

Rising Demand for Electric Vehicles Highlights the Need for Investments in the Power Grid: Which ETFs May Benefit?

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The outlook for electric vehicles (EVs) has strengthened recently, supported by decreasing costs for advanced battery technology and increasing support from automakers, politicians, and consumers. In our view, a shift to EVs over the next decade may boost electricity consumption and contribute to the need for massive investments in electrical infrastructure around the world. This may benefit companies involved in both the build out and management of those assets. Below, we discuss these trends, highlighting two ETFs that may benefit: First Trust NASDAQ® Clean Edge® Smart Grid Infrastructure Index Fund (GRID) and the First Trust EIP Carbon Impact ETF (ECLN).

What's Driving Growth for Electric Vehicles?

While a potential transition to electric vehicles is not without hurdles, public policy around the world has grown increasingly supportive. In the US, President Joe Biden signed an executive order on August 5, 2021, calling for 50% of new passenger vehicles sold in the US to be zero-emission electric vehicles by 2030.¹ For context, EVs represented just 2% of US auto sales in 2020.² While this order is not legally binding, executives from several automakers joined the President in announcing their own goals of having EVs represent 40-50% of annual US sales volume by 2030.³

Several other regions/nations have enacted even more aggressive plans to phase out conventional vehicles in favor of EVs over the next decade or two.⁴ In Europe, electric vehicle sales gained significant market share in 2020, accounting for 11% of overall car sales, compared to 3.4% in 2019. A few European countries, led by Norway (76%), Iceland (49%), and Sweden (32%) reported an even higher percentage of EV sales than the overall region. In China, electric vehicle sales accounted for 6% of total car sales in 2020 but could receive a boost over the next few years from stricter fuel economy standards and requirements for automakers to produce more "New Energy Vehicles" (NEVs). From 2021-2023, automakers that fail to produce at least 14%, 16%, and 18% of NEVs, respectively, must purchase credits from other automakers to avoid penalties.⁵

Of course, in a market economy, there are limits to how much public policies and political dictates can drive consumer behavior. In our view, the most sustainable way for a transition to electric vehicles to occur is for automakers to produce EVs with features that consumers want, at a price that they're willing to pay. To that end, recent announcements from automakers have been encouraging. For example, Ford made headlines in May when the company announced plans to launch an EV version of its F-150 pickup truck—the best-selling truck in America over the past 44 years—in 2022, with a base price under \$40,000.⁶ Ford claims this vehicle will have an estimated range of up to 300 miles and a 10,000 pound towing capacity; but it will also offer new features, such as the ability to function as power source, replacing traditional generators for contractors on a worksite or homes that lose power in a storm. Early demand for this truck has been more robust than expected, leading Ford to double its production target for the vehicle after receiving over 120,000 F-150 Lightning reservations by the end of July.^{7,8}

