

# IOWA ENERGY PLAN

## PROGRESS REPORT

SEPTEMBER 2018

IOWA ENERGY PLAN IS A JOINT INITIATIVE BETWEEN



Dear Iowa Energy Plan Stakeholder:

We are pleased to report on the progress toward implementing the Iowa Energy Plan to date. Released in December 2016, the Plan was the result of a comprehensive and collaborative effort to develop a forward-looking road map that ensures Iowa's energy leadership into the future. Since the plan was a call to action, we are gratified to see so many accomplishments achieved by a diverse mix of energy stakeholders during the first year-and-a-half of implementation.

Follow-through is often the most challenging portion of a strategic plan. However, with continued collaboration among leadership and stakeholders and a shared commitment to provide energy-economic development benefits for all Iowans, we have made meaningful progress. This report is intended to capture and recognize those achievements and to help maintain the momentum moving forward.

Thank you for your involvement in Iowa's energy future. We look forward to reporting additional progress from the second half of 2018 and beyond, which we believe will be accomplished by continuing to collaborate locally, grow sustainably and lead nationally.

Sincerely,



Governor  
State of Iowa



Director  
Iowa Economic Development Authority



Director  
Iowa Department of Transportation

## Introduction

In the first year-and-a-half since the Iowa Energy Plan was introduced, Iowa stakeholders advanced numerous projects and initiatives in alignment with the Plan's foundational pillars, key focus areas and objectives.

A survey was provided in early 2018 to capture stakeholder feedback on implementation activities. Responses were compiled and incorporated into the progress report. Additionally, this report details efforts by the Iowa Economic Development Authority (IEDA) and the Iowa Department of Transportation (DOT), as well as other recent Energy Plan-related developments and news.

An important development at IEDA since the Energy Plan's release is the addition of the Iowa Energy Center (IEC). In October 2017, the IEC moved from Iowa State University to IEDA. A new, governor-appointed, thirteen-seat board now oversees IEC activities. The board has diverse representation from Iowa's utility companies, state government entities and Iowa's colleges and universities.

