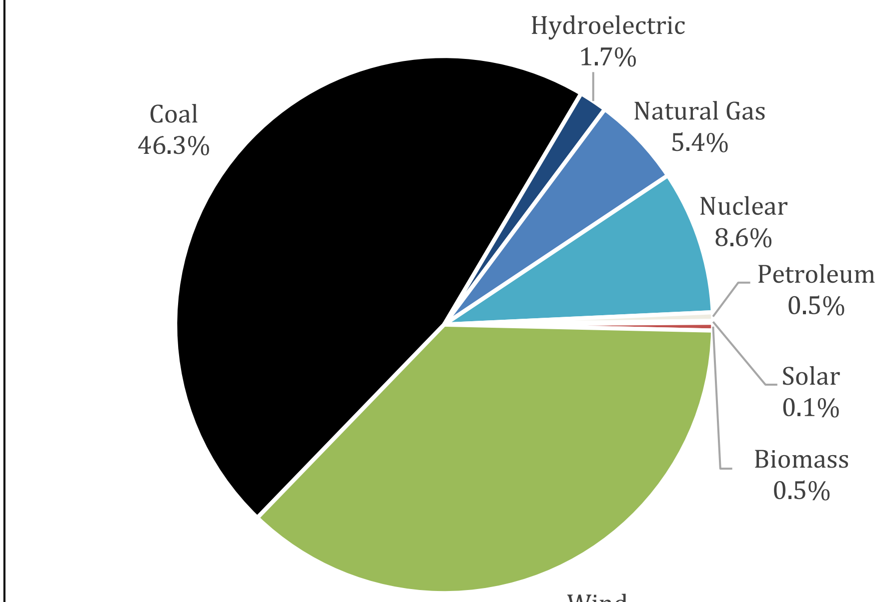
State Brief: Iowa

BACKGROUND

Iowa's Electricity Mix 2016



The primary source of electricity for Iowa is imported coal, which supplies nearly half of the state's electric generation. Coal's contribution has declined recently; coal provided more than three-quarters of the state's energy in 2008.

While natural gas-fired generation has increased steadily, wind energy's contribution to the state's energy mix has risen dramatically, from 24.7% in 2012 to 36.9% in 2016. Iowa is one of the nation's largest producers of electricity from wind. In 2016, wind energy provided more than one-third of the Hawkeye State's net electricity generation – the highest share in the nation. Only Texas and Oklahoma surpassed Iowa in total amount of electricity generated from wind. Wind development is expected to continue, MidAmerican Energy has received approval for several large projects. Alliant Energy, after receiving approval to add 500 megawatts (MW) of wind in Iowa, announced in April 2018 that wind would constitute almost one-third of its in-state capacity by 2020. Solar power's contribution to in-state generation is minimal, with a few utility-scale projects. Iowa is the largest producer of ethanol and has the second-largest biodiesel production capacity in the U.S.

In May 2018, Governor Kim Reynolds signed Senate File 2311. The legislation restricts utility energy efficiency programs in the state. The bill removed any requirement for energy efficiency programs by municipal utilities and electric co-operatives (which together serve about one-third of homes in the state). It also imposed a spending cap on energy efficiency programs provided by investor-owned utilities (IOUs). Furthermore, it created an unprecedented policy allowing any customer to opt out of paying for utility efficiency programs if the utility's package of programs does not pass the Ratepayer Impact Measure test (RIM test). The RIM test is one of the most restrictive cost-effectiveness tests, because reduced sales revenues to the utility are treated as a cost. Typically, the more energy a program saves, the worse it does on the RIM test.

The Iowa Utilities Board (IUB) regulates the state's two IOUs and has limited authority over municipal utilities and electric cooperatives. The IUB also regulates several certified natural gas providers. The Governor appoints the three members of the bipartisan Board. Currently, the IUB has two Republican members and a Democratic chair, all of whom were appointed by former Governor Terry Branstad (R). Branstad's Lieutenant Governor, Kim Reynolds (R), assumed the duties of the Governor's office when Branstad resigned to become the U.S. ambassador to China in May 2017. Both chambers of Iowa's legislature are under Republican control.

