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Electrifying Growth

Decarbonization megatrend offers generational growth for electrical equipment suppliers.

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Contents

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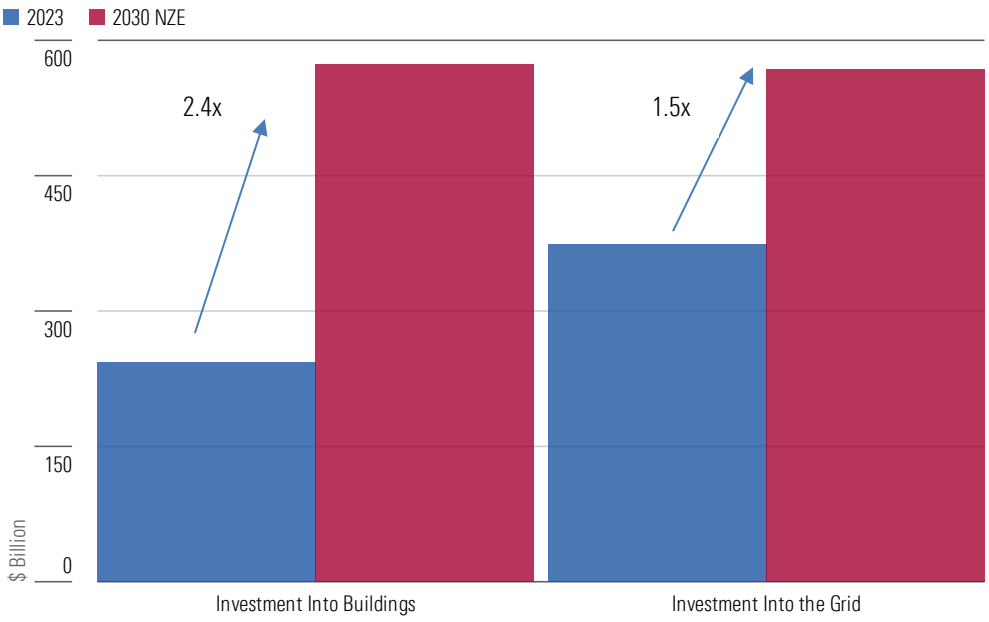
Executive Summary

Electrical equipment suppliers are set for generational growth, underpinned by the energy transition. We're forecasting revenue growth 2 times higher than expected GDP during the next five years. However, the growth story for electrical equipment suppliers lasts much longer than simply five years if environmental targets are going to be delivered. Modernizing an outdated electrical grid built over 40 years ago and reducing emissions in buildings are two major obstacles to achieving net-zero by 2050. According to the IEA, electrical infrastructure and building efficiency annual investment will need to double by 2030, propelling demand for mission-critical electrical equipment. (Exhibit 1).

Exhibit 1 Achieving Net-Zero Requires Double the Annual Investment Into the Electrical Grid and Building Efficiency



Source: International Energy Agency, 2023.

As Mark Twain is believed to have said, "During the gold rush, it's a good time to be in the picks and shovel business." Electrical equipment represents a small but critical cost enabling the reduction of CO2 emissions from the power sector and buildings, which collectively contribute half of global greenhouse gas emissions. We believe Schneider Electric and Eaton are best positioned to benefit from rising investment by utilities and building owners, reflected by our expected 5-year annualized EPS growth of

10% and 15%, respectively. While their peers enjoy similar opportunities, many have more complex businesses with other operating segments, diluting their exposure to the energy transition theme.

Key Takeaways

- Suppliers of electrical equipment earn the majority of their revenues from the power sector and buildings, which collectively contribute half of global greenhouse gas emissions. We anticipate equipment suppliers are poised for once-in-a-generation growth as both sectors decarbonize to meet environmental targets, supporting an average 10% earnings per share growth through 2028 across the electrical sector.
- Climate commitments made by governments and industries in developed markets imply a 2.5 times increase in the annual investment in grid infrastructure during the next decade, which offers visibility into demand from businesses previously perceived by investors to be correlated to the macroeconomic environment. Even if the announced pledges are met, they will still fall short of the IEA's net-zero by 2050 scenario, providing even further upside.
- Underinvestment in the power grid is one of the biggest bottlenecks to the energy transition. Modernizing the grid with new electrical equipment and digital enhancements to accommodate an influx of renewable energy sources and protect the grid from frequent extreme weather-related events will require $600 billion of annual investment before the end of the decade.
- Investment plans by US and European utilities indicate over 20% investment growth in the electrical grid during the next three years, which will underpin record profitability for suppliers of critical equipment.
- Buildings contribute 26% of greenhouse gas emissions and are being targeted by regulators to improve their energy efficiency. Assets owners risk having stranded assets unless they revamp existing properties to satisfy energy-efficiency standards, which will require incremental electrical content.
- Schneider Electric and Eaton are the best-positioned multinational electrical equipment suppliers for higher investment by building owners and electric utilities to support climate ambitions. We estimate Schneider and Eaton will grow their Earnings Per Share by 10% and 15%, respectively, annualized through 2028.
- We prefer Schneider Electric over Eaton because of valuation reasons. We view shares in Schneider Electric to be fairly valued, while Eaton screens as overvalued.

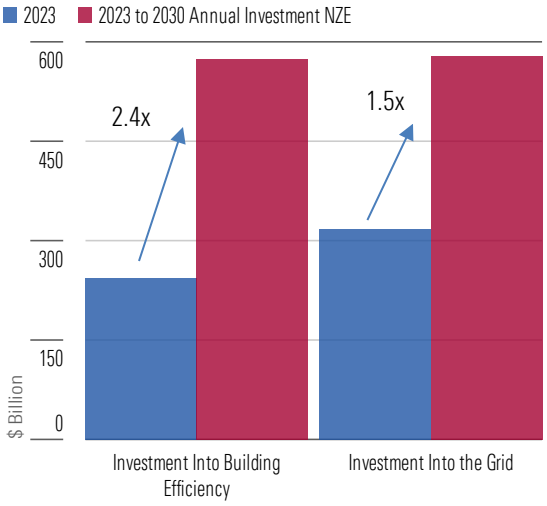
Companies Mentioned

Name/Ticker	Economic Moat	Currency	Fair Value Estimate	Current Price	Uncertainty Rating	Morningstar Rating	Market Cap (Bil)
Schneider Electric SU	Wide	EUR	236.00	239.40	Medium	★★★	146.00
Eaton ETN	Wide	USD	274.00	331.58	Medium	★★	137.00
ABB ABBN	Wide	CHF	45.00	48.43	Medium	★★★	92.73
Siemens AG SIE	Wide	EUR	194.00	181.72	Medium	★★★	151.61
Siemens Energy ENR	None	EUR	25.00	35.23	Very High	★★	28.95
Legrand LR	Narrow	EUR	94.00	104.50	Medium	★★	27.45
GE Vernova GEV	Narrow	USD	203.00	276.42	High	★★	75.51
Honeywell HON	Wide	USD	197.00	2052.68	Medium	★★★	133.74

Exhibit 2 Six Charts Showcasing the Secular Growth Drivers for Electrical Equipment Suppliers

