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Impacts, Competing Use, and Economic Development

Photo from Turner Hunt, Vision Energy, NREL 16108

BOEM Offshore Renewable Energy Workshop

July 29-30, 2014

Ian Baring-Gould

Stakeholder Concerns Regarding Offshore Wind

Marine animal populations:

European studies suggest minimal impacts. U.S. studies required to better understand potential risks and develop mitigation strategies. Pile driving during construction has highest impact although mitigation strategies may be effective in reducing this temporal risk. Alternative technology can also be implemented if appropriate to avoid some of the pile driving activity.

Visual effects:

Coastal residents near offshore wind farms be concerned about visual impacts, some research has been done which provides insight but typically assessment within each community or region needed.

Property values:

Studies conducted on land-based wind projects show no long term impact on real estate prices and property values as a result of the presence of wind turbines; however, extensive studies have not been conducted on the impact of offshore wind turbines on coastal communities.

Noise:

The most significant noise associated with pile driving during construction. Once installed, noise issues are very unusual.

Tourism:

Impacts on tourism may concern some communities dependent on beach vacationers and the resulting local revenues and tax base. The evidence is ambiguous and actual effects appear to be minimal or positive.

Marine safety:

The possibility of a ship colliding with a turbine could pose a risk to the marine environment from fuel leaks or to human safety should the turbine collapse. No reported incidents have occurred to date.

National Security/Radar:

Very little really known at this point, but has been highlighted as a siting issue.

Community engagement and discussion is the best method to address concerns

Visual impacts

Pre-visualization of the Horns Rev wind farm from Blåvands Huk (above) and actual post-construction photograph from Blåvands Huk (below) (Credit: DONG Energy)

