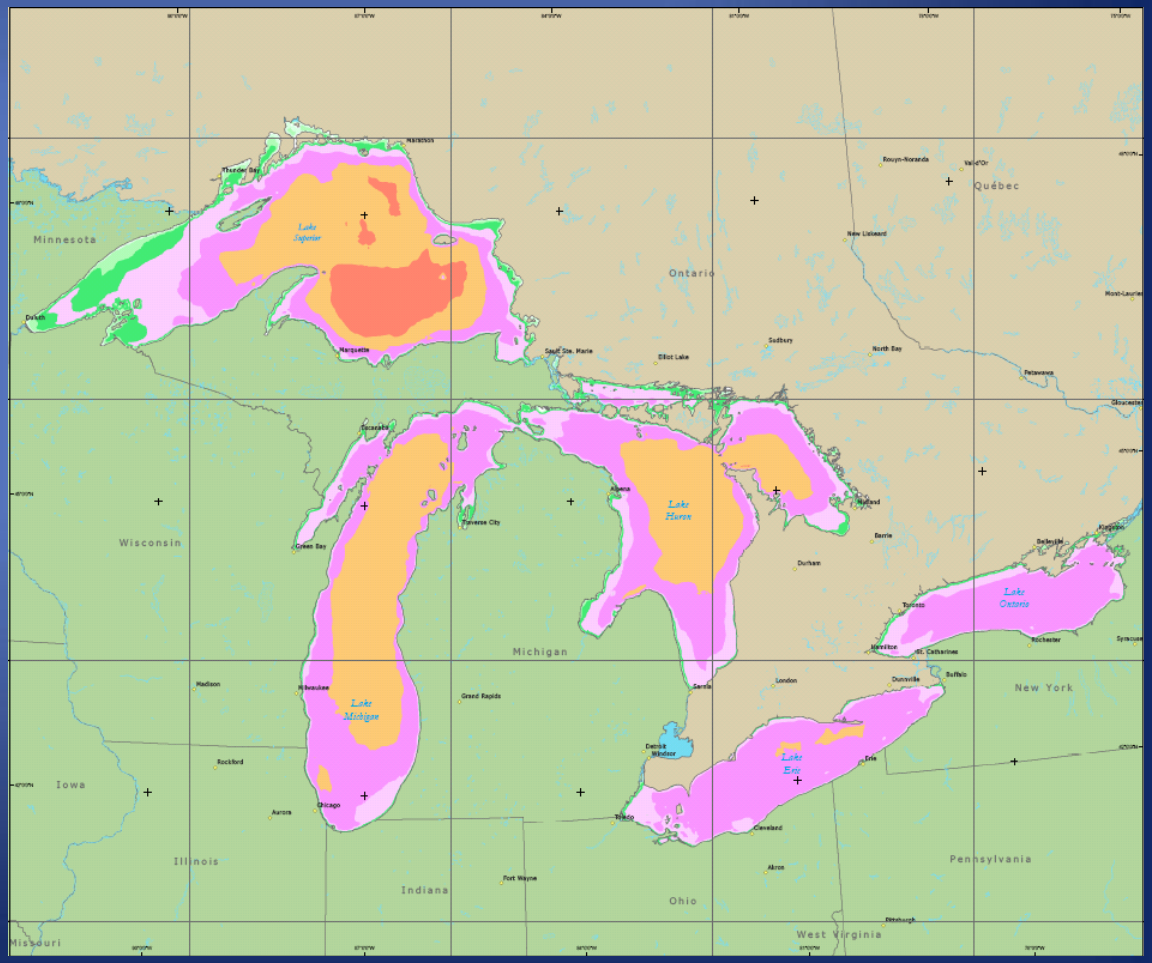
Offshore Wind in the Great Lakes: Challenges and Opportunities

May 6, 2008

Presented To:

Great Lakes Wind Collaborative
1st Annual Meeting
Buffalo, NY



BQ Energy LLC

Presentation Outline

- Introduction to BQ Energy
- NYSERDA Study Scope
- Q&A

Introduction To BQ Energy

- Developer of Medium-Sized Wind Energy Projects
- Specialize in Working On or Adjacent to Industrial Sites
- Founded in 2003 by Senior Executives from the Energy Industry
- Offices in Patterson, NY and Erie, PA
- National market focus

Target Markets

- Steel Mills
- Oil Refineries
- Ports
- Chemical Plants
- Military Bases
- Many Sites are Coastal