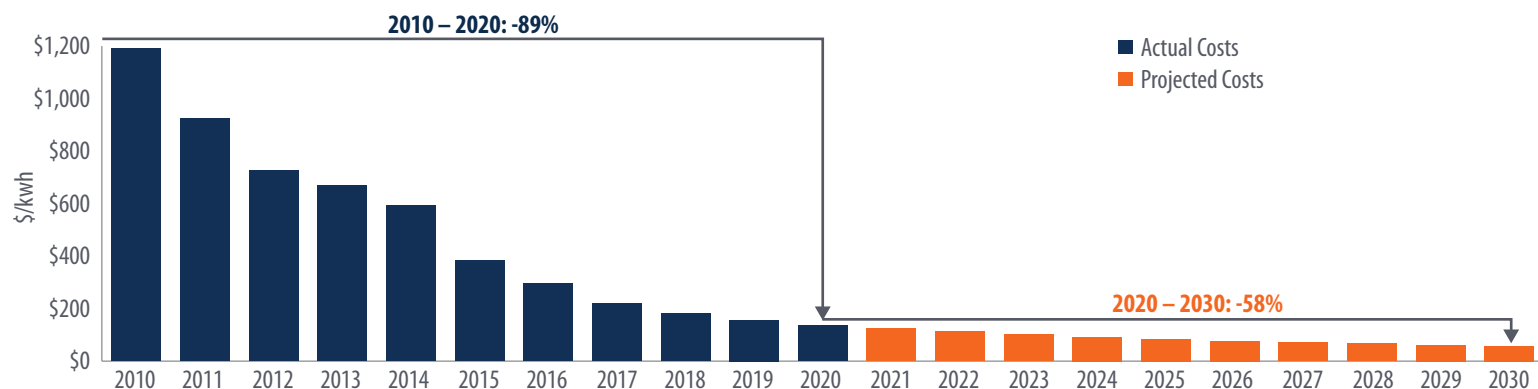
In our view, a sharp decline in the cost of battery packs—largely due to technological advancements and economies of scale—is a key factor driving automakers' desire to shift production in favor of electric vehicles. Over the past decade, the cost of lithium-ion battery packs has dropped by nearly 90%, and Bloomberg New Energy Finance estimates that costs could decline by another 58% by 2030.⁹ Since batteries are a key input for manufacturing EVs, cost parity with some conventional automobile segments could be achieved as soon as 2023.¹⁰ If battery costs continue to trend lower, we believe automakers may be able to compete more aggressively on selling prices for EVs, without necessarily sacrificing profit margins.

Connections between Electrical Vehicles and the Power Grid

One simple reason that increased EVs sales may accelerate capital investments in the power grid is that they will increase demand for electricity to charge batteries, offsetting a decline in demand for gasoline.¹¹ The Energy Information Administration forecasts that US electricity generation will grow by around 10% from 2020 to 2030, driven mainly by economic growth and offset by efficiency gains.¹² However, this forecast assumes that new electric vehicle and plug-in electric hybrid vehicle sales grow from under 2% in 2020 to just 3.9% in 2030, far less than the Biden administration's 50% goal referenced above. Only time will tell which figure is more realistic, and whether EV sales in US will follow the pattern of European EV sales. But given how strong early demand for new EV launches has been, we believe EV adoption could happen more quickly in the US than some forecasts assume, leading to increased electricity demand.

Another reason that a transition to EVs may require more investment in the power grid is that 80%-90% of EV charging takes place at home.¹³ Patterns of electricity consumption vary by season, but peak demand is typically in the evening, soon after people return home from work, which may also coincide with their desire to recharge depleted EV batteries. Considering that power grids in certain states, such as California, already face the risk of being overwhelmed when the weather gets too hot, the additional load from EVs must be addressed.¹⁴ Investments to make the power grid more resilient and digital may be key to balancing growing demand. Interestingly, EVs may become an important contributor to balancing peak electricity demand in the future by allowing part of their stored power to be sold back to the grid.¹⁵

Actual and Projected Costs, 2010 – 2035



Source: BloombergNEF. As of 12/16/20.

¹WhiteHouse.gov, *Executive Order on Strengthening American Leadership in Clean Cars and Trucks*, 8/5/21.

²International Energy Agency, *Global EV Outlook 2020*.

³Reuters, *Biden seeks to make half of new U.S. auto fleet electric by 2030*, 8/5/21.

^{4,11,13,15}International Energy Agency, *Global EV Outlook 2020*.

⁵BloombergNEF, *Electric Vehicle Outlook 2021*.

⁶Ford.com, based on 1977-2020 calendar year sales.

^{7,8}Reuters, *EXCLUSIVE Ford doubles Lightning production target on strong pre-launch demand-sources*, 8/23/21.

⁹BloombergNEF, *2020 Lithium-ion Battery Price Survey*, 12/16/20.

¹⁰BloombergNEF, *When Will Electric Vehicles be Cheaper Than Conventional Vehicles?*, August 9, 2021.

