

2017 Annual Development Plan



The West Virginia Office of Energy (WVOE) is required by 5B-2F-2(f) of the *West Virginia Code* to submit an annual report to the Governor and the Joint Committee on Government and Finance. It requires that the report “shall relate to the division’s implementation of the energy policy and the activities of the division during the previous year” on or before the first day of December of each year. This submission addresses activities for the period Dec. 1, 2016-Nov. 30, 2017.

The activities for the reporting period are addressed by energy resource as described in “West Virginia Energy Plan 2013-2017”: fossil fuels, renewable energy and energy efficiency. This report will address each energy resource and the activities of WVOE in supporting them.

Fossil fuels

Since 2007, WVOE has coordinated and sponsored annual Governor’s Energy Summits. The summits are co-sponsored by the West Virginia Governor’s Office and gather energy experts on a wide range of topics. In 2017, the 11th annual event, “Advancing Energy Development,” featured “Potential Benefits of Expanded Petrochemical and Plastics Manufacturing in Appalachia,” panel discussions including “Advancing Energy Development: Energy Efficiency, Renewable Energy and Fossil Energy”; “West Virginia Forward”; “Energy and Economic Development in Small Businesses,” and “Storage Hub Acceleration/Development.” Also featured: “Industrial Energy Rates,” “Status of Electricity Production,” “Status of Coal in West Virginia,” “Status of Natural Gas in West Virginia,” “The Importance of Energy Education,” “Entrepreneurship and Empowerment in Energy,” “Assisting WV Companies with Combined Heat and Power,” “Emerging Technologies in the Electric Grid,” “Regional Economic Implications and Opportunities from New Petrochemical Projects in Our Region,” and “West Virginia Jobs Project: Creating Jobs in Industrial Energy Efficiency.” Open for the first time to the public, the 2017 summit was also sponsored by Antero Midstream Partners LP; Antero Resources; the U.S. Department of Energy’s National Energy Technology Laboratory; Dominion; Orion Strategies; Thrasher Architecture, Engineering, Field Services; Elite Coal Services; Trimodal Terminal, West Virginia Propane Gas Association, Pickering Associates and WVU’s Energy Institute.

As the energy emergency liaison between the state of West Virginia and the U.S. Department of Energy, the WVOE works in collaboration with the WV Public Service Commission, WV Division of Homeland Security and Emergency Management (WVDHSEM) and WV Voluntary Organizations Active in Disaster (VOAD) to maintain current energy emergency response capability by continuing to develop and refine the operational aspects of the State Emergency Plan as conditions warrant. Throughout the 2017 year, staff participated in several exercises including:

- a long-term power outage project with FEMA Region III;

- a Homeland Security Information Network webinar hosted by NASEO and DHS;
- and a series of National Association of Energy Officials/Energy Emergency Assurance Coordinator/U.S. Department of Energy/State hurricane updates, monitoring impacts on fuel and energy infrastructure from the summer hurricanes.

Renewable energy

WVOE has continued collaboration with the WVU Appalachian Hardwoods Center on promoting use of West Virginia hardwoods as an energy resource. Wood pellets, co-firing of wood and coal, combined heat and power systems for kiln applications, bio oil from wood and residue-fired power plants have been promoted at wood-focused conferences. Energy from wood remains relevant, especially in residential and small commercial applications. WVOE has supported an annual survey of primary and secondary wood producers from West Virginia and adjacent counties in neighboring states to maintain a listing of wood residues available for resale. WVU AHC makes this information available to the industry. West Virginia's three wood pellet manufacturers add to the diversity of the state's energy production and produce pellets for regional markets. Wood pellet use has been on the agenda of the Governor's Energy Summit and was a focus of a Morgantown conference. Wood pellet use in the European Union has continued to support a regional market.

The New Creek Wind Project, a 103-megawatt wind farm in Grant County, began commercial service in December 2016. It generates enough electricity to meet the needs of 23,000 homes. Enbridge acquired a 100 percent interest in the project from EverPower Wind Holdings, LLC, in November 2015. The completion of this project has resulted in six operating wind projects in West Virginia totaling 686 MW of operating capacity. The state ranks 23rd in installed capacity in the U.S. and has the potential for nearly 1,900MW more on private lands. About 36 percent of West Virginia's potential capacity on private land has been developed.