Offshore Wind Study

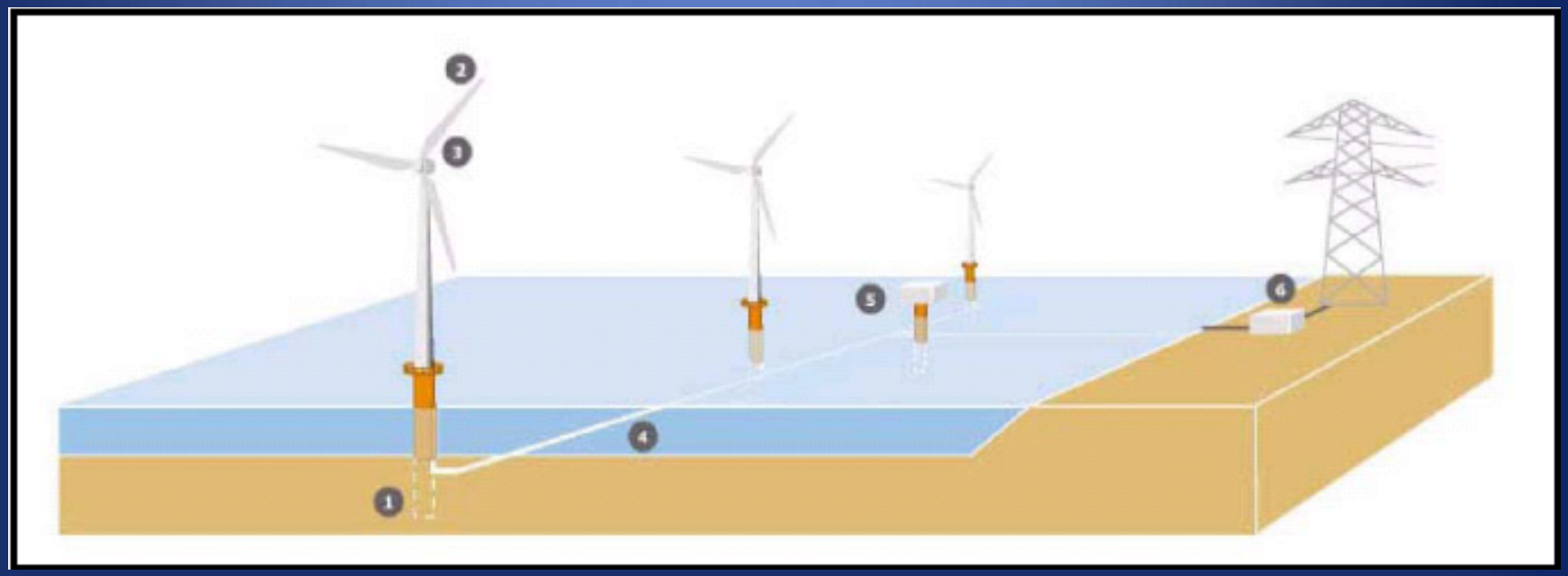
- Steel Winds Project is Coastal
- Previous Experience
- Public Interest

NYSERDA Study Scope

- Site Characterization & Control
- Wind Resource & Production
- Permits & Public Outreach
- Power Sales
- Engineering, Procuremen
  Construction
- Budgeting & Finance

