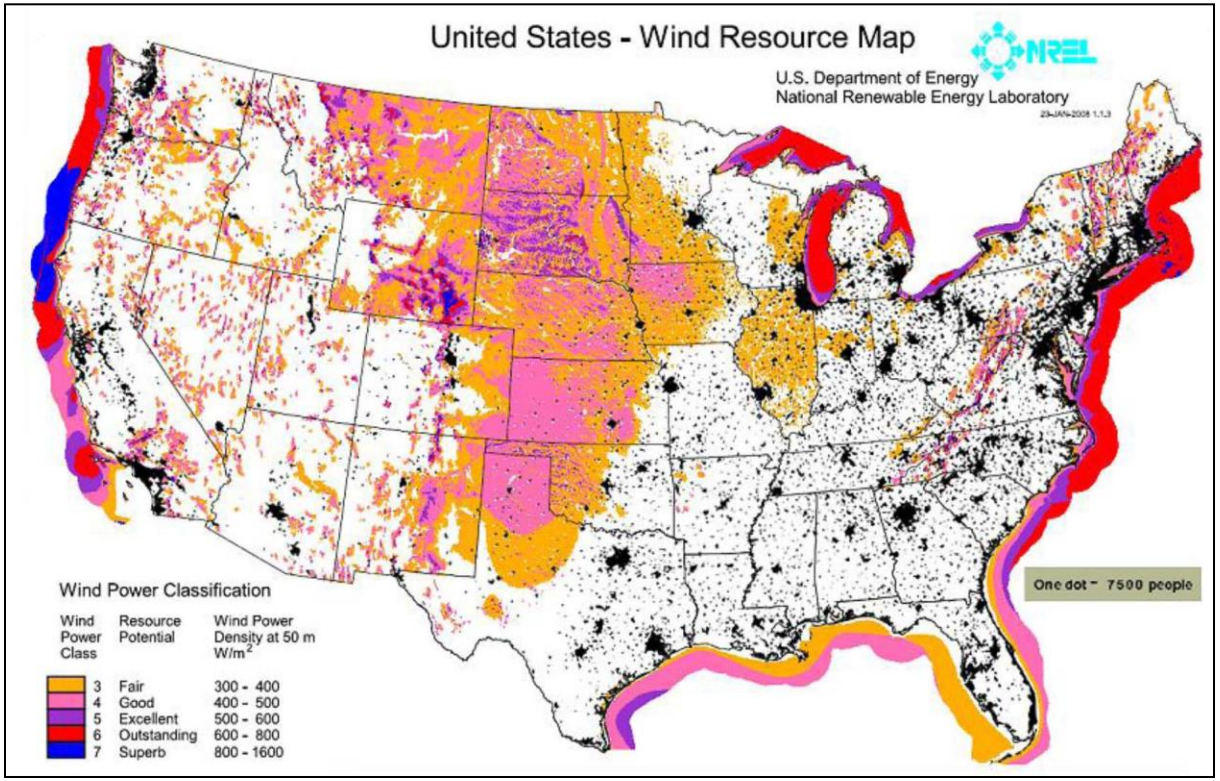

Atlantic
Wind Connection
ATLANTIC WIND CONNECTION
Electric Transmission Superhighway
BUILDING AN INDUSTRY
CREATING JOBS
STRENGTHENING THE GRID
BregalEnergy
Google
elia
Powering a world in progress
Marubeni
CORPORATION

U.S. Energy Demand

AWC securely delivers power to the vital East Coast



3x the amount needed to power the entire Mid-Atlantic region and full fleet of electric cars

East Coast
Mid-Atlantic region

- Home to nation's largest population centers
- Headquarters to nation's key institutions:
  - Financial (NYC/NJ)
  - Political (DC)
  - Military (VA)

