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# **Maine Aqua Ventus (MAV)**

**Revolutionary Game Changer for:**

**Deep Water Offshore Wind and  
Maine Economic Revitalization**

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**e2tech**

**Portland, ME**

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**Carpe Diem**

# Key Points

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- Project is one of the few ways , maybe even the only one, to jump start Maine economy
- Scope of the opportunity is very large and very underappreciated in Maine
- Smart platform manufacturing is key to low power cost and capturing jobs for Maine
- Becoming project developer was NOT an overreach but essential step to cost cutting
- MAV is now able to show global turbine companies how to get to 10-15 cents / kWh
- Monhegan demonstration project is higher cost necessary step on way to price target
- Monhegan will provide lenders and insurers years of performance data they demand
- MAV is critically needed answer to dangerous & costly winter Nat Gas supply pinch
- Unnecessary project delay raises cost of construction and interest rates -Carpe Diem

# Economic and Financial Considerations

## State Wide Boost in Maine

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**Only a few ways exist to jumpstart a regional economy:**

**1/ Extract value from a very large natural resource**

**2/ Achieve critical mass of university driven intellectual horsepower applied in the commercial realm (MIT-Harvard- and other Boston universities and the biotech industry, Stanford & Silicon Valley, Research Triangle in NC, Austin TX)**

**3/ Possess proximity to essential transportation for large manufactured goods (Galveston TX and New Iberia LA for offshore oil in the Gulf of Mexico)**

**Deep water wind is the only realistic way to achieve #1 for Maine**

**If that step is taken #2 and #3 will follow with tremendous impact**

# **Economic and Financial Considerations**

## **Size of Opportunity for Maine**

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**Annual revenue from initial 500 MW wind farm approximately \$320 million  
(very close to that from all ME lobstering in 2012)**

**Eventual plan is for at least 5 GW or \$3.2 billion annual revenue**

**Building initial 500 MW wind farm would be ~ \$3 billion project ~ ½ labor**

**MAV has focused on keeping a dominant majority of those jobs in Maine  
(reason for exclusive use of concrete and composites)**

**Land based jobs to make smart use of this energy could be even bigger boost  
(Tie-in to electric heat storage and heat pumps – Emera)**

# Economic and Financial Considerations

## U Maine Design = Revolutionary Breakthrough

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U Maine approach is a game changing paradigm shift where the construction methods & cost structures of oil & gas industry are replaced by civil engineering

Methods & processes are radically changed from custom fab to mass production

Welded steel is replaced by precast concrete & composites

Result is a deep cut in costs and much longer platform lifetime

20 year platform lifetime becomes 60+ years

Most importantly as steel becomes concrete and composites jobs stay in Maine

By far this is the most deeply innovative approach being presented to DOE

Maine should celebrate enthusiastically that this has been done here

Habib Dagher is the Steve Jobs of offshore wind – but the Jobs stay in Maine

*An opportunity like this comes along only once a century – if then*

# Economic and Financial Considerations

## Manufacturing Method Key to Success

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Of equal importance to hitting \$ 0.10-0.15 / kWh price target as platform design

Wick Skinner called upon to bring his “focused factory” expertise to bear

“Industrialization” of platform production and installation carefully designed

Total integrated project view was key to cost cutting breakthroughs -Feedback

This critical perspective only becomes apparent in full “project developer” role

Becoming project developer was NOT an overreach but essential step to cost cutting

# Deep Water Offshore Wind Cost Cutting

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For deep water offshore wind to be commercially and politically viable the cost per kWh has to be cut from ~\$0.25 to ~\$0.10-0.15 which is DOE target

This is a heavy industry where the basic metric per large component is hundreds of tons. No Silicon Valley “Magic Bullet” will solve the problem

Cost solution lies in relentless innovative use of Materials and Methods (Processes and Procedures) along with convincing full-scale demonstrations