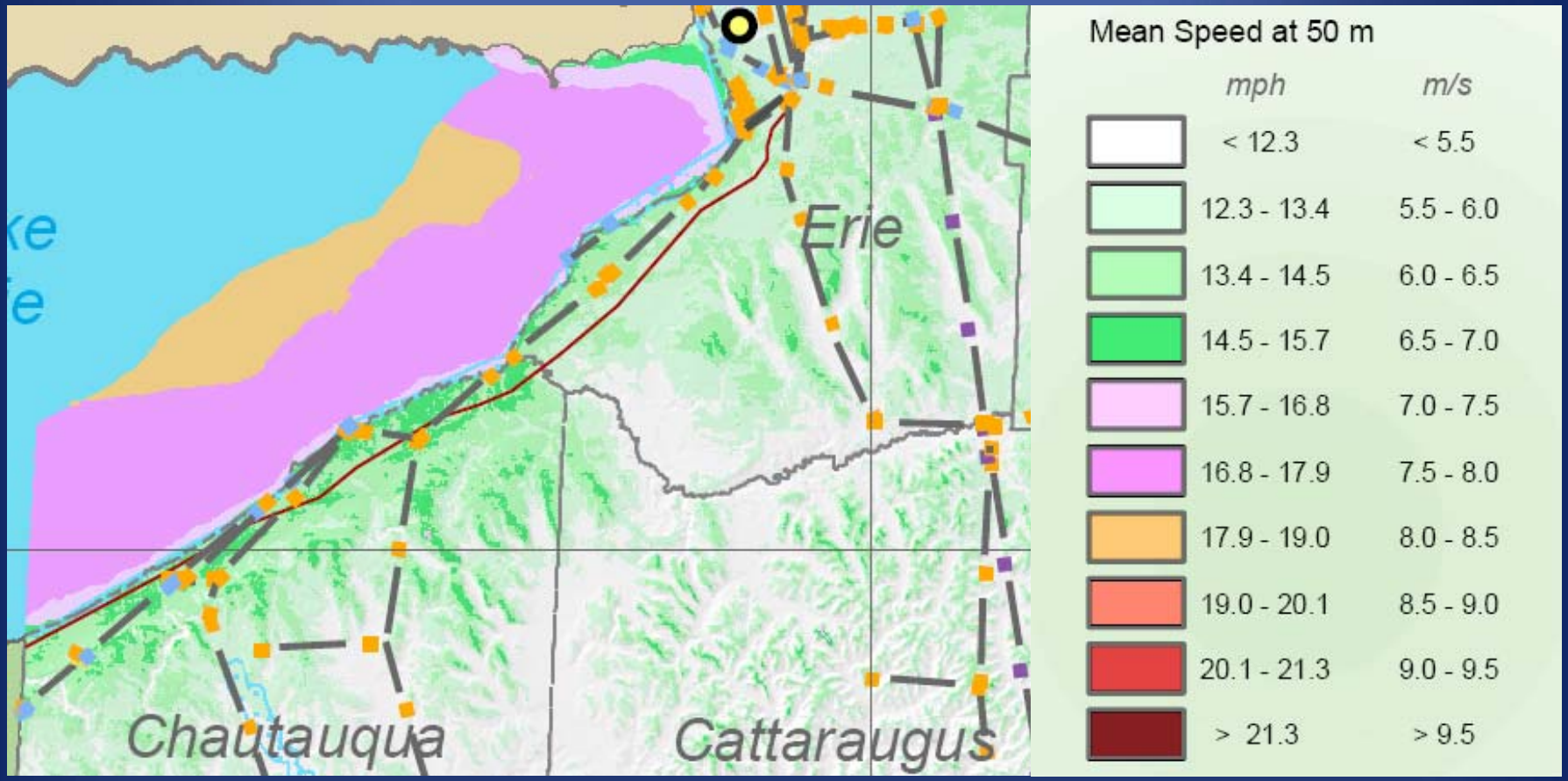
Offshore Wind

- Foundations in Lake Bed
- Undersea Electrical Cables
- Offshore Substation
- High-Voltage Cable to Shore
- Interconnect with Transmission Grid



