningstar. Share price of Oct. 18, 2024.

Research Methodology for Valuing Companies

Overview

At the heart of our valuation system is a detailed projection of a company's future cash flows, resulting from our analysts' research. Analysts create custom industry and company assumptions to feed income statement, balance sheet, and capital investment assumptions into our globally standardized, proprietary discounted cash flow, or DCF, modeling templates. We use scenario analysis, in-depth competitive advantage analysis, and a variety of other analytical tools to augment this process. We think analyzing valuation through discounted cash flows presents a better lens for viewing cyclical companies, high-growth firms, businesses with finite lives (mines, for example), or companies expected to generate negative earnings over the next few years. That said, we don't dismiss multiples altogether but rather use them as supporting cross-checks for our DCF-based fair value estimates. We also acknowledge that DCF models offer their own challenges (including a potential proliferation of estimated inputs and the possibility that the method may miss short-term market-price movements), but we believe these negatives are mitigated by deep analysis and our long-term approach.

Morningstar's Equity Research Group ("we," "our") believes that a company's intrinsic worth results from the future cash flows it can generate. The Morningstar Rating for stocks identifies stocks trading at a discount or premium to their intrinsic worth—or fair value estimate in Morningstar terminology. Five-star stocks sell for the biggest risk-adjusted discount to their fair values, whereas 1-star stocks trade at premiums to their intrinsic worth.

Four key components drive the Morningstar rating:

- our assessment of the firm's economic moat.
- our estimate of the stock's fair value.
- our uncertainty around that fair value estimate.
- the current market price.

This process ultimately culminates in our single-point star rating.

Economic Moat

The Morningstar Economic Moat Rating is a structural feature that Morningstar believes positions a firm to earn durable excess profits over a long period of time, with excess profits defined as returns on invested capital above our estimate of a firm's cost of capital. The economic moat rating is not an indicator of the investment performance of the investment highlighted in this report. Narrow-moat companies are those that Morningstar believes are more likely than not to achieve normalized excess returns for at least the next 10 years. Wide-moat companies are those that Morningstar believes will earn excess returns for 10 years, with excess returns more likely than not to remain for at least 20 years. Firms without a moat, including those that have a substantial threat of value destruction-related risks related to environmental, social, and governance; industry disruption; financial health; or other idiosyncratic issues, are more susceptible to competition. Morningstar has identified five sources of economic moats: intangible assets, switching costs, network effect, cost advantage, and efficient scale.

Fair Value Estimate

Each stock's fair value is estimated by using a proprietary discounted cash flow model, which assumes that the stock's value is equal to the total of the free cash flows of the company is expected to generate in the future, discounted back to the present at the rate commensurate with the riskiness of the cash flows. As with any DCF model, the ending value is highly sensitive to Morningstar's projections of future growth.

Fair Value Uncertainty

The Morningstar Uncertainty Rating represents the analysts' ability to bound the estimated value of the shares in a company around the fair value estimate, based on the characteristics of the business underlying the stock, including operating and financial leverage, sales sensitivity to the overall economy, product concentration, pricing power, exposure to material ESG risks, and other company-specific factors. Based on these factors, analysts classify the stock into one of several uncertainty levels: Low, Medium, High, Very High, or Extreme. Our recommended margin of safety—the discount to fair value demanded before we'd recommend buying or selling the stock—widens as our uncertainty of the estimated value of the equity increases.

Market Price

The market prices used in this analysis and noted in the report come from exchanges on which the stock is listed, which we believe is a reliable source.

Morningstar Rating for Stocks

The Morningstar Rating for Stocks is a forward-looking, analyst-driven measure of a stock's current price relative to the analyst's estimate of what the shares are worth. Stock star ratings indicate whether a stock, in the equity analyst's educated opinion, is cheap, expensive, or fairly priced. To rate a stock, analysts estimate what they think it is worth (its "fair value"), using a detailed, long-term cash flow forecast for the company. A stock's star rating depends on whether its current market price is above or below the fair value estimate. Those stocks trading at large discounts to their fair values receive the highest ratings (4 or 5 stars). Stocks trading at large premiums to their fair values receive lower ratings (1 or 2 stars). A 3-star rating means the current stock price is close to the analyst's fair value estimate.

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Please note that investments in securities are subject to market and other risks, and there is no assurance or guarantee that the intended investment objectives will be achieved. Past performance of a security may or may not continue in the future and is no indication of future performance. A security investment’s return and an investor's principal value will fluctuate so that, when redeemed, an investor's shares may be worth more or less than their original cost.

A security's current investment performance may be lower or higher than the investment performance noted within the report. Morningstar's Uncertainty Rating is a useful data point with respect to sensitivity analysis of the assumptions used in our determining a fair value price.

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