

CHALLENGES AND SOLUTIONS FOR THE NEXT PRESIDENT AND CONGRESS

COMPETING TO WIN

ENERGY IN FOCUS

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Our energy resources and the way we use them have changed dramatically over the past decade. The United States now has a mix of energy resources and innovative technologies unmatched by any other nation in the world. We have abundant supplies of coal, natural gas and oil; our fleet of nuclear power plants cleanly and efficiently produce a substantial portion of the nation's electricity; renewable sources are growing quickly and diversifying the nation's energy portfolio; and advances in energy efficiency continue to cut manufacturers' energy costs.

Unfortunately, Washington policies have failed to keep pace with this energy renaissance. Too many of our resources remain off limits to development, and access to federally controlled resources is decreasing. Our energy infrastructure is in need of massive investment and buildout, but developers are increasingly unwilling or unable to run the gauntlet of laws, regulations, permits and protests necessary to break ground on a new project. Despite the fact that manufacturers have grown more efficient in the way we produce and use energy, the laws and policies governing efficient energy use are often conflicting, ineffective and counterproductive.

Manufacturers need consistent access to all forms of energy so that our energy costs remain a competitive advantage versus the rest of the world. We need transmission lines, pipelines and import and export terminals to ensure that the energy we depend on can be delivered to us safely and reliably. Finally, we need policies that give us the power to use the energy best suited for our operations responsibly and efficiently, rather than make those choices for us.

Manufacturing accounts for roughly one-third of the energy consumed in the United States. For energy-intensive manufacturers, such as chemicals, paper, metals and refining, energy is one of the largest costs.

Three Big Trends Shaping the Changing Energy Landscape

Trend 1: The Domestic Energy Renaissance

America's newfound energy resources are spurring major investment by manufacturers. For instance, abundant natural gas and natural gas liquids (NGLs) from shale resources have driven the chemical industry to invest in 264 new projects representing \$164 billion in capital investment in the United States.¹ These energy-related chemicals are the primary building blocks for a wide range of manufacturing sectors, including, but not limited to, fertilizer, plastics, rubber, building and construction, paint and coatings, automotive and electronics.

A National Association of Manufacturers–supported study by PricewaterhouseCoopers recently predicted that by 2040, the shale gas boom could create 1.41 million new manufacturing jobs in the United States and generate annual cost savings for manufacturers of \$34.1 billion due to lower energy and feedstock costs.²

The energy renaissance is not limited to oil and gas. More than 100,000 workers contribute to the energy production at the nation's 99 nuclear power plants,³ including manufacturers providing on-site repair, operations and maintenance, as well as replacement components, modifications and upgrades when necessary. Pending retirements are spurring the industry to hire another 25,000 employees over the next few years, and in anticipation of new nuclear plant construction, U.S. companies have created in excess of 15,000 new U.S. jobs since 2005, which include manufactured products like turbines, polar cranes, pumps, valves, piping and instrumentation and control systems.⁴ Renewable energy sources have also steadily grown—consumption from wind, solar and geothermal energy sources have increased more than 400 percent over the past decade⁵—now accounting for about 10 percent of total U.S. energy consumption and about 13 percent of electricity generation.⁶ Overall energy intensity in manufacturing (i.e., energy consumed per each dollar of goods produced) has steadily improved as manufacturers have grown more energy efficient.⁷ Finally, while the coal industry has faced its share of headwinds in the electric power sector, coal use in the non-electric-generation manufacturing sector has remained relatively consistent, at around 43 million short tons of coal per year.⁸

¹ "U.S. Chemical Investment Linked to Shale Gas: \$164 Billion and Counting," American Chemistry Council, Inc., April 2016. Available at <https://www.americanchemistry.com/Policy/Energy/Shale-Gas/Fact-Sheet-US-Chemical-Investment-Linked-to-Shale-Gas.pdf>.

² "Shale Gas: Still a Boon to US Manufacturing?," PWC, December 2014. Available at <http://www.pwc.com/us/en/industrial-products/publications/shale-gas-transforming-manufacturing.html>.

³ <http://www.nei.org/Why-Nuclear-Energy/Economic-Growth-Job-Creation/Economic-Benefits>.

