

# Ensuring Future Capital Access

Utilities Prepare for ESG Financial Challenges

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he utility industry has powered America’s development and growth for more than a hundred years. Since the late 1800s, power companies have successfully met the needs for electricity through a range of supply sources. A vibrant generation sector comprised of both conventional and unconventional assets spans the eras of coke to hydro to coal to gas to nuclear to renewables to batteries and beyond.

Total gross plant-in-service of the power sector is currently more than two trillion dollars. Total plant-in-service investment has been increasing by more than a hundred billion dollars annually since 2014, with generation comprising about twenty-eight percent of this investment in 2019, down from thirty-six percent in 2013.

See Figure 1.

This decline is partially due to the advent of federal and state-level environmental regulations evolving toward more stringent greenhouse gas controls resulting in a de facto prohibition on new coal, substantial retirements of existing coal, emerging discussion of the future of gas, and an explosion of renewables development.

Since 2005, carbon emissions of Edison Electric Institute member companies have declined about thirty-seven percent, with expectations to achieve a fifty percent cumulative reduction by 2030. The direct actions of the utilities sector, such as retirements, closures, environmental controls, etc., reflect the combination of both EPA standards adherence and utility industry commitment to carbon reduction as a matter of corporate policy.

See Figure 2.

The utilities industry is now buffeted by powerful voices in the environmental debate – Wall Street – that are creating potential financial headwinds for future financing. As an industry, the financial sector is coalescing around the need for expanded commitment to sustainability and a reshaping of finance in an environment of social responsibility.

The increasing emphasis on environmental, social, and governance (ESG) principles is heightening climate-related investment exposure among financial services providers. ESG has become a mainstream theme, elevating risks to utilities and related fuels providers for continued capital access. Utilities now face an aggressive financial community with high expectations on sustainability commitment.

### Changing Sentiments

The Wall Street banking community earnestly began to pursue active environmental stewardship in 2008 with the release of Carbon Principles, which established guidelines for banks to follow when lending to carbon-intensive projects, including related evaluation and disclosure of carbon risks.

Wall Street further engaged in environmental stewardship in 2012 when several banks and other entities joined with the American Council on Renewable Energy to form the U.S. Partnership for Renewable Energy Finance to encourage an all of the above strategy for power supply, with a focus on new renewables sources.

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This latter event signaled a maturation in the views of financial institutions, moving beyond traditional capital providers, to corporate entities taking a far more engaged view on environmental stewardship and support to climate change initiatives.

In 2019, Goldman Sachs issued a statement about its priorities and expectations for ESG-based investing. This announcement reflected its point of view that it was not just

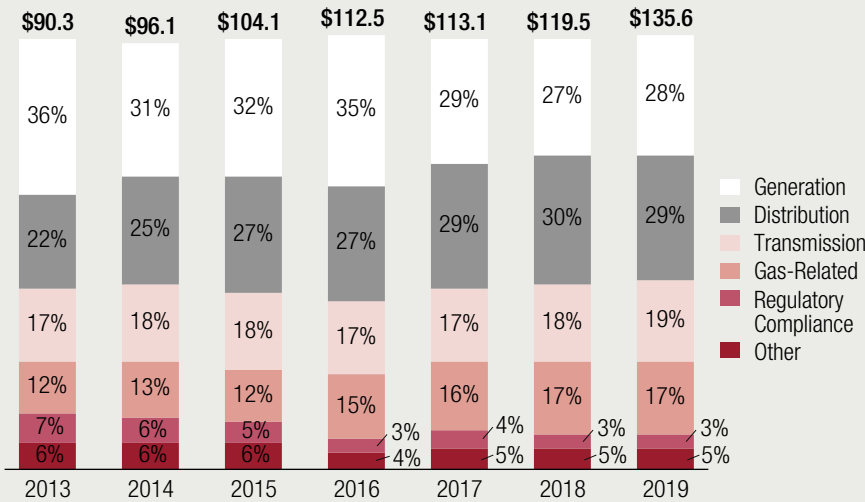
environmentally responsive action, it was smart business.

