JAG CAPITAL MANAGEMENT LLC

JAG Team Insights

An Electric Opportunity: Upgrading the Grid

Total reading time = 4 minutes

Reliable, affordable electrical power is a key requirement for US businesses to compete effectively in a global economy and a necessity for consumers. Meanwhile, there is growing consensus among global policymakers, corporations, and investors that supports transitioning to clean and renewable sources of energy. The US has committed to a multi-year program to produce 80% of domestic electricity from clean sources by 2030. This is a very ambitious goal, since as of 2022, fossil fuels like natural gas and coal still provide 61% of our power nationwide. Upgrading the grid and improving the transmission and distribution of electricity is critical to making progress towards the current administration's vision.

Grid modernization is an enormously complex topic. It will require massive capital investment, according to Princeton University, potentially as much as $360 billion in this decade, and a total of $2.4 trillion by 2050. It will also require cooperation between the public and private sectors, and new legislation at the federal, state, and local levels. Much of our domestic infrastructure needs to be upgraded, modified, or replaced to increase capacity and effectively generate, store, and transport electricity. We believe that this modernization will produce significant and long-lasting investment opportunities over the next decade and beyond.

Some Historical Perspective

Thomas Edison is famously credited for inventing the incandescent light bulb, but not everyone gives him credit for being the father of our modern power grid. The invention of the power grid dates to 1882, giving birth to the Edison General Electric company. Edison was able to create a system to distribute electricity from a centralized generator at an affordable cost to customers. Transmission expanded significantly at a national level in the early 1900s after Nikola Tesla introduced the alternating current ("AC"), challenging Edison's empire. AC had the ability to travel miles, reaching rural settings, and it incentivized centralized power generation with larger economies of scale, providing lower power costs.

Much of our transmission infrastructure still dates to the early beginnings, with some towers being over 100 years old. Evidence has shown that worn-out metal parts caused the California wildfire in 2018. The steel parts holding the 72-year-old power line had severe wear and tear.

As we see in Chart 1, between 1902 and 1950, US electrical power generation grew at an 8.8% annualized rate. Growth moderated to 4.4% per year between 1950 and 2007 before flattening after 2007 to today. According to the Department of Energy, more than 70% of the nation's grid transmission lines and power transformers are over 25 years old. The interstate and local power grids were not built with the foresight of our current electricity generation supply nor with today's current and forecasted demand.

Chart 1: US Electricity Generation Annually 1902 - 2021

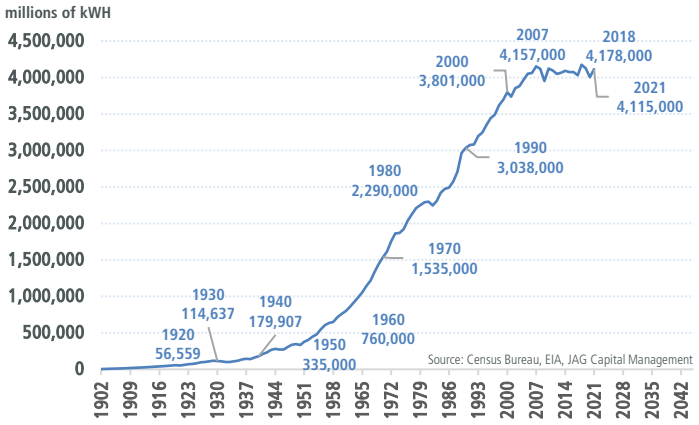
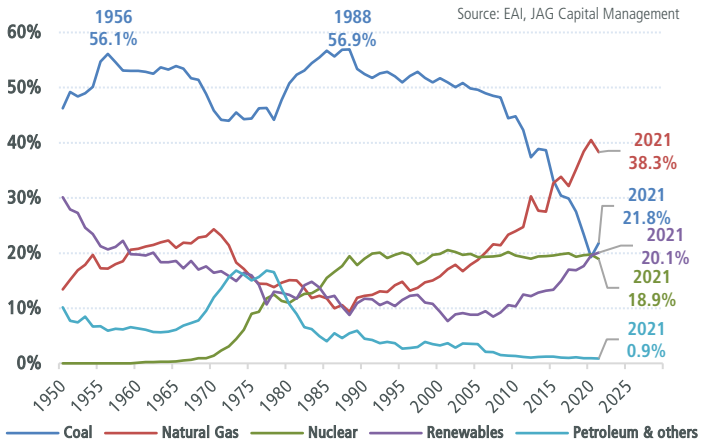


Chart 2 shows the mix of energy sources used to generate electricity in the US. As recently as 1988, coal was used to generate 57% of the electricity in the US. In the 25 years since, power generated by coal plummeted to ~22% in favor of natural gas and renewables.