West Virginia now has two utility-scale solar projects totaling 35 MW in PJM's interconnection queue, which will subject the projects to several studies from the grid operator as well as from associated electric utilities. Residential solar in the state now totals 4.4 MW.

Energy efficiency

The 2017 Energy Efficiency Conference was held June 13. This year's focus was economic development through energy efficiency. The meeting was well received, with nearly 60 attendees, and received local news coverage.

WVOE continues to partner with the Home Builders Association of West Virginia Foundation (HBAWVF) to ensure that builders are knowledgeable of the 2009 International Energy Conservation Code as an integrated part of the standard building permit. HBAWVF provided nine workshops to 69 participants over this reporting period. Training sessions included information on HERS (Home Energy Rating System), code compliance at the manufacturing level, building Energy Star homes, the insulation

envelope of existing housing stock, thermodynamics, energy principles, common building types as well as existing codes relative to duct testing, combustion safety and heating, ventilation and air conditioning. In September, HBAWVF provided intermediate training for realtors, designed to give them a basic understanding of energy efficiency concepts as it relates to buildings and homes.

WVOE continues a collaboration with the WV Manufacturing Extension Partnership (WVMEP) to perform carbon footprint (ISO 13000) evaluations, providing efficiency and operational improvement recommendations to manufacturers. Hands-on technical assistance was provided to manufacturers, retailers, and other commercial entities throughout the state, conducting energy audits and carbon footprint studies. Estimated potential savings through these projects are more than 600,000 kWh and \$212,000, encompassing over 650,000 ft² of building area. Individual projects are outlined in the table below.

Company	Location	Potential Savings (KWh)	Space audited (ft ²)	Potential lean process Savings (\$)
Polymer Alliance Serv	Washington	371,981	100,000	\$140,000
Washington Homeopathic	Berkeley Springs	27,481	12,500	\$10,000
Berkeley Springs Water	Berkeley Springs	35,901	20,200	\$5,000
NGK Sparkplugs	Sissonville	100,000	145,000	\$5,000
Alternative 2 Wood	Aurora	10,000	11,000	\$5,000
Precision Tool	Westover	5,050	13,000	\$2,000
Progressive Industries	Westover	58,000	52,000	\$10,000
Mine Power Systems	Beaver	Report pending	44,000	\$10,000
Mountain Lumber	Multiple locals	Report pending	62,000	\$15,000
Team Sledd Convenience	Wheeling	Report pending	200,000	\$10,000
Total		608,413	659,700	\$212,000

The WVOE collaborative effort with WVMEP to cost-share a WVMEP representative at Southern W.Va. Community and Technical College (SWVCTC) will be completed at the end of 2017. This activity identifies and provides technical assistance and training to manufacturers in Logan, Mingo, Boone, Lincoln, McDowell, and Wyoming counties. To date the effort has assisted 58 companies, created 43 jobs and retained 390 jobs within the counties serviced.

Through the Industrial Assessment Center and the WVU College of Industrial and Management Systems Engineering, WVOE supports energy assessments for West Virginia businesses meeting certain energy use criteria, including annual energy costs greater than \$100,000 but less than \$2 million. This year, through the Industries of the Future program, over two dozen assessments were conducted for commercial and industrial facilities throughout West Virginia. These projects provided learning opportunities for 24 graduate engineering students. Total floor area audited was over 3.8 million ft² and recommended annual energy savings total 3.5 million kWh, and \$518,000 in annual costs.

WVOE completed the first year of activity on its US Department of Energy (USDOE) 2016 State Energy Program Competitive Grant Award, to assist in increasing industrial stakeholder participation in statewide energy efficiency technical assistance. This is the award received by the WVOE from this highly competitive funding stream. An Oct. 19 workshop was held by WVU's Manufacturing Extension Partnership and Industrial Assessment Center at Touchstone Research Labs in Wheeling and the first newsletter was released in November 2017. WVOE is currently preparing a \$300,000 Energy Performance Benchmarking of State Buildings proposal to be submitted to USDOE in January 2018.