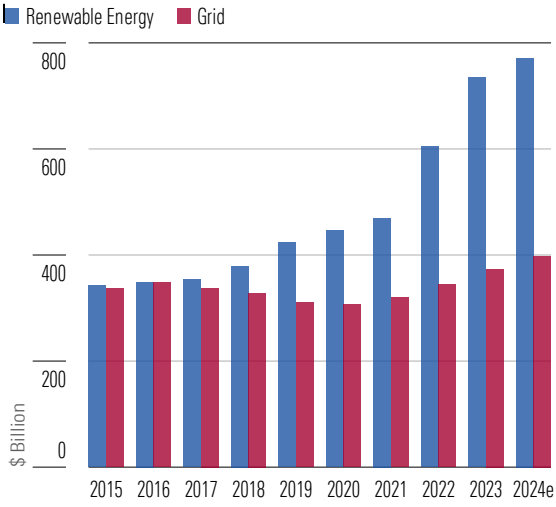
Source: Morningstar

Exhibit 2a Net-Zero Targets Require Double The Annual Investment



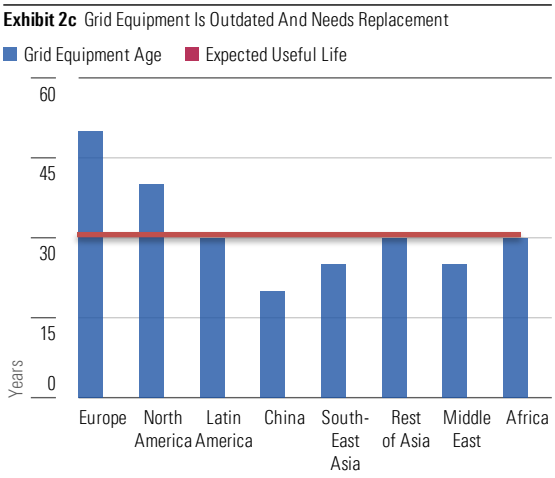
Source: IEA

Exhibit 2b Grid Investments Have Failed to Keep Up With Renewable Growth



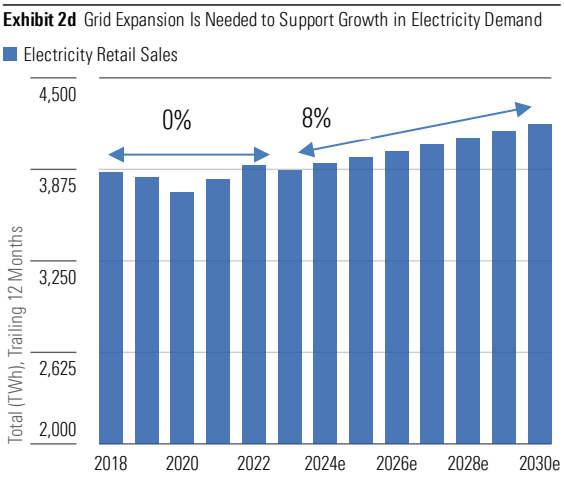
Source: IEA

Exhibit 2c Grid Equipment Is Outdated And Needs Replacement



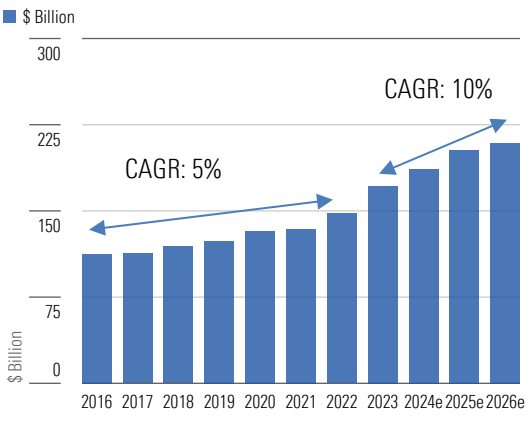
Source: Nexans Capital Markets Day

Exhibit 2d Grid Expansion Is Needed to Support Growth in Electricity Demand



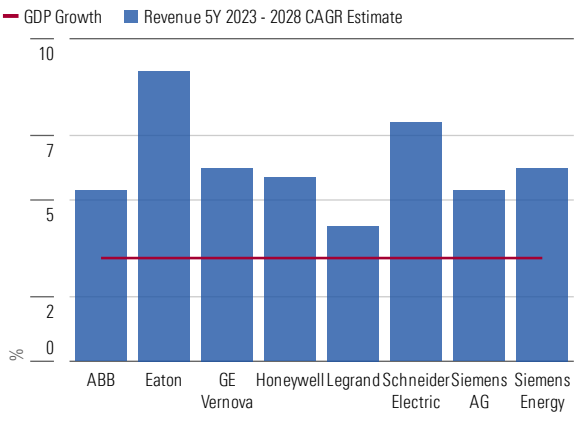
Source: Morningstar, EIA

Exhibit 2e U.S. Electric Utilities Have Laid Out Ambitious Grid Investment Plans



Source: Morningstar, EEI

Exhibit 2f We Forecast Revenues to Grow Double Expected Global GDP

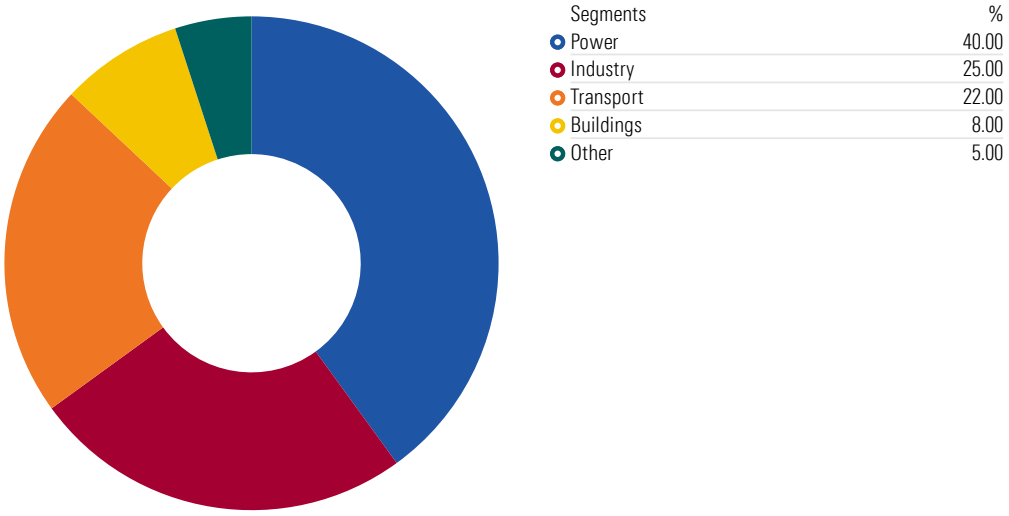


Source: Morningstar, IMF

Government Stimulus and Strict Regulations Will Incentivize Investment into Decarbonizing Buildings and the Power Sector

When asked about achieving environmental targets, Kadri Simson, the European commissioner of energy, astutely stated, " It is time to shift our attention from targets and rules to what is needed to make things happen." We expect global stimulus packages and strict building regulations to trigger such action. Buildings and the power sector collectively contribute half of global greenhouse gas emissions (Exhibit 3), but are also two industries that we believe are most easily decarbonized.

Exhibit 3 The Power Sector and Buildings Account for Half of Greenhouse Gas Emissions



Source: ABB, IEA.

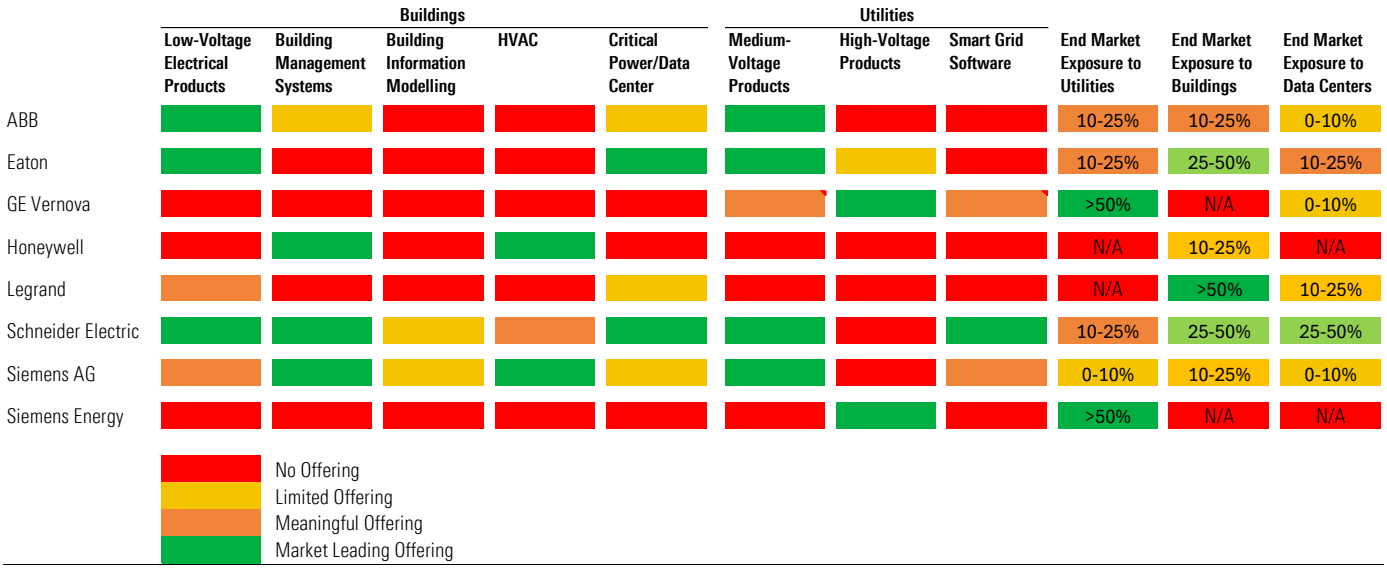
Decarbonizing electricity generation is the most immediate target for emissions reductions, in part because it is the largest source of energy sector carbon emissions (40% globally) and also because electrification using emissions-free power generation is the fastest scalable path for decarbonizing other sectors. Buildings, which emit most of their emissions through the production of heat and electricity used within the building, offer corporations a relatively easy target to decarbonize without impacting their core operations.

Summary of Electrical Suppliers' Exposure to Decarbonization Themes

Electrical equipment is used by different customers depending on its voltage, and therefore suppliers have varying exposure to decarbonization themes. Utilities typically require a combination of high- and medium-voltage equipment for different parts of the grid, while residential buildings have low-voltage requirements. Therefore, high- and medium-voltage equipment will benefit most from an increase in investment by utilities, while medium- and low-voltage equipment is best positioned for the electrification of buildings.

We don't differentiate between the exposure for US- and European-listed suppliers, as the below-mentioned businesses each have sizeable businesses across continents. ABB, Legrand, Schneider Electric, Siemens AG, and Siemens Energy each earn between 20% and 35% of their revenue from the US, which is their largest geographical market, despite being listed in Europe. The secular growth themes are also visible on both continents, as evident by stimulus imposed and investment plans from listed-utilities in both regions.

Exhibit 4 Schneider Electric Is the Best-Positioned Electrical Business to Decarbonize Buildings and Enable the Energy Transition



Source: Morningstar, company reports.