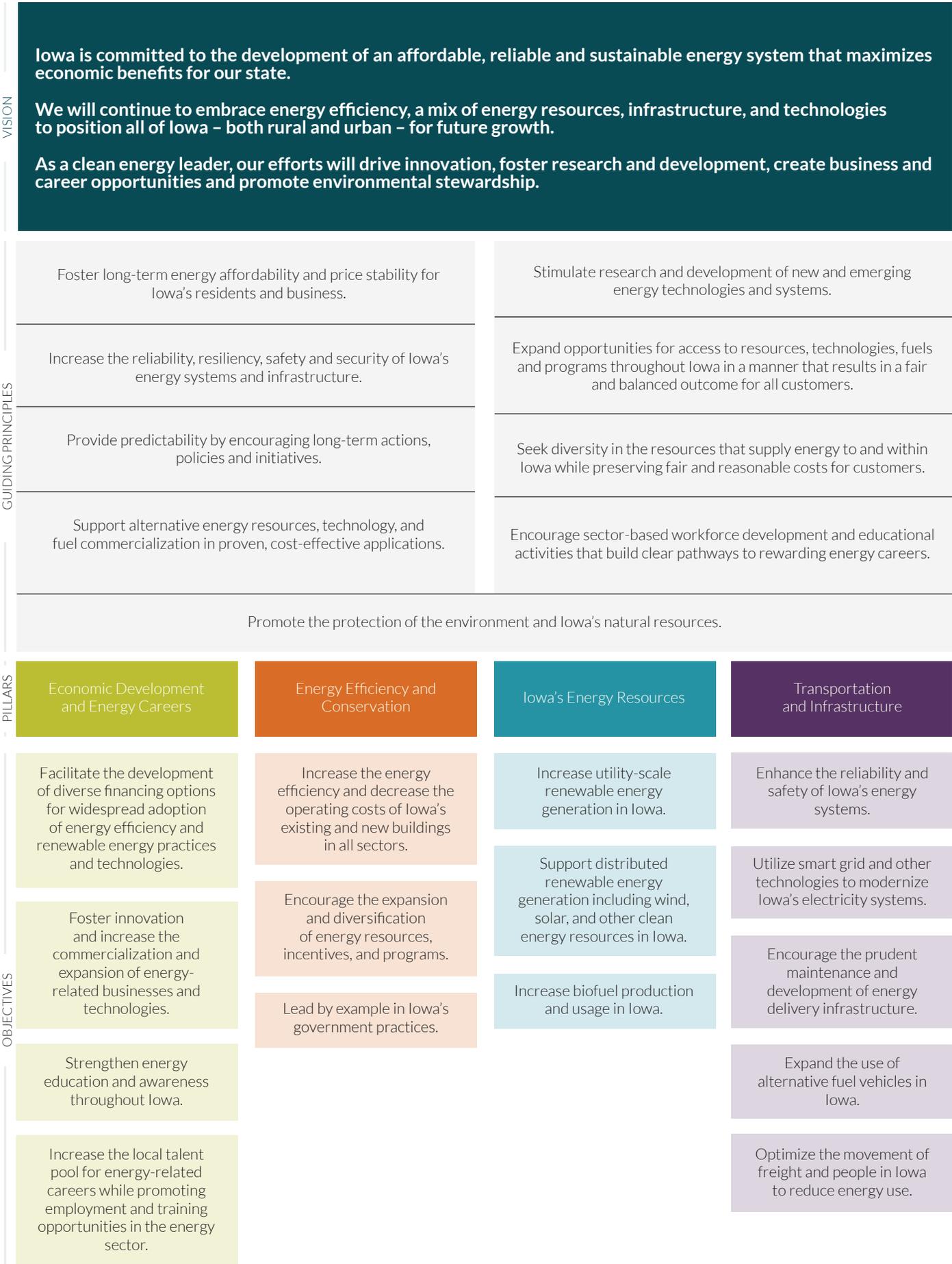
The new mission of the IEC is to support activities that align with the seven key focus areas of the Iowa Energy Plan:

- Energy Workforce Development
- Technology-based Energy Research and Development
- Support for Rural and Underserved Areas and Populations
- Biomass Conversion Potential
- Natural Gas Expansion in Underserved Areas
- Electric Grid Modernization
- Alternative Fuel Vehicles

The IEC's financial resources provide support for Energy Plan-related projects via two pathways: a revolving loan fund, called the Alternate Energy Revolving Loan Program, which supports the development of renewable energy production in Iowa; and competitive grant-like funds that support initiatives that align with IEC's mission.

As evidenced by the numerous achievements contained within this progress report, impactful activities are well underway. With the addition of the IEC, its dedicated financial resources, collaborative board and supportive mission, the state has an unparalleled opportunity to further spark near-term energy-economic development opportunities for Iowa.

# Iowa Energy Plan Organizational Structure and Portfolio of Objectives





# Progress Updates



## Economic Development and Energy Careers

Iowa's ability to integrate renewable energy while also offering long-term energy affordability, reliability and stability makes it attractive for businesses. As companies whose sustainability plans include the increased use of renewable energy, Iowa—a leader in wind energy—is the logical choice for new and growing companies.

The state is continuing and expanding collaboration with industry, academic and government partners to build on the momentum of the growing energy sector. Working together, these efforts will help identify energy needs and assist in the development and deployment of a path forward that capitalizes on a skilled and trained workforce to meet Iowa's current and future energy labor needs.

**OBJECTIVE: Foster innovation and increase the commercialization and expansion of energy-related businesses and technologies**

Several of Iowa's rural electric cooperatives from across the state have joined together to create a new business, Iowa Choice Renewables. Its mission is to provide renewable energy resources that benefit cooperative members, as well as those in surrounding communities.

