

## 2009 Annual Development Plan West Virginia Division of Energy

The West Virginia Division of Energy (WVDOE) 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 Jan. 1-Dec. 31, 2009.

The WVDOE consists of two divisions: the Office of Coalfield Community Development (OCCD) and the Energy Efficiency Program (EEP). The WVDOE director serves as chairman of the West Virginia Public Energy Authority (PEA) and administers its daily operation. The activities for the reporting period are addressed by energy source resource area as described in the state energy plan, “West Virginia Energy Opportunities”: fossil fuels, renewable energy and energy efficiency. This report will address each resource area and the activities of WVDOE in supporting these objectives.

### New activities:

A significant change in the division’s activities resulted from the award of **\$41.8 million** in American Recovery and Reinvestment Act Funding for projects to be administered by the division. Activities under four programs, Energy Assurance, the State Energy Program (SEP), the Energy Efficiency and Conservation Block Grant (EECBG) and Industrial Assessment Centers-Plant Best Practices, were developed and will continue until April 2012.

- Energy Assurance/ARRA: **\$366,482** will support a review and development of a proposed revision to West Virginia’s Emergency Operations Plan (EOP) energy emergency section (Annex V). WVDOE, in cooperation with the West Virginia Department of Military Affairs and Public Safety (DMAPS) and WVU will develop a revised plan component, a data tracking system to support the proposed planning component and training on energy emergency tools and issues for state and local first responders.
- State Energy Program/ARRA: **\$31 million** will support energy efficiency retrofits in state-owned buildings. Retrofits, involving seven state agencies, include lighting, HVAC and window upgrades in 77 buildings totaling nearly 6 million square feet. This program also will result in switching Huttonsville Correctional Center from oil to natural gas, saving \$400,000 in annual heating costs. The program will also result in a geothermal heating system for a new elementary school in Berkeley County. **\$1 million** will support green jobs curricula (wind, solar, building performance and energy code training) in selected community and technical colleges.
- Energy Efficiency and Conservation Block Grant Program: **\$9 million** will support energy efficiency retrofits in buildings owned by local governments. WVDOE will contract West Virginia’s 11 Regional Planning and Development Councils to develop projects that may include installation of insulation; installation of energy efficient lighting; HVAC upgrades; weather sealing; purchase and installation of ENERGY STAR appliances and replacement of windows and doors in city halls and county courthouses.
- Industrial Assessment Centers-Plant Best Practices: **\$500,000** will enable a multi-state approach to the WV Save Energy Now program to include collaboration with Pennsylvania and Tennessee. Activities include energy assessments and industrial grade audits for industries as well as the development of an energy management certification pilot program.

