A Vision for High Volume Wind Energy Markets

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Today
2006
Bulk Power Generator
5-8¢ at 13mph
With No PTC
• Land Based
• Bulk Electricity
• Wind Farms

Less than 1% of Electricity Market

Land-Based Electricity Path

Land-Based LWST Large-Scale
2–5 MW

Cost & Regulatory Barriers

Offshore Electricity Path

Offshore Turbines
5 MW and Larger

Cost & Infrastructure Barriers

Advanced Applications Path

• Hydrogen
• Clean Water
• Plug Hybrids

Custom Turbines for Multi-markets:
• Electricity
• H2 production
• Desalinate water
• Transport & Storage

Tomorrow

LWST Turbines:
• 3.6¢/kWh at 13mph
• Electricity Market 2012

Offshore LWST Turbine:
• 5 cents/kWh
• Shallow/Deep water
• Electricity Market
• Higher wind Sites 2014 and Beyond

Offshore Electricity Path

2006
Bulk Power Generator
5-8¢ at 13mph
With No PTC

• Land Based
• Bulk Electricity
• Wind Farms

Less than 1% of Electricity Market
Advanced Turbines Competitive without a PTC

- Lifetime O&M cost reduction through innovation giving high reliability
- Condition monitoring to actively analyze the turbine condition and forecast maintenance
- Drivetrain innovation to reduce weight/cost while improving reliability
- Active rotor pitch and speed control for load reduction and more energy
- Lighter rotors with higher tip speeds and more flexible blades giving higher energy and lower loads
- Twist/flap coupling for passive load control during turbulence conditions
- Scaling to larger sizes with transport and installation constraints?
Plug Hybrid Electric Vehicles
(A Future Off-Peak Electricity Market with Storage)
Offshore Wind / Wave Synergy

- Long-term Possibility +20 Years
- Maximize Grid Interconnect Potential
- Reduce Intermittency & Increase Total Energy Output
- Increase System Reliability & Reduce Maintenance

Credit: GE Energy

Wind / Wave Integrated Platform
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