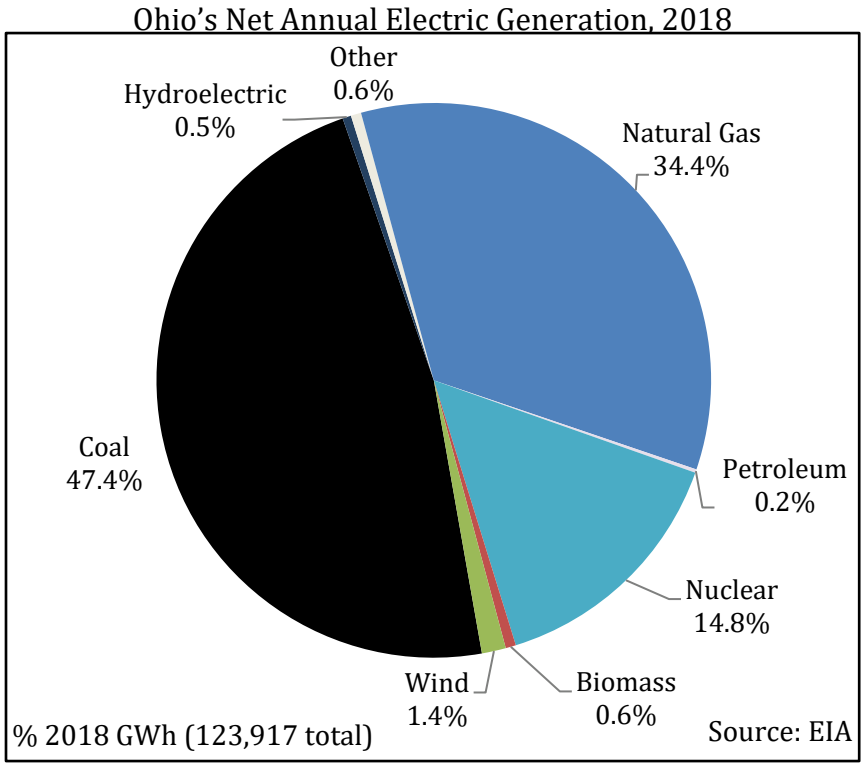
State Brief: Ohio

BACKGROUND

Ohio is the nation's 15th largest coal-producing state, shipping two-fifths of the coal mined in state out to other states by barge, truck, and rail. High demand, especially by the state's electric sector, requires that the state also import coal, primarily from neighboring states. In 2019, in-state natural gas production was 30 times greater than in 2012, and electric sector use was 14 times greater than in 2008.



Ohio has the fourth-largest interstate system in the U.S., and transportation is the third largest consumer of energy in the state.

Renewable energy resources supply almost 3% of Ohio's net electricity generation. The Buckeye State had 39 wind projects, with a combined capacity of 864 megawatts (MW) online at the beginning of 2020. An additional 250 MW is under construction. Ohio's renewable portfolio standard (RPS) was a driving force behind wind development, however in 2019, H.B. 6 reduced the current RPS by 5%, and will terminate the RPS after 2026. The 2020 U.S. Energy and Employment Report found that Ohio has 97,983 traditional energy workers (1.8% of total state employment) and an additional 83,165 workers employed in energy efficiency.

The Public Utilities Commission of Ohio (PUCO) regulates the state's electric and natural gas utilities. Bipartisan by law, the PUCO's five commissioners are appointed to a term of five years by the Governor. Ohio is currently under unified control with Republican majorities in both the House and Senate. Republican Governor Mike DeWine was elected in 2019.

In April 2018, PUCO approved American Electric Power's (AEP) Electric Security Plan (ESP). The ESP Allocates over $20 million for an electric vehicle (EV) charging station program and for one or more microgrid projects. In addition, the ESP requires that AEP will build or enter into power purchase agreements (PPAs) for 900 MW of wind and solar. AEP will spend approximately $200 million to modernize its grid and equip nearly 900,000 homes with smart meters. As of July 2020, the city of Columbus has raised approximately $600 million of its $1 billion goal to fund its 'smart-city initiative.' The city is using a $40 million grant from the Department of Energy to modernize its transportation network. Honda and Ohio State University are collaborating to build an autonomous-vehicle test ground.

