



*Joint Committee on Government and
Finance
Initial Results of Alternative and
Renewable Energy Planning Assessment*

Report to the West Virginia Legislature
West Virginia Code §24-2F-9(b)

201 Brooks Street
Charleston, WV 25323
1-800-344-5113 General
1-800-642-8544 Complaints
www.psc.state.wv.us

Michael A. Albert, Chairman
Jon W. McKinney, Commissioner
Ryan B. Palmer, Commissioner

This report represents the initial results of the “alternative and renewable energy resource planning assessment.” The report has been prepared by the Public Service Commission of West Virginia, in collaboration with the West Virginia Division of Energy/Public Energy Authority, in accordance with W.Va. Code §24-2F-9(b).

Table of Contents

Overview	1
(i) Identify Current and Operating Alternative and Renewable Energy Resource Facilities	2
(ii) Assess the Potential for Future Alternative and Renewable Energy Resource Facilities	5
(iii) Assess the Conditions of the Alternative and Renewable Energy Resource Marketplace, including Costs Associated with Alternative and Renewable Energy.....	7
(iv) Assess the Economic Impacts of Act on Coal and Coal Mining in West Virginia.....	9
(v) Recommend Methods to Maintain or Increase Competiveness of Alternative And Renewable Energy Resource Market in West Virginia	9
(vi) Recommend to the Legislature Additional Compliance Goals Beyond 2025	10
Summary of Initial Assessment	10

Report to Joint Committee on Government and Finance
Initial Results of
Alternative and Renewable Energy Resource Planning Assessment

Overview

As part of the requirements under the Alternative and Renewable Energy Portfolio Standard Act (Portfolio Act or Act) enacted by the West Virginia Legislature in 2009, codified at W.Va. Code §24-2F-1 *et seq.*, the Public Service Commission of West Virginia (Commission), in cooperation with the West Virginia Department of Environmental Protection (WVDEP) and the West Virginia Division of Energy (WVDOE), is to prepare on or before July 1, 2012, an Alternative and Renewable Energy Resource Planning Assessment (Assessment) for the Governor, the President of the Senate and Speaker of the House of Delegates to report on the development of alternative and renewable energy resources in the State. Thereafter, an annual report is required, pursuant to W.Va. Code §24-2F-9(b).

The statute also requires that the initial results of the Assessment, prepared by the Commission, in collaboration with the West Virginia Public Energy Authority (Authority) under the administration of the Division of Energy, are to be filed with the Joint Committee on Government and Finance on or before January 1, 2012.

W.Va. Code §24-2F-9(b) provides that the Alternative and Renewable Energy Resource Planning Assessment shall:

- (i) Identify current and operating alternative and renewable energy resource facilities in this state; (ii) assess the potential to add future generating capacity in this state from alternative and renewable energy resource facilities; (iii) assess the conditions of the alternative and renewable energy resource marketplace, including costs associated with alternative and renewable energy; (iv) assess the economic impacts of this article on coal and coal mining in West Virginia; (v) recommend methods to maintain or increase the relative competitiveness of the alternative and renewable energy resource market in this state; and (vi) recommend to the Legislature additional compliance goals for alternative and renewable energy portfolio standards beyond 2025.

The initial results of the Assessment have been prepared addressing the topics listed in W.Va. Code §24-2F-9(b), based on meetings that took place in December 2011 with representatives of the Commission, the WVDEP and the WVDOE, including the

Chairman of the Authority, at the offices of the Commission at 201 Brooks Street, Charleston, West Virginia.

The initial results of the Assessment are set forth below.

(i) Identify Current and Operating Alternative and Renewable Energy Resource Facilities

The current and operating alternative and renewable energy resource facilities are identified in the Portfolio Act and the Rules Governing the Alternative and Renewable Energy Portfolio Standard, 150 CSR 34, the Commission promulgated under the Portfolio Act

W.Va. Code §24-2F-3(13) defines renewable energy resources as solar photovoltaic or other solar electric energy; solar thermal energy; wind power; run of river hydropower; geothermal energy, biomass energy; biologically derived fuel including methane gas, ethanol or biodiesel fuel; fuel cell technology; and, recycled energy.

