



# DELIVERING INTEGRATED CNG PROJECTS

NORTH AMERICAN ROADSHOW

26 FEBRUARY 2018



**GLOBAL ENERGY VENTURES** LTD

Global Reach | Energy Efficiency | Venture Focus

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# CORPORATE OVERVIEW

## BOARD OF DIRECTORS

Maurice Brand	Chairman & CEO
Garry Triglavcanin	Executive Director
Paul Garner	Non-Executive Director
Jens Jensen	Non-Executive Director

## MANAGEMENT

Jack Toby	Company Secretary & CFO
Roger Whelan	Project Director, Atlantic CNG
Raj Selvendra	Country Director, India & Sri Lanka
David Bradley	Director, GEV Canada
William Hornaday	Director, GEV Canada
David Stenning	Chief Operating Officer, GEV Canada
John Fitzpatrick	Chief Technical Officer, GEV Canada
Milton Schmedje	Gas Projects Manager
Luke Velterop	Gas Projects Officer

## CAPITAL STRUCTURE

CAPITAL STRUCTURE	GEV.ASX
Total Shares on Issue post transaction and Capital Raising	324.4m
Market Capitalisation at \$0.40/share (undiluted)	\$129.7m
Cash Balance as at 6 February 2018	\$7.89m
Performance Shares – SeaNG Transaction <sup>3</sup>	15.85m (4%)
Options on Issue <sup>1</sup>	43.9m (11%)
Performance Rights <sup>2</sup>	12m (3%)
Fully Diluted Shares	396.1m (100%)

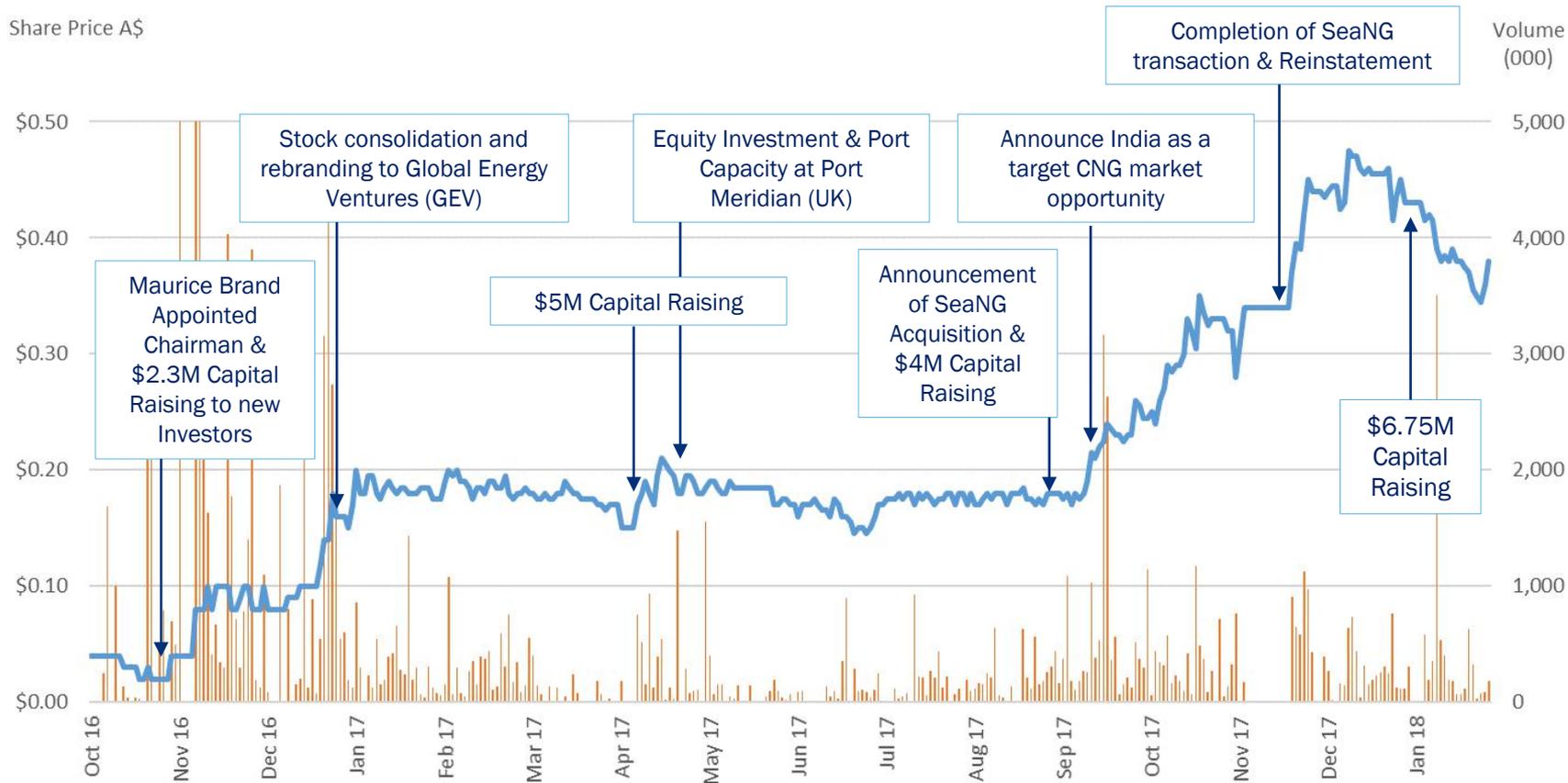
1. 7.26m 10c options, expiry 30/5/20; 2m 14c, expiry 18/6/20; 3m 21c, expiry 19/6/20; 31.63m 40c options, expiry 31/5/20;
2. Performance Rights issued to Maurice Brand, Garry Triglavcanin and Paul Garner
3. Refer to the Notice of Annual General Meeting for full details of the Milestone Conditions