POLICY STRENGTHS AND OPPORTUNITIES

The National Renewable Energy Laboratory (NREL) developed the notion of "policy stacking,"[1] 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.

[1] 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.

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

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.

Grid modernization will require a suite of state and federal policy changes to support advancements in grid technologies, grid management, and utility regulation.

In the most recent (2018) Grid Modernization Index, Ohio ranked 22nd overall for grid modernization efforts. Launched in April 2017, the PUCO's PowerForward proceeding was intended to "chart a path forward for future grid modernization projects, innovative regulations, and forward-thinking policies." The PUCO released the follow-up report, PowerForward: A Roadmap to Ohio's Electricity Future, at the end of August 2018. The Roadmap recommended creating a PowerForward Collaborative to study issues related to the deployment of electric vehicle (EV) charging infrastructure, energy storage, and other non-wires alternatives (NWAs). However, the proceedings were officially closed in April 2020. No work appears to have been undertaken on this initiative post early 2019. Ohio's policymakers might consider reviving the PowerForward workgroup to continue this work.

There are additional supportive policies that Ohio's policymakers could adopt to promote grid modernization.

1. Build upon the PowerForward proceeding. Legislation could require that grid modernization plans address cybersecurity, integrating distributed energy resources (including EVs and energy storage), and demand response and/or demand-side management (DSM) programs. Policymakers might also consider requiring that these plans outline a clear set of grid modernization goals and that they describe methods to measure, report, verify, and enforce progress towards those goals. The state can also provide incentives or cost recovery mechanisms for utilities that meet grid modernization goals.

2. Develop new utility business models. Today, non-traditional energy resources, including emerging, disruptive technologies (for example, customer-owned distributed generation, EVs, and energy storage) are increasingly cost competitive with more traditional resources. This has not only led to shifting customer expectations but also to new market realities confronting energy providers. In light of this, many argue that the regulated utility industry needs a new set of principles that are more sophisticated, forward-planning, and incentive-based. The state could build upon the PowerForward proceeding by continuing to investigate alternative ratemaking mechanisms and utility business models that support grid modernization, which includes promoting improved system efficiency, increased penetration of distributed energy resources (DERs), and enhanced affordability, reliability, and customer satisfaction. The state might also investigate performance-based regulation.

3. Utilities in Ohio have taken the lead in smart meter deployment, and PUCO's recent order approving AEP's gridSMART Phase 2 project will bring smart meters to an additional 894,000 customers. AEP filed for approval for gridSMART Phase 3 in 2019. The PowerForward Roadmap suggested creating a Data and the Modern Grid

Workgroup to address a protocol for privacy protections and real-time data availability. Ohio does not have clear state policies governing customer data access and privacy protections. To address this, policymakers could develop legislation or rules that, at minimum, do the following: clarify who owns the energy data associated with customer 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 possible. AEP facilitates customer access to energy data through the Green Button Connect program.

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

ENERGY STORAGE

Energy storage offers a unique opportunity to manage supply and demand dynamically while also maximizing the value of grid resources. By deploying storage to strategic locations, utilities can more effectively manage their energy portfolios. First, storage allows utilities to manage intermittent demand – helping to flatten peak demand requirements. Second, the responsiveness of energy storage can allow utilities to implement voltage regulation and other ancillary services, which are useful for improving system efficiency. Third, storage can dispatch power to better integrate intermittent power generation resources like renewable energy to the grid. Finally, energy storage can help the commercial sector avoid costly demand charges. As utilities around the country consider implementing or extending demand charges to other sectors, energy storage will become more relevant as a customer cost-saving investment.

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.