Through a partnership with the College of Mechanical and Aerospace Engineering (MAE) at West Virginia University (WVU), the Projects with Industry program uses senior-level engineering students to provide no-cost energy services and technical assistance to West Virginia businesses. Participating students receive credit in two three-credit-hour classes offered in senior design by MAE. Projects focus on process and technological improvements. During the 2017 SEP program year, 24 students participated in projects involving energy audits, a public transit project and a robotic device design project with manufacturers, commercial establishments, school districts and municipalities. Estimated potential savings through these projects is more than 2,200,000 kWh and \$420,000, encompassing more than 700,000 ft² of building space. In 2017 project year, six students worked with the owner of Doc's Tea Company in Inwood, WV, where they designed an energy efficient heat exchanger for sterilization of organic tea, speeding up the bottling process by four hours. An additional six students participated in a smokestack wind turbine feasibility study for First Energy's Pleasants Power Station. Other projects included the Zigenfelder Company, Simex Corporation and energy audits for Trinity High School and the Monongalia County Health Department.

WVOE continued to address energy education and conservation efforts in the K-12 schools program by assisting the W.Va. School Building Authority focus on energy efficiency and use reduction in public school facilities, including continued efforts to authorize qualified energy conservation bonds for use in energy efficiency upgrades and addressing issues in energy performance contracting. In addition, on September 12-13, 2017, WVOE and WVASHRAE, the state's commercial energy code chapter, co-hosted two WV High Performance, Zero Energy Schools Workshops at Bridge Valley CTC and Fairmont State University. Over 100 attendees participated from K12, higher education school facilities personnel and energy services companies, including WVSBA Executive Director Frank Blackwell. Requests have already been made to expand this training next year.

WVOE partnered with the Center for Business and Economic Research (CBER) at Marshall University to develop and disseminate a newsletter, the Energy Efficiency and Renewable Energy (EE & RE) Tracker. This publication educated West Virginians on energy efficiency and renewable energy, announced workshops and conferences, provided consumer information on energy-related building products and services and helped establish a core competency in energy efficiency throughout West Virginia. Two editions of the EE/RE Tracker were developed and distributed to more than 1,300 recipients each issue. They can be found at <http://www.energywv.org/report-archive?folderId=28>.

Transportation

A U.S. Department of Agriculture Biofuel Infrastructure Partnership Grant to West Virginia in the amount of \$2.5 million will expand the use of ethanol blends E85 and E15 through the installation of 107 dispensers at 22 fueling stations throughout the state. Construction on this project began November 2016 and was officially completed by June 30, 2017. Monitoring of this grant will continue through February 2022.

The W.Va. Clean State Program (WVCS) completed a video with the West Virginia University EcoCAR3 Team, which is creating a hybrid-electric Chevrolet Camaro that reduces environmental impact, while maintaining the performance expected from this iconic American car. Watch the video at <http://www.energywv.org/alternative-fuels-and-vehicles/clean-state-program>.

In January, WVCS participated in the ribbon cutting for electric vehicle charging infrastructure at Twin Falls State Park. The program's co-coordinator performed site visits ranging from January-August 2017 at Twin Falls, Blackwater Falls, Cacapon, Tygart Lake, Stonewall Jackson, Hawk's Nest, Canaan Valley, and Chief Logan for the electric vehicle chargers State Energy Program grant to W.Va. Division of Natural Resources. The only remaining park awaiting installation is North Bend, which is being combined with another electrical installation and should be completed by December 31, 2017. West Virginia will become the first state park system in the country to have chargers at all lodges.

Also in January the program also provided 150 attendees at the WV International Auto Show with information on electric/hybrid vehicles, a focus on ethanol with the Biofuel Infrastructure Partnership project at Sheetz stores, Clean Cities Now, and the WV Division of Natural Resources state parks electric vehicle charging project.

In March, WVCS presented information on the Volkswagen settlement to members of the W.Va. Electric Auto Association. Also in March, the program presented "Alternative Fuel Vehicles in WV" to 41 attendees during "Building Alternative Fuel Vehicle Infrastructure" as part of the 2017 W.Va. Construction and Design Exposition. WVCS staffed an exhibit booth both days of the expo and provided literature on electric vehicles, ethanol and an upcoming alternative fuel and vehicle event.

