



Energy Policy



Executive Summary

Energy is at the core of America's long-term economic competitiveness and fuels what has traditionally been the driver of U.S. economic growth: manufacturing. The paradigm of energy scarcity that has driven much of our nation's energy policy for the previous decades is changing to one of abundance, and has left the U.S. and its energy future at a crossroads.

The policy decisions that are made now regarding our energy resources will have real and lasting effects on manufacturers and the economy. The U.S. must capitalize on our new abundance by developing a comprehensive energy plan that grows the economy.

Advanced manufacturers such as Dow operate at the apex of energy and manufacturing, and need sound energy policy to remain globally competitive. It is more critical now than ever that a strategy be defined that provides the long-term certainty companies need to continue to make investments. For manufacturers, energy costs can make the difference between investing here in the U.S. or in other nations.

At Dow, we believe the future of energy is connected to innovative technologies and materials from chemistry, and that energy policies at all levels of government should focus on four fundamental principles to transition to a sustainable energy future:

1. **Conserve** by aggressively pursuing energy efficiency
2. **Optimize**, increase and diversify domestic hydrocarbon resources
3. **Accelerate** the development of cost-effective clean energy alternatives
4. **Transition** to a sustainable energy future



Dow is one of many companies that calls the U.S. home and we remain committed to growing here. We have announced more than \$6 billion worth of investments in the U.S. Gulf Coast to capitalize on abundant domestic energy resources. However, we are deeply concerned that the U.S. continues to lose ground because of uncompetitive energy policy. Simply put, there is no better time than now for the U.S. to develop a comprehensive energy policy that secures an affordable and sustainable energy supply, and signals to manufacturers that the U.S. is committed to accelerating the manufacturing renaissance. The cost of inaction is too high, and the technology and expertise already exist to make this plan a reality.

Energy Efficiency

Energy efficiency enables us to do more with less, and is the easiest and most affordable way to conserve energy while also reducing carbon emissions. According to the Alliance to Save Energy, if the U.S. tried running today's economy without the energy efficiency improvements that have taken place since 1973, we would need 55 percent more energy supply than we presently use. In fact, energy-efficiency is the U.S.'s greatest energy resource. The amount of energy saved in 2011 was more energy than the U.S. got from any single energy source, including oil, natural gas, coal, and nuclear. Numerous studies have made clear that the financial benefits of energy fuel savings far exceed the upfront investment costs of energy efficiency.

Dow is in a unique position to help accelerate the development and deployment of energy efficiency technology. Our products enable energy efficiency by making vehicles lighter, and by using less energy to keep buildings cooler in the summer and warmer in the winter.

Building Codes

Updated building codes do more than simply increase energy efficiency – they drive structural, electrical and mechanical improvements across all sectors of the construction industry that enhance safety and make buildings perform more effectively. Delays in adopting code updates will affect building safety and energy-efficiency in the U.S. well into the future. Governments should accelerate the adoption and implementation of energy-efficient building codes. Additionally, as the largest single energy user, the federal government should lead by example and apply cost-effective and innovative best practices to federal buildings and vehicle fleets.

The National Petroleum Council found available energy efficiency technology applied to residential and commercial buildings would reduce energy use 15 to 20 percent, and yet our nation's building industry continues to lag behind other sectors in effective policies that drive significant energy savings. Many of the innovative products needed to achieve greater energy efficiency are manufactured in the U.S. Updated building codes apply to all new construction and would result in greater energy efficiency measures being adopted across the construction industry. Building energy code advancement will have a direct economic impact through the sale of energy-efficient technologies, lower energy bills, and the reduction in energy demand that helps the U.S. preserve its energy resources and reduce energy imports.

Accelerating Energy Productivity

Dow is committed to advancing the U.S. Department of Energy, the Council on Competitiveness, and the Alliance to Save Energy's challenge to Accelerate Energy Productivity 2030. This goal is a bold but achievable plan to double energy productivity in the U.S. by 2030 (getting twice as much economic output from each unit of energy). Energy productivity gains have proved to be cost-effective and can be achieved without burdensome mandates or excessive government spending. Meeting such an ambitious goal will require investing in energy productivity throughout the economy, modernizing regulations and infrastructure, and educating and engaging stakeholders on ways to drive energy productivity gains.