W.Va. Code §24-2F-3(3) defines alternative energy resources as advanced coal technology; coal bed methane; natural gas, including any component of raw natural gas; fuel produced by a coal gasification or liquefaction facility; synthetic gas; integrated gasification combined cycle technologies; waste coal; tire-derived fuel; and, pumped storage hydroelectric projects. As defined in W.Va. Code §24-2F-3(1), advanced coal technology is a technology that is used in a new or existing energy generating facility to reduce airborne carbon dioxide emissions associated with the combustion or use of coal and includes, but is not limited to, carbon dioxide capture and sequestration technology, supercritical technology, advanced supercritical technology, ultrasupercritical technology and pressurized fluidized bed technology and any other resource, method, project or technology certified by the Commission as advanced coal technology.

The Portfolio Act authorizes the awarding of credits to electric utilities for greenhouse gas emission or offset projects or energy efficiency and demand-side energy initiative projects pursuant to W.Va. Code §24-2F-4. Thus, although these projects are not specifically included in the items listed for consideration under W.Va. Code §24-2F-9(b), this report acknowledges that the two major electric utilities operating in the State, Appalachian Power Company and Wheeling Power Company, dba American Electric Power (AEP) and Monongahela Power Company and The Potomac Edison Company, dba Allegheny Power (Allegheny Power), have recently undertaken energy efficiency and demand-side energy initiative projects. Allegheny Power is now a wholly-owned subsidiary of FirstEnergy, as a result of the merger of Allegheny Power with FirstEnergy approved by the Commission in Case No. 10-0713-E-PC (Commission Order dated December 16, 2010).

The Commission approved AEP’s implementation of a SMART lighting program, Residential Home Retrofit, Residential Low Income and Commercial and Industrial (C&I) Incentive for its customers, including annual cost recovery for the programs in the amount of \$ 6.1 million in Case No. 10-0261-E-GI (Commission Order dated October 5, 2010).

The Commission has also approved a petition seeking approval of Allegheny Power’s Phase I Energy Efficiency and Conservation Plan (Phase I Plan), filed on March 31, 2011, consisting of two energy efficiency and conservation (EE & C) programs: (i) a residential low-income program, and (ii) a non-residential high efficiency lighting program for commercial, government and industrial customers, in Case No. 11-0452-E-P-T (Commission Order dated December 30, 2011). The Allegheny Power energy efficiency and conservation programs will become effective January 1, 2012.

Alternative Energy Resource Facilities

As a result of filings under the Portfolio Act or as a result of other proceedings, the Commission is aware of the following Alternative Energy Resource Facilities:

Name	Owner	Location	Fuel Type	Capacity
Longview Power Plant*	Private	Maidsville, WV	Supercritical technology	695 MW
Morgantown Energy Facility	Private	Morgantown, WV	Waste coal	68.9 MW
Grant Town	Private	Grant Town, WV	Waste coal	80 MW
John Amos Plant	AEP	Winfield, WV	Supercritical technology	2900 MW
Mountaineer Plant	AEP	New Haven, WV	Supercritical technology, (with partial carbon capture and sequestration technology demonstration project)	1300 MW

Name	Owner	Location	Fuel Type	Capacity
Ceredo facility	AEP	Huntington, WV	Natural gas-fired	523 MW
Fort Martin Power Station	Allegheny Power	Maidsville, WV	Supercritical technology	1107 MW
Harrison Power Station	Allegheny Power	Haywood, WV	Supercritical technology	1984 MW
Pleasants Power Station	Allegheny Power	Willow Island, WV	Supercritical technology	1300 MW
Willow Island **	Allegheny Power	Willow Island, WV	10% tire –derived fuel with coal-fired generation	187 MW

*Currently certificated by PSC under the definition of advanced coal technology as supercritical technology, but can reapply as advanced supercritical technology.

