

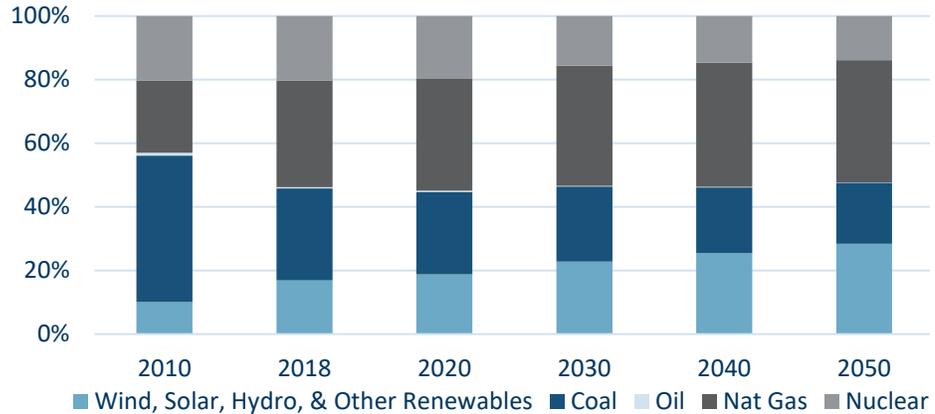


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## Increasing Renewable Mix and Implications

*The United States power generation mix has shifted significantly away from carbon-intensive fuel towards cleaner renewable sources over the last decade<sup>1</sup>. A large part of this was due to greenhouse gas regulations that require utilities to obtain an increasing percentage of electricity from non-emitting sources. Now that costs of new technologies such as solar and wind have dropped to levels below the cost of traditional sources of power, many utilities are including more renewables in their supply mix for economic reasons. Other drivers of this trend include stronger customer preference for cleaner fuel, integration of Environmental, Social, and Governance (ESG) factors that lead companies to become more socially responsible, and regulation that is supportive of the industry's evolution toward more renewable generation. To deliver signature performance for investors, we favor parts of the utility sector that are better equipped to navigate through this transition.*

**Exhibit 1:** US electric power generation mix by source



Source: US Energy Information Administration Annual Energy Outlook as of January 24, 2019

### Major contributors to the growth of renewable energy

State renewable portfolio standards<sup>2</sup> and tax incentives have been major contributors to the growth of renewable energy. But declining cost is increasingly becoming the largest driver. The average cost of new wind and solar are now approximately 25%, 60%, and 70% cheaper compared to the average cost of new natural gas, coal, and nuclear generation, respectively<sup>3</sup>. For example, the cost<sup>4</sup> of new wind generation has dropped 69% in the nine years from 2009 to 2018. Some of the drivers of lower costs for solar and wind include fierce competition among developers, global procurement savings, improved product design, and increased use of smart technology. Utilities' revenues are challenged by decelerating electricity usage caused by energy efficiency and conservation measures, but with a lower cost of ownership for renewable power generation, decarbonization is creating new opportunities to bolster earnings. For many years, utilities procured renewables from third-party power producers under multi-decade contracts because regulators were concerned that if utilities took on the risk of building, owning, and operating the plants customer rates would increase. Under this arrangement utilities did not earn any returns and just passed on the prices to customers. However, a growing number of utilities are looking to access renewables via direct investment, where they own the assets and are authorized to earn a reasonable return. Because utilities are replacing older, dirtier, less efficient, and higher fixed cost plants, renewable investments are now welcomed by regulatory commissions and local politicians, which provide the utilities with supportive cost recovery.