Iowa Choice Renewables offers turnkey solar systems that can be sized, purchased, installed and connected to the power grid. It also helps homeowners identify ways to make their homes more energy efficient. Products and services are offered to everyone, not only members of a participating electrical cooperative.

*Seven of Iowa's community colleges offer wind-related coursework.*



**OBJECTIVE: Strengthen energy education and awareness throughout Iowa**

Central Iowa Power Cooperative (CIPCO) is committed to ensuring members have access to its power generation. CIPCO created a solar dashboard that provides real-time information on CIPCO's solar generation, distinguishing between the six solar farms and their corresponding production. The dashboard also includes information on the cooperative's environmental impact and benefits of solar generation. For example, the addition of the solar systems to its portfolio has saved more than 5.5 million gallons of water.



*Iowa has the most ethanol and biodiesel refinery employees of any state in the country.*

Source: Bureau of Labor Statistics (BLS)

*Iowa has the second-most wind turbine technicians of any state in the country.*

Source: Bureau of Labor Statistics (BLS)

**Objective: Increase the local talent pool for energy-related careers while promoting employment and training opportunities in the energy sector**

The Iowa Energy Workforce Consortium (IEWC) is comprised of, and led by, investor-owned utilities (IOUs), electric cooperatives and municipal utilities, with participation from community colleges and state agencies like IEDA, Iowa Workforce Development and the Iowa Department of Education. IEWC is actively working to address workforce demand, education supply and career awareness. With both an aging workforce and a need to cultivate the necessary skillsets to embrace emerging energy technologies, the consortium wants to ensure the energy industry is doing everything possible to attract and train professionals to meet the state's future energy needs.

Through scholarships and supporting education and technical training curriculum, Iowa's utilities and electrical cooperatives are working to encourage people to consider careers in the energy sector. For example, Black Hills Energy has employed students from programs offered at Marshalltown Community College and Northeast Iowa Community College. Black Hills Energy is also actively promoting these programs and career opportunities in high schools within its service territory. Additionally, the Iowa Association of Electric Cooperatives has partnered with several electric cooperatives to offer scholarships for electric lineman programs.

MidAmerican Energy continues to support a robust apprenticeship program for its critical frontline positions. The company recently celebrated the completion of a 28,000-square-foot line mechanic training facility in Des Moines. The Center for Excellence is a state-of-the-art facility designed to train future line mechanics with indoor and outdoor training grounds. MidAmerican's apprenticeship program offers a mix of classroom instruction, lab work and field experience to train future "first responders" in a more realistic setting.



# Energy Efficiency and Conservation

As energy demand continues to rise, energy efficiency and conservation strategies play an important role in meeting needs. Iowa companies and agencies continue to make significant investments and advance innovative energy programming.

**OBJECTIVE: Increase the energy efficiency and decrease the operating costs of Iowa's existing and new buildings in all sectors**

Iowa's electric cooperatives offered even more energy efficiency incentives in 2017, with benefits for both existing buildings and new construction. Electric cooperatives invested nearly \$22 million in energy efficiency programs in 2015 and 2016, which resulted in 1.45 billion kwh saved over the lifetime of the measures installed.

**OBJECTIVE: Encourage the expansion and diversification of energy resources, incentives and programs**

IEDA and the Iowa Association of Municipal Utilities (IAMU) have partnered on an innovative and collaborative two-year pilot program to provide technical energy expertise to IAMU's rural utility members and communities. Examples of technical energy support include conducting outreach to increase knowledge about energy, energy efficiency, the use of renewable energy resources and identifying measures to assist in the reduction of energy usage and associated costs. IAMU staffs the program and IEDA provides programmatic support through the Iowa Energy Office.