¹²Energy Information Administration, *Annual Energy Outlook 2021*. Based on reference case forecast for electricity generation.

¹⁴California ISO, 9/7/21.

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Finally, more electric vehicles may accelerate investments in the power grid because new electricity generation is likely to come primarily from renewables, such as wind and solar. This is because, in addition to having favorable regulatory policies and tax credits in many parts of the world, renewables have become significantly more cost competitive in recent years. Even without subsidies, renewables are the cheapest source of new electricity in nations accounting for two-thirds of the global population, and 91% of overall electricity generation.¹⁶ Because renewable power plants are often situated in different locations than decommissioned coal, natural gas, and nuclear plants, existing power lines are often not useful in connecting them. Moreover, renewable power plants tend to be smaller and more distributed, which may also increase the need for new investments. Lastly, renewable power resources are often abundant in certain locations, but lacking in others, which may require longer transmission lines.¹⁷

Which ETFs May Benefit from These Trends?

In our opinion, two ETFs that may benefit from these trends are the First Trust NASDAQ® Clean Edge® Smart Grid Infrastructure Index Fund (GRID) and the First Trust EIP Carbon Impact ETF (ECLN).

GRID is an ETF that invests in companies around the world that are involved in power grid infrastructure, smart meters, energy management, connected mobility, and related activities. We believe many of these companies will provide the products and services needed for the build out and modernization of the power grid around the world. From a broad sector standpoint, GRID's largest allocations are to Industrials (50.8%), Information Technology (25.5%), and

¹⁶ BloombergNEF, *1H 2021 LCOE Update*, 6/23/21.

^{17, 18} BloombergNEF, *Power Grid Long-Term Outlook 2021*, 2/21.

You should consider the funds' investment objectives, risks, and charges and expenses carefully before investing. Contact First Trust Portfolios L.P. at 1-800-621-1675 or visit www.ftportfolios.com to obtain a prospectus or summary prospectus which contains this and other information about the funds. The prospectus or summary prospectus should be read carefully before investing.

Risk Considerations

A fund's return may not match the return of its underlying index. A fund invests in securities included in the index regardless of investment merit and the securities held by a fund will generally not be bought or sold in response to market fluctuations.

Investors buying or selling fund shares on the secondary market may incur customary brokerage commissions. Market prices may differ to some degree from the net asset value of the shares. Investors who sell fund shares may receive less than the share's net asset value. Shares may be sold throughout the day on the exchange through any brokerage account. However, unlike mutual funds, shares may only be redeemed directly from a fund by authorized participants in very large creation/redemption units. If a fund's authorized participants are unable to proceed with creation/redemption orders and no other authorized participant is able to step forward to create or redeem, fund shares may trade at a discount to a fund's net asset value and possibly face delisting.

A fund's shares will change in value, and you could lose money by investing in a fund. One of the principal risks of investing in a fund is market risk. Market risk is the risk that a particular stock owned by a fund, fund shares or stocks in general may fall in value. There can be no assurance that a fund's investment objective will be achieved. The outbreak of the respiratory disease designated as COVID-19 in December 2019 has caused significant volatility and declines in global financial markets, which have caused losses for investors. While the development of vaccines has slowed the spread of the virus and allowed for the resumption of "reasonably" normal business activity in the United States, many countries continue to impose lockdown measures in an attempt to slow the spread. Additionally, there is no guarantee that vaccines will be effective against emerging variants of the disease. In managing a fund's investment portfolio, the sub-advisor will apply investment techniques and risk analyses that may not have the desired result.

Energy companies are subject to certain risks, including volatile fluctuations in price and supply of energy fuels, international politics, terrorist attacks, reduced demand, the success of exploration projects, natural disasters, clean-up and litigation costs relating to oil spills and environmental damage, and tax and other regulatory policies of various governments. Oil production and refining companies are subject to extensive federal, state and local environmental laws and regulations regarding air emissions and the disposal of hazardous materials. In addition, oil prices are generally subject to extreme volatility.

