



LNG AND THE FUTURE

AAPA MARINE TERMINAL MANAGEMENT TRAINING PROGRAM

**ANTHONY CHIARELLO
PRESIDENT & CEO
TOTE**

Our values:
safety, reliability
and commitment

Family owned
and managed

\$2.8 billion in
annual revenues

More than
7,500 employees

Investment
Grade credit
rating

90% of earnings
reinvested

MARINE RESOURCES



Largest coastal
and harbor service
company in the
United States

Revenues
\$435M

Over 150 tugs
and barges

2 Shipyards

International
towing
operations

Hawaii inter-
island common
carrier

TRUCKING



National full
truckload operation

Revenues
\$300M

1,500 Tractors

5,600 Trailers

18 Terminals

PETROLEUM DISTRIBUTION



Independent
petroleum marketer
and distributor in
Alaska & Hawaii

Revenues
\$800M

Over 20 million
gallons of
fuel storage
capacity

AIR CARGO



Largest all-cargo air
carrier in Alaska &
Hawaii

Revenues
\$165M

100-150 weekly
scheduled
flights

Ad-hoc 737
charter service
in N.America

DOMESTIC
SHIPPING & LOGISTICS



Leading domestic
logistics & marine
transportation
provider

Revenues
\$700M

5 Vessels;
4 Sailings per
week

Heavy Haul