The Iowa Energy Plan, developed through a statewide stakeholder process, was released in December 2016. The plan, organized around four central pillars, outlines 15 objectives and 45 strategies to address economic development, energy efficiency and conservation, energy resources, and transportation and infrastructure. The Iowa Energy Center, previously managed by Iowa State University and now based within the Iowa Economic Development Agency, creates and administers programs aligning with the Plan's four pillars. The Center's activities are overseen and approved by the Governor-appointed Iowa Energy Center Board. Implementation of the plan began in 2017.

POLICY STRENGTHS AND OPPORTUNITIES[1]

The National Renewable Energy Laboratory (NREL) developed the notion of "policy stacking,"[2] an important framework for policymakers to consider. The basic idea behind policy stacking is that there is an interdependency and sequencing of state policy that, when done effectively, can yield greater market certainty, private sector investment, and likelihood of achieving stated public policy objectives.

In theory, but not always in practice, clean energy policies can be categorized into one of three tiers of the policy stack. Tier 1, market preparation policies, remove technical, legal, regulatory, and infrastructure-related barriers to clean energy technology adoption. Tier 2, market creation policies, create a market and/or signal state support for clean energy technologies. Tier 3, market expansion policies, create incentives and other programs in order to expand an existing clean energy market by encouraging or facilitating technology uptake by additional market participants.

For example, before financial incentives for combined heat and power (CHP) will be successful, two key considerations for deployment are having clear interconnection standards and favorable stand-by rates for customers who opt to add CHP. In this example, states should adopt policies to address interconnection and stand-by rates before adopting financial incentive programs.

GRID MODERNIZATION

Policymakers can view grid modernization as creating a policy structure that supports and ties together many other initiatives, such as smart metering infrastructure, customer data management, energy storage, electric vehicle infrastructure, and utility business models.

In the last two decades, new digital technologies have enabled utilities to better manage the grid and provide opportunities for consumers to customize their services to fit their priorities. These technologies allow a two-way flow of information between the electric grid and grid operators and between utilities and their customers. Emerging technologies improve system reliability and resiliency by enabling better tracking and management of resources. These technologies allow grid operators to incorporate central and distributed energy resources, energy storage technologies, electric vehicles, and assist in addressing the challenges associated with planning, congestion, asset utilization, and energy and system efficiency. On the customer's side of the meter, advanced metering infrastructure, dynamic pricing, and other emerging technologies allow an exchange of information and electricity between a consumer and their electric provider.

GridWise Alliance's latest Grid Modernization Index ranks Iowa in the bottom 10 states for overall grid modernization efforts. The state is in a good position to improve this ranking. The Iowa Energy Plan's transportation and infrastructure pillar includes strategies to advance grid modernization through planning, and pilot projects. The plan also notes the increasing role of consumer control over their energy usage: "a modernized grid is essential for the prosperity, competitiveness, and innovation of the economy that increasingly relies on high quality power and must integrate customers and their end-use decisions into grid operations, rather than assuming that 'the grid' represents only supply-side actors and decision-makers." [3]

As part of a $220 million Grid Modernization Initiative announced by the Department of Energy (DOE) in 2016, a research team at Iowa State University is researching grid improvements that will support renewable energy generation and transmission across major eastern and western U.S. grids. The Iowa Energy Center, as part of the implementation of the Iowa Energy Plan, is currently accepting pre-applications for grants for projects that engage in new energy technologies research and development, and for projects that will contribute to a modernized grid. Alliant Energy plans to invest $1.3 billion on projects that will modernize Iowa's grid over the next five years. In

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1 For more information on policy opportunities, please visit the SPOT for Clean Energy. For more information on specific policy actions related to these opportunities, please review the *Clean Energy Policy Guide for State Legislatures*.