The April 2018 settlement leading to PUCO's order approving AEP's ESP includes a provision requiring that AEP assist Kroger and Walmart with DSM programs that utilize battery storage. Funding will be provided through AEP's energy efficiency and peak demand reduction plan. The Village of Minster is home to the nation's first municipal utility-owned solar-plus-storage project. There are several opportunities for developing supportive state policies:

1. Amend existing interconnection policies to ensure that storage can connect to the grid through a transparent and simple process. The Interstate Renewable Energy Council (IREC) has produced a series of interconnection protocols that states can easily adopt. The state could establish best practices for interconnecting storage in statute, or legislation could provide an instruction to the PUC to update existing policy.

2. 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.

3. 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 that utilities 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.

4. 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.

5. 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. These incentives can also be designed to decline as the value of storage becomes more readily monetized, and/or as the cost of storage decreases. Policymakers could allow utilities that provide storage incentives to customers to also 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 could help reduce their demand charges. Policymakers might start first with a policy that provides grants to pilot projects, and/or that targets existing solar system owners. Financial incentives should be designed to ensure that the state meets other goals including emissions and peak demand reductions, and equitable access to clean energy.

MAINSTREAMING RENEWABLES

As the renewable energy industry matured, technology improved, and global production of generating equipment increased. Renewable energy is increasingly seen as the least cost, and lowest risk form of energy (excluding energy efficiency). A 2019 Bloomberg New Energy Finance report predicts that renewable resources will generate at least 60% of total global electricity and 43% of U.S. electricity 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 interest of policymakers to ensure that their states are well positioned to benefit from the transition to clean energy resources.

To reduce barriers to customer and utility participation in the renewable energy market, Ohio 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 process for connecting renewable energy systems to the grid. To ensure this, Ohio's policymakers could consider requiring that utilities credit net excess generation at the customer's retail rate. Allowing aggregated net metering would be especially beneficial to the state's agricultural 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 permitting processes, or resources to support local governments that voluntarily implement a streamlined program, as Cleveland 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.

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. Consolidated Electric Cooperative's 100 kilowatt community solar array has been operational since 2016. To expand access to these types of projects, state policymakers might consider requiring that utilities contract a minimum capacity of shared renewables annually. Alternatively, legislation might direct PUCO to develop a statewide virtual net metering policy. 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 Ohio 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. Ohio is home to facilities for 61% of the Fortune 500 companies and 73% of the Fortune 100 companies that have such goals. Procter & Gamble, headquartered in Cincinnati, recently set a goal of 100% renewable energy by 2030. In 2017, Facebook announced that it would locate a new data center in New Albany, citing access to renewable energy as critical to its decision. Amazon also has a data center in New Albany, and has a long-term goal to achieve 100% renewable energy usage globally. JPMorgan Chase is building a 20 MW on-site solar system at its Polaris Corporate Center in Columbus. This project is part of the company's commitment to source 100% of its energy from renewable resources by 2020. Over the last five years, over 20 gigawatts (GW) of renewable contracts have been announced by corporate entities nationwide. This is leading policymakers to provide additional avenues for businesses to procure renewable energy.

   Ohio's policy allows companies to purchase renewable energy credits (RECs), provides access to renewable energy through the retail and wholesale markets, and develop or lease onsite renewable energy projects. State policy could be updated to address the Corporate Renewable Energy Buyers' Principles and Ohio's policymakers might consider developing a statewide shared renewables policy to support corporate procurement. In addition, it is prudent to integrate corporate renewable purchase commitments into the long-term plans that utilities submit to regulators to plan for resource needs over multiple decades. By integrating these renewable purchase commitments into utilities' plans, regulators can avoid over-building resources and stranding generation assets.

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 an RPS. To support utility adoption of clean energy technologies, Ohio's policymakers might consider adopting a clean peak standard.

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.