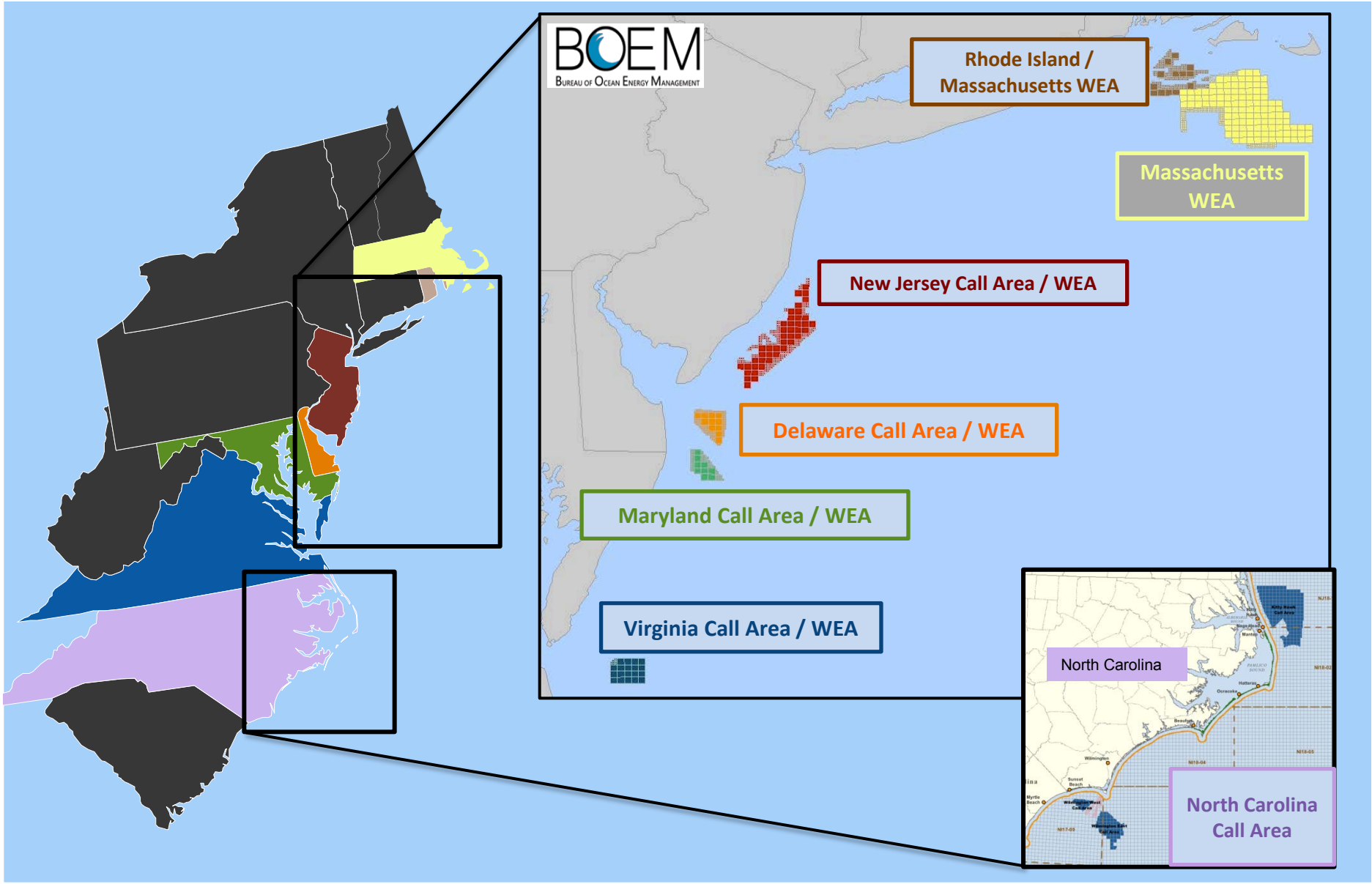
Potential Competing Uses

We are tied to the ocean – so there are a great deal of competing uses..

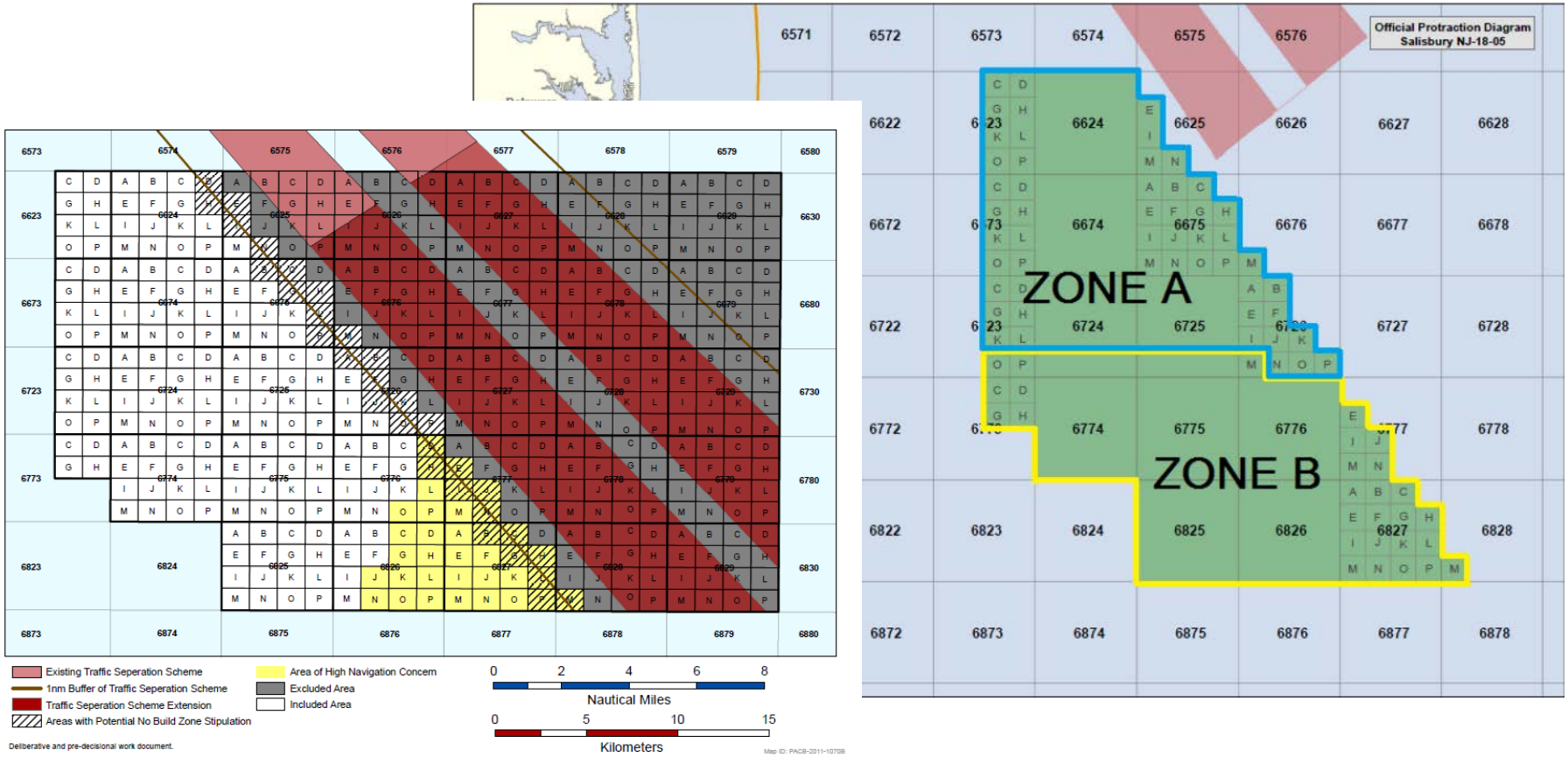
- Shipping lanes and potential safety requirements
- Fisheries and fishing
- Military use including security buffers, training areas, and radar
- Development of other energy resources
- Recreational boating
- Environmentally sensitive areas (marine wildlife, avian, sea floor and cable landing)
- Areas of historical significance (both coastal and offshore)
- Tourism
- …