2 V.A. Krasko and E. Doris, *National Renewable Energy Laboratory*, 2012. Strategic Sequencing for State Distributed PV Policies: A Quantitative Analysis of Policy Impacts and Interactions. http://www.nrel.gov/docs/fy13osti/56428.pdf.

3 Iowa Energy Plan, 2016. Iowa Economic Development Authority and the Iowa Department of Transportation, pp. 65. http://www.iowaenergyplan.org/resources.html.

February 2018, the IUB approved a settlement allowing Alliant Energy to increase its rates. The order requires that the utility files new grid modernization plans. Alliant Energy had 476,000 smart meters installed in Iowa and Wisconsin by the end of 2016 and expects to have 961,000 installed by 2020.

Iowa's policymakers could consider the following actions to advance grid modernization:

1. Build upon the Iowa Energy Plan by developing a detailed grid modernization strategy through a stakeholder process. States may also decide to require that utilities propose a ten-year grid modernization plan within a specified timeframe. Legislation could require plans to outline a clear set of grid modernization goals and describe methods to measure, report, verify, and enforce progress towards those goals. States might also provide incentives or cost recovery mechanisms for utilities to meet grid modernization goals.

2. Require that utilities develop plans to enhance cybersecurity, integrate distributed energy resources (including electric vehicles and energy storage), increase smart meter deployment and demand response and/or demand-side management (DSM) programs, and measure and report on the results of grid modernization efforts.

3. Iowa does not have clear state policies governing customer data access and privacy protections. To address this, policymakers should develop legislation or rules that, at minimum, do the following: clarify who owns the energy data associated with consumer energy usage; protect customer privacy; outline the process for allowing direct access to data by third parties; and promote access to the highest resolution of data by third parties. The state could establish customer access to energy data through the Green Button Connect program, for example.

The adoption of incentives for or a requirement to integrate a certain amount of energy storage on the grid alongside enhancing renewable energy and electric vehicle policies would support modernization efforts and improve the chances of successful grid modernization.

ENERGY STORAGE

Energy storage offers a unique opportunity to dynamically manage supply and demand while maximizing the value of grid resources. By deploying storage in strategic locations, utilities can more effectively manage their energy portfolios. First, storage provides management of intermittent demand – helping to flatten peak demand requirements for the utility. Second, the responsiveness of energy storage can allow the utility to implement voltage regulation and other ancillary services, which are useful for improving system efficiency. Third, storage can dispatch power to better integrate intermittent resources like renewable energy. Finally, energy storage can help the commercial sector avoid costly demand charges. As utilities around the country consider extending demand charges to the residential sector, this will become an even more important issue.

The flexibility of battery storage, combined with advanced metering infrastructure, allows customers to control how and when they use energy from the grid or from solar panels installed on their home or business. In most cases, this can provide greater cost savings than standalone solar systems. Combined with time-varying rates or real-time pricing programs, state policy can further support customer choice and open a new market for energy services. Prices that better reflect the time-varying and location-dependent costs of producing and delivering electricity can lead to a number of economic and environmental gains.

Storage provides multiple benefits to both the customer and the utility. State planning and regulatory policies can help maximize these benefits by 1) establishing a framework for easy integration of energy storage into the grid and 2) establishing a marketplace that monetizes the benefits of energy storage for cost effective investment.

With assistance from the Interstate Renewable Energy Council (IREC), the IUB adopted improved interconnection rules in 2017 which define battery storage systems as distributed generation technologies, streamlining the process for customers to install energy storage on their property. While a few utility-scale battery storage projects are under development in the state, Ideal Energy recently unveiled plans to construct a 1.1 MW solar-plus-storage system in Fairfield, IA. The Iowa Stored Energy Park (ISEP) was a 270 MW compressed air energy storage (CAES) system under construction until 2011, when the project was terminated due to insurmountable geological limitations.[4] Iowa State University is involved in the research and development of glassy solid electrolytes, a key component for designing long lifecycle batteries.