⁴ "Nuclear Energy's Economic Benefits—Current and Future," Nuclear Energy Institute, April 2014. Available at <http://www.nei.org/CorporateSite/media/filefolder/Policy/Papers/jobs.pdf?ext=.pdf>.

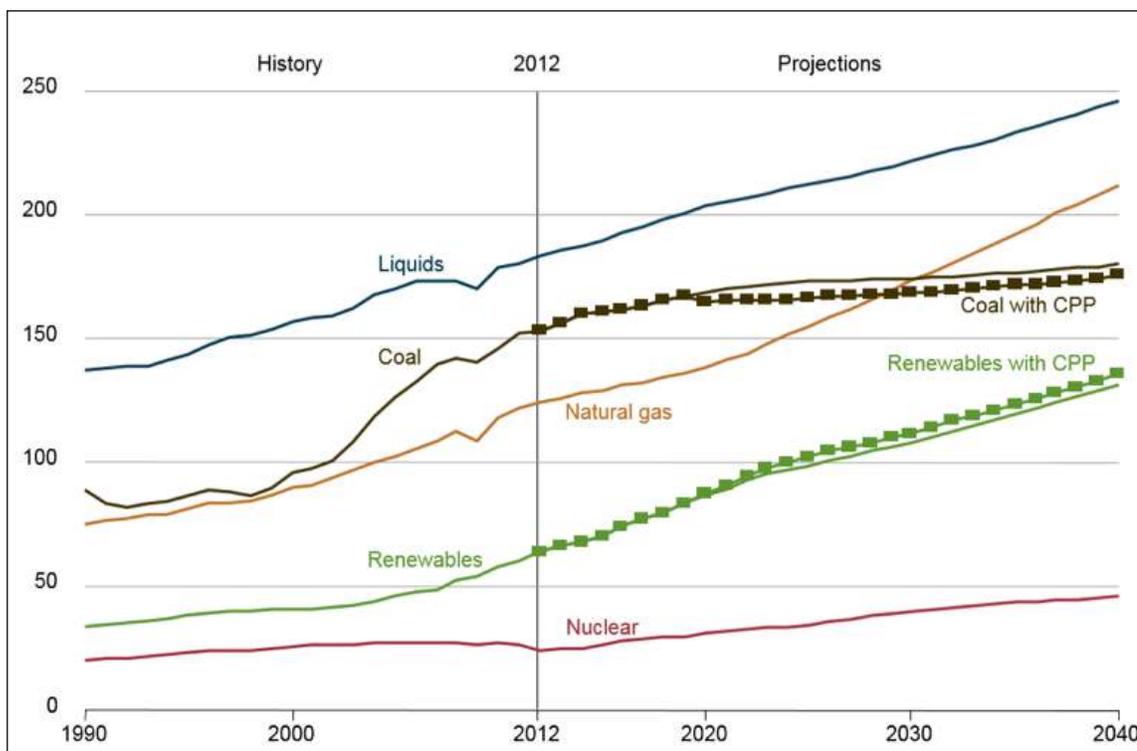
⁵ "Renewable Energy, Monthly Energy Review," U.S. Energy Information Administration, June 2016. Available at <http://www.eia.gov/totalenergy/data/monthly/pd>.

⁶ <http://www.eia.gov/tools/faqs/faq.cfm?id=92&t=4>.

⁷ "Tracking Energy Efficiency Performance in the United States," 2016. Available at <http://aceee.org/ee-metrics>.

⁸ <http://www.eia.gov/coal/annual/pdf/table26.pdf>.

Global Energy Consumption Trends (quadrillion Btu)



Source: U.S. Energy Information Administration; chart available at <http://www.eia.gov/forecasts/ieo/world.cfm>.

Trend 2: The Evolving Electric Grid

Innovation, regulations and market dynamics are driving rapid changes to the electric grid and the way electricity is produced in the United States. The electric grid has traditionally been a one-way system: power plants make electricity, and consumers use it. The grid of the future—and, increasingly, the present—is multidirectional, relying on traditional electric generation but also combined heat and power (CHP) technologies, distributed resources like rooftop solar, energy storage and microgrids and demand-side management technologies like smart metering. The utility sector expects to invest more than \$300 billion over the next three years to enhance the grid and reshape the nation's electric generation fleet.⁹

A transforming grid provides opportunities and challenges. Utilities have expressed concerns about cost recovery when implementing demand-side management programs and integrating distributed resources onto the grid. Manufacturers must also adapt to new options and rules, which must be reconciled with a need for consistent, reliable energy at all times.