Trucking

170,000
square feet of
warehouse

325 Tractors

INTERNATIONAL
SHIPPING & LOGISTICS



Cargo transportation
to the Bahamas & The
Caribbean

Revenues
\$500M

14 vessels

Ports from
Canada to
South Florida

Cargo
insurance,
consolidation
and logistics

Fixed day
sailings, fastest
transit times

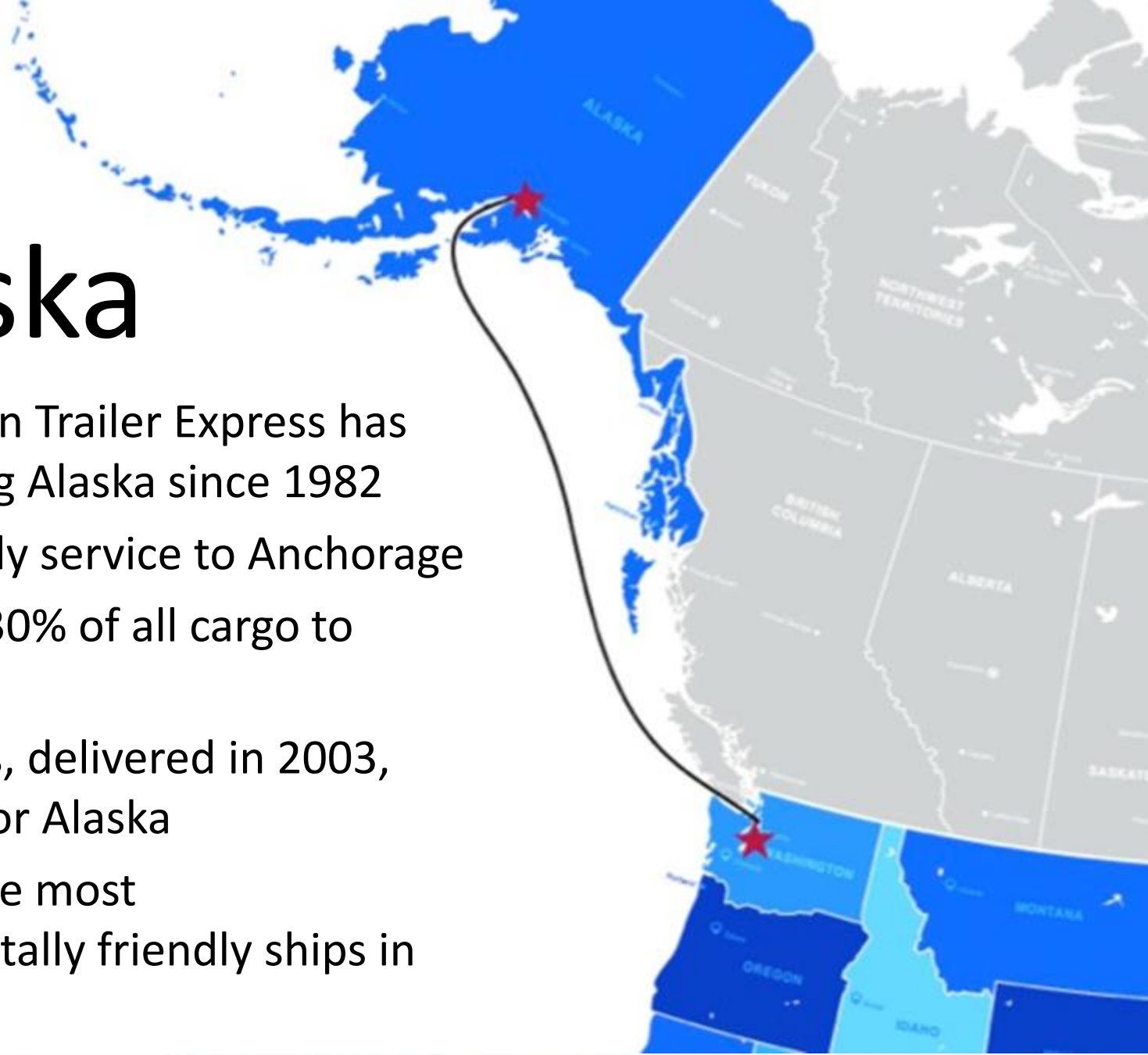


- High-speed, high-quality liner service in US Domestic Trade
 - Washington to Alaska
 - Florida to Puerto Rico
- Logistics based operations in Alaska, Hawaii, and Puerto Rico
 - Terminals in Anchorage, Fairbanks, Kenai, Kodiak, Prudhoe Bay and Seward, as well as Tacoma, WA, Houston, TX, Blaine, MN, and Edmonton, AB
 - Jacksonville and other Southeast locations
- Full technical management and partial management/crewing services



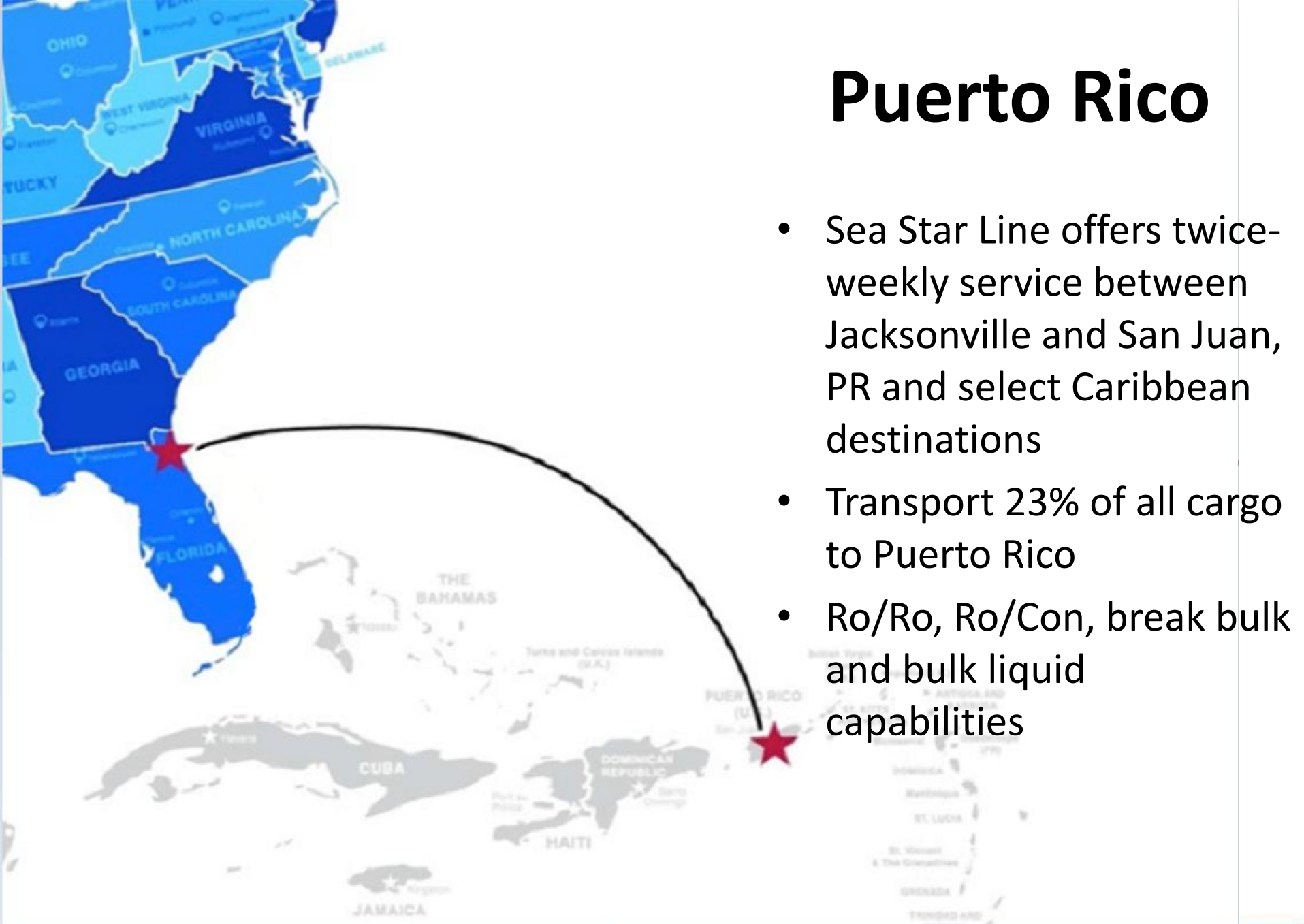
Alaska

- Totem Ocean Trailer Express has been serving Alaska since 1982
- Twice-weekly service to Anchorage
- Transports 30% of all cargo to Alaska
- Orca vessels, delivered in 2003, were built for Alaska
- Currently the most environmentally friendly ships in the trade



