
ELECTRON
CAPITAL PARTNERS LLC
Energy Transition
The Next Global Revolution

# Energy Transition – The Next Global Revolution

## *The Energy Transition*

The energy transition refers to the global shift of energy consumption away from fossil fuels to renewable sources and the creation of new technologies that aid in the decarbonization of world economies. Investors should focus on key areas in this transition involving electric generation, transmission and distribution, mobility, and storage.

## *Traction & Momentum*

We believe the velocity of structural change within these key areas is occurring faster than equity markets expect. As a result, this is creating an opportunity to identify corporate winners and losers. Notable drivers behind the speed of the transition include advancements in technology, lower financing costs, changes in consumer behavior, government and corporate initiatives aimed at sustainability, and a complete overhaul of the electricity grid to smarten and harden existing and new infrastructure.

**Electricity Grid Overhaul** – Substantial investment in clean energy technologies and transmission and distribution infrastructure needed to smarten and harden the grid, globally.

**Renewable Energy Costs** – Renewables are undercutting fossil fuels in many power markets as the cheapest form of energy today.[1,2] Moreover, advancements in battery storage are solving many of the challenges associated with solar and wind intermittency, making renewables capable of providing base load power, while also becoming increasingly cost effective.

**ESG & Sustainability** – Capital flows to clean companies are increasing as investors prioritize ESG and sustainable factors. In 2021, Global ESG ETFs saw a record $119 billion of inflows, approximately $40 billion more than the full year 2020 record.[3]

**Government Leadership** – Over 130 countries set or are considering net zero emissions targets by 2050 or earlier.[4] Ongoing government intervention in the form of investment and production tax credits continue to lead discussions and encourage growth and innovation.

**Corporate Leadership** – Glasgow Financial Alliance for Net Zero (GFANZ), a group of over 450 fund managers, banks, pensions, and other asset owners, is aiming to provide $130 trillion of private capital to the net zero transition by 2050. The GFANZ believes it could provide 70% of the $32 trillion needed by 2030 to keep the world on track for a net zero economy by 2050.[5] Industry leaders have also made significant pledges to become carbon free / neutral (e.g., Google and Microsoft committed to be carbon free / negative by 2030).

**Electric Vehicle (EV) Penetration & Growth** – General Motors, Ford, and Stellantis[6] (formerly Fiat Chrysler) – collectively making up over 40% of the US auto market – announced they are targeting 40-50% of annual US volumes to be EVs by 2030.[7] In August 2021, President Biden signed an executive order aimed at making half of all new vehicles sold in 2030 electric. Additionally, the number of EVs registered globally is expected to increase from 10 million today to 145 million by 2030.[8]

## *Old World to New World*

We believe structural tailwinds involving key areas of the energy transition are increasing.[15] Key beneficiaries include:

**Generation** – As fossil fuel generation becomes obsolete, low / zero carbon generation from solar, wind, water, nuclear, and potentially hydrogen will become the dominant source of electricity. In many markets worldwide, including nearly all of the US, renewable energy is more economic than traditional fossil fuels, even in the absence of government subsidies / tax incentives. This fact is driving larger adoption and development of renewables across economies, particularly as traditional utilities become the largest developers of renewable generation assets.

**Industrial & Retail Demand** – EVs are rapidly displacing gasoline-powered automobiles due to lower operating costs, as well as increasing regulation and corporate commitments to phaseout the internal combustion engine (ICE). To maximize decarbonization efforts, the electricity generated to charge EVs should feature a significantly greener mix from renewable sources than in existence today.

Other technologies including solar, batteries, and storage are also providing significant investment opportunities. Battery costs (specifically lithium-ion) have fallen 98% over the last three decades,[9] further supporting the economic viability and power reliability of renewables.

**Transmission & Distribution** – In its current state, the US electricity grid is unable to handle the major expansion of renewable power needed to satisfy true decarbonization. Therefore, the grid will need to be redeveloped, enhanced, and expanded. New green energy will require transmission lines that can transport substantial amounts of power over long distances and other factors specific to intermittent power. Sizeable capital expenditures (CAPEX) by governments and companies are needed to solve this problem – creating an attractive opportunity for investors.

