



WESPAC MIDSTREAM

Great Lakes Maritime Research Institute
LNG: Potential for the Great Lakes Region

May 2014

WesPac Midstream LLC

- WesPac founded in 1998 to develop, own, and operate energy infrastructure projects
- Project history in tank farms, pipelines, marine terminals , rail offloading, and airport fuel facilities
- Focus on LNG, NGL, and gas processing infrastructure
- Geographic emphasis is in North America, Central America, and Caribbean



Ownership



- \$7 Billion Independent, infrastructure investment firm with deep expertise in energy investing and development
- Portfolio includes Kinder Morgan G.P., Ports America, Southern Star, Advanced Disposal

- Diversified construction company focused on energy, including pipelines, terminals, power plants, process and refining
- Over 5,000 employees, revenue \$1.5BB, strong balance sheet and large bonding capabilities



Newark Container Terminal



Jaxport Container Terminal



American Ref-Fuel Plant



Kern River Pipeline



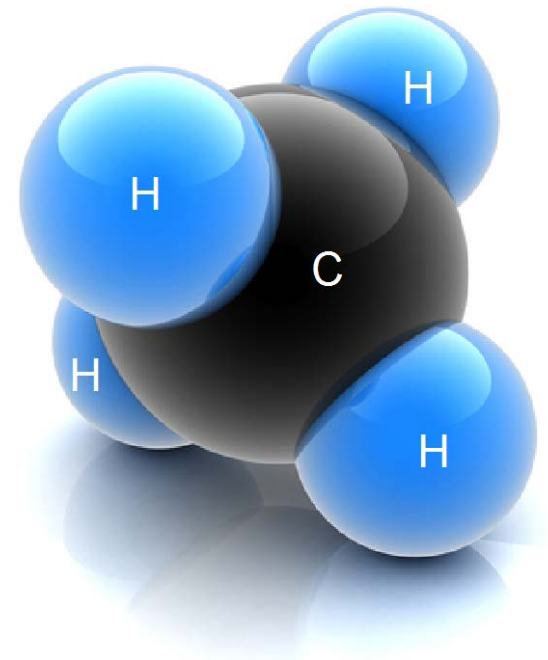
Boron LNG Plant



Sunrise Power Plant

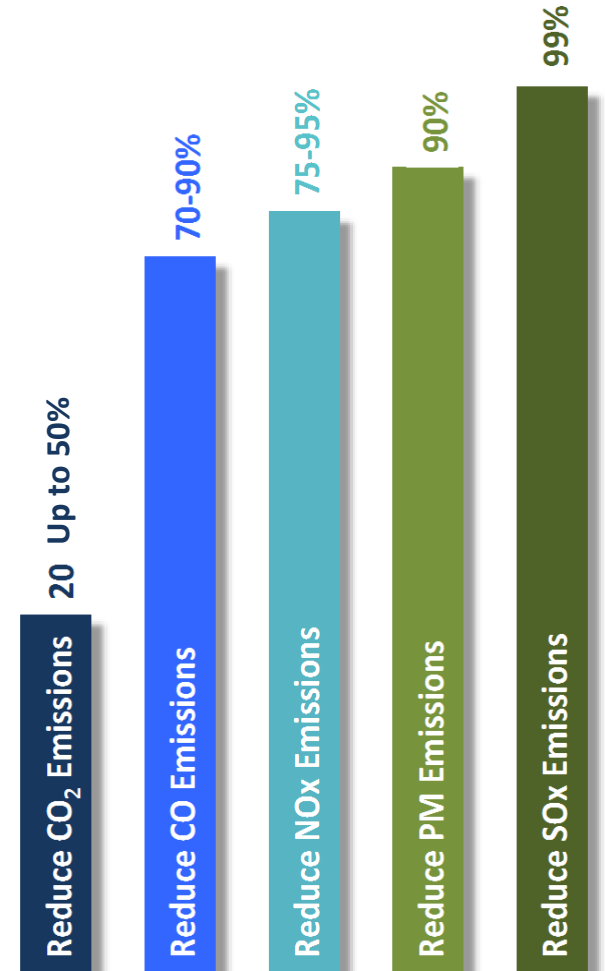
Liquefied Natural Gas (LNG) Facts

- Mixture of natural gas materials used, but primarily methane
 - Normally includes small amounts of ethane, butane, propane and other gases
 - Typically greater than 95% CH₄ (methane)
- Natural Gas Liquefaction Process
 - Chill methane to -260°F
 - Reduces volume by a factor of 600
- Vital Statistics
 - Heat Value - 86,000 Btu/gallon
 - Density - 3.5 pounds/gallon
 - Odorless, non-toxic, non-corrosive