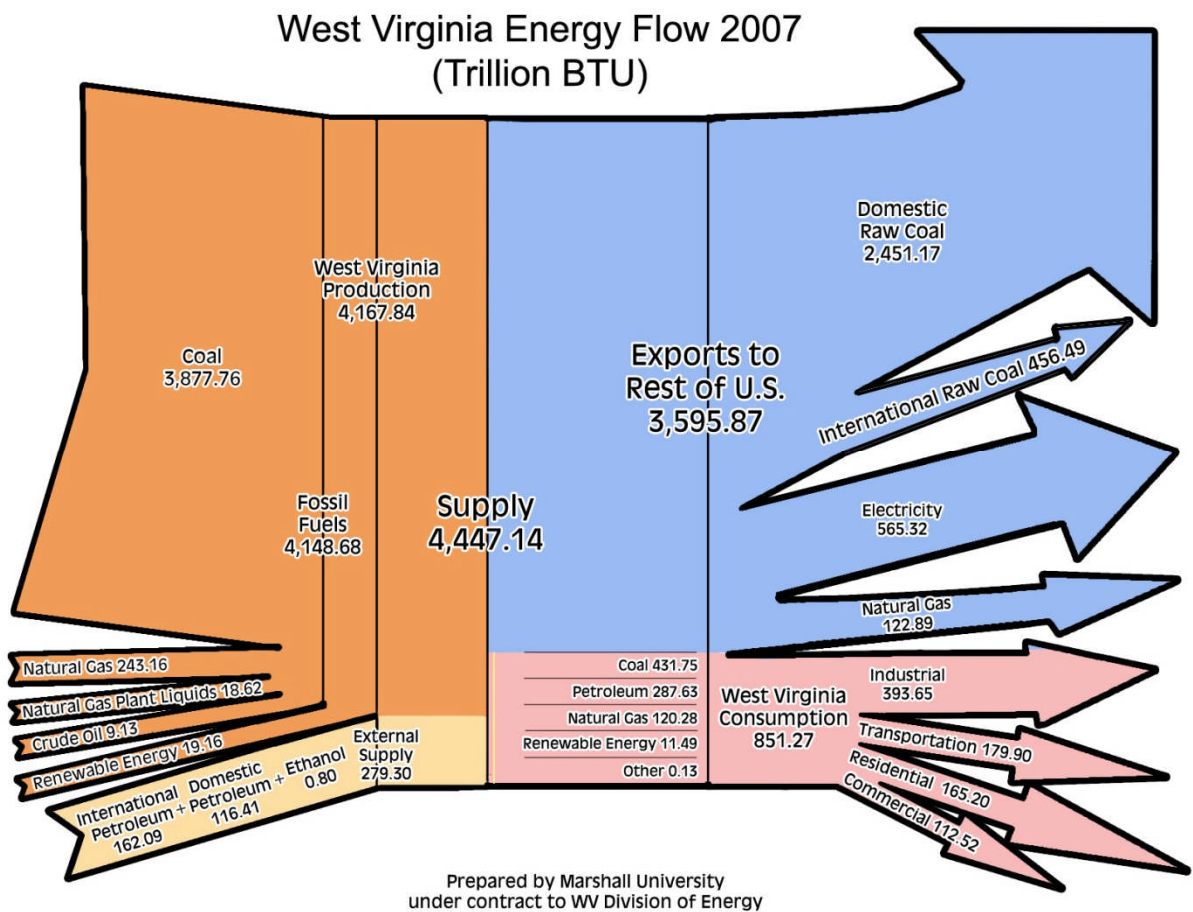
### Fossil fuels

- The West Virginia Governor’s Office, the West Virginia Department of Commerce, the West Virginia Division of Energy and the Southern States Energy Board hosted “Governor’s

Energy Summit: Working to Secure Our Nation's Energy Future" Dec. 8, 2009, at Stonewall Resort. The conference featured presentations including "Coal is the Cornerstone of Our Energy Future," "A Wall Street View of the Energy Space," "Hydrogen Energy in West Virginia," "The Chevrolet Equinox Fuel Cell Vehicle," "AEP CCS Project Update: Mountaineer Plant, New Haven, WV," "Allegheny Power Smart Grid Activities in West Virginia," "Smart Grid Technology Integration," "Longview Power: A Merchant Coal Plant," "Natural Gas: A Promise for Tomorrow's West Virginia," "West Virginia Natural Gas Infrastructure Projects," "An Environmental Challenge," "Wind Power," "Duke Energy's Low Carbon Strategy Initiatives for West Virginia," "Renewable Biomass Power: Key Considerations," "Hydropower in West Virginia," "The Eastern Interconnect," "West Virginia Coal: Our Natural Advantage," "Carbon Capture and Sequestration: Challenges and Costs for Coal," and "Economic Impact of the American Clean Energy and Security Act of 2009 (HR 2454) on the West Virginia Economy." In 2008, the conference featured presentations on W.Va. coal distribution for power generation across the U.S.; hydrogen energy in West Virginia; the Southern States Energy Board's plan, Energy Security for America's Future; the Ned Power Mt. Storm Wind Farm; energy forecasts; the Smart Grid; the Marcellus Shale; the Regional Greenhouse Gas Initiative: The Nation's First Carbon Cap and Trade Program; coal-to-liquids in northern W.Va.; and TransGas Development Systems, LLC.