PATHWAYS TO A LOW CARBON FUTURE

The international scientific community has determined that steep and rapid reductions in global greenhouse gas (GHG) emissions are needed to avoid the worst impacts of global warming and climate change. Federal and state policy interventions are necessary to transform our energy systems and rapidly reduce GHG emissions in the U.S. In general, effective policies will:

1) Establish performance standards and place enforceable limits on carbon pollution;
2) Provide financial incentives for individuals, businesses, and industry to choose clean energy and greatly improve energy efficiency;
3) Spur public and private investment in clean energy infrastructure, including investment in advanced transportation systems for the movement of people and goods; and
4) Provide funding for research, development, and demonstration of technologies that will underpin the de-carbonization of the U.S. economy.

AEP and FirstEnergy recently announced CO_2 emissions reduction targets. AEP, after meeting its 2020 target, set a goal of reducing carbon emissions 80% below 2000 levels by 2050. In 2019, FirstEnergy said that it would reduce carbon emissions 90% below 2005 levels by 2045, continuing on their path after reaching 62% reduction by the end of 2018. Statewide, Ohio benefitted from a 37.7% reduction in power sector carbon emissions between 2005 and 2015. To compliment this, Ohio's policymakers might consider the following:

1. GHG Emissions Monitoring and Reporting – To effectively implement policies that reduce emissions, a mandatory system for monitoring, reporting, and verifying GHG emissions must be put in place. While the U.S. EPA has GHG reporting requirements, the federal reporting requirements focus on major industrial sources, leaving significant gaps in the information states need to fully understand their emissions profile. Policymakers might consider legislation similar to Colorado's SB19-096, which requires annual GHG reporting and establishes emissions baselines from which to measure progress.

2. Emissions Targets – Emissions targets 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 a carbon portfolio standard approach, under which a state sets an emissions reduction target to be achieved over time, for example, 40% below 1990 levels by 2040. This can be implemented through the IRP or other long-term planning process or by establishing a maximum allowable rate of emissions per unit. Such a standard can also be designed to address other concerns such as pollution, asthma risk, environmental justice, and water use.

3. Cap-and-Trade / Cap-and-Invest – These policies place enforceable limits on carbon emissions that cannot be exceeded by regulated entities without penalty. Emissions allowances are allocated or sold to companies by the state and sources must hold an allowance for each ton of carbon they emit in a given year. Emissions caps and available allowances are reduced every year, requiring that industries reduce their emissions or pay higher market prices for available allowances. States might choose to invest the revenue associated with emissions allowances in renewable energy, public transportation, zero-emission vehicles, environmental restoration, sustainable agriculture, recycling, and other actions.

   Ohio might consider joining an existing program like the Western Climate Initiative (WCI) or the Regional Greenhouse Gas Initiative (RGGI), as joining an established network can remove administrative barriers to entry.

4. Carbon Tax – Carbon taxes impose a price on each ton of carbon emitted and are levied on the purchase and use of fossil fuels by business and industry. That cost is subsequently reflected in consumer prices. If carbon taxes are levied at a high rate, they will discourage the use of GHG emitting resources and technologies, encouraging a market switch to new technology. Alternatively, carbon taxes can be set at a lower rate, which will have a limited impact on market behavior, but the revenue can be substantial and that revenue can be invested in energy efficiency and emission reduction technologies which will result in lower emissions. States considering this option might examine British Columbia's existing tax structure or the federal proposals from the Citizen's Climate Lobby and the Climate Leadership Council.

5. Emissions Performance Standards – Transportation sources now emit more GHGs than any other sector, and rapid reductions from all types of vehicles, engines, and equipment is critical to achieving carbon reduction goals. The Low Carbon Fuel Standard (LCFS) implemented by both Oregon and California is another example of a flexible, market-based approach to regulating carbon emissions at the state level. LCFSs regulate the carbon intensity of transportation fuel in order to reduce the use of petroleum-based fuels and promote investment in low-carbon options (electrification, biofuels, hydrogen, etc.). The market mechanism LCFSs use is a crediting system where each fuel type is assigned a carbon intensity (CI) score. The allowable CI score is decreased yearly, requiring a switch to lower CI fuels. Entities who provide fuel below the regulated CI score earn credits. These credits can be sold to providers who operate at a deficit (above the mandated CI score), creating a market incentive for investment in cleaner fuels

ELECTRIFICATION OF THE TRANSPORTATION SECTOR

Bloomberg New Energy Finance estimates that 58% of all new passenger vehicle sales will be electric by 2040 and that price parity with conventional vehicles will be met for most segments in the mid-2020s. 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.