Puerto Rico

- Sea Star Line offers twice-weekly service between Jacksonville and San Juan, PR and select Caribbean destinations
- Transport 23% of all cargo to Puerto Rico
- Ro/Ro, Ro/Con, break bulk and bulk liquid capabilities





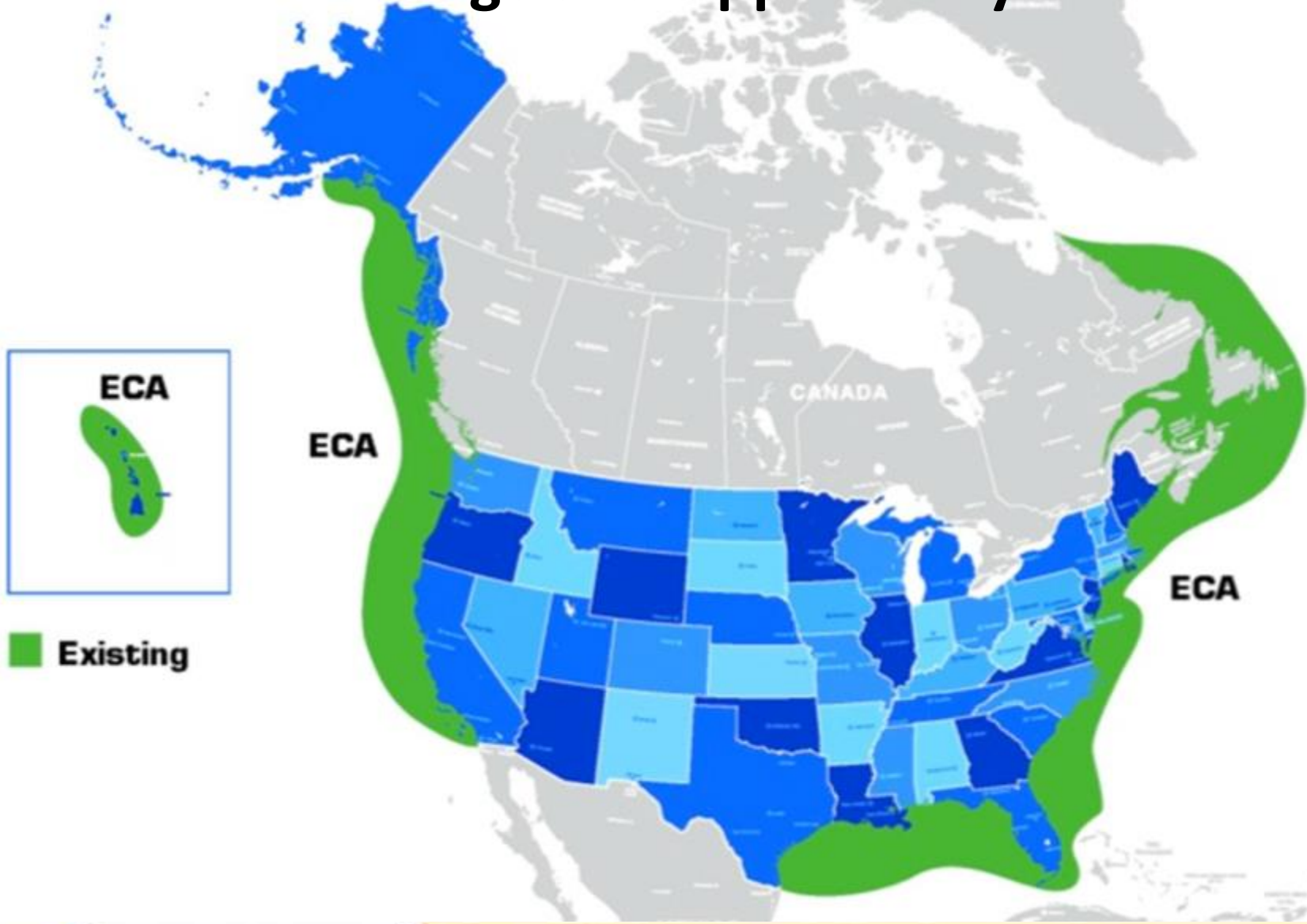
Carlisle
TRANSPORTATION SYSTEMS



TOTE
Logistics

Acquisition in May 2013 significantly increased cargo consolidation, warehousing, trucking and other logistics capabilities

North American Emission Control Area (ECA) Challenge and Opportunity



Possible Solutions

- **Do nothing:** Cost of 1% compliant IFO 380 is significantly higher with further increases expected in 2015 and beyond
- **Install exhaust gas cleaning system:** Scrubbers use existing fuel with added costs
- **Convert to Natural Gas:** Meet all current and future emissions requirements, cleanest of all options

LNG – A Clean & Safe Fuel

- Conversion to natural gas will reduce ship emissions well below even the world's most stringent air quality standards that are outlined in the North American Emissions Control Areas
- LNG will virtually eliminate Particulate Matter (PM) and dramatically reduce Sulfur Dioxide (SO_x) Nitrous Oxide (NO_x) and Carbon Dioxide (CO₂).
- No other viable fuel source provides the same levels of environmental safety

