

AAPA MEDC Meeting
June 28, 2013

Alternative Energy Facilities & Cargo
Development Briefing

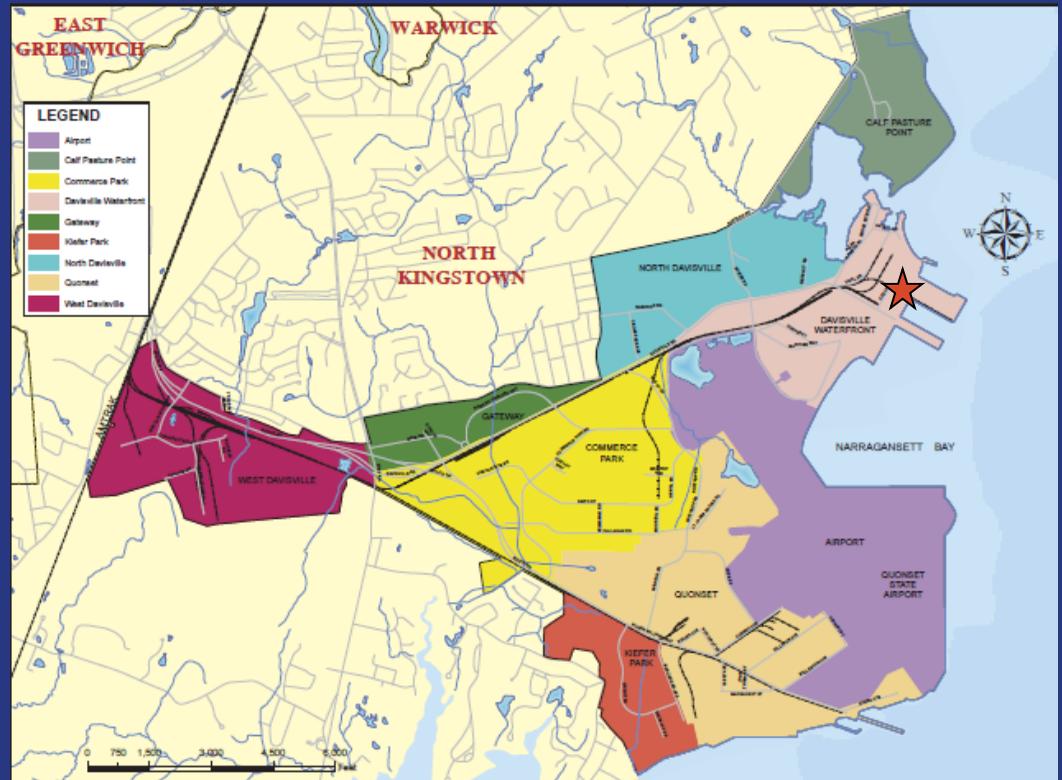


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9,100 Jobs**



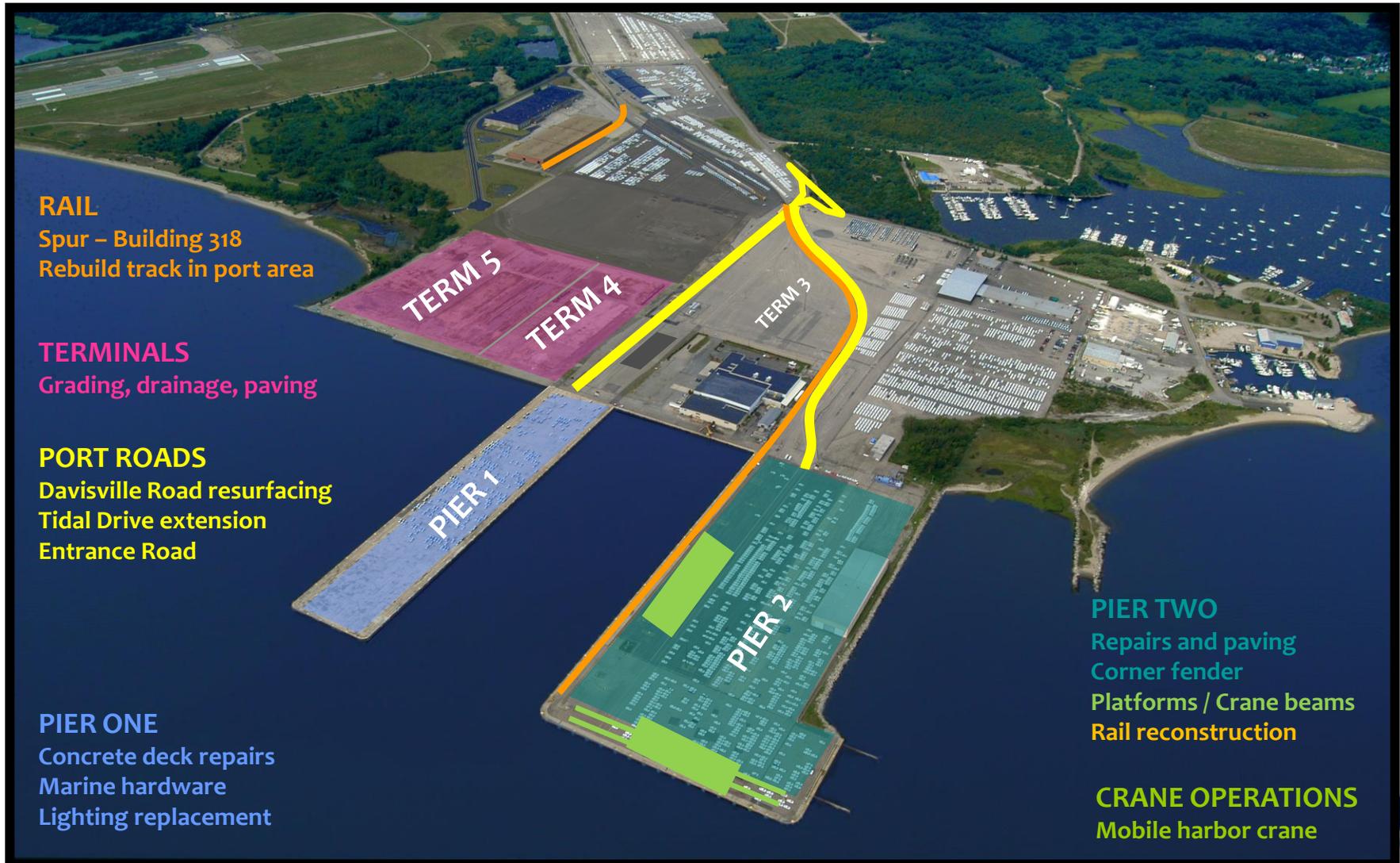
Port of Davisville



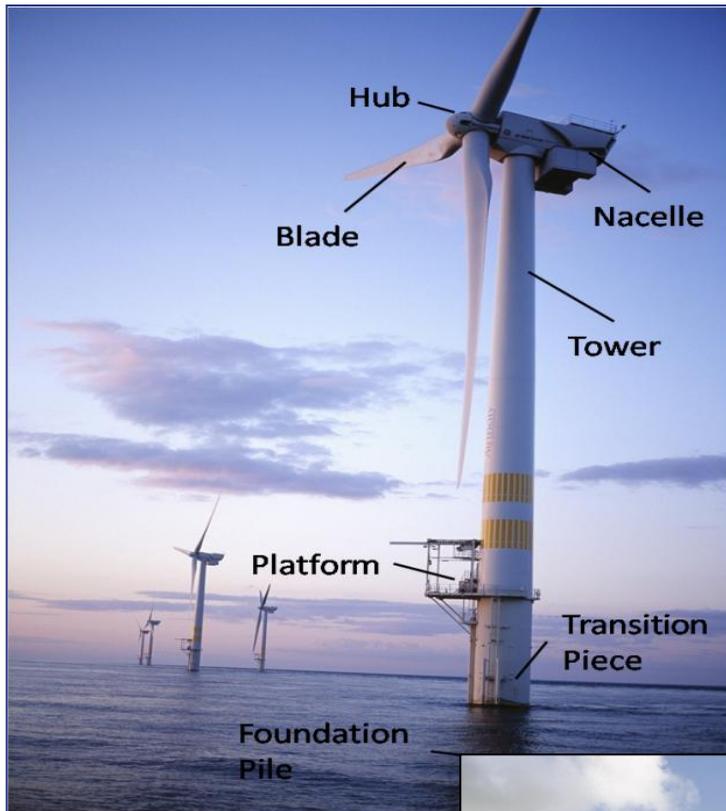
- Record breaking 172,000 autos in 2012
 - 14.6% increase over 2011
 - Nearly 5X volume since 1996
- 3,000 linear feet of pier space on 2 piers
- 32' controlling water depth
*as of January 30, 2013
- Dredging recently completed at no taxpayer expense
- Foreign Trade Zone 105



