

Industry Newsletter: Infrastructure

INDUSTRY OVERVIEW

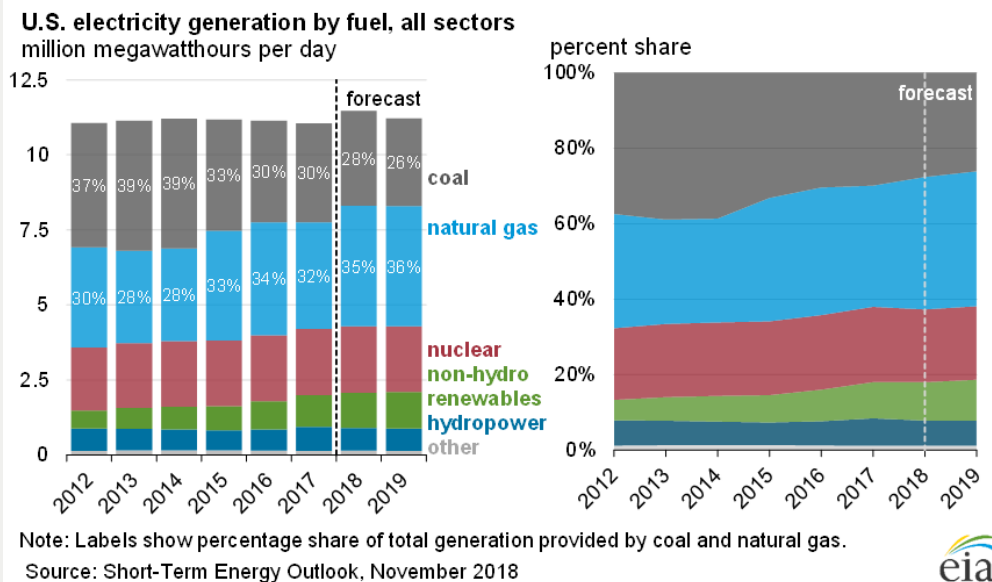
With the midterm elections just concluded few analysts expect any meaningful legislative programs from Washington's deadlocked government over the next two years. A possible exception is infrastructure.

An increase in infrastructure spending would have considerable economic benefits for the nation's economy. A Business Roundtable economic report forecast that there could be an increase of \$320 billion in economic output by the year 2020 if infrastructure investment went up by 1 percent of Gross Domestic Product (GDP) annually. The report also stated that for every \$1 spent on the nation's infrastructure, we would see approximately \$3 in increased economic activity.

According to the American Society of Civil Engineers (ASCE) the nation's infrastructure is in poor shape as reflected by the average grade of "D+" that was awarded in its 2017 report. This includes items such as dams, water systems, airports, highways, roads, bridges, and the nation's electric grid. According to the ASCE the cost to repair, upgrade, and replace America's sagging infrastructure would come to \$3.6 trillion by 2020. The longer the wait to make the necessary repairs, the higher the cost: ASCE states that it will cost \$4.59 trillion to fix the nation's infrastructure if the country waits until 2025.

ASCE also stated that the poor state of the nation's infrastructure costs every American family approximately \$3,400 in disposable income annually.

ASCE gave the nation's entire energy infrastructure a grade of "D+" in its 2017 report and this includes the electric grids servicing the country. The nation's electric grid has more than 640,000 miles of high-voltage lines that are functioning at full capacity. To make matters worse, many of the nation's power lines were built in the 1950's and 1960's and are regarded as being significantly past their normal usage period. The problem is that it will cost billions to replace these aging power lines. Operators are having a difficult time raising the necessary funds and also deal with frequent power outages which are costing the country's economy billions in lost productivity. According to Joshua D. Rhodes, a postdoctoral researcher of Energy at the University of



Texas at Austin, the cost to replace the nation's power plants, wires, power cables, transformers and poles would be approximately \$5 trillion. Dr. Rhodes has estimated that replacing the nation's power plants would cost \$2.7 trillion.

The U.S. Energy Information Administration (EIA) expects the share of U.S. total utility-scale electricity generation from natural gas-fired power plants to rise from 32% in 2017 to 35% in both 2018 and 2019. EIA's forecast electricity generation share from coal averages 28% in 2018 and 27% in 2019, down from 30% in 2017. Nuclear's share of generation was 20% in 2017 and EIA forecasts that it will be slightly below 20% in 2018 and in 2019. Wind, solar, and other non-hydropower renewables provided slightly less than 10% of electricity generation in 2017, and EIA expects them to provide more than 10% in 2018 and nearly 11% in 2019. The generation share of hydropower was 7% in 2017 and EIA forecasts that it will be about the same in 2018 and 2019.

In 2017, EIA estimates that U.S. wind generation averaged 697,000 megawatt hours per day (MWh/d). EIA forecasts that wind generation will rise by 8% to 750,000 MWh/d in 2018 and by a further 6% to 793,000 MWh/d in 2019. Solar power generates less electricity in the United States than wind power but continues to grow at a faster rate. EIA expects solar generation will rise from 211,000 MWh/d in 2017 to 267,000 MWh/d in 2018 (an increase of 26%) and to 305,000 MWh/d in 2019 (an increase of 14%).