MidAmerican Energy introduced its MidAmerican Energy GreenAdvantage™ program to give customers an easy way to claim the renewable energy delivered to them. Through this program, the Iowa Utilities Board verifies MidAmerican's annual production of renewable energy delivered to its customers as a percentage of total energy production. MidAmerican Energy GreenAdvantage provides certainty about the amount of renewable energy MidAmerican is providing to customers. In 2016, 47 percent of energy provided to its Iowa customers was generated by wind. The no-cost program is aimed at sustainability-minded companies and individuals and gives Iowa a competitive edge when attracting new businesses.



# *Electric cooperatives invested more than \$10 million annually in energy efficiency.*

**OBJECTIVE:** Lead by example in Iowa's government practices

The Iowa B3 Benchmarking Program has helped increase the energy awareness of facility managers, while tracking energy consumption and measuring building performance against other similar or more efficient buildings. Benchmarking identifies potential energy savings by comparing the current buildings' energy use to an energy code compliant building.

By making energy performance measurable and visible, building managers and organizations can act to improve the efficiency of their buildings by identifying weaknesses and allocating dollars to those projects. Since its inception in 2011, 134 organizations and more than 2,324 public buildings have been entered in the B3 Benchmarking Program. During 2017, B3 Benchmarking expanded its services by recruiting and assisting schools and other public buildings throughout Iowa. The program was broadened to include a pilot project for commercial buildings participating in the city of Des Moines' Energize Des Moines program. A goal of Energize Des Moines is to reduce energy usage (electric, gas and water) in the city's largest buildings by 10 percent by 2020.

The Iowa Energy Office aided new users in 2017 by helping add their buildings into the B3 Benchmarking Tool, and in some cases, entered two years' worth of energy data and conducted in-house training to help them fully integrate into the program. The Iowa Energy Office also offered a hands-on training workshop to new and existing B3 Benchmarking users, which demonstrated how the program drives implementation of energy efficiency projects for program participants.



*Iowa's B3 Benchmarking Program has benchmarked  
over 83 million square feet of space in buildings  
throughout the state.*



# Iowa's Energy Resources

Consumption of renewable energy in the United States is at the highest level in history, contributing to energy security and other economic and environmental benefits. The largest single source of renewable energy is biomass, representing nearly half of renewable energy consumed in 2016. With Iowa's abundance of biomass potential, finding a way to better capitalize on this resource was one of the primary recommendations within the Iowa Energy Plan. In addition, Iowa is a national leader in wind energy production and is beginning to integrate other alternative energy sources into its portfolio. New renewable energy projects not only diversify the state's energy mix, but also provide additional income to local economies.

## **OBJECTIVE: Increase utility-scale renewable energy generation in Iowa**

The Iowa Energy Plan highlights the connections between agriculture and biomass and the importance of rural economic development in the state. Bioenergy is recognized as an important aspect of Iowa's energy profile and an economic development opportunity. As the nation's largest producer of ethanol and biodiesel, Iowa has seen limited success in other biomass applications. The Biomass Conversion Action Committee was formed in January 2017 to identify the markets, business cases and potential barriers for biomass-to-energy expansion in Iowa. The committee created an action plan, released in August 2018, that provides direction for policy, programming and regulations related to the biomass industry.

Other bioenergy efforts underway include the transformation of Dubuque's Water Pollution Control Plant to the new Water & Resource Recovery Center. Upgrades to the wastewater treatment facility allow for the capture of biogas from anaerobic digestion tanks. Not only is the captured biogas used to generate electricity, it provides an alternative supply source in Black Hills Energy's natural gas distribution system.

Iowa State University, Easy Energy Systems and Stine Seed Company are collaborating on the commercial development of a modular system to convert biomass into sugars, which can then be used for ethanol, other fuels and value-added products. The goal is to design and build a demonstration-scale Modular Energy Production System based on technology developed at Iowa State's Bioeconomy Institute. The demonstration project, which will process 50 tons of corn stover and other biomass per day, will be located at a Stine Seed facility in Redfield, Iowa. Beyond generating sugars that can be converted to fuel and Lignocol, which can be co-fired with coal in electric-generating plants, other potential products include a fuel oil substitute and bio-asphalt. The U.S. Department of Energy (DOE) is partially funding this demonstration project through the Rapid Advancement in Process Intensification Deployment (RAPID) Institute, which is managed by the American Institute of Chemical Engineers.