This release called for provision of seven hundred and fifty billion dollars in financing and advisory support to businesses emphasizing climate change and inclusive growth. It also indicated it would adopt more restrictive fossil fuel lending policies, even though it was not totally pulling back from fossil fuel-related financing. Globally, it is estimated that thirty trillion dollars in assets are under managements that follow ESG principles.

In January of this year, the CEO of BlackRock sent his annual letter to clients with the announcement his firm would become more circumspect about holding investments and financing companies with businesses or assets contributing to climate change from greenhouse gas. BlackRock clearly linked the notions that climate change action was necessary to mitigate related investment risk and sound strategy to secure future profitability.

**FIG. 1** PROJECTED FUNCTIONAL CAPITAL EXPENDITURES

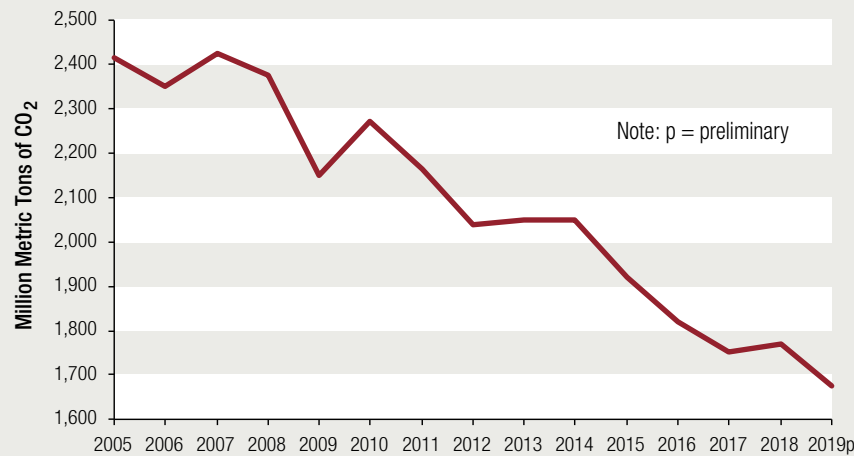
Total and segment capital spend, in billions.



Note: Total company functional spending of U.S. Investor-Owned Electric Utilities may not sum to 100% due to rounding errors

Source: E&I Finance Department, company reports, S&P Global Market Intelligence (October 2019)

**FIG. 2** REDUCING CARBON EMISSIONS



Note: p = preliminary

Source: Developed from U.S. Department of Energy, Energy Information Administration (EIA), Monthly Energy Review, November 2019

This view of climate change importance to the investment community applies to companies with carbon-based businesses, carbon-emitting assets or carbon-related investment. These emphases on carbon-neutral investing are seminal moments in introducing environmental matters into an ongoing discussion between the financial community and the utility industry.

These releases provide the foundation for how Wall Street is evolving its views on the meaning, impacts, and implications of ESG as a table stake for understanding utility strategies, portfolio shifts, and future commitments. There is general agreement that what started as directional change is now translating into formal outcomes within defined timeframes.

ESG principles are now embraced by significant influencers across rating agencies, shareholder advisors, proxy firms, and insurance providers, as well as the core banking and investing community. These entities assess ESG progress as an indicator of how companies grasp the significance of business responsibility and environment stewardship, and whether strategies align with investing community philosophies.

An extended view of ESG principles has emerged that goes beyond the funding and investing community. Other corners of the financial

services sector, such as insurance companies, are also recognizing that climate-related issues affect food production, health, and education, among other sectors, creating additional societal risks.