Trend 3: Permitting Paralysis for Energy Infrastructure

The dominant energy headline for the past decade has been the Keystone XL pipeline, a crude oil pipeline project that would have brought crude oil from Canada and the Bakken region of the United States to Gulf of Mexico refining centers. That project, which should have been a symbol of energy security and economic progress, instead became synonymous with red tape and political gridlock. For manufacturers, the Keystone XL saga was a harsh reminder that the permitting process for energy projects is riddled with flaws that must be corrected so that the nation's energy infrastructure can adequately meet future energy demand.

Permitting hurdles are currently delaying projects across the energy landscape, including, but not limited to, oil and gas pipelines, electric transmission lines, crude by rail facilities, coal, nuclear and liquefied natural gas (LNG) exports, and even new renewable energy installations. Opposition groups are better funded and more driven than ever before, and the regulatory process to permit energy infrastructure affords opponents too many opportunities to delay decisions and stop agencies from doing their work.

Disruptive technologies will almost certainly change the way we produce and use energy in the future. Hydraulic fracturing and horizontal drilling unlocked vast natural gas resources and changed the face of manufacturing in America. Advanced technologies like battery storage, demand-side management, electric vehicles, small modular nuclear reactors and many others will almost surely do the same.

⁹ "The Promise of Tomorrow: Electric Power Industry Outlook," The Edison Electric Institute's 2016 Wall Street briefing, Edison Electric Institute, February 2016. Available at http://www.eei.org/resourcesandmedia/industrydataanalysis/industryfinancialanalysis/Documents/Wall_Street_Briefing.pdf.

Ways to Lead on Energy

Promote and continue an energy renaissance that advances research, development and deployment of new technologies that improve energy efficiency and supports domestic energy production and manufacturing.

The Challenge

Federal policies, particularly those manifested through regulations, frequently choose winners and losers among energy sectors and technologies and impair the ability of energy-producing and energy-consuming segments of the industry to obtain adequate funding for energy-related investments. The unpredictability hampers manufacturers' ability to make long-term decisions on how to fuel their operations and ultimately impacts our ability to attract and retain new manufacturing facilities and the jobs they create.

The Stakes

Manufacturers—particularly those that are energy-intensive—are increasingly investing in the United States because of the competitive advantage our energy resources provide. By artificially limiting the availability of certain types of energy, manufacturers lose this advantage. They will look to other countries where energy is cheaper, where important feedstocks like petrochemicals or natural gas liquids are available or where regulations are more predictable. Similarly, by failing to consistently administer programs dedicated to energy efficiency and new technologies, we are only ensuring that this intellectual property is developed elsewhere.

The Solutions

Leaders should take the following actions to ensure that adequate energy resources are developed in the United States:

- Issue a new five-year plan for offshore leasing that expands the areas available for exploration in the Gulf of Mexico, Atlantic and Pacific Outer Continental Shelf and off the coast of Alaska.
- Take strong steps to maintain the existing fleet of nuclear power plants and ensure these plants remain competitive.
- Craft a coherent national coal strategy that provides a stable regulatory structure for the leasing, transport and use of coal in electric power and industrial sectors.
- Institute a long-term, stable and reliable leasing policy for natural resources on federal lands. Where prudent, turn management and leasing of these resources over to states and tribes.

Leaders should take the following actions to promote continued research, development and deployment of new technologies that improve energy efficiency:

- Open access to manufacturers and other private-sector innovators to national laboratories to share expertise and spur innovation.
- Commit to research, development and demonstration of carbon capture, beneficial use and storage technology for all fossil fuel applications.
- Institute a new \$5 billion goal for federal agencies to use Energy Saving Performance Contracts and Utility Energy Service Contracts to retrofit federal buildings.
- Create and implement federal programs that encourage and help manufacturers, especially small and medium-sized manufacturers, to understand and deploy energy-efficiency and energy-management measures for the purposes of becoming more competitive.
- Increase the utilization of advanced clean coal utility and industrial generation technology and expand coal-to-gas and coal-to-liquid technologies in an environmentally sound manner.
- Support research, development and demonstration of advanced nuclear technologies, including front-end enrichment, advanced centrifuges, small modular reactors and technologies to close the nuclear fuel cycle.

