



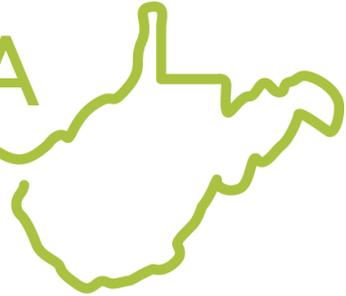
2021/2022

WEST VIRGINIA

OFFICE OF

ENERGY

ANNUAL REPORT & ACTION PLAN



OFFICE OF ENERGY

ENERGY ICONS



COAL

More than three-fourths of West Virginia's mined coal is shipped out of state, mostly to about two dozen other states, but also to other countries.



NATURAL GAS

West Virginia is the seventh-largest natural gas-producing state in the nation, largely because of shale gas production.



OIL

Recent drilling in the Marcellus Shale in West Virginia has discovered liquid hydrocarbons, including crude oil and natural gas liquids.



WIND

There are almost 700 megawatts of installed wind capacity in West Virginia, and, recently, wind energy contributed slightly more than hydropower to the state's net electricity generation.



HYDRO

West Virginia's largest hydroelectric facility, with more than 100 megawatts of capacity, was built in the 1930s, and the newest, with a capacity of 80 megawatts, began operating in 2001.



SOLAR

There are 14.6 megawatts of net-metered solar in West Virginia with 1,193 net metered solar arrays.



BIOMASS

West Virginia is the third most heavily forested state in the nation covering more than 12 million acres of forest land.



GEOTHERMAL

West Virginia University is pursuing local geothermal options to provide heating and cooling to the campus. There is currently a two phase research project involving the drilling and sampling of a deep exploratory and scientific well to track data.



ENERGY EFFICIENCY

In West Virginia, 430,949 customers are served by ENERGY STAR utility partners and 713 homes have earned the ENERGY STAR. More than 105 million square feet (1,790 buildings) have been benchmarked using EPA's ENERGY STAR Portfolio Manager, and 96 buildings have earned the ENERGY STAR for superior efficiency, including 41 schools, two hospitals, six office buildings, and one industrial plant.



ALTERNATIVE FUELS AND VEHICLES

West Virginia has 91 electric vehicle charging stations with 275 ports, 35 ethanol stations with 25 of those offering ethanol blends of E15 and E85, five propane fueling stations, and one compressed natural gas station.

2021 MAJOR SUCCESSES

- House Bill 2667
- Energy Efficiency Impact Grants
- Energy Education
- Community Outreach
- Transportation
- Geothermal
- Mid-Atlantic Electrification Partnership
- Public Energy Authority

2022 ACTION PLAN

- West Virginia Energy Codes
- West Virginia Benchmarking Initiative
- WVASHRAE Partnership
- Commercial Energy Auditor Training – BridgeValley
- Homebuilders Association of WV Foundation
- Energy Efficient West Virginia
- West Virginia Sustainable Energy Education Program (SEED)
- Energy Outreach and Communications
- High Performance Buildings
- Preparing the Next Generation for Energy Efficiency
- Industries of the Future
- Energy Efficiency Assistance to Communities
- WVOE Program Support
- Energy Efficiency/Renewable Energy Conference
- Energy Emergency Planning
- More Renewables in West Virginia's Energy Portfolio
- Alternative Fuels in Transportation





THE WEST VIRGINIA OFFICE OF ENERGY

is responsible for the formulation and implementation of fossil, renewable and energy efficiency initiatives designed to advance energy resource development opportunities and provide energy services to businesses, communities, and homeowners in West Virginia.

The primary funding source for the office is the U.S. Department of Energy's State Energy Program. The WV Office of Energy is the only state entity legally eligible to implement State Energy Program projects; therefore; its duties are prohibited from privatization.

Priority areas for the office include buildings and industry; policy, planning and energy security; energy education; transportation; electric power and renewable energy and energy resiliency and emergency response. Our role is to support and promote a variety of energy-related projects; provide education, training and technical assistance; host workshops and conferences, and collaborate with local governments, organizations, and agencies.

2021 PARTNERSHIPS



HOUSE BILL 2667



Goal: Reduce energy consumption by 25% in WV Public Buildings by 2030 Prime deliverable: strategic plan for long-term sustainability of energy savings program.