Previously, Ohio's Development Services Agency's Alternative Fuel Transportation Program provided financial assistance to businesses, non-profits, school districts, and local governments for the purchase of alternative fueling infrastructure, but the program is not currently funded. To encourage EV adoption, lawmakers might consider reinstating funding for this program. After receiving a one-time verification inspection, EVs in Ohio are exempt from state emissions inspections. Additionally, in April 2018, PUCO approved AEP's $10 million electric vehicle supply equipment (EVSE) program, which will fund the installation of 375 charging stations and rebates for home and workplace installations. Dayton Power and Light agreed to provide up to $1 million to fund charging stations. There are a number of additional opportunities to expand the market for EVs in Ohio:

1. Financing and Financial Incentives – Providing financial incentives and innovative financing options can help increase market penetration of EVs. Sales, property, and income tax credits are some of the simplest methods for addressing the 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.[2] 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. HOV and HOT Incentives – Allowing EVs to use high-occupancy vehicle (HOV) or high-occupancy toll (HOT) lanes regardless of number of passengers, and without paying the toll may make EV ownership more attractive. Most states require that EVs using these lanes display a decal or particular license plate; others also limit eligibility to certain types of vehicles or to a certain number of vehicles.

3. Charging Infrastructure Plan – Locating charging infrastructure is different from locating conventional fueling stations. While some drivers will need to charge more quickly, others will refuel when they are parked for longer periods of time, for example when shopping, eating at a restaurant, or going to work. Charging infrastructure plans should attempt to pair the appropriate level of charging (level 2 or direct current fast charging) with a reasonable amount of time a person will be at that location. Legislation could direct a state agency to develop an infrastructure plan through a stakeholder process. States with existing registration fees for EVs could use a portion of this revenue to fund charging infrastructure development efforts, as Washington has done.

4. 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. Hawaii, for instance, requires that for every 100 parking spaces, there must be at least one EV charging space. States and local governments are also updating building standards and codes to require that new buildings are EV ready, meaning that all conduit and wiring are able to accommodate EVSE. States can also implement programs to provide parking incentives for owners of EVs. Typically, these programs provide access to carpool parking, preferential spaces, reduced fees, and/or access to charging stations.

NEWS

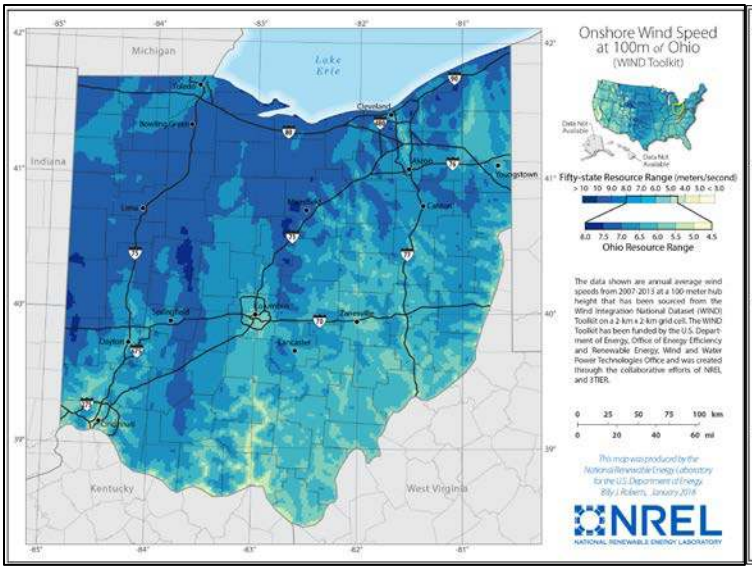
- August 31, 2020: New Group Sees Great Potential in Utility-Scale Solar Energy for Ohio
- August 31, 2020: Ohio House Begins Process of Repealing HB 6, Nuclear Bill Tainted by Corruption Probe
- August 31, 2020: Ohio Lawmakers Challenge Siting Board over 'Poison Pill' for Offshore Wind
- July 23, 2019: Nuclear Bailout Bill Passes Ohio Legislature, Signed by Gov. Mike DeWine
- May 21, 2020: Ohio Regulators OK Lake Erie Wind Farm with 'Poison Pill' That May Kill Project
- June 23, 2020: An Electric Pickup Truck Brings New Energy to Lordstown, Ohio
- July 2, 2020: Clean Energy Programs Can Help Address Some Racial Disparities, Advocates say