A 2017 report from the National Renewable Energy Laboratory (NREL) finds significant potential for the expansion of Iowa's battery storage market due to the state's higher demand charges paid by commercial customers (in the commercial sector, high demand charges are a predictor of financial viability for energy storage systems).[5] There are several opportunities to develop supportive state policies for energy storage in Iowa:

1. Instruct utilities to evaluate the value of energy storage in multiple strategic locations across the utility system and consider a requirement to deploy storage where it will be cost effective, or identify the price point at which it will become cost effective.

2. Require the inclusion of energy storage as a critical piece of the energy system as both a demand and supply management resource. Some states have required that utilities evaluate the cost effectiveness of non-wires alternatives (NWAs) to large transmission and generation investments. Alternatively, states might want to require utilities to develop a distribution investment plan that identifies the locations on the distribution system where energy storage or other distributed resources would offer the greatest value.

3. Consider adding a mandatory energy storage procurement target or requirement for energy storage with a documented process for periodic review of progress towards that goal. Procurement targets can jump-start market creation, spur fast learning, and guide the development of a regulatory framework. Five states currently have energy storage goals that range from five megawatt hours (MWh) to two gigawatts (GW).

4. Finance and incentivize energy storage for customers and utilities. Incentives could enable customers to use storage to manage their electric load and store locally produced renewable energy. Incentives in the form of rebates, grants, and tax credits can provide a bridge to scalable deployment for storage. Incentives can be designed to decline as storage values become more readily monetized. Policymakers could allow utilities that provide incentives to customers to recover the costs of installing smart meters. This would enable dynamic and time-varying energy management from multiple distributed battery systems. This should signal to customers the value of leveraging storage while better aligning customer costs with system costs. Financing energy storage installations for commercial customers would help reduce their demand charges. Policymakers might want to start first with a policy to incentivize solar system owners.

MAINSTREAMING RENEWABLES

As the renewable energy industry has matured, technology has improved, and global production of generating equipment has increased, renewable energy is increasingly seen as the least cost and lowest risk form of energy (excluding energy efficiency). A Bloomberg New Energy Finance report from this year predicts that at least 50% of total global electricity will be renewable by 2050. With increased deployment, utilities are learning more about how to integrate renewables effectively, investors are becoming more comfortable with the technologies, and building code officials are recognizing common standards and best practices. For these reasons, it is in the interests of policymakers to ensure that their states are well positioned to benefit from the transition to clean and sustainable energy resources.

To reduce barriers to customer and utility participation in the renewable energy market, Iowa might consider several policy options.

Customer-Oriented Policies

1. Interconnection, net metering, and streamlined permitting – In general, customers want a clear, streamlined, affordable, and predictable system for connecting renewable energy systems to the grid. To ensure this, Iowa's

[4] R. H. Schulte, K. Holst, N. Critelli, and G. Huff, 2012. *Sandia National Laboratories.* Lessons from Iowa: Development of a 270-MW Compressed Air Energy Storage Project in Midwest Independent System Operator. http://energystorage.org/system/files/resources/lessonsfromiowa_summaryreport.pdf

[5] M. Long, T. Simpkins, D. Cutler, K. Anderson, *National Renewable Energy Laboratory*, 2016. A Statistical Analysis of the Economic Drivers of Battery Energy Storage in Commercial Buildings. https://www.nrel.gov/docs/fy17osti/66832.pdf

policymakers could consider removing the net metering system size limitation, which was amended in 2016 to 1 MW, or up to 100% of a customer's load. Allowing aggregated net metering would be especially beneficial to the state's agricultural and manufacturing operations. Other applications for aggregated net metering include commercial properties and public entities like state and local governments, universities, and schools. The state might also consider establishing either statewide standards for streamlined solar permitting processes, or resources to support local governments that voluntarily implement a streamlined program, as Linn County has done. State incentives, such as tax credits, financial incentives, or loans can be tied to systems that are established within a designated streamlined permitting jurisdiction. Iowa already offers a range of incentives for residential and commercial customers, including a property tax exemption for renewable energy systems, a sales tax exemption for renewable equipment purchases, and a personal tax credit for solar installations.

