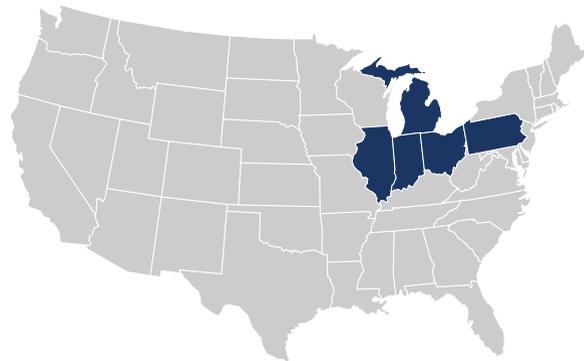


Manufacturing the future in the industrial Midwest

By Zoe Lipman, National Wildlife Federation

The Midwest is undergoing an industrial transformation. Over the past 18 months, Toledo, Ohio, has seen more than \$1 billion in investment by just three of the many recovering companies in the area. Chrysler Group, LLC, will invest \$500 million and add 1,100 jobs to build a redesigned and more efficient replacement for the Jeep Liberty.¹⁴⁶ General Motors Co. is spending \$200 million and adding 250 jobs to build fuel-saving 8-speed transmissions.¹⁴⁷ Johnson Controls, Inc., an industry leader in conventional automotive batteries, will invest \$140 million to retain 400 jobs and add an additional 50 positions to build Absorbent Glass Mat batteries for stop-start systems.¹⁴⁸ This technology—which avoids idling and today enables hybrid cars to shut off at a stoplight and start again immediately when the accelerator is pressed—will soon be used in large numbers of conventional vehicles.¹⁴⁹



Referring to these projects, among others, a Toledo economic development leader recently noted that, “It wasn’t too many years ago that Toledo, Ohio, in any economic development statistic would have been listed as leading the race to the bottom. Now ... we’re helping to lead the recovery.”¹⁵⁰

Toledo is not alone. After decades of manufacturing and employment decline that gutted family-supporting jobs and communities across the industrial Midwest, many of the same cities are now seeing significant job growth, anchored by a revival in advanced clean vehicle innovation and manufacturing.

This industrial renaissance is built squarely on the notion that America leads when we are at the cutting edge of new technologies, at the same time as growing U.S.

and global demand for highly efficient and low-emission vehicles is creating a huge new market for those technologies. Our energy vision for the Midwest is one in which the region anchors national leadership on new and better technologies that boost energy security, reduce pollution, and tackle climate change—all while building American prosperity, creating long-lasting jobs, and fostering our global leadership in innovation.

In contrast, the American Petroleum Institute’s vision for the Midwest is the drive to enhance production of one of the dirtiest fuels—Canadian heavy crude from the Alberta oil sands—and pipeline it to the Gulf of Mexico (or other ports) for refining and export. This approach does little for the region’s consumers or economy, carries big risks to critical regional water resources, and undoes pollution reductions being achieved by Midwest industry.

Largely bypassing Midwest refineries, the proposed Keystone XL pipeline expansion would not lower, but would raise, fuel prices in the Midwest,¹⁵¹ while threatening natural habitats and essential aquifers that water the nation’s breadbasket. Similarly, another company, Enbridge Inc.—the company responsible for the nation’s largest inland crude spill, which released more than 1 million gallons of tar sands crude into Michigan’s Kalamazoo River in 2010¹⁵²—is rapidly expanding pipeline capacity on its system in the upper Midwest and is seeking a route through the Midwest to the Maine coastline, destined for export.¹⁵³ At the end of the day, these strategies to expand reliance on the dirtiest fuels leave the Midwest with little more than risks and pipelines running through its backyard.

The worst environmental degradation from these projects is taking place in Canada, where tar sands production has destroyed vast swaths of the boreal forest, a critical ecosystem that supports billions of birds and iconic species such as woodland caribou, moose, and gray wolves. Not only is their habitat being bulldozed and fragmented at a rapid pace, but tar sands extraction is so energy intensive that the carbon pollution from producing and refining the fuel can be more than double that of conventional petroleum.¹⁵⁴ The carbon pollution from the oil carried by the Keystone XL pipeline would negate the pollution cuts made under new U.S. standards to improve fuel economy in medium and heavy-duty trucks.¹⁵⁵ In addition, pipelines such as Keystone XL effectively lock us into decades of reliance on this destructive fuel, limiting Americans’ energy choices and potentially crowding out investments in cleaner fuels, including cleaner forms of conventional petroleum.