Above all Risk Reduction = Cost Reduction because cost of money drops

# Uncertainty Reduction = Risk Reduction = Cost Reduction

To satisfy Investors and Insurers to reduce **cost of money**

Validate

Validate

Validate

Demonstrate

Demonstrate

Demonstrate

--- this requires “Turbine –Years” to get solid statistics on

Survivability

Reliability

Performance

***Evidence: Construction Method    Power Out    Maintenance Reqt's***

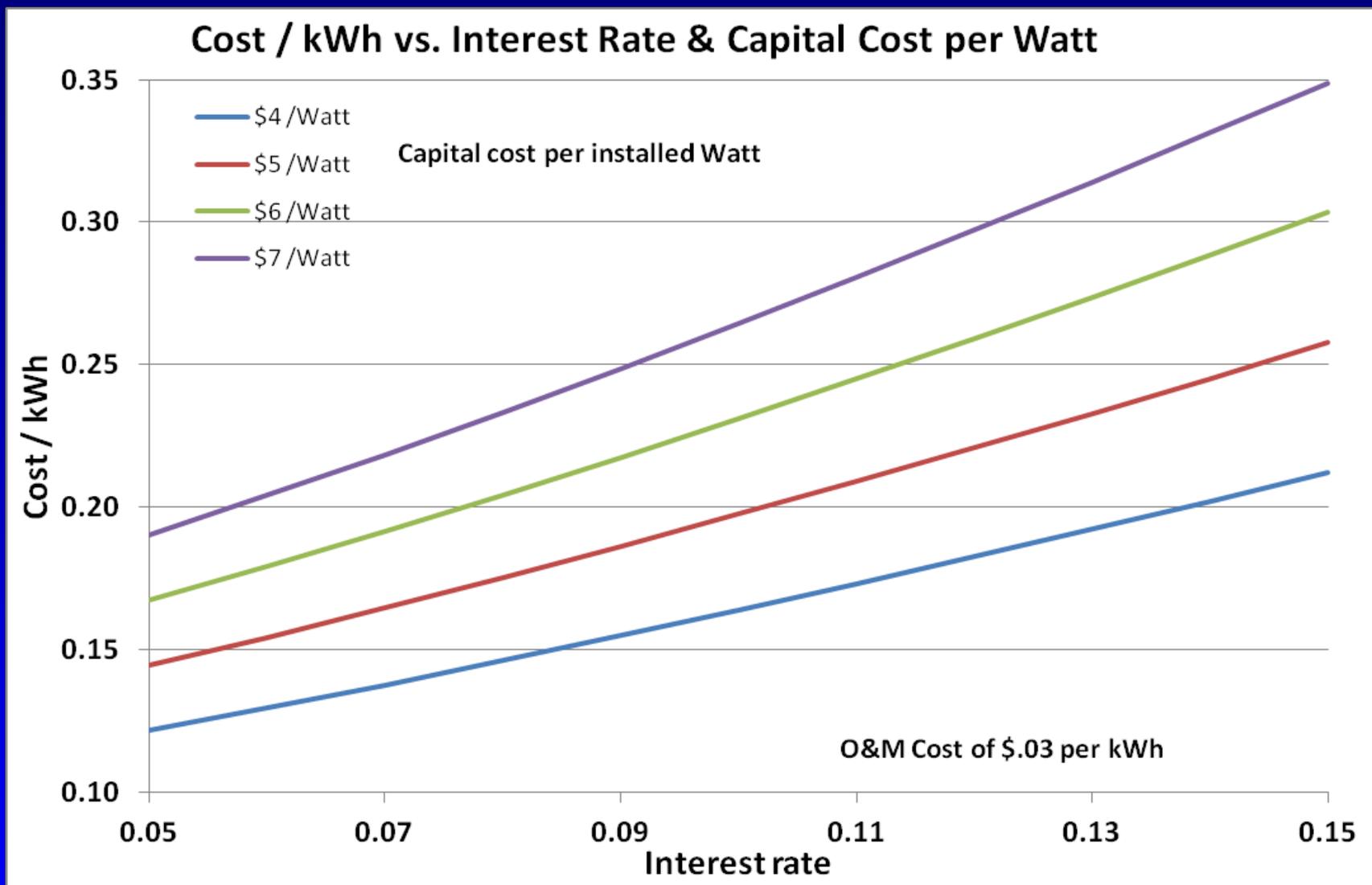
This is the whole point of the MAV Monhegan Demonstration Project