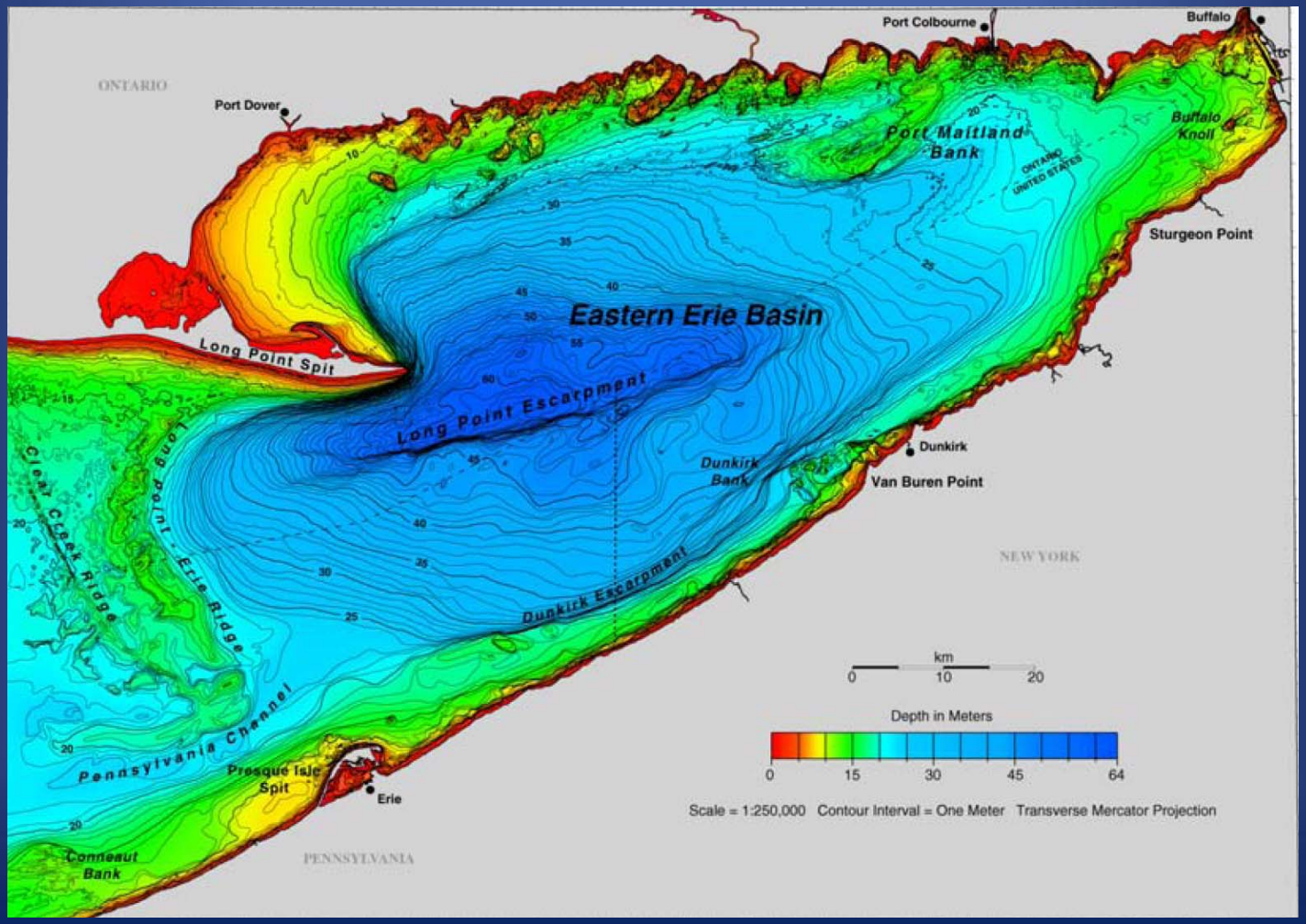
Site Characterization

- Large Area of High Average Wind



Site Characterization

- Much of NY Portion of Lake Erie is Very Deep

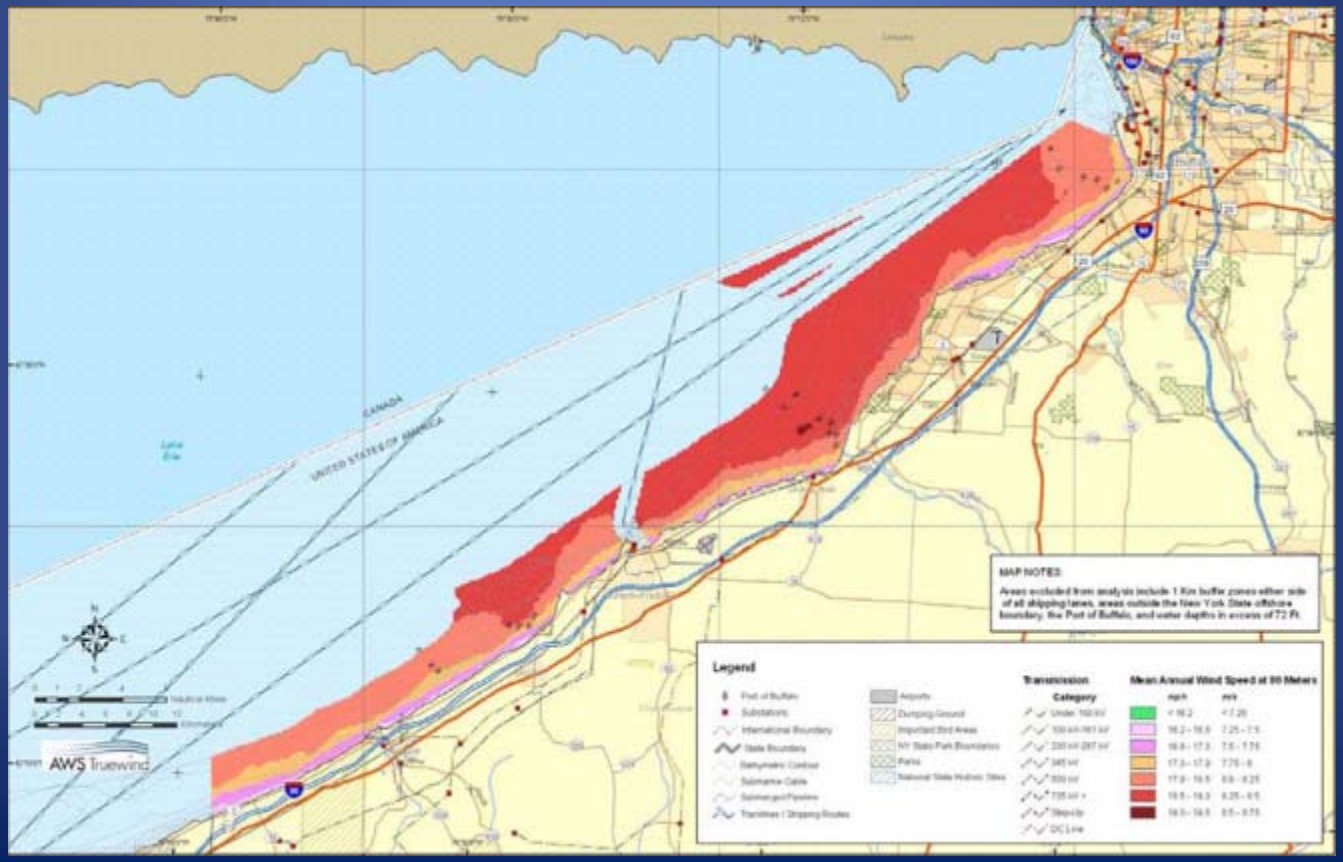


Site Characterization

- Significant Ice in Winter

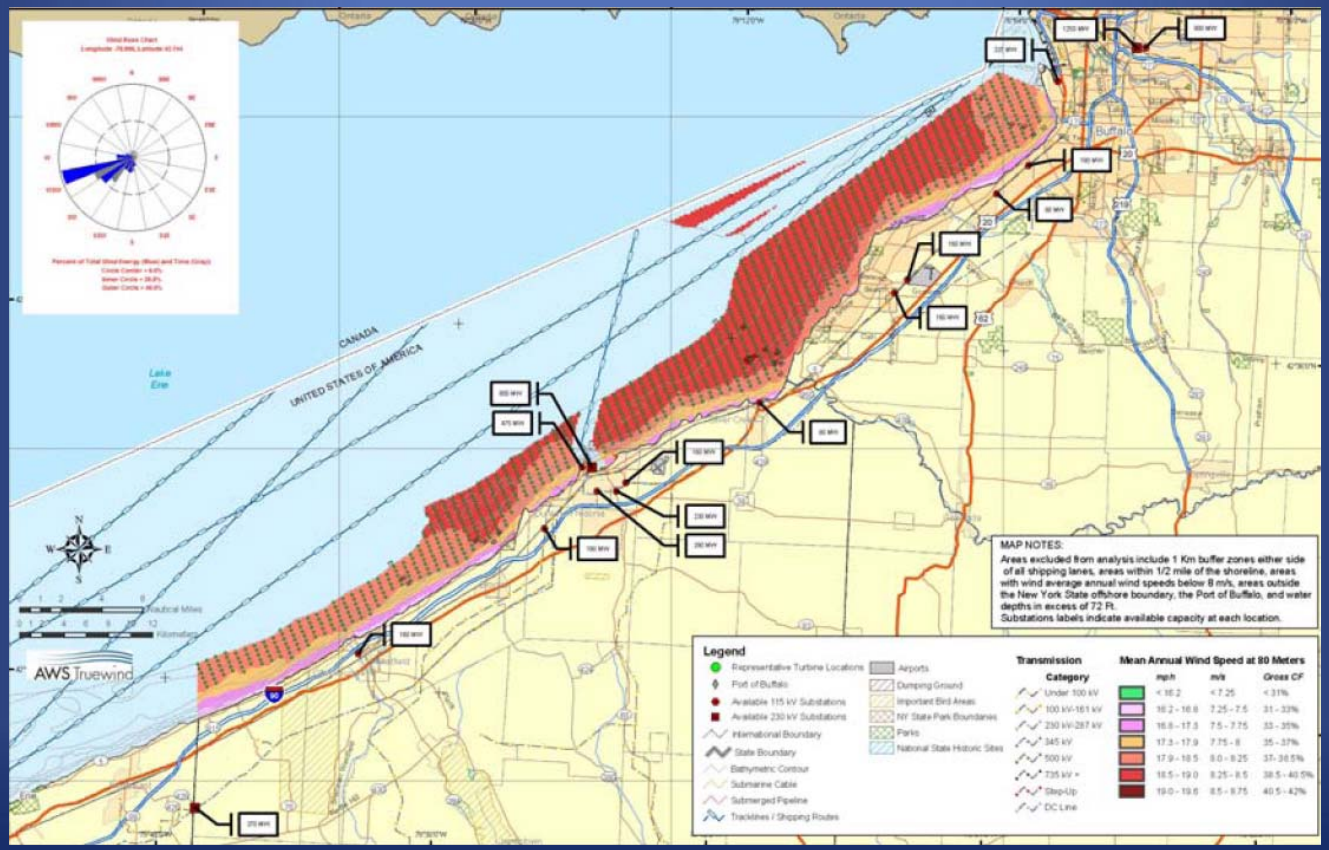
Site Characterization

- Practical Area Limited:
  - Water Depth 72 Feet or Less
  - Shipping Lane Buffer
  - Exclude Buffalo Harbor



Site Characterization

- Within this Area, 3.2 GW Theoretical Capacity
- Practicalities will Limit Actual Build-Out
- Wind Rose Shows Predominant Southwest Pattern



Site Control

- Submerged Land Owned by People of State of New York
- Administered by Office of General Services

Wind Resource & Production Estimate

- AWS Truewind Evaluated Six Wind Turbines
- Considered Four Representative 200 MW Siting Areas
- Net Capacity Factors Mid-High 30s