2. Shared Renewables – Due to building and property attributes and ownership issues, many customers are unable to install renewable energy technologies. Allowing shared, or community, renewable energy projects addresses these barriers. These projects have multiple owners or subscribers who pay for a portion of the generation provided by the system. Iowa currently has no statewide community solar or shared renewables program, but some programs have been established or are under development by municipalities, electric co-operatives, and Alliant Energy. The state might consider adopting a virtual net metering policy to support the growth of community solar. Virtual net metering allows a customer to receive credits from a shared system as if the generation were on site. Virtual net metering is different from a power purchase agreement (PPA), which pays the customer for the proportion of power they produce. Because it is treated as a credit on the customer's bill, the customer can avoid the tax implications of a PPA payment - which can adversely affect the economics of the system (and may come as a surprise to the participant).

   Low credit ratings often deter participation in renewable energy markets; this can affect low- and moderate-income (LMI) households' adoption of renewable energy solutions. Supportive policies for shared renewables can be designed to encourage participation by LMI households; this can increase adoption of renewable technologies and reduce energy costs. Low-income participation can be encouraged either through a percentage mandate for the overall annual contracted capacity, or by offering a higher rate of payment for the portion of shared solar capacity attributed to low-income customers. States that have a shared renewable program may want to coordinate this program with implementation of the federal Weatherization Assistance Program to provide recipients of assistance with participation in a shared renewable system.

   There are several additional policy options that Iowa might consider to promote renewable energy uptake by low- and moderate-income consumers. Generally, successful state policies should be tailored to these customers, be cost-effective and financially sustainable, have measurable performance indicators, and be flexible enough to allow later changes in design.

3. Corporate Procurement – Many Fortune 100 and 500 companies have established either climate goals or commitments to purchase renewable energy. In just the last four years, over nine GW of renewable contracts have been announced by corporate entities. In the first quarter of 2018 alone, corporations signed 14 agreements for over 1700 MW of renewable energy. This is leading policymakers to provide additional avenues for businesses to procure renewable energy. In 2017, Iowa ranked first in the Corporate Clean Energy Procurement Index for the ease with which companies located in the state can procure renewable energy. Iowa receives the highest score in part because it is a top wind energy-producing state. Google, Microsoft, Facebook, and recently Apple, have constructed or are planning to build data centers in Iowa that rely 100% on renewable energy.

   Iowa's policy allows companies to purchase renewable energy certificates (RECs), access renewable energy through the wholesale market, and develop, lease, or enter into a power purchase agreement for an onsite renewable energy project. The state could expand corporate access by adopting a shared renewables policy or by requiring green tariffs. The products available in Iowa meet five out of six of the Corporate Renewable Energy Buyers' Principles. The state could improve cost-competitiveness of renewable energy systems by implementing a standard tariff as an alternative contractual arrangement; at the present, there are only one-on-one deals between utility companies and corporate buyers.

Utility-Oriented Policies

Some states have created programs that aim to reduce greenhouse gas emissions and increase investments in clean energy resources. States might see an emissions or clean peak standard as the next step in a progression from renewable portfolio standards (RPSs). Iowa was the first state in the nation to establish a renewable energy requirement. The 1983 Alternative Energy Production Law set a minimum target for renewable capacity for the state's two IOUs at 105 MW total.[6] Utilities are taking the lead on setting more aggressive renewable energy targets. In April 2016, MidAmerican announced its 100% renewable energy vision. Recent projects will bring the company closer to its goal. These include the 154-MW Adams wind project, the 301-MW Ida Grove project, the 250-MW O'Brien project, all completed in 2016, and the more recent 550-MW Adair project, which forms part of the 2,000-MW Wind XI, and the 591-MW Wind XII project. In 2017, MidAmerican served 50.8% of its retail electrical load using renewable generation.