A key area of investment opportunity is clean energy transportation, requiring the current electrical grid and transportation/distribution infrastructure network to be overhauled. Execution will require an enormous amount of investment from both public and private markets and Bloomberg New Energy Finance (BNEF) forecasts the global electricity and hydrogen transport and storage investment alone could exceed $50 trillion between 2020-50 (substantially more than the $37 trillion they predict for renewable energy generation). Put another way, BNEF estimates the global average annual investment in energy supply and infrastructure needs to double from $1.7 trillion today over the next 30 years.[10]

We believe the electric utility sits at the center of the energy transition and is a critical link to decarbonizing the electrical grid. As more utilities migrate their business models to clean generation sources, and invest in better transmission capabilities, investors should expect to see large investments and returns for these companies.

The revenues of regulated utilities are heavily linked to their CAPEX plans. As a result, investors should look carefully at those utilities who will be beneficiaries of significant increases in capital spending needed to build new renewable generation plants and / or transmission and distribution networks.

**Role of Green Hydrogen** – Certain aspects of economic activity cannot be decarbonized by electrification. Green hydrogen will be the solution to this problem (i.e., long-haul trucking or heavy industrial manufacturing) Energy from renewables creates green hydrogen by separating water molecules into gaseous hydrogen and oxygen (electrolysis).

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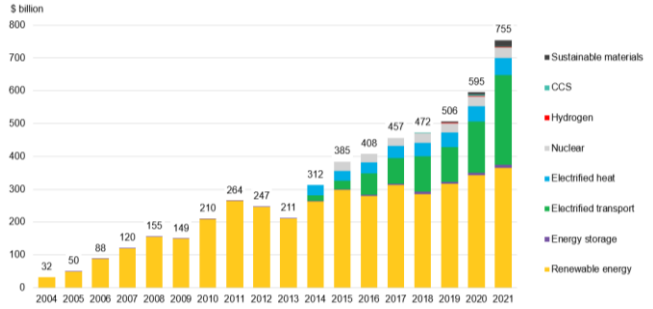
Today, creating green hydrogen is cost prohibitive compared to gray hydrogen (derived from natural gas); however, there is a path to becoming cost competitive in the imminent future via government subsidies, which would subsequently drive the need for substantial renewable capacity growth to power the process.

However, the near-term adoption of green hydrogen, particularly in the US, remains dependent on pending legislation (subsidies), which remains a near-term risk. We believe that the decrease in green hydrogen costs should follow a similar path of renewables over the last decade, eventually becoming an economically viable replacement for gray hydrogen.

**Global Investment in The Energy Transition** – Investment in the energy transition reached $755 billion in 2021, up 25% from 2020 and 100% from 2015. While renewable energy still captures the lion's share of investment, a new growth driver has emerged – electrified transport – which exceeded $270 billion in 2021 (refer to the chart below).[11]




Compounded growth rates indicate that electrified transportation (i.e., investment in the electricity grid and transmission and distribution infrastructure) will become the dominant driver of the energy transition in the coming years.

**Scope & Magnitude** – To further stress the magnitude of the energy transition and how the electric utility will play a pivotal role enabling it, the CEO of the largest US Utility by market capitalization (NextEra Energy), stated:

> *"The electric grid is going to be the vehicle to decarbonize the transportation sector, it's going to decarbonize the industrial sector..." Additionally, "We're very excited about the potential for green hydrogen… it is an incremental trillion dollars investment opportunity above and beyond what just decarbonizing the electric grid means."*[12, 15]

As the energy transition continues to take shape, investors will begin to view it as a virtuous cycle, feeding on itself to drive revolutionary innovation and growth. And for those well positioned as experts in the space, the path will create attractive investment opportunities for alpha generation on the long and short side of portfolios.