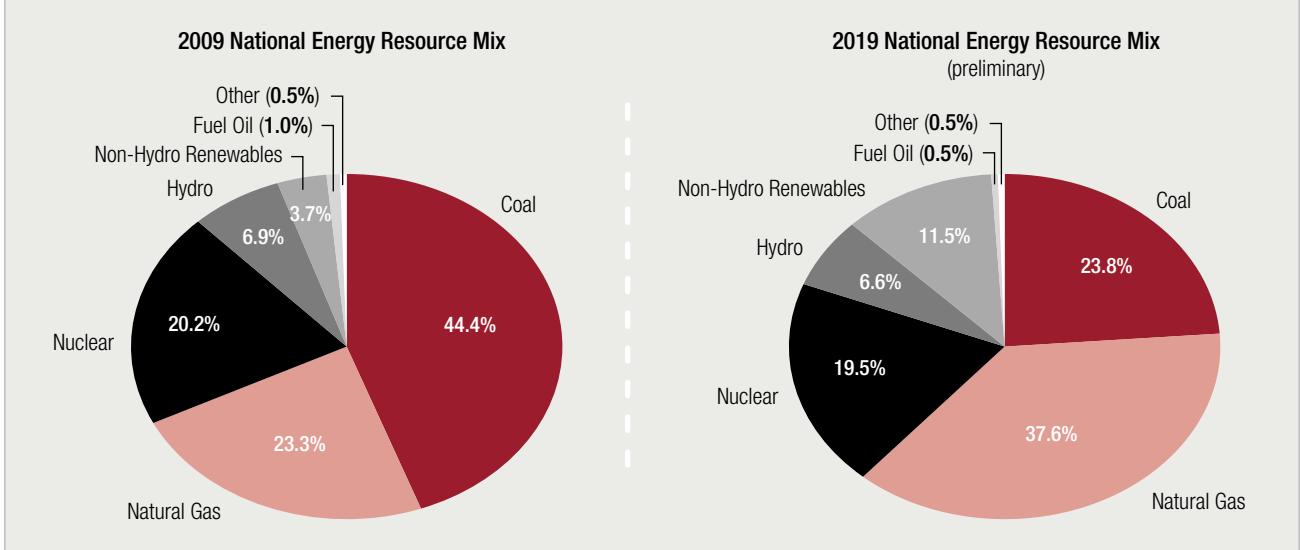
Beyond the financial community, states and municipalities are also closely attuned to the role of carbon in business. These entities are providing additional nudges to the business community to elevate its actions about carbon emissions and establishing hard targets to be carbon-free within defined time periods. These commitments presently span 2035 - 2050 and further reinforce climate change action.

To accent these statements, a global survey in 2019 by Octopus Investment Limited, a financing and investment firm in the United Kingdom, reports that investor respondents plan to divest almost a trillion dollars in fossil fuel investments over ten years and recycle that capital into almost six hundred and fifty billion dollars of renewables investment.

In a visible way of aligning purpose with action, Microsoft is committing a billion dollars to a carbon innovation fund to accelerate the global development of carbon reduction, capture,

**FIG. 3****TRANSFORMING THE ENERGY MIX**

Source: U.S. Department of Energy, Energy Information Administration



and removal technologies. In parallel, Microsoft is seeking to be carbon negative by 2030 and by 2050 will remove from the environment all the carbon it emitted since 1975 from operations and electric consumption.

The power sector, among others, is now faced with securing future capital access in an environment where external pressure to be climate policy compliant is almost ubiquitous and considered a mandate, rather than a suggestion.

Utilities have faced challenges of this magnitude before and are making significant strides that often go less noticed than single asset operating decisions. The industry has adopted strategies directed at reducing carbon emissions as rapidly and broadly as practical in their businesses. Continued application of innovative technologies accelerates this shift and is leading to greater emission reductions than generally recognized.

### Emission Trends

The utilities sector has been actively pursuing reductions in carbon emissions, mercury, and other particulates for years – in part as a result of mandated requirements from the Environmental Protection Agency (EPA), and in part from global and domestic shifts in policies creating groundswells of public support for aggressive climate change response.