In 2017, Alliant Energy built the state's largest solar project. The 6.2-megawatt Dubuque Solar Project is made up of two separate sites. At 5-megawatts, the West Dubuque Solar Garden is the largest single solar garden in Iowa. The site covers 21.1 acres and uses more than 15,000 panels. The 1.2-megawatt Port of Dubuque Solar Garden welcomes travelers from the tri-state area (Iowa, Illinois and Wisconsin) and features an educational display for visitors. Alliant has announced plans to add more renewable energy from utility-scale wind – about 1,000 additional megawatts or enough to power 430,000 average Iowa homes. Additionally, initial construction activities have started on the Upland Prairie Wind Farm in Clay and Dickinson counties.



*Iowa ranks No. 1 in the 2017 Corporate Clean Energy Procurement Index.*

## Iowa ranks second in the nation in investment in wind projects at \$14.2 billion.

MidAmerican Energy's Wind XI, a 2,000-megawatt wind project approved in 2016, includes the 170-megawatt Beaver Creek project in Boone and Greene counties and the 168-megawatt Prairie project in Mahaska County, which were completed in 2017. Construction has also begun at the North English wind farm in Poweshiek County. In May 2018, MidAmerican announced plans for Wind XII, when combined with its other projects, would make MidAmerican the first investor-owned utility in the country to generate 100 percent of its customers' annual energy needs from renewable sources. The project will mean another \$922 million in investment, 300 full-time construction-related jobs, 28 full-time, on-going positions and \$6.9 million in Iowa property taxes.

Because of these efforts, Iowa ranks number one in the 2017 Corporate Clean Energy Procurement Index. The index ranks all states based upon how easily name-brand retail and technology companies can obtain domestic sources of renewable energy for their operations. The report concludes that states investing in clean domestic energy production are the most likely to attract businesses, creating thousands of jobs locally.



### Objective: Increase biofuel production and usage in Iowa

The Iowa Renewable Fuels Infrastructure Program (RFIP) has been providing grants since 2006. Managed by the Iowa Department of Agriculture and Land Stewardship, RFIP assists retail operators of fueling stations in the conversion of its equipment to allow for the expanded use of renewable fuels in the state. The program received an additional \$3 million appropriation for fiscal year 2018 to support continued investment in providing increased consumer access to biofuels. In October 2015, Iowa was one of 21 states to receive funding from the U.S. Department of Agriculture's Biofuels Infrastructure Program to increase access to higher ethanol blends through the installation of blender pumps and tanks. Iowa leveraged the \$5 million grant, along with state and private dollars, to install ethanol blender pumps and tanks across the state.

Governor Reynolds is the 2018 Chair of the Governors' Biofuels Coalition, a longstanding organization providing leadership on biofuels policy. The group advocates for favorable ethanol policies and regulations, including Environmental Protection Agency actions that could increase market access for mid-range blends and offer credit for the fuel economy and emissions benefits of high octane fuel vehicles. Governor Reynolds' leadership role in this organization can help generate high-octane, mid-level ethanol blends to the market through a supportive national regulatory and policy framework.



## Transportation and Infrastructure

The efficient movement of goods and people are foundational to Iowa's economy. The transportation sector is not only a large consumer of energy, but it is also critical to the energy sector, moving energy products and components across the state.