MARLIN Class

- First Steel Cutting on February 24, 2014
- Keel July and November 2014
- Engine mounted for Hull 495
- Launch on schedule April and August 2015

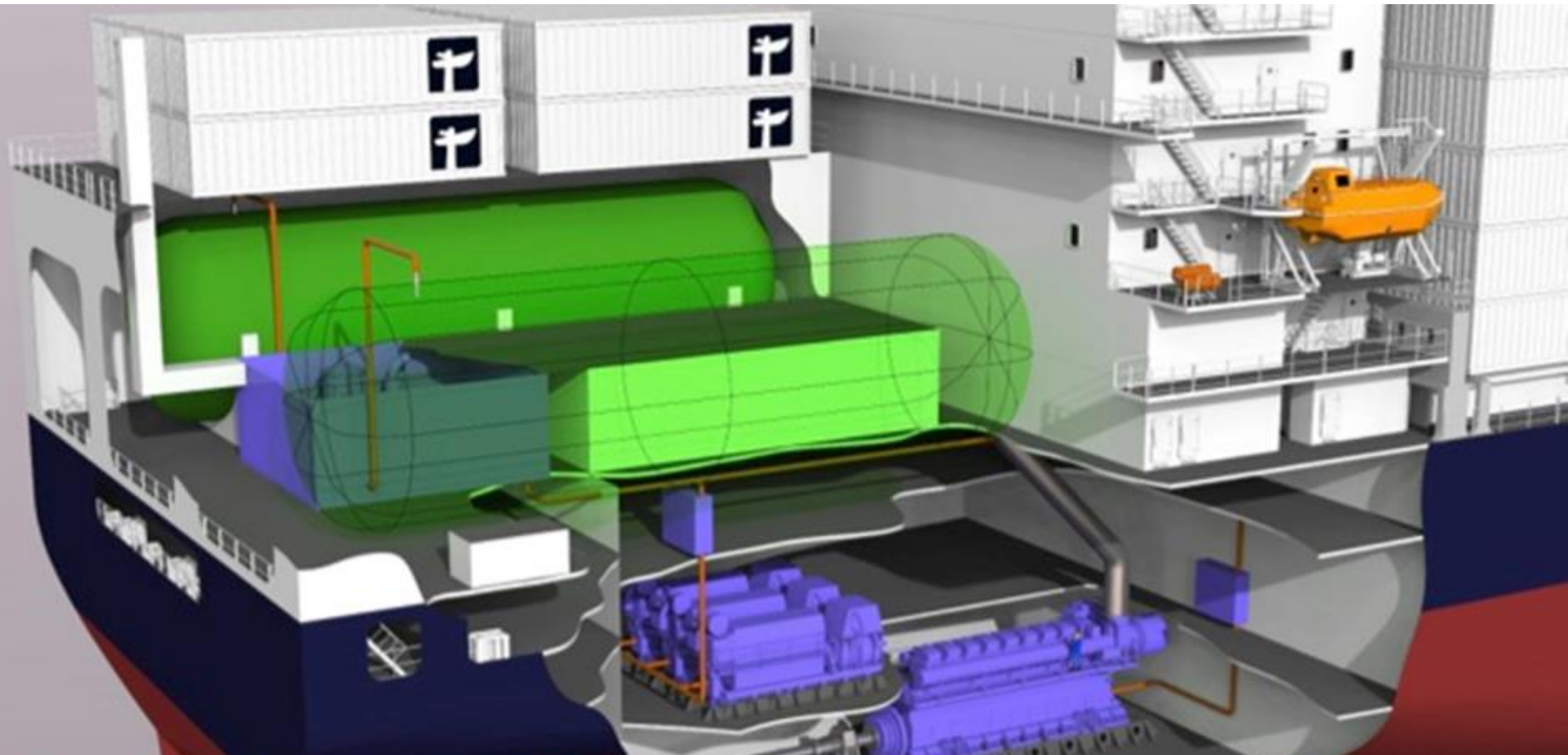


New LNG Ships – *MARLIN Class*



- 3100 TEU
- First LNG container ships in the world
- Dual fuel capable MAN engine
- Bunker in Jacksonville
- First delivery 4th QTR 2015, second 1st QTR 2016