Beyond EPA regulatory dictums, the utilities industry has consistently been taking direct action on carbon emissions levels for its own merits. Utilities have championed an environmental sea-change in generation mix for many years. The advent of no or lower emissions supply sources from renewables, along with a focus on lower carbon natural gas, have rapidly influenced the supply stack.

Since 2010, the Energy Information Administration (EIA) reports more than a hundred thousand megawatts of coal capacity retired across the U.S., with these retirements driven by asset age,

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economics, performance, emissions, and investment factors. Utilities evaluated the trade-offs of continued operation versus retirement and concluded the benefits of capacity replacement and carbon emission reduction were compelling.

With these retirements, coal generation has declined from forty-four percent in 2009 to twenty-four percent in 2019. However, further reductions in the coal fleet are planned, in excess of seventeen thousand megawatts by the end of 2025, taking coal generation as expected by EIA to seventeen percent, with even more retirements to follow.

But coal-fired generation is not the only target of environmentalists, agencies, and public supporters – natural gas is also in the target circle for displacement or abandonment at generation, transportation, and distribution levels. While gas emits substantially less emissions than coal, it is nonetheless now viewed by critics as contributing to climate change and a source that should be curtailed.

Like coal, natural gas reserves are abundant in the U.S. Gas-fired generation has grown from twenty-three percent of total generation in 2009 to thirty-eight percent in 2019. While non-hydro renewables have grown from four percent of generation in 2009 to twelve percent in 2019, its asset characteristics requires substantial investment for construction to approach the contribution of fossil-fueled portfolio sources.

See Figure 3.

An aggressive campaign to displace or preclude new gas-based energy sources and supply would substantially hamper the U.S.

industry's ability to provide secure energy for customers. To prohibit gas to be transported (or offered) for new end-use would further complicate energy diversity and require significant capital for facilities conversion at the local level.

Emission reduction accomplishment has enabled the power sector to improve overall air quality at a rate faster than originally anticipated. Much work remains to be done, but the U.S. electric sector has made tough decisions about the future generation portfolio and taken aggressive action to ensure that carbon levels are attenuated and clean technologies are able to proliferate.

“Carbon emissions of EEI member companies have expectations to achieve a 50% cumulative reduction by 2030.”

– Tom Fanning



### **New Normal Financing**

The increasingly voluble chorus around socially responsible investing is unsettling a number of industries that have legacy models still evolving toward meeting in-place environmental guidelines or mandates. Yet, certain industries cannot change asset profiles at the same pace policies advance.

Several industries receive attention for their contribution to carbon emissions, notably transportation, oil and gas, and utilities. While often singled out for the level of emissions they produce, they should also be recognized for the leadership they have demonstrated on environmental matters, and air and water quality.

Sustainability and social responsibility principles provide guidelines to companies for environmental action, but they have the potential to dramatically disrupt these sectors. Applied unevenly, they can hinder sector and company ability to secure unrestricted access to capital and preserve their status as investable industries.

Proliferation of a strong social responsibility sentiment – which ultimately can lead to distinct investment preferences and thresholds – creates potential constraints to financing in industries among the most capital intensive in the economy. It is not difficult to see that aggressive pursuit of portfolio limitations could make certain industries and companies un-investable.

This perception could extend beyond financial community investment policies to also classify industries and companies as

carrying incompatible risks to objectives of ESG. If this occurs, then both direct and indirect sources – such as insurance – of financial support may be limited or foreclosed, and industry and company risk substantially heightened, with options seriously curtailed.

The financial community as a group has not yet moved toward aggressive adoption of socially responsible investing. It is still determining how to balance support for climate change and ESG, with responsibilities to also produce results for investors from current portfolios. A change in the political landscape through election outcomes could quickly accelerate actions and dramatically alter the availability of capital.

The utilities sector will need to be creative in future capital sourcing given its massive future capital needs for deployment to clean technologies, grid and network modernization, and digitalization. Utilities need to articulate their ESG commitment and craft effective messages to all stakeholders, not just the financial community. This sector also needs to help investors better understand the path toward environmental objectives and progress against these outcomes.