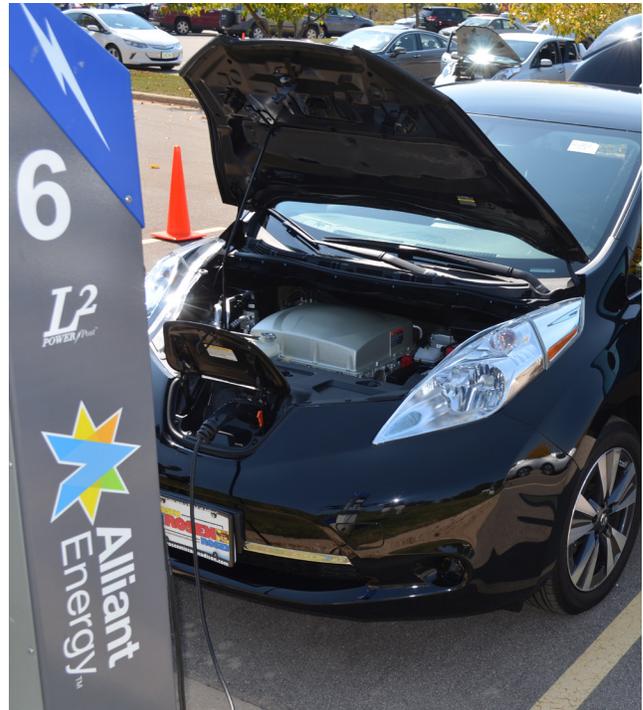
**OBJECTIVE: Enhance the reliability and safety of Iowa's energy systems**

Muscatine Power & Water, a municipal utility, made a \$4 million capital improvement investment in a 161kV transmission substation to bolster system reliability. The utility initiated a nearly \$500,000 project to proactively rebuild a distribution transformer to ensure high customer reliability and upgraded a 69kV transmission line between two substations to enhance system capabilities.

Iowa's electric cooperatives are doing more to provide better and efficient service to its customers. In 2017, the Iowa Association of Electric Cooperatives improved its outage map and now provides real-time information on the 85 percent of meters covered by the automated system. Iowa cooperatives are using web-based technology to model and predict the amount of accumulating ice on electric lines during winter storms. Such tools help electric cooperatives when dispatching resources during winter weather events.

*Iowa has 114 electric vehicle charging stations in 35 communities throughout the state.*

Source: [chargehub.com](http://chargehub.com)



**Objective: Utilize smart grid and other technologies to modernize Iowa's electricity systems**

A "smart" grid allows for digital communication between utility providers and consumers. This interconnectedness enables the grid to respond more quickly to ever-changing energy needs. Alliant Energy is enhancing the power grid to accommodate the growing two-way flow of electricity and information. This includes targeted investments to replace and upgrade aging infrastructure in the electric distribution system. Additionally, Alliant is investing in smart meter infrastructure and a customer billing and information system, which support the integration of new technologies, as well as improved security, reliability and resiliency for the power grid. Alliant Energy began installing smart meters for its Iowa customers in 2017, and approximately 100,000 have been deployed to date. Installation is expected to be fully complete by mid-2019. Now considered an industry standard, these smart meters can be read remotely, detect outages faster and enable better integration of renewable energy, including a better opportunity to connect new and enhanced battery storage options.

## Objective: Encourage the prudent maintenance and development of energy delivery infrastructure

Supporting the expansion of natural gas build-out to rural communities was identified as a need during development of the Iowa Energy Plan. In early 2017, IEDA hosted a Natural Gas Roundtable with a diverse mix of stakeholders to brainstorm potential solutions. Iowa's utility companies proposed, and the Iowa Utilities Board approved, a regulatory rule change to expand the cost feasibility model for the build-out of new natural gas infrastructure to unserved and underserved areas of Iowa. The move has the potential to benefit economic development in rural Iowa, where business growth can be limited by natural gas availability. Projects, which are under evaluation, may include new gas pipelines or mobile pipeline facilities utilizing liquefied natural gas technology. Additionally, in 2018, the Iowa Legislature enacted, and Governor Reynolds signed, SF2311 that further supports this natural gas expansion initiative.