In addition to updating its RPS requirement, Iowa's policy makers might consider the following actions to increase utility adoption of clean energy technologies:

1. Emissions standards can take a technology neutral approach that looks at the total emissions of the utility portfolio and drive emissions down with a combination of renewables, traditional fuels, efficiency, and technological advances. Emissions reductions can be achieved through 1) a carbon portfolio standard approach, or 2) a market-based approach. A portfolio emissions standard sets emissions reduction targets to be achieved over time. This can be implemented through the utility planning process or by establishing a maximum allowable rate of emissions per unit. Under a market-based approach, a state or a group of states might set a certain emissions reduction target, for example, 20% below 1990 levels by 2040. This reduction is achieved by the distribution of annual emission allowances that decrease to the point that the standard is met in 2040. One of the advantages of a market-based program is that it is designed to reduce emissions in the most economically efficient manner possible. Such a standard can also address other concerns such as pollution, asthma risk, environmental justice, and water use.

2. Clean Peak Standards aim to increase the share of clean energy resources used to meet peak demand and decrease energy bills over the long-term by reducing peak demand in the hours when energy costs are highest. These objectives can be met through different policy options including: planning and procurement that focuses on peak demand; a moratorium on the construction of new peaking units or a phase out of existing units; incentives – including carve-outs in states with RPSs – for clean energy resources delivered during peak times; and/or adopting a new clean peak standard that sets a target for clean energy deliveries during peak times.

ELECTRIFICATION OF THE TRANSPORTATION SECTOR

An estimated 55% of new car sales will be electric by 2040. Therefore, a key part of building a modernized grid involves designing infrastructure that will facilitate easy connection of electric vehicles (EVs) to the grid. One of the most important barriers to increased adoption of EVs is the consumer's awareness of the availability of EV charging stations. Ultimately, drivers want to be sure that their car will get them where they need to go. Another important barrier to increased adoption of EVs is their higher up-front cost as compared to similar conventionally fueled vehicles. The good news is that both supportive policies for developing charging infrastructure and technological advancements have eased "range anxiety."

In 2016, the Iowa Economic Development Authority (IEDA) commissioned a report to determine the status of the EV market and recommend policy actions to reduce market barriers to EV penetration in the state. The study offers a wide range of options to expand and support the market, including the construction of public charging stations and an "electric highway" to mitigate range anxiety. The study also recommends incentives for workplace EV charging programs, financial instruments such as rebates/loans, the adoption of time-of-use rates by utilities, and others. The IEDA subsequently opened a survey for businesses and other property owners to indicate their interest in installing DC fast charging stations along major corridors. The results of this study will inform the use of Volkswagen settlement monies. The Iowa Energy Center, as part of the implementation of the Iowa Energy Plan, is currently accepting pre-applications for grants for projects that engage in new energy technologies research and development, and for projects that would encourage the adoption of EVs and EV supply equipment (EVSE). Customers in Alliant

[6] DSIRE: Database of State Incentives for Renewables and Efficiency. Iowa Alternative Energy Law.

Energy's service territory may receive a rebate for purchasing EV charging equipment. Alliant Energy also offers a rebate for the purchase or lease of plug-in electric vehicle (PEV).

There are a number of opportunities to expand the market for EVs in Iowa:

1. EV Financing and Financial Incentives – Iowa neither provides incentives for citizens that purchase EVs, nor does the state provide incentives to citizens installing EVSE. Providing additional financial incentives and innovative financing options can help spur greater market penetration of EVs. Sales, property, and income tax credits are some of the simplest methods for addressing high up-front costs of EVs and EVSE. While sales tax credits are typically applied at the time of purchase, property and income tax credits may do less to address upfront cost barriers as receipt of the credit is typically removed in time from the purchase.[7] Some states have adopted other financial incentives including low-interest loans, grants, vouchers, and rebates. A handful of states qualify EVSE under their property assessed clean energy (PACE) programs. A simple solution is to increase and expand existing tax credits to incentivize commercial, publicly available charging stations.

