Wind Energy: A National Perspective
Wind Powering America (WPA) was established by Department of Energy to advance “high priority” states. Virginia benefited from WPA support from 2002 until 2012.

The on-shore American wind resource alone could electrify the nation nearly 10 times over.
20% Wind Energy by 2030

20% Wind Energy by 2030
Increasing Wind Energy’s Contribution to U.S. Electricity Supply

July 2008
20% Wind Scenario

Cumulative Installed Capacity (GW)

- Offshore
- Land-based

305 GW
20% Wind Scenario

- Goal: 20% of U.S. power to be produced by wind by 2030
- To achieve that, wind power will have to exceed 300 GW
- As of 2006, 11.6 GW installed
- As of 2012, > 60 GW installed
- Report shows roadmap for annual increases, reaching 16 GW/yr to be installed between 2018 and 2030
Utility Scale wind capacity includes installations of wind turbines larger than 100-kW for the purposes of the AWEA U.S. Wind Industry Annual Market Report. Wind turbines 100-kW and smaller are included in the AWEA Small Wind Global Market Study. Annual capacity additions and cumulative capacity may not always add up due to decommissionings and repowers. Wind capacity data for each year is continuously updated as information changes.

46 states would have substantial wind development by 2030

The black open square in the center of a state represents the land area needed for a single wind farm to produce the projected installed capacity in that state. The brown square represents the actual land area that would be dedicated to the wind turbines (2% of the black open square).

Wind Capacity
Total Installed (2030) (GW)

0.0 - 0.1
0.1 - 1
1 - 5
5 - 10
> 10

Includes offshore wind.
20% Wind Scenario impact on generation mix in 2030

- Reduces electric utility natural gas consumption by 50%
- Reduces total natural gas consumption by 11%
- Natural gas consumer benefits: $86-214 billion
- Reduces electric utility coal consumption by 18%
- Avoids construction of 80 GW of new coal power plants
Where are we now?

Figure 13 U.S. Wind Power Capacity Installations, by State

NATIONAL-SCALE BENEFITS

Footnote: AWEA tracks and reports U.S. wind energy industry employment in terms of full-time equivalents (FTE). This methodology and approach adjusts and accounts for part-time positions such as construction jobs that may only last a few weeks or months during the year or manufacturing positions that only work part-time on wind components. While employment reports at the project level often report out number of individuals employed, AWEA adjusts all jobs to FTEs for consistency.
OFFSHORE
U.S. Offshore Wind Resource
Jobs & Economic Development Impact (JEDI) Analysis

• A study and application of the JEDI model to estimate the economic impacts associated with offshore wind power developed off the coasts of:
  • Virginia
  • North Carolina
  • South Carolina
  • Georgia

• Spreadsheet-based tools that estimate the economic impacts of construction and operating power plants at the local level

• JEDI models estimate the number of jobs, earnings, and economic output distributed across 3 categories:
  – Onsite labor and professional services
  – Equipment production and supply chain
  – Induced economic activity

• Results report *gross jobs* (in Full-Time Equivalents [FTE’s]) as opposed to net jobs and are not a measure of project viability.
Major attributes for each state were identified and understood, including:

- Federal, state, and local activities
- Wind resource
- Transmission infrastructure
- Ports
- Supply chain

Assumptions were made based on the knowledge gained for the major variables associated with JEDI:

- Deployment and Market
- Regional Content
- Cost

Three scenarios in the Southeast were developed for application using the JEDI model.

<table>
<thead>
<tr>
<th>Total Capacity Installed by 2030</th>
<th>Capital Cost/kW (2020-2030)</th>
<th>Regional Content (2020-2030)</th>
<th>FTE/MW (2020-2030)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>1.7 GW</td>
<td>$5,407 - $5,040</td>
<td>20% - 38%</td>
</tr>
<tr>
<td>Med</td>
<td>4.0 GW</td>
<td>$5,199 - $4,480</td>
<td>23% - 60%</td>
</tr>
<tr>
<td>High</td>
<td>9.8GW</td>
<td>$4,972 - $3,920</td>
<td>28% - 78%</td>
</tr>
</tbody>
</table>
Atlantic Wind Connection
Offshore Transmission Backbone
What’s driving interest in Wind Power?

• National and state electricity needs
• Jobs
• Environmental concerns with fossil, nuclear power
• \( \text{CO}_2 \) emissions and climate change
• Renewable Portfolio Standards
• Cost competitiveness with coal and natural gas
• Attractive wind resources
• National goals
Questions?

Jonathan J. Miles, Ph.D.
Director

Remy Pangle
Associate Director,
Curriculum Coordinator

Blaine Loos
Project Facilitator,
Education Coordinator

Cindi Smead
Administrative Assistant

Dane Zammit
Data Manager

Deanna Zimmerman
Outreach Coordinator

1401 Technology Drive, Suite 120
MSC 4905
Harrisonburg, VA 22807
540-568-8770
vacenter4windenergy@jmu.edu

www.windpowerVA.org
www.offshorewindVA.org

Visit our Facebook Page to ask questions, give feedback, see current events and project photos, and stay up-to-date on what’s happening at the Center and with wind energy throughout Virginia!

Join our LinkedIn Group to engage in discussions, participate in polls, read current articles, and ask questions!

Skype us via VACenterforWindEnergy to ask questions or just chat with us!