	Net Capacity Factor					
	REpower	Mitsubishi	Vestas	Clipper		Vestas
Location	MM92	MWT95	V80	C96	GE 3.6sl	V90
Site 1	38.9%	36.0%	35.6%	35.5%	34.5%	30.8%
Site 2	39.5%	36.7%	36.3%	36.1%	35.2%	31.5%
Site 3	40.4%	37.6%	37.3%	37.1%	36.1%	32.4%
Site 4	40.5%	37.7%	37.3%	37.1%	36.1%	32.4%
Average	39.8%	37.0%	36.6%	36.5%	35.5%	31.8%
Ranking	1	2	3	4	5	6

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Site 3	40.4%	37.6%	37.3%	37.1%	36.1%	32.4%
Site 4	40.5%	37.7%	37.3%	37.1%	36.1%	32.4%
Average	39.8%	37.0%	36.6%	36.5%	35.5%	31.8%
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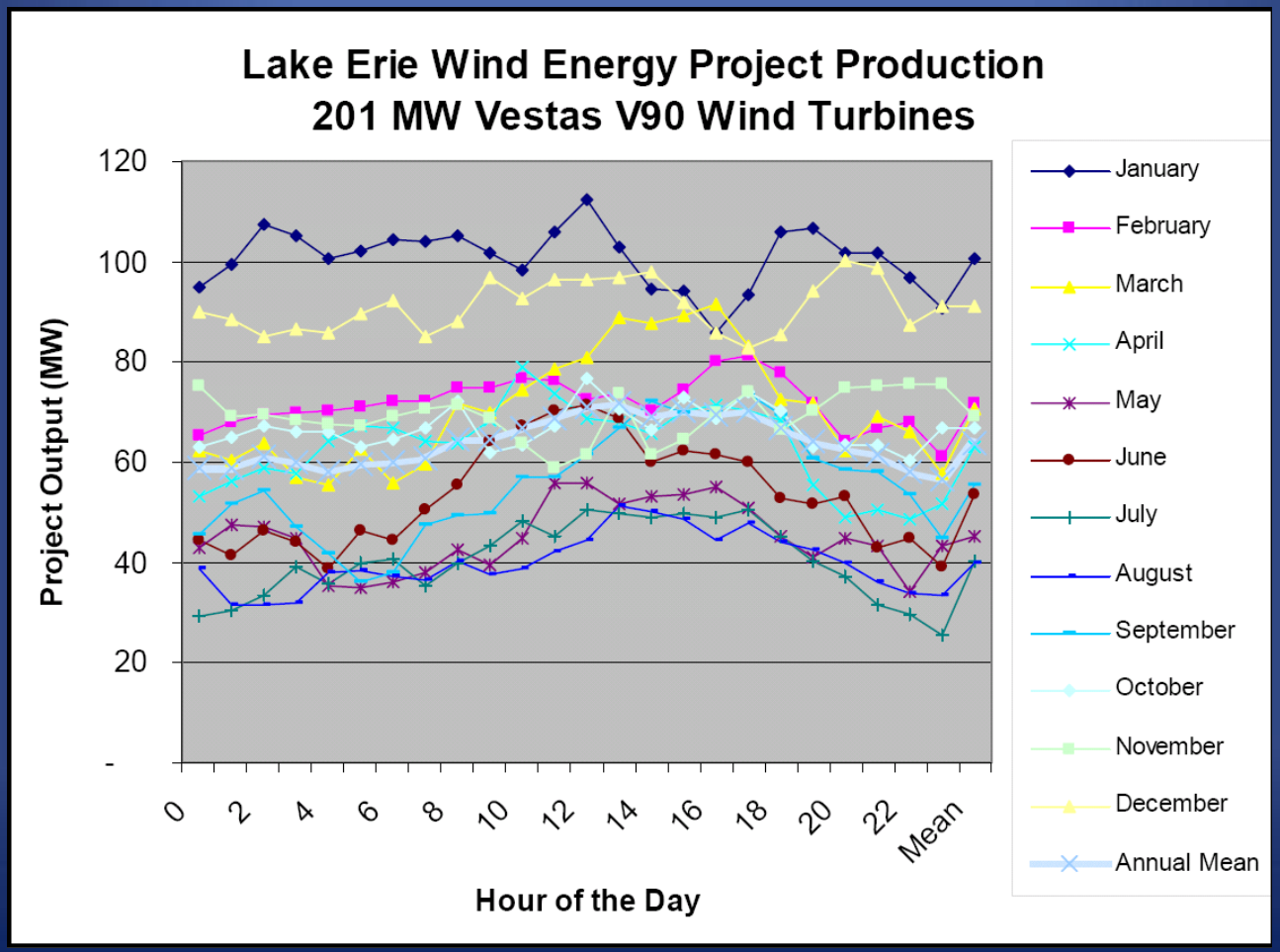
Wind Resource & Production Estimate