## *Government Intervention Catalyzing Growth*

**Global** – Governments and policy makers are pressing the decarbonization agenda at local, regional, and global levels. The 2015 Paris Climate Agreement – an international treaty on climate change adopted by 195 countries – aims to limit global warming well below 2°C compared to pre-industrial levels. Global leaders, alongside tens of thousands of negotiators, government representatives, businesses, and citizens from nearly every nation, gathered in Glasgow, Scotland in early November 2021for the 26th annual Conference of the Parties (COP26) to uphold climate change as a global priority and set critical plans needed to limit the warming of our planet.

Governments have also implemented Cap-and-Trade systems in an effort to harness market forces to reduce carbon emissions. Setting limits on emissions and enabling the trading of emission units can provide the necessary incentives to innovate and reduce carbon emissions, allowing those who can reduce emissions faster or more cheaply to sell excess credits to those who need them. Today, there are more than 60 carbon pricing initiatives covering 46 national jurisdictions,[13] and the overall market is estimated to exceed as much as $22 trillion by 2050.[14]

**United States** – While global efforts to decarbonize persist, we believe the most attractive investment opportunities today exist within the US, as many elements within the world's largest economy have committed to going green.

On November 5th, 2021, Congress passed the $1.2 trillion Infrastructure Investment and Jobs Act, which President Biden signed into law on November 15th, 2021. This bipartisan legislation stands to inject $550 billion of new capital into transportation, broadband, and utility companies, which will stimulate the growth and velocity of the transition within the US, specifically as it relates to rebuilding the nation's aging infrastructure and electricity grid over the next five years.

In addition to the $1.2 trillion Infrastructure Investment and Jobs Act, Congress is also considering the Build Back Better (BBB) Plan – a climate and social spending bill – or a carve-out of the BBB framework focused specifically on clean energy and infrastructure investment in the form of incentive programs.

The climate and clean energy provisions highlighted within the BBB Plan could inject over $550 billion in the next 10 years. Specifically, bipartisan support for 10-year investment and production tax credits for solar and wind generation, a new credit for standalone battery storage, renewed and expanded credits for EVs, and a $3/kg subsidy for green hydrogen appear feasible in a new, standalone bill. The path forward faces more uncertainty than previously anticipated, but approval would be game changing for the US, propelling the transition forward faster than investors anticipate.

## *Winner & Losers*

The energy transition will present investors with an opportunity to identify winners and losers within the equity markets. It will bring an abundance of new market entrants, some of which will follow the trajectory of large successful technology companies and become dominate players; however, companies unable to innovate fast enough, or finance themselves in the short-term, will fail.

Additionally, we believe ESG & Sustainability factors are becoming increasingly important to investors, having positive and negative implications for companies. Those who innovate quickly and aid in decarbonization will be rewarded, while corporate polluters will continue to incur increasing costs and opprobrium from investors.[15]

We believe the opportunity for alpha generation within the renewables, infrastructure, and utility sectors will last decades. Investors should consider obtaining exposure to this opportunity through an experienced long / short manager who can manage through market cycles to capture alpha, while minimizing risk.[15]