Remove regulatory barriers that slow access and improvements to traditional energy resources, electricity generation, renewable and alternative energy and the nation's privately funded energy delivery system.

The Challenge

New energy production and delivery infrastructure—power plants, refineries, pipelines and processing facilities, transmission lines—is needed to connect new supply sources with new and growing sources of demand. However, permitting paralysis has made it easier to leave old energy infrastructure in place rather than invest the resources and time necessary to develop and install much-needed capital. In addition, manufacturers of advanced, energy-efficient products frequently confront new regulations that exceed the pace of innovation or impose timelines inconsistent with product lifecycles.

The Stakes

When regulatory barriers impede adequate energy infrastructure, manufacturers suffer. Reliability is paramount for manufacturers, and delays and regulatory impediments threaten reliability. Similarly, finding a workaround to a stalled pipeline project or transmission line

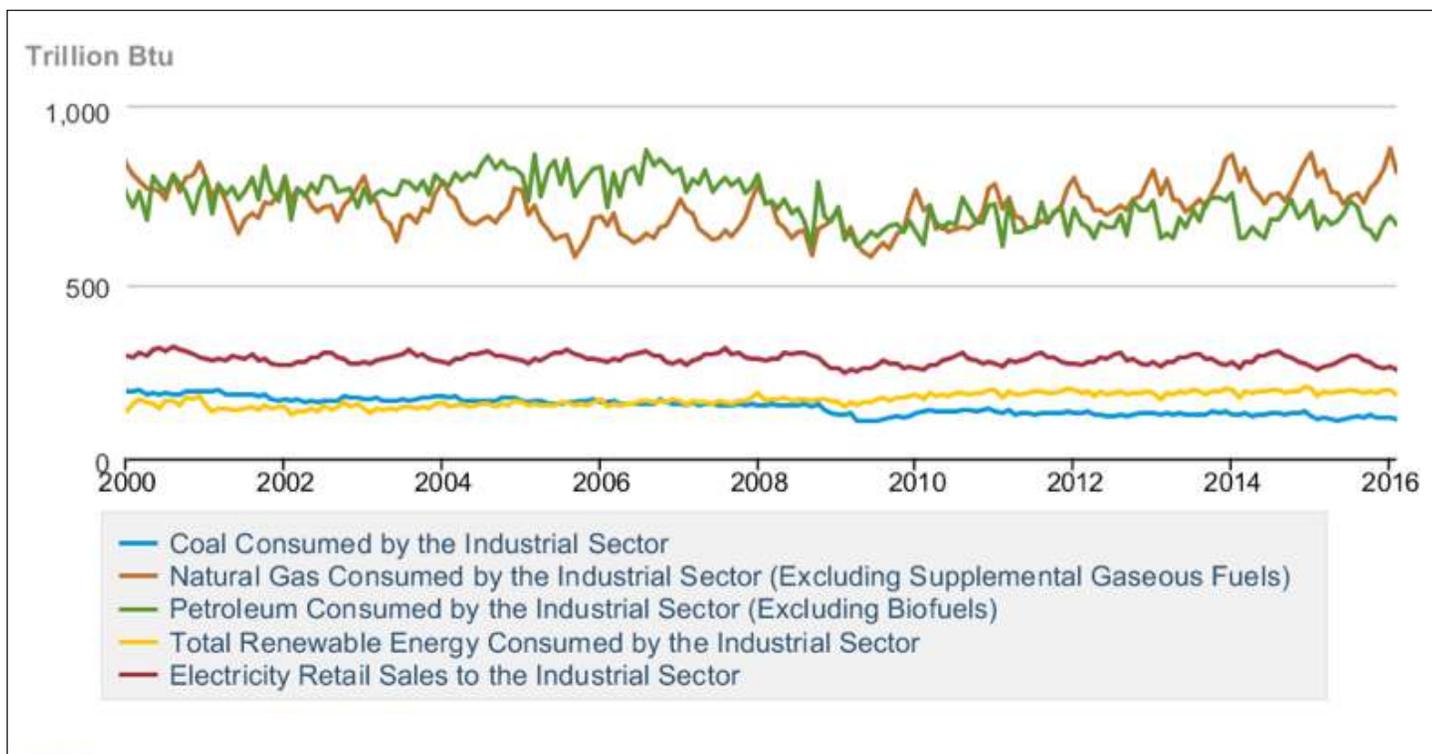
can lead to a significant increase in manufacturers' costs. For product manufacturers, a regulatory system that imposes unnecessary costs or overly aggressive timelines will make it much harder to keep U.S. manufacturing facilities.