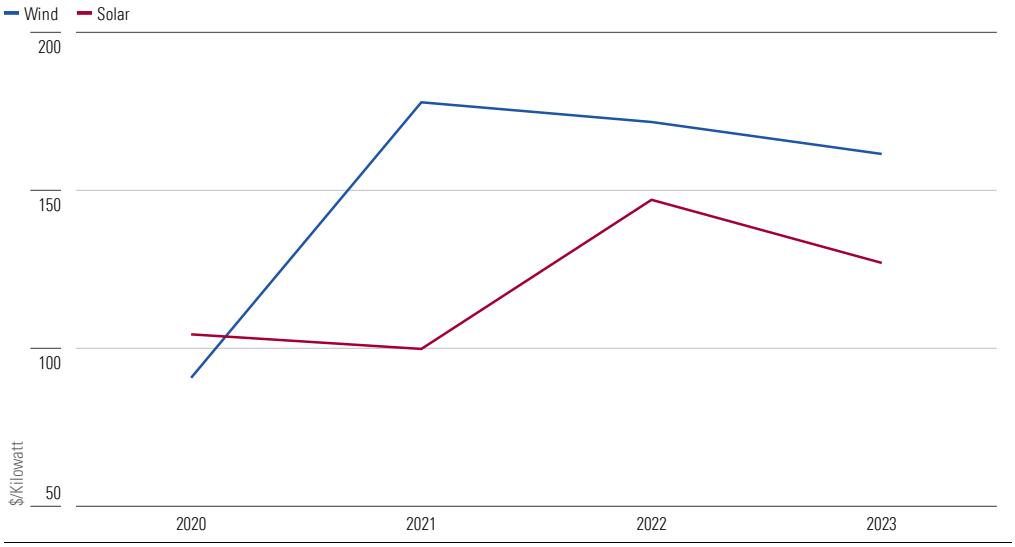
While suppliers of high-voltage electrical equipment, such as GE Vernova and Siemens Energy's Electrification segments will benefit most from higher spending to upgrade grid infrastructure, we deem their investment thesis to be more uncertain. Both GE Vernova and Siemens Energy earn a large contribution of revenue from gas and wind turbines, which we think offers a more complicated investment thesis than Schneider Electric and Eaton. Conversely, Legrand has the largest end-market exposure to buildings, but its portfolio is weighted toward low-voltage electrical equipment which benefits least from grid modernization needed for the energy transition.

Achieving Renewable Energy Targets Will Require Grid Modernization, Propelling Demand for Electrical Equipment

A major aspect of the electrification megatrend is the additional investment required to modernize outdated infrastructure to support the energy transition and improve its resilience to extreme weather events. Much of the focus of the energy transition has been on increasing renewable energy generation, but an outdated power grid is proving to be the biggest obstacle in achieving renewable energy targets. Costs and lead times associated with connecting renewable energy to the grid have nearly doubled since 2020 (Exhibit 5), mostly driven by the necessary upgrades needed to accommodate new generating capacity. For wind projects, the costs are mostly connected to the investment required into transmission lines, while solar plants are more often connected to the distribution grid. According to

Lawrence Berkeley National Laboratory, it cost twice as much to connect a US wind plant to the grid than a thermal plant in 2023. For solar, it was 50% more expensive. We expect the data to be similar in Europe.

Exhibit 5 Costs To Add Renewables to the Grid Have Almost Doubled and Threaten Climate Change Ambitions



Source: ThunderSaid Energy, 2023.

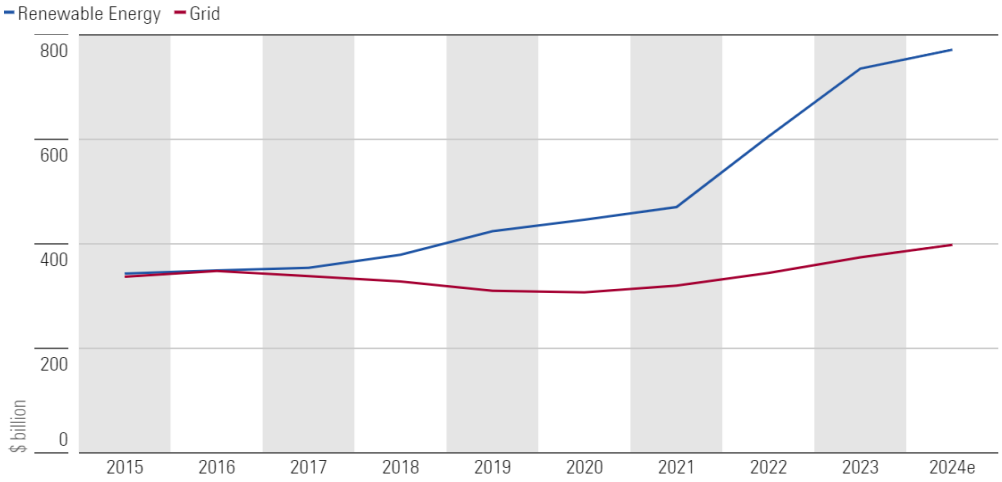
The required grid investment will drive demand for electrical suppliers in the following ways:

- Replacement Demand
  1. Grid Expansion.
  2. Adoption of Digital Solutions to Ensure the Reliability of the Grid.

Grid Modernization Creates Replacement Demand for Outdated Electrical Equipment

While investment into renewable power has grown by 9% annualized since 2015 due to proven reliability and declining costs, investment into the grid has remained largely stable at around $300 billion per year (Exhibit 6). Spending remains comfortably below the $600 billion estimated by the IEA to achieve net-zero emissions, supporting evidence of the significant upside potential possible for suppliers of equipment. The CEO of Nexans, a leading supplier of long-distance cables connecting electricity grids to renewable energy projects, explains the magnitude of the task by comparing the necessary upgrades needed to the grid to meet renewable energy targets with the telecommunications sector moving from 2G to 5G in 10 years.

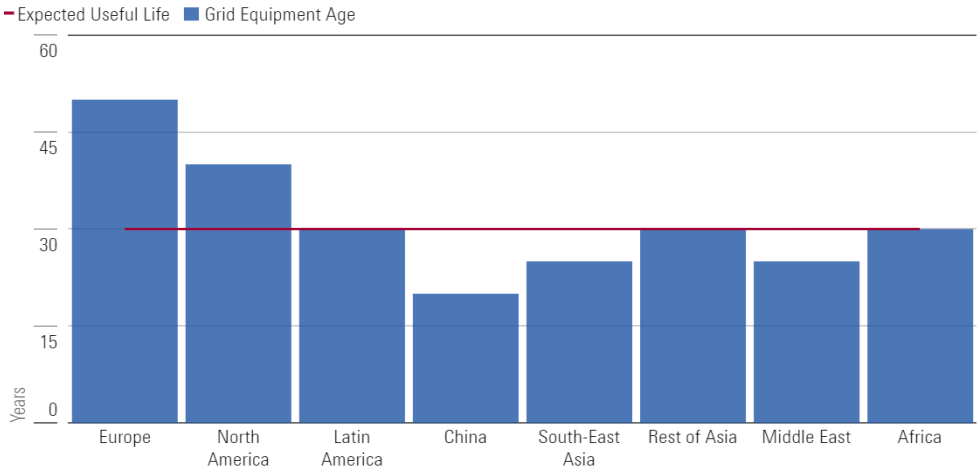
Exhibit 6 Investment Into the Electrical Grid Has Failed to Keep Up With Renewable Energy Investment



Source: International Energy Agency, 2024.

Most of the electrical grid in Europe and the US was built over 40 years ago, well beyond its useful life, and is outdated even without considering the energy transition or an influx of extreme weather-related events (Exhibit 7). When old equipment fails, the consequences can be disastrous, causing wildfires and outages.

Exhibit 7 Electrical Grid Is Beyond Its Useful Life and Needs Major Modernization To Accommodate Renewables



Source: Nexans CMD Presentation, 2021.

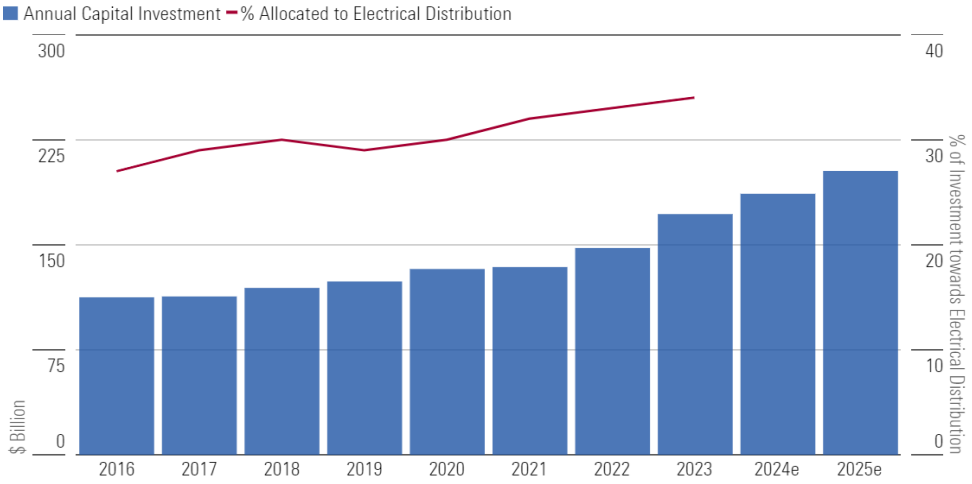
An outdated grid also poses a threat to achieving climate targets, reducing the efficiency of the electricity being transmitted through it, and is a major contributor the rise in interconnection fees of renewable energy to the grid. Upgrade delays have been most pronounced in Europe and North America. Even if both regions deliver on the announced pledges, implying investment growth of 45%

and 69%, respectively, during the next two decades—they will still fall short of the IEA's net-zero targets.