Iowa's electric cooperatives in 2017 invested more than \$35 million in the operation of the distribution electric grid in Iowa and more than \$30 million in the maintenance of the distribution electric grid.

Following the September 2016 completion of "Optimizing the Propane Supply Chain in the State of Iowa," a working group of propane industry and state government stakeholders has met regularly to implement its recommendations. Initial focus areas include: effective communication during periods of peak propane demand; potential development of a pipeline terminal reservation system; development of a dashboard to monitor the potential for periods of high propane demand; and ways to streamline extending truck driver hours of service during periods of high demand.

## Objective: Expand the use of alternative fuel vehicles in Iowa

IEDA is leveraging its Iowa Clean Cities program, its network of leaders and assistance from the DOE to gather industry information, technology advancements and best practices about electric vehicle (EV) charging corridors. IEDA and DOT have identified dozens of locations near Iowa's interstates ideal for fast charging stations. The state has secured federal designations by the U.S. Federal Highway Administration for Interstates 35 and 80 as Alternative Fuel Corridors. This designation supports development of a convenient and strategically located EV charging station infrastructure, which enables longer-distance travel for electric and alternative fuel vehicles.

Iowa can use funds from the Volkswagen settlement to invest in transportation projects across the state. Iowa is expected to receive approximately \$21 million in Environmental Mitigation Trust funds for projects that reduce the emission of nitrogen oxides from vehicles. The development of EV charging stations is an eligible mitigation activity.

Nearly 1,900 new EVs, including all electric and plug-in hybrids, were sold in Iowa between 2011 and 2017. Electric vehicle sales increased 50 percent from 2016 to 2017, with 433 purchased in 2017 alone.

## *Iowa electric vehicle sales increased 50 percent from 2016 to 2017.*

MidAmerican Energy is partnering with area convenience stores and local businesses within communities served by MidAmerican to develop charging infrastructure along major traffic corridors. In addition, MidAmerican Energy is a partner in the DOE's Workplace Charging Challenge, a program that encourages employers to provide charging access for employees. There are currently two fast charging stations under development along the I-80 corridor in Council Bluffs and Des Moines. MidAmerican also installed two workplace charging stations in Des Moines and Davenport.

Over the last two years, Alliant Energy provided more than \$47,000 in incentives to residential customers who installed EV chargers in their homes. Alliant also partnered with several government and private entities to host EV ride-and-drive and educational events across the state in 2017 and provided more than \$29,000 in incentives to support workplace and public charging stations. Additionally, Alliant Energy provided \$110,000 in incentives to commercial and industrial customers who transitioned diesel or propane idling transportation equipment, like fork lifts and truck refrigeration units, to electric.

Propane is gaining interest as a safe transportation fuel. The State Fire Marshal Division of the Iowa Department of Public Safety adopted a new section of fire code detailing requirements for public propane fueling of motor vehicles. The new code also specifies reasonable training requirements for safe operation by those who dispense the fuel. The use of propane-powered school buses has increased across the state. Many propane providers have helped schools get started by leasing fueling equipment, which reduces up-front costs. In the past year, the number of propane-powered school buses has increased 42 percent and the number of school districts using propane increased 22 percent. Currently, 54 school districts use 183 school buses running on propane. This provides tremendous fuel savings and emissions benefits, with potential for expansion to a greater share of these schools' bus fleets.

**Objective: Optimize the movement of freight and people in Iowa to reduce energy use**

The Iowa State Freight Plan was completed in 2017 by the DOT. This plan was developed through extensive consultations with stakeholders, other state agencies, the Iowa Transportation Commission and the Iowa Freight Advisory Council. The plan will guide transportation investment decisions to maintain and improve the multimodal freight transportation system and ultimately strengthen the state's economy and raise the quality of life for Iowans. The plan was recently recognized by the American Transportation Research Institute as the fourth-best freight plan in the country.