- Existing Wind Turbine Maximum Size 3.0 MW
- REpower Prototyping 5 MW Offshore Turbine (Picture Below)
- Clipper Designing 7.5 MW Offshore Turbine

Wind Resource & Production Estimate

- Diurnal Pattern: More Output in Day than Night
- Seasonal Pattern: More Output in Winter than Summer



Permit Approval Process

- Lead Agency Likely to be US Army Corps of Engineers

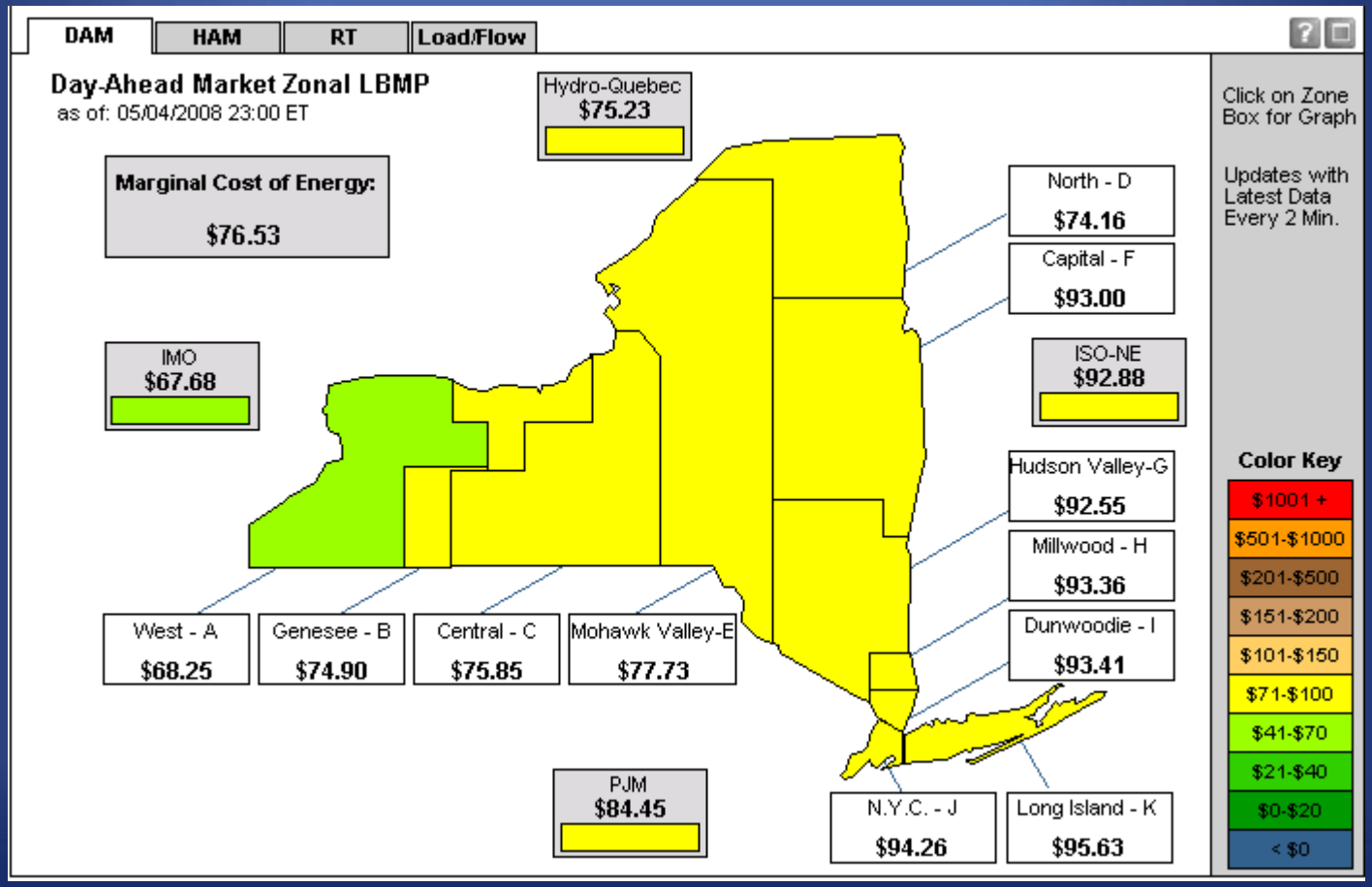
- Key New York Agencies:
  - Office of General Services
  - Department of State
  - Department of Environmental Conservation
  - Office of Parks, Recreation & Historic Preservation
  - Erie, Cattaraugus, Chautauqua Counties
  - Coastal Municipalities

- Key Federal Agencies:
  - Fish & Wildlife Service
  - U.S. Coast Guard
  - Federal Aviation Administration