According to the Alliance to Save Energy, doubling U.S. energy productivity by 2030 would save \$327 billion annually in avoided energy costs, create up to 1.3 million new jobs, and reduce imports to a mere 7 percent of overall energy consumption.

Doubling energy productivity by 2030 will require significant investments across all sectors of the economy that will stimulate innovation and create jobs. Reaching this goal means powering our daily lives – including our homes, transportation systems, and manufacturing facilities – using less energy.

Cogeneration

Advancing integrated cogeneration for the industrial sector is another key way to encourage energy efficiency. According to the EPA, the average efficiency of fossil-fueled power plants in the U.S. is 33 percent. By putting the wasted heat to use, combined heat and power (CHP) is estimated to offer thermal efficiency between 60 and 80 percent.



Recommendations

- State and local governments should accelerate the adoption and implementation of energy-efficient building codes on an ongoing basis, including the most recent nationally recognized energy efficiency standards for residential and commercial buildings.
- Align utility financial incentives so that utility investments in demand-side resources are on equal footing with supply-side investments.
- Implement policies to increase the use of CHP, including eliminating regulatory barriers that limit market access, fair pricing, and access to long-term contracts.
- Facilitate energy-productivity financing by:
 - Improving the accuracy of mortgage underwriting used by federal agencies by ensuring that energy costs and the technologies to lower those costs are accounted for in the underwriting process.
 - Establishing effective state and local government mechanisms to finance energy-efficiency and renewable-energy improvements, such as on-bill repayments financed through utilities or property-assessed clean energy (PACE) funding tools.
- Advance the U.S. Department of Energy, the Council on Competitiveness and the Alliance to Save Energy's challenge to Accelerate Energy Productivity 2030 through focused investments, modernizing regulations and educating stakeholders.
- Advance energy productivity through tax reform:
 - Refocus incentives on high-efficiency technologies and innovation.
 - Adjust commercial and industrial depreciation schedules to encourage investments that can boost energy productivity.
 - Promote retrofits in existing residential and commercial buildings by maintaining the use of targeted incentives with a schedule to gradually phase out.
- Increase investment in basic and applied R&D directed at improving the energy productivity of all sectors of the economy.

Optimizing Hydrocarbons

As we seek to transition to a lower-carbon, sustainable economy, hydrocarbon resources will continue to play a significant role in meeting growing energy demands until cleaner energy technologies can be brought online at scale. Hydrocarbons provide critical feedstock for the manufacturing of products and technology that drive economic growth and innovation. These resources enable many of the products that advanced manufacturers such as Dow make to produce products that will help move us closer to a lower-carbon, sustainable future, including photovoltaics, wind turbine blades, and energy-saving insulation.

Future economic prosperity and national security depend on optimizing, increasing, and diversifying our domestic energy production. To reduce our dependence on less-secure sources of imported energy and mitigate the domestic impacts of global market volatility, the U.S. must commit to developing domestic energy resources in a sustainable, environmentally responsible manner. The government should prioritize policies that increase access to a diverse supply of competitively priced energy resources. We can plan for a prosperous energy future by making well-considered public policy decisions that are based in science and sound data.

Natural Gas

The U.S. chemical industry relies on natural gas not only as a heat and power source, but also as a source for raw materials for petrochemistry. Chemical manufacturers use ethane – as well as other materials derived from natural gas – to develop thousands of products that make our lives better, healthier, and safer. To date, the chemical industry has announced over \$145 billion of new investments based on abundant and stably priced natural gas. Advancements in the recovery of unconventional shale gas are powering a manufacturing resurgence in the U.S. These abundant supplies of unconventional natural gas will be an important resource for the U.S. over the coming decades, and Dow supports environmentally responsible methods of bringing these resources to market.

As more power generation is shifted to natural gas, it is critical to avoid any measure that drives increased demand for natural gas without assuring ample supply is available. Fluctuations in natural gas prices can have significant negative impacts on manufacturing. When prices are high and volatile, manufacturing suffers. With a once-in-a-generation opportunity to fuel the manufacturing renaissance, it is critical to avoid any missteps that would derail growth and remove the competitive advantage of the U.S., including:

- Policies that place excessive constraints on natural gas supply, such as bans or excessive restrictions on hydraulic fracturing.
- Measures that artificially accelerate demand ahead of supply:
 - Policies that drive the nation toward a single fuel source.
 - Subsidies that artificially accelerate the demand for natural gas vehicles.