While the auto industry is proving that a modern, successful industry can take sustained, effective steps cut carbon pollution and oil dependence, a big new commitment to tar sands oil would directly undercut the gains from these improvements and would take the nation in the opposite direction.

Fundamentally, both visions are about oil. The major difference is that the American Petroleum Institute proposes putting the region's long-term prosperity, natural resources, and quality of life at risk for short-term profit in world oil markets, while our vision provides an alternative path away from economic dependence on oil and toward real relief from pain at the pump. It employs homegrown ingenuity and talent to rebuild our economy now and for the long term.

The automotive success story unfolding in the Midwest is not an accident. Instead, it is the result of a smart combination of public and private investment, together with effective environmental, technology, and economic policy working to drive innovation, enhance global competitiveness, and spur job growth at home.

Renaissance

Whether in car ads, dealerships, traffic, or their own driveway, Americans are seeing a transformation in the auto industry. Best-selling vehicles such as the Chevy Cruze are showing that U.S. automakers can build high-quality, high-efficiency, affordable small cars, while new pick-up trucks such as the Ford F150 (the nation's best-selling vehicle) are delivering huge improvements in fuel economy alongside greater power and performance.¹⁵⁶ Companies such as Ford Motor Co., Honda, and Toyota are not just offering hybrid cars but also are building more of those advanced vehicles and/or hybrid components in the United States, as well. The Chevy Volt had its best sales month yet in August, and seven different automakers offered electric and plug-in hybrid electric vehicles in 2011.¹⁵⁷

Having recovered from near bankruptcy less than three years ago, the industry is now profitable, sales are rebounding,¹⁵⁸ and fuel economy improvements have exceeded projections. Encouraging sales figures show consumers welcoming the opportunity to move to more fuel-efficient vehicles across a wide range of vehicle types.

Behind every great new vehicle is a supply chain that includes hundreds (and fleetwide, thousands) of high-tech manufacturing, materials, and electronics companies. Automotive parts and assembly remains the largest single manufacturing

sector in America, employing about 800,000 people directly in manufacturing.¹⁵⁹ About 2.5 million Americans are directly employed in auto and parts manufacturing, sales, and service taken together,¹⁶⁰ while still more depend on the auto industry for their livelihood when indirect employment is taken into account.¹⁶¹

These jobs continue to grow. Retooling the auto industry to build the next generation of vehicles has proved to be one of the most effective elements of a national recovery, adding 236,000 direct jobs in manufacturing and auto sales since the low point of the recession in mid-2009.¹⁶² That adds up to a 14 percent growth rate that has far outpaced the economy as a whole.

Today's auto industry connects innovation in traditional auto-supply sectors—such as steel, electronics, materials, and high-tech machinery—with innovation in the power sector, in information technology, and in consumer electronics.

Maintaining advanced clean vehicle leadership is essential for the nation as a whole. But for the industrial Midwest (as well as for states across the south, California, New York, and other communities with a deep manufacturing infrastructure, workforce, and history), it provides a key opportunity for revitalization, growth, and economic competitiveness. As countries and customers across the world move to use limited resources wisely, cut their spending on oil, and take seriously the commitment to reducing carbon emissions, the Midwest is poised to become a global leader.

How clean car and truck innovation works for the Midwest

The Midwest has a powerful base from which to supply U.S. and global demand for the next generation of transportation technology. In 2011 a study by the Natural Resources Defense Council, National Wildlife Federation, and the United Auto Workers, called “Supplying Ingenuity,” identified more than 300 companies in 500 locations nationwide already making components or technology that specifically contribute to increasing fuel economy. These companies employ more than 150,000 workers in 43 states. In Michigan alone, 97 facilities employing 38,000 people make “clean car” parts or materials.¹⁶³ These jobs were found in huge so-called tier-one auto parts suppliers (those at the very top of the supply chain, supplying parts directly to the major auto companies), as well as in tiny start-ups; in “conventional” gas technologies such as turbochargers and in “new” auto technologies such as battery-grade lithium carbonate production.