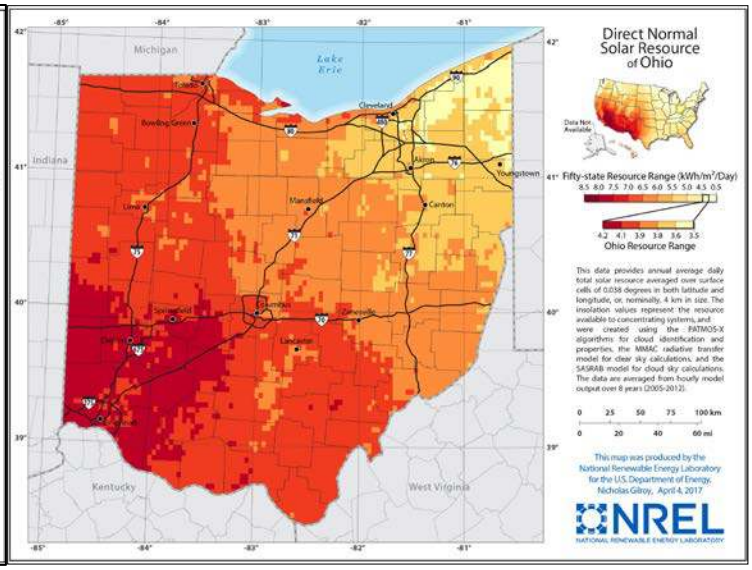
[2] A study by the Congressional Budget Office however suggests that tax credits are important tools for ensuring increased adoption of alternative-fueled vehicles.

- July 2, 2020: Illinois Wind Farm to Power Google Data Center in Ohio
- July 8, 2020: Crown Batter, AEP Ohio Save Enough Electricity to Power 13,000 Homes

OHIO'S WIND AND SOLAR RESOURCES

WIND https://windexchange.energy.gov/states/oh





OTHER RESOURCES

- American Wind Energy Association (AWEA): https://www.awea.org/resources/fact-sheets/state-facts-sheets
- Ohio Development Services Agency: https://development.ohio.gov/
- The American Council for an Energy-Efficient Economy State and Local Policy Database, Ohio: https://database.aceee.org/state/ohio
- The Database of State Incentives for Renewables and Efficiency, Ohio: http://programs.dsireusa.org/system/program?fromSir=0&state=OH
- U.S. Energy Information Administration, Ohio: https://www.eia.gov/state/?sid=OH
- National Renewable Energy Laboratory Biomass Maps: https://www.nrel.gov/gis/biomass.html
- U.S. Department of Energy's Alternative Fuels Data Center, Ohio: https://www.afdc.energy.gov/states/oh
- SPOT for Clean Energy, Ohio: https://spotforcleanenergy.org/state/ohio/
- The Rocky Mountain Institute, From Gas to Grid – Building Charging Infrastructure to Power Electric Vehicle Demand: https://rmi.org/wp-content/uploads/2017/10/RMI-From-Gas-To-Grid.pdf
- The GridWise Alliance, EVs - Driving Adoption, Capturing Benefits: 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/
- The Interstate Renewable Energy Council, A Playbook for Modernizing the Distribution Grid, Volume 1: https://irecusa.org/publications/a-playbook-for-modernizing-the-distribution-grid-volume-1/

Our Resources

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

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

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

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