

Green Electricity and Transportation (GET) Smart Policy solutions to increase energy independence

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Executive summary

Ohioans spend a large amount of money on energy. In 2010, we spent \$45 billion, nearly 10 percent of our state's gross domestic product.¹ Nearly half of those energy dollars (or more than \$20 billion) was spent to fuel cars, trucks, and buses, and nearly all of which left the state or country in order to import oil. Ohio can reduce its dependence on imported oil by promoting electric vehicles (EVs) and buses, as well as passenger and freight rail.

Positive policy changes, market trends are driving demand for electric vehicles.

Federal Corporate Average Fuel Economy (CAFE) standards will drive production and adoption of EVs. California adopted similar technology-driven standards, which will lure manufacturers of EV technology to the state.

If consumers demand EV technology, somebody will need to manufacture it. Ohio is well positioned to be a key player in the EV supply chain if the state promotes early adoption of this technology. Other states, however, are working harder to develop this new industry. In 2012, Californians bought one-third of all electric vehicles, in large part because of strong local incentives. Ohio currently has none.

Federal and state incentives, as well as state fleet requirements help drive demand. Of course, incentives should only be implemented with strong standards and accountability. The federal income tax credit for plug-in electric vehicles (PEVs) ranges from \$2,500 to \$7,500. A number of other states offer additional incentives. Pennsylvania, for instance, offers residents \$3,500 in rebates for EVs. The majority of states favor alternative fuel vehicles over conventional fuel vehicles in their procurement process. In the past, the Ohio Department of Transportation has supported green transit vehicle adoption with the use of flexible federal funds allocated to the state.

Investments in electric vehicle infrastructure reduce barriers by ensuring greater availability and convenience of charging stations. Electric-car maker Tesla plans to build a nationwide network of solar "supercharger" stations. Ford has been working on a joint project with the solar manufacturer SunPower to provide solar panels to EV owners for home charging. The [Drive Electric Ohio](#)

Key findings

- Ohioans spend 10 percent of state gross domestic product on energy, half on transportation; 98 percent of the oil we use is imported.
- States have adopted policies to drive demand for electric vehicles and reduce petroleum dependency.
- Ohio is well positioned to be a key player in the EV supply chain, but other states are working harder to develop this new industry.
- Several Ohio communities, including Oberlin, Cincinnati, Cleveland, and Cuyahoga Falls are using municipal aggregation and municipal utility power to increase use of local clean energy, thus keeping energy dollars local.

¹ Energy Information Administration, Energy Prices, and Expenditures.

initiative has been working to map existing infrastructure and identify key locations for future infrastructure development.

Policy changes, market trends translate into homegrown electricity from cleaner energy resources to fuel our cars and trucks in the future.

Ohio's clean energy laws require that 25 percent of electric generation come from advanced energy resources by 2025; half must be generated in state. Ohio utility companies also must achieve a 22 percent reduction in overall energy use by 2025.

Low natural gas prices, due in part to shale gas production in the state, will affect Ohio's electricity mix, increasing use of homegrown energy and thereby reducing emissions. Natural gas burns cleaner than coal, and natural gas power plants are also more efficient. If 30 percent of Ohio power was generated from natural gas and 12.5 percent from renewable energy sources, we estimate that emissions from Ohio's electric power sector would be 33 percent lower.

Smart local policies are increasing use of renewable energy from local resources. Exciting examples include aggregated green power purchase in Cincinnati, the community-wide green development effort in Oberlin, Sustainable Cleveland 2019, and the city of Cuyahoga Falls' Community Energy Strategic Plan. In these cities, PEVs will be running on up to 100 percent clean power, much of it from domestic resources.

Green Electricity and Transportation (GET) Smart policy solutions can help cities build on these positive trends toward energy independence.

Cities can adopt **complete street policies** to be accessible to all modes of transportation, including walking, biking, mass transit, and EVs.

Public power, local government, and planning officials should participate in [Drive Electric Ohio](#), a statewide stakeholder network organized by Clean Fuels Ohio, made up of public and private stakeholders, designed to identify and address major barriers to travel via EVs. One excellent resource for this collaborative could be the new statewide network of Ohio's metropolitan planning organizations. Among other issues, MPOs should help finance EV infrastructure projects.

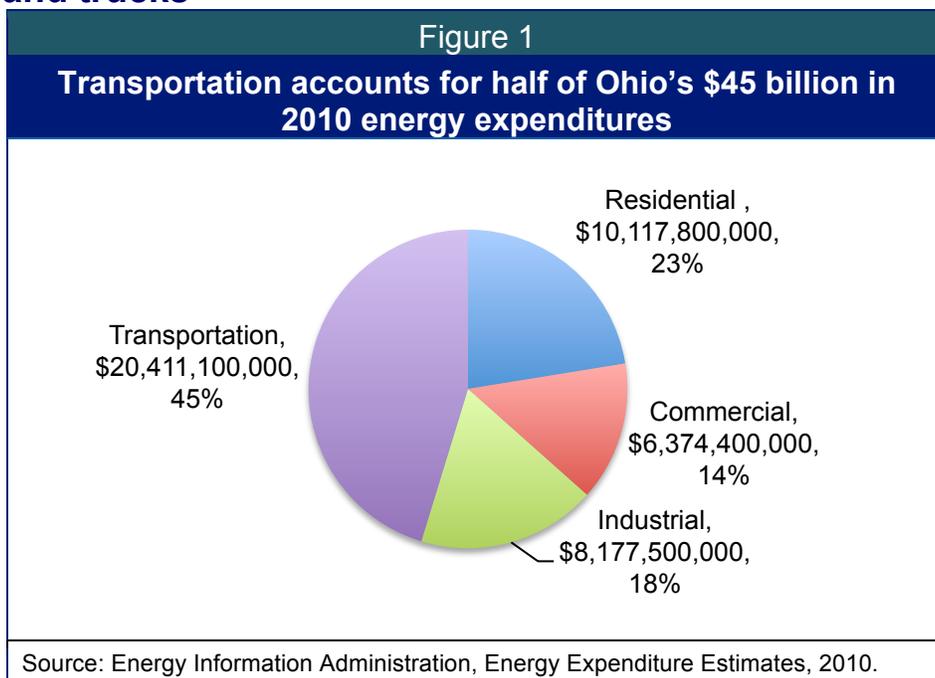
More communities should take advantage of their potential for energy self-reliance. They can do so by using their **municipal aggregation or utility powers** to procure homegrown energy from clean sources, which Cincinnati and Oberlin have done, and Cleveland is now doing.

The state of Ohio can support local GET Smart efforts and the development of the state's electric-vehicle supply chain. There are several opportunities that will help Ohio reach these goals:

- **Create a Transportation Choice fund** in Ohio's transportation budget. By 2030, ramp funding up to 10 percent of the state's multi-billion dollar transportation budget;
- **Expand Ohio's Advanced Energy Fund** and using it to provide grants, rebates, vouchers, and low-interest loans to promote EV adoption;
- **Protect and expand Ohio's clean energy laws;**
- **Identify existing Ohio manufacturers** that can participate in the EV supply chain, helping them retool to meet the needs of this industry, and investing in related research and development.