- West Virginia, with substantial quality coal reserves, abundant water, an established energy infrastructure and trained work force, is in a position to capitalize economically on advanced coal technology such as carbon capture and storage (CCS). Dow Chemical Co. in South Charleston, in collaboration with Alstom, recently unveiled a new pilot project to capture about 1,800 metric tons of carbon dioxide a year from the flue gas of a coal-fired boiler at the facility. Alstom will design, construct and operate the pilot plant. It will use Alstom's and Dow's advanced amine technology. Dow will provide the site and utilities, as well as the chemicals and its amine technology expertise for this project. American Electric Power, in another Alstom partnership, announced a CCS project at the Mountaineer Plant at New Haven. It will be the first coal-fired power plant in the U.S. to capture a portion of its carbon dioxide emissions and inject them underground. The project will sequester about 1.5 percent of the plant's emissions using experimental technology from France's Alstom. The project uses chilled ammonia to capture CO<sub>2</sub> before it escapes the plant's flue, absorbing it to form ammonium bicarbonate, then stripping out the CO<sub>2</sub> and returning the ammonia for reuse. The carbon dioxide is pumped into deep saline aquifers at the site. The demonstration project, which is costing American Electric about \$70 million, captures more than 90 percent of the CO<sub>2</sub> from about 20 megawatts. Germany's RWE AG and the Electric Power Research Institute, an industry-funded organization based in Palo Alto, California, are partners in the project.
- TransGas Development Systems LLC (TGDS) has filed a permit to build a \$3 billion coal-to-liquids plant in West Virginia. Projected to be operational by 2013, the plant will be built in Mingo County's new energy park near Gilbert. The construction phase is expected to generate 3,000 jobs. When fully staffed, the facility will employ as many as 200 workers. TGDS estimates the facility will use up to 3 million tons of locally mined coal a year to produce more than 6.5 million barrels of gasoline. TGDS has signed a licensing agreement with Uhde Corporation of America for the use of the new PRENFLO gasifier reactor. The proprietary technology is under authorized license from Uhde GmbH, Germany.
- WVDOE and the West Virginia University National Research Center for Coal and Energy are continuing a multi-agency task force to address fossil energy priorities identified in the state energy plan, "West Virginia Energy Opportunities." Resultant activities under way include the identification of sites for coal-to-liquid (CTL) plants and assessing carbon sequestration opportunities in West Virginia.

- The Center for Business and Economic Research (CBER) at Marshall University engaged in several components of work outlined in S.B. 177 related to preparation of an energy use database. The CBER created energy flow charts for the state of West Virginia for the years 2005, 2006 and 2007 detailing energy production by resource, exports by resource and consumption by sector. [See chart, **West Virginia Energy flow 2007 (Trillion BTU)**] Time series data on the components of the charts are also collected and posted within CBER's website. A report was also produced describing calculations related to inputs of water, coal, electricity, natural gas and petroleum per unit of energy product produced in the state. Additional reports included maps and data describing West Virginia's coal transportation infrastructure for waterborne, rail and road modes. A dataset of school energy expenditures and calculated energy consumed per square foot of school space was also analyzed and submitted including energy consumption per student. The CBER is also making an effort to collect data on state facilities.



- Coal/biomass to liquids activities include identification of biomass resources and meetings regarding coal blending opportunities. Upon request, WVDOE supports the production of reports on the availability of biomass resources within 50 and 100 miles of a proposed business location.
- The OCCD activities for the period included:
  - The review of approximately 30 permits, consisting of approximately 43 original notifications of requirement to file community impact statements (CIS). The office approved 30 new and updated CIS plans during the period.
  - OCCD approved more than 200 exemptions from requirements to file CIS plans. Most of these exemptions were granted to non-surface mine operations and permits beyond their first renewal period.