Ambitious Utility Investment Plans Helped by Supportive Stimulus

Favorable stimulus from the U.S Infrastructure Investment and Jobs Act has already translated into higher capital-expenditure spending by utilities. In 2023, US electric utilities invested $172 billion in capital expenditure, a 16% increase year over year, which followed a 10% increase in the previous year (Exhibit 8). An increasing percentage of this expenditure is being allocated toward distribution equipment, rising from 27% in 2016 to 34% in 2023.

Exhibit 8 Distribution Equipment Is Capturing a Greater Share of Electric Utilities' Investment



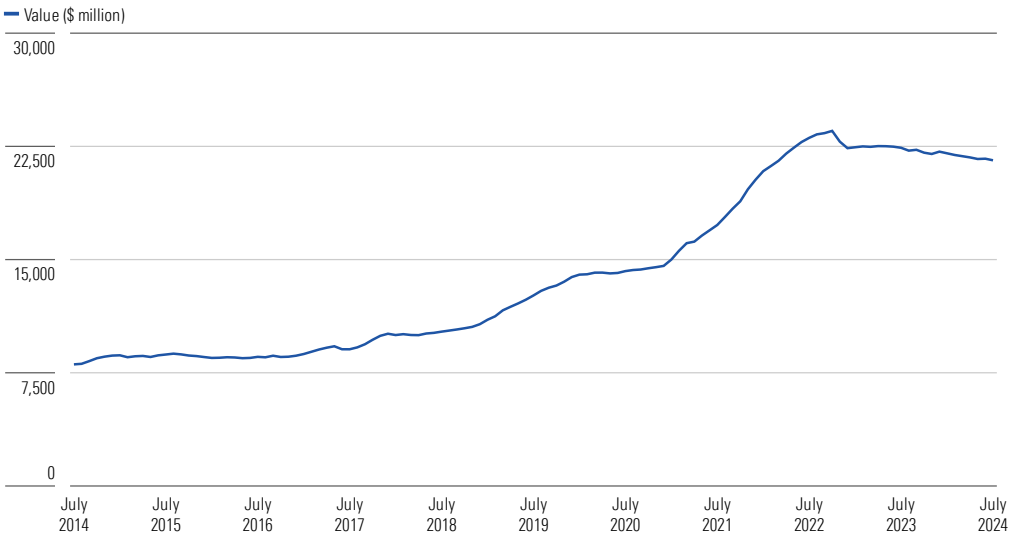
Source: Edison Electric Institute, 2024.

We expect to observe a similar theme in Europe following the European Commission's launch of 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. Several European utilities have laid out optimistic plans to increase their investments into the electrical grid. We expect the median investment into the electrical grid by National Grid, Redeia, E.On, Iberdrola and SSE to double over the next five years compared with the previous five years.

For more information on European electric utilities' grid investment plans, refer to: (Electric) Grid is Good for European Utilities

The rise in spending has created unprecedented demand for electrical equipment (Exhibit 9), increasing lead times to one year-3 years and from 12 weeks-24 weeks. According to Wood Mackenzie, the prices of circuit breakers and medium-voltage switchgear prices have increased by 21% and 26%, respectively, since January 2022. Bolstering transmission and distribution to accommodate for increasing electricity demand is one of the main drivers behind the elevated demand.

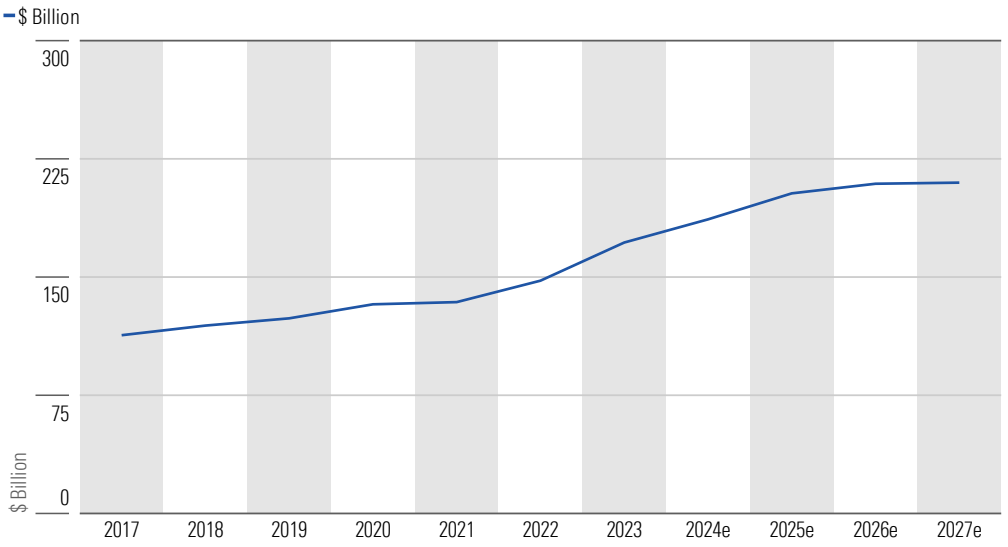
Exhibit 9 Grid Modernization Is Propelling Demand for Electrical Equipment to Unprecedented Levels



Source: US Bureau of Labor Statistics. Data as of September 2024.

We view recent levels of growth to be sustainable, supported by our internal capital expenditure forecasts for Utilities (Exhibit 10). During the next three years we forecast average capital expenditure of $200 billion by US utilities, or 7% annualized growth. We estimate that approximately 70% of the investments are being allocated to modernizing and expanding the electric grid.

Exhibit 10 We Forecast 7% Annualized Capital Expenditure Growth by US Electric Utilities During the Next 3 Years

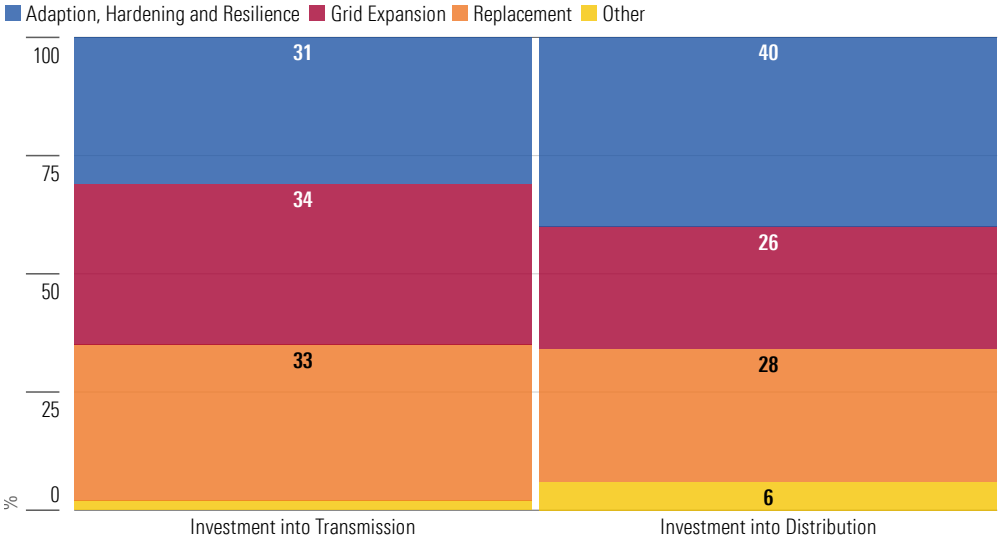


Source: Morningstar, Edison Electric Institute.

Improving Grid Resilience From Extreme Weather Creates Additional Demand for Electrical Equipment

Replacing aging infrastructure is one part of the grid investment required, another meaningful part is improving its resilience to extreme weather by moving infrastructure underground. Approximately 40% of capital expenditure is being directed toward improving the resilience of the grid from more frequent severe weather events, which makes it the largest sub-category of investment by US electric utilities (Exhibit 11).

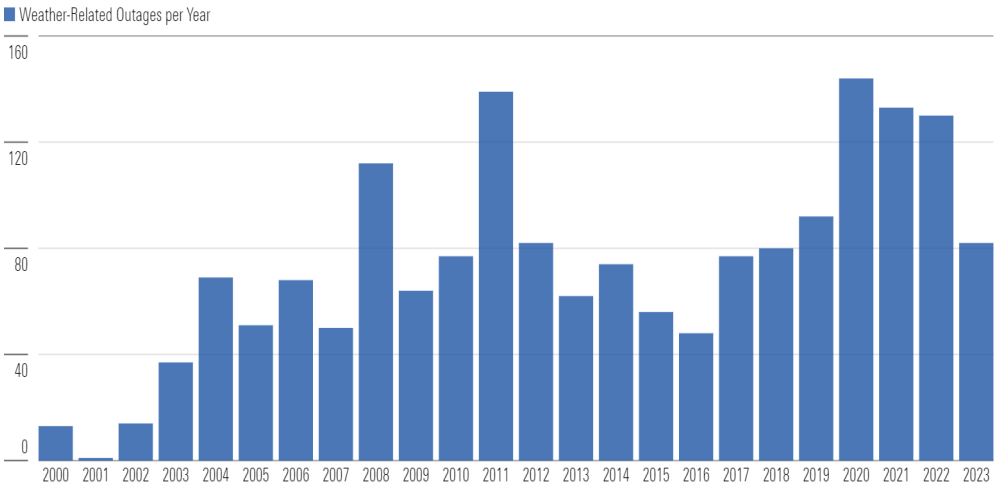
Exhibit 11 Investments Into Hardening the Grid Represent the Biggest Portion of Electric Utilities Capital Expenditure in the US



Source: Edison Electric Institute, 2024.