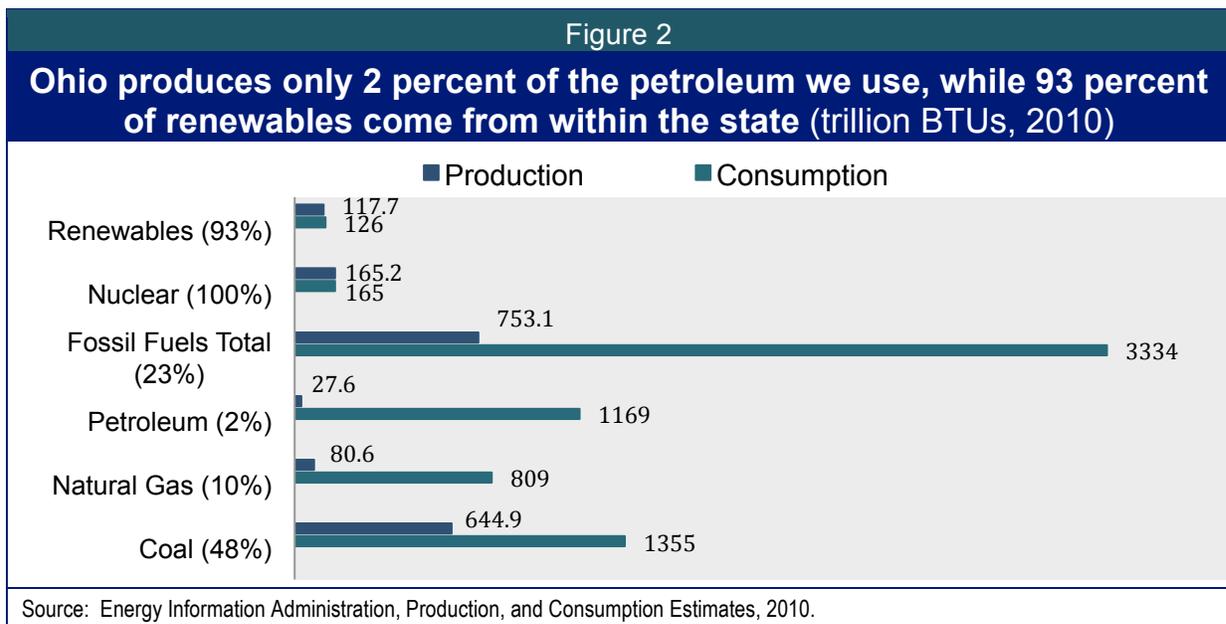
Fueling Ohio's cars and trucks

We spend a lot on energy, much of it to fuel cars and trucks. Ohio ranks sixth among states in terms of the amount its residents and businesses spend on energy. In 2010, Ohioans spent \$45 billion, nearly 10 percent of our state's gross domestic product. About half of those energy dollars – more than \$20 billion – was spent to fuel cars, trucks, and buses. Figure 1 shows that transportation accounted for 45 percent of Ohio's energy expenditures that year.



Ohio imports the vast majority of fuel used

Nearly three quarters of Ohio's \$45 billion in energy expenditures leave the state. Ohio currently produces 27 percent of the total energy it consumes—only 2 percent of petroleum we use, 10 percent of natural gas, and 48 percent of coal. On the other hand, 93 percent of the renewable energy we use is produced in state. Figure 2 compares energy production to consumption among these various energy resources.



Electric vehicles will reduce reliance on foreign oil

The federal Corporate Average Fuel Economy (CAFE) standards are driving the necessary innovation in advanced vehicle technology, as well as the production and adoption of EVs. By model year 2025, the CAFE standards are expected to nearly double vehicle efficiency, increasing fuel economy for cars and light-duty trucks to the equivalent of 54.5 miles per gallon, while saving consumers an estimated \$1.7 trillion at the gas pump.² By 2035, hybrid and plug-in hybrid vehicles are projected to grow nationally to about 1.3 million vehicles.³ By 2040, half of all new light-duty vehicles are projected to use diesel, alternative fuels, or hybrid technology. Heavy-duty alternative-fueled vehicles are expected to increase as well. Additionally, California's emission and production standards require manufacturers (with annual state sales greater than 60,000 vehicles) to produce and deliver a certain percentage of zero-emission vehicles and to meet the state's average fleet emission requirements. Since California is a high-demand state for vehicles, these standards will have a national impact on electric vehicle production.

Vehicle efficiency saves money, creates good jobs

The Blue Green Alliance estimates the federal CAFE standards will create more than 500,000 full-time U.S. jobs by 2030 due to money saved and thus kept in the nation's economy, with 50,000 of them in vehicle manufacturing.⁴ Ohio should be a key player in the electric vehicle manufacturing supply chain, but if the demand is elsewhere, so might the supply. As mentioned earlier, the new federal fuel standards are expected to create tens of thousands of jobs manufacturing advanced energy vehicles. Ohio is well positioned to capture many of those jobs. Almost 600 Ohio companies already operate in the automotive industry, employing almost 80,000 people, and producing more than one million vehicles a year. We rank third in the nation for motor vehicle production, second for Tier-1 suppliers, and fourth for automotive assembly.⁵

According to the Blue Green Alliance, nearly 14,000 Ohioans are already helping to produce fuel efficiency technologies.⁶ A study by Duke University's Center on Globalization Governance and Competitiveness found that at least **35 Ohio companies and organizations** would benefit from increased investments in hybrid technology for medium and heavy-duty trucks alone. Surprisingly, most relate to work derived from greater investments in public buses and passenger rail through component part production. Several relate to clean passenger vehicle technology: [Eaton](#) in Cleveland and [ISE](#) in Maumee provide power electrification systems for vehicles; [Cobasys](#) in Springboro provides electric motors, and; Bosch Rexroth in Wooster for engineering hydraulic hybrids. Ohio original equipment manufacturers are also expected to benefit, including: Ford Motor Company in Avon Lake; Kenworth Truck Company Chillicothe; Oshkosh Truck Corporation in Orrville, and; Navistar International Corporation in Springfield. Ohio University, Ohio State University, and University of Toledo conduct related research and development.

With help from American Recovery and Reinvestment federal stimulus dollars, a leading global chemical company, BASF, recently expanded and retooled its Elyria plant to manufacture materials used in advanced lithium ion batteries for hybrid/electric vehicles. As a result, it is expected to employ an additional 25 people.⁷ Even more recently, Ford announced plans to invest \$200 million in a Cleveland plant and create 450 new jobs manufacturing the award-winning EcoBoost engine®.

² <http://l.usa.gov/RVCva2>.

³ *Annual Energy Outlook 2013* at [http://www.eia.gov/forecasts/aeo/er/pdf/0383er\(2013\).pdf](http://www.eia.gov/forecasts/aeo/er/pdf/0383er(2013).pdf).

⁴ Blue Green Alliance, *Gearing Up: Smart Standards Create Good Jobs Building Cleaner Cars*, at <http://bit.ly/N2WE9c>.

⁵ JobsOhio, *Ohio Automotive Industry* at <http://jobs-ohio.com/automotive/>.

⁶ Blue Green Alliance, *New Clean Car Standards: A Job Creator for America and Ohio*, <http://bit.ly/UjkHSq>.

⁷ www.cleveland.com/business/index.ssf/2012/11/basf_starts_electric_car_batte.html.

Other states, however, are working harder to develop this new industry. By promoting demand for EV-related products, encouraging early adopters, developing the needed infrastructure for rapid EV adoption, and offering consumer and manufacturing incentives, a number of states are making their states EV-business friendly. By doing so, these states could firmly establish themselves as the new epicenters of an advanced vehicle technology supply chain, and leave Ohio behind. These states are setting standards, providing incentives, establishing strong procurement requirements and funding mechanisms to support fleet transition, establishing public/private partnerships, and developing the necessary infrastructure to promote electric vehicle adoption and thus increase local demand. Table 1 shows that 12 states are providing incentives to manufacturers of electric vehicle technologies. Ohio is not one of them.

| Table 1 | |
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| Twelve states provide incentives to electric vehicle manufacturers | |
| California | <p>Advanced Transportation Financing. The California Alternative Energy and Advanced Transportation Financing Authority provides financing for property used to develop and commercialize advanced transportation technologies to reduce pollution and energy use and promote economic development.</p> <p>Technology Advancement Funding-South Coast. The South Coast Air Quality Management District's Clean Fuels Program provides funding for projects that are expected to help accelerate the commercialization of advanced low emission transportation technologies.</p> |
| Georgia | <p>Alternative Fuel and Advanced Vehicle Job Creation Tax Credit. A business that manufactures alternative energy products for use in battery, biofuel, and electric vehicle enterprises may claim an annual tax credit per eligible new full-time employee job for five years. Credit amounts differ depending on how the county in which the business is located ranks, based on unemployment rates and income levels.</p> |
| Indiana | <p>Hoosier Heavy Hybrid Initiative. Nationally, trucks consume more than two million barrels of oil a day, with a fuel economy that averages roughly 6 miles per gallon.⁸ Indiana's Hoosier Heavy Hybrid Initiative—a consortium of industry, government, and universities—is designed to tackle this issue by supporting the development of new electric motor systems. Vehicle Research and Development Grants. The Indiana Economic Development Corporation administers the Indiana 21st Century Research and Technology Fund, which provides grants and loans to support proposals for economic development in high technology industry clusters. Incentives are available for qualified alternative fuel technologies and fuel-efficient vehicle production.</p> <p>Certified Technology Park Designation. The Indiana Economic Development Corporation may designate an area as a certified technology park if it meets certain criteria, including a commitment from at least one business engaged in a high technology activity that creates a significant number of jobs. High technology activities include technology that involves electric vehicles, hybrid electric vehicles, alternative fuel vehicles, or components used in the construction of these vehicles.</p> |
| Iowa | <p>Alternative Fuel Production Tax Credits. The Enterprise Zone Program and the High Quality Jobs Program offer state tax incentives to business projects for the production of biomass or alternative fuels. Depending on the program, incentives may include: an investment tax credit equal to a percentage of the qualifying investment, amortized over five years; a refund of state sales, service, or use taxes paid to contractors or subcontractors during construction; a doubling of the state's refundable research activities credit; and a local property tax exemption of up to 100 percent of the value added to the property.</p> |

⁸ Apollo Alliance, *Make it in America: The Apollo Clean Transportation Manufacturing Action Plan* (2010).