MARLIN Class



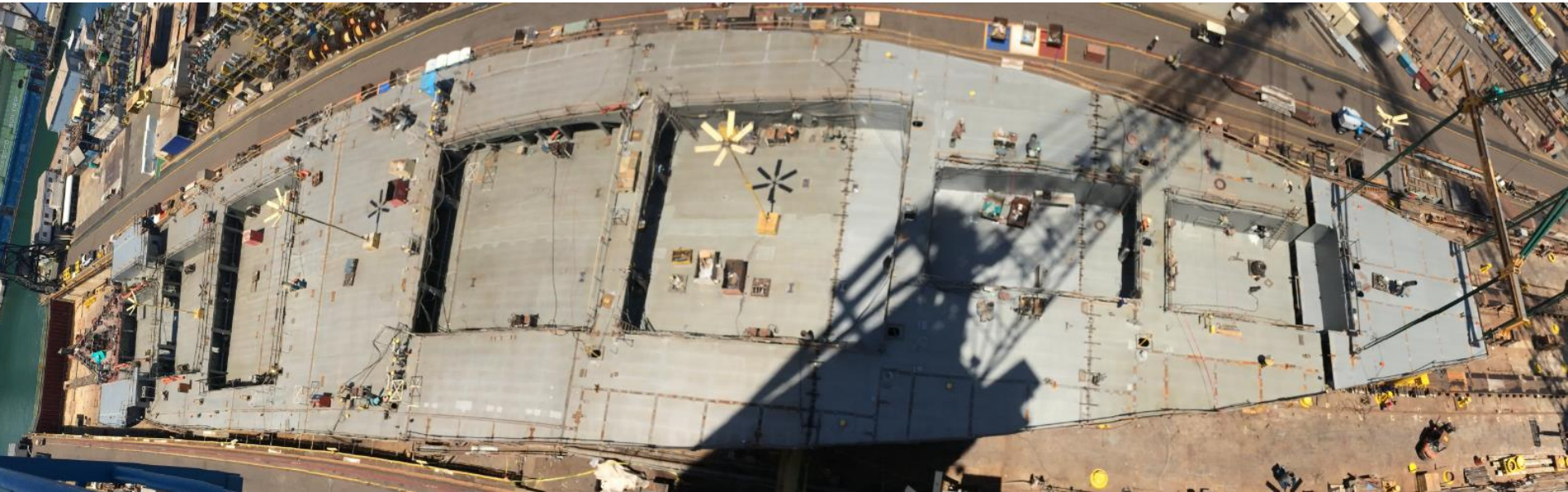
- Slow speed engine fueled by LNG
- Dual fuel capable
- Two 900 cubic meter LNG tanks
- MAN ME-GI Direct drive
- Main and Auxiliary Engines manufactured by Doosan



Bow Thruster



Dual Fuel Diesel Generators
(DFDG)