All of these continue to highlight the importance of state taskforce meetings and other venues that allow dialog and education between all of the potentially impacted communities

BOEM Lead Collaboration to Identify Likely Development Areas



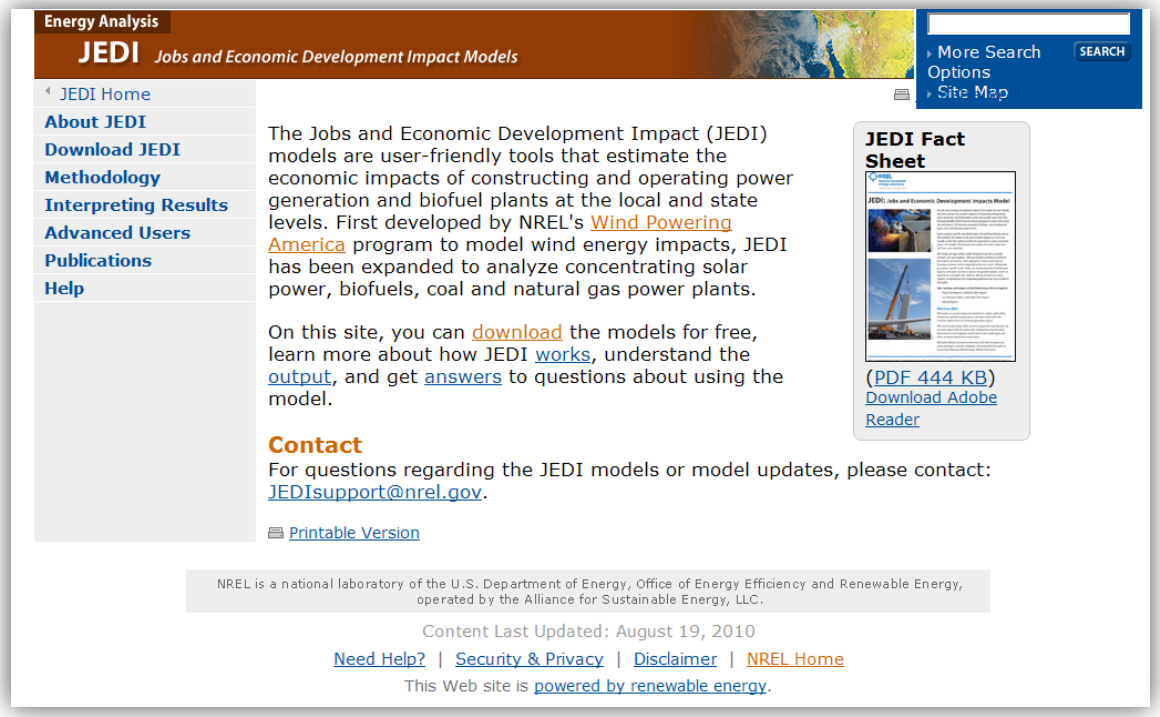
Modifications to MD proposed Wind Energy Area Lease Zones



The original proposed zones for Maryland identified by BOEM through a collaborative process of the State Task Force have changed significantly over time.

