

ACEC Private Industry Brief

Energy & Utilities

October | November 2018

Market Scope

For engineering firms, the energy and utilities market is estimated to be \$20 billion, resulting in 21 percent of overall market share for *Engineering News-Record's* Top 500 firms in 2017. Many firms count oil and gas companies, as well as utilities, as major clients. Typically working under a Master Services Agreement or similar type of contract, a wide range of engineering services are provided to these clients, including: civil, mechanical/electrical, structural, environmental, geotechnical, and water-related design. Energy and utility clients are also significant buyers of surveying and mapping services, because their projects often span large geographies.

Top Clients

The list below features the top 10 largest U.S. electric utilities (by revenue), and the states in which they operate. The total number of electric utilities in the United States is estimated to be 3,300, with about 200 providing the majority of power to commercial and residential customers.

1. **NextEra Energy:** 34 states in Continental U.S.
2. **Duke Energy:** FL, IN, KY, NC, OH & SC
3. **Southern Company:** 19 states in Continental U.S.
4. **Dominion Resources:** ID, NC, OH, UT, VA, WV & WY
5. **Exelon:** 28 states in the Continental U.S.
6. **American Electric:** AR, IN, KY, LA, MI, OH, OK, TX, VA & WV
7. **Public Service Enterprise Group:** NJ & NY
8. **Consolidated Edison:** NY
9. **Xcel Energy:** CO, MI, MN, NM, ND, SD, TX & WI
10. **PG&E:** CA

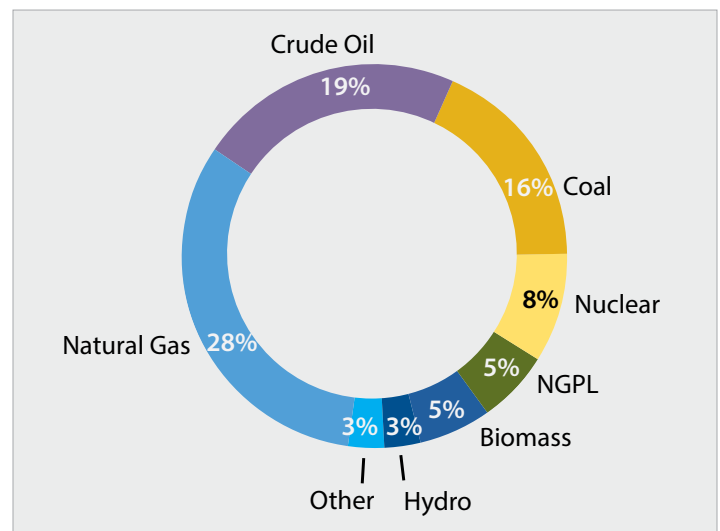
Source: Statista

5 Current Market Trends

- **1. Natural Gas Grows; U.S. Becomes Net Energy Exporter:** At a recent Brookings Institution briefing, International Energy Agency (IEA) Executive Director Fatih Birol, a renowned energy expert and chair of the World Economic Forum's (Davos) Energy Advisory Board, referred to the United States' "seven-year silent revolution in shale gas" as an "upheaval" reshaping the global energy industry. IEA predicts that within five years, the United States will account for close to three-quarters of all liquid natural gas (LNG) export growth, and its market share will jump to 20 percent in 2023 from only four percent today. China will be the recipient of much of this LNG, as it becomes the largest importer of natural gas by 2019, with demand forecasted to grow by 60 percent between 2017-2023 (IEA). This growth is attributed to recent Chinese policies aimed at reducing air pollution by switching from coal to natural gas.

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2017 U.S. Energy Production by Source

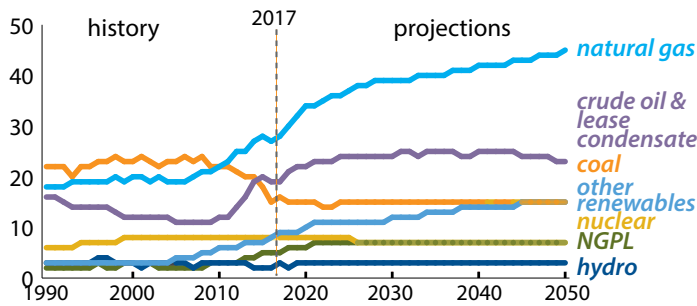


Source: U.S. Energy Information Administration (EIA)