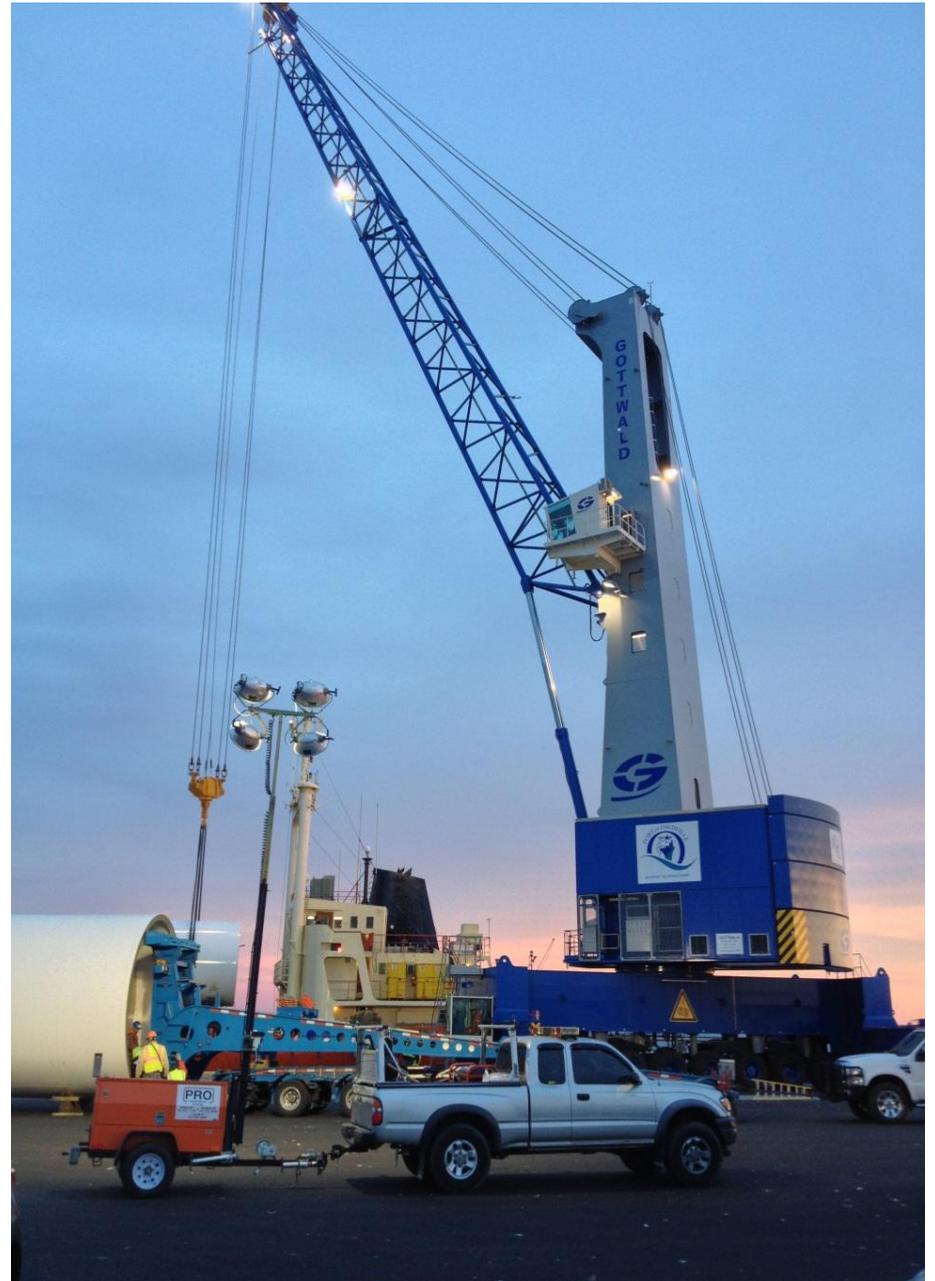
Port of Davisville -- TIGER QWEST Projects