Mid-Atlantic Energy Demand

73 GW

East Coast Energy Demand

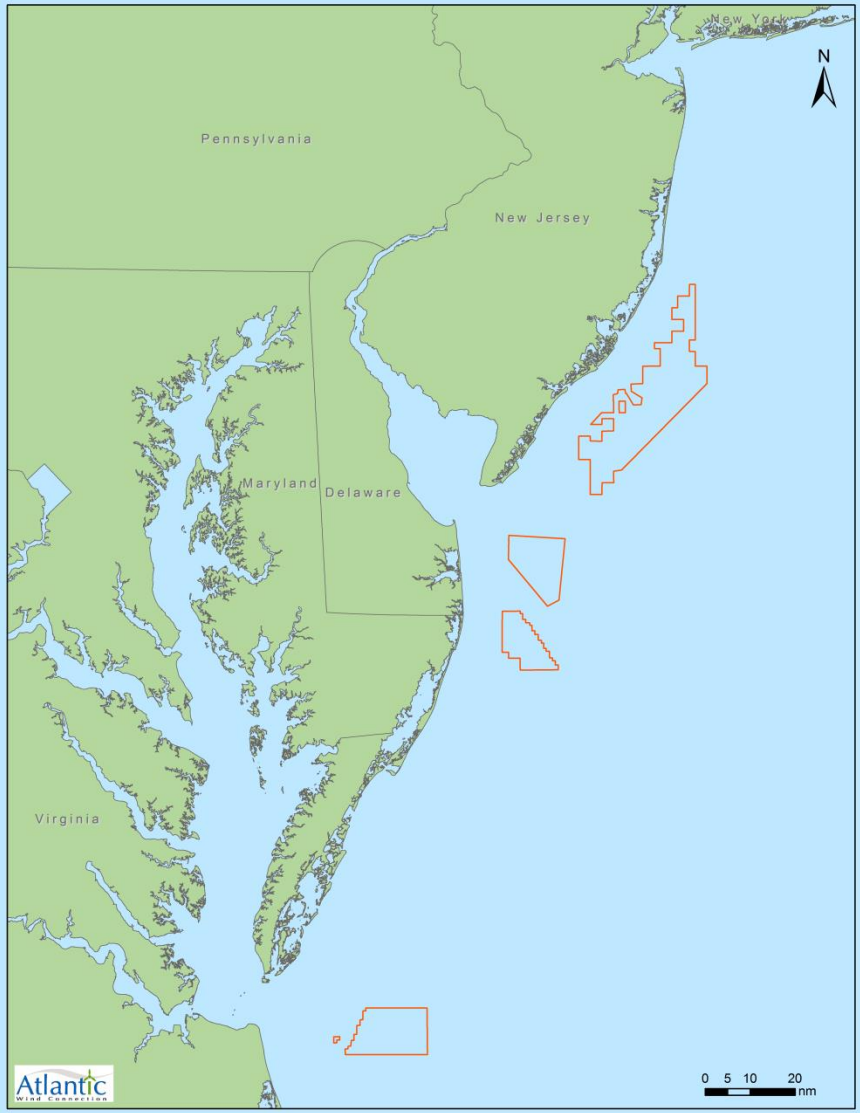
120 GW

Developable Offshore Wind

330 GW from NC to MA

Atlantic Wind Connection

U.S. Department of Interior – *"Smart from the Start"* *Designated Wind Energy Areas*



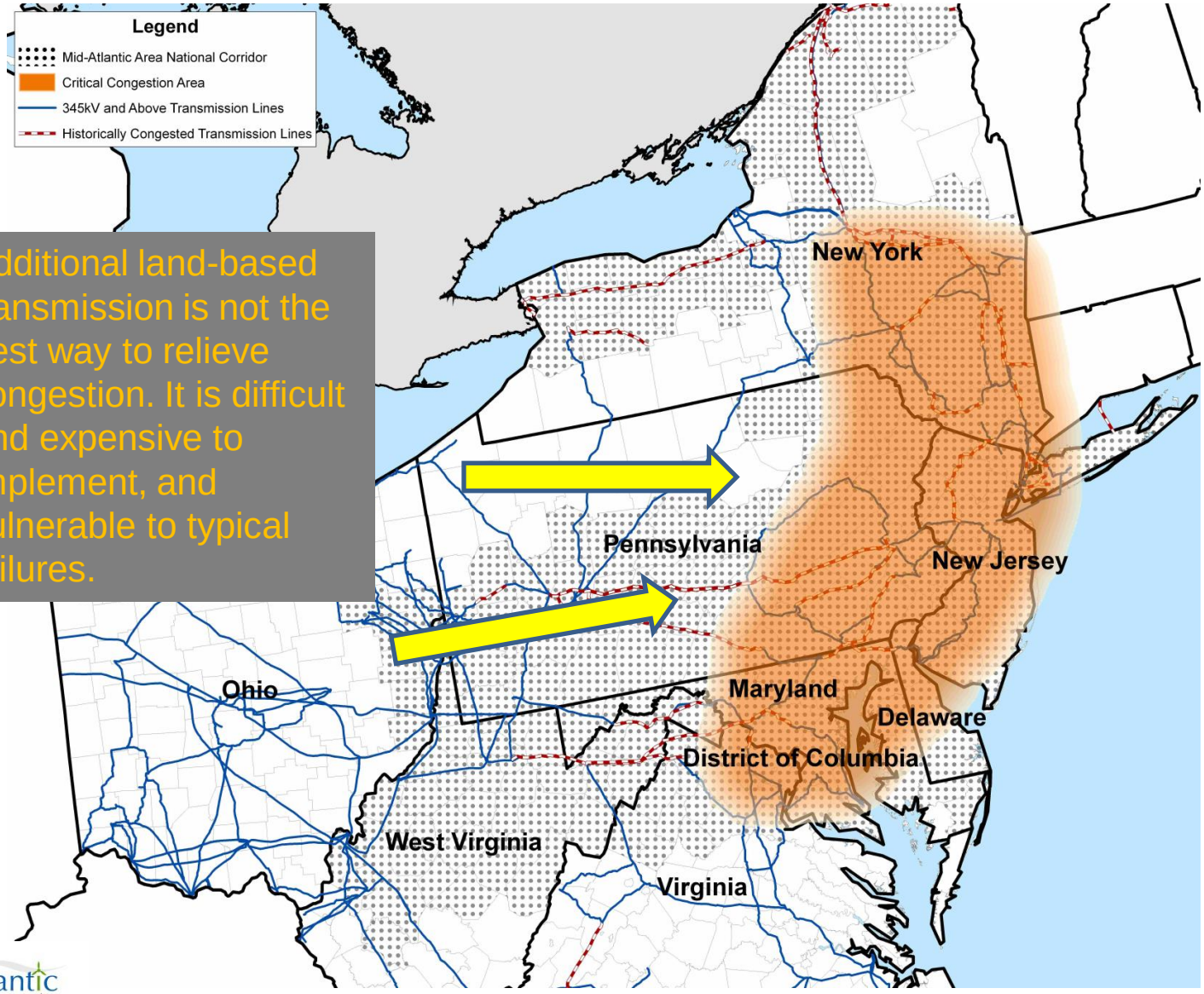
Two transmission options to connect offshore wind to the grid:

Radial Ties: Each wind farm lays 3 or more cables to get power to land (radial interconnections or "ties"), or
AWC: The wind farms connect to a high-capacity offshore "backbone" transmission system

Complexity **Simplicity**

DOE Report on East Coast's Grid Congestion Problem

Caused by lack of transmission & generation



Additional land-based transmission is not the best way to relieve congestion. It is difficult and expensive to implement, and vulnerable to typical failures.

- Congestion is the inability to deliver power where it is needed.
- In recent years, **PJM** ratepayers have paid **$0.5 - $2.0 Billion** per year in congestion charges.
- Reducing congestion will provide huge value to consumers.

Atlantic Wind Connection

Background – New Jersey Energy Link

1. **New Jersey has the 7th most expensive electricity in the United States**

2. **There are two reasons as identified by the BPU, Governor's *Energy Master Plan*, & NJLEUC:**

   - Shortage of generation
   - Transmission constraints

3. **Causes and consequences of the shortages:**

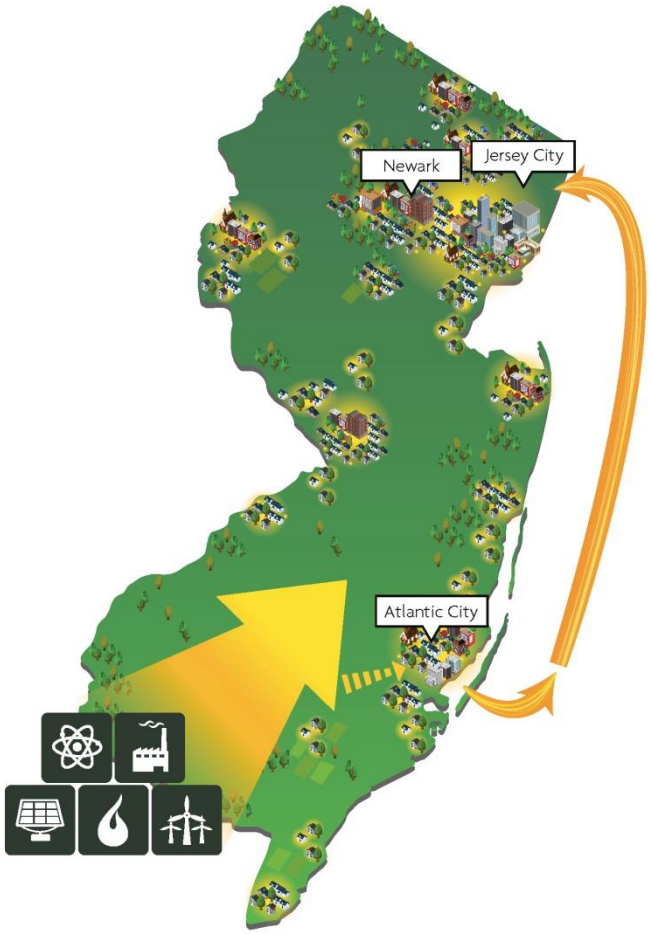
   - Very difficult to site generation or transmission (especially over-head)
   - Shortages create congestion pricing which is good for PSEG. 51-73% of PSEG net income comes from their generation assets.
   - Recent PJM auction for capacity supply in 2016/2017 resulted in $219 per mw/day in PSE&G service area while the rest of NJ was $119.

4. **NJEL is a new solution from an independent company that will invest private sector dollars to fix the problem using a transmission system built under the sea and land from the Atlantic City area to Jersey City.**

   - If NJEL was available to address the PSEG zone capacity requirement in 2016/2017, the savings to ratepayers would be approximately $475 million.

New Jersey Energy Link

A modern subsea, electric transmission cable 12 miles from shore to move power to where it is needed, when it is needed.



The Line Pays for Itself.