- Regulations that accelerate the already quick conversion of coal-fired power plants to gas.
- Exports of natural gas that prioritize export sales over U.S. gas competitiveness for U.S. manufacturers.

The share of natural gas in the power generation mix is growing and the U.S. Energy Information Administration projects it will account for 31 percent of the mix in 2015, up from 27 percent in 2014. In fact, electricity generation fueled by natural gas exceeded coal-fired generation in April 2015 for the first time since 1973.

Access to Federal Lands

To fully optimize our domestic energy resources, Congress and the Executive Branch should increase access to onshore and offshore federal lands by focusing on the most promising areas – including the Eastern Gulf of Mexico, the Atlantic Coast, the Pacific Coast and Alaska – to ensure reliable domestic energy supplies.

Significant opportunities exist on federal lands. Consider that nearly 87 percent of federal offshore acreage is off limits to energy development, according to the American Petroleum Institute, and just 2.8 percent of all federal lands are presently leased to drillers. The federal land that is open to production has seen both crude oil and natural gas output fall in recent years. Crude oil production on federal lands as a share of total U.S. production has fallen partly because of the production surge on non-federal lands. However, nearly 43 percent of all U.S. crude oil reserves are located on federal land. The picture for natural gas production does not look any better. Production on federal lands has declined 28 percent since FY 2009, while production on non-federal lands has grown by 33 percent.

Recommendations

Congress and the Executive Branch should remove regulatory barriers that prevent the development of energy resources on federal lands.

- Legislative and regulatory action should not place undue constraints on natural gas supply, such as bans or excessive restrictions on hydraulic fracturing.
- Congress should avoid adopting measures that artificially accelerate demand by driving the nation toward a single fuel, subsidizing natural gas vehicles or forcing rapid conversion of coal-fired power plants to gas.
- States should be given the jurisdiction to pursue the development of onshore and offshore federal lands that are within their borders.
- New federal regulations of oil and natural gas activities on federal lands located within a state should be developed in consultation with states and be consistent with existing state regulations.

- Where regulatory authority overlaps between state and federal agencies, the federal government should avoid promulgating conflicting or duplicative regulations and should work collaboratively with states and industry to ensure regulations are developed in harmony.
- States should retain their traditional pre-eminent role in regulating oil and gas production within their borders.
- Modernize regulations to allow for the construction of new pipeline and infrastructure capacity to efficiently transport natural gas and natural gas liquids throughout the supply chain.

Accelerating Cost-Effective Clean Energy Alternatives

Any comprehensive energy plan must recognize the critical role clean energy sources will play in a more sustainable energy future. A wide range of clean energy technology exists today, but the appropriate mix depends on geography, power needs and affordability. Policymakers should consider the reliability and cost of renewable energy, remembering the sun does not always shine and the wind does not always blow, but manufacturers and society alike depend on a constant source of consistent and competitively priced energy. These same manufacturers, many of them energy intensive, are often the ones bringing clean energy innovations to market. Manufacturers such as Dow are making the products that go into wind turbines and solar panels, and we are making them with a cleaner fuel mix than our overseas competitors.

Wind and Solar

Since wind and solar energy can be captured in many places, policymakers should place greater emphasis on the economic impacts of congestion and location when considering policies to promote renewable energy development. The U.S. needs to establish a clear and stable policy framework for wind energy that appropriately values its attributes, including zero emissions power with no water use, but also its intermittency that can compromise power reliability. Wind energy's primary policy driver, the Production Tax Credit (and the alternative Investment Tax Credit) has operated under short-term extensions with great uncertainty, creating a boom-bust cycle for the industry.

The wind power industry saw dramatic growth between 2005 and 2012, the longest stretch during which Congress did not allow the PTC to expire. American wind power grew 800 percent over that period with an annual growth rate of 31 percent.

Policies to advance clean energy development in the U.S. should focus on boosting research and development, and create a playing field that allows the marketplace to choose the most cost-effective solutions. Innovation is already making alternative and renewable energy solutions more efficient and affordable. Fully transitioning to a sustainable energy future will take further collaboration between policymakers and innovative advanced manufacturers.