In March 2021, the state legislature passed House Bill 2667 directing the establishment of a benchmarking and disclosure program for state buildings. The bill also creates an energy use reduction goal of 25% by 2030, relative to 2018 levels. To meet this objective, it directs development of a state building energy savings program, including an Energy Savings Performance Contract (ESPC) program to costeffectively achieve guaranteed energy savings.

As of the end of the 2021 calendar year, the WVOE has completed the benchmark of 577 buildings across 3 state agencies, 2 higher education institutions, and 36 county school systems. Total annual utility cost is approximately \$29 million. Potential annual savings if these buildings is nearly \$6 million.

Objective 1: Inventory and benchmark state owned and operated buildings, beginning with DOA portfolio. Identify energy intense buildings. Target of 600 building per year. Metrics: # of buildings completed; SqFt benchmarked; \$ in potential savings ID'd Timeframe: 5 years from July 2021. 15% complete.

Objective 2: Audit all state electric and gas accounts for discrepancies, errors and orphaned meters. beginning with DOA portfolio. Target of 5000 accounts per year. Metrics: # of accounts audited; SqFt benchmarked; \$ in potential savings Identified Timeframe: 5 years from July 2021. 5% Complete. Data collected is not sufficient enough to report.

Objective 3: Catalog deferred maintenance of state buildings, starting with DOA portfolio. Target of 600 buildings per year. Metrics: # of buildings completed; total assessment of maintenance needs per building. Timeframe: 5 years from July 2021. 5% Complete. Data collected is not sufficient enough to report.

Objective 4: Create state Guaranteed Energy Savings Contracting Program. Timeframe October 2021. Metrics: Established working group; prequalified ESCO process; Standardized documents; tracking and reporting process; program administration; program funding. Template program "in a box" is near complete.



HOUSE BILL 2667



As part of an ongoing partnership with WVU's Statler School of Engineering, two teams of five students each worked on energy audits for the Guthrie Center for the West Virginia Department of Agriculture in Charleston, WV. The center contains 22 buildings that are on one electric meter. Students teams looked at buildings 2, 5, and 17 to audit and determine the peak HVAC and electrical demand. Buildings 2 and 5 were modeled to estimate the size of an emergency generator needed to improve sustainability and reliability. A 250 KW natural gas generator was recommended. The teams also designed a metering system for the buildings to determine the energy usage for benchmarking purposes. Another team designed a new HVAC system for building 17. It was found to have poor temperature control and was found to be undersized. A new split system heat pump system was designed. Presentations to WVDA officials were made in late April 2021.

Obstacles that have occurred in the utility collection process for HB 2667 have been staffing issues at the individual agencies, delayed response time at the utility companies for 3rd Party Authorizations due to lack of staffing, delayed/no response from agencies when trying to establish contact and agencies unaware of the bill and the requirements. Software platforms that have been demoed for utility data collection storage are Caspio, Dude Solutions, Energy Print, Energy Cap, and Jade Track. While these software platforms perform the necessary applications for data collection, the development and subscription costs exceed the current budget for the bill as they are based on the number of individual meters per utility.

Agency	Utility Cost/ \$million	Deferred Maintenance Costs/ \$million	# of meters	# of Bldg	SqFt million	EUI / Nat'l Avg	Cost /sqft\$	Potential Savings
Dept of Admin	\$3.5	\$36.4	46	24	11	70 / 53	.024	\$722,000
DHHR	\$2.5	TBD	39	12	1.8	108 / 100	.013	\$204,000
Corrections	\$5.1	TBD	117	28	2.8	123 / 70	.015	\$2,100,000
WV K12 Schools	\$14.9	TBD	TBD	520/711	23	64 / 48	.014	\$2,900,000
Total	\$26,000,000			584	38.6			\$5,926,000



ENERGY EFFICIENCY IMPACT GRANTS



The highly successful WV Energy Efficiency Impact Grant program for small businesses, in partnership with Jackson County Development Authority, continued into its second successful year. The WVOE develop this program as a way to assist these businesses recovering from the impacts of Covid-19 that also aligned with our deliverables, which resulted in a micro-grant program for small businesses to make energy efficiency upgrades.