Even as recently as January 2013 the Coast Guard raised concern around navigation from Delaware Bay and requested an additional one (1) nautical mile setback from the outer edge of the traffic separation scheme – eliminating some 32 aliquots

The JEDI Analysis Tools



JEDI is used by industry, government, academics, advocates, consultants, and others.

Currently public

- Utility-Scale Wind
- Natural Gas
- Coal
- Geothermal
- Ethanol
- Solar (CSP, PV)
- Marine and hydrokinetic
- Marine and hydrokinetic
- Fixed offshore wind

In process

- Hydropower (conventional)
- Natural gas (combined cycle)
- Transmission
- Biopower
- Small wind
- Geothermal
- Floating offshore wind

Jobs and Economic Development Impacts (JEDI) Model

Economic Development at Multiple Levels

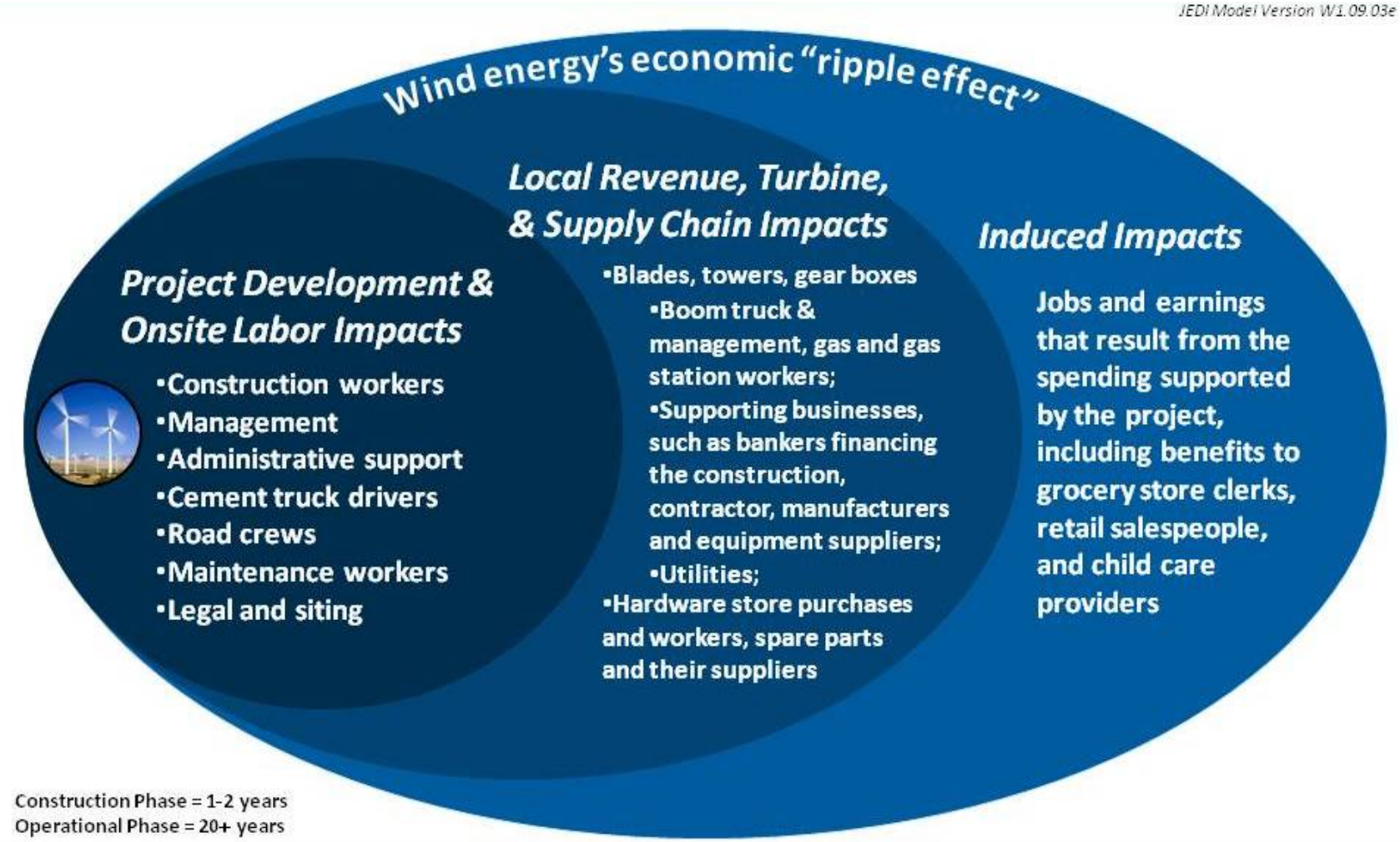
1. On-site labor and professional services