Building successfully on this foundation wasn't inevitable. High-performance, high-efficiency components could have remained only a small part of the industry, serving niche customers such as the buyers of the Tesla luxury sports car. The industry could have also become split between traditional vehicle manufacturing and the "green" part of the industry, competing with one another for customers and market share. Instead, over the past few years we've seen smart policies that drive a domestic transformation of the industry as a whole, ensuring growth both in new technology and widespread integration of that technology into all segments of the fleet—turning one of our most basic industries green.

Smart policy is critical

The current turnaround would not have been possible without the hard work and innovation of hundreds of thousands of Americans nationwide and billions of dollars of public- and private-sector investment in America's manufacturing capacity. Equally critical is the framework of decisive environmental and energy policy coupled with economic development initiatives at the federal and state levels.

Most notably, after decades of inaction at the federal level, bipartisan support for a new direction for American vehicles emerged in the 2007 Energy Independence and Security Act, which tasked the U.S. Department of Transportation with setting far stronger and better-structured fuel economy standards. Building on this foundation, prompt and effective action by Department of Transportation and the Environmental Protection Agency resulted in groundbreaking standards to raise the fuel efficiency and meet requirements to cut carbon pollution from our cars and trucks. New fuel economy standards require the industry to double fuel economy in new vehicles from today's average levels of about 27 miles-per-gallon to a 54.5-miles-per-gallon average in 2025.¹⁶⁴ This means new cars, SUVs, and pickup trucks in 2025 will use about half the fuel those same vehicles use today. In 2011 the agencies also set the first-ever standards to improve fuel efficiency in medium and heavy trucks.

The new standards are sufficiently strong and sustained to drive significant innovation and provide the long-term certainty companies need to make large, capital-intensive investments. Unlike earlier standards, which rewarded companies for shifting to small cars, the new standards are structured to ensure fuel economy improvements across all types and sizes of vehicles. This not only means that consumers will see fuel savings no matter what size of vehicle they need, but it

also encourages industry innovation and investment across a far wider range of technologies and vehicles—creating large, long-term domestic markets for those who create this technology.¹⁶⁵

While well-structured standards are essential to spurring domestic job growth in advanced vehicles, they are not necessarily sufficient to maximize those benefits. Fortunately, strong fuel economy standards have been coupled with economic development, research and development, and commercialization policies at local, state, and federal levels that help take full advantage of domestic potential—not just to innovate but also to create and grow businesses and to manufacture the high-tech advanced vehicles and technology the new market demands.

The federal Advanced Technology Vehicle Manufacturing Loan program, for example—also established in the Energy Independence and Security Act—leverages the existing manufacturing strength of the industrial Midwest and other manufacturing centers in the South and West, and has aided firms in those areas to retool their plants or build new ones to manufacture more fuel-efficient vehicles.¹⁶⁶ Loans to Ford alone facilitated investment in plants in five states and saved or added 33,000 jobs.¹⁶⁷ Similarly, the Advanced Research Projects Agency–Energy¹⁶⁸ and the Vehicles Technology Program¹⁶⁹ at the Department of Energy and our National Labs¹⁷⁰ have aided research, development, and commercialization programs across a wide range of advanced automotive, power, fuel, and manufacturing technologies have helped position small and large firms to meet the demands of a rapidly innovating supply chain.¹⁷¹

The Midwest is seeing results first hand

Auto industry revival putting the Midwest back to work

Clean-vehicle manufacturing and sales help drive down unemployment

	U.S. unemployment rate	Indiana unemployment rate	Michigan unemployment rate	Ohio unemployment rate
Oct-09	10	10.5	14.1	10.6
Jan-10	9.7	10.6	13.8	10.6
Jul-10	9.5	10	12.6	9.9
Jan-11	9.1	9	10.6	8.9
Jul-11	9.1	9.2	10.6	8.9
Jan-12	8.3	8.7	9	7.7
Jul-12	8.3	8.2	9	7.2

Source: Bureau of Labor Statistics

Rapidly improving technology means additional components and retooling, which in turn means additional jobs. A big U.S. market for globally competitive technologies means companies are onshoring investment and production of next-generation vehicles and technology both to serve the U.S. market and for export. Great automotive products drive strong sales, and strong sales drive jobs.