The DOT also implemented a new federal funding program, Linking Iowa's Freight Transportation System (LIFTS). The initial awards of up to \$2.6 million will be made in summer 2018 and will help increase multimodal freight transportation efficiency – reducing fuel use and cost and ensuring Iowa's energy-related commodities and products effectively reach their destinations.

The DOT and Alliant Energy Transportation are collaborating on a logistics park in Cedar Rapids to improve connectivity between the state's robust rail and highway networks. When complete, the facility aims to offer intermodal container shipping and rail-truck transfer services that capitalize on rail's economies of scale. Additional shipment consolidation and storage services will be available. The estimated \$47 million facility has been awarded a nearly \$26 million federal FASTLANE Grant for its projected economic benefits.



## *In 2015, Iowa moved 21.23 million tons of freight multimodal.*

Source: Iowa DOT

The DOT, working with HERE North America, the University of Iowa and Iowa State University, have initiated Iowa's Automated Vehicle Project. This effort will lead to an automated vehicle-ready environment that better enables the DOT to deliver a safe, reliable and efficient transportation system. The initial focus is on the I-380 corridor between Iowa City and Cedar Rapids to develop and deploy a set of key capabilities to the driving public that center around: 1) real-time hazard alerting; 2) predictive weather and traffic conditions; and 3) real-time data feeds for use by automated vehicles. In 2017, the project completed high definition mapping of the corridor, the internal proof of concept and initiated a pilot project with 400 drivers using mobile-phone based hazard alerting. The University of Iowa is using a custom vehicle to test and demonstrate automated vehicle control and DOT completed a study of the I-80 corridor across Iowa to assess the potential effects of automated vehicles in the future. This study evaluated how automated vehicles can impact safety and mobility on the corridor and how automated vehicles can impact future improvement needs.

The DOT and IEDA have also been working with the U.S. Army Corps of Engineers to improve access to, and the reliability of, the Upper Mississippi Lock and Dam System. The ongoing discussions regarding the federal infrastructure initiative provide a unique opportunity to improve this system, which provides critical low-cost access for Iowa's agricultural products to the rest of the world.

Overall, DOT continues its efforts to provide passenger transportation options that reduce single-occupant vehicle travel. For example:

- DOT funding is supporting a carpool/vanpool project to mitigate traffic resulting from the Interstate-80/ Interstate-380 interchange reconstruction. In addition, DOT will fund an I-380 Express Bus service beginning fall of 2018.
- Environmental and preliminary engineering work for a Chicago-to-Iowa City passenger rail service continues. This work will be completed in 2018 and allows the corridor to be prepared for next steps if federal and state funding for construction becomes available.
- A bicycle/pedestrian plan will be complete in 2018.
- An Iowa Transportation Coordination Council Retreat will explore the future of passenger transportation in the state.



## NEXT STEPS

After a year-and-a-half of implementation activities, Iowa's energy leaders and diverse stakeholders have fully embraced the Iowa Energy Plan's objectives. Leadership is eager to build upon the positive momentum throughout the remainder of 2018 and beyond. The impressive volume of implementation activities to date further solidifies Iowa's position as a proud, national leader in the energy space.

One example of many state-led efforts already underway is the "Iowa Energy Storage Committee," which will identify strategies to further harness and complement the state's existing renewable energy resources. The committee is comprised of diverse stakeholders from the energy sector and will be releasing recommendations following several working sessions, which began in June 2018.

Another example of state-led efforts is the creation of an electric vehicle infrastructure support study for both commercial and noncommercial vehicles. IEDA, DOT and the utility industry have been tasked by the Iowa Legislature to evaluate a cost-benefit analysis of various electric vehicle infrastructure support options and to submit findings for review by June 30, 2019.

Many stakeholders are helping place the Iowa Energy Plan into action. These investments in and commitment to making the Plan a reality play a critical role in advancing Iowa's energy future.

**IOWA ECONOMIC DEVELOPMENT AUTHORITY**

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