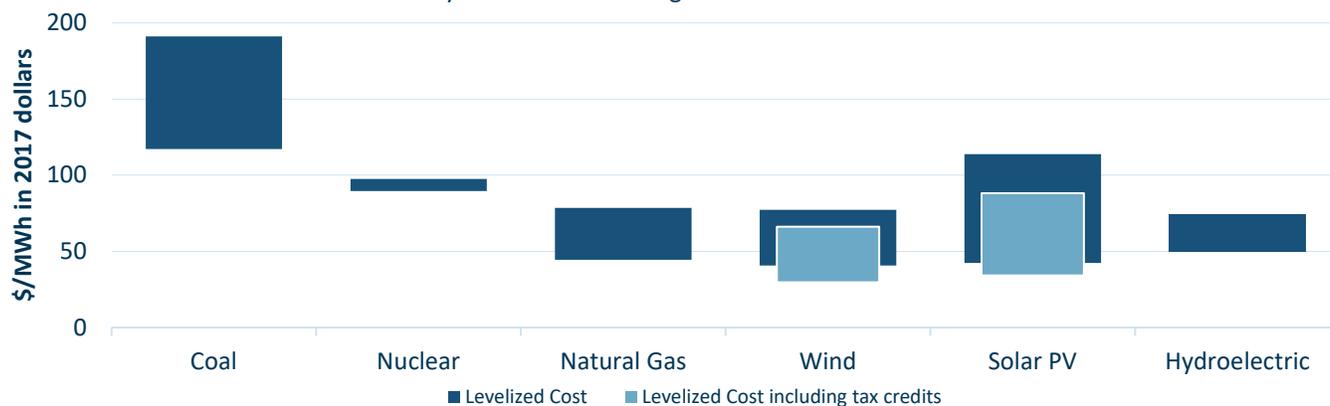
Recent polls show that customer support for green energy is rising due to awareness and concerns about climate change, and utilities are responding to public preferences. Environmental, social and governance issues, (ESG), are gaining prominence with investors too. Investors are increasingly seeking ways to integrate ESG into their investment decision making and risk management practices. Technological advances and improved disclosures from companies on their ESG policies have made it easier for investors to incorporate ESG factors into investment decision making.

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Environmental factors are the main area of focus for the power sector. A company's carbon footprint is a good way to measure its environmental impact. Companies scoring poorly on this factor can be viewed unfavorably by the market, which could lead to lower valuations and higher cost of capital. That in turn would then get passed on to customers in the form of higher rates, which then has the potential to create unhappy customers and more friction with regulators and elected officials.

**Exhibit 2: Levelized Cost of New Electricity Generation Entering Service in 2022**



Source: Lazard's Levelized Cost of Energy Analysis Version 12.0

### Limitations of renewable energy

There is, however, a limit to renewable penetration due to intermittency, i.e. a source of energy that is not continuously available. Currently solar panels only generate electricity up to 25% of the time and wind power approximately 35%. The sun shines for a limited number of hours during the day based on the calendar and cloud cover, while wind generation depends on wind speed, air density, and other variables. Gas-fired power plants are used to balance the grid as more renewables are added to utilities' power mix since they have quick startup and shutdown times, are able to run without interruption, and are 50% cleaner than coal-fired plants. However, with the cost of battery storage coming down thanks in large part to development of electric vehicles, gas plants might eventually find themselves under threat as well. In some jurisdictions, utilities and their regulators are beginning to look at battery storage technologies to stabilize the grid as a non-emitting alternative to natural gas.

*In summary, the utility industry is increasingly becoming greener due to regulatory advances and improving economics of new technologies. Additionally, increased awareness of climate change among customers, regulators, politicians, and investors has led more utilities to adopt ESG policies to operate in a more socially responsible manner. Because a utility's carbon footprint can influence the risk and return profile of its investment securities, our investment management process and decision-making incorporate actual and potential impacts of environmental risks and opportunities. Accordingly, as it relates to investing in the electric utility industry, this leads us to favor companies that operate in jurisdictions where there are established frameworks to recover the cost of new renewable investments within a gradual timeframe that ensures a smooth transition to a lower emission fleet. We believe this approach can produce outcomes that are favorable for all stakeholders and the environment.*

#### Sources:

1. US Energy Information Administration Annual Energy Outlook as of January 24, 2019
2. According to the Lawrence Berkeley National Laboratory, these policies accounted for roughly half of the growth in U.S. renewable energy generation since 2000.
3. Lazard's Levelized Cost of Energy Analysis Version 12.0.
4. The industry uses levelized cost of energy to allow comparison of different methods of electricity generation on a consistent basis. It is the average total cost to build and operate a power-generating asset over its life divided by the total energy output of the asset over that life.

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