Health, Safety & Environmental Advantages

- Safety
 - Vapors rise and dissipate into the air
 - Stored at atmospheric pressure
 - Lower flammability limit of 5% is 10 times higher than fuel oil
 - 1,000 °F auto ignition temperature is highest among all hydrocarbon fuels
- Environmental
 - Significant emission reductions from combustion versus fuel oil or diesel
 - LNG plant emissions are very minimal
 - Vaporizes when spilled without contaminating soil or water



Natural Gas Emission
- Reductions Versus Diesel -

Comparison Between LNG and Other Fuels

	LNG	PROPANE	DIESEL
Btu Per Gallon	86,000	91,000	139,000
Gallons Per MMBtu	11.63	10.99	7.19
Relative Energy Density	1.00	1.06	1.62
Ignition Temperature (F)	1,004	842	437
Boiling Point	-260	-44	+370
Leaks and Spills	Vaporizes To Atmosphere	Gathers in low areas	Puddles in ground

Boiling point simple definition: The point at which a liquid turns into gas

LNG Projects In Development



WesPac has won the right to build a small scale LNG facility in Jacksonville to serve TOTE container vessels operating between Jacksonville and Puerto Rico

Great Lakes LNG Market Strategy Considerations

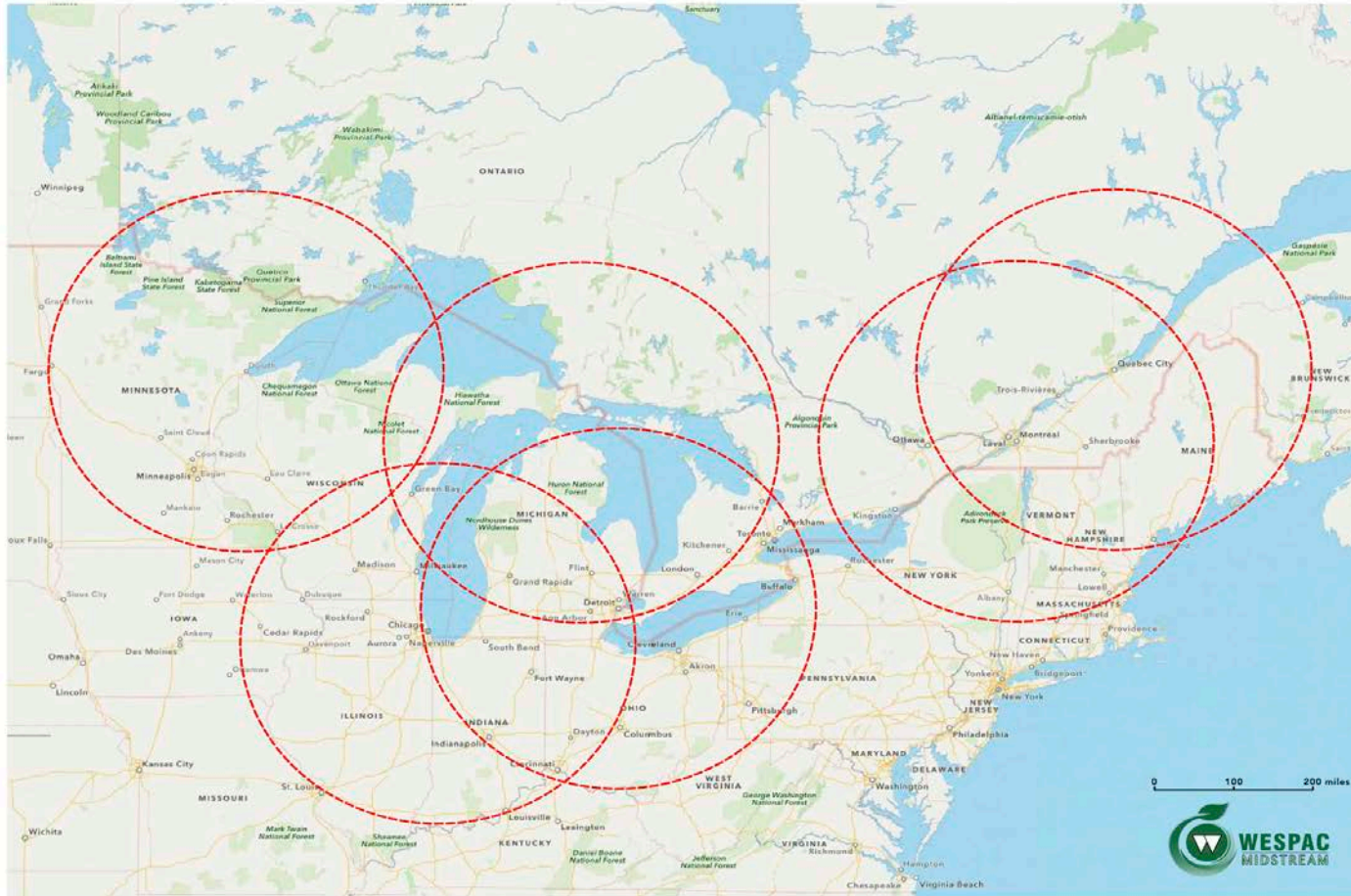
Challenges

- Multiple fueling points
- Winter shipping shut-down
- Shipping patterns are not always point-to-point
- Fresh water ship conversion economics
- Complex logistics model