2. Equipment production and supply chain

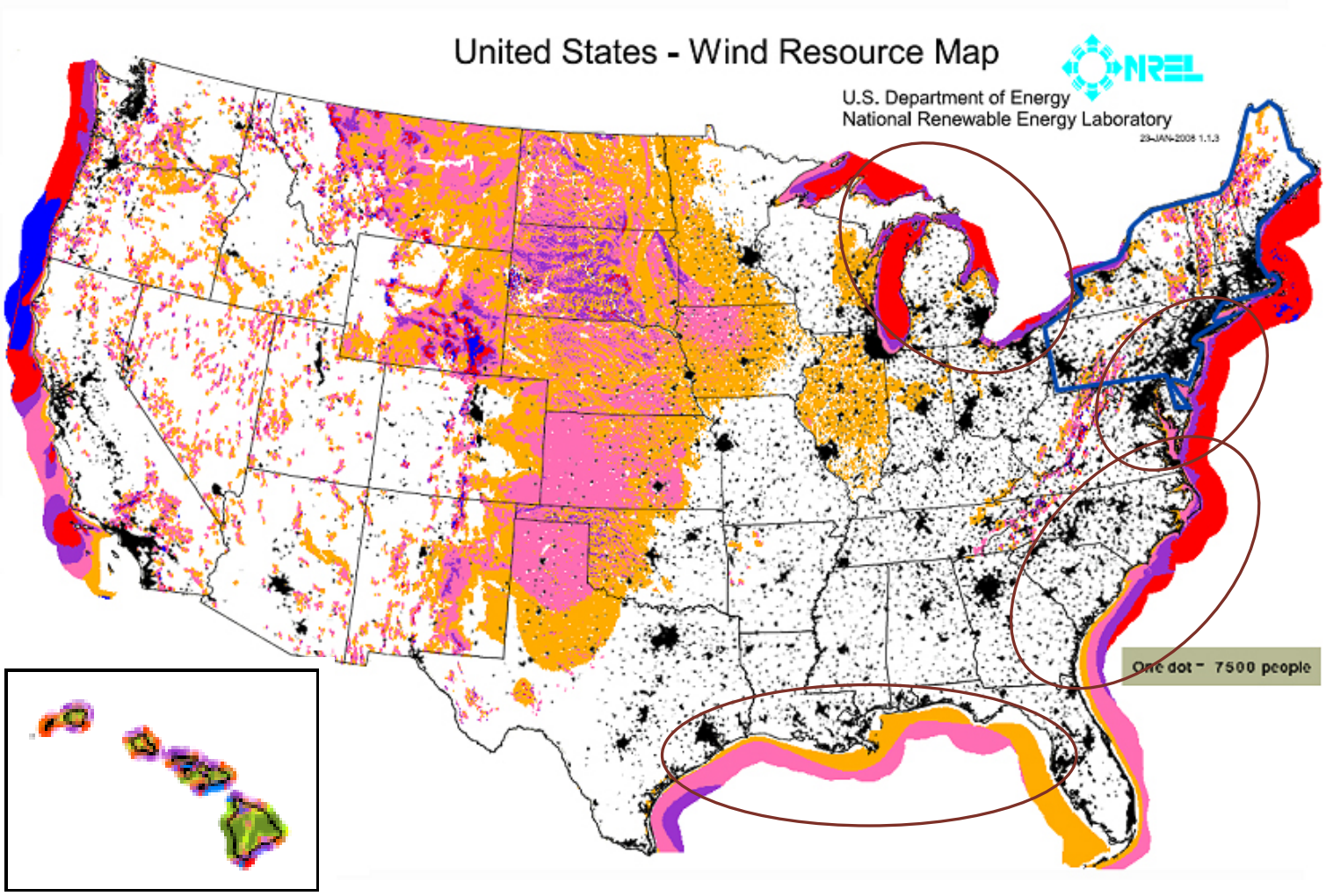
3. Induced economic activity (household purchases due to injection of income)