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| Louisiana | Green Jobs Tax Credit. The state offers a corporate or income tax credit for qualified capital infrastructure projects in Louisiana that are directly related to industries including, but not limited to, the energy efficient and advanced drivetrain vehicle industry and the biofuels industry. The tax credit is for 10 percent to 25 percent of the project costs, up to \$1 million per state-certified green project. The portion of the base investment expended on payroll (for Louisiana residents employed in connection with the construction of the project) may be eligible for an additional 10 percent tax credit. |
| Michigan | Alternative Fuel Development Property Tax Exemption. A tax exemption may apply to industrial property that is used for, among other purposes, high-technology activities including those related to advanced vehicle technologies such as electric, hybrid electric, or alternative fuel vehicles and their components. |
| New Mexico | Alternative Fuel and Advanced Vehicle System Manufacturing Incentive. The Alternative Energy Product Manufacturers Tax Credit is applied against combined reporting taxes (gross receipts, compensating, and withholding) for qualified manufacturers of alternative energy products, which includes hydrogen and fuel cell vehicle systems, and electric and hybrid electric vehicles. The credit is limited to 5 percent of qualifying expenditures, and manufacturers must fulfill job creation requirements to be eligible. |
| New York | Alternative Fuel Vehicle Research and Development Funding. The New York State Energy Research and Development Authority (NYSERDA) provides funding for projects that improve efficiency and diversity in transportation methods and fuels, through research and development of advanced technologies. Once developed, NYSERDA also provides incentives to accelerate the market introduction of emerging technologies through its Alternative Fuel Vehicle Program. |
| Oklahoma | All-Electric Vehicle (EV) Manufacturing Tax Credit. Vehicle manufacturers are eligible for a tax credit for EVs. Any EVs that can legally be operated on interstate highways and turnpikes in the state are eligible for a \$2,000 credit per vehicle. Tax credits may be carried forward for up to five years. |
| Pennsylvania | Alternative Fuel Development and Deployment Grants. Pennsylvania Energy Development Authority provides grants up to \$1,000,000 for alternative energy projects, as well as research related to deployment projects or manufacturing, including fuel cells, and clean and alternative fuels for transportation. Project funds may be used for equipment purchases, construction, contractor expenses, and engineering design necessary for construction or installation. |
| Vermont | Alternative Fuel and Advanced Vehicle Research and Development Tax Credit. High-tech business involved in the design, development, and manufacture of alternative fuel vehicles, hybrid electric vehicles, all-electric vehicles, or energy technology involving fuel sources other than fossil fuels are eligible for up to three of the following tax credits: 1) payroll income tax credit; 2) qualified research and development income tax credit; 3) export tax credit; 4) small business investment tax credit; and 5) high-tech growth tax credit. |
| Virginia | Alternative Fuel Research and Development Funding. The Virginia Universities Clean Energy Development and Economic Stimulus Foundation funds alternative fuel and related technology research, development, and commercialization through grants and loans. |
| Source: U.S. Department of Energy, Alternative Fuels Data Center at http://www.afdc.energy.gov/fuels/laws/3270 . | |

Federal, state, and local incentives help jumpstart the market

To help jumpstart the electric vehicle market, reduce consumer dependency on petroleum and save money over the life of a vehicle, the federal government and many states are offering incentives to early adopters of EV technology and other alternative fueled vehicles.⁹ Table 2 describes those incentives in further detail. Unfortunately, Ohio currently has no such incentives.

| Table 2 Federal, state, and local incentives for plug-in electric vehicles | |
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| Federal Income Tax Credit | The federal income tax credit for plug-in EVs ranges from \$2,500 to \$7,500, depending on the battery capacity and the gross vehicle weight rating. |
| Fourteen states offer additional tax incentives | <ul style="list-style-type: none"> • Income tax credit in West Virginia for 35 percent of the vehicle purchase price (up to \$7,500 for light-duty vehicles and \$25,000 for heavy-duty vehicles), • Up to \$6,000 in a refundable tax credit in Colorado, and • An income tax credit of \$605 in Utah. • In Georgia, 10 percent of the cost of the vehicle up to \$2,500 for an alternative fueled vehicle, or 20% up to \$5,000 for a zero-emission vehicle. • Arizona, Illinois, and Iowa offer reduced license and registration taxes. • Exemption from sales, excise, and/or use taxes is offered in Arizona, Maryland, New Jersey, North Carolina, and Washington. • Missouri exempts EVs from the motor fuel tax. Wisconsin exempts electric taxis. |
| Local | <ul style="list-style-type: none"> • Virginia enables local governments to reduce personal property taxes on EVs. • The District of Columbia offers an exemption from its vehicle title tax. • Warren, Rhode Island exempts alternative-fueled vehicles from excise taxes up to \$100. |
| Rebates, grants, and vouchers | <ul style="list-style-type: none"> • Pennsylvania offers residents \$3,500 rebates for electric and other alternative fueled vehicles, • Tennessee offers \$2,500 rebates. • Illinois provides a rebate for 80 percent of the incremental cost of purchasing an AFV from an Illinois-based company to all state residents, businesses, government units, and organizations (up to \$4,000). • North Carolina provides grants to cover the incremental cost. • California offers up to \$2,500 rebates for light-duty zero emission and plug-in hybrid vehicles to individuals, business owners, and government entities. • The Maryland Energy Administration provides \$20,000 vouchers for all-electric trucks, if bought from a dealership in Maryland. • AirCheckTexas provides \$3,500 vouchers toward EVs. |
| Toll and parking discounts | <ul style="list-style-type: none"> • The New Jersey Turnpike offers a 10 percent discount on tolls. • Nevada provides an exemption from parking fees. |
| Source: Alternative Fuels Data Center http://1.usa.gov/18fp9e9 ; See DERG materials at http://bit.ly/12s5x0s . | |

Federal Congestion Mitigation and Air Quality (CMAQ) dollars support state incentives

The federal CMAQ program provides funding to state departments of transportation, municipal planning organizations, and transit agencies for projects/programs in air quality nonattainment areas to reduce transportation-related emissions. Eligible activities include transit improvements, development of alternative fueling infrastructure, and conversion of public fleet vehicles to operate on cleaner fuels. Ohio uses \$10 million per year in CMAQ funds for its Diesel Emissions Reduction Grant program, which, among other things, is used to provide grants for the replacement of old vehicles with new ones (such as hybrid and alternatively fueled vehicles, and permanently removing the old vehicle from service).

⁹ *Alternative Fuels Data Center* <http://www.afdc.energy.gov/fuels/laws/3270>.

Alternative fuel vehicle and transportation-efficiency funds in the states

A few states have created funds to promote adoption of alternative vehicles. Illinois requires non-EV fleet owners (with fleets of 10 or more vehicles) to pay an annual user fee of \$20 per vehicle, which is then deposited into an Alternate Fuels Fund. California's fund derives revenues from a motor vehicle registration fee program, North Carolina from an EPA Credit Banking and Selling program, and Nevada from penalties assessed for violations of air pollution control laws.