Offshore Wind Turbines



Component	Weight	Length
Monopile Foundation	250 t	Up to 60 m
Transition Piece	190 t	15 m
Tower	100 t	25 m segments
Nacelle	140 t	10 m
Hub	50 t	5 m
Blade	15 t	50 m







LNG as Marine Fuel

Key Drivers:

- Catalyst for change in marine fuel market is environmental regulation enacted by IMO
- IMO MARPOL Annex VI
 - US EPA
 - North American ECA
 - US Caribbean ECA
- USCG Guidance and Regulations
- Ship Economics
- Market Uncertainty

Conference

The LNG for Marine Transportation

Conference & Exhibition

June 11-12, 2013

Houston, TX

Emissions Control Areas (ECA)

- MARPOL Annex VI
 - Establishes program for engine emission standards and fuel sulfur limits to ships that operate in designated Emission Control Areas
 - existing ECAs: Baltic Sea, North Sea
 - planned ECAs: Coasts of USA, Hawaii and Canada
 - discussed ECAs: Coasts of Mexico, Coasts of Alaska and Great Lakes, Singapore, Hong Kong, Korea, Australia, Black Sea, Mediterranean Sea (2014), Tokyo Bay (in 2015)
- North American ECA
 - March 26, 2010, IMO designated waters off North American coasts as an ECA. First-phase fuel sulfur standard entered into force August 1, 2012, and second phase begins in 2015. Beginning in 2016, NOx aftertreatment requirements become applicable.
- US Caribbean ECA
 - July 15, 2011, IMO designated waters around Puerto Rico and U.S. Virgin Islands as an ECA. Effective date of the first-phase fuel sulfur standard will enter into force January 1, 2014, and the second phase begins in 2015. Stringent NOx engine standards begin in 2016.

ECAs

- 200 nautical miles or entire EEZ under UNCLOS
- Under MARPOL Annex VI, within ECAs, marine fuels used must have a sulfur content of no more than 1% m/m, falling to 0.10% m/m on 1 January 2015.

US Coast Guard

- In USA, ECAs are regulated by EPA and enforces by USCG.
- USCG is working on national policies for LNG as fuel & guidance to establish consistent regulations for all COTP zones
- Vessels not required to conduct WSA
- Considering studies to help guide exclusion zones
- No position on Passenger loading during bunking
- Regards fuels tanks differently than cargo
 - Fuel: 49 CFR Parts 171- 179
 - Cargo: 33 CFR 126
- Regulation of small bunkering facilities may be outside jurisdiction, and may fall to other federal, state, and local authorities.

Ship Economics

- Estimated 10 year payback on LNG conversion
- Less than 50 ships worldwide use LNG
- EIA estimates LNG will remain 70%-85% cheaper through 2035
- Conversion costs
 - Tug - \$7 million
 - Ferry - \$11 million
 - Great Lakes bulk carrier \$24 million
- Fuel Consumption
 - Tug - 400,000 gal/yr
 - Ferry - 700,000 gal/yr
 - Great Lakes bulk carrier 2 million gal/yr

Dual Fuel Vessels

- Maybe cheaper to build new than convert existing fleets
- Over 20 year life, outfitting for dual fuel may cost between \$850 - \$1750 per day of additional CapEx
- Very limited ports offer LNG Bunkering
- Efficient bunkering requires new vessels to be constructed

Market Uncertainty

- Port: invest in LNG infrastructure – number of ships?
- Carriers: invest in conversion – number of ports w/ LNG?
- Suppliers: ships? Ports? Facilities/customers?

LNG Bunkering Facilities

- Cost of infrastructure could double delivered cost of LNG eroding cost efficiencies for operation
- Facilities developed near existing LNG terminals may reduce cost
- Significant first-mover disadvantages may require government subsidies to close market gaps
- First LNG Bunkering Facilities in America' to be at Port Fourchon, Louisiana
- Harvey Gulf International Cites \$400 Million Investment in LNG Vessels and Fueling

Sources

- US EPA Website
- American Clean Skies Foundation
- American Association of Port Authorities
- Morgan Stanley
- GDF Suez



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