Severe weather is the number-one cause for power outages in the United States. According to Climate Central, 80% of all major US power outages were due to extreme weather. There were an average of 60 weather-related outages between 2000-13 (Exhibit 12), but an average of over 90 between 2014 -23, an increase of over 50%. The increasing likelihood of extreme weather affecting infrastructure has led several electric utilities including PG&E, Dominion Energy, WEC Energy and FPL to harden their electrical systems by moving them underground.

Exhibit 12 A 50% Increase in Weather-Related Outages Since 2014 Is Driving Infrastructure Underground

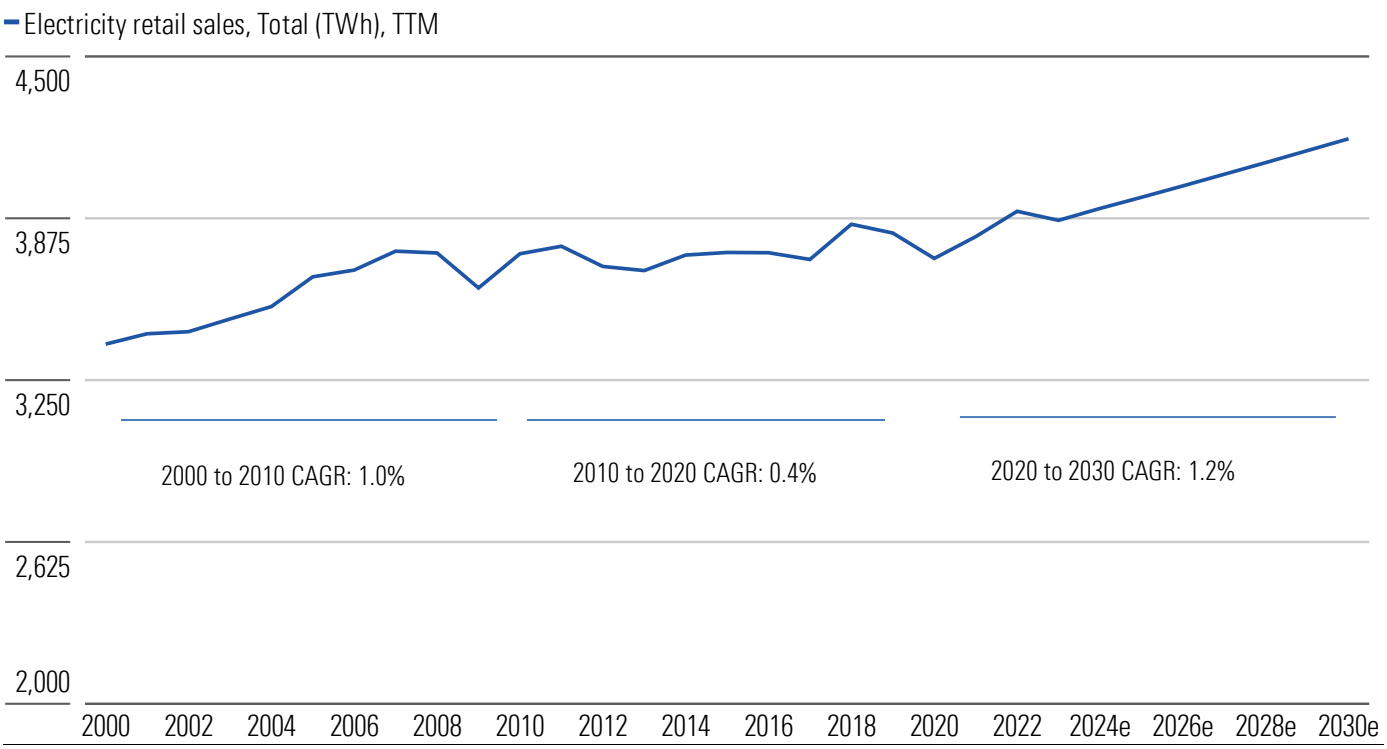


Source: Climate Central.

New Electrical Equipment Will Be Needed to Expand the Grid To Accommodate the Fastest Growth In Electricity Demand Experienced In Two Decades

Electricity demand is set to experience its highest demand in the last two decades. Our base case is for 1.4% annualized US electricity demand growth through 2032, while according to the IEA, demand in Europe is expected to grow 2.4% per year on average during the next three years. To put this into perspective, this follows two decades of virtually flat power demand across Europe and the US (Exhibit 13). The main growth drivers are the electrification of the transportation sector combined with the onshoring of manufacturing and large amounts of electricity needed to power energy-intensive data centers.

Exhibit 13 Electricity Demand Is Expected To Grow at Its Fastest Pace in the Last Two Decades



Source: Morningstar, US Energy Information Administration.

The surge in power demand triggered by artificial intelligence is another major driver behind the expected increase in electricity demand. Modern data centers can require over 50 times the electricity per square foot compared to a typical office building. Generative AI requires 30 times more electricity than a Google search, according to a study by Alex de Vries of the VU Amsterdam School of Business and Economics. Estimates from third parties suggest electricity use for generative artificial intelligence could climb to between 6%-7.5% of total demand, up from just 2.5% today. That figure is even higher in countries with favorable legislation/climates for data centers. In Ireland, data centers are expected to account for 32% of national electricity demand in 2026, according to the IEA.

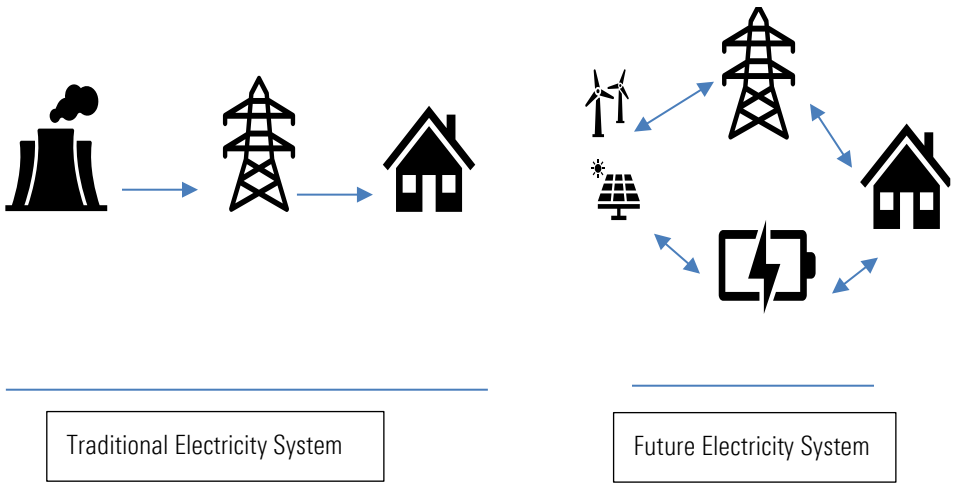
The grid in its current form is not prepared for an increase in electricity demand. Bloomberg New Energy Finance estimates over 150 kilometers of grid expansion is needed by 2050, according to Bloomberg New Energy Finance, which is the equivalent of the total length of the power grid at present.

Renewable Energy Growth Demands Adoption of Solutions for a Digital and Smarter Grid

We expect renewable energy generation will nearly triple by 2032 in the US, an 11% average annual growth rate. Globally, Wood Mackenzie forecasts global renewable energy capacity will also triple in the coming decade. A transition from fossil fuels to renewable power source will require a shift in how electricity is distributed. The conventional method using fossil fuels was one of centralization. However, with an influx of intermittent renewable energy, grids need to become smarter and more flexible to manage periods of sun and wind availability. The second factor to consider is that the average solar and

wind plant have much lower generation than the average fossil-fuel plant and therefore encourages decentralized grids to service nearby demand (Exhibit 14).

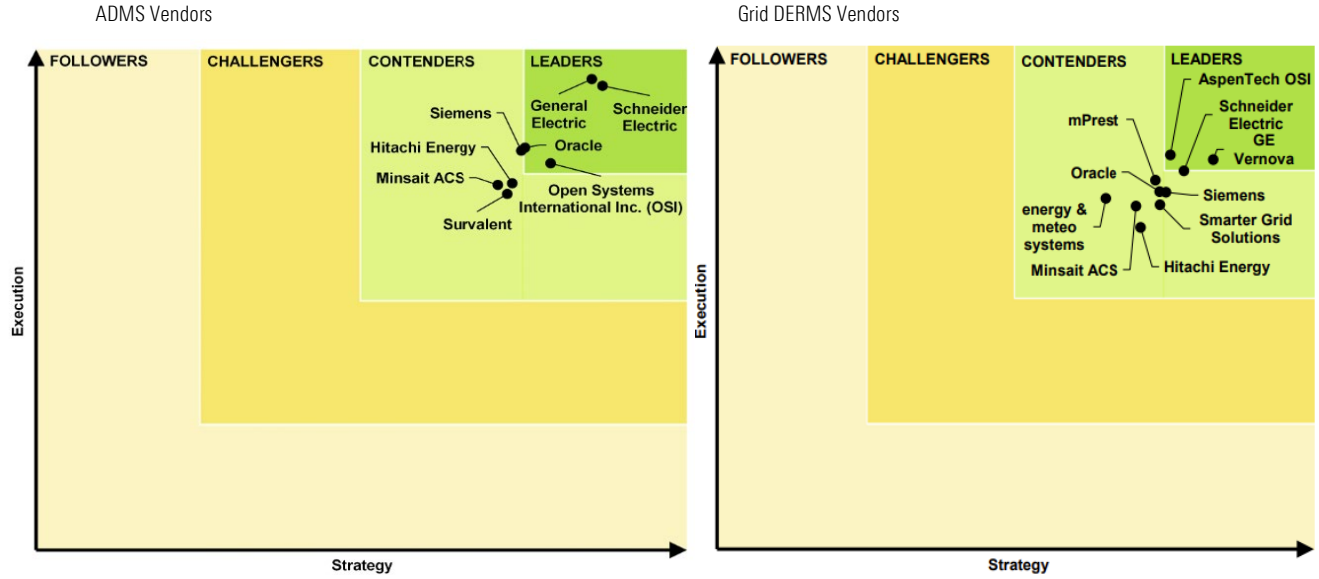
Exhibit 14: An Influx of Intermittent Renewable Energy Requires a Digitally Enabled Grid



Source: IRENA, Morningstar.