Federal and state fleet requirements and incentives¹⁰

The federal government, 35 states, and the District of Columbia have green fleet policies to increase the efficiency of public and private fleets, decrease emissions, and reduce dependence on oil.

| Table 3 Federal and state fleet requirements and incentives | |
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| Federal procurement requirements | To reduce federal government emissions 28% by 2020, each federal agency is required to develop and annually update a Strategic Sustainability Performance Plan , including a plan to improve its fleet efficiency. Federal agencies with 20 or more vehicles must reduce their petroleum consumption by 2 percent each year through 2015, while increasing alternative fuel use by 10% per year. In addition, 75% of new light-duty vehicles are required to be alternative fuel vehicles. The Department of Defense gives preference for electric and hybrid vehicles in the procurement process (except for combat vehicles). The U.S. General Services Administration and other federal agencies procuring vehicles cover incremental costs of purchasing alternative fuel vehicles for federal fleets. |
| State procurement requirements | <p>Most states have developed procurement procedures favoring alternative fuel vehicles, requiring the purchase of best value vehicles based on life cycle cost, creating a minimum standard for the ratio of alternative fuel vehicles in state fleets, or compelling state agencies to reduce petroleum consumption.¹¹ Some states also require annual reports or plans to evaluate the cost effectiveness of alternative-fueled vehicles and show an increase in average fleet fuel economy over time.¹²</p> <ul style="list-style-type: none"> • Arizona and Connecticut have specific requirements for school bus fleets, • West Virginia requires it of higher education vehicles, • Illinois reimburses local school districts for any extra cost to convert fleets to alternative fuels. • Arizona includes a similar requirement for local governments and federal fleets. • Mississippi has a travel policy with petroleum reduction requirements, and • Wisconsin encourages state employees to use hybrid EVs whenever feasible and cost effective. <p>In 2006, Ohio mandated alternative fuels in capable state vehicles. In 2007, the Office of Fleet Management created an easy-to-read scorecard for each agency on its alternative fuel use, which earned the state national recognition.¹³ In 2012, Governor Kasich made natural gas conversion of state fleets one of his ten energy pillars.¹⁴</p> |

¹⁰ *Alternative Fuels Data Center* <http://www.afdc.energy.gov/fuels/laws/3270>.

¹¹ Alabama, Alaska, Arizona, California, Connecticut, District of Columbia, Delaware, Hawaii, Illinois, Indiana, Iowa, Kansas, Kentucky, Massachusetts, Minnesota, Mississippi, Missouri, Nevada, New Hampshire, New Mexico, New York, North Carolina, Ohio, Oklahoma, Oregon, Rhode Island, South Carolina, Tennessee, Texas, Vermont, Virginia, Washington, and Wisconsin. The Utah and West Virginia legislatures have given agencies the authority to require it if they choose to do so.

¹² Alabama, Alaska (every 5 years), California, Connecticut, Minnesota, North Carolina, Oklahoma, Vermont.

¹³ <http://das.ohio.gov/LinkClick.aspx?fileticket=snK8JvWqUzA=&tabid=449>.

¹⁴ <http://www.government-fleet.com/article/print/story/2009/07/bright-ideas-going-green.aspx>.

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| Financial support for fleet conversion | <p>To help state and local agencies convert fleets to alternative fueled vehicles, 17 states provide grants, vouchers, low or zero interest loans to state agencies, cities, counties, public schools, colleges and universities, special districts, non-profit agencies, mass transit authorities, public utilities, and parishes (including nearby Pennsylvania, Illinois, and New York, but not Ohio).¹⁵ Nine states allow school and educational institutions to apply, with three specifically designed to replace school buses with alternative fueled vehicles.¹⁶ Six states and the federal government also allow private fleet owners to apply or have programs for commercial fleets.¹⁷ Examples include:</p> <ul style="list-style-type: none"> • The San Joaquin Valley Air Pollution Control District, which offers a \$20,000 grant per vehicle up to \$100,000 per agency; • The Colorado Energy Office provides up to 80% of the incremental cost of purchasing an EV; • The Nebraska Energy Office provides up to \$750,000 in low-interest loans; • Louisiana administers the Alternative Fuel Vehicle Revolving Loan Fund; • New York provides \$20,000 vouchers for all electric trucks, and; • Oklahoma offers zero-interest loans to government fleets for the incremental cost of alternative fuel vehicles. <p>In Nevada, money raised from penalties for air pollution requirements is given to the county school district where the penalty occurred, and then used for alternative fuel school buses.</p> <p>For commercial fleets, Oregon provides \$20,000 vouchers for zero-emission trucks and Oklahoma provides 3 percent loan rates to convert private fleets. The federal government has a pilot program for zero-emissions airport vehicles and infrastructure.</p> |
| Green transit trends | <p>Public transit agencies are also leading efforts towards greater adoption of vehicles that run on alternative or less-polluting fuels. Rail and streetcars have long been run largely on electric power. With state support, transit agencies are now transitioning their bus fleets to run on electricity and clean fuels as well.</p> <ul style="list-style-type: none"> • New Jersey requires all transit vehicles to be equipped with emissions controls or run on alternative fuels. • Oklahoma offers zero percent loans up to \$10,000 for newly purchased alternative fuel vehicles and \$300,000 for fueling infrastructure. • Ohio transit agencies have been supported in the past by an Ohio Department of Transportation's Clean and Green initiative, which provided up to \$15 million in annual funding to Ohio's transit agencies to purchase environmentally-friendly, electric and clean fuel buses (in FY2010 and FY2011).¹⁸ |
| Non-financial incentives | <p>Under federal law, states can exempt low-emission and energy-efficient vehicles from High Occupancy Vehicle lane restrictions. Eleven states and the District of Columbia have done so.¹⁹ Seven states have also exempted alternative fuel vehicles from emissions inspection requirements.²⁰ Four states – Arizona, California, Florida, and Hawaii – provide parking incentives such as preferential spaces, reduced fees, and charging equipment.</p> |
| Source: Alternative Fuels Data Center http://www.afdc.energy.gov/fuels/laws/3270 . | |

¹⁵ California, Colorado, Connecticut, Nebraska, New Mexico, Oregon, Louisiana, Nevada, New Mexico, New York, Oklahoma, Oregon, Pennsylvania, Texas, Utah, Virginia, and Washington.

¹⁶ California, Colorado, Louisiana, Nevada, New Mexico, Oklahoma, Oregon, Pennsylvania, and Washington.

¹⁷ California, Illinois, New York, Oklahoma, Oregon.

¹⁸ [http://www.dot.state.oh.us/Divisions/Planning/Transit/Documents/Programs/Misc/SFY_2010_Clean and Green Program Overview and Application Instructions Final 3-31-10.doc](http://www.dot.state.oh.us/Divisions/Planning/Transit/Documents/Programs/Misc/SFY_2010_Clean_and_Green_Program_Overview_and_Application_Instructions_Final_3-31-10.doc).

¹⁹ States include Arizona, California, Florida, Georgia, Hawaii, Maryland, Nevada, North Carolina, Tennessee, Utah, and Virginia.

²⁰ Idaho, Michigan, Missouri, Nevada, North Carolina, Virginia, and Washington.

Development of electric vehicle infrastructure

One major barrier to wide-scale adoption of EVs is the limited availability of charging stations to charge vehicles at home, work, stores, and rest areas. To address this, Ford Motor Co. and SunPower, are partnering to enable EV owners to help meet home-charging needs with solar power. EV carmaker Tesla plans a nationwide network of solar electric “supercharger” stations for all of their vehicles. This will begin with charging stations in California and expand to high-traffic corridors across the country, eventually enabling Tesla electric car owners to drive anywhere powered by sunlight. To enable other EV owners to travel this freely, state and local governments are studying infrastructure needs, coordinating with public, private, and utility partners, disseminating information to consumers, and providing funding and financial incentives to encourage infrastructure investments.