Modernizing the nation's electricity grid is critical to maintaining the competitiveness of manufacturers. Grid failures that disrupt the power supply have a devastating affect on manufacturing operations. Investments in the grid to ensure efficiency and reliability will ultimately expand the opportunity for clean energy deployment and save customers money.

Dow is leading the way on building renewable energy into operations. In 2015 Dow signed a long-term agreement to supply its Freeport (TX) facility with 200 MW of wind power annually, which is the equivalent amount of electricity needed to power more than 55,000 homes. Dow is the first company in the U.S. to power a manufacturing site with renewable energy at this scale and will become the third largest corporate purchaser of wind energy in the U.S.

Nuclear

Nuclear is the only energy source capable of providing the 24/7 reliability of conventional fuels, with the low-carbon benefits of renewable sources. Newer technology has made nuclear inherently safer, to the point where the incidents of the past would not occur with the newest generation of nuclear reactors. The intermittency of renewable resources means there must be complementary baseload power that can respond at all hours of the day. With significant coal retirements coming, the nation is moving toward relying on a single fuel for reliable power generation: natural gas. Nuclear is a unique alternative that can provide 24/7 power generation and a near-zero carbon footprint.

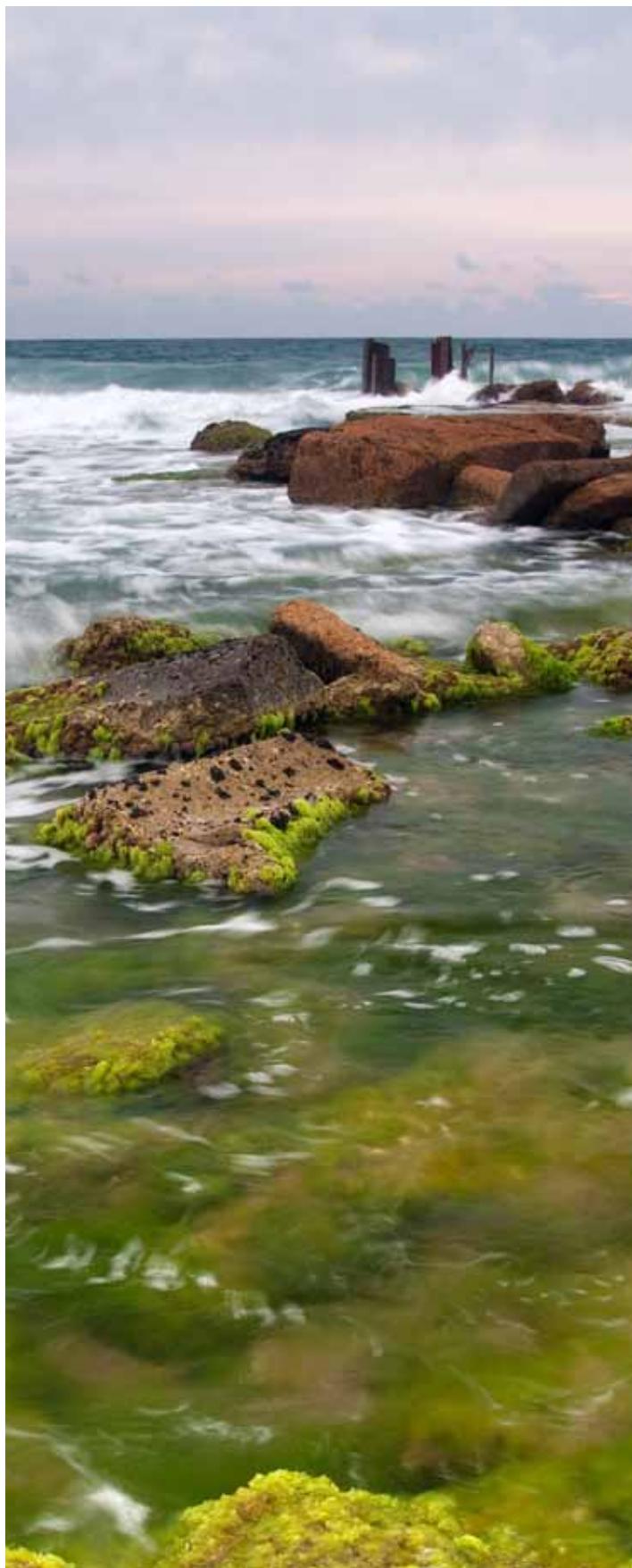
Energy Recovery

Every American generates an average of over four pounds of waste every day according to the EPA and, despite expanded recycling programs, more than half of all U.S. trash still ends up being thrown away in landfills. However, there are emerging technologies that are offering solutions for diverting difficult-to-recycle plastics from landfills and “recycling” them into feedstocks and valuable energy resources.

In 2014, Dow partnered with The Flexible Packaging Association, Agilyx, Reynolds Consumer Products and the city of Citrus Heights, California, to launch a first-of-its-kind pilot program in the U.S., testing the feasibility of collecting households’ non-recycled plastics and effectively converting them into an energy resource – all through an existing waste management infrastructure. Energy recovery is becoming another source of renewable energy and has the potential to significantly reduce waste that is sent to landfills.

Recommendations

- The federal government should partner with companies to create market-based incentives to develop and commercialize renewable technologies and develop the necessary infrastructure.
- Recognize the need for reliability, the need for cost competitiveness, and the fact that expansion of renewables requires complementary conventional or nuclear alternatives that can deliver power reliably.
- Congress should maintain the Solar Investment Tax Credit (ITC), which has encouraged private-sector investment in solar manufacturing and solar project construction.
- Policymakers should eliminate regulatory obstacles that discourage utility buy-back of residential power generation so that customers are only billed on their net energy use.