Fisheye view of Hull 495 on Way 4





LNG Tank



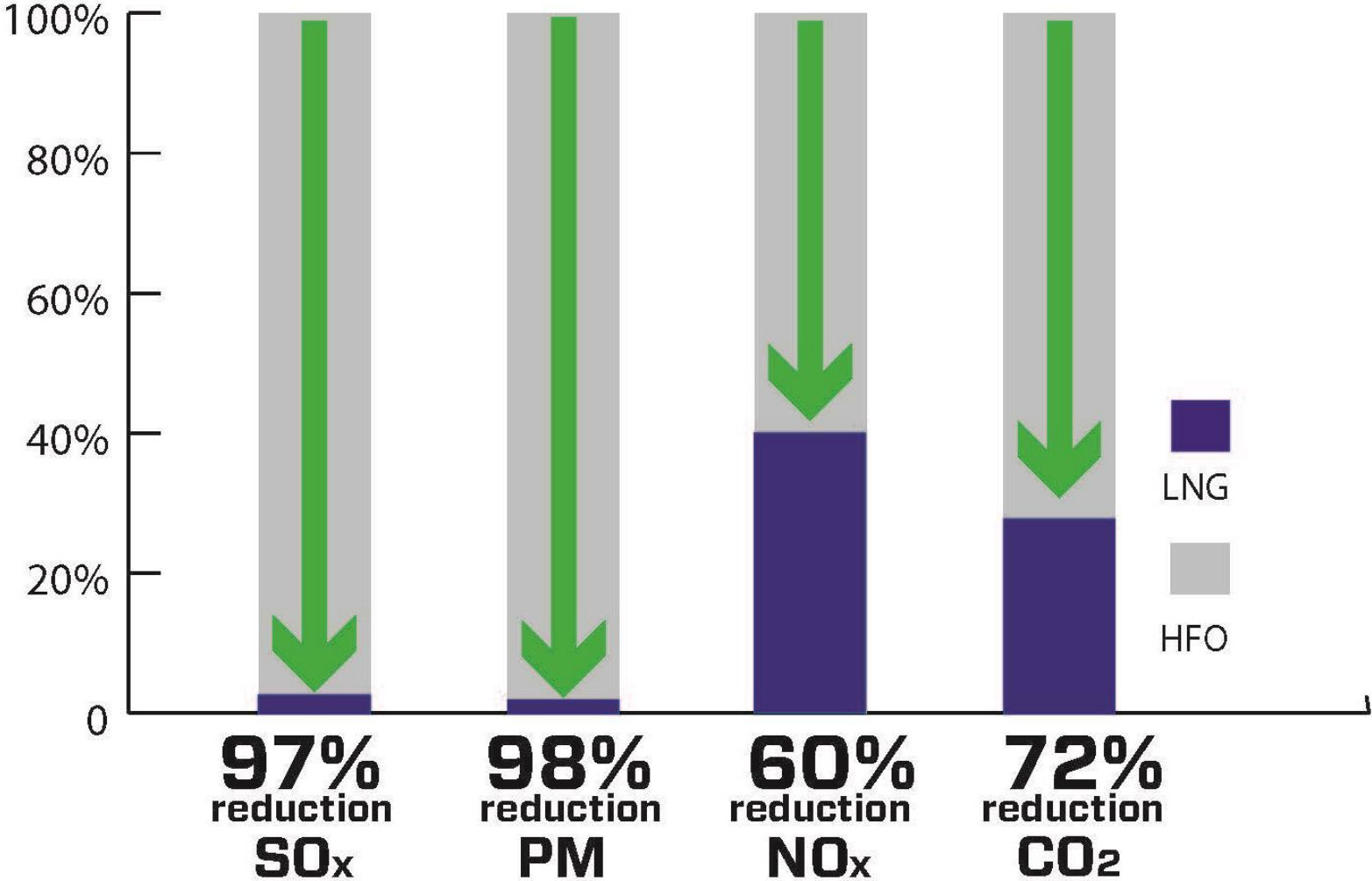




Emissions Comparison: *Ponce* versus *Marlin*

Marlin Vessel Emissions

(kg/annual kFEU-nm)
Ponce compared to Marlin Class



Other Important Vessel Attributes

- Marlins will accommodate 5x more 53' containers than current ships serving Puerto Rico
 - Extension of domestic supply chains
- Increased capacity for refrigerated equipment
 - Multi-temp being tested and evaluated
 - 40', 45', 53' all accommodated
- Specialized container assets will accommodate break bulk, bulk liquids & cars
- Bulk tanks designed to fit 53' cells below

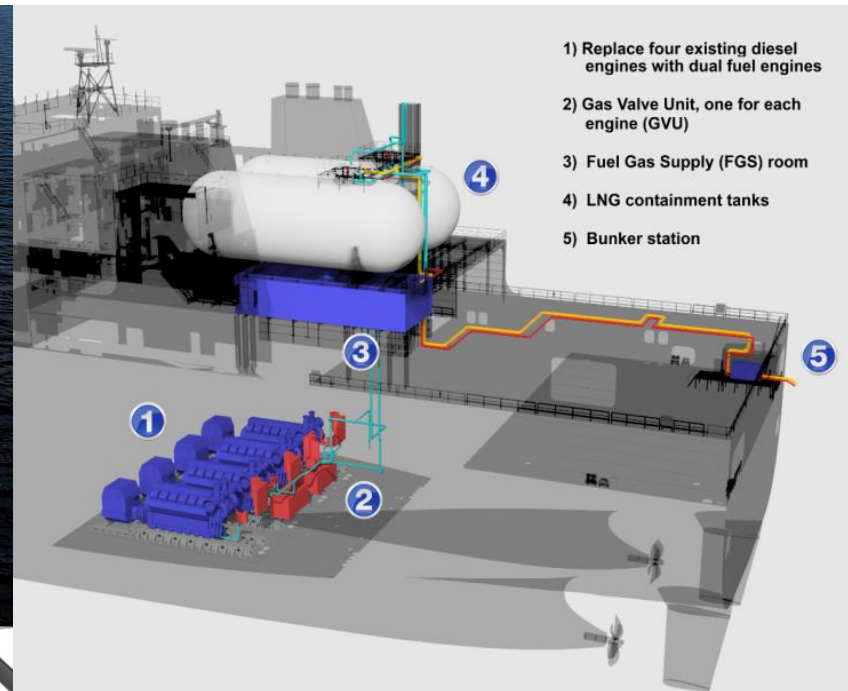
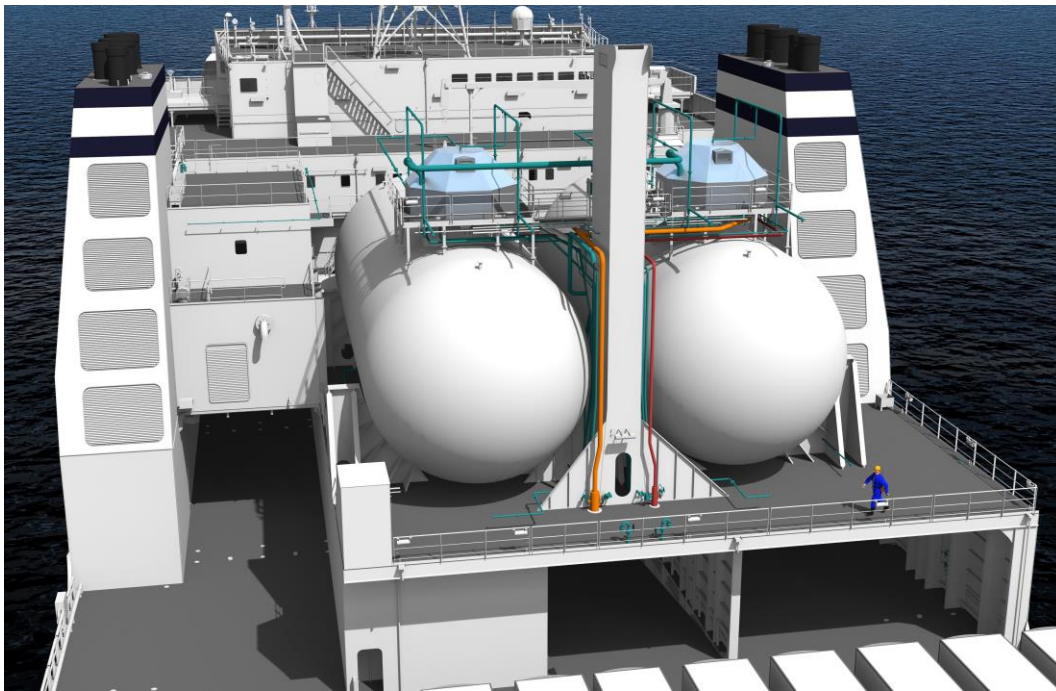
ORCA Re-Engine