Chart 2: US Electricity Generation by Fuel Source 1950 - 2021

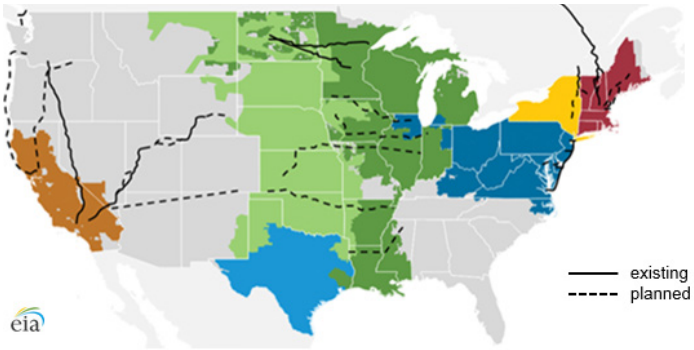


Transmission: Transporting Electricity is a Key Part of Grid Modernization

Most of the new renewable energy development will be located in remote geographic areas throughout the Midwest and Plains areas, far from the areas with the biggest demand. A significant portion of renewable energy sources will require new interstate high-voltage transmission lines before the electricity they generate can be integrated into the US power grid and delivered to population centers. The map shown in Figure 1 outlines existing and planned high voltage direct current power lines.

Before a transmission line can be built, the land where the towers and cable will be built needs to be leased from the property owners, and these projects can take 3-10 years. Interconnection queues are becoming longer for new solar and wind energy projects, as the grid is at maximum capacity. Upgrading and installing thousands of miles of new high-voltage transmission lines is an undertaking that will likely take a decade or more to complete. Companies involved in this work will have dependable revenue streams for years to come. Publicly traded companies in this space are particularly interesting to JAG.

Figure 1: Existing and Planned High-Voltage Direct Current Power Lines

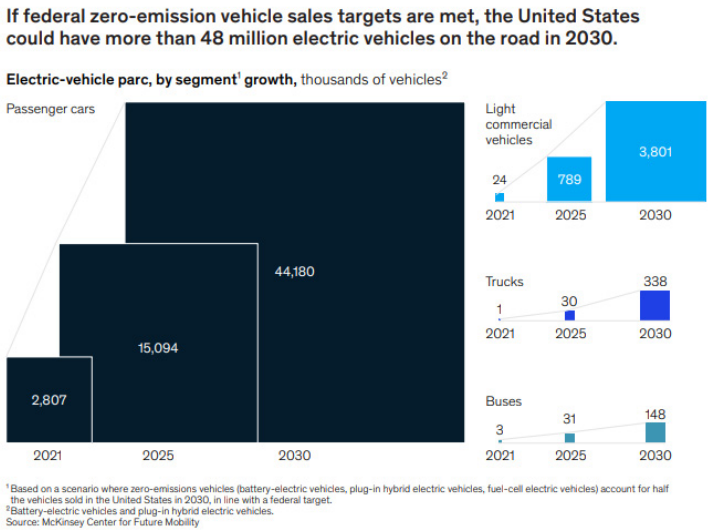


Preparing the Grid to Power Electric Vehicles

An important part of the grid modernization effort will involve providing the capacity and the means to charge battery powered vehicles. In a recent report, the consulting firm McKinsey & Company estimated there could be 48 million electric vehicles in operation by 2030. Electric vehicles currently represent only 1% of total vehicles and this percentage would rise to 15% of the total.

To support this fleet, McKinsey & Company estimates the country will need roughly 30 million new chargers. Although they estimate that approximately 27.5 million chargers will be installed in private homes, we will still need over 1 million public chargers. Providing this infrastructure represents another significant opportunity for the industry.

Figure 2: Electric Vehicle Growth



Opportunity at Hand

We believe US grid modernization efforts will offer a multi-decade investment opportunity. Multiple industries and publicly traded companies will participate and benefit from this modernization.

In transmission and distribution development, Quanta Services (PWR), along with MasTec (MTZ), MYR Group (MYRG), and Emcor (EME), are well positioned to benefit from grid upgrades.

We are monitoring companies like NV5 Global (NVEE) that offer engineering and design services, as well as companies like Itron (ITRI) and Honeywell (HON) that provide smart grid solutions with smart meters and analytics, to reduce outages and make the grid more reliable.

Companies that produce components, parts, and equipment will capture a portion of the money being invested in electrical infrastructure work. Examples in this category include Hubbell (HUB), Eaton Corp (ETN), ABB (ABB), and General Electric (GE).

Grid modernization is one of the most significant infrastructure upgrades the US will undertake in the coming years. The work needed to meet stated goals is not discretionary — these investments have to be made. Companies with the required expertise have the opportunity to participate in large-scale, multi-year projects.

The transmission and distribution industry will be supported by The White House for the next several political administrations, as our country upgrades the power infrastructure to deliver clean and reliable energy to all our citizens. The infrastructure bill signed in 2021 allocated $65 billion to build thousands of miles of new transmission lines and fund new development of cutting-edge, clean energy technologies.

Electric grid investments also spur economic growth and new businesses. Investment in the power grid will create jobs in construction and will drive innovation, commercialization, and deployment of energy technologies.

JAG is writing one of a multi-part series on the electrical opportunity as the US and multiple developed countries transition from the use of fossil fuels to renewable sources to generate electricity. We believe grid modernization, upgrading and adding capacity to our transmission and distribution systems is a key pillar for this transition. In our future Insights we will discuss the role of renewable technologies and storage.

JAG's investment approach helps us identify great companies that can capitalize on durable sector and industry-specific trends and opportunities. We welcome your comments and questions any time!

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