- Bi-National Agency:
  - International Joint Commission

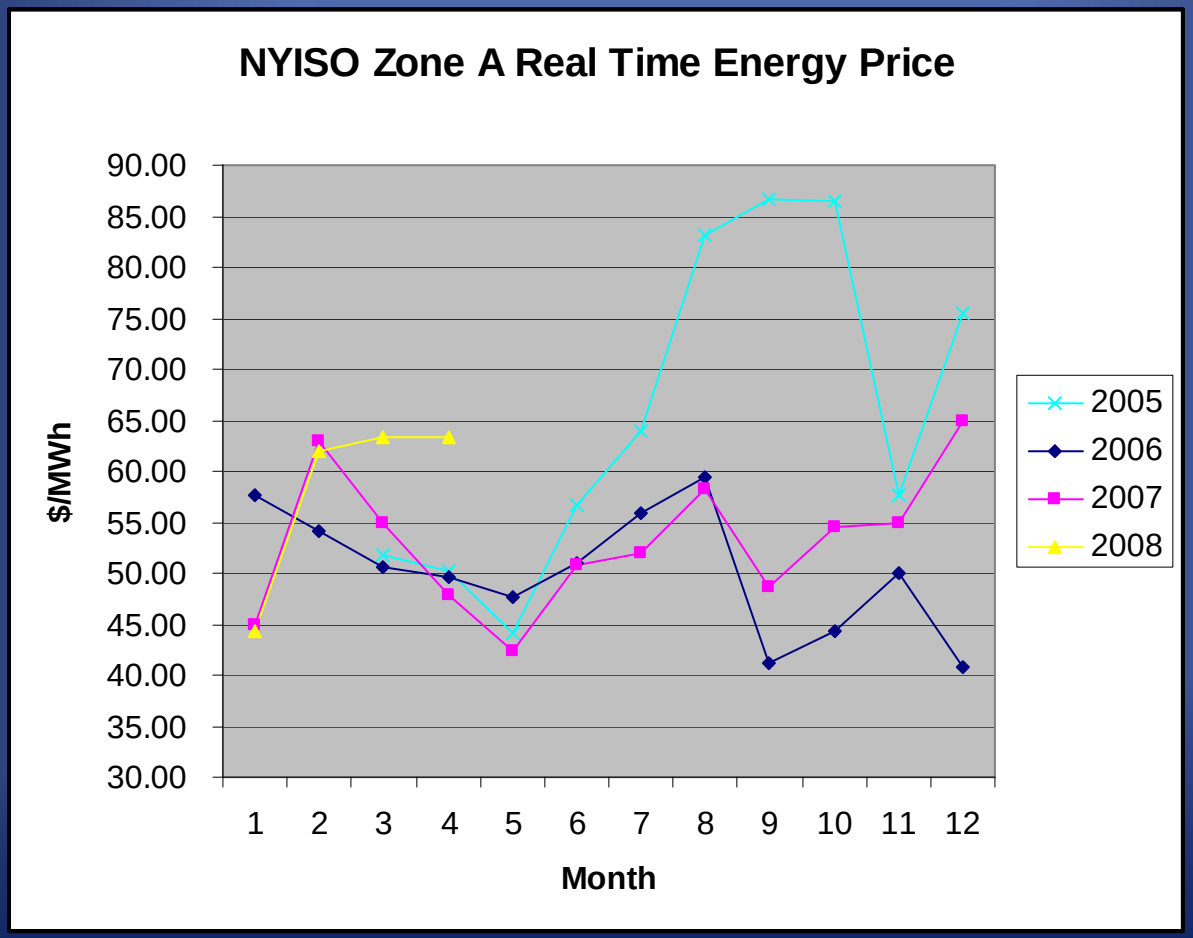
Power Sales

- Ample Interconnection Capacity for 500-1,000 MW Project
- Two Primary Products: Electricity and Renewable Energy Credits



Power Sales

- Zone A Power Prices Trending Higher with Higher Natural Gas Prices
- Renewable Energy Credits Worth $15-23/MWh



Economics of Offshore Wind

- Much Higher Capital and Operating Costs than Land-Based Turbines
- Required Power Prices at Least $160 per MWh
- Significantly Higher than Prevailing Prices
- Equivalent to Land-Based Project with 22% Net Capacity Factor

- Timing of Offshore Wind in United States
  - Prices for Electricity may Increase (Increasing Fuel Cost, CO_2 Caps)
  - Prices for RECs may Increase ($50/MWh in Massachusetts)
  - NY or Other States may Provide Financial Incentives
  - Possible Renewable Portfolio Standard Incentive for Offshore Wind

Feasibility Study Completion

- Ice Engineering Being Done by C-Core
- More Specific Cost Estimates
- Financing Plan
- Public Opinion Survey
- Next Steps

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