In a recent Consumer Reports survey, fuel economy ranked number one among attributes consumers seek in a new vehicle,¹⁷² and recent evidence suggests that providing better, more fuel-efficient (and money-saving) options in every vehicle segment is driving sales growth.¹⁷³ Making the most efficient vehicles here means that as consumers respond to rising and volatile gas prices by moving to more fuel-efficient vehicles, those purchases will boost U.S. jobs in factories and dealerships rather than deserting them.

In its 2012 report, “How Fuel Efficiency is Driving Job Growth in the U.S. Auto Industry,” the project Driving Growth highlights dozens of recent new plant, technology, and job announcements in the Midwest.¹⁷⁴ These stories provide a vivid sense of how a shift to more fuel-efficient technology translates directly into job growth in the region. These stories range from added manufacturing and construction jobs as steel and components companies add plants and lines for innovative new products, to added shifts to keep up with demand for more efficient engines for pickup trucks and SUVs, to investments to boost hybrid-vehicle production in the United States for export worldwide. Taken together, the results are impressive.

Over the past two and a half years, the recovery in the auto industry significantly outpaced recovery in the economy as a whole and had an even more disproportionately positive impact in manufacturing states. Auto industry employment has grown nationwide by 14.5 percent (26 percent in manufacturing and 7 percent in sales) since the low point of the auto crisis and recession. Auto industry job growth in manufacturing states has been even faster and large enough to make a significant impact on statewide employment outcomes.¹⁷⁵

As of July 2012, Michigan had added 35,000 automotive jobs—half of total job growth in the state—and experienced a drop in statewide unemployment to 9 percent from 14.1 percent in 2009. Ohio added 11,000 automotive jobs—a quarter of total job growth—and saw unemployment drop by 3.4 percent, to 7.2 percent in July 2012, which was significantly below the U.S. average of 8.2 percent. Indiana has added 20,000 auto-sector jobs—a third of total job growth—and has seen statewide unemployment drop to 8 percent from nearly 11 percent. Though progress still needs to be made, the significant gains made in the past three years provide a roadmap for continued success.

Sustaining clean vehicle leadership for the future

The current turnaround is underscoring how innovation and manufacturing leadership go hand in hand. While leading U.S. research and development has all too often ended up underwriting industrial growth overseas, the advanced manufacturing revival in the auto sector is boosting domestic research and development, putting cutting edge, publicly funded research to work and attracting foreign investment not just in production but also in innovation.

Ford recently said the company had doubled—to 1,000—the number of engineers working on hybrid, electric, and other advanced fuel efficiency at its Advanced Engineering Center in Dearborn, Michigan.¹⁷⁶ Meanwhile, Honda wowed auto shows this past winter with the Acura NSX, a hybrid supercar—and with the surprise that it would be developed and made in Ohio.¹⁷⁷ Michigan and California have alternately led in receipt of clean energy patents over the past several years, while General Motors and other auto companies also regularly lead those rankings.¹⁷⁸ Sustaining this virtuous cycle requires both an ongoing commitment to manufacturing and to innovation.

Midwest and U.S. leadership in electric vehicle technology is a critical part of this story. While the bulk of vehicles built to meet high fuel-economy targets will be advanced gasoline and hybrid vehicles, electric vehicle innovation in materials, batteries, electric motors, and controls serves to speed advances across the supply chain.

Further, electric vehicles provide a means to ensure a U.S. technological foothold in critical areas of future transformation of the auto sector. Electric vehicles provide high-performance driving nearly or entirely without gasoline or any liquid fuel. They enable drivers to power their vehicles at home, with stable, domestic, and increasingly clean electricity that costs the equivalent of about a dollar per gallon.¹⁷⁹ They enable customers to connect their cars with mobile and smart-grid home or business energy-management systems, creating the potential for new consumer benefits and business opportunities.