According to estimates by the Federal Environmental Protection Agency (EPA) it will take \$632 billion in additional funding to maintain and upgrade the nation's drinking water, wastewater, and irrigation systems. ASCE has estimated that at least \$1 trillion are needed for maintenance and expansion of the nation's existing pipe system. ASCE has estimated that the nation experiences about 240,000 water main breaks annually resulting in a loss of 2.1 trillion gallons of water per year. Currently the nation's water system has not seen any signs of improvement: ASCE gave the nation's drinking water system a grade of "D" in 2013 and 2017. Many engineers feel that the situation in Flint, Michigan in 2014 and 2015 is

only the start of a water system crisis that will be seen in other municipalities across the country.

The 2017 ASCE report gave the nation's bridges a grade of "C+". And while this may seem like good news compared to the grades given to other infrastructure systems, the bad news is that a grade of "C+" was also given to the nation's bridges in 2013. ASCE gave a grade of "D" to the country's roads in 2017 and with good reason: there are massive problems facing the nation's motorists when they get into their vehicles on a daily basis. For example, ASCE states that more than two out of every five miles of the nation's city roads face daily traffic congestions and backups that cost the United States \$160 billion in wasted time and energy as recently as 2014. The United States is heavily dependent on its automobiles for transportation to work, school and to take a vacation. The nation's logistic system is heavily dependent upon trucks, large and small, to deliver goods, products, and raw materials to consumers, manufacturers, and retail stores in order to keep the economy moving along. The interstate highway system, first started under President Dwight Eisenhower in the 1950's, was designed for commercial, military, and private use. However, since that time spending for public infrastructure has dwindled significantly.

BUSINESS TRENDS

The age of the electric vehicle (EV) is dawning. Although EVs accounted for just 1 percent of US and global light duty vehicle sales in 2016, sales are growing rapidly and new models have lit up customer interest due to falling prices, increased driving range, and the overall "cool factor" that comes from combining advanced technologies with exceptional design. Supportive policies in many US states and abroad, as well as goals announced by several automakers and countries such as China, the UK, France, and India to phase out sales of fossil-fuel-powered vehicles in the next two decades, will likely add momentum. Bloomberg New Energy Finance projects global electricity consumption from electric vehicles could rise 30,000 percent, to 1,800 terawatt hours (TWH) annually by 2040 from 6 TWH in 2016.

While that projection is at the high end of a wide range, if current trends toward shared, autonomous vehicles play out as projected, EV adoption rates could accelerate. We expect power companies can look forward to positive momentum from transportation-sector electrification, as car buyers increasingly look at electric vehicles.

The financial impacts of and regulatory remedies for the 2017 federal tax overhaul will continue to dominate the landscape for the electric and gas utilities. The December 2017 enactment of federal legislation lowering the corporate income tax rate to 21% from 35% represents the first major overhaul of the U.S. tax code in more than 30 years. A significant portion of spending will continue to be dedicated to non-revenue-producing regulated investments. And after several years of robust growth in capital spending in the sector, it remains to be seen whether utilities will be constrained by cash flow challenges presented by the new tax laws or whether the associated rate reductions will provide additional headroom for rate recognition of new investment. Capital spending, as reported by the companies in Regulatory Research Associates' 52 utility holding company coverage universes, reached \$110 billion in 2017, almost double the \$57 billion expended in 2007, with projections for \$131 billion in 2018 portending a new recent high.

Many US electric power companies have already taken the first baby steps toward digital transformation—a multi-stage journey that can ultimately help them predict, manage, and control increasingly decentralized and complex networks, make more informed decisions, and enhance customer relationships. Digital transformation builds toward a set of interconnected, data-driven solutions that mature from traditional monitoring to intelligence and active control. With ever-increasing news reports regarding incursions into proprietary data, be it customer information or the systems that control the nation's resources, this issue will continue to receive attention as regulators seek to establish appropriate standards and necessary cost recovery frameworks. As the grid becomes more "distributed," with increasing and varied entities interconnected to

it, security will become an increasingly complex issue. RRA has observed nascent interest by regulators and industry participants with respect to advanced technologies, like cloud computing, multifactor authentication, and distributed ledger technologies as potential tools for addressing cyber security.

The traditional utility regulation model of cost recovery and allowed rate of return on investments will likely need to evolve and adapt to recognize and incentivize new technology options such as utility involvement in energy storage, two way power flows, and behind-the-meter customer solutions. Innovation in pricing structures and utility remuneration can enable wider deployment of innovative customer-service technologies.

MERGERS & ACQUISITIONS

In recent years, the appetite for strategic combinations has been steady, although there has been a bit of a drop off in the last 18 months, or so that can be attributed to uncertainty regarding the impact of tax reform and how regulators will address associated revenue requirement issues, financing concerns in the wake of rising interest rates, and headwinds in the form of increasing demands from regulators for enhanced customer benefits. After rising from under \$5 billion in aggregate transaction value in 2012 to more than \$50 billion in 2016, merger activity, as measured by announced deals, moderated to a little more than \$45 billion in transaction value in 2017.

We expect an uptick in M&A and consolidation in many sectors of the Infrastructure industry, such as electric power production and water systems. Due to the large number of stakeholders in companies in this sector, execution of M&A transactions requires that all stakeholders benefit from a transaction. Therefore, deal structures need to be crafted carefully so that all stakeholders share benefits from the transaction. M&A can also be used as a tool to (i) upgrade facilities; (ii) improve efficiency at inefficiently managed facilities; and (iii) recapture some of the investment previously made in dormant projects, such as incomplete nuclear power plants.