The integration of several software applications is proving to be successful in enabling grid reliability through real-time knowledge about the health of the system. Advanced Distribution Management Systems, or ADMS, act as a digital twin of the grid, used by utilities to improve the efficiency of power distribution, minimize outages, and identify fault locations. Distributed Energy Resource Management System, or DERMS, is another software application used, which provides grid stability, by managing grid congestion from increasing demand. Schneider Electric, Siemens, and General Electric have been three of the major suppliers of electrical equipment who identified the convergence of hardware and software, with leading smart grid software (Exhibit 15).

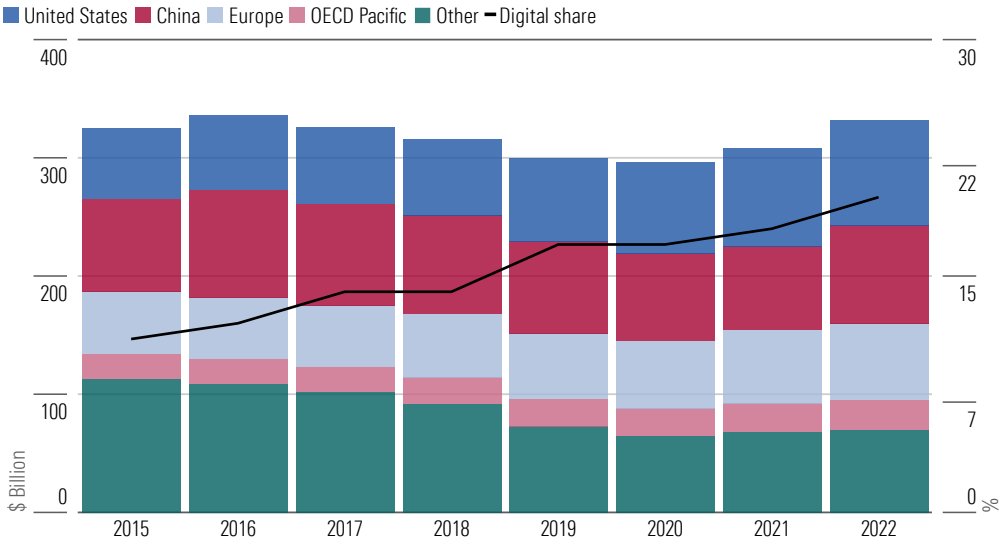
Exhibit 15 Schneider Electric Is Recognized as a Leader in Smart Grid Management Software



Source: Guidehouse Insights 2023.

Digital investment into the electricity grid has already nearly doubled to 20% since 2015 (Exhibit 16), as smart grids become critical in maintaining the stability of a system with an increasing mix of renewable energy. The European Commission introduced the "Digitalisation of the energy system" action plan at the end of 2022, supporting EUR 170 billion for the digital investment of the electricity grid. Canada and Japan are also both investing over $100 billion each to promote the deployment of smart grid technologies.

Exhibit 16 Digital Investment Into the Grid Has Doubled Since 2015 as Renewables Gain Share



Source: IEA.

How Do Electrical Equipment Suppliers Benefit From Grid Investments

Existing electrical grid equipment needs to be replaced and new equipment needs to be purchased to accommodate the energy transition and increase in electricity demand. Suppliers of high and medium-voltage electrical equipment are the biggest beneficiaries of an increase in investment in the grid infrastructure. High-voltage transmission lines are used to transport electricity long distances from power plants to customers via substations. Medium-voltage electrical equipment then enables the distribution of power to towns and other large users of electricity, such as industries. Smart Grid software vendors also stand to benefit from a more digitally-enabled grid to ensure the reliability of an influx of intermittent renewable energy.

Exhibit 17 Demand for High-Voltage Electrical Equipment Benefits Most From New Investment Into the Grid

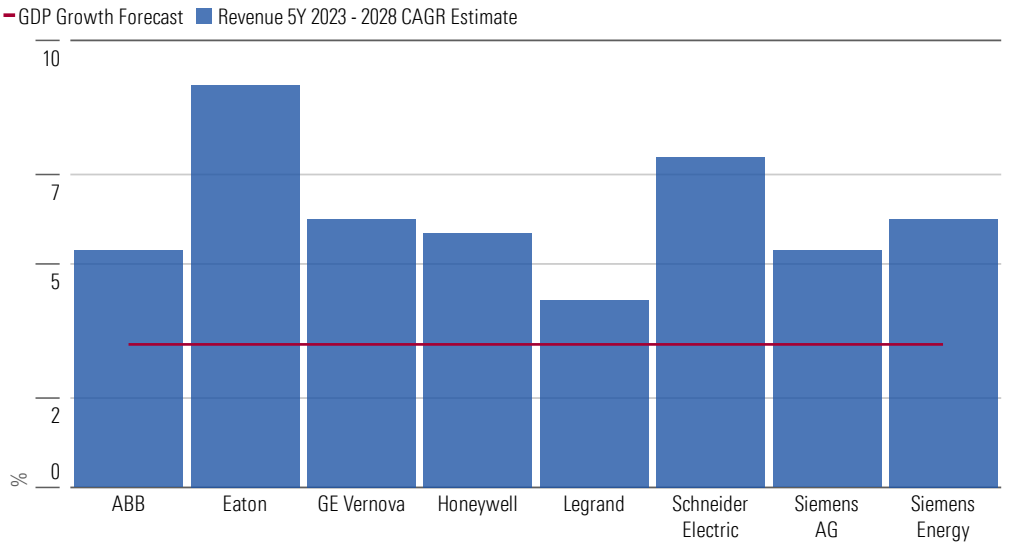
	Utilities					
	Medium-Voltage Products	High-Voltage Products	Smart Grid Software	End Market Exposure to Utilities	End Market Exposure to Buildings	End Market Exposure to Data Centers
ABB				10-25%	10-25%	0-10%
Eaton				10-25%	25-50%	10-25%
GE Vernova				>50%	N/A	0-10%
Honeywell				N/A	10-25%	N/A
Legrand				N/A	>50%	10-25%
Schneider Electric				10-25%	25-50%	25-50%
Siemens AG				0-10%	10-25%	0-10%
Siemens Energy				>50%	N/A	N/A

No Offering
Limited Offering
Meaningful Offering
Market Leading Offering

Source: Company reports, Morningstar.

We expect the above-mentioned electrical equipment suppliers will grow revenue by 6% on average annualized through 2028. These growth rates are approximately double the expected global GDP growth rate, which typically has been the biggest driver of growth for these businesses historically.

Exhibit 18 We Expect Electrical Equipment Suppliers to Grow Revenues Double the Pace of Expected Global GDP



Source: Morningstar, IMF.

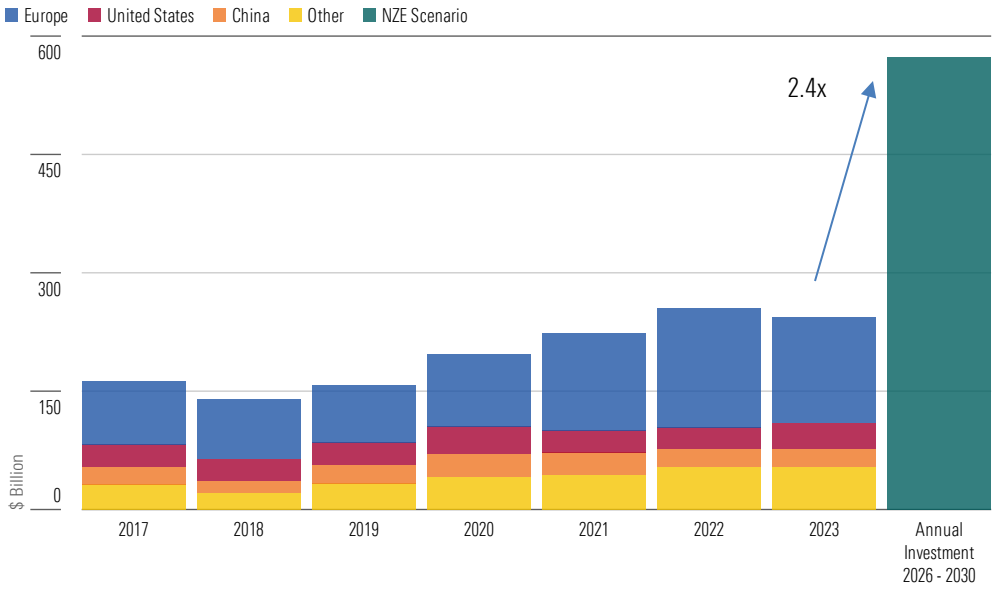
Siemens Energy and GE Vernova will experience the biggest benefit on the grid side of their businesses because of the rise in electricity grid investments, with average revenue growth through 2028 of 13% and 11%, respectively. However, as mentioned earlier in the report, both these businesses also earn a significant portion of their revenue from wind and gas turbines, which dilutes their overall exposure to the grid modernization secular growth theme. Eaton and Schneider Electric are also well-positioned for both the replacement and incremental demand of existing outdated medium-voltage equipment. We think Schneider Electric will also be the biggest beneficiary of a digitally-enabled grid, thanks to their leadership status in several software applications. Software products also typically earn higher margins than equipment, and are a driver in our operating margin expansion forecasts for the business.