- Boone, Lincoln and Mercer counties have updated the information to evaluate their Land Use Master Plans.
- McDowell County has approved its first Land Use Master Plan.
- Webster County updated its plan based on the new information, which includes 100 acres for light industrial development
- Clay and Wyoming county commissions have charged their development authorities with updating their plans before the July 1 deadline.
- Mineral and Greenbrier counties are including this specific plan within their Comprehensive Land Use Plan
- OCCD's contract with the Brownfield Assistance Center has been utilized by Webster and Wyoming to assist in keeping the cost of mapping down. No counties have used consultants.
- OCCD's contract with the Brownfield Assistance Center was used to create a December 2009 workshop to educate counties on the process and tools available to create their Land Use Master Plans.
- All surface mine counties have been contacted throughout the year to ensure they know about the new legislation and the assistance the office can provide to help them comply with the new legislation
- OCCD has contracted with the Brownfield Assistance Centers located within Marshall and WVU to provide technical assistances such as GIS mapping and geological reviews. This has been extremely helpful in providing information on specific sites for wind and biomass development as well as assisting counties on creating or updating their Land Use Master Plans.
- OCCD has worked with the West Virginia Department of Environmental Protection to allow Community Impact Statements to be completed online along with surface mine permits.
- OCCD has a working relationship with the West Virginia Division of Forestry and WVDEP to help facilitate biomass projects on surface mine sites.
- OCCD is working with the Appalachian Hardwood Center to evaluate biomass resources and potential projects on surface mine sites.
- OCCD is working with the West Virginia Geological Survey to provide mapping assistance to counties.
- OCCD has met with large land owners, securing agreement for OCCD to review maps of their properties for development opportunities.
- OCCD has gathered information on sites with wind opportunities and is promoting the opportunity through the West Virginia Development Office.
- OCCD has digitized all Community Impact Statements and will be dispersing them to all county development groups throughout the year.
- The W.Va. Division of Energy was awarded an ARC grant to assist with renewable energy projects on surface mine sites. This grant will be implemented in 2010.
- OCCD has responded to requests for information from interested parties on the development of wind and solar on surface mine sites. Information is provided with assistance from local development groups.
- OCCD is assisting Webster County and coal operators in evaluating development opportunities on new surface mine operations.

- OCCD is working with several partners on a significant agriculture/entrepreneurial project involving the cultivation of honey bees on surface mine sites.
- OCCD continues to assist TransGas with the CTL project in Mingo County on a surface mine site.
- OCCD is assisting the National Guard and the Charleston Area Alliance on a specific project within Kanawha County.

## **Renewable energy**

- WVDOE continues to promote the development of renewable energy in West Virginia, working with developers to locate projects including hydroelectric, wood-fired power and wind.
- A grant from the U.S. Department of Energy will expand the activities of the West Virginia Wind Working Group to include identifying areas in the state where wind farms are technologically feasible and economically prudent, considering the impact of wind farms on economic development and staying abreast of pending wind developments.
- WVDOE supported the passage of West Virginia's Alternative and Renewable Energy Portfolio Standard, which requires the state's large electric utilities to own credits equal to the electricity sold to retail customers in the state with mandated percentages of 10% by 2015, 15% by 2020 and 25% by 2025.
- In August at Yeager Airport in Charleston, West Virginia opened its first hydrogen production and dispensing station, constructed and operated with support from the Office of Fossil Energy's National Energy Technology Laboratory (NETL). The facility will produce, compress, store and dispense hydrogen as a fuel source for vehicles that have been converted to run on hydrogen, as well as other types of ground equipment at the airport. The Yeager facility uses coal-generated grid electricity to split water to produce pure hydrogen fuel. About 300 gallons of water is used to produce up to 12 kilograms of hydrogen per day, enough to completely refuel three vehicles. The fuel will be used by airport operations, the 130th Air Wing of the West Virginia Air National Guard and the Charleston community. The commissioning of the new station marked the start of the Mountain States Hydrogen Business Council's (MSHBC) 5th Annual Hydrogen Implementation Conference August 17-19 in Charleston. The West Virginia Clean State Program co-sponsored the conference, which featured a workshop on hydrogen for first responders presented by the National Alternative Fuels Training Consortium based in Morgantown. Gov. Joe Manchin III proclaimed Aug. 18 as Hydrogen Awareness Day as he presented the keynote. More than 130 participants heard presentations on the global state of hydrogen, new and upcoming OEM vehicles, and on the use of hydrogen for stationary power applications. They also had the opportunity to ride in General Motors' hydrogen fuel cell car.
- As of December 2009, 31 West Virginia county school systems power their school buses with biodiesel.
- WVDOE received \$400,000 from the Appalachian Regional Commission for the development of renewable energy projects on surface-mined lands. The program will be split into two initiatives that will be managed through the WVDOE's relationship with Marshall University's Center for Environmental, Geotechnical and Applied Sciences (CEGAS). Initiative 1 will include six competitive cost-shared subgrants for projects with the potential to yield sustainable biomass energy production, wind generation of electricity and solar photovoltaic and concentrated solar power applications on surface-mined lands in West Virginia. Initiative 2 will assess and advance wind opportunities on surface-mined lands.