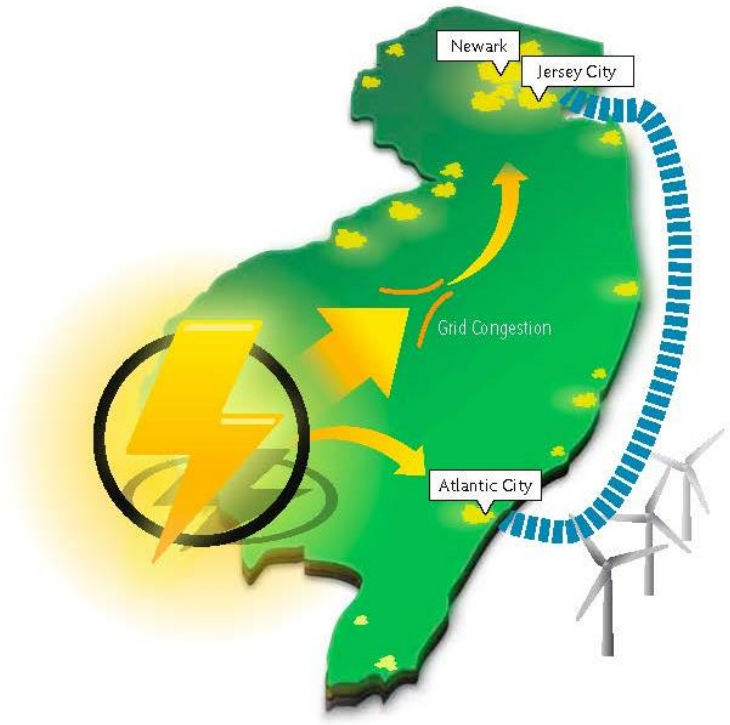
A less congested, more efficient and reliable grid with the New Jersey Energy Link will save New Jersey ratepayers about $1.4 billion over the project's operating life. This means a savings of $207 for the typical residential customer.

More Reliable, Resilient and Secure than Traditional Overhead Lines

Traditional overhead lines are exposed and vulnerable to severe weather. The New Jersey Energy Link will be buried six feet underground, where it is more resilient against storms and terrorist attacks than overhead transmission. A modern, storm-hardened backbone will mean that New Jersey will be better prepared when the next big storm hits.

New Jersey Energy Link

When New Jersey moves forward with offshore wind



Electric superhighway connecting northern, central and southern New Jersey

Delivers up to 3,000 megawatts of offshore wind and conventional electricity to where it is needed, when it is needed

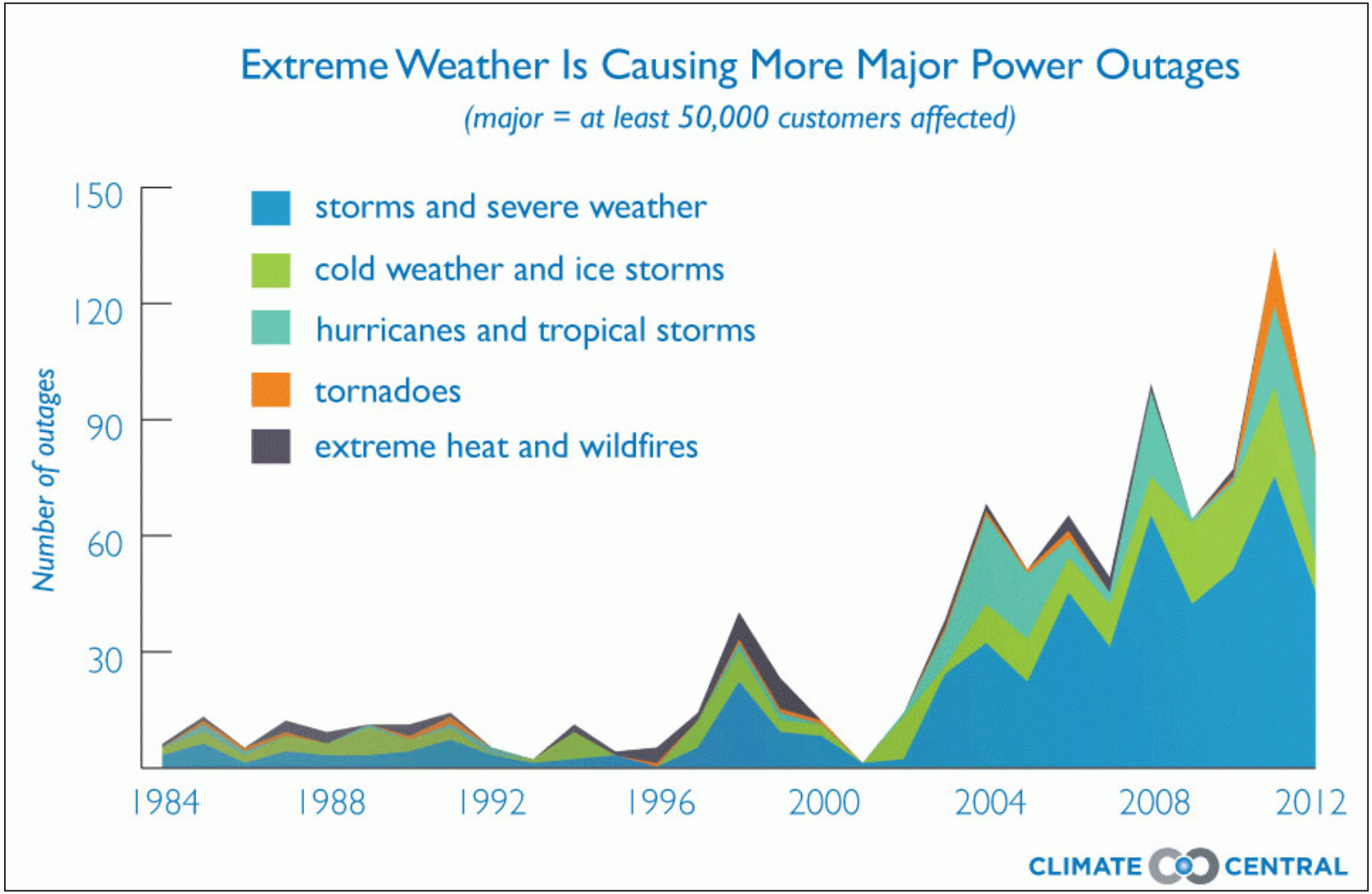
- **Enough to power 1 million homes**
- **Eliminate 8 million tons of CO_2 emissions**
- **Equivalent to taking 1.5 million cars off the road**