Optimizing Energy Usage in Buildings Is Critical to Achieving Net-Zero Ambitions

As more companies pledge to become carbon neutral, decarbonizing buildings is a relatively straightforward way to make progress relative to other parts of their business. First, the majority of CO2 emissions from buildings can be reduced with existing technologies. Second, addressing emissions from buildings is less disruptive of day-to-day operations than decarbonizing aspects of one's core business.

Buildings have a carbon-intensive footprint, accounting for 26% of greenhouse gas emissions and 30% of energy consumption, according to the IEA. Therefore, decarbonizing buildings will play a pivotal role in achieving net zero by 2050. Investment in energy efficiency has grown since 2017, most notably in Europe which has benefitted from favorable stimulus and stronger regulation. However, annual investment still needs to more than double this decade to be on-track for the IEA's net-zero emissions by 2050 scenario (Exhibit 19).

Exhibit 19 Energy Efficiency Investments for Buildings Need to Double Annually to Meet Net-Zero Targets



Source: IEA.

According to the European Union, 75% of building stock on the continent is energy inefficient. The introduction of the European Green Deal in October 2020 served as a catalyst for building-efficiency investment in the region, growing to EUR 134 million from EUR 73 million between 2019-23. With even stricter regulation being introduced more recently (Exhibit 20), and other regions following suit with their own energy efficiency requirements for buildings, we expect a long runway of investment into building renovation and adoption of digital building management systems, benefiting equipment suppliers.

Exhibit 20: Stimulus Aimed at Reducing Building Emissions

Europe:
Approximately EUR 12 billion was dedicated to energy efficiency renovation of buildings as part of the European Green Deal.

France:
50% funding increase year over year to EUR 4 billion in 2024 revised budget for MaPrimeRenov to cover the cost of energy efficiency improvements.

United Kingdom:
GBP 6 billion dedicated to energy efficiency between 2025 and 2028.

Germany:
EUR 45 billion in subsidies over 3 years for heating systems and retrofit.

USA:
The 2022 Inflation Reduction Act has set aside $9 billion in incentives for investment into energy efficiency.

Source: Morningstar.

Building Owners Risk Having Stranded Assets Following Strict Regulation Imposed

There has been a strong push from governments for energy-efficiency renovation, which is enforceable by legally binding regulation (Exhibit 21). In response, building owners will be forced to improve their energy performance to prevent holding stranded assets, encouraging a wave of renovation activity and adoption of digital applications. In Europe, the revised Energy Performance of Buildings Directive, which forms part of the "Fit for 55" legislative package, entered into force in 2024, mandating an increase in building renovations to improve energy efficiency. To accelerate progress, certain countries are also mandating a required minimum energy performance certificate rating for buildings to be rentable. For example, in The Netherlands, office buildings will be required to have an energy level of C or better to be rented out. The United Kingdom has also set a minimum EPC rating of B by 2030 for non-residential buildings.

Exhibit 21 Minimum Energy Performance Standards Have Been Introduced Globally

USA:

Phasing out of fossil-fuel energy in federal buildings by 2030. Several cities, including New York, Denver, San Francisco, and Seattle have tried to ban natural gas for home cooking and heating but have had these bans overturned in court.

New York:

Buildings larger than 25,000 square feet need to meet strict greenhouse gas emissions limits starting in 2024. is expected to reduce cumulative emissions from large buildings by at least 40% citywide by 2030.

Europe:

In March 2023, the European Commission strengthened the EU Energy Efficiency Directive as part of efforts to deliver the European Green Deal and the REPowerEU strategy. Under the new agreement, EU nations must hit 1.49% reduction per year in final energy consumption on average from 2024-30, up from the current 0.8%.

France:

Ban on the most poorly insulated dwellings from listing on the rental market from 2023 and commercial buildings to cut energy consumption by 40% by 2030.

Belgium:

Compulsory energy renovation for homeowners from 2023 within five years after purchase.

United Kingdom:

Energy consumption in buildings and industry to be reduced by 15% by 2030.

Netherlands:

Mandatory minimum EPC rating of C for office buildings from 2023.

Germany:

Starting in 2024, a new law sets out requirements for the energy performance of buildings, the issuing and use of energy performance certificates, and the use of renewable energy in buildings.

China:

In 2022, China strengthened its industrial energy efficiency policies to improve the energy intensity of the sector by 13.5% by 2025 compared with 2020 levels.

India:

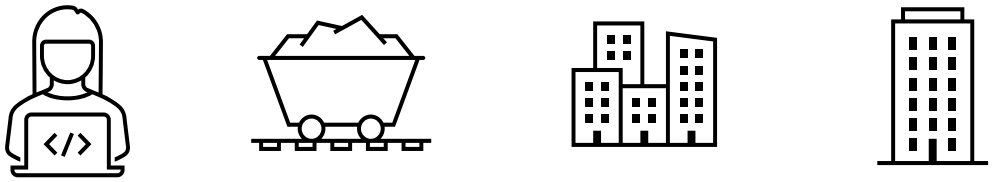
India strengthened building codes and efficiency policies, covering industrial and commercial buildings.

Source: Saint-Gobain, Morningstar.

Decarbonizing Buildings Requires More Electrical Content

The operating and maintenance phase of a building's useful life contributes between 60% and 80% of carbon emissions across its life cycle (Exhibit 22) throughout a building's lifespan. Decarbonizing buildings can take one of two approaches. First, by electrifying as many of the key loads as possible that had previously been run on fossil fuels. An example of this would be using an electric heat pump for heating space and water (the biggest use of energy within a building) instead of a gas boiler. The second way is to invest in building management software that optimizes the use of various building equipment and thereby reduces its energy needs. Historically, investment decisions were centered around payback periods, which can range anywhere between a few months and 10 years, a fraction of a building's 50-year or more useful life. However, with regulation mandating a building's CO2 emissions, investment into energy efficiency is becoming less of a discretionary cost

Exhibit 22 Retrofitting Existing Buildings Will Have the Biggest Impact on Reducing CO2 Emissions



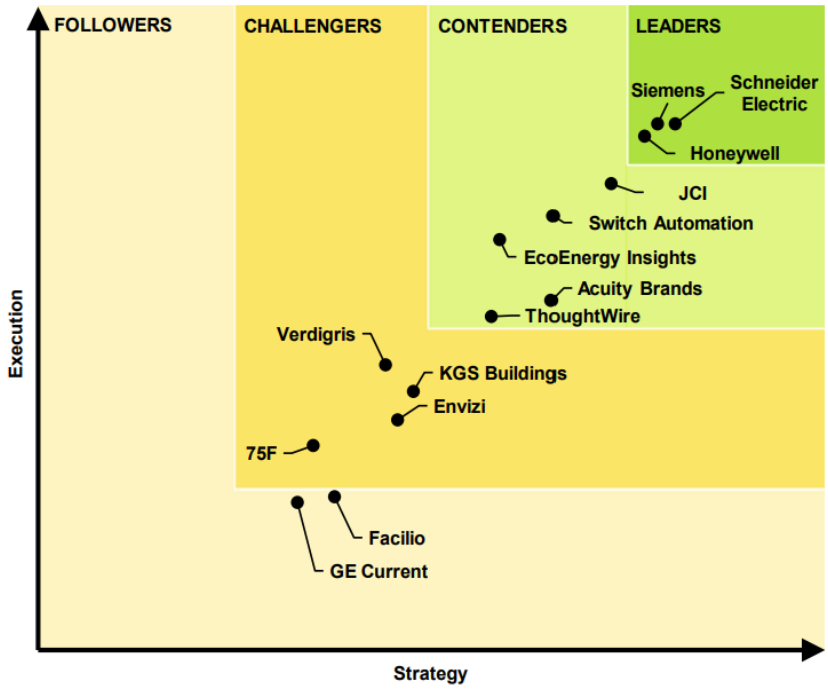
Building Life Cycle:	Design and Planning	Sourcing building materials	Operating and mantaining building	Demolition
Carbon Emissions:	1%	10% to 30%	60% to 80%	1%

Source: Boston Consulting Group, Morningstar.

Introducing Energy Management Software Reduces a Buildings Emissions

Digitalization is another aspect of making a building more energy efficient. A smart building uses data, collected by sensors and controllers, to manage energy demand based on a variety of datapoints. Building Management Systems are an effective way to optimize energy usage and minimize the environmental impact of a building, providing building owners with attractive payback periods on their investments. Incumbents with a large installed base of building equipment, such as Siemens and Honeywell, have extended software to their capabilities. Schneider Electric has also emerged a leader, thanks to its data capabilities and breadth of offering (Exhibit 23). According to Guidehouse Insights, leaders were able to display operational efficiencies via reduced energy consumption highlighting the attractive paybacks of such investments.