Per requirements from the U.S. Department of Energy, the allowable uses for the funds are: the installation of insulation, energy efficient lighting, weather sealing, HVAC upgrades and ENERGY STAR appliances. Businesses applying must be established for minimum of one year, have 15 employees or less, be in good standing with the State of WV and generate under \$1 million in revenue.

Since the program's inception in 2020, we have awarded 64 businesses with grants with 43 of those in 2021. The most commonly selected upgrade amongst businesses is the installation of energy efficient lighting, followed by the installation of ENERGY STAR appliances.

Also in 2021, we were able to help two buildings become ENERGY STAR certified through this program. ENERGY STAR certified buildings save energy, save money and help protect the environment by generating fewer greenhouse gas emissions than typical buildings. On average, certified buildings use 35% less energy, generate 35% fewer greenhouse gas emissions, and cost an average of \$0.54 less per square foot to operate. Our project partner, Jackson County Development Authority, as well as, Moyer Law Firm, a grant recipient, are now certified. We hope to assist more recipients in becoming certified in 2022.



ENERGY EDUCATION



Through a longterm partnership with the WVU Statler School of Engineering Office of Mechanical Engineering, WVOE provide no-cost technical assistance, special projects and / or energy audits to public buildings and eligible West Virginia businesses. Participating graduate and undergraduate engineering students are paired with clients needing help with an energy efficiency or productivity issue. Students receive class credit for a senior or graduate capstone course, as well as 60-80 hours of hands on field experience. To date over 300 WV businesses have received technical experience and more than 500 students have been trained.

In 2021, 70 engineering students participated in 24 energy assessments and 6 special projects were conducted through the program year. Response to participant surveys show more than 50% of energy efficiency recommendations are being considered for implementation in 2022. Projects identified annual energy savings of over 13,728,000 kWh, and annual monetary savings of \$1,300,000. Significant annual savings and pay back on investment times were identified for:

- CertainTeed manufacturing, in Moundsville \$525K, with payback in 3 months
- Gestamp, in South Charleston \$240K, with payback in 11 months
- Technimark, in Inwood \$200K with payback in 6 months

Other projects included:

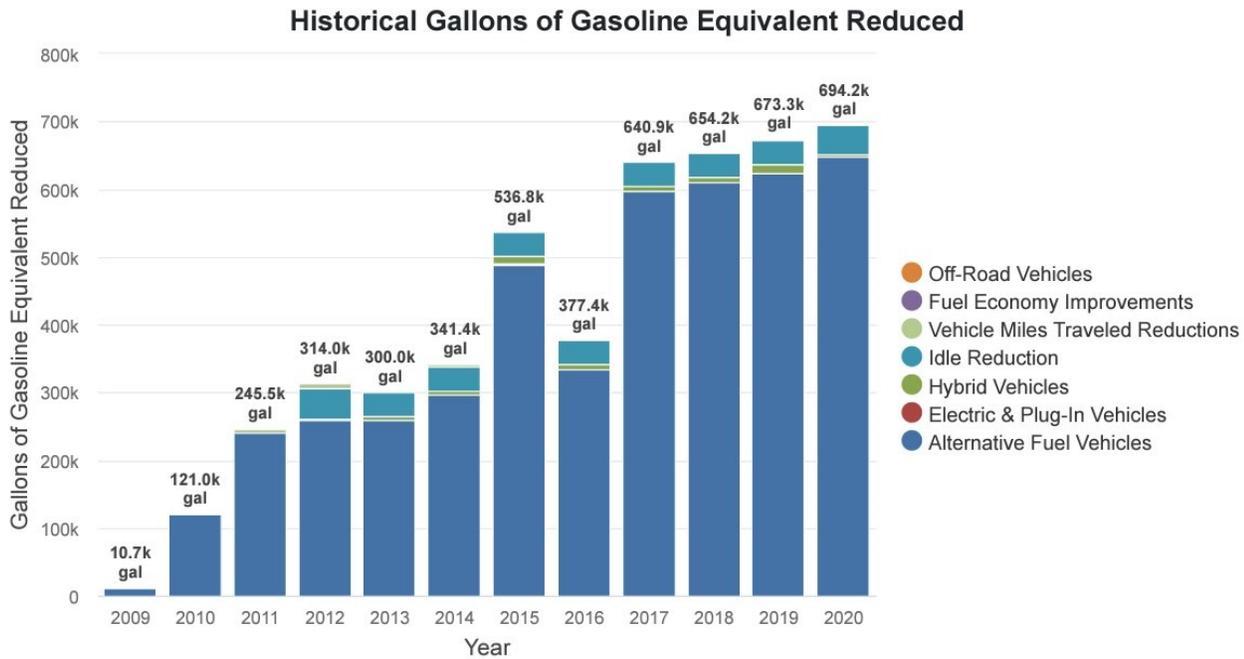
- Design of a system to extract essential oils from Lavender plants for an entrepreneur in Summersville, WV. A boiler with 30 gallon capacity and electric immersion heaters was designed.
- Solar and geothermal projects for the City of Morgantown Airport.
- Design of ball retrieval system for New Vision LLC youth sports complex, in Philippi, WV. The system can handle balls ranging from tennis balls to basketballs in size.
- Design of a hydro-power system for Mann Cave Distillery in Weston, WV using water flowing from abandoned coal mines. The flow of 140-70 gallons per minute drops approximately 80 feet. The system will generate between 1-2 KW continuously for the distillery. Payback period will be less than 3 years.