Reduces cost of offshore wind

Creates thousands of New Jersey jobs and strengthens the State's economy

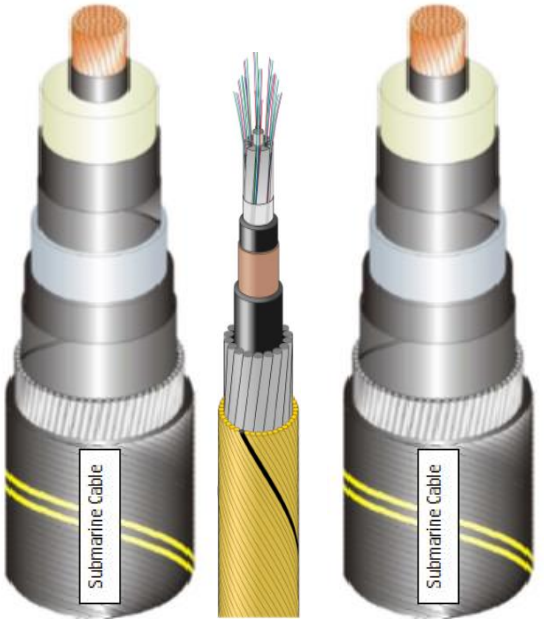
Cuts cost of electricity and improves grid reliability & resiliency

REPORT: Weather-Related Blackouts Doubled Since 2003



NJEL system components

- A multi-terminal HVDC network
  - Buried submarine cable
  - Buried land cable
  - Terrestrial converter stations
  - Offshore converter hub platforms



Building an Industry

Experienced Partners

BECHTEL ALSTOM

Bechtel Study

Build Feasibility of Paulsboro Marine Terminal

By making the Paulsboro Marine Terminal the construction hub for the New Jersey Energy Link:

- **500 to 600 jobs** will be created in Paulsboro
- Plus an **additional 1,100 jobs** throughout the State from constructing the New Jersey Energy Link

Study by IHS Global Insight

A leading global analytics firm

The build-out of 3,400MW of offshore wind and the New Jersey Energy Link is estimated to:

- Create **10,000 – 20,000 jobs** in New Jersey
- Pump $9 billion into the State's economy
- Add $2.2 billion to State and local government tax revenues

Development Status of Project

Federal Energy Regulatory Commission

FERC approves AWC 219 Order (May 2011): *Atlantic Grid Operations A LLC*, 135 FERC ¶ 61,144 (2011)

- 12.59% return on equity
- 100% Construction Work in Progress (CWIP)
- Incentives do not take effect until the project is approved into PJM's Regional Transmission Expansion Plan

U.S. Department of Interior

- AWC Right-of-Way application submitted to U.S. Department of Interior's Bureau of Ocean Energy Management (BOEM) in March 2011
- BOEM issues "Determination of No Competitive Interest" for AWC Right-of-Way (June 2012)