- The West Virginia Wind Working Group, in cooperation with WVDOE, hosted its annual symposium on wind energy development in West Virginia. More than 60 representatives of the wind energy industry, government, utilities and the environmental community attended the session, which featured presentations including “Financing Wind Energy Projects,” “Attracting Wind Energy Manufacturers to West Virginia,” “An Update on AEP and Appalachian Power Activity in Wind Energy,” “Overcoming the Challenges to Acceptance of Wind Energy in PJM,” “Market Barriers to Wind Development in Central Appalachia,” “The Alternative and Renewable Energy Legislation,” “The Cost of Developing and Constructing Wind Farms,” “Training West Virginia’s Energy Workforce,” “The Community Colleges and Green Jobs Training” and “Opportunities for Wind Energy in the Coal Fields of Southern WV.”
- Meetings were conducted with forestry representatives about the prospect of locating wood-fired electric generation facilities in West Virginia.

## Energy efficiency

- WVDOE supported the adoption of the 2009 International Energy Conservation Code for residential construction and the ANSI/ASHRAE 90.1-2007 standard for commercial construction. The W.Va. Fire Commission approved the adoption of these codes; the W.Va. Legislature will complete the process in 2010.
- Supported by WVDOE, student teams with the WVU Projects With Industry program have provided process energy analyses at Bright of America (Summersville); Grant Town Power Plant (Grant Town); Flint Group Pigment Plant (Huntington); Gemark (Bluefield); Laurel Creek Hardwoods (Richwood) and Wilson Works (Morgantown). Among the manufacturers who participated in WVDOE-supported program, Industrial Gas Utilization and Industrial Assessment, at WVU in 2009 were: ATK (Rocket City); Bombardier (Bridgeport); Aleris (Buckhannon); Dallison Lumber (Jacksonburg); Danser (Parkersburg); and Superior Fiber (Reedsville).
- The respective WVDOE-supported Centers for Building Energy Use (CBEU) at WVU and WVUIT have provided energy benchmarking and technical assistance in 2009 to five county school systems. These include Monongalia County Schools, Pleasants County Schools, Roane County Schools, Hampshire County Schools and Pleasant County Schools. Benchmarking determines a baseline of energy use against which future energy savings will be measured.
- The Center for Building Energy Use (CBEU) program assisted Wyoming County Schools in certifying its schools for ENERGY STAR® building awards. Since 2007, when the CBEU began assisting Wyoming County Schools in using ENERGY STAR® Portfolio Manager, eight of its 13 schools have been certified as ENERGY STAR® buildings. The remaining schools are anticipated to be recognized for this achievement in 2010. The average benchmark rating for in Wyoming County school is 88 out of a possible score of 100, meaning these schools are in the top 12 percent of nationally in energy efficiency.
- In its second year, the state’s ENERGY STAR sales tax holiday was expanded from one week to three months. The 2009 event eliminated sales tax on purchases of ENERGY STAR products valued at \$5,000 or less. The sales tax holiday continues in 2010. WVDOE supported this activity through a news release and media event, a four-color handout and promotion on its website.
- WVDOE sponsored advanced building practice training for more than 150 architects, engineers, building code officials and other W.Va. residents during workshops in Charleston, Lewisburg, Bluefield, Oak Hill, Bridgeport and Martinsburg. The workshops were partially supported by a grant from the Appalachian Regional Commission.

- WVDOE continued to work with the Consumer Advocate Division of the Public Service Commission to explore possibilities for demand-side energy efficiency programs to be offered through the state's utilities.