Electric and gas utilities face a complex energy landscape characterized by structural changes and impending growth. Greenhouse gas regulation, decarbonization objectives, changes in commodity prices, and shifting public perceptions have put the sector’s traditional business model at risk despite growing global energy and electricity demand. Utilities must now find a way to continue to reliably produce and distribute energy while simultaneously lowering their carbon footprint.

The main determinant of a utility’s sustainability profile—and of its environmental and social impacts—is the mix of energy sources it uses to generate electricity. These sources can be broken down into two categories: fossil fuels and low-carbon energy.

Fossil Fuels

- Coal, the most polluting fossil fuel, emits nearly 1000 g of CO₂ per kWh generated. Coal negatively affects human health through the release of particulate matter into the air, and eliminating its use as quickly as possible is an essential part of turning back the effects of global warming.
- Oil emits about 750 g of CO₂/kWh but typically represents a very small part of utilities’ electricity generation mix; it is too expensive to use for large-scale electricity production and is mainly used to power transportation.
- Natural gas is the least carbon-intensive fossil fuel at the point of energy generation, emitting about 500 gCO₂/kWh. However, it is mostly composed of methane, a molecule with even more warming potential than CO₂. Environmental risk management is therefore of utmost importance in the natural gas supply chain. While gas can lead to climate benefit when it replaces coal, small leaks throughout the supply chain can quickly negate all of its climate advantages.

Fossil fuel electricity generation can be replaced by cleaner energy sources without modifying the electricity transmission and distribution infrastructure, and without changing the business models of utilities. Many alternatives to fossil-fired capacity exist: wind, solar, hydropower, geothermal, and biomass. All of these are “zero emissions” energy sources.

Renewable Energy

- Wind and solar have dropped substantially in price in recent years. In regions with good solar or wind resources, they can even be economically competitive with fossil fuels on a lifecycle basis. Both also have very limited environmental and social risk exposure.
- Hydropower and geothermal are very location-dependent. Many of the most suitable installation sites have already been developed. In some regions, hydropower can also negatively impact biodiversity or result in the displacement of local populations. Geothermal has a lower environmental and social risk profile.

Mirova* is an investment manager dedicated to sustainable investing through a conviction-driven approach. The firm’s goal is to combine value creation over the long term with sustainable development. Mirova is a pioneer in sustainable finance and dedicated to developing impactful solutions for its clients.

* Mirova (AUM: USD 14.9B as of September 30, 2019) is operated in the US through Mirova US LLC (Mirova US). Prior to April 1, 2019, Mirova operated through Ostrum US.
Biomass, typically in the form of forestry byproducts, is often used as a substitute for coal. It is considered carbon neutral because burning wood "liberates" the carbon dioxide that had been absorbed by the tree during its lifetime. To reap the full benefit of biomass, it is crucial that the supply is sustainable, preferably coming from agricultural or forestry waste.

Finally, nuclear power entails very low carbon emissions and generates large quantities of power, but carries substantial social and environmental risk and has unappealing financials in many markets.

As the energy sector evolves, utilities must evolve too. They are key players in the shift to a lower carbon energy system, with a pivotal role to play in achieving the goals of the Paris Agreement. Decreasing the use of fossil fuels and increasing the share of renewables in the generation mix – all while managing worker health and safety, environmental impacts, nuclear security, and more – are the major levers for action within a sector seeking to ensure its place in a volatile energy environment.

Furthermore, energy utilities and their investors run the risk of being left behind. Renewables, like solar in particular, are expected to dominate the energy mix at a fixed cost overtime. This is good for business; box stores and warehouses generating enough power from solar panels to operate refrigeration units, for example, provide business owners an attractive level of predictability.