2. Charging Infrastructure Plan – Locating charging infrastructure is different from locating conventional fueling stations. For the most part, EVs are cars used for commuting and local trips. Furthermore, while a driver of a conventional vehicle stops only briefly at a gas station for the specific purpose of filling up, a driver of an EV is generally looking to refuel when they are parked for longer period of time, for example when going shopping, going to a restaurant, or going to work. Charging infrastructure plans should target these types of locations and attempt to pair the appropriate level of charging infrastructure with a reasonable amount of time a person will be at that location. Senate File 2311, enacted in the 2018 session, requires a study to evaluate the costs and benefits associated with different options for EV infrastructure support. The report, conducted by the IEDA, the state Department of Transportation, and the utility industry, is due to the General Assembly in June 2019.

   Regional collaborations are emerging around the U.S. to coordinate the development of EV infrastructure. The REV West Plan and the Transportation and Climate Initiative (TCI) are in the process of planning EV charging corridors to reduce transportation sector carbon emissions. Iowa could consider working with similar organizations in the Midwest. Charge Up Midwest is a partnership of several environmental and clean energy groups in Michigan, Illinois, Ohio, Minnesota, and Missouri whose purpose is to accelerate EV adoption by designing incentives and investing in charging infrastructure. The Midcontinent Transportation Electrification Collaborative (M-TEC) consists of a variety of stakeholders including auto manufacturers, electric utility companies, state agencies, and environmental organizations. M-TEC's mission is to "increase EV use, decarbonize the transportation sector, improve air quality, improve electric system efficiency, provide a great customer experience, and build infrastructure to support EV travel throughout the Midcontinent region."[8] The Michigan to Montana (M2M) I-94 corridor alternative fuel project has funding assistance from the DOE.

3. Parking Infrastructure Requirements – In tandem with the development of a statewide plan, legislation could set requirements for EV parking infrastructure. Some states have adopted permitting standards for parking lots, requiring, for instance, that for every 100 parking spaces, there must be at least one EV charging space. Legislation could also incentivize utilities to develop make-ready locations. These locations supply power to the point where a utility or third party developer might install an EV charging station. Iowa's statewide building energy code could also be updated to include requirements for EV charging infrastructure.

NEWS

- July 15, 2018: Iowa Utility Agrees To Phase Out Seven Coal Plants in Settlement
- July 15, 2018: Will New EPA Chief Continue Rollback of Clean Car Standards?
- July 11, 2018: Iowa Utilities Unveil Scaled Back Efficiency Plans Under New State Law
- June 24, 2018: A Small Community's Big Dreams for the Future
- May 1, 2018: Senate Revamps Iowa's Energy Policies: Critics Warn of Higher Utility Bills, Job Losses

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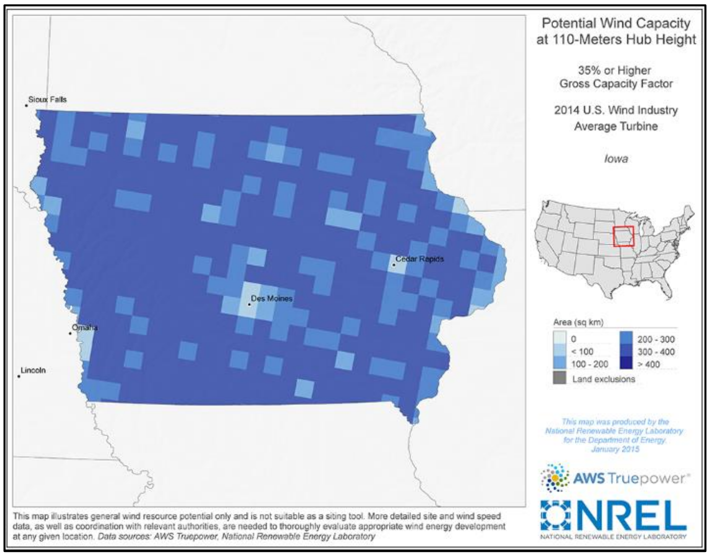
7 A study by the Congressional Budget Office however suggests that tax credits are important tools for ensuring increased adoption of alternative-fueled vehicles.