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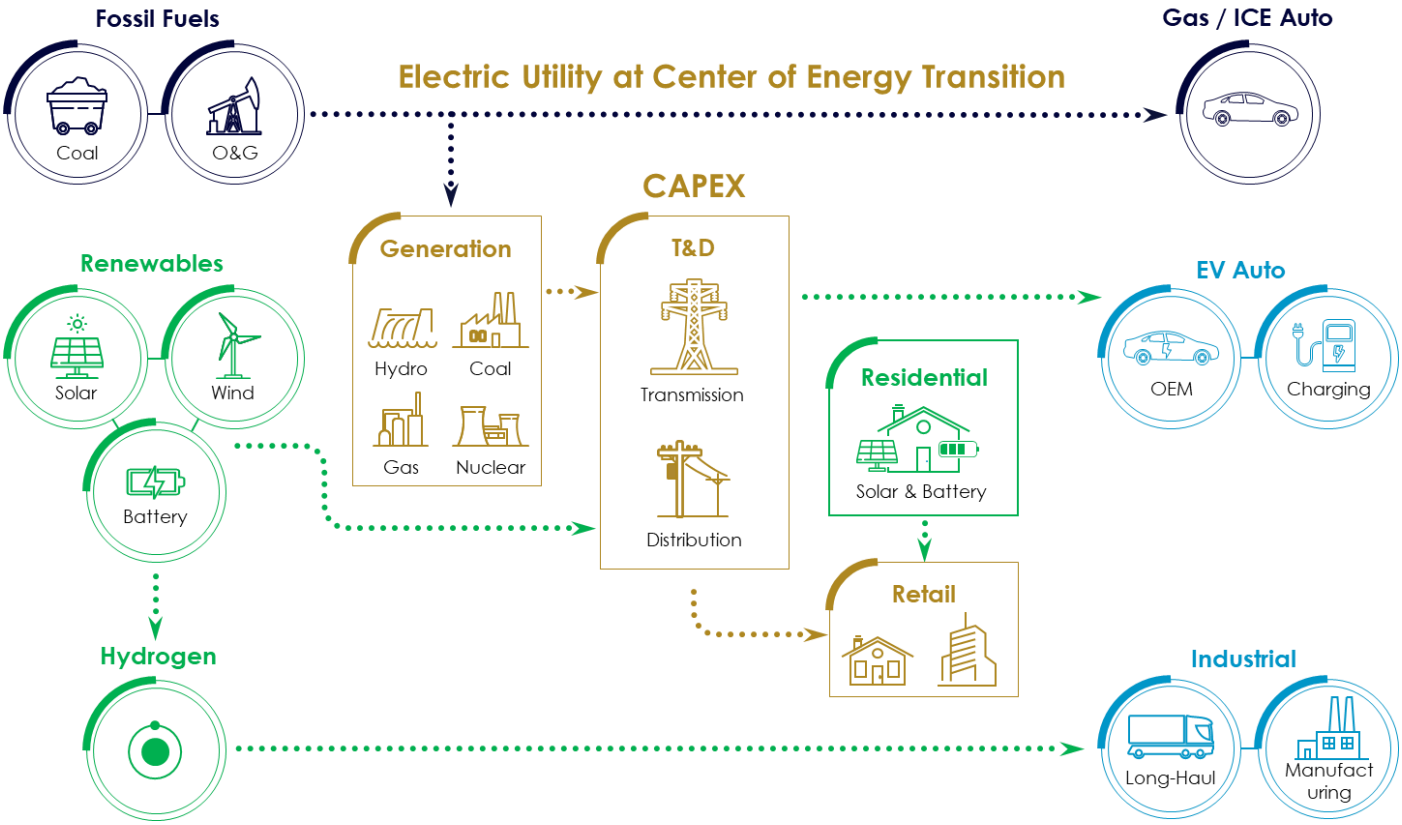
## *Appendix: The Energy Transition Schematic*




## *Endnotes*

1. International Renewable Energy Agency, Renewable Power Generation Costs in 2020.
2. International Energy Agency, World Energy Outlook 2020.
3. NASDAQ, 2021 Was a Record Year for ETFs. January 21, 2022.
4. United Nations Climate Actions October 2021.
5. The Institutional Investors Group on Climate Change.
6. Stellantis N.V. is a multinational automotive manufacturing corporation formed in 2021 on the basis of a 50-50 cross-border merger between the Italian American conglomerate Fiat Chrysler Autos & the French PSA Group.
7. IHS Markit Update: Biden challenges automakers to make EVs half of all new US vehicles by 2030. August 2021.
8. International Energy Agency, Global EV Outlook 2021.
9. Energy & Environmental Science, "Re-Examining Rates of Lithium-Ion Battery Technology Improvement & Cost Decline." March 2021.
10. BloombergNEF, New Energy Outlook 2021, January 2022.
11. BloombergNEF, Energy Transition's Big Dollars and Big Themes, February 2022.
12. September 30, 2021, Wolfe Conference.
13. Morgan Stanley, Global Carbon Primer. March 17, 2021.
14. Wood Mackenzie, COP26: Make or Break for Global Emissions Trading. August 11, 2021.
15. Please refer to the Disclosures section on page 4 for additional important information.

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