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| Electric vehicle infrastructure councils and collaboratives | Responsibilities of the Maryland Electric Vehicle Infrastructure Council include developing a plan to integrate EVs into its transportation network; developing statewide standards for streamlined permitting for supply equipment; recommending a statewide charging infrastructure plan and incentives; developing policies to encourage EV fleet purchases; and, encouraging local and regional efforts to promote the use of PEVs. Similar work is being done by the Federal Department of Energy Clean Cities Program (100 cities), and several states including Alabama, Illinois, Hawaii, Kentucky, Maine, Nevada, Rhode Island, Tennessee, Vermont, Virginia, and Washington. In California, state agencies are required to participate in the Plug-in Vehicle Collaborative. Clean Fuels Ohio is leading the effort in to create an EV Readiness Plan for Ohio . They also have a workplace charging initiative, an EV supply equipment program, and host local government workshops focused on permitting, building and zoning codes. |
| Electric vehicle infrastructure requirements | California requires state agencies to install EV charging stations at state employee parking facilities. Arizona state and local governments with EV charging stations must allow other state and local governments to use them. Massachusetts Turnpike fuel providers must offer alternative fuels. Washington requires installation of electrical outlets in each of the state’s parking facilities, and allows both publicly and privately owned EVs to be charged at state-owned facilities. Washington also allows the Department of Transportation to contract with alternative fuel providers to use public land for alternative fuel corridor projects. The North Carolina Department of Transportation can install and operate publicly accessible charging stations. The Wisconsin Department of Administration is required to establish a sufficient alternative-fueling infrastructure at retail outlets. California and Hawaii laws enable homeowners in multi-family dwellings to install charging stations in designated parking spots. |
| Electric vehicle infrastructure rebates, grants, and low-cost loans | Seven states offer rebates, grants, or low-interest loans for installing electric-vehicle infrastructure (California, Illinois, Iowa, Tennessee, Texas, Utah, and Washington). Florida authorizes local governments to use infrastructure tax revenues for this purpose. Illinois offers rebates for 50 percent of the cost of installing EV equipment, up to \$3,750 for a networked station and \$3,000 for a non-networked charging station, with a total rebate possible of \$49,000. Iowa offers a combination of forgivable and traditional low-interest loans for related business projects. Texas provides grants for 50 percent of projects costs, up to \$500,000. Utah offers grants and loans to cover the cost of fueling equipment. Washington provides assistance for alternative-fueling stations along interstate corridors. |
| Electric vehicle infrastructure tax credits | Providers of electricity supplying equipment and infrastructure for alternative fuels are eligible for a federal tax credit of 30 percent of the cost (not to exceed \$30,000). Consumers may receive a tax credit of up to \$1,000. Eight states – Arizona, Georgia, Louisiana, Maryland, Oklahoma, Oregon, Washington, and West Virginia – offer additional tax credits to residents and businesses installing EV infrastructure. The tax credits range from \$75 in Arizona to 75 percent of the cost of the alternative-fueling infrastructure in Oklahoma, including 10 percent in Georgia, 20 percent in Maryland, between 25 percent and 35 percent in Oregon, and 50 percent in Louisiana and West Virginia. |
| Source: Alternative Fuels Data Center http://www.afdc.energy.gov/fuels/laws/3270 . | |

Electric utility actions and incentives

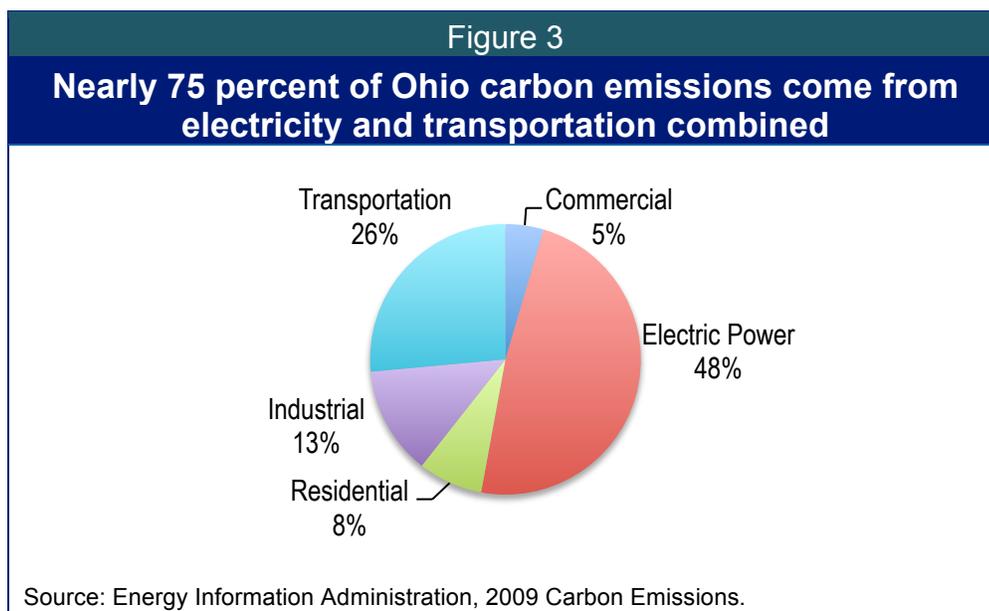
Electric utility companies are seemingly natural partners in the EV market, but many investor-owned electric utilities have taken a ‘wait-and-see’ approach rather than proactively supporting its development. Ohio’s investor-owned utilities are studying potential EV market penetration and expected grid impact. FirstEnergy and AEP are also working with EV stakeholder groups to support PEV readiness initiatives and setting up small demonstration projects, but nothing bold. This is the case in most states. As a result, seven states have directed their public utility commissions to study potential effects of EVs on the grid, evaluate policies to overcome barriers, and adopt rules and incentives to promote their widespread use (including California, Florida, Maine, Maryland, Delaware, Oregon, and Virginia). Interestingly, Duke Energy provides incentives in Indiana and the Carolinas, but not Ohio (up to \$1000 to help cover costs of charging stations and free maintenance). Table 5 shows that despite investor-owned utility reluctance, a number of municipal- and consumer-owned utilities have taken a lead on helping to build up the infrastructure for EVs.

| Table 5 | |
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| Unlike most investor-owned utility companies, municipal- and consumer-owned utilities are supporting adoption of EVs and making infrastructure investments | |
| ECotality | Several public power utilities in other states, including Nashville Electric Service, Seattle City Lights, and Salt River Project are partners in the “EV Project” driven by ECotality, an electric transportation and storage technology company. Through the EV Project, ECotality offers free home charging stations to individuals in the Chicago, Philadelphia, Washington D.C., Atlanta, Los Angeles, San Diego, Portland, Eugene, Salem, Corvallis, Nashville, Knoxville, Memphis, Chattanooga, Dallas, Fort Worth, Houston, Phoenix, Tucson, and Seattle metropolitan areas. They also cover most, if not all, costs of EVSE installation. Nashville Electric Service has deployed 450 public charging stations in Tennessee. |
| Austin Energy | As part of its “Plug-in EVerywhere Network” pilot, Austin Energy is building a “five-mile grid” so that customers never find themselves more than five miles from a public station, and formed a “plug-in vehicle readiness initiative” to put the puzzle pieces together. EV owners can participate in the network by purchasing a \$25 six-month swipe card for unlimited charging at any Plug-In EVerywhere station. They can pay \$2 per hour with a credit card. Service area customers may be eligible for a rebate of 50 percent of the cost to purchase and install a charging station, up to \$1,500. |
| Plug-in Carolina | Santee Cooper Public Electric Utility is one of several utilities sponsoring Plug-in Carolina, an independent advocacy organization. The utility also provides free power for three years at central charging stations. |
| Alabama Power | Offers businesses low off-peak rates for charging EV fleets. |
| Glendale Water & Power | Offers an electricity bill discount of \$0.33 per day to residential and commercial customers who own qualified PEVs. |
| Arizona Public Service Co. | Offers an electricity rate option that includes low off-peak rates to residential customers who own a qualified PEV. |
| The Los Angeles Dept. of Water and Power | Provides rebates of up to \$2,000 to residential customers, including those living in apartment buildings or condominiums with permission from their landlords and homeowner’s association, who purchase or lease a new EV and install electric vehicle charging infrastructure with a separate time-of-use meter at their home. The department also offers a \$0.025 per kilowatt discount for electricity used to charge PEVs during off-peak times (for the first 500 kw-h/month). |
| Sacramento | SMUD offers a reduced time-of-use rate option to residential customers who own a licensed passenger |