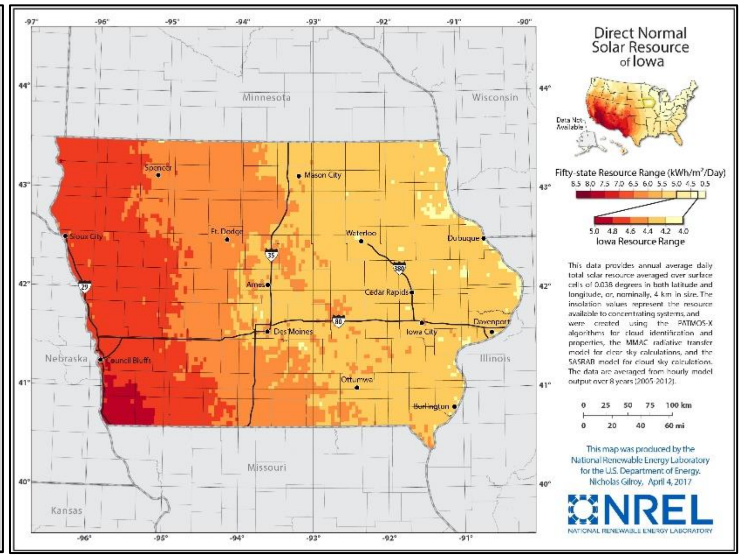
8 M-TEC, 2018. White Paper: Electric Utility Roles in the Electric Vehicle (EV) Market: Consensus Principles for Utility EV Program Design. *Midcontinent Transportation Electrification Collaborative*, pp. 2. http://www.betterenergy.org/wp-content/uploads/2018/04/MTEC_White_Paper_April_2018-1-1.pdf

- April 19, 2018: [Power Struggle: Iowa Town Takes on Utility Giant for Right to Go Greener]
- April 17, 2018: [Alliant Energy to Add More Wind Energy in Iowa]
- March 5, 2018: [Iowa Tax Reform Bill Puts Solar Tax Credit on the Chopping Block]

IOWA'S WIND AND SOLAR RESOURCES

WIND https://windexchange.energy.gov/states/ia[9]
SOLAR https://www.nrel.gov/gis/solar.html





OTHER RESOURCES

- American Wind Energy Association (AWEA), Iowa: http://awea.files.cms-plus.com/FileDownloads/pdfs/Iowa.pdf
- Iowa Economic Development Authority - Iowa Energy Office: www.iowaeconomicdevelopment.com/energy
- The American Council for an Energy-Efficient Economy State and Local Policy Database, Iowa: https://database.aceee.org/state/iowa
- The Database of State Incentives for Renewables and Efficiency, Iowa: http://programs.dsireusa.org/system/program?fromSir=0&state=IA
- U.S. Energy Information Administration, Iowa: https://www.eia.gov/state/?sid=IA
- National Renewable Energy Laboratory Biomass Maps: https://www.nrel.gov/gis/biomass.html
- U.S. Department of Energy's Alternative Fuels Data Center, Iowa: https://www.afdc.energy.gov/states/ia
- SPOT for Clean Energy, Iowa: https://spotforcleanenergy.org/state/iowa/
- The Rocky Mountain Institute: [From Gas to Grid – Building Charging Infrastructure to Power EV Demand]
- The GridWise Alliance, EV Report: http://gridwise.org/evs-driving-adoption-capturing-benefits/
- The Regulatory Assistance Project, Performance-Based Regulation: https://www.raponline.org/event/performance-based-regulation-the-power-of-outcomes-part-1/

Our Resources

CNEE Homepage: http://cnee.colostate.edu/

The SPOT for Clean Energy: https://spotforcleanenergy.org/

The Advanced Energy Legislation (AEL) Tracker: https://www.aeltracker.org/

Clean Energy Policy Guide for State Legislatures: http://cnee.colostate.edu/cleanenergypolicyguide/

The Energy Policy Podcast: http://energypodcast.colostate.edu/

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[9] Please see your packet for a higher resolution wind energy capacity map.