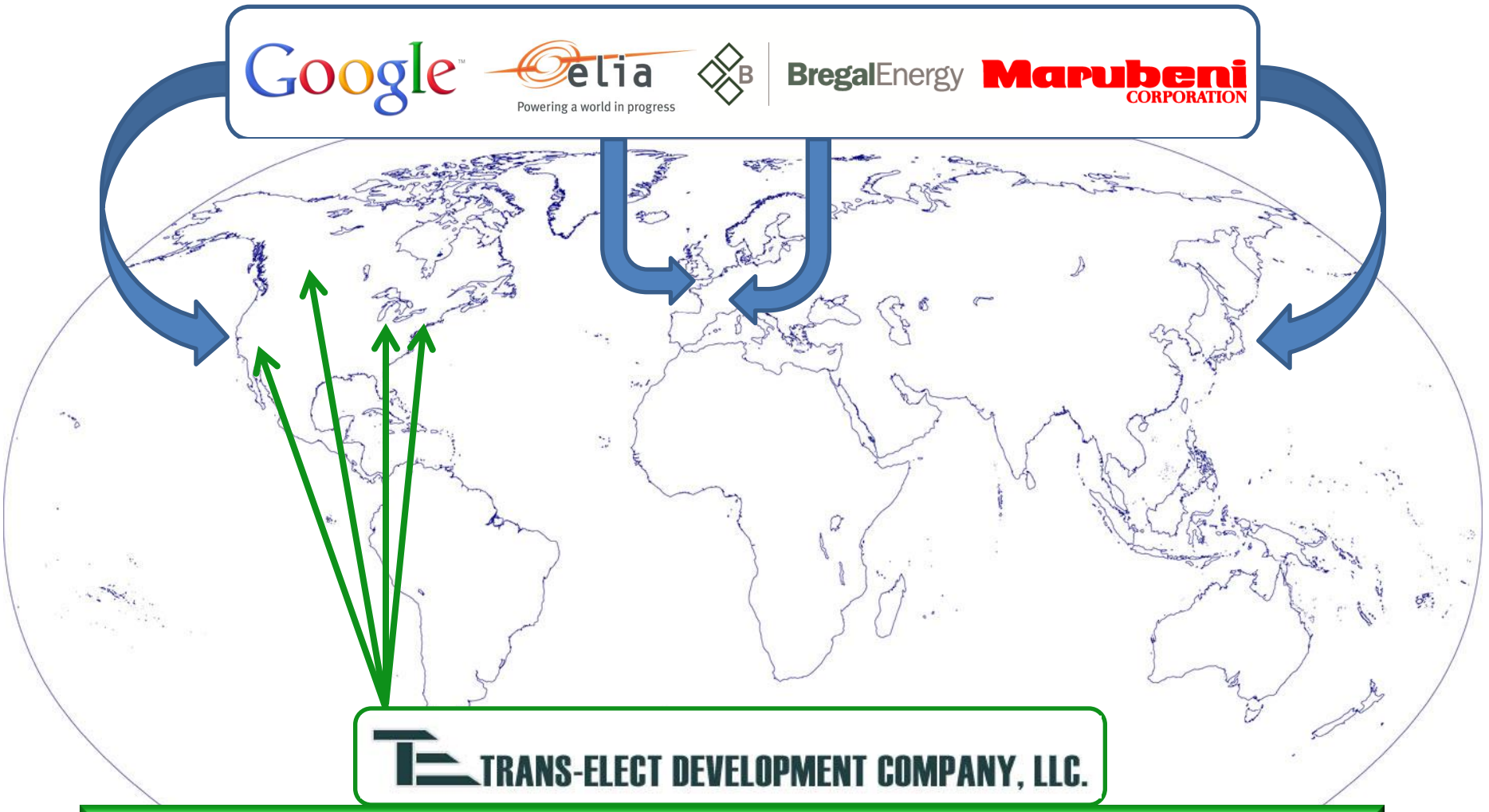
PJM Interconnection

PJM determines Atlantic Grid is pre-qualified to build AWC (March 2013)

New Jersey State Legislature

The NJ Legislature passed a Joint Resolution (ACR197/SCR159) with strong bi-partisan support (June 2013). Urges NJ's Board of Public Utilities to work with PJM & State agencies to coordinate with PJM to facilitate NJEL development.

Global Partners



Development Led by Experienced Independent Transmission Company

Building the

Atlantic Wind Connection

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Overview

- Bernard EnergyAdvocacy
- The Elia Group
- Elia's interest in the AWC
- The European Supergrid
- North Sea Countries Offshore Grid Initiative
- EU Energy Infrastructure Regulation

Bernard
EnergyAdvocacy

Bernard EnergyAdvocacy

FOCUS:
T&D, offshore, solar, efficiency

- **Policy and regulation, specialized legal support**
- **Executive business development**
- **EU, US, Middle East/Gulf, Africa**

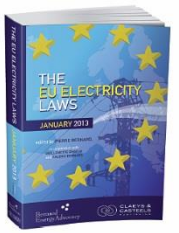
ONE STOP-SHOP

- **Advisors have "in-house" energy background**
- **BEA Energy Experts Network: Unique in US, EU & Gulf**
- **Advising T&D, OEMs, investors & governments**
- **Regulation/legal, economic, engineering & political science**

BEAM
Bernard EnergyAdvocacy Monitoring

The most comprehensive and up-to-date overview of developments at EU level in energy/electricity

- **What:** Monthly and quarterly "to the point" review of ongoing and forthcoming EU energy policy initiatives and key stakeholder positions
- **Plus:** Ad hoc email Flashes covering urgent info; expert Commentaries and editorial pieces
- **Subscription price** (PER ORGANISATION!): Only **€75/month!**
- **Option: Tailored BEAM**



The major EU Electricity legislative texts (4 volumes): paper and/or electronic subscription