Jobs & Economic Impacts from the JEDI Model

Wind Energy's Economic Impact



JEDI Assessments being finalized by DOE

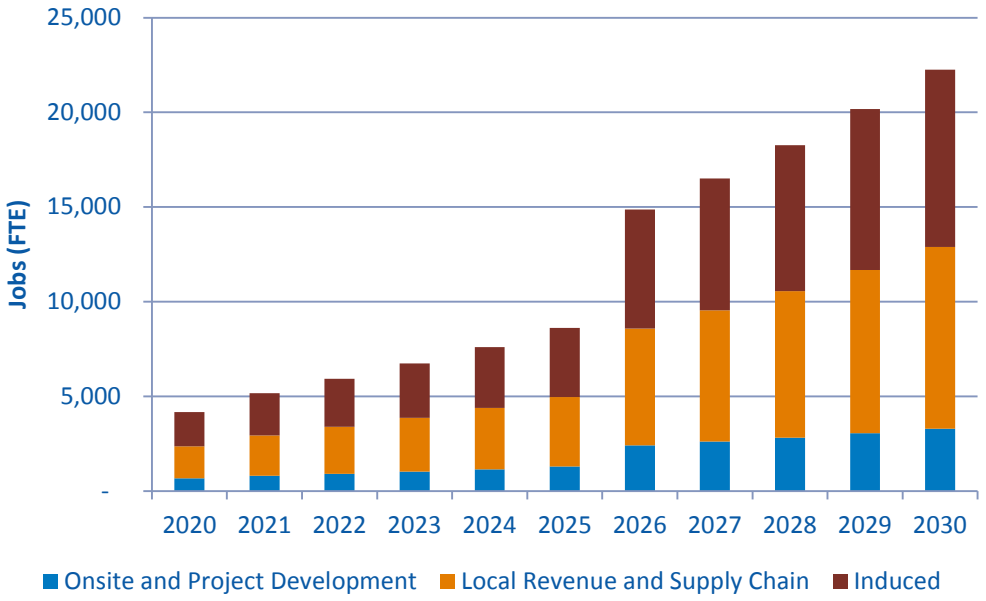


Credit: Dr. H. J. Dagher

Mid Atlantic Assessments

Multiple cases assessed with different assumptions on local supply chain

Scenario	Scenario Detail	2020/2030 Cumulative Capacity Installed (MW)	2020/2030 Supply Chain Investment (Local Content)	2020/2030 Construction Cost ($/kW)
A	Low deployment	Low (95/1,695)	Low (20%/53%)	High ($5,400/$5,000)
B	Average deployment	Medium (252/4,027)	Medium (20%/53%)	Medium ($5,000/$4,500)
C	High deployment	High (985/9,760)	High (26%/75%)	Low ($5,000/$3,900)
D	Low deployment with more aggressive local and regional investment and supply chain development	Low (95/1,695)	High (26%/75%)	Medium ($5,000/$4,500)
E	High deployment with less aggressive local and regional investment and supply chain development	High (985/9,760)	Low (20%/53%)	Medium ($5,000/$4,500)



	Jobs (FTE) 2020	Jobs (FTE) 2030
During Construction Period		
Project Development and Onsite Labor Impacts	854	24,598
Construction and Interconnection Labor	663	21,885
Construction-Related Services	192	2,713
Turbine and Supply Chain Impacts	1,547	44,701
Induced Impacts	1,807	50,677
Total Impacts during Construction	**4,211**	**119,978**
During Operating Years (Annual)		
Onsite Labor Impacts	18	328
Local Revenue and Supply Chain Impacts	225	3,952
Induced Impacts	171	3,212
Total FTE Jobs during Operation	**414**	**7,492**

Results for the average deployment case (B) strong local labor needs

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NREL 14927

Carpe Ventum

E. Ian Baring-Gould

Technology Deployment Manager

National Wind Technology Center &
Deployment and Industrial Partnerships

303-384-7021

Ian.baring-gould@nrel.gov