Powering Ohio’s Economy with Offshore Wind

First in the Water, First in Jobs
US Electric Power Sources

2009 U.S. Electricity Generation by Source

- Coal: 44.9%
- Natural Gas: 23.4%
- Nuclear: 20.3%
- Hydroelectric Conventional: 6.9%
- Other Renewables: 3.6%
- Petroleum: 1.0%
LEEDCo
Lake Erie Energy Development Corporation

Regional
Public/Private
Private Investment

Jobs
Offshore Epicenter
20 MW Pilot Project

Turbine Supplier
“Freshwater Wind”
Research Partners
Strategic Advisors

GE
GLW Energy
Cavallo Energy
Bechtel

Ohio State University
Case Western Reserve University
Bowling Green State University
National Renewable Energy Laboratory
Cleveland State University

NorTech Energy Enterprise
Cleveland Foundation
Lorain County Fighting the Way
Lake County, Ohio

Ashtabula County Courthouse
Cuyahoga County of Ohio
Cleveland Foundation funds anemometer on the water intake crib offshore Cleveland.

2004

Cleveland Foundation vision for an Ohio driven Lake Erie offshore wind industry.

Task Force proposes offshore wind as a regional economic development engine, calling for a Feasibility Analysis.

Cuyahoga County forms Great Lakes Energy Task Force to promote advanced energy in Ohio.

2005

Feasibility Analysis is completed, confirming environmental and technical viability of offshore wind in Lake Erie.

Cleveland Foundation funds the Great Lakes Science Center Wind Turbine

2006

LEEDCo is formed as the vehicle to advance Ohio’s offshore wind energy initiative.

2007

Geotechnical, fisheries, historic preservation, & permitting analysis, power purchase agreement.

2008

GE selected as turbine supplier

2009

Bechtel/GLWE/Cavallo selected as developer

2010

Economic Impact Study by Kleinhenz Associates

Avian Radar/Bat Survey

2011

Geophysical Survey

2012

Basic Fisheries Survey

Shipwreck Survey

2020

1000 MW in Lake Erie

Ohio becomes hub for a Great Lakes offshore wind industry.

2011

Commence construction on 20 MW wind project.
Beyond generating power, LEEDCo seeks to maximize Ohio’s offshore wind energy potential by capturing the emerging Great Lakes industry – dubbing Ohio as the epicenter.

**Vision:**
- 2013 – 20 MW
- 2020 – 1000 MW
- 2030 – 5000 MW
Mission

Cost/kWh

Lower Costs

Jobs

Lake Erie 68,000 MW Capacity
Great Lakes 250,000 MW

Nuclear - 1957
Ohio & Wind Energy History

- Charles F. Brush
  - Born in Euclid, Ohio
  - 1887 - world's first wind-powered electric generator in Cleveland.
  - 144 blades, 50-ft. Rotor = 12 kilowatts
  - Brush’s company eventually became GE.

- NASA Glenn Research Center
  - Located in Brook Park, Ohio
  - Turbine development paved the way today
  - Program eventually divested.

Question: “Where did Ohio’s turbines go?”

3.2 MW turbine in Hawaii
Europe:
- 3,185 MW in operation
- $100 BB planned
- Manufacturing is growing
- Ports revitalized/Jobs created

Asia:
- $30 BB Investment in Wind
- Using European experience & dramatically driving costs down
What does this mean for Ohio?

- **Sputnik moment**…
- **Ready or not: Offshore wind industry is coming**
- **Urgency: Race is on to capture economic benefits**
- **Utilize momentum to be first in the water**

Select Great Lakes Projects*
- MI – Scandia Wind – 150 MW
- NY – NYP A – 100-500 MW
- WI – Aquilo Wind – 50 MW
- IL – Evanston – 200 MW
- OH – LEEDCo/Freshwater Wind – 20 MW
- OH – LEEDCo/Freshwater Wind – 1,000 MW

Select East Coast Projects*
- MA – Hull - 15 MW
- MA – Cape Wind – 468 MW
- RI – Deepwater Wind/Block Island – 30 MW
- RI – Deepwater Wind/RI Sound – 385 MW
- NY – Con Ed/LIPA – 350/700 MW
- NJ – Fishermens Energy Atlantic City – 20 MW
- NJ – Fishermens Energy Federal Waters – 350 MW
- NJ – Garden State Offshore Energy – 350 MW
- NJ – NRG Bluewater Wind – 350 MW
- DE – NRG Bluewater Wind – 300-450 MW
- VA – APEX Wind – 1,200 MW
- VA – Seawind Renewable Energy – 1,000 MW
Ohio Currently...

- Ohio a leader onshore
- 7,500 wind manufacturing jobs
- World Class Manufacturing Strengths
...But There’s More in Offshore
Ohio Ports to Dominate

Lake Erie Activity

- Canada - 4,500 MW
  - 1500 Turbines
- New York - 500 MW
  - 150 Turbines
- PA - 1000 MW
  - 300 Turbines

- 50% Canadian content = Ohio component/job exports
- LEEDCo as a model
Scale of Deployment

• Revitalize Ohio’s Ports/Shipyards

• Initial fabrication & staging to be in Cleveland or Lorain.

• Commercial scale projects could utilize most ports.
Initial Project:

- Big enough to **capture** attention
- Small enough to do fast and position Ohio as **first**
- Small enough to **limit** rate impact
- Target dates:
  - Begin 2012
  - COD late 2013

- Iconic
- 7 Miles offshore
- 5-8 turbines producing 20-30 MW
Industry to coalesce where 1st projects are built.

- Claim stake
  - Demonstrate
  - Capture new investment
  - Supply Chain

- Jobs
  - Manufacturing, construction, installation, maintenance, research, and innovation

- Infrastructure
  - Ports, Shipbuilding, Grid-System
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