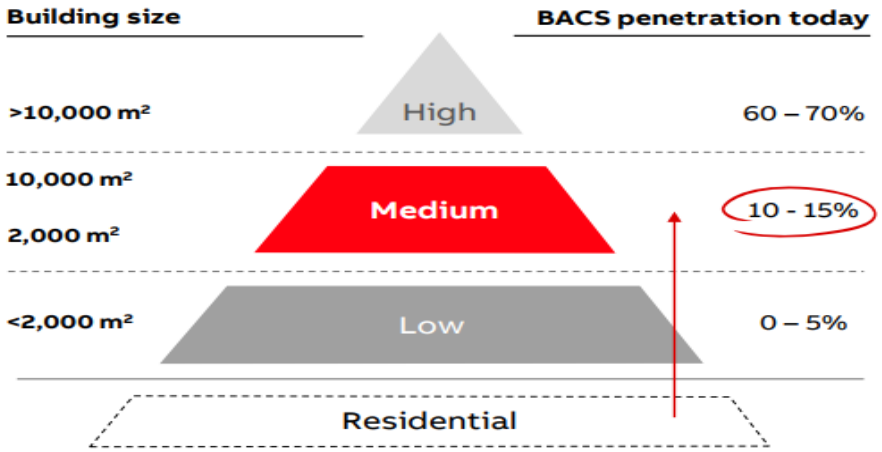
Exhibit 23 Schneider Has Emerged as Leader in Building Management Software, Surpassing HVAC Incumbents



Source: Guidehouse Insights, October 2023.

There remains a large opportunity for higher adoption rates in building energy management software, particularly for small and residential buildings. Medium and small buildings only have a building energy management software penetration rate of below 15%, compared with between 60%-70% for large buildings. Given the short paybacks through reduced energy consumption, we believe this will be a useful method for building owners to comply with strict energy codes.

Exhibit 24 Adoption Rates for Building Energy Management Software Is Low for Small and Medium Buildings



Source: ABB, 2019.

In addition to Smart Building applications, we expect greater adoption of project planning tools such as Building Information Modeling, or BIM< software to ensure new buildings are efficiently constructed. According to McKinsey, the average large construction project takes 20% longer than scheduled and costs up to over 80% of the initial budget. By having a digital representation of both a building's physical and functional characteristics, an asset owner can help reduce significant cost overruns, which contribute to wasteful emissions. Schneider's EUR 1.5 billion acquisition of RIB provided access to the fast-growing building information modelling market, and it has also partnered with market-leader Autodesk with its electrical equipment.

In certain countries, such as the UK, Canada, and Scandinavia, it is mandatory to use BIM for public construction projects. BIM isn't law yet in the US, but several states have adopted it and made it mandatory for federal projects above a certain size. We expect more nations to implement stricter enforcement of BIM to help meet their environmental objectives, which supports its double-digit annualized growth expectation through the end of the decade.

Building Efficiency Targets Are at Risk Due to Growth in Data Centers

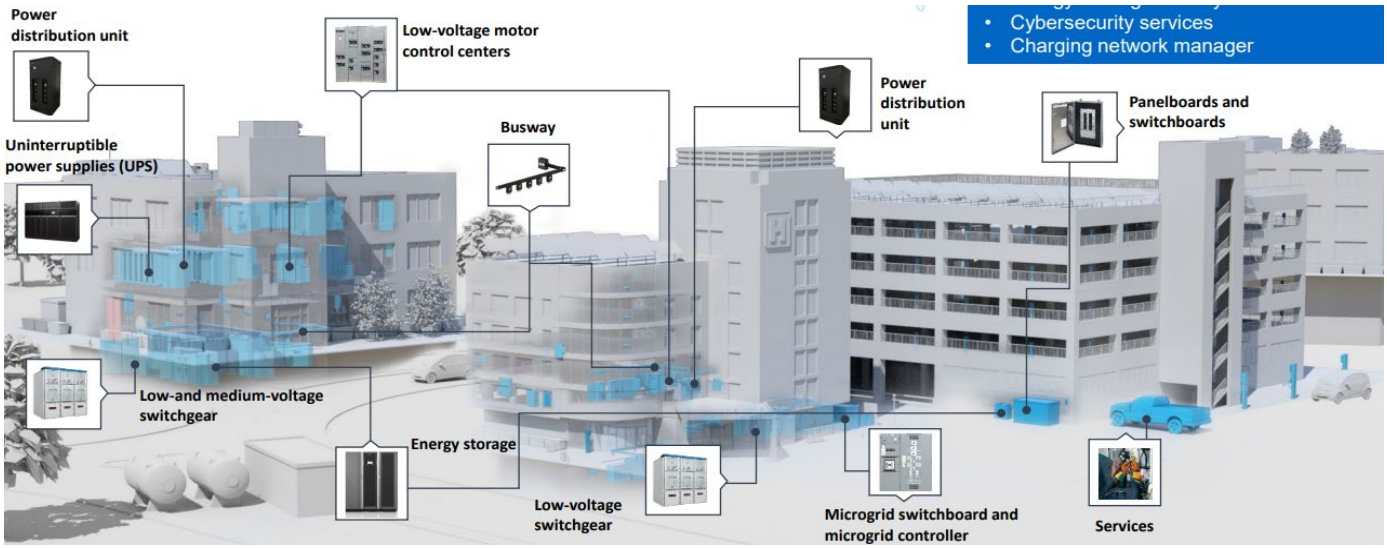
The average data center uses more than 50 times the electricity of an average commercial building. As chips get more powerful to meet the demands of artificial intelligence, they generate more heat and therefore need more cooling. According to Thunder Said Energy, chips need to be kept below 27 degrees, and therefore cooling comprises between 10%-20% of both the capital expenditure and energy consumption of a typical data center.

Electrical Equipment Suppliers Benefit From Higher Electrical and Digital Content in New and Revamped Buildings

The modern building will require a higher content of low and medium voltage electrical equipment, such as circuit breakers which help facilitate the flow of electricity (Exhibit 25). A typical net-zero building will

comprise electric vehicle charging stations, solar panels and electric heat pumps, collectively demanding a meaningful increase in electricity and therefore propelling demand for low- and medium-voltage electrical equipment. We also anticipate more meaningful mix digital solutions, which provides more recurring revenue and higher margins for multinational electrical equipment suppliers.

Exhibit 25 A Modern Building Requires a Meaningful Increase in Demand for Electrical Equipment



Source: Eaton.

We believe Schneider Electric is best positioned for an increase in higher spending to improve the energy efficiency of buildings via its unique combination of a market-leading portfolio of low-voltage electrical equipment and building management software, which help optimize the costs of running a building and provide attractive paybacks. Other suppliers include Honeywell and Siemens, which benefit from a significant installed base of building equipment, but which are either without as strong of a software offering or broad product portfolio. Schneider Electric also earns the largest contribution of its sales from data centers through a combination of its electrical and cooling equipment.

Exhibit 26 Schneider Electric Has Full Suite of Products and Software to Support the Decarbonization of Buildings

	Buildings						
	Low-Voltage Electrical Products	Building Management Systems	Building Information Modelling Software	HVAC	Critical Power/Data Center Products	End Market Exposure to Buildings	End Market Exposure to Data Centers
ABB						10-25%	0-10%
Eaton						25-50%	10-25%
GE Vernova						N/A	0-10%
Honeywell						10-25%	N/A
Legrand						>50%	10-25%
Schneider Electric						25-50%	25-50%
Siemens AG						10-25%	0-10%
Siemens Energy						N/A	N/A

No Offering
Limited Offering
Meaningful Offering
Market Leading Offering

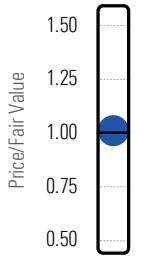
Source: Company reports, Morningstar.

What's an Equity Investor to Do?

The market appears to have recognized the robust outlook for electrical equipment suppliers resulting from the decarbonization secular growth theme for the time being, with only Siemens trading below our fair-value estimate. Given Siemens' conglomerate status, it has the lowest exposure to the electrification of buildings and grid modernization. We therefore suggest Schneider Electric as our preferred pick, which has an above-average revenue and EPS growth of 8% and 11%, respectively, and is trading not too dissimilarly from its undervalued peers. Eaton enjoys the highest growth rate, but we view its shares to be overvalued.

Well Positioned and Fairly Valued:

Schneider Electric (Electrical Equipment) SU



Market Cap	Moat
EUR 146 Bil	Wide
Rating	**Yield**
★★★	1.6%
P/FV	**P/E**
1.01	29.4x

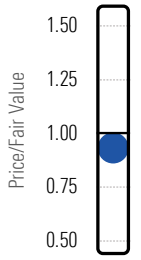
Well Positioned and Overvalued:

Eaton ETN

Market Cap	Moat
$137 Bil	Wide
Rating	**Yield**
★★	1.1%
P/FV	**P/E**
1.23	32.1x

Slightly Undervalued:

Siemens SIE



Market Cap	Moat
EUR 156 Bil	Wide
Rating	**Yield**
★★★	2.8%
P/FV	**P/E**
0.93	16.8x

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.

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