The Solutions

Leaders should take the following actions to reduce regulatory barriers for energy production, transport and use:

- Provide a consistent, reasonable scope and timeline for environmental analysis of energy projects subject to the National Environmental Policy Act that includes deadlines for decision making and a firm statute of limitations on actions to challenge a final record of decision.
- Provide the Federal Energy Regulatory Commission additional tools to quickly and efficiently issue certificates of public convenience and necessity for new natural gas pipelines.
- Expedite the licensing and permitting process for LNG and remove regulatory barriers to the export of nuclear, coal and clean energy technologies.
- Ensure a robust and predictable nationwide permitting system under the Clean Water Act for activities with limited or no impacts to wetlands or other jurisdictional areas.
- Modify the process by which the Department of Energy sets and revises its conservation and energy-efficiency standards to allow for greater stakeholder input and more flexibility.
- Update the Nuclear Regulatory Commission's permitting process to enable faster approvals.
- Require the federal government to fulfill its legal obligation to remove used fuel from commercial nuclear power plants and manage its long-term disposal.
- Improve the presidential permit process set forth in Executive Order 13337—the executive order that sets forth the approval process for cross-border pipelines and other energy delivery projects—to accelerate decision-making time and eliminate Keystone XL-type delays.

How Manufacturers Use Energy



Source: U.S. Energy Information Administration; chart available at <http://www.eia.gov/totalenergy/data/monthly/>.

Provide for a reliable electric grid that ensures manufacturers can access energy when they need it, even as policies and markets change.

The Challenge

Distributed energy resources, CHP, energy storage, microgrids and demand-side management technologies are rapidly changing the electric grid. Manufacturers need government policies that enable continued energy reliability as the grid transforms—not the opposite.

The Stakes

The stakes are particularly high for manufacturers, which depend on 24-hour, secure, continuous electric power for their operations.

The Solutions

Leaders should take the following actions to provide for a reliable electric grid:

- Promote significant investments to modernize the national utility grid and utilize advanced metering infrastructure, distributed energy resources and other advanced technologies to improve efficiency, affordability, reliability and security.
- Invest in grid improvements to ensure manufacturers have secure, flexible and competitive energy options.
- Issue model best practices for states to address regulatory barriers to CHP deployment, including guidance for assigning reasonable fees and rates for interconnection to the local distribution grid, supplementary power, backup or standby power, maintenance and interruptible power supplied to facilities that operate CHP systems that also allow for reasonable cost recovery by an electric utility based on the costs to provide these services and do not shift costs to non-CHP customers.
- Promote cost-effective demand-side management services by customer and aggregator programs, energy-efficiency measures and distributed energy resources. Allow electric and natural gas utilities to meet future energy needs with these technologies and measures.

COMPETING TO WIN THE UNITED STATES WINS WHEN WE LEAD

Conclusion

Manufacturers enter the next presidential administration embracing new energy opportunities. In sharp contrast to 2009, manufacturers today enjoy a competitive advantage versus their international competitors on energy, one of their largest input costs. This energy advantage makes up for the many other U.S. policies through which manufacturers operate at a competitive disadvantage, such as tax, trade and regulations. In addition to fixing those other major policy issues, it is imperative that the next administration enact sensible policies that maintain and widen the competitive advantage manufacturers enjoy on energy. The recommendations in this paper, if enacted, will spur investments from existing manufacturers and attract new ones, creating jobs and fueling economic growth in the United States.

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