**Certificated by PSC as alternative energy resource when using tire-derived fuel.

Renewable Energy Resource Facilities

Based on information prepared by the WVDOE in 2011, the following current and operating renewable energy resources exist in the State:

Name	Location	Fuel Type	Capacity
Summersville Dam	Gauley River	Hydro Power	80 MW
Winfield Dam	Kanawha River	Hydro Power	28.8 MW
London/Marmet Dam	Kanawha River	Hydro Power	14.76 MW
Lake-Lynn Dam	Monongahela River	Hydro Power	51.2 MW
Hawks Nest Dam	New River	Hydro Power	69 MW
Belleville Dam	Ohio River	Hydro Power	42 MW
New Martinsville Dam	Ohio River	Hydro Power	35.72 MW
Dam No. 4	Potomac River	Hydro Power	1.9 MW
Dam No. 5	Potomac River	Hydro Power	1.21 MW
Millville Dam	Shenandoah River	Hydro Power	2.84 MW
Morgan County Courthouse	Berkeley Springs, WV	Solar Power	25.38 kW
Hurricane Waste Water	Hurricane, WV	Solar Power	20.24 kW

Name	Location	Fuel Type	Capacity
Treatment Plant			
Beech Bottom City Building	Beech Bottom, WV	Solar Power	4.8 kW
Man Town Hall	Man, WV	Solar Power	19.2 kW
Williamson Family Care Center	Williamson, WV	Solar Power	11.7 kW
Appalachian Offroad MC	Cross Lanes, WV	Solar Power	36 kW
Mountaineer Wind Energy Center	Tucker County	Wind Energy	66 MW
NedPower Mount Storm	Grant County	Wind Energy	264 MW
AES Laurel Mountain	Randolph and Barbour Counties	Wind Energy	98 MW
Beech Ridge	Greenbrier County	Wind Energy	100 MW
Pinnacle Wind Farm	Mineral County	Wind Energy	55 MW
Albright facility*	Albright, WV	10% biomass with coal-fired generation	140 MW

*Currently certificated by PSC as renewable energy resource when using bio-mass fuel.

(ii) Assess the Potential for Future Alternative and Renewable Energy Resource Facilities

Based on information prepared by the WVDOE in 2011, these are the alternative and renewable energy resource facilities that currently possess FERC preliminary permits that would allow construction or are under construction in the State:

Name	Location	Fuel Type	Capacity
Glen Ferris Dam	New River	Hydro Power	38 MW
Willow Island Dam	Ohio River	Hydro Power	35 MW
Sutton Dam	Elk River	Hydro Power	12 MW
R.D. Bailey Dam	Guyandotte River	Hydro Power	7.8 MW

Name	Location	Fuel Type	Capacity
Hildebrand Dam	Monongahela River	Hydro Power	20 MW
Morgantown Dam	Monongahela River	Hydro Power	15 MW
Opekiska Dam	Monongahela River	Hydro Power	10 MW
Pike Island Dam	Ohio River	Hydro Power	49.5 MW
New Cumberland Dam	Ohio River	Hydro Power	36 MW
Tygart Dam	Tygart River	Hydro Power	29 MW
Stonewall Jackson Dam	West Fork River	Hydro Power	0.3 MW
Mount Storm pumped storage	Maysville, WV	Hydro Power	450 MW
DEP Headquarters	Charleston, WV	Solar Power	24.26 kW
US Wind Force Mount Storm	Grant County	Wind Power	150 MW

The State established its WVDOE in 2007. At the time the WVDOE was established, it was given the requirement to prepare a five-year state energy plan. The first plan, referred to as the Energy Opportunities Document (EOD) addressed the period of 2007-2012.

According to W.Va. Code §5B-2F-2, the West Virginia Energy Policy and Development Act, the plan is to focus on:

“[D]eveloping energy policies emphasizing the increased efficiency of energy use, the increased development and production of new and existing domestic energy sources, the increased awareness of energy use on the environment and the economy, dependable, efficient and economical statewide energy systems capable of supporting the needs of the state, increased energy self-sufficiency where the ratio of indigenous to imported energy use is increased, reduce the ratio energy consumption to economic activity and maintain low-cost energy. The energy policies and development plans shall also provide direction for the private sector.”

The WVDOE is currently in the process of developing a new five-year EOD for the period of that identifies West Virginia fossil, renewable and energy efficiency resources and the future of alternative and renewable energy resource facilities and energy efficiency projects in the state. The development of the EOD is contracted to Marshall University for the renewable energy and energy efficiency component of the plan and to West Virginia University for the fossil energy component of the plan.