TRANSPORTATION



Stakeholders of the West Virginia Clean Cities coalition, which advances and promotes alternative fuels and vehicles, used hybrids, electric vehicles, propane and biodiesel school buses, compressed natural gas and E85 to reduce 694,159 gasoline gallon equivalents in 2020.



West Virginia Clean Cities, in partnership with coalitions across the United States, received two federal funding awards from the US Department of Energy’s Vehicle Technologies Office in 2021. Electric vehicle charging infrastructure, electric vehicles, and outreach will benefit the state through “Rural Reimagined: Building an EV Ecosystem and Green Economy for Transforming Lives in Economically Distressed Appalachia” (\$4,012,930) and “EMPOWER, Equitable Mobility Powering Opportunities for Workplace Electrification Readiness” (\$3,970,539)

BIKE BECKLEY



Beckley Welcome Center, home to southern West Virginia's newest bike-sharing program, is at the heart of McManus Trail.



Many groups came together to make Bike Beckley a reality, including the West Virginia Office of Energy.

In October 2021, Bike Beckley's open house and ribbon-cutting revealed five new bikes with Bluetooth locks and GPS tracking devices.



Beckley Mayor Rob Rappold says Beckley has been designed a bike-friendly community, key to setting up bike lanes. Vickie Webb, Community Transformation Project, hopes other cities and towns will replicate Beckley's model.



Bike share program starts rolling in Beckley

The crowd at Beckley Bike Share's ribbon-cutting had their minds on spring activities despite the cold October rain.

Around 50 people gathered at the Beckley Welcome Center's open house, which showcased five new bikes with Bluetooth locks and GPS tracking devices. The center, at the heart of McManus Trail, houses southern West Virginia's newest bike sharing program.

"Our outcomes are excitement, more traffic on the McManus Trail, promoting physical activity, and keeping cars parked, which reduces emissions," said Vickie Webb, project director, Community Transformation Project, one of several sponsors of the program.

Other sponsors include WVOE through its USDOE State Energy Program funding; City of Beckley; West Virginia State University Extension; Raleigh County Chamber of Commerce; and Active Southern WV.

Beckley Bike Share supporters hope other West Virginia cities and towns will look toward The City of Champions to replicate bike sharing across the state.

"Beckley has been designated a bike-friendly community, a prelude to the establishment of bike lanes," said Mayor Rob Rappold.

Inside and out, the Welcome Center honors bicycles and bicycling, with locally made sculptures dotting the grounds and a full-size traffic light in the garage, which houses bikes of all shapes and sizes.

GEOTHERMAL



Water under WV mines attractive for energy-saving heating and cooling

In Fall 2021, WVOE released “Minepool Geothermal Opportunities in West Virginia” by Marshall University’s Center for Business and Economic Research (<https://energywv.org/report-archive?folderId=86>). Report results will help capitalize on this resource and enable energy savings and possible future economic development in mining regions.