Current Market Trends, *continued*

Natural Gas to Lead Future U.S. Production

quadrillion British thermal units

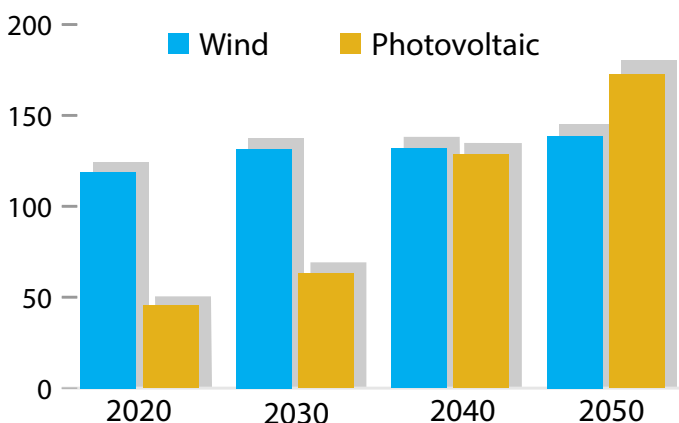


- **2. Pipeline Limitations Challenge Market:** Because exports need to move from basins to terminals before being exported, having the necessary infrastructure is one of the "market evolutions and reforms" identified as critical by IEA. The estimated spend for infrastructure investment over the next 17 years is substantial; for natural gas it is \$417 billion, with an additional \$320 billion for oil infrastructure, according to a June 18, 2018 Interstate Natural Gas Association of America (INGAA) report. The report details that the U.S. Southwest will lead in oil and gas infrastructure investment, followed by the Northeast. As it has in the past, design and construction will hinge largely on pipeline approvals, particularly in the Northeast where environmental groups have successfully blocked new pipelines.

- **3. Solar and Wind Growing to Meet Electricity Demand:** Public and private-sector investments in renewable energy technologies resulted in production from wind and solar reaching record highs for 2017, according to EIA. This upward trend is expected to continue, as renewable generation is projected to increase 139 percent by 2050, with solar accounting for 94 percent of that growth. Project opportunities connected to solar and wind farms will increase as a result.

Wind and Solar Capacity to Increase

in gigawatts



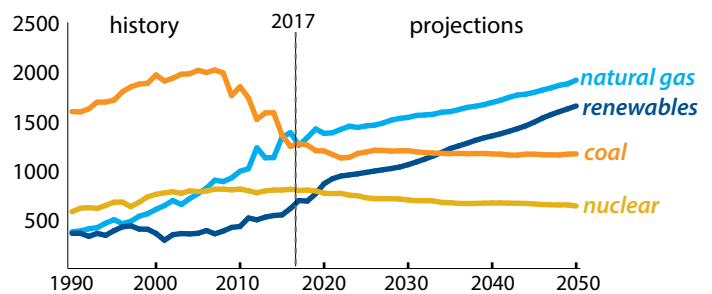
Source data for graphics on this page: EIA

► 4. Resiliency and Security of Increasing

Importance: Global demand for electricity is expected to double, as the world becomes more technologically advanced and electric vehicles become more common. Having the ability to store and deliver electricity, which comes from a mix of sources that is trending towards natural gas and renewables from coal and nuclear, is key. Disruptions in the form of natural and man-made disasters, such as hurricanes or cyber attacks, is of significant concern. Climate change, and the challenge of addressing it, "is a clear economic opportunity for many companies and could be a significant risk if companies fail to act" according to Tufts University's 2018 report *Clean Energy Policy and Expanding Markets: Insights from Corporate, Labor and Investor Leaders*.

Electricity Generation from Select Fuels

billion kilowatthours

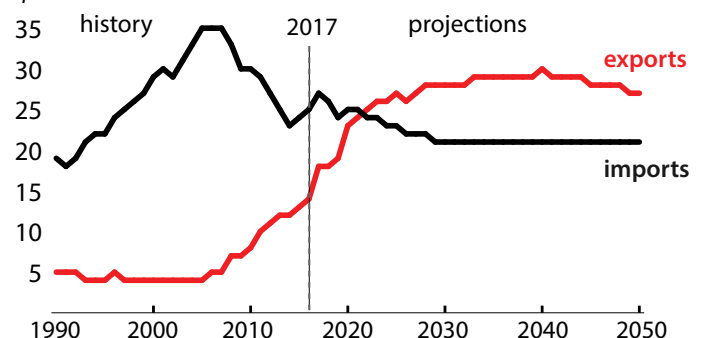


► 5. Future Geopolitics and Economies are Unknown:

EIA estimates that the United States will become a net energy exporter by 2022, with others giving even earlier estimates. This is a major market shift because the United States has been an net energy importer since 1953. The major factors that will influence this radical shift are maintaining favorable geological and technological innovations domestically, as well as higher world oil prices and a growing global economy. In addition, because China is one of the largest importers, clarity regarding trade policy will be key, as well as the future exchange value of the U.S. dollar.