WVCS collected alternative fuel and vehicle use data points from stakeholders for inclusion in the program's annual report, submitted to the U.S. Department of Energy's Clean Cities program in March. Stakeholders reduced 377,416 gasoline gallon equivalents using electric and hybrid vehicles, propane, biodiesel and compressed natural gas. That figure includes heavy-duty CNG vehicles in the state fleet as well as the use of E85, a blend of 15 percent petroleum and 85 percent ethanol. The state's county school buses reduced 271,389 gasoline gallon equivalents using a blend of 5 percent biodiesel and 95 percent petroleum diesel. The fleet also contained three propane-fueled school buses.

In May, WVCS led “ABCs of AFVs” Odyssey Day workshop with 22 in attendance on the State Capitol Complex. About 60 people visited the alternative fuel vehicle display, which included two Chevy Volts, three Priuses, and a propane truck from Bluebird of Pittsburgh plus the cutaway Prius from WVU’s National Alternative Fuels Training Consortium.

In June, the program issued its summer edition of the W.Va. Clean State Program newsletter.

The U.S. Department of Energy’s Clean Cities program maintains an alternative fuel station locator at <https://www.afdc.energy.gov/locator/stations/>. As part of the Biofuel Infrastructure Partnership project, WVCS added 107 dispensers at 22 Sheetz locations to the locator. WVCS also added new electric vehicle charging stations at West Virginia state parks as projects were completed. As of Nov. 15, West Virginia has 118 public, private and planned alternative fuel stations. The state has two biodiesel stations, four compressed natural gas stations, 33 E85 stations, 68 electric vehicle charging stations and 11 propane stations.

In August, WVCS attended Midwest Green Fleets Expo on alternative fuels. Also in August, WVCS participated in 2017 National Clean Cities Coordinator Training at the National Renewable Energy Laboratory (NREL) in Golden, Colorado.

In September, WVCS attended the W.Va. Electric Auto Association’s National Drive Electric Week event in South Charleston with eight vehicles displayed and approximately 75 attendees.

WVCS participated in an electric vehicle display at the Huntington Mall with WVU’s National Alternative Fuels Training Consortium with a plug-in Prius and a Chevy Volt on display. About 150 people participated.

WVCS continued a tracking project on the number and type of alternative fuel vehicles registered with the W.Va. Department of Motor Vehicles. During the calendar year 2017 through Sept. 30 there were 1,571 hybrid vehicles, 40 electric vehicles, 57 plug-in hybrid electric vehicles, 21,022 flex fuel vehicles capable of using ethanol-blended fuels, 12 compressed natural gas vehicles and three propane-fueled vehicles registered.

2017 NEW ALTERNATIVE FUEL VEHICLES REGISTERED IN WEST VIRGINIA							
MONTH	HYBRID	ELECTRIC	PHEV	FLEX FUEL	CNG	ETHANOL ONLY	LPG
Sep-17	252	4	8	2349	1	1	0
Aug-17	195	4	12	2761	1	2	3
Jul-17	150	6	4	2227	1	0	0
Jun-17	199	3	5	2716	3	0	0
May-17	246	6	6	3078	0	2	0
Apr-17	145	5	4	2193	0	1	0
Mar-17	148	2	5	2302	5	5	0
Feb-17	113	8	4	1611	1	2	0
Jan-17	123	2	9	1770	0	2	0
TOTAL	1571	40	57	21007	12	15	3

WVCS was selected by the automotive television series, Motorweek, to film a segment featuring the WV State Parks EV Charging Program. Shooting took place by the MotorWeek crew on November 14-15 at Cacapon, Canaan Valley and Blackwater Falls state parks, with participation from WVCS, MountainView Solar and the West Virginia Electric Auto Association. The completed video will be found on MotorWeek's website, social media and will air on the channel Velocity, which is a subsidiary of the Discovery Channel dedicated to automotive related programming, beginning in late 2017 or early 2018.