Renewable Energy in the State of West Virginia

May 12, 2016
Huntington, WV
West Virginia Energy Flow 2013 (Trillion BTU)

Based on EIA Production & Consumption Data

Supply 3,916.0

Coal 2,874.7
Fossil Fuels 3,715.9
Natural Gas (including NGPL) 797.3
Crude Oil 43.9
Renewable Energy 53.7
International Petroleum 72.8
Domestic Petroleum 67.2
Ethanol 6.3

Export to U.S. and International 3,178.3

Domestic Raw Coal 1,164.1
International Raw Coal 937.0
Natural Gas 647.7
Electricity 429.5

West Virginia Consumption 737.7
Coal 357.6
Petroleum 184.0
Natural Gas 149.6
Renewable 46.5

External Supply 146.4

Industrial 281.2
Residential 174.0
Transportation 170.2
Commercial 112.3

Prepared by Marshall University Center for Business and Economic Research under contract to WV Division of Energy
Numbers may not sum to total due to rounding.
West Virginia Net Electric Generation, 2015

- Coal: 95.3%
- Other: 4.7%
- Wind: 2.31%
- Hydro: 1.91%
- Natural Gas: 0.32%
- Other: 0.16%
## Licensed WV Hydro Facilities

<table>
<thead>
<tr>
<th>Name</th>
<th>Capacity (MW)</th>
<th>Licensee</th>
<th>Waterway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belleville</td>
<td>42.0</td>
<td>American Minicipal Power, Inc</td>
<td>Ohio River</td>
</tr>
<tr>
<td>Dam No. 4</td>
<td>1.9</td>
<td>PE Hydro Generation LLC</td>
<td>Potomac River</td>
</tr>
<tr>
<td>Dam No. 5</td>
<td>1.2</td>
<td>PE Hydro Generation LLC</td>
<td>Potomac River</td>
</tr>
<tr>
<td>Hawks Nest &amp; Glen Ferris</td>
<td>108.2</td>
<td>Hawks Nest Hydro, LLC</td>
<td>New River</td>
</tr>
<tr>
<td>Jennings Randolph</td>
<td>14.0</td>
<td>Fairlawn Hydroelectric Co., LLC</td>
<td>Potomac River</td>
</tr>
<tr>
<td>Lake Lynn</td>
<td>51.2</td>
<td>Lake Lynn Generation, LLC</td>
<td>Monongahela River</td>
</tr>
<tr>
<td>London/Marmet</td>
<td>28.8</td>
<td>Appalachian Power Co. (VA)</td>
<td>Kanawha River</td>
</tr>
<tr>
<td>Millville</td>
<td>2.8</td>
<td>PE Hydro Generation LLC</td>
<td>Shenandoah River</td>
</tr>
<tr>
<td>New Martinsville</td>
<td>35.7</td>
<td>City of New Martinsville (WV)</td>
<td>Ohio River</td>
</tr>
<tr>
<td>Racine</td>
<td>47.5</td>
<td>AEP Generation Resources, Inc.</td>
<td>Ohio River</td>
</tr>
<tr>
<td>Summersville</td>
<td>80.0</td>
<td>City of Summersville (WV)</td>
<td>Gauley River</td>
</tr>
<tr>
<td>Willow Island L&amp;D</td>
<td>35.0</td>
<td>American Minicipal Power, Inc</td>
<td>Ohio River</td>
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<tr>
<td>Winfield</td>
<td>14.8</td>
<td>Appalachian Power Co. (VA)</td>
<td>Kanawha River</td>
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</table>

**Total Capacity:**

463.1 MW
**Hydro Power, Continued**

### Preliminary Permitted WV Hydro Facilities

<table>
<thead>
<tr>
<th>Name</th>
<th>Capacity (MW)</th>
<th>Licensee</th>
<th>Waterway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hildebrand Lock &amp; Dam</td>
<td>7.5</td>
<td>Lock+Hydro Friends Fund XLVI</td>
<td>Monongahela River</td>
</tr>
<tr>
<td>New Cumberland Locks &amp; Dam</td>
<td>49.8</td>
<td>FFP Project 121 LLC</td>
<td>Ohio River</td>
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<tr>
<td>Stonewall Jackson</td>
<td>0.3</td>
<td>Mahoning Hydropower, LLC</td>
<td>West Fork River</td>
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<td>Sutton</td>
<td>9.2</td>
<td>James R. Robertson</td>
<td>Elk River</td>
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<tr>
<td>Jennings Randolph</td>
<td>14</td>
<td>Fairlawn Hydroelectric Co.</td>
<td>North Branch Potomac</td>
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<td>Tygart</td>
<td>30</td>
<td>Tygart LLC</td>
<td>Tygart River</td>
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**Total Preliminary Permit Capacity:**

110.8 MW
## WV Wind Farms

<table>
<thead>
<tr>
<th>Name</th>
<th>Capacity (MW)</th>
<th>Operator</th>
<th>County</th>
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</thead>
<tbody>
<tr>
<td>Beech Ridge Energy, LLC</td>
<td>100.5</td>
<td>Invenergy Services, LLC</td>
<td>Greenbrier</td>
</tr>
<tr>
<td>Laurel Mountain</td>
<td>97.6</td>
<td>AES Wind Generation, Inc.</td>
<td>Randolph</td>
</tr>
<tr>
<td>Mountaineer Wind Energy Center</td>
<td>66.0</td>
<td>FPL Energy, LLC</td>
<td>Tucker</td>
</tr>
<tr>
<td>NedPower Mount Storm</td>
<td>264.0</td>
<td>Shell Wind Energy, Inc.</td>
<td>Grant</td>
</tr>
<tr>
<td>Pinnacle Wind Force, LLC</td>
<td>55.0</td>
<td>Edison Mission Energy</td>
<td>Mineral</td>
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</tbody>
</table>

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<thead>
<tr>
<th>Name</th>
<th>Capacity (MW)</th>
<th>Operator</th>
<th>County</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Creek*</td>
<td>103.0</td>
<td>Enbridge</td>
<td>Grant</td>
</tr>
</tbody>
</table>

*A construction extension was granted by the PSC in September 2014. AES Wind Generation, Inc. is looking for a buyer for the project. (Construction has been stalled since early 2012.)*

**Operating Capacity:**

583.1 MW
Wind Capacity

WV Wind Electric Generating Capacity
2007-2011

Solar

Examples of state and local government installations supported by WV Division of Energy

- Morgan County Courthouse
- Town of Man
- Village of Beech Bottom
- Hurricane Municipal Waste Water Treatment
- Mt. View High School
- University High School
- Cameron High School
- West Virginia DEP Headquarters
Solar Generation

West Virginia Solar Capacity Growth
October 2006 – February 2016

Source: PJM GATS Database
Biomass

- West Virginia wood pellet producers:
  - Appalachian Wood Pellets
  - Hamer Pellet Fuel Company
  - Lignetics of West Virginia

- West Virginia is the third most heavily forested state in the nation with more than 78% of the land covered with forest.

- Wood for residential purposes: 130,308 cords
- Wood for boiler fuels: 5,000 cords
- Total wood pellet production capacity: 300,000 tons/year

- 150,000 acres harvested annually represents 1.25% of our 12 million forested acres
Thank you.