Exports to Outpace Imports

quadrillion British thermal units



Government Affairs Action

- ▶ **Energy Legislation:** ACEC supports S. 1460 the "Energy and Resources Act of 2017" and urges Congress to send the President a final bill to develop America's energy resources. Congress has limited opportunity to finalize legislation this year. S. 1460 calls for modernizing electricity infrastructure and streamlining the federal permitting of natural gas exporting facilities. Several House-passed energy bills (H.R. 2910 - "Promoting Inter-agency Coordination for Review of Natural Gas Pipelines Act", H.R. 3043 - "Hydropower Policy Modernization Act," and H.R. 2883 - "Promoting Cross-Border Energy Infrastructure Act") could be combined with S. 1460. In the 114th Congress (2015-2017), the House and Senate each cleared ACEC-supported energy bills, which included provisions to expedite LNG export facility approvals and cross-border energy infrastructure projects.
- ▶ **Permitting:** ACEC supports S. 3303 the "Water Quality Certification Improvement Act of 2018" clarifying provisions of Section 401 of the Clean Water Act where developers of federally permitted projects seek state water quality certifications necessary for final federal project approval. The bill requires states to grant or deny requests in a timely manner and inform applicants within 90 days as to whether any additional information is needed to complete the review. Recently, the White House Council on Environmental Quality (CEQ) opened the review of National Environmental Policy Act (NEPA) implementing regulations pursuant to Executive Order (EO) 13807, which directs agencies to optimize inter-agency coordination of NEPA review and decisions and reduce unnecessary burdens and delays. ACEC supports NEPA; however, we share many of CEQ's stated goals for this proposed rulemaking, including promotion of efficient, well-informed, and timely federal decision making.
- ▶ **FERC:** ACEC actively supports the filling of Federal Energy Regulatory Commission (FERC) vacancies and maintaining a functional quorum. Without a functional quorum, billions of dollars of energy infrastructure can languish due to deadlock. Today, FERC has one vacancy, with the four positions evenly split between Democrats and Republicans.
- ▶ **Cybersecurity:** ACEC engages with FERC and the National Energy Reliability Corporation (NERC) so ACEC members and utilities are not subjected to unreasonable cybersecurity liability standards in engineering contracts. ACEC views FERC/NERC advocacy as a key area in the broader public dialogue on supply-chain cybersecurity.

Business Development Insight

Trending: Water use for fracking is growing and so may related services.

A major component of fracking is water and how to process the wastewater that results from drilling.

Fracking is a process that blasts a mix of water, sand and chemicals into rock formations to release oil and gas. One of shale drillers biggest challenges is what to do with the vast volumes of wastewater that are the byproduct of fracking wells.

According to a recent article in *The Wall Street Journal*, "The Next Big Bet in Fracking: Water" (August 22, 2018), drillers in the Permian Basin in New Mexico and Texas currently generate more than 1,000 Olympic-size swimming pools full of murky, salty water daily. Handling this water is up to 25 percent of a wells' lease operating expense. *The Wall Street Journal* describes that private-equity firms are investing more than \$500 million into wastewater-disposal companies. Many of these companies are building pipelines to transport wastewater for underground disposal, as an alternative to trucks that currently haul it away, a problem exacerbated by the current trucking shortage.