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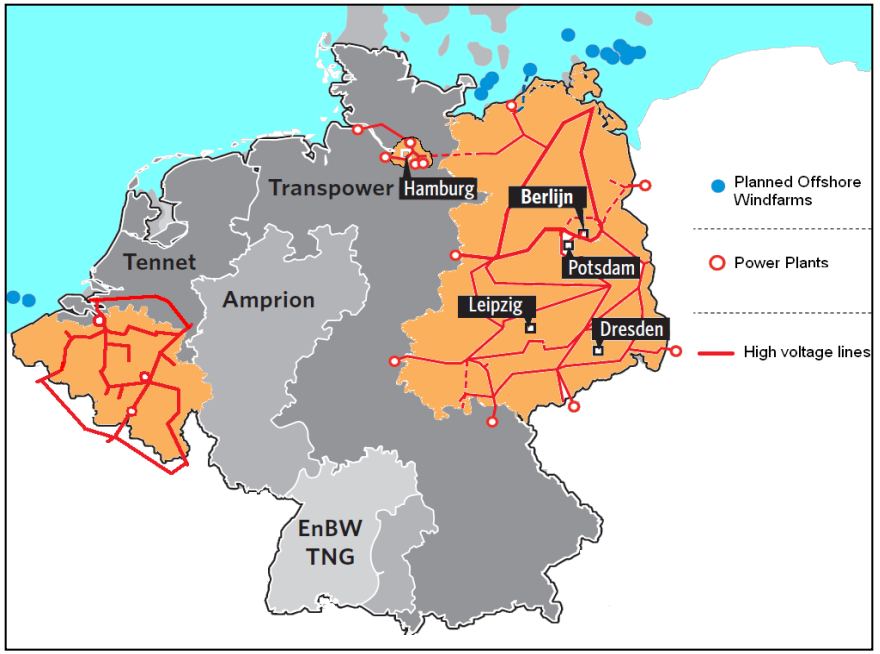
www.bernardenergy.com

Bernard EnergyAdvocacy

The Elia Group

- Among the top 5 TSOs for electricity in the EU
- Frontrunner in grid integration of renewables since incorporation in 2001
- BE + ¼ DE with 870 substations
- Listed on Euronext since 2005
- Fully unbundled
- 380 kV and 220 kV (down to 30 kV in BE)
- 1,950 employees
- International consulting and engineering

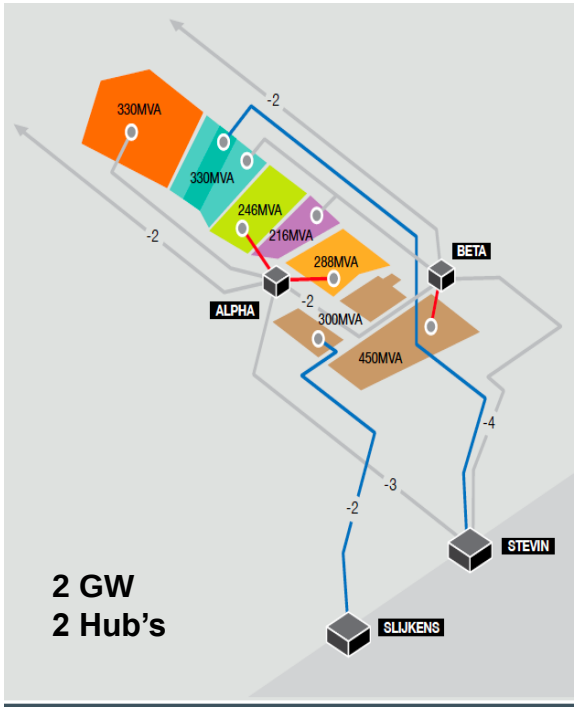


The Elia Group (cont.)

	Elia	50Hertz
System operation	➢ Network operation ➢ Capacity allocation ➢ Balancing generation and demand	
Infrastructure management	➢ Asset management and ownership ➢ Network development ➢ Predictive and curative maintenance	
Related activities	➢ EU and local market facilitator ➢ Activities for third parties	
	➢ Capacity auctions: CASC - CWE ➢ Regional monitoring: Coreso ➢ Power exchanges: APX, HGRT ➢ Renewables: Green certificates	➢ CAO, EMCC ➢ Coreso ➢ EEX ➢ EEG

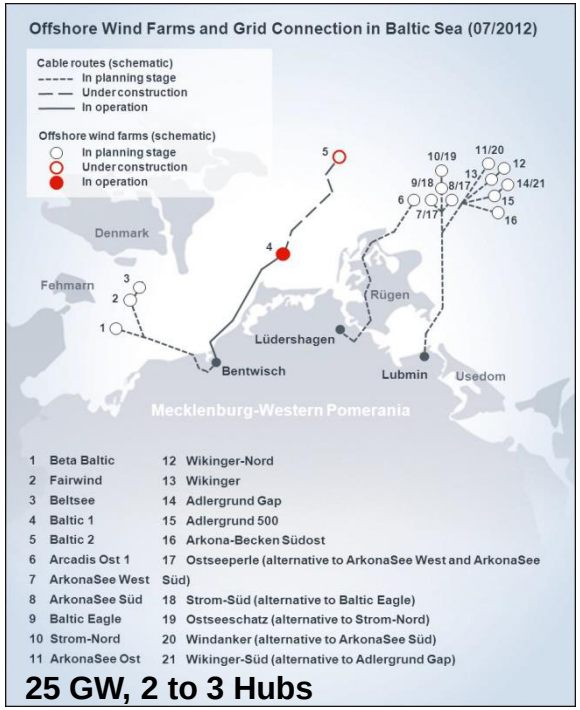
The Elia Group (cont.)