Our leadership stake to date is paying dividends. In 2010 General Motors was the first to market the plug-in hybrid electric Chevy Volt built in Michigan, joined by the all-electric Nissan Leaf, soon to be manufactured in Tennessee.¹⁸⁰ Through July of this year, Volt sales were up nearly 300 percent compared to the same time in 2011.¹⁸¹ Despite ongoing politically motivated attacks on electric vehicles, the industry continues to grow and automakers continue to see the potential of electric vehicle technology; in coming years, consumers will be able to choose from electric models from nearly every automaker. In their first year, the Volt and the Leaf sold more strongly than the Toyota Prius—the first hybrid car—did in its first year. Ten years later, hybrid technology is now commonplace.

The Midwest is a significant player in many aspects of this technology: batteries, electric motors, hybrid and electric drivetrains, and electric-vehicle assembly. But our competitors, chiefly in Asia, are rapidly implementing their own strong policy and financing packages intended to capture this market. As a result, the region needs to stay the course if it is to continue to reap the benefits of cutting-edge vehicle innovation across the supply chain. No cutting-edge field is without risk, but the biggest risk for our future economy is to leave the field open to others.

Trading pain at the pump for still more jobs at home

Leadership in producing the next generation of highly efficient transportation technology provides a powerful opportunity for the Midwest industrial region, built on advanced technology, advanced manufacturing growth, and rapid job cre-

ation. But jobs in the auto industry and its supply chain are only part of the story. The broader economic impact of oil savings is equally great.

Improvements on light and heavy-duty car and truck fuel economy are the largest step ever taken to cut oil use—equivalent to 3.1 million barrels per day by 2030, or more than all the oil we currently import from Saudi Arabia, Venezuela, and Russia. This means big savings to households and businesses. Relative to the average vehicle today, a family that buys a new car in 2025 will save \$8,000 over the life of that vehicle—even after taking into account the modest increased cost of new technology. Americans will save \$1.7 trillion at the pump over the life of the more fuel-efficient vehicles built between 2012 and 2025. That’s a net savings of about \$140 billion a year in 2030.¹⁸²

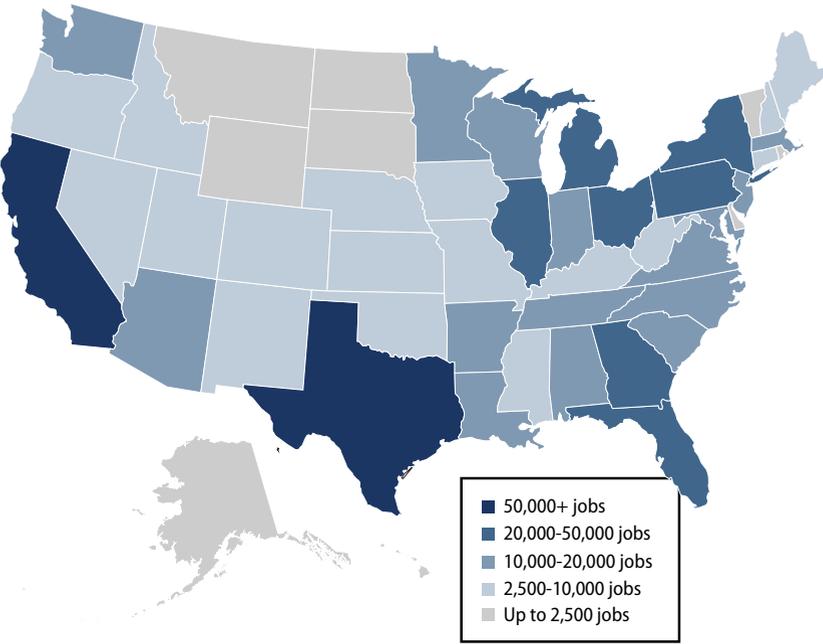
Two recent studies—by the investor group Ceres¹⁸³ and by the Blue Green Alliance—each found that the new fuel economy standards would drive the growth of an additional half a million jobs, relative to business as usual. The Blue Green Alliance found that the move to more fuel-efficient vehicles would add 570,000 jobs across our economy as families and businesses spend the money they save on fuel (much of which would otherwise flow overseas) on local goods and services.¹⁸⁴

For the industrial Midwest states of Michigan, Ohio, Indiana, Pennsylvania, and Illinois, the latest round of standards alone mean projected net consumer savings of \$6 billion a year by 2030—money that families and businesses can then spend in the local economy.¹⁸⁵ The standards would also add 95,000 jobs across these states.