- Built for Alaska Trade
- 400,000 gals of LNG needed per week, per ship
- Dual fuel capable Wartsila engines.
- Bunker in Tacoma or Anchorage
- Minimal out of service time during re-engineing

ORCA Class

- Wartsila chosen for engine replacement
- NASSCO project design
- Shipyard - TBD later this year as full design packages available. Down to 2 yards



LNG Bunkering - Jacksonville

- Pivotal/Wespac chosen as vendor
- Short term supply available from existing peak shavers
- Preliminary long term plant location chosen
- Contracting for bulk bunker barge
 - Design considerations
 - Simultaneous operations
 - Common bunker procedures
- Training and safety considerations

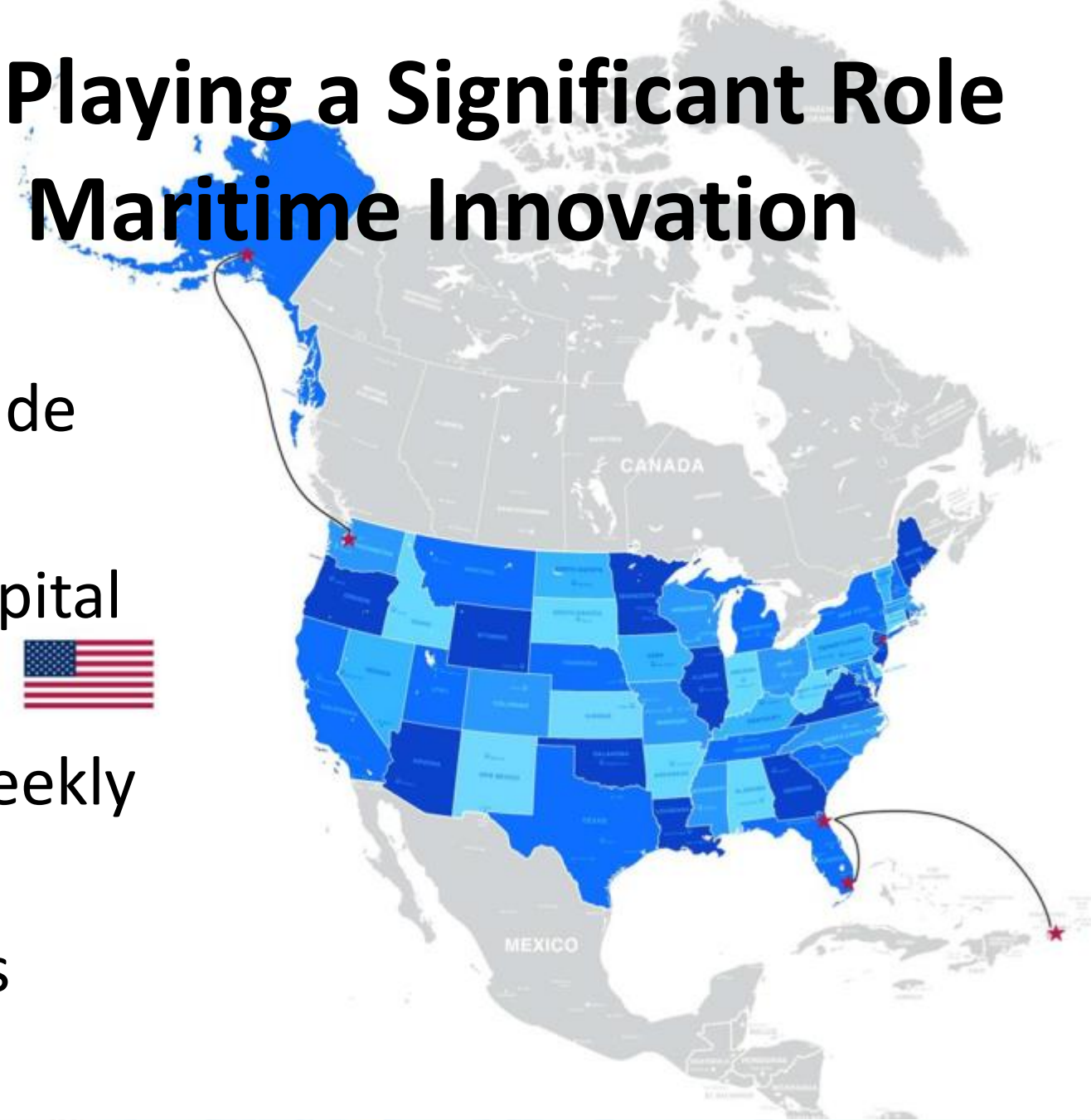
LNG Bunkering - Tacoma

- Working with PSE for long term LNG supply
- Long term plan is to bunker from a cryogenic pipeline connecting to a plant in the Port of Tacoma
- Port of Tacoma has approved lease of necessary land
- Short term supply sourcing LNG from existing peak shavers
- Close cooperation with USCG and others for safety, operations, common policies across all Ports are important considerations for the future