The companies held by ECLN may not ultimately undertake, or be successful in, their efforts to reduce the carbon impact of the production, transportation, conversion, or storage of energy. The fund's investment strategy limits the number of investment opportunities available to it, which may cause the fund to underperform other funds that are not subject to such investment limitations.

Changes in currency exchange rates and the relative value of non-US currencies may affect the value of a fund's investments and the value of a fund's shares.

As the use of Internet technology has become more prevalent in the course of business, funds have become more susceptible to potential operational risks through breaches in cyber security.

Depository receipts may be less liquid than the underlying shares in their primary trading market.

Utilities (12.5%), as of 8/31/21. From a geographical standpoint, GRID's largest allocations are to Europe (46.4%) and the United States (42.4%), as of 8/31/21.

ECLN is an actively-managed ETF that invests in companies that are believed to be having a "positive carbon impact" by reducing (or enabling the reduction of) carbon and other greenhouse gas emissions from the production, transportation, conversion, storage and use of energy. As of 8/31/21, 82.6% of ECLN was invested in utilities. In our opinion, many of these companies may benefit from making capital investments to modernize the power grid. This is due to the way in which electric utilities are regulated. Regulations permit them to earn a predetermined rate of return on capital investments. In other words, these companies are incentivized to invest as much capital as regulators will allow, because such investments are a key to earnings growth.

In our view, the global economy may be in the early stages of a transition away from fossil fuels to renewable energy. Electric vehicles may be an important part of that shift, based on improving economics for manufacturers, supportive government policies, and increasing consumer demand. But much of the current power grid is not well-suited for renewable energy or electric vehicles. Bloomberg estimates that \$14 trillion will need to be spent over the next three decades to enable this transition.¹⁸ We believe companies involved in the build-out and management of electrical infrastructure are a compelling way to invest in these trends.

As inflation increases, the present value of the fund's assets and distributions may decline.

Certain fund investments may be subject to restrictions on resale, trade over-the-counter or in limited volume, or lack an active trading market. Illiquid securities may trade at a discount and may be subject to wide fluctuations in market value.

Master limited partnerships (MLPs) are subject to certain risks, including price and supply fluctuations caused by international politics, energy conservation, taxes, price controls, and other regulatory policies of various governments. In addition, there is the risk that MLPs could be taxed as corporations, resulting in decreased returns from such MLPs.

A fund may be a constituent of one or more indices which could greatly affect a fund's trading activity, size, and volatility.

There is no assurance that the index provider or its agents will compile or maintain the index accurately.

A fund classified as "non-diversified" may invest a relatively high percentage of its assets in a limited number of issuers. As a result, a fund may be more susceptible to a single adverse economic or regulatory occurrence affecting one or more of these issuers, experience increased volatility and be highly concentrated in certain issuers.

Securities of non-U.S. issuers are subject to additional risks, including currency fluctuations, political risks, withholding, the lack of adequate financial information, and exchange control restrictions impacting non-U.S. issuers.

A fund and a fund's advisor may seek to reduce various operational risks through controls and procedures, but it is not possible to completely protect against such risks.

High portfolio turnover may result in higher levels of transaction costs and may generate greater tax liabilities for shareholders.

A fund with significant exposure to a single asset class, country, region, industry, or sector may be more affected by an adverse economic or political development than a broadly diversified fund.

Securities of small- and mid-capitalization companies may experience greater price volatility and be less liquid than larger, more established companies.

Smart grid companies can be negatively affected by high costs of research and development, high capital requirements for implementation, government regulations, limited ability of industrial and utility companies to implement new technologies and uncertainty of the ability of new products to penetrate established industries.

Trading on the exchange may be halted due to market conditions or other reasons. There can be no assurance that the requirements to maintain the listing of a fund on the exchange will continue to be met or be unchanged.

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