- Congress should establish a policy framework to encourage plastics-to-fuel conversion programs at the federal and state levels, and broaden the definitions of renewable energy to include energy from non-recycled plastics.



Transitioning to a Sustainable Energy Future

Meeting the energy needs of a growing global population will be one of the greatest challenges facing humankind in the coming decades. The U.S. must commit to playing a leadership role by slowing, stopping, and eventually reversing the global growth of greenhouse gas (GHG) emissions while preserving economic growth.

Emission pricing policies that are pursued independent of the global community can have a reverse effect of hurting the economy and increasing global GHG emissions. As new ways of addressing GHG emissions are considered, policymakers should remember that advanced manufacturers such as Dow are the ones bringing clean energy innovations to market. Policies that seek to reduce GHG emissions absent a global commitment will drive up energy costs in the U.S. and increase the likelihood of carbon leakage, ultimately hurting the competitiveness of U.S. manufacturers. The very negative impact of carbon leakage underlines the necessity for global cooperation in achieving meaningful reductions in global GHG emissions.

Dow supports science and technology solutions to reduce global GHG emissions. Many of these solutions exist today, including energy-efficient building materials, energy-saving insulation and lightweighting vehicle technology. To the extent that policymakers pursue mechanisms to reduce GHG emissions, Dow favors the most cost-effective market-based approaches, since such systems provide the most effective ways to drive innovation at the lowest economic cost.

Policymakers should support science and technology solutions to reduce emissions. At Dow, we are committed to growing our company without growing our GHG emissions. Dow has already committed to maintaining all GHG emissions below 2006 levels and will use 400 megawatts of clean energy by 2025. Being a world leader in chemistry, we are also positioned to provide innovations that lead to energy alternatives and less carbon use. Dow has prevented over 200 million metric tons of GHG emissions from entering the atmosphere since 1990. Dow's insulation products alone avert more than six times our own carbon dioxide emissions from operations on an annual basis.

Manufacturers are delivering by reducing emissions while increasing economic output. Since 2005, manufacturers have lowered their GHG emissions by more than 10 percent while the industry's value added to the economy has grown by 19 percent.

Recommendations

- Realistically set GHG reduction targets for all the major economies, recognizing that no economy can afford to compromise growth. These policies must account for the reality that developing countries need to pursue GHG reduction policies.
- When carbon policies are considered, coordinate all contributing factors including renewable, efficiency initiatives and carbon policies into a single policy framework that focuses on delivering the highest benefit at the lowest economic cost.
- Maximize the role of energy efficiency, which is often the most cost-efficient method of reducing energy consumption.