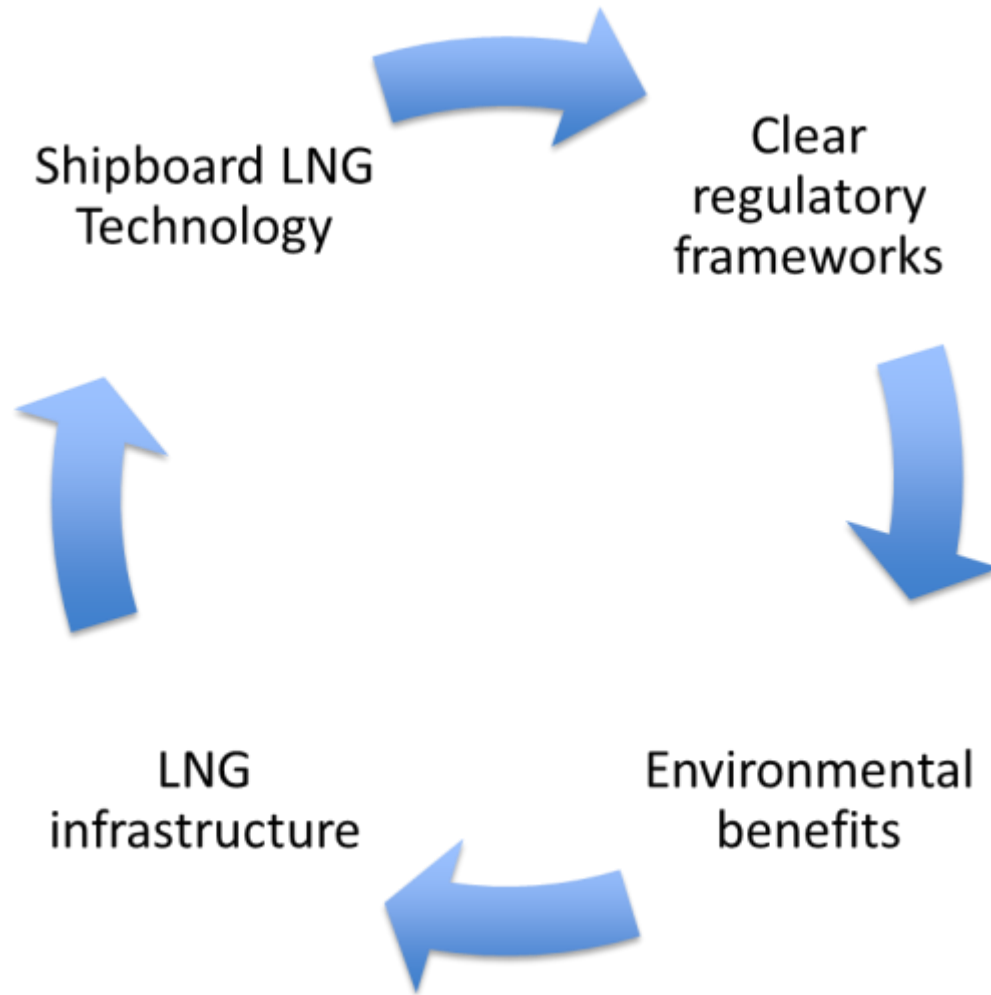
Jones Act Playing a Significant Role in U.S. Maritime Innovation

Advantages

- Dedicated trade lanes
- Long-term capital investments 
- Consistent weekly bunkering requirements



Snowball Effect of Adoption



Some Lessons We Are Learning

- Conversion is difficult and complex
- LNG fuel acquisition critical but available
- Every deployment and vessel type has it's own issues
- Regular itineraries are helpful to insure supply of LNG fuel
- Many misconceptions at all levels that require education and outreach
- Bunkering LNG is very different from loading LNG vessels
- Bunkering LNG is safer than current fuels

Now is the Time

- LNG as a transportation fuel will dramatically increase as road, rail and maritime refine the technology
- Clear window of opportunity to develop LNG supply infrastructure for the maritime industry
- For vessels spending a third of their time or more in the ECA, LNG is a viable alternative to consider
- We predict a boom in the construction of dual fuel, LNG powered vessels as well as LNG as a transportation fuel