For offshore wind to hit price target this evidence must first be collected

Power price for full farm 1/2 as much - Fixed costs with only 2 turbines

At \$0.75/month/family this is cheap “insurance” and a good investment

# Deep Water Wind Very Interest Rate Sensitive



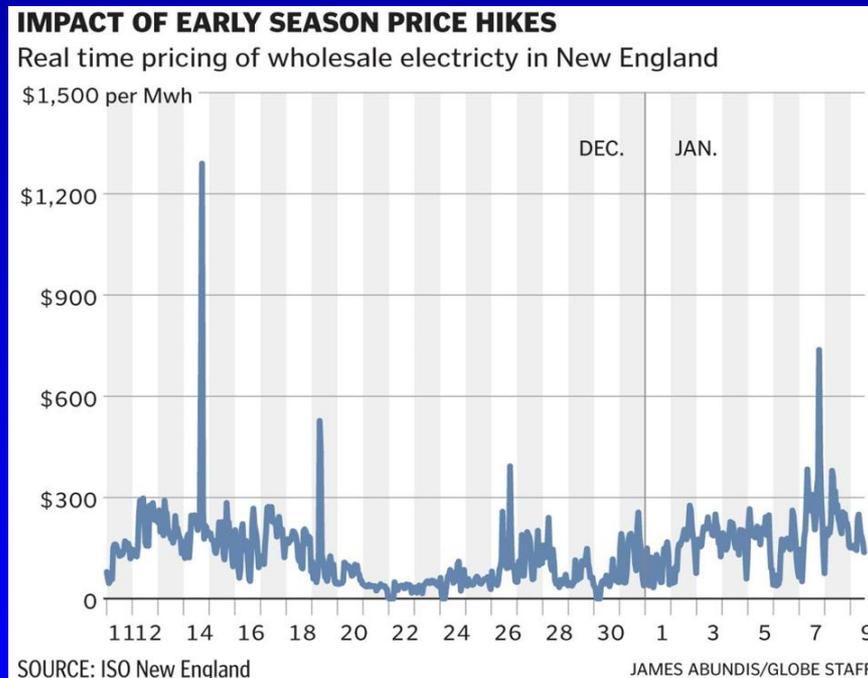
20 year basis

# MAV as Insurance Against What?

- An international incident in Middle East could send oil price skywards at once
- New England has repeatedly faced Nat Gas shortages on coldest winters days
- Very low cost Nat Gas will be a memory within a couple of decades
- That low cost Nat Gas should be used to build, not block, our energy future
- Burning Nat Gas and Oil for heat is a really unwise use of a precious fuel

*“The sharp increases in the cost of power have forced paper mills in Maine and New Hampshire to cut operations or shutter temporarily”*  
1/10/14 Boston Globe

= \$0.30/kWh →



Winter is precisely when MAV would be at max output

“Tuned” source of power for Maine and New England

# **Carpe Diem - Window of Opportunity is Short Lived**

## **Deep Water Wind is Capital Intensive & Energy Intensive**

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**Net energy cost from deep water offshore wind is directly proportional to interest rates -- doubling of rates would heavily damage its viability**

**Recent extraordinarily low interest rates have been a rare anomaly which are showing signs of ending (10 yr T Bill rates, “tapering” talk)**

**As long as it can Fed Gov’t will try to keep a ceiling on long term rates so that interest on Nat’l Debt doesn’t devour budget – it may not work**

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**Equally important is cost of energy which directly affects any heavy industry in raw materials, fabrication and transportation costs**

**\$100 / barrel oil is testimony to temporary restraining effect of fracking on energy prices -- this restraint will not last forever**

**Bottom line – build out the energy system of the future as soon as we can while we can still afford to – use taxes on low cost gas/oil to fund it**