Advantages

- Small number of shippers
- Ample brownfields for development
- Pro-development mindset
- Great Lakes environmental sensitivity
- Inherent complimentary high horsepower users

Great Lakes - Areas of Development



Great Lakes Strategy Concepts

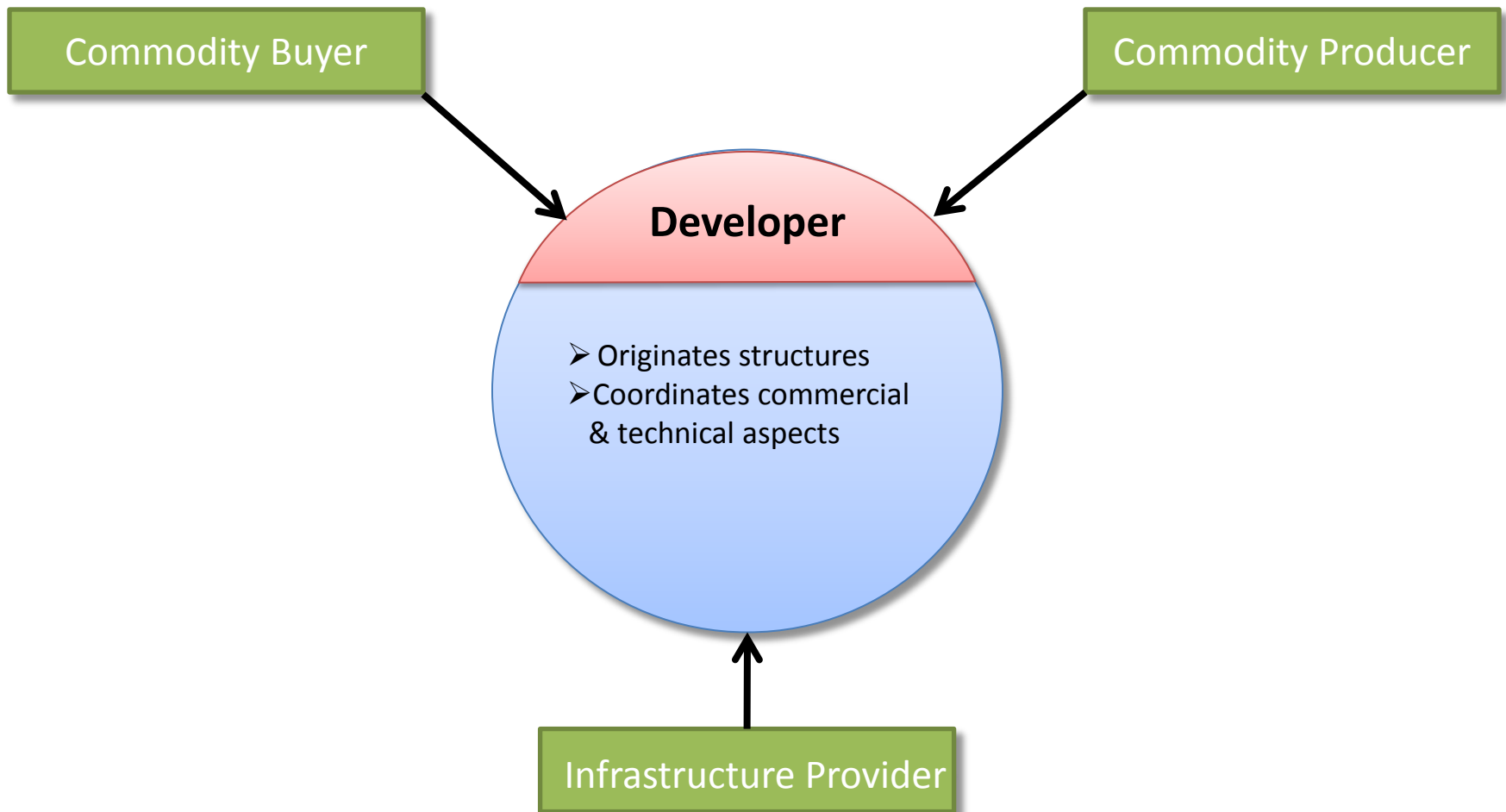
- Strategically site LNG plants to minimize LNG transport costs and ensure supply security
- Site multiple fueling points around Great Lakes anchored by shipping fleets
- Improve economies of scale by adding incremental volumes from other high horse power markets
- Employ a “gas plus” pricing strategy to drive compelling engine conversion economics