The following institutions are participating in the development of the five-year EOD for the WVDOE: (i) Marshall University Center for Business and Economic

Research (CBER); West Virginia University Bureau of Business and Economic Research (BBER) College of Business and Economics; and West Virginia Department of Commerce, Division of Energy (DOE).

The CBER will be responsible for providing analysis of (i) renewable energy, including wind (commercial and residential); solar (utility scale, residential, net metering impact; geothermal (co-production, thermal, electric generation, relevance to CO₂ sequestration); biomass (power plants fired by wood, wood pellets, liquid fuels, and grasses); landfill gas; chicken litter; vehicles (hybrids, electric, biodiesel); and small scale hydro; and (ii) energy efficiency (industrial, commercial, and residential programs). The analysis will enable portfolio eligible resources, if appropriate, to be reviewed and contrasted for their economic competitiveness as electric generation fuels.

The BBER will be responsible for providing analysis of fossil energy, including (i) coal (coal to liquids, coal bed methane, waste coal, advanced electric generation technologies, including IGCC, advanced supercritical and oxy combustion, and hydrogen including fuel cells (vehicles and stationary), vehicles, and electric generation (FutureGen 1) carbon capture and sequestration including technology and West Virginia sequestration opportunities; (ii) natural gas: conventional, Marcellus Shale; natural gas liquids including ethane, propane and butane; infrastructure: Utica compressed natural gas (CNG) and (iii) oil, including enhanced oil recovery and oil shale. The analysis, as discussed above, would assist in determining the economic competitiveness of fossil energy technologies as portfolio energy sources.

The 2007-2012 plan is expected to be completed in 2012. The final annual Assessment, due on July 1, 2012, or subsequent annual assessment, will incorporate the results of the WVDOE five-year plan if the results of the plan are available.

(iii) Assess the Conditions of the Alternative and Renewable Energy Resource Marketplace, including Costs Associated with Alternative and Renewable Energy

According to the National Renewable Energy Laboratory (NREL) for the time period 2007 to 2010, average wind power prices – represented by the price of purchase power agreements (PPAs) – in the East (defined as the States of TN, KY, NC, VA, WV, PA, NJ, MD, DE, NY) were the third highest compared to other areas in the U.S. These prices averaged about \$70/MWh compared to national average of around \$52 with the production tax credit (PTC) subtracted. The PTC is a federal incentive, currently at \$22/HWH (cents per kWh for producing electricity from wind, solar, geothermal and closed loop biomass (biomass that is grown for the sole purpose of producing electricity). The East's relative position has become more favorable, falling from having the highest prices for the 2006 to 2009 time period. California and the Northwest became first and second in 2010 for having the highest price for wind generation. These higher prices

appear to be due mainly to lower wind speeds/capacity factors that make the cost per MWh higher in the East. Prices have declined, particularly in the Midwest, and are expected to decline further.

According to the Lawrence Berkeley National Laboratory, since 2008, wind turbine costs in the United States have fallen by nearly one-third on average. This has occurred as a result of a combination of factors, including the relative position of the United States dollar, cheaper inputs, reduced demand for turbines and more international competition.

For solar, the installed costs (behind the meter) have been falling, particularly for large facilities (> 500 KW). Small installations remain the most costly per kWh. The cost per kWh for solar power is still much higher than wind power and other resources. According to Energy Information Administration of the US Department of Energy (EIA) the levelized cost of photovoltaic-generated electricity is \$210/MWh compared to wind at \$97/MWh.

Other market-influencing factors, such as developing Federal Energy Regulatory Commission (FERC) actions, may increase the costs of wind energy by allowing utilities to pass along the cost of providing regulation services to counter frequency drag caused by wind turbines. Some new PJM protocols, such as the recently approved process for allowing wind facilities to receive payments for “lost opportunity costs” when they are curtailed due to reliability reasons, are favorable for the competitive position of wind power compared to other resources.

From the perspective of the Commission, one of the cost factors to be considered under W.Va. Code §24-2F-9(b)(iii) is the cost to the utility customers for utility compliance with the requirements of the Act. The costs were addressed in the compliance plan filings of the seven electric utilities considered and approved by the Commission in 2011. The Commission reviewed the utility compliance plan filings in accordance the standard of review set forth in W.Va. Code §24-2F-6 that requires that the estimated compliance costs incurred by the utility customers be reasonable in order for the plan to be approved by the Commission.