| | |
|--|---|
| Municipal Utility District | PEV. In addition, SMUD is installing 140 charging stations and working collaboratively with the California Energy Commission, the city of Sacramento, and other local governments to install stations, as well as General Motors and Chrysler to test electric fleet vehicles. |
| S. California Edison | Offers a discounted rate to customers for electricity used to charge PEVs during on- and off-peak hours. |
| Pacific Gas & Electric | Offers a discounted Experimental Residential Time-of-Use rate for electricity for plug-in EV charging and natural gas vehicle home-fueling appliances. |
| San Diego Gas & Electric | The Plug-In Electric Vehicle (PEV) and Natural Gas Infrastructure Charging Rate Reduction offers lower rates to customers for electricity used to charge PEVs. Time-of-Use rates are available for home and vehicle electricity use on a single meter, or bills for vehicle electricity used separately, requiring the installation of a second meter. |
| Georgia Power | Offers a Plug-In Electric Vehicle Charging Rate Incentive, with a time-of-use electricity rate for residential customers who own an electric or plug-in hybrid EV. |
| Hawaiian Electric Co. | Offers a Plug-In Electric Vehicle (PEV) Charging Rate Incentive with Electric Vehicle Pilot Rates for residential and commercial customers. |
| Indianapolis Power & Light | Offers special PEV charging rates, including year-round time-of-use based options, for residential and fleet customers. IPL will provide charging and associated metering equipment for the first 150 eligible customers to take advantage of the special rate, as well as the cost of installation. Indianapolis residents and visitors may also use public EVSE by paying a flat fee of \$2.50 per charging session. |
| N. Indiana Public Service Co. | IN-Charge Electric Vehicle Program offers a credit of up to \$1,650 to purchase and install residential EVSE, free PEV charging during off-peak hours, and a free meter specifically dedicated to the EVSE. |
| Louisville Gas & Electric | Offers a pilot low emission vehicle time-of-use rate for residential customers who own an EV or PEV (Kentucky). |
| Louisville Gas & Electric | Offers a pilot Low Emission Vehicle time-of-use electricity rate for residential customers who own an EV, a PEV, or natural gas vehicle fueled through a home fueling appliance (Kentucky). |
| Indiana Michigan Power | Provides rebates of up to \$2,500 to residential customers who purchase or lease a new PEV and install a Level 2 EVSE with a separate meter. Customers must also sign up for the utility's PEV time-of-use rate. Offers a special time-of-use rate option to residential customers who own a qualified PEV. |
| Consumers Energy | Offers two time-of-use rate structures for PEV owners. Qualified customers are eligible for a reimbursement of up to \$2,500 to cover purchase, installation, and wiring for Level 2 EVSE (Michigan). |
| DTE Power | Offers a reduced electricity rate to qualified residential customers for charging PEVs during off-peak hours. Also provides up to \$2,500 for the purchase and installation of a separately metered EVSE to those who enroll in the DTE PEV rate (Michigan). |
| Dakota Electric | Members enrolled in the ChargeWise pilot program receive a reduced rate for the electricity used to charge PEVs between specified off-peak hours (Minnesota electric coop). |
| Nevada Energy | Offers discounted electricity rates to residential customers who charge electric or plug-in hybrid electric vehicles during off-peak hours. The discounted rate applies during off-peak hours. |
| PECO | Provides rebates of \$50 to residential customers who purchase a new PEV (Pennsylvania). |
| Virginia Dominion Power | Offers two rates for residential customers who own qualified PEVs: the Electric Vehicle Pricing Plan, which offers lower rates during off-peak hours using a separate meter installed at no charge, and the Electric Vehicle + Home Pricing Plan, a whole-house pricing plan in which the customer's EVSE is treated as another appliance with a new meter installed at no charge; this records energy usage in 30-minute intervals, allowing Dominion to apply time-of-day pricing to encourage customers to charge their PEV during off-peak hours. |
| Source: U.S. Department of Energy, Alternative Fuels Data Center at www.afdc.energy.gov/fuels/laws/3270 . | |

Using homegrown power from clean energy sources to fuel our cars

Pure electric vehicles, those without petroleum reserves, have no tail pipes or tail pipe emissions. But they do plug into the electric grid, which is currently outdated and inefficient, and loses more energy during generation and transmission than actually reaches the end user. This inefficiency in the electric power sector is a source of unnecessary emissions, a waste of money and a drain on Ohio's economy. It also reduces the immediate net positive environmental impact from the transition to electric vehicles from conventional fuel vehicles. However, when the transition to electric vehicles is put in the context of long-term trends in the electric power sector to become more efficient and to generate energy from clean, local resources, the economic value from transition becomes clear. Positive trends in the electric power sector mean that homegrown power from clean energy sources will increasingly be used to fuel our cars, reducing our reliance on imported oil, keeping energy dollars local, and reducing emissions. Figure 3 shows that the electric power and transportation sectors, combined, currently account for three-quarters of Ohio's carbon emissions.



Inefficiencies in the electric power sector are due to our centralized system of generating electricity, which relies largely on coal and wastes an enormous amount of heat energy. Heat produced from burning coal could be put to better use by piping it into homes for heating, or to industry for use in the manufacturing process (to bend metals, for instance). However, coal power plants are primarily located in remote regions of the state, away from manufacturing and urban centers where the heat could be employed. Since heat does not travel this far, the energy is wasted. In addition to being a waste of scarce resources and money, this results in unnecessary emissions. For details, see the Policy Matters report, *Capturing Energy Waste*.²¹

Ohio's clean energy laws, coupled with an increased use of natural gas and sustainable community efforts, will lead to more local clean energy, energy savings, and fewer emissions.²²

Ohio's clean energy laws require electric utilities to generate 25 percent of their electricity from advanced energy sources by 2025, with 12.5 percent of electricity sales to come from renewable energy sources. At least half of the energy must be generated in the state. Investor-owned electric utilities are also required to enact programs to reduce energy consumption by 22 percent by 2025.

²¹ Woodrum, Amanda, available at www.policymattersohio.org/combined-heat-power-march2012.

²² *Annual Energy Outlook 2013* at [http://www.eia.gov/forecasts/aeo/er/pdf/0383er\(2013\).pdf](http://www.eia.gov/forecasts/aeo/er/pdf/0383er(2013).pdf).

In early 2012, the clean energy laws were amended to allow investments in combined heat and power (CHP) to qualify. The Policy Matters report, *Energy Standards at Work*, found that as long as utilities reach their annual benchmarks, Ohio will see increases in homegrown energy from clean resources, jobs created, less pollution, and money saved in the long run.²³ The report, *Capturing Energy Waste*, also details why promoting CHP technologies in Ohio's clean energy laws, will lead to more efficient generation, energy savings, and fewer emissions.²⁴

Low natural gas prices, in part due to shale gas production, will also affect Ohio's electricity mix and lower emissions. Natural gas burns cleaner than coal. Natural gas power plants are more efficient and produce less waste than coal plants, with energy input yielding more power output and fewer dollars needed to achieve the same ends. Existing natural gas power plants are 25 percent more efficient than coal plants. New natural-gas power plants, if built with current best available technology, are 56 percent more efficient.²⁵ As a result, natural gas produces half the emissions of coal-fired generation.²⁶ Therefore, the trend from coal to natural gas will also lead to significant emissions reductions from the electric sector. Natural gas is projected to outstrip coal as the primary fuel source in PJM's 13-state region by 2016 (including Ohio).²⁷ Nationally, natural gas is expected to represent 30 percent of the electricity mix by 2040. Coal-to-electricity already declined 6 percent from 2000 to 2010 in Ohio, while natural gas-fired generation increased nearly fivefold. According to testimony provided to the Ohio legislature in March 2013 by PJM Interconnection, a regional transmission organization serving Ohio and twelve nearby states, federal air pollution rules have prompted the retirement of several coal-fired power plants in Ohio, while development of shale gas has generated interest in gas-fired power plants. Table 6 shows that if 30 percent of Ohio power is generated from natural gas and 12.5 percent from renewable energy sources, emissions from the electric power sector would be 33 percent lower (with roughly 16 percent fewer overall emissions).