America's utilities and other industries with legacy carbon footprints are continuing with their efforts to continue emissions reductions at a steady pace. Many utilities have already announced their intent to be a hundred percent carbon emissions free between 2035 and 2050. This timetable needs to balance how fast practical asset portfolio changes can occur with societal impatience for outcomes.

Utilities will continue to lead on environmental actions and have demonstrated the ability to navigate challenging policies within the realities of a hundred-plus years of conventional operations. The industry is well on its way toward meeting its targets and has responsive strategies in place to enable net-zero emissions outcomes to be achieved.

The utilities sector is employing strategy and innovation agendas that address almost all elements of the value chain, particularly the generation sector that has dominated historical capital expenditures. To the extent new technologies can move the industry from current legacy asset limitations toward a more friendly, cleaner supply portfolio, and maintain open capital access is fundamental to success.

### **Innovation Contribution**

To achieve the state of sustainability and carbon emission reduction targets stakeholders seek from the power sector, the industry will need to leverage the innovation capabilities it has been nurturing since 2014 - 2015. In addition, it will need to put the electron at the center of innovation and the new clean energy economy.

The electron is fast becoming the innovative catalyst for electrification of the transportation, agriculture, and manufacturing sectors. Indeed, innovation and electrification are synonymous with one another in driving carbon and other emissions reductions.

to coal-based carbon. It needs to also address emissions from natural gas, and Southern Company is already working to advance the next generation of CCUS technologies for both natural gas- and coal-based power plants.

Sustained investment is required from Southern Company, other utilities, original equipment manufacturers, Federal laboratories, academic institutions, and the Electric Power Research Institute to complement these investments and ensure collective industry focus on innovation is targeted at carbon emission reduction.

Perhaps the most intriguing focus of utility innovation that centers on clean technologies relates to hydrogen and its expansion in energy supply. A number of companies, like Southern Company, and governments are actively promoting hydrogen as the supply source of the future given its property characteristics.

Hydrogen supply sources already exist and already come, in part, from fossil fuels. Existing levels need to be complemented, and given its wide uses, such as transportation and refueling, building envelopes, renewables electrolysis, etc., this impact can be beneficial across the economy.

Innovation is also burgeoning in transmission and distribution systems in the industry with the deployment of software and artificial intelligence to provide more efficient management of demand and supply.

“ Powerful voices in the environmental debate – Wall Street – are creating potential financial headwinds for future financing. ”

– Kevin Fitzgerald



Two approaches to innovation in power supply exist for the sector: innovate around current technologies to improve their environmental performance and lower carbon emissions or innovate in over-the-horizon technologies that offer the promise of emission-free generation and little to no adverse environmental impact.

The power sector is actively engaged in adoption of new technologies offering enhanced generating plant performance, lower costs, and lower emissions outputs. The range of technologies deployed is broad and addresses fossil fuels, renewables, nuclear, batteries, and micro-generation, among known supply sources.

However, over-the-horizon technologies like fuel cells, hydrogen, and small modular reactors are also being pursued for application. These supply-side technologies are complemented by innovation efforts leveraging software and device integration that enable sensors, monitors, and controllers to enable real-time demand flexibility and provide enhanced system and equipment performance insights.

Over the last several decades, the utilities industry has expended billions on environmental controls of various types to reduce emissions from its fossil-based assets. Southern Company is acknowledged as a leader in research and development on carbon capture, use and storage (CCUS) technologies, managing more than five hundred million dollars in investments in the last ten years, including funding from the U.S. Department of Energy and industry partners.

But environmental innovation in electric utilities is not limited

“ ESG has become a mainstream theme, elevating risks to utilities and related fuels providers for continued capital access. ”

– Tom Flaberty



As the utility industry places customers at the center of its business platform, the integration of multiple internet-of-things devices in the home and in multi-family housing units presents tremendous opportunity for consumer driven carbon reduction efforts.