WesPac's Great Lakes Market Approach

- Focus on Great Lakes fleets supplemented by mines and railroads
- Determine optimal LNG plant and fueling points
- Build small scale LNG plants to suit regional market
- Provide assistance with conversion economics through third party financing vehicles

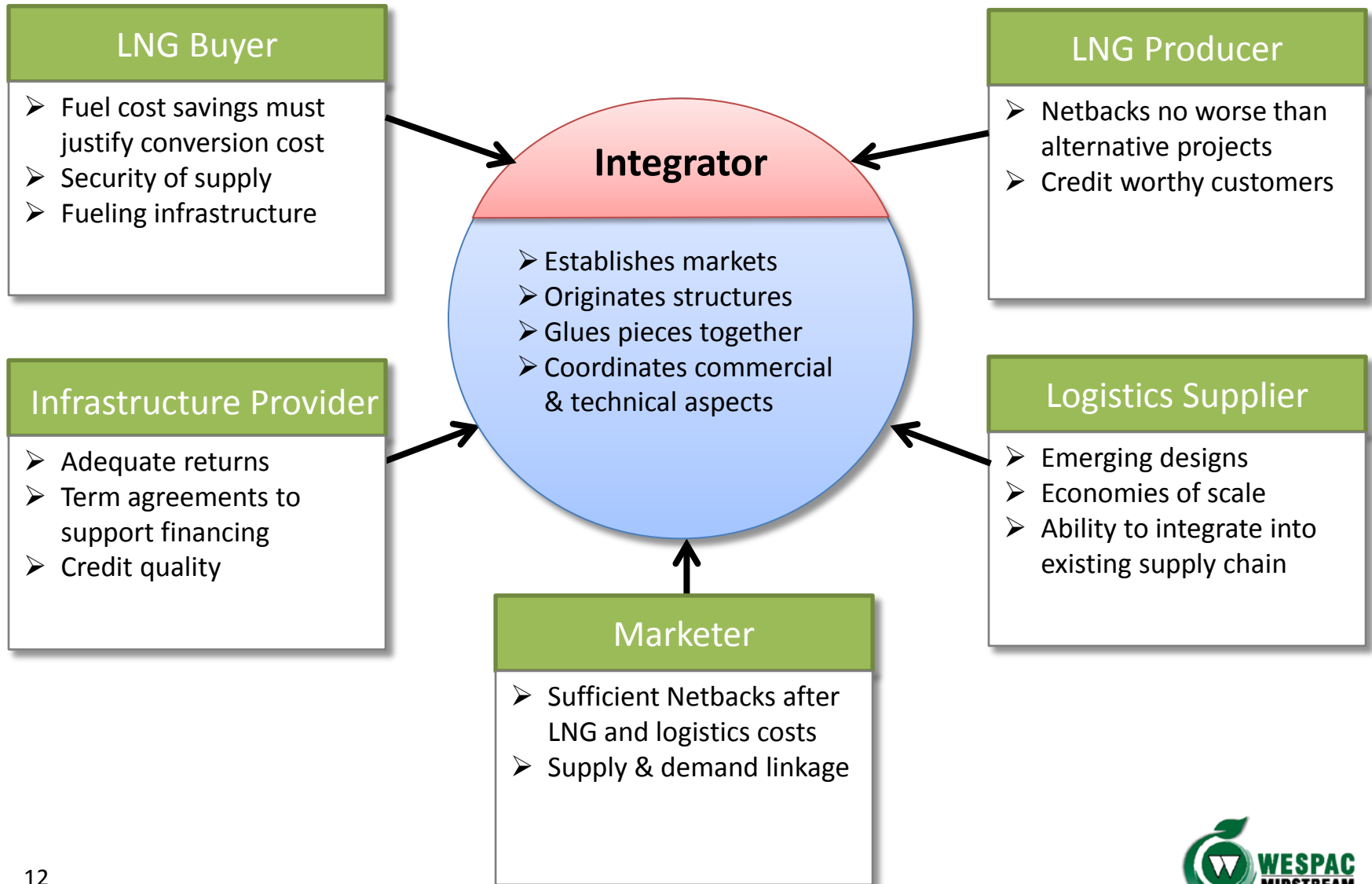
Market development under way to advance projects

Conventional Midstream Developer Business Model



Emerging Market Integrator Business Model

Multiple Stakeholders Interests Must Be Addressed to Implement LNG Project



Economic Growth Potential

- Approximately 100-200 jobs created during two-year construction period
- Approximately 25 full time jobs for ongoing plant operation
- Annual salary for plant operations employees an average of \$70,000

Based on 100,000 gallon/day liquefaction facility

Thank You