Far more efficient vehicles also insulate families and businesses from the risk of volatile oil prices and take the pressure off the rush to find new, often risky or dangerous sources of supply. These new efficient vehicles will result in the largest step the United States has ever taken to cut the carbon pollution that causes climate change—reducing carbon pollution by nearly 600 million metric tons in 2030, or nearly 10 percent of total U.S. carbon pollution from all sources today.¹⁸⁶

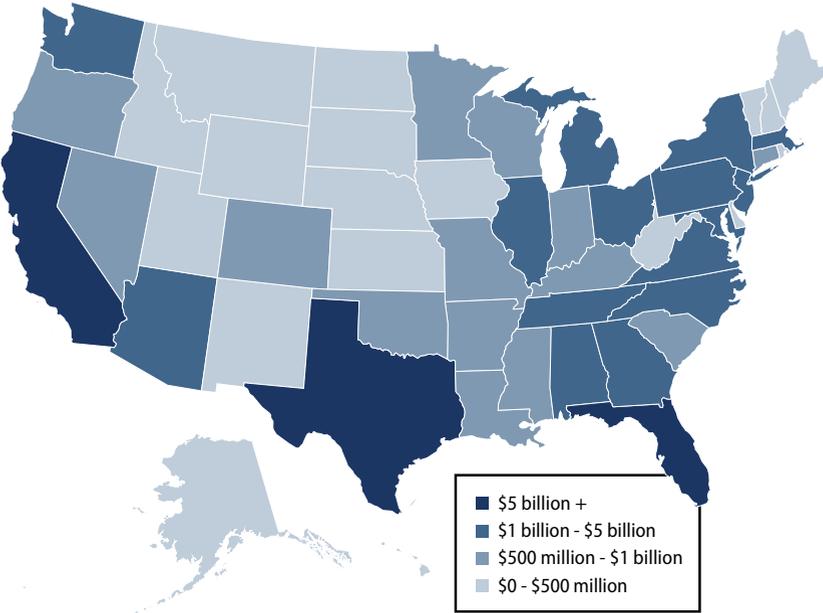
The auto story clearly demonstrates that American businesses can address climate change in a way that spurs innovation and makes us more—not less—competitive, while improving our health, livelihoods, and natural world at the same time.

Fuel efficiency means major savings, job growth nationwide
 State job gains by 2030 from improving fuel efficiency



Source: Natural Resources Defense Council; BlueGreen Alliance

Driving the economy with investment in fuel efficiency
 Annual net consumer fuel savings in 2030 dollars from improving fuel efficiency*



*Net Savings equals fuel savings minus incremental cost of fuel-saving technologies
 Source: Natural Resources Defense Council; BlueGreen Alliance

Looking forward

The Midwest is a key player in the American manufacturing economy, but it's also key to our energy future. We could see this region only as an energy consumer or as a place only valuable to extract or pipeline fossil fuel resources.

But the region is more than that. It is the key to a long-term strategy to innovate and use less oil and fewer natural resources in meeting our household and business objectives, while simultaneously diversifying and strengthening the national economy. At the same time this strategy can protect communities, natural resources, and the Great Lakes for future prosperity and quality of life.

Ensuring that the Midwest remains a global leader in fuel-efficient and advanced vehicles will result in job growth, consumer savings, greater competitiveness, and synergy with global markets. The auto success story demonstrates that the American industry can achieve dramatic cuts in oil demand and carbon pollution while building world-beating products and improving careers and quality of life. Indeed, these fuel cuts are so deep that they make it clearly feasible to achieve domestic energy security without increased reliance on Canadian tar sands or other extreme fuels that pose real economic and environmental risks to the region.

This circle of economic and job growth, decreased dependence on costly and risky fossil fuels, and enhanced innovation and competitiveness is critical to the future of the Midwest and other manufacturing regions of the country. It's not a pipe dream. We not only know how to get there—we are already on the way. The combination of forward-looking standards, investment in domestic advanced manufacturing, and innovation provides a model for revitalization of other core industries through the kind of green renaissance that is working in the auto industry today.