But the nature and level of innovation investment doesn't  
*(Cont. on page 104)*

## March Birthdays

(Cont. from p. 106)

replaced Reddy's safety gloves with the elegant white gloves of Mickey Mouse. For the very most senior readers among you, that's the same Walter Tetley who was the voice of Sherman, the dorky boy who accompanied beagle Mr. Peabody in *Rocky and His Friends* and *The Bullwinkle Show*.

**Georg Ohm**, whose law of resistance, electrical as opposed to political, was born on March 17, 1789, in Erlangen, Germany. His 1827 book introduced Ohm's Law,  $E = IR$ , all too familiar to physics and electrical engineering students as the relationship between an electrical line's voltage,  $E$ , current,  $I$ , and resistance,  $R$ . The law was resisted at first, pun intended, with the German Minister of Education saying this: "a professor who preached such heresies was unworthy to teach science." Hey Mr. Minister, guess nobody remembers your name.

Units of resistance are called ohms. Its unique symbol is the last letter of the Greek alphabet, as everybody knows. The symbol, which looks like an up-side down bath tub, is not in many fonts. So a variety of substitutes have been utilized, which can be a little bit confusing.

**Robert Millikan**, whose work on the photoelectric effect led to the solar industry and ultimately to the net metering controversy, was born on March 22, 1868, in Morrison, Illinois. Convinced that the 1905 theory on the photoelectric effect of the aforementioned Albert Einstein was wrong (firm in his belief that light is solely a wave), in 1914 Millikan found experimentally that Einstein was indeed correct. What are the odds of that? The 1923 Nobel Prize for physics was won by Millikan for this famous finding. He later conducted astronomical research and came up with the name "cosmic rays." A serious hazard for space travelers that the Starship Enterprise evidently solved. [PUF](#)

## Steve Goodman

(Cont. from p. 97)

at speeds faster than the minimum 25/3 megabits per second, including significant preferences for gigabit speed networks.

In addition, it includes a mechanism for favoring higher speed networks once the clearing round is reached. Thus, an electric utility or broadband service provider that is willing to deploy fiber optic service to its customers would be at a big advantage in the RDOF auction.

The possibility of RDOF subsidies is certainly worth studying as a means of making an effective business case for a utility contemplating deploying fiber in its territory. Any such assessment should also take into account other FCC programs that provide subsidies for broadband service to schools, libraries, and health care providers, potentially making the case for fiber deployment even more attractive. [PUF](#)

## Ensuring Future Capital Access

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stop there – utilities and venture capital are also focused on areas where operating performance, ESG principles, and commercial value can collectively align and flourish.

Energy Impact Partners (EIP), the world's largest venture capital firm focused on energy transformation, with 1.3 billion dollars in funding and assets under management, has been founded by and for utilities to transform the industry toward a cleaner, more efficient and resilient future.

Together with more than twenty utility and industrial partners, EIP invests and advances the adoption of technologies supporting the clean energy transition

across electric transport, software and artificial intelligence, smart homes, cities and buildings, and cyber-security, making innovation in the sector easier.

Despite the level of targeted carbon reduction investment occurring to date, significant future capital needs remain to meet the challenge of sustained innovation investment levels, particularly if certain funding sources become less accessible due to rigorous adoption of ESG principles by the financial community.

Innovation is a fundamental element to support sector strategies for emissions reduction and transition away from

carbon-based supply. New ideas continually generated by market participants apply to the current, and future, generation fleet. But breakthroughs in carbon emission reductions will be accelerated when aggressive, collaborative innovation becomes a collective, industry-wide undertaking.

The utilities sector has been an ardent investor in new clean technologies in many forms. These investments – and the underlying innovation giving rise to this investment – have made meaningful impacts, but more remains to be done to meet the high standards of the industry. In partnership with Wall Street and other stakeholders, America's utilities are fully committed to meeting ESG and sustainability principles and enabling clean technology adoption to thrive. [PUF](#)