Table 6

Ohio's electric power sector would produce one-third fewer emissions if it used 30 percent natural gas and 12.5 percent renewable energy

| | Coal | Natural gas | Renewables | Electric power emissions |
|---|--------------------|--------------------|----------------------|---------------------------|
| 2010 electricity mix | 118,194 GW | 7,475 GW | 455 GW | 112.1 million metric tons |
| | 83 percent of BTUs | 4 percent of BTUs | > 1 percent of BTUs | 1.74 lbs/KwH |
| Hypothetical scenario | 48,274 | 59,464 | 17,930 | 75.2 million metric tons |
| | 48 percent of BTUs | 30 percent of BTUs | 12.5 percent of BTUs | 1.65 lbs/KwH |
| CO ₂ reductions due to change in electricity makeup | | | | 36.9 million metric tons |
| Percent CO ₂ emissions reductions from hypothetical scenario | | | | 33 percent |

Source: Energy Information Administration, EPA. These calculations make some assumptions: Ohio natural gas usage in electricity equates to levels predicted nationally for 2040 in EIA Energy Outlook; new natural gas-fired generation comes from plants using current best available technology (EIA); natural gas and renewable generation directly offsets coal-fired electricity generation.

²³ <http://www.policymattersohio.org/energy-standards-at-work-ohio-senate-bill-221-creates-a-cleaner-economy>.

²⁴ www.policymattersohio.org/combined-heat-power-march2012.

²⁵ http://www.npc.org/study_topic_papers/4-dtg-electricefficiency.pdf.

²⁶ <http://www.epa.gov/cleanenergy/energy-and-you/affect/natural-gas.html> (The average emissions rates in the U.S. from natural gas-fired generation are: 1135 lbs/MWh of carbon dioxide, 0.1 lbs/MWh of sulfur dioxide, and 1.7 lbs/MWh of nitrogen oxides. Compared to the average air emissions from coal-fired generation, natural gas produces half as much carbon dioxide, less than a third the nitrogen oxides, and one percent the sulfur oxides at the power plant).

²⁷ Testimony of Andrew Ott, PJM Interconnection's senior vice president for markets to the Senate Public Utilities Commission (March 2013) at: <http://bit.ly/162Wmua>.

Several Ohio communities procure electricity from renewable energy, enabling plug-in hybrid/electric vehicles to run on green power.

Cities across the nation continue efforts started under the American Recovery and Reinvestment Act to revitalize their communities and make them more sustainable.²⁸ A recent report from Ohio State University researcher Dr. Parwinder Grewal, director of the Center for Urban Environment and Economic Development, concluded that Ohio cities have the potential to generate 100 percent of their energy needs from clean local energy resources, and in the process retain millions of energy dollars in local economies, while simultaneously creating new jobs and improving the environment.²⁹ The study further determines that enhanced energy self reliance in Cleveland alone could result in up to \$1.76 billion being retained in the city, thereby improving its economic resiliency.³⁰ The report notes that while the city does not have significant coal, natural gas, or petroleum resources, it does have wind, solar, and biofuel potential, and could therefore be more energy self-reliant. Many other communities in Ohio are similarly situated.

Seven Ohio communities are members of ICLEI Local Governments for Sustainability,³¹ 15 are members of Ohio Green Fleets,³² nine are members of the Northeast Ohio Sustainable Communities Consortium Initiative,³³ and at least another four have made independent public commitments to clean energy.³⁴ As part of that commitment, a number of Ohio communities are proactively embracing green power and investing to increase electric vehicle adoption. Ohio cities are using their municipal power authority or municipal aggregation power as an economic development tool to promote a sustainable community agenda.

Cincinnati: Municipal aggregation presents an exciting opportunity

In 2012, Cincinnati became a national leader in the sustainable community movement when it used the purchasing power of its 53,000 residents to negotiate a two-year contract for 100 percent green power, the first all-green deal in a major city in the U.S. (with service by Ohio-based company FirstEnergy).³⁵ This was possible, because Ohio passed a community choice law in 1999 that allowed communities to aggregate resident purchasing power. The goal was to enable cities to negotiate lower electric prices on behalf of residents via aggregated buying power.³⁶ To date, 245 Ohio communities have applied to the Public Utilities Commission of Ohio for the right to aggregate resident purchasing power for electricity.³⁷ These bulk purchasing groups are made up of residents within cities, counties, and in some cases whole regions, as is the case for the Northeast Ohio Public Energy Council (NOPEC), which negotiates on behalf of residents in ten counties. This purchasing power can also be used to negotiate low rates for renewable energy.

²⁸ <http://www.policymattersohio.org/category/research-policy/energy/sub-topics-energy/sustainable-communities/>.

²⁹ Parwinder and Parbir Grewal, *Can Cities Become Self-Reliant in Energy? A Technological Scenario for Cleveland, Ohio* (June 2012), at <http://bit.ly/ZC4tKc>.

³⁰ <http://www.sciencedirect.com/science/article/pii/S0264275112000947>.

³¹ Akron, Alliance, Athens, Cincinnati, Cleveland, Oberlin, and Youngstown, see <http://bit.ly/roNQz>.

³² Cincinnati, Dayton, Green, Avon Lake, Centerville, Cleveland Heights, Columbus, Cuyahoga Falls, Dublin, Gahanna, Grove City, Hamilton, Logan, Solon, Westerville; see <http://www.cleanfuelsohio.org/current-members/>.

³³ Akron, Cleveland, Elyria, Youngstown, Cuyahoga County, Mahoning County, Stark County, Summit County, Trumbull County, see <http://vibrantneo.org/neoscc/member-organizations/>.

³⁴ Hocking County, Village of Greenfield, Village of Bratenahl, and City of Lorain.

³⁵ <http://www.midwestenergynews.com/2012/12/17/municipal-aggregation-a-new-direction-or-the-same-old-thing/>.

³⁶ <http://1.usa.gov/tnwi4f>.

³⁷ <http://bit.ly/ZY3C6f>. For a map of Ohio aggregated communities, see <http://bit.ly/121lnjK>.

Community-wide green development in Oberlin, Ohio

Oberlin, in collaboration with Oberlin College (and a variety of engaged citizens and community stakeholders) is undertaking a community-wide green development effort to create a “living city” – a resilient and resourceful economy that takes advantage of nature’s infrastructure in cooperation with the ecosystem, rather than in opposition to it. The municipal utility is on track to procure more than 90 percent of its energy from renewable energy sources by 2015, reducing city emissions by half. Plus, all of the energy comes from within Ohio, most of it near Oberlin. This means that the vast majority of energy dollars Oberlin residents spend on electricity will stay in the region and Ohio.

Sustainable Cleveland 2019 and [Cleveland Public Power](#)

In 2008, Cleveland adopted an advanced and renewable energy portfolio standard that ensures 15 percent of Cleveland Public Power’s energy comes from advanced or renewable sources by 2015, 20 percent by 2020, and 25 percent by 2025.³⁸ Using this transition as an opportunity to help revitalize the city, CPP committed to purchase five MW of offshore wind from a project near Cleveland in Lake Erie; this was in collaboration with local partners including Greenfield Solar and American Municipal Power in the Cleveland’s Rockefeller Greenhouse demonstration project to produce solar electricity and thermal energy for residential, commercial and industrial use. CCP is currently purchasing electricity created from organic waste at the Collinwood Bioenergy facility.

Cuyahoga Falls Electric System Community Energy Strategic Plan³⁹

As a member of the U.S. Department of Community Energy Strategic Planning Academy, Cuyahoga Falls began developing a long-term strategy to become more efficient and improve the city’s economic and environmental sustainability.⁴⁰ Through its municipal utility, the city has partnered with American Municipal Power on several large joint venture projects for renewable power, including wind, landfill gas, and hydroelectric. Cuyahoga Falls Electric System gives residents and commercial customers the option to participate in a green pricing program that enables further investments in related energy projects.

Encouraging residents to fuel up with green power

The transition to electric vehicles promotes energy self reliance by enabling our cars and trucks to power up with locally procured energy from clean sources instead of imported oil. If you plug in your electric car in Cincinnati, for instance, you will be fueling up with green power. To encourage residents to do so, Cincinnati also promotes electric vehicle adoption. Aside from purchasing its own hybrid vehicles, the city offers free parking for all-electric vehicles at city-owned garages, parking lots, and parking meters within city limits.⁴¹ Oberlin’s electric portfolio means that anyone who plugs in a hybrid/electric vehicle will be powering up with “locally grown” clean energy. To encourage electric vehicles in the city, Oberlin plans to put an electric vehicle charging station in an easily accessible downtown location sometime in 2013. Oberlin and several regional partners recently received a grant from the state of Ohio’s Local Government Innovation Fund to investigate options for shared alternative fuel vehicle infrastructure that could be used by city, public school, college, and corporate fleets. Cleveland has a sustainable purchasing policy that targets hybrid, alternative fuel, and electric vehicles. The city has already purchased 77 hybrid vehicles and 142 alternative fuel vehicles for its own fleet. To help promote electric vehicle adoption for residents, CPP will install three public EV stations.⁴²

³⁸ <http://bit.ly/12sj87N>.

