Quonset Business Park®

3,207 Total Acres

Over 175 Great Rhode Island Companies

More than 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

RAIL
Spur – Building 318
Rebuild track in port area

TERMINALS
Grading, drainage, paving

PORT ROADS
Davisville Road resurfacing
Tidal Drive extension
Entrance Road

PIER ONE
Concrete deck repairs
Marine hardware
Lighting replacement

PIER TWO
Repairs and paving
Corner fender
Platforms / Crane beams
Rail reconstruction

CRANE OPERATIONS
Mobile harbor crane
Offshore Wind Turbines

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
<th>Length</th>
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</thead>
<tbody>
<tr>
<td>Monopile Foundation</td>
<td>250 t</td>
<td>Up to 60 m</td>
</tr>
<tr>
<td>Transition Piece</td>
<td>190 t</td>
<td>15 m</td>
</tr>
<tr>
<td>Tower</td>
<td>100 t</td>
<td>25 m segments</td>
</tr>
<tr>
<td>Nacelle</td>
<td>140 t</td>
<td>10 m</td>
</tr>
<tr>
<td>Hub</td>
<td>50 t</td>
<td>5 m</td>
</tr>
<tr>
<td>Blade</td>
<td>15 t</td>
<td>50 m</td>
</tr>
</tbody>
</table>
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
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**

- **US Caribbean ECA**
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.
In USA, ECAs are regulated by EPA and enforced 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
Duel 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
Evan Matthews
Port Director

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