Elia Belgian Offshore Grid Solution



2 GW
2 Hub's

50 Hertz Baltic Sea Offshore Projects



25 GW, 2 to 3 Hubs

US East Coast Backbone

7 GW
350 miles

elia

50hertz

Atlantic Wind Connection

Elia's Interest in the AWC

US regulatory system (FERC) + higher returns

- US: Return on investment more reflective of incentives (risk is better acknowledged and compensated – e.g. adders)
- Understanding this is helpful in negotiations with EU regulators

Innovative technology

- Offshore HVDC combined with VSC: Most advanced transmission technology
  - Offshore backbone able to connect multiple offshore wind farms
  - Lower losses
  - Higher controllability of power flows

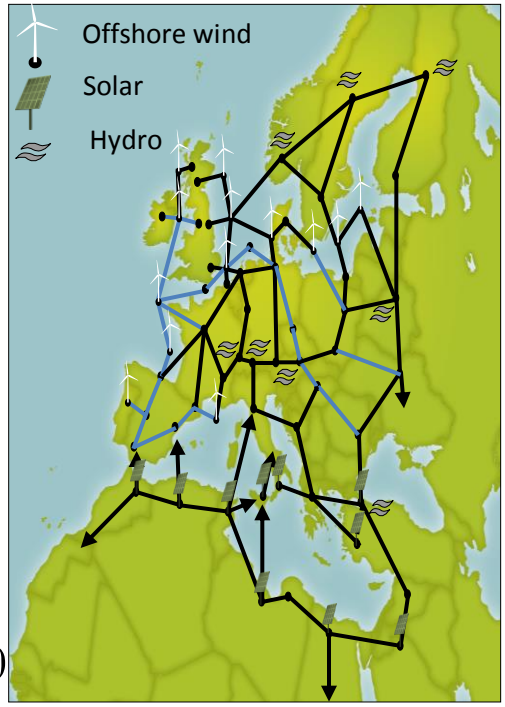
Non-TSO partners

Google | BregalEnergy | Marubeni

The European Supergrid

Supergrid:

Pan-European transmission network facilitating RES integration, balancing and transportation of electricity, with the aim of improving the European market



Why a Supergrid?

- Carbon neutral Europe by 2050
- Single European electricity market
- Secure and sustainable supply
- Transformed energy system
- Innovative technology
- Skilled employment opportunities

FRIENDS OF THE SUPERGRID

Member Companies:

ABB, ACS, ALSTOM, Bernard EnergyAdvocacy, CESI, DONG energy, elia group, GE, HOCHTIEF SOLUTIONS AG, intel, MAINSTREAM RENEWABLE POWER, nationalgrid, Nexans, PARSONS BRINCKERHOFF, Prysmian Group, REN Redes Energéticas Nacionais, Rte Réseau de transport d'électricité, SIEMENS, wpd think energy, VSMC

Bernard EnergyAdvocacy

North Sea Countries Offshore Grid Initiative

Source: the Scottish Governement, 2010

- Initiative being developed by the Energy **Ministries of Belgium, Denmark, France, Germany, Ireland, Luxembourg, the Netherlands, Norway, Sweden and the UK**.
- MoU signed in December 2010
- Support from ENSTO-E, ACER, EC and national regulators

Aim: Integrate the offshore electricity grid and other interconnectors in the North Sea:

- Transfer offshore generation to load and storage centers
- Increase cross-border power trades

EU Energy Infrastructure Regulation

PCI Selection Process

First PCI list published in October 2013

120 electricity transmission projects selected to benefit from:

Accelerated Permit Granting	Regulatory Measures	Eligiblity for EU Financing
• 3.5 years time limit for permitting procedure • One-stop-shop • Priority treatment in MS	• Cross-border cost allocation • Investment incentives • Cost benefit analysis	Connecting Europe Facility: • Grants for studies and works • Financial instruments

A total of <u>20 offshore transmission projects selected</u>

EU Energy Infrastructure Regulation (cont.)

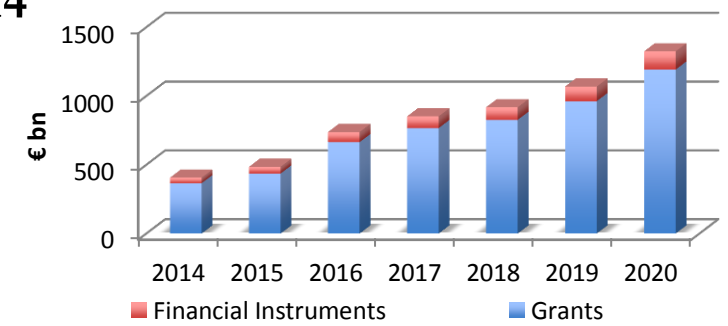
Connecting Europe Facility

Framework for (facilitating) financing of PCIs: Improve bankability of projects and reduce cost of capital

- **Grants for studies**
- **Grants for works**
- **Financial instruments**

- Status: Entry into force on 1 January 2014
- 1st call for proposals: May-July 2014

EC estimated budget distribution



Total Budget: €5.85 bn (2014-2020)

Any questions?

Thank you

www.bernardenergy.com

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