## SHAREHOLDER SUMMARY

Maurice Brand	6.5%
Board of Directors Holding	14.4%
Top 20 shareholders <sup>4</sup>	43.5%
Top 50 shareholders <sup>4</sup>	65.5%
Institutional Holders	30.9%

4. Including shares held by the Board of Directors

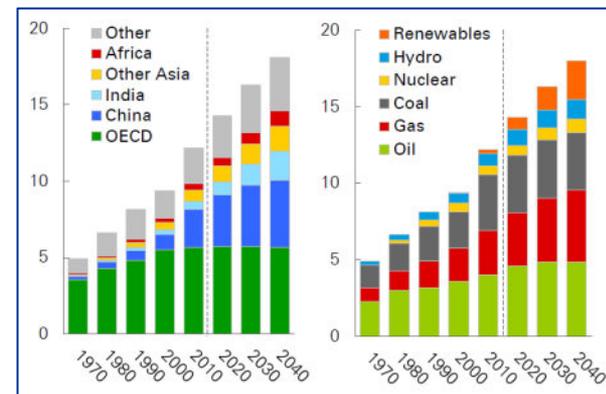
# SHARE PRICE PERFORMANCE



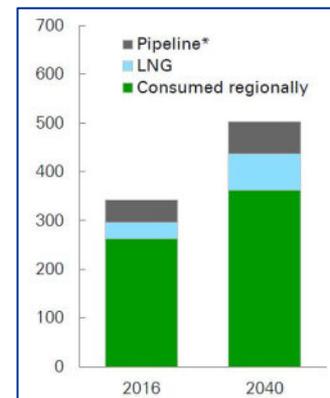
# ENERGY OUTLOOK POSITIVE FOR GLOBAL GAS MARKETS

- World GDP more than doubles by 2040 – driven by increasing prosperity in fast-growing emerging economies:
  - 2.5B people are lifted from low incomes > rising prosperity drives increase in global energy demand
  - Industrial demand for energy will account for ~50% of the increase in energy consumption
  - The world continues to electrify, ~70% of growth going to the power sector
- India, China and other emerging Asian regions account for two-thirds of the growth in global energy demand
- While renewables is a fast growing energy source, natural gas remains the winner over coal and oil given the ‘coal-to-gas’ shift in the energy mix as emerging markets focus on emissions
  - China energy policy doubles natural gas to 10% of energy mix by 2020 > set to overtake Japan as the largest importer of LNG, importing 37.5Mt in 2017 (increase of 50%)
  - India to double the share of gas to 15% by 2025 > LNG imports to triple to 70Mtpa
- Gas markets becoming more integrated through changing contracts for LNG > mobility of LNG cargoes develops new and expanding markets > desire for diversification of portfolio buyers/sellers

## PRIMARY ENERGY DEMAND (BILLION TOE)



## NATURAL GAS TRADE (BCF/D)



*Doubling of LNG volumes provides significant opportunity for Marine CNG*



# WHY CNG MARINE TRANSPORTATION?

Over **100 trillion cubic feet of discovered gas resources and curtailed production** are stranded and provide no value to asset owners – opportunity to upgrade resources to bankable gas reserves.

**Global excess of LNG production dragging down seaborne prices** and curtailing development of large LNG and Gas development projects

**Growing gas markets readily available** in both established (Europe) and emerging markets (Middle East, Asia, Latin America)

CNG projects can yield even **higher returns due to repeatable design, gas delivery flexibility and redeployment of assets** – economics support customers seeking intermittent deliveries of smaller quantities (0.25mtpa to 1mtpa)

**CNG aligns with structural changes to the LNG market** – buyers are pushing for non-traditional pricing models

CNG can scale a **'fit for purpose integrated supply chain solution'** to meet delivery volumes or market growth

CNG projects have **robust economics that are "design one and build many"** – repeatable

**Multiple CNG projects already identified in North America, Europe, Asia and the Indian Subcontinent**

GEV'S BUSINESS MODEL IS TO DEVELOP AND OWN PROJECTS THAT GENERATE BANKABLE LONG-TERM CASHFLOW AND STRATEGIC INVESTMENTS IN PROVEN UPSTREAM GAS RESOURCES



# BACKGROUND TO GEV CANADA CORPORATION



Launch of the  
new Optimum  
Technology  
now underway

- GEV Canada Corporation (Previously SeaNG Corporation) is located in Calgary, Canada, and was founded in May 2005 by the current technical team to develop the Coselle® System
- Completed full ABS approval process for Coselle® ship in September 2006 (first such approval for CNG marine)
- Formed an alliance with Marubeni Corporation and Teekay Corporation in January 2007
- In 2010, upgraded ABS approval for higher operating pressure – innovation resulting in ~25% reduction in costs (tariff)
- October 2010, Enbridge Inc. invested in SeaNG (19.2% shareholder) and joined the alliance
- Recent focus on “Optimum Technology” to deliver a ‘game changer’ for the economics of CNG marine transportation

# CNG MARINE TECHNOLOGIES

## COSELLE® SYSTEM

- SeaNG's traditional marine CNG technology is competitive with all other marine CNG proponents to-date
- *Requires a Coselle® factory to manufacture and install the Coselles® into the ship's holds*
- Each Coselle® contains approximately 4 MMscf of gas at high pressure
- Coselle® frames integrate with, and strengthen ship reducing overall steel required for the CNG ship
- Each Coselle® is manifolded to above deck control volumes and loading / offloading headers