³⁹ 2012 Sustainability Survey provided by Cuyahoga Falls Electric System.

⁴⁰ http://www.nrel.gov/tech_deployment/state_local_activities/webinar_20110512.html.

⁴¹ <http://bit.ly/ZpQgws>.

⁴² <http://bit.ly/106tYQz>.

How can Ohio cities GET Smart?

By greening the electricity sector and promoting adoption of electric vehicles and buses, cities can do their part to reduce global warming while promoting homegrown, efficiently produced power from clean energy resources:

Make your community EV ready. For ideas on how to make electric vehicle adoption easy and to encourage residents to do so through streamlined permitting, preferential parking, and financial incentives, see the Electric Vehicle Readiness Plan for Ohio at www.driveelectricohio.org/.

Adopt a complete street policy and incorporate electric vehicle infrastructure investments. The complete street concept is an effort to complete our streets so they serve all modes of transportation. Typically, complete street policy requires transportation planners to accommodate pedestrians, transit riders, and cyclists, along with cars. Cleveland recently adopted a complete and green street policy that requires 25 percent of all transportation dollars to be spent on alternative modes of transportation. Cities should consider electric vehicle infrastructure investments as part of this policy to serve electric vehicle users while on the road.

Participate in Clean Fuel Ohio's [Drive Electric Ohio](#) initiative. A major barrier to both electric vehicles and public transit is a lack of intercity travel options and infrastructure. In addition to reliable transportation to meet daily needs, residents need to know that they will be able to make trips to other communities safely, reliably, and conveniently. Currently, concerns about where to plug in electric vehicles for longer distances, and a lack of inter-city transit make alternative transportation choices seem less viable for travel between cities. Among other things, Drive Electric Ohio is tasked with identifying these barriers and finding solutions such as identifying the EV infrastructure needed for widespread adoption of electric vehicles, and then helping find public or private funding to put it in place. The Mayors of Cleveland, Columbus, Cincinnati, Toledo, and other urban core communities should help lead these efforts. One tool the initiative should embrace is a new statewide network of Ohio's Metropolitan Planning Organizations. Metropolitan planning authorities such as Akron Metropolitan Area Transportation Study (AMATS), Northeast Ohio Area Coordinating Agency (NOACA), and Mid-Ohio Regional Planning Commission (MORPC) are already playing an important role in sustainable community efforts. The Ohio Department of Transportation is now tasking them, together, to come up with a more coherent statewide transportation plan; this planning process might include a vision for a complete network of alternative transportation choices, and enable intercity travel by alternative transportation modes including rail, bus, and electric vehicles.

Take advantage of the potential for greater energy self-reliance via cleaner energy resources. Cities can use their municipal aggregation and utility powers to procure homegrown energy from renewable energy resources and invest in electric vehicle infrastructure. As mentioned, 245 communities applied for the power to aggregate residents; many more could do so as well. All could require some portion, or all power, to come from clean energy resources, which the state of Ohio Clean Energy Laws require. Cities can also investigate the potential to use this power to create an electric vehicle infrastructure program, as some have already done. Ohio has 81 municipal utilities and 25 rural electric cooperatives. In this way, cities could direct their municipal utilities to procure renewable energy resources and invest in alternative fuel infrastructure.

How can the state of Ohio support community efforts to GET Smart?

Create a designated transportation choice fund within Ohio's multi-billion dollar transportation budget and use it to expand transportation choices. Ramp up "transportation choices" funding to 10 percent of the state's transportation budget by 2030. Funding for Transportation choices should include, among other things: surface transportation program dollars for capital and infrastructure investments in transit, rail, biking, walking, electric vehicle infrastructure, and public, private and transit fleet conversions to employ homegrown power; and Congestion Mitigation/Air Quality program dollars for capital spending on transit operations. By investing to increase transportation choices, we can reduce Ohio's economic vulnerability to oil, while promoting jobs, improving public health, and providing affordable transportation options.

Expand Ohio's Advanced Energy Fund and use it to provide grants, rebates, vouchers, and low-interest loans to consumers, businesses, state agencies, and local governments for electric cars and trucks, as many other states have done. The Advanced Energy Fund was originally created as a surcharge on investor-owned electric utility bills. This surcharge has since been allowed to expire, while current funds come from various and unstable resources. The surcharge should be reinstated and expanded. See our report, [Investing to Re-Energize Ohio](#), for a history of the fund, how it has been used, its economic impact, and the value of expanding it.⁴³

Require the Ohio Public Utilities Commission to study barriers to electric vehicle adoption and design incentives to promote increased use. This has been done in California, Florida, Maine, Maryland, Delaware, Oregon, and Virginia.

Protect and Expand Ohio's clean energy laws. These laws are critical to maintaining state investments in the transition toward energy self-reliance and efficiency.

How can we secure Ohio's place in the advanced vehicle supply chain?

Drive demand locally for electric vehicles through supportive policies and incentives;

Identify existing Ohio manufacturers that could benefit from adoption of electric vehicles by participating in the advanced vehicle technology supply chain. In 2008, the Ohio Department of Development mapped Ohio companies that manufacture component parts similar to those in wind turbines, and asked them what they would need to enter this new market. The same should be done with the electric vehicle technology supply chain;

Help Ohio manufacturers retool and invest in production of electric vehicles and component parts. In February 2013, the Obama Administration announced \$150 million in competitively awarded, advanced energy manufacturing tax credits for production of batteries and electric vehicles, among other technologies; these aim to increase domestic manufacturing of clean energy technologies.⁴⁴ The program is based on legislation authored by U.S. Senator Sherrod Brown, with a previous allotment supporting seven Ohio companies. Ohio should work to ensure that some of the new allotment of funds also come to Ohio for electric vehicle supply chain development;

Improve procurement practices to support Ohio manufacturers of clean vehicle technologies, reduce emissions, and promote use of vehicles running on homegrown power from clean energy resources. Approaches include setting a minimum percent for Ohio content, preference for projects

⁴³ www.policymattersohio.org/investing-to-re-energize-ohio.

⁴⁴ <http://politicalnews.me/?id=21132&keys=CLEAN-ENERGY-MANUFACTURERS-INITIATIVE>.

exceeding requirements, and providing support for manufacturers through Ohio manufacturing extension partnerships to increase local content and companies participating in the supply chain;

Invest in research and development to invent and produce the next generation of advanced vehicle technologies.

Conclusion

Ohioans spend a great deal on energy, most of which comes from outside the state or country, and much of it is wasted. Positive policy changes and market trends in transportation and the electric power sector mean more efficient, local, cleaner energy in the future. Cities can build on these positive trends toward energy independence with Green Electricity and Transportation Smart policy solutions. This involves the use of municipal aggregation and utility powers to procure homegrown energy from renewable energy resources; investments in electric vehicle infrastructure; adoption of complete and green street policies; and participation in Drive Electric Ohio to help identify and address major barriers to intercity travel in electric vehicles or via public transit. The state of Ohio can support community efforts to GET Smart as well as the development of the state's electric vehicle supply chain by protecting and expanding Ohio's clean energy laws; creating a Transportation Choice fund within Ohio's multi-billion dollar transportation budget, and; expanding Ohio's Advanced Energy Fund to provide grants, incentives, and low-interest loans for renewable energy and electric vehicle adoption.

Author

Amanda Woodrum focuses primarily on energy issues. She has written reports examining the economic impact of Ohio's advanced energy fund and clean energy standards, outlined strategies to make our transportation and manufacturing sectors more energy efficient and Ohio's communities more sustainable, all while creating good jobs and building green pathways out of poverty in the process. Amanda also convenes the statewide network Ohioans for Transportation Choice. Before joining our staff, she clerked for the Cleveland law department and the Summit County Council, where she received a commendation for commitment to public service. Amanda has a master's in economics, a law degree from the University of Akron, and a bachelor's degree from Bowling Green State University.

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