Mine pools are passive, low-temperature geothermal resources; energy-saving opportunities for businesses and institutions near them. Underground mines often contain very large pools of water at very stable temperatures. This water, once transported to the surface, can transfer heat that can make heating and air conditioning more efficient. Water-source heat pumps are said to be the easiest and least expensive type of geothermal system to install because these projects do not require the extensive digging and trenching that ground-source projects do. In addition, water provides better heat transfer than earth and a large waterbody is an excellent heat sink.

Mine pool resources are considered to be quite versatile due to the wide range of possible end-users. Public buildings such as hospitals, commercial facilities, and universities with year-round and round-the-clock heating and cooling needs are considered ideal users, as are server farms and manufacturing processes with high cooling requirements.

Former coal-mining areas in Nova Scotia and Pennsylvania have been utilizing mine pool water for decades and are excellent sources of expertise for West Virginia. A large, flooded mine under the town of Springhill in Cumberland County, Nova Scotia has made that area a continental leader in use of the resource. Several manufacturing facilities and public buildings are already utilizing the mine water to heat and cool interior space, and the county has plans to create a geothermal district that will house a 100-acre business park.

Mine pool geothermal systems are typically installed as retrofits to existing facilities. However, in the future there may be opportunities to build new facilities near the mine pools to take advantage of the low-cost energy the resource provides. The energy efficiency features of this resource will become more important as energy costs rise.



MID-ATLANTIC ELECTRIFICATION PARTNERSHIP



The Mid-Atlantic Electrification Partnership is a U.S. Department of Energy funded project that will create a regional EV Ecosystem in Virginia, the District of Columbia, Maryland, and West Virginia. The ecosystem project will connect the Mid-Atlantic Region's cities, employing multiple EV and infrastructure sub-projects, including multimodal hubs such as airports, seaports and logistics centers. It will also address educational, planning and equity issues of populations near these hubs and support inter-and intra-city routes for commercial and government fleets and consumers and rideshares.

As part of the Mid-Atlantic Electrification Partnership, the Eastern West Virginia Regional Airport located in Martinsburg, WV will be receiving several electric vehicle (EV) chargers, including one that is solar powered, the BEAM EV ARC. An EV will also be available to demo throughout the project.

The BEAM EV ARC solar powered charger became in operation and available for public use in December 2021. It was designed, engineered and manufactured in the U.S. and is the world's first and only fully autonomous, transportable, solar powered EV charging system. The BEAM EV ARC fits inside a standard parking space without reducing available parking, while being ADA compliant.

The WVOE is leading the initiative in the state and will work with the Eastern WV Regional Airport for the duration of the project to provide community education opportunities as well as data on EV usage for a case study.



PUBLIC ENERGY AUTHORITY



In August 2021, Governor Justice announced the reactivation of the West Virginia Public Energy Authority. The WVPEA was created by the Legislature with a mission to foster, encourage, and promote the mineral development industry in West Virginia.

New appointees include:

- Chris Hamilton, Kanawha County, for the term ending June 30, 2023. He is a Republican who is employed by or associated with an industry the authority is empowered to affect.
- Charles Burd, Wood County, for the term ending June 30, 2025. He is a Republican who is employed by or associated with an industry the authority is empowered to affect.
- Jeffrey Allen, Putnam County, for the term ending June 30, 2024. He is a Republican.
- Jeff Herholdt, Kanawha County, for the term ending June 30, 2022. He is a Democrat.

“By reactivating the Public Energy Authority, the State will maintain real time, firsthand knowledge of the status of each power plant, their life cycle, and whether there are concerns of household power supplies being disrupted” says Governor Justice.

The WVPEA will also help coordinate the output of merchant plants with capacity needs of regulated plants. Additionally, the Authority will assist in developing the next generation of coal plants and long-term energy policies that use all of West Virginia’s resources.

The WV Public Energy Authority has the power to enter into management contracts with second parties to operate any electric power, or gas transmission projects by making secured loans to provide funds to buy or build those projects. It can also take property through eminent domain.

By code, the West Virginia Office of Energy is responsible for managing and administering the daily functions of the Authority and for performing all other functions necessary to the effective operation of the Authority. The WVOE looks forward to serving the Authority as they move forward.



2022 ACTION PLAN

The West Virginia Office of Energy Action Plan for 2022 includes a compilation of projects funded under the U.S. Department of Energy's State Energy Program.

The U.S. Department of Energy's State Energy Program (SEP) provides funding and technical assistance to states, territories, and the District of Columbia to enhance energy security, advance state-led energy initiatives, and maximize the benefits of decreasing energy waste. SEP emphasizes the state's role as the decision maker and administrator for program activities within the state that are tailored to their unique resources, delivery capacity, and energy goals.



2022 ACTION PLAN



WEST VIRGINIA ENERGY CODES

The West Virginia Office of Energy has been integral in moving the state's energy codes forward. After consensus stakeholder group meetings in Summer 2021, the WV Fire Marshal submitted an update to the state building code, with public comments due July 2021. The final rule request includes moving the state to the 2015 IECC (from 2009 IECC) and ASHRAE 90.1-2013 (from 2010). The 2022 session of the WV Legislature will consider this rule. WVOE partners with the state home builders' association and its chapters, the ASHRAE chapter, the fire marshal, and code officials to ensure the built community and other groups are properly trained in these new codes and beyond. More evidence of success: local municipalities throughout WV are moving to adopt and enforce state energy codes. To date, 48 towns and seven counties have adopted state energy codes. In 2020-21, WVOE reached nearly a thousand individuals, through one in-person event – the 2021 Charleston Home Show – and many virtual events. Seven new entities/individuals received Building Performance Institute certifications.

WEST VIRGINIA BENCHMARKING INITIATIVE

In partnership with WV ASHRAE, WV Department of Education's Office of School Facilities, and WVU Statler School of Engineering, WVOE has benchmarked schools in 33 of the state's 55 counties, using Portfolio Manager. Funded through a \$300,000 USDOE competitive State Energy Program grant, partners have benchmarked 193 public buildings and more than 400 schools.

WVASHRAE PARTNERSHIP

WVOE continues to work with WVASHRAE and the West Virginia University School of Engineering to provide training and continuing education opportunities to architects, engineers, code officials, and other stakeholder groups in West Virginia on how to meet and enforce advanced ASHRAE codes cost-effectively in the state. Training will focus on differences between ASHRAE 90.1-2007 and 2010 standards as well as resiliency and security in efficient buildings. Seminars will cover how to design/operate a net-zero commercial building, benchmarking, and other areas of energy efficiency and conservation.

COMMERCIAL ENERGY AUDITOR TRAINING – BRIDGE VALLEY CTC

WVOE continues to build a new partnership with BridgeValley Community & Technical College to develop and deliver courses focused on commercial energy auditing, building operator certification, BPI certification, and other energy efficiency-related curricula. This program year will continue to target curriculum and class development, as well as identifying and training trainers.



2022 ACTION PLAN



HOMEBUILDERS ASSOCIATION OF WV FOUNDATION

WVOE continues its partnership with the Home Builders Association of West Virginia Foundation (HBAWVF) to ensure West Virginia's built community is trained in the adopted state energy codes and beyond. HBAWVF will provide training for builders and other industry professionals on the unique requirements of the 2009/2015/2018 IECC and help them understand how these requirements are accommodated in residential buildings during different phases of construction.

The 2015 IECC includes a new compliance pathway: Energy Rating Index (ERI). Training during this performance period will include information about ERI. RESNET's Home Energy Rating System (HERS) index is the existing compliant ERI method. During this performance period, HBAWVF will provide evaluations of homes constructed by HBA members using HBAWVF-trained HERS raters, in addition to further classroom-style training sessions.

ENERGY EFFICIENT WEST VIRGINIA

WVOE continues its relationship with Energy Efficient West Virginia (EEWV), an organization of residents, businesses, and nonprofits focused on promoting energy efficiency among residential, commercial, and industrial customers in West Virginia. EEWV will continue its efforts to improve enforcement and adoption of energy codes in jurisdictions around the state of West Virginia. During the 2019-2020 program year, EEWV found that in addition to scant adoption of energy codes, there is also scant enforcement, even in places that have adopted the International Energy Conservation Code (IECC). In the coming program year, EEWV will provide specific market outreach, education, and technical assistance related to energy efficiency, to selected local governments. These efforts will include assistance to adopt and enforce state energy codes and benchmarking standards. In addition, EEWV will coordinate with the W.Va. Fire Marshal's Office to develop a better understanding on what the reality is for state municipalities vs. what their code adoption letters indicate.

WEST VIRGINIA SUSTAINABLE ENERGY EDUCATION PROGRAM (SEED)

WVOE is working with Marshall University to facilitate an interdisciplinary, interagency committee to begin work on development of a West Virginia Sustainable Energy Education Development program and to seek revenue streams from public and private sources. Partnerships include the National Energy Education Development (NEED) Project and the Northeast Energy Efficiency Partnership (NEEP). The mission is to design and deliver objective, multi-sided energy education programs through networks of students, educators, business, government, and community leaders.

ENERGY OUTREACH AND COMMUNICATIONS

WVOE's outreach and media activities are coordinated through the W.Va. Department of Commerce's communications division, Commerce Communications, which operates on a fee-for-service basis. WVOE website design and content, media releases, and the coordination of major WVOE events such as the Governor's Energy Summit are included in Commerce Communications' responsibilities.



2022 ACTION PLAN



HIGH PERFORMANCE BUILDINGS

WVOE continues its collaboration with the W.Va. Department of Education (WVDE), W.Va. School Building Authority (WVSBA), WASHRAE, and West Virginia University to promote high performance buildings in the public sector. This program year, WVOE will continue promoting high-performance schools through regional meetings, presentations, and technical assistance with a goal of eliminating identified barriers such as a lack of understanding by local education decision-makers and county school system staff in the processes involved in performance contracting selection, implementation, and financing, as well as indoor air quality and healthy environments.

WVOE will continue efforts to implement a statewide benchmarking initiative in K-12 institutions as well as to train and provide technical assistance and information on energy use in K-12 schools, operation and maintenance considerations, appreciation of design impacts on energy use, and operational metrics. WVOE is working with the National Energy Education Development Project (NEED), as well as WASHRAE, to develop a High-Performance Building Design workshop curriculum.

In addition, WVOE is working with the W.Va. Department of Administration, General Services Division, to benchmark energy use and savings efforts in state-owned buildings. Efforts will be made to prioritize buildings and enter into the Energy Star Portfolio Manager database.

PREPARING THE NEXT GENERATION FOR ENERGY EFFICIENCY

In partnership with the WVU Statler School of Engineering's College of Mechanical and Aerospace, WVOE provides low and no-cost energy efficiency, training audits, technical assistance, and other service options to businesses, municipalities, schools, and nonprofits throughout the state. This program uses senior and graduate-level engineering students, providing them with real world working experience. Since 2010 this partnership has provided:

- Hands-on training to 600 engineering students
- Assistance to 400 public- and private-sector clients
- Identification of 30.3 million kWh and \$20 million in potential energy cost savings

A notable example is Crestwood Inc, a natural gas compression station in Salem, WV. The client requested an energy assessment. Suggested recommendations included: condensing turbine for electricity generation from waste heat, installing a PLC based control system to improve operation of a reboiler, installation of a building energy management system, adjusting boiler air-to-fuel ratio, and energy efficient lighting. When implemented the company will see 11,000,000 kWh/year of electricity and 3,700 MMBtu/year of natural gas saved, with annual cost savings of nearly \$1 million. Estimated payback on investment is approximately two years.

This activity focuses on helping West Virginia businesses become more productive and energy efficient. WVOE will continue its Projects with Industry Program operated through West Virginia University. This program uses senior-level engineering students to provide no-cost energy services to West Virginia businesses. The students receive class credit. Two, three-credit-hour classes are offered in senior design by the College of Mechanical and Aerospace Engineering. Projects focus on process and technological improvements. Funds will be used to pay for personnel and fringe for WVU faculty involved in the projects, as well as travel and supply expenses. Five to seven projects will be completed and 10 to 20 students will receive training.

2022 ACTION PLAN



INDUSTRIES OF THE FUTURE

WVOE will continue its partnership with the WVU Industrial Assessment Center (IAC) to provide industrial assessments. The IAC provides energy assessments to industries with annual energy costs greater than \$100,000 but less than \$2 million. WVOE has found these assessments to be an important tool in initiating energy efficiency and environmental improvement programs within West Virginia industries. All industries are encouraged to take advantage of this service. The program will target those industries that are either near or above the energy consumption criteria established by U.S. DOE for the IAC centers. Five to 10 assessments will be conducted and 20 to 24 students will be trained with the funding provided.

ENERGY EFFICIENCY ASSISTANCE TO COMMUNITIES

WVOE will begin a new partnership with Jackson County Development Authority to develop a grant fund (Statewide Energy Efficiency Grant) for existing legal businesses located in all counties in West Virginia for energy efficiency related upgrades in response to COVID-19 relief for impacted businesses. Jackson County Development Authority was selected because of its expertise in operating grant programs to small businesses. The proposed West Virginia Energy Efficiency Impact Grant will require the completion of a desktop energy audit and the incorporation of data into Portfolio Manager. Provided that projects have been appropriately vetted with the W.Va. Historic Preservation Office, they are limited to:

- a. installation of insulation;
- b. installation of energy efficient lighting;
- c. HVAC upgrades (to existing systems);
- d. weather sealing;
- e. purchase and installation of ENERGY STAR appliances (includes, but not limited to, furnaces and air conditioners);
- f. replacement of windows and doors; and
- g. high efficiency shower/faucet upgrade.

WVOE PROGRAM SUPPORT

WVOE staff administers all program activities outlined in this plan, including contractual initiatives. Professional employees of the office have specific tasks associated with U.S. DOE activities. Clerical and accounting duties are combined within this element. In addition, project monitoring, administrative, and financial management functions are included under this program activity.

ENERGY EFFICIENCY/RENEWABLE ENERGY CONFERENCE

WVOE will host a free public conference focusing on energy efficiency, renewable energy, and transportation. Subject matter experts will present on renewable energy developments in West Virginia, as well as the latest programs to increase energy efficiency at schools, businesses, and homes. Experts also will present the latest developments in alternative fuel transportation. Exhibitors will be encouraged to display informational material at the conference site.



2022 ACTION PLAN



ENERGY EMERGENCY PLANNING

The WVOE continues to maintain the current energy emergency response capability by developing and refining the operational aspects of the State Emergency Plan as conditions warrant. WVOE staff designated NASEO EEAC contact for West Virginia will attend pertinent DOE-sponsored conferences and seminars on energy emergency topics. In addition, staff will continue to work in collaboration with W.Va. Department of Homeland Security and Emergency Management to update and maintain the W.Va. Emergency Operations Plan, specifically regarding Emergency Support Function 12: Energy. Staff also work with the W.Va. National Guard to ensure energy resiliency of the state's primary military facilities.

WVOE will begin a new effort to resiliency technical assistance, training, and planning resources to local governments that are interested and committed to developing resiliency plans for their community. WVOE staff will also continue to maintain a petroleum information database to enhance its response capability. The U.S. Energy Information Agency serves as the primary source for state petroleum information. Maintenance of this data is essential for developing historical and current supply pattern information.

MORE RENEWABLES IN WEST VIRGINIA'S ENERGY PORTFOLIO

Legislative advancements have fostered incredible interest in utility-scale solar developments in West Virginia. More favorable tax treatment, the legalization of third-party power purchase agreements, and encouragement to the state's investor-owned utilities are pushing this interest. The state's energy mix includes:

- Wind (installed capacity): 742MW
- Hydro (installed capacity): 463MW
- Rooftop solar (installed capacity): 14.6MW (3.5MW in 2016)

ALTERNATIVE FUELS IN TRANSPORTATION

West Virginia has 131 public alternative fueling stations including:

- 79 Level 2 electric vehicle chargers with 196 ports
- 12 DC fast chargers with 69 ports
- 35 E85 stations with 26 of those also offering mid-level blends
- 5 LPG stations
- 1 CNG station

In 2020, stakeholders reduced 694,159 gasoline gallon equivalents using electric and hybrid vehicles, propane, biodiesel, and compressed natural gas. This number includes heavy-duty CNG vehicles in the state fleet as well as the use of E85. The state's school bus fleet reduced 142,750 gasoline gallon equivalents using a 95/5 percent petroleum/ biodiesel blend. The fleet also contains 62 propane-fueled school buses, which used 153,553 gasoline gallon equivalents.

In 2021, West Virginia's participation in the USDOE's Mid-Atlantic Electrification Partnership will result in the installation of a solar electric vehicle charger and a new electric vehicle at the Eastern Regional Airport in Martinsburg, WV.