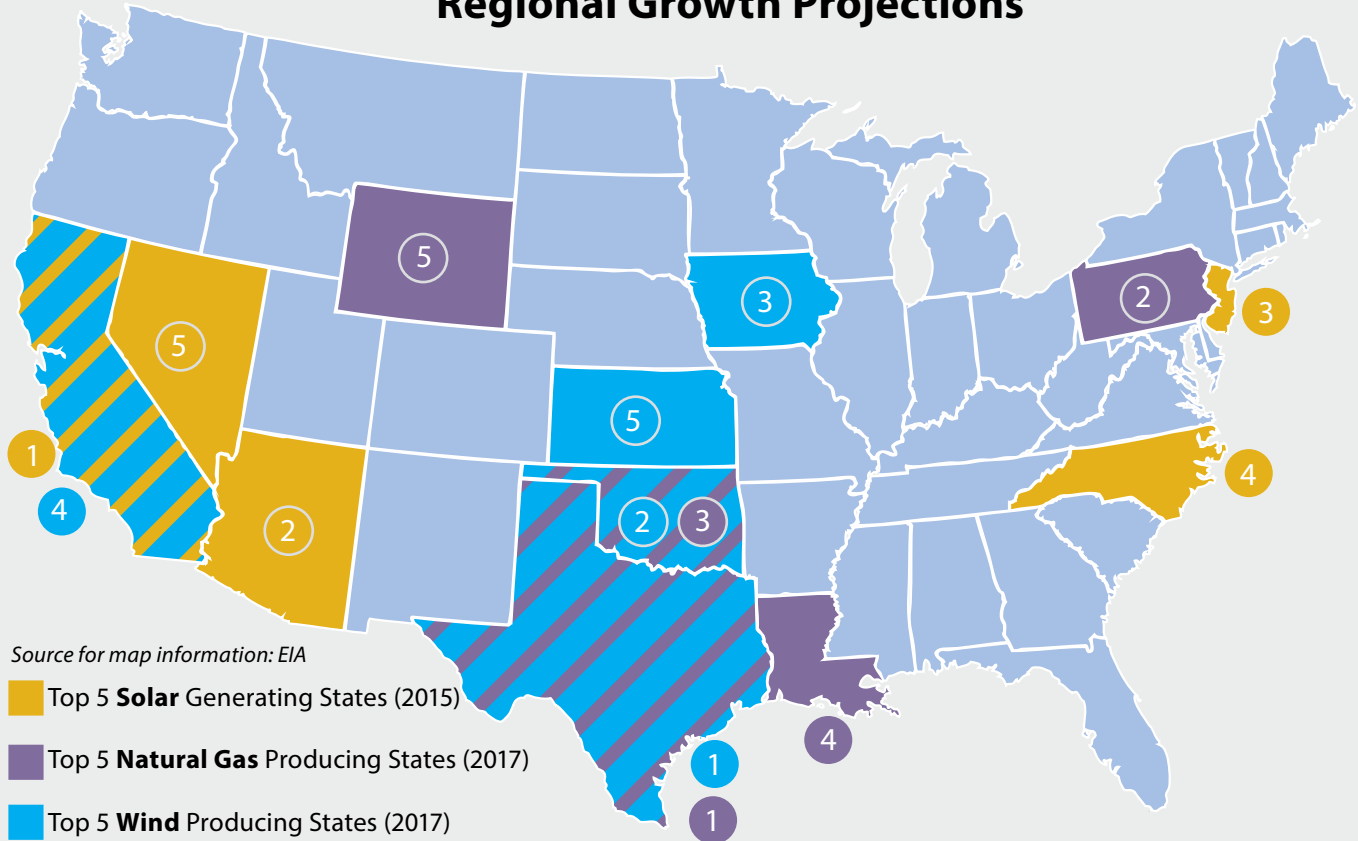
Besides the increase in water byproduct from production rising, the actual volume of water being used to frack a single well is increasing due to changes in production processes. Duke University researchers published their peer-reviewed findings in the journal *Science Advances* (August 15, 2018), and they are garnering considerable attention. The article describes that the amount of water used per well for hydraulic fracturing (fracking) surged by 770 percent between 2011 and 2016 in all major U.S. shale gas and oil production regions. The volume of brine-laden wastewater that wells generated during their first year of production also increased by up to 1440 percent during the same period.

Clearly, solutions and services around the treatment, transmission and disposal of this wastewater presents opportunities for engineering firms.

Within 5 years the United States will account for close to three-quarters of all LNG export growth and its market share will jump 20% in 2023, from 4% today. China is also set to dominate the growth in global gas demand in the next 5 years, and becomes the largest natural gas importer by 2019.

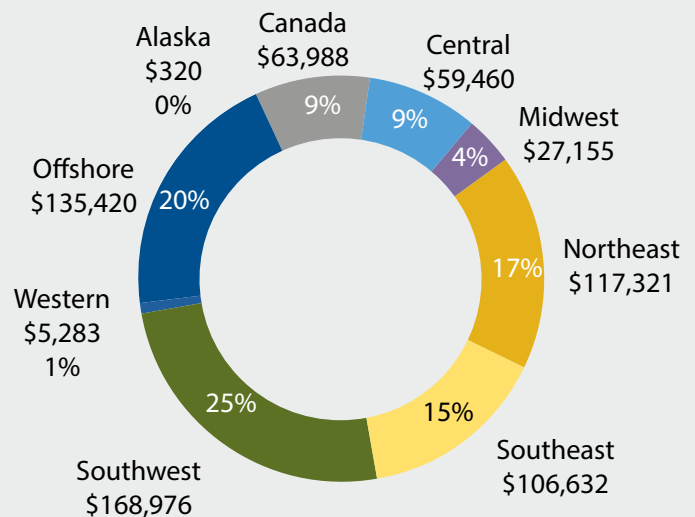
- International Energy Agency, 2018

Top Energy Producing States & Regional Growth Projections



North American Regional Growth Projections

The great need for continued oil, gas and natural gas liquids infrastructure continues. The INGAA Foundation, Inc.'s *North America Midstream Infrastructure through 2035* report projects total oil and gas infrastructure investment averaging between \$55-70 billion per year between 2018-2035, suggesting the "robust environment for oil and gas infrastructure development has not yet run its course and is likely to continue for many years." In North America there are regional trends that greatly influence infrastructure development, depending on where production is expected to grow and locations where product would be used or exported. The chart to the right details the projected infrastructure spend per region between 2018-2035.



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