Iowa: Heartland of the clean economy

American wind power is one of the pillars of our clean energy success story. It is not only creating jobs while spurring one of the country's largest manufacturing industries, but it is also providing clean, affordable electricity all across the country. Nationally, wind power represented a remarkable 32 percent of all new electric capacity additions in America in 2011—and leading our nation in the development of wind energy is the Midwest.¹⁸⁷

Harnessing clean natural resources—specifically wind—in the Midwest has led to substantial economic growth, reduced carbon emissions, and decreased dependence on fossil fuels, all of which is much more beneficial than following the American Petroleum Institute's "drill, baby, drill" plan for this region. Iowa is now one of the country's largest and fastest-growing wind markets. According to the 2011 Wind Technologies Market Report, Iowa installed 647 megawatts of new wind capacity in 2011, bringing its total to 4,300 megawatts.¹⁸⁸ That is enough capacity to power about 1 million homes. This growth in wind capacity allows Iowa to generate 20 percent of its electricity from wind.¹⁸⁹

But installed wind energy capacity in Iowa only tells part of the story. During one of the largest recessions in American history, embracing the potential of clean energy helped Iowa diversify its economy and create jobs of the future. Newton, Iowa, is a prime example: For 115 years, Newton was headquarters of the Maytag Corporation, the appliance maker that once employed nearly one-quarter of the town before closing its doors in 2006. A year later, with help from the state and federal government, Newton attracted the turbine blade manufacturer TPI Composites, Inc., and the wind tower producer Trinity Structural Towers, Inc., leading to the creation of 950 manufacturing jobs. Operations of the wind towers even opened in the old Maytag plant.¹⁹⁰ "Wind is about jobs for us," says Newton Mayor Chaz Allen. Iowa currently has up to 7,000 jobs in the wind industry.¹⁹¹

Over the past three decades, Iowa generated nearly \$5 billion in private investments in the wind industry.¹⁹² The federal production tax credit that provides wind farm owners with 2.2 cents per kilowatt-hour of electricity stimulated the midwestern wind market, but it is set to expire at the end of 2012. According to the American Wind Energy Association, since the start of the federal credit, the wind industry has decreased installation costs by 90 percent.¹⁹³ Failing to extend the production tax credit would result in the loss of 37,000 American jobs and would halt the progress of the country's clean energy economy.

Facing the threat of this tax credit expiring, wind project developers have already become hesitant in planning future U.S. projects, and jobs are evaporating.¹⁹⁴ This is causing politicians—especially in Iowa—to urge Congress to extend this critical tax credit.

Sen. Chuck Grassley (R-IA) supports the extension of the production tax credit while calling the credit "successful in developing clean, renewable, domestically produced wind energy and the jobs that go along with it."¹⁹⁵ He and other senators from both parties have argued for a floor vote to extend it.

In contrast, the American Petroleum Institute's vision for the vast middle of the country centers around building the Keystone XL pipeline to transport 830,000 barrels of dirty Canadian oil across the Great Plains to refineries in Texas and Oklahoma, and exploiting coal and shale gas resources across large sections of the Midwest. While the American Petroleum Institute's plan overlooks Iowa completely, we see the state as a true leader in an emerging industry. The success of the wind industry in Iowa shows how a region's existing resources and skillset can be used to pave the way for a brighter economic and environmental future built on clean energy. That progress must be allowed to continue.

About the Center for American Progress

The Center for American Progress is a nonpartisan research and educational institute dedicated to promoting a strong, just, and free America that ensures opportunity for all. We believe that Americans are bound together by a common commitment to these values and we aspire to ensure that our national policies reflect these values. We work to find progressive and pragmatic solutions to significant domestic and international problems and develop policy proposals that foster a government that is “of the people, by the people, and for the people.”



About the Center for the Next Generation

The Center for the Next Generation works to shape national dialogue around two major challenges that affect the prospects of America’s Next Generation—advancing a sustainable energy future and improving opportunities for children and families. As a nonpartisan organization, the Center generates original strategies that advance these goals through research, policy development, and strategic communications. In our home state of California, the Center works to create ground-test-ed solutions that demonstrate success to the rest of the nation.

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