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Here at Monarch, it's our belief that over the next decade we'll likely see a number of opportunities to generate outsized returns investing in and around renewable energy and efforts to reduce greenhouse gas emissions. Significant global policy support combined with a push for more socially and environmentally responsible investing has created a new paradigm in energy investing – for the first time, renewables are the fastest growing energy source in the United States; a trend that should remain for the foreseeable future. Yet, despite the recent success seen in alternative energy sectors, a significant amount of investment, innovation, and policy support needs to occur for the world to reach the lofty goals set by the Paris Agreement.

The implications of climate change are forcing the world to take a new approach to energy. It's no secret that climate change is upon us. Since the pre-industrial era global average surface temperatures have risen ~2°F[1]. It's believed that global warming is driving extreme weather conditions in and across regions, reducing snow coverage, causing significant drought, changing plant and animal habitats, impacting sea levels and the ability to grow crops. The economic, social and political implications of these extreme weather conditions are significant. It's estimated that "under the current trajectory, global GDP could be 11–14% less by mid-century than in a world without climate change."[2]

Unfortunately, global climate trends have only worsened in more recent years. According to data provided by the National Oceanic and Atmospheric Administration (NOAA), "the 10 warmest years on record have occurred since 2005" and since 1981 Earth's temperature has risen, on average, 0.32°F every decade which is greater than two times the rate of gain in each decade since 1880. In response to the potential threat of climate change, governments around the globe have made a concerted push to reduce greenhouse emissions to stave off further negative effects.

Policy support continues to strengthen globally yet more support is needed to reach global goals. Known as the Paris Agreement, in 2016, 197 countries (effectively constituting all CO2 emitting economies) signed a pact to limit global average temperature gains to just 1.5 °C (2.7 °F), recognizing that this would substantially reduce the impacts of climate change. Similarly, at the local level, governments over the past decade have adopted policies to support greater investment in and adoption of renewable energy to help fight climate change.

Still, many economists and environmentalists argue there's much work to be done reducing emissions to reach the Paris Agreement's objective. Today, only 75 of the 197 signatories have submitted plans for reducing emissions between now and 2030 (known as nationally determined contributions or NDCs). Notably, neither the United States nor China are included in that group of 75 despite strong verbal commitments from both countries. And despite the market share gains seen in renewables over the past decade, the "share of renewable energy in primary supply would have to grow from ~14% in 2018 to

1 NOAA: "Climate Change: Global Temperature", March 15, 2021
2 Swiss Re Institute: "The economics of climate change: no action not an option", April 2021

74% in 2050 to attain the Paris Agreement goal of 1.5°C."[3] This will require strengthening both local and global policy actions as well as significant private and public investment over the next several years. Estimates provided by IRENA suggest that by 2050 a total of $33 trillion of additional investment is required into efficiency, renewables, end-use electrification, power grids, flexibility, hydrogen and innovations to meet the 1.5°C goal. This undoubtedly will provide significant opportunities for both public and private investors.

As a result, renewable energy is growing faster... On average, renewable energy consumption (which includes slower growth hydro, geothermal, wood and waste sources) has grown 3.9% and 3.5% over the past 5- and 10-year periods, respectively, and when excluding some of the older forms of renewable sources from the equation (i.e., wood and hydroelectric power, etc.), renewable sources like solar, wind, and biofuels have grown well over 7% per year over the past 5-year and 10-year periods. Still, renewable energy accounts for just ~12% of total U.S. energy consumption according to the U.S. Energy Information Administration (EIA) and ~14% globally (as of 2018). To meet the goals set out by the Paris Agreement, IRENA estimates that renewable energy share of total primary energy supply would have to reach ~38% globally by 2030 and ~74% by 2050.

Wind and solar will likely remain key growth drivers. To reach those goals, ~90% of electricity generation would have to come from renewable sources with wind and solar energy being essential to attaining those marks. According to IRENA, solar PV (rooftop and utility scale) would need to see an average investment of $237 billion per year while onshore and offshore wind would need an additional $212bn and $177bn annually, respectively. That compares to the ~$115bn being spent on solar and $80bn and $18bn, on onshore and offshore wind.

The global energy transition will be a huge opportunity not just for solar and wind. Obviously, solar PV and wind turbine manufacturers and suppliers are primed to benefit from the required investment to meet the lofty Paris Agreement goals. Yet some of the best investments will likely come from the other, less obvious, beneficiaries to a sustained energy transition. For example, energy efficiency systems like smart meters, heat pumps, and energy storage will play an integral role in reducing global greenhouse gas emissions. Similarly, service operators, aftermarket parts manufacturers and distributors are sure to benefit. To help support the growth we are expected to see in solar and wind power generation, a commensurate investment is required in global electricity transmission and distribution infrastructure. We believe the implications and opportunities are far reaching.

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3 IRENA: "IRENA's World Energy Transitions Outlook Re-Writes Energy Narrative for a Net Zero World", June 30, 2021