Because West Virginia ratepayers have faced increasing utility rates as reflected in the recent rate base and Expanded Net Energy Cost (ENEC) proceedings of the major electric utilities as result of a number of factors, including fluctuating fuel costs in the ENEC proceedings and increasing environmental compliance costs, the Commission will continue to monitor ratepayer costs and to report on those costs.

(iv) Assess the Economic Impacts of Act on Coal and Coal Mining in West Virginia

To date, the net effect on the coal mining industry of the Portfolio Act itself has been minimal. The West Virginia utilities have stated that they will not need to build any new non-coal generation to meet the Portfolio Act standards so the near-term impact on the coal industry is likely to be minimal. The working group intends to address this issue more fully based on the results of the EOD and other sources of data, for example, from the West Virginia Coal Association and other source of data that may be available.

(v) Recommend Methods to Maintain or Increase Competitiveness of Alternative and Renewable Energy Resource Market in West Virginia

Because of the diverse array of resources covered under the Portfolio Act, a number of existing plants considered to be “conventional” generating plants qualify to meet the standard. It is not certain whether this directive actually refers to keeping natural gas or supercritical coal plants competitive, although those plants qualify under the Act. The “competitiveness” of existing coal plants will be driven by the scope of future federal regulation. Consequently, our initial assessment addresses wind energy.

Wind energy development in West Virginia is almost entirely due to federal policy, especially the production tax credit. Without a credit, wind development would be limited. Development of wind resources in West Virginia is largely the result of geography, transmission access and proximity to load centers. The lack of transmission access has prohibited extensive development of higher wind speeds in the Midwest.

If transmission access to more Midwest wind resources was to be expanded, then future West Virginia wind resources may be less developed than in the absence of expansion. Supporting a transmission cost allocation policy that acknowledges such potential shifts in development may help maintain competitiveness and could benefit State customers. PJM is mandated to design an allocation policy that incorporates input from all states within its territory. West Virginia’s share of the allocation should reflect the fact that some of the costs that will be allocated may change the future location of plants built to meet policy goals.

As noted previously, the costs and the benefits to the State through the development of alternative and renewable energy resources, greenhouse gas emission or offset projects and energy efficiency and demand-side energy initiative projects will be addressed in the annual Assessments, as more complete information is available from the EOD study and other sources of information.

(vi) Recommend to the Legislature Additional Compliance Goals Beyond 2025

At this point, it is premature to recommend future compliance goals beyond 2025 until the marketplace for alternative and renewable energy resources is established in West Virginia. This issue will be addressed and a recommendation will be made in future reports as more complete information is available.

A working group, consisting of representatives from the Commission, the WVDEP and the WVDOE, collaborated in the preparation of this report. The working group consists of Richard Hitt, Esq., General Counsel for the Commission, and Amy Haden, Esq., from the Office of General Counsel; Randy Huffman, Director, WVDEP and Vice Chair of the Authority, and Lisa McClung, Deputy Director of the WVDEP, and Jeff Herholdt, Director, WVDOE and Chairman of the Authority, and Casey Randolph from the WVDOE and the Authority. The working group plans to meet again in mid-March, 2012, to prepare the final annual Assessment to be filed with the Governor, the President of the Senate and the Speaker of the House of Delegates by July 1, 2012 pursuant to W.Va. Code §24-2F-9(b).

Summary of Initial Assessment

The initial results of the Alternative and Renewable Energy Resource Planning Assessment prepared by the Public Service Commission in collaboration with the Public Energy Authority Division of Energy identify the sources of information that are available for the development of the annual Assessment due July 1, 2012 and a plan for the development of this Assessment. The working group will continue to collaborate in the preparation of the Assessment that is due July 1, 2012.

The next meeting of the group is planned for mid-March 2012. In the interim, if the members of the Joint Committee have any comments or suggestions regarding this report, please contact the Public Service Commission of West Virginia, Amy Haden, at (304) 340-0435, ahaden@psc.state.wv.us. A copy of this report has been filed electronically with the http://www.legis.state.wv.us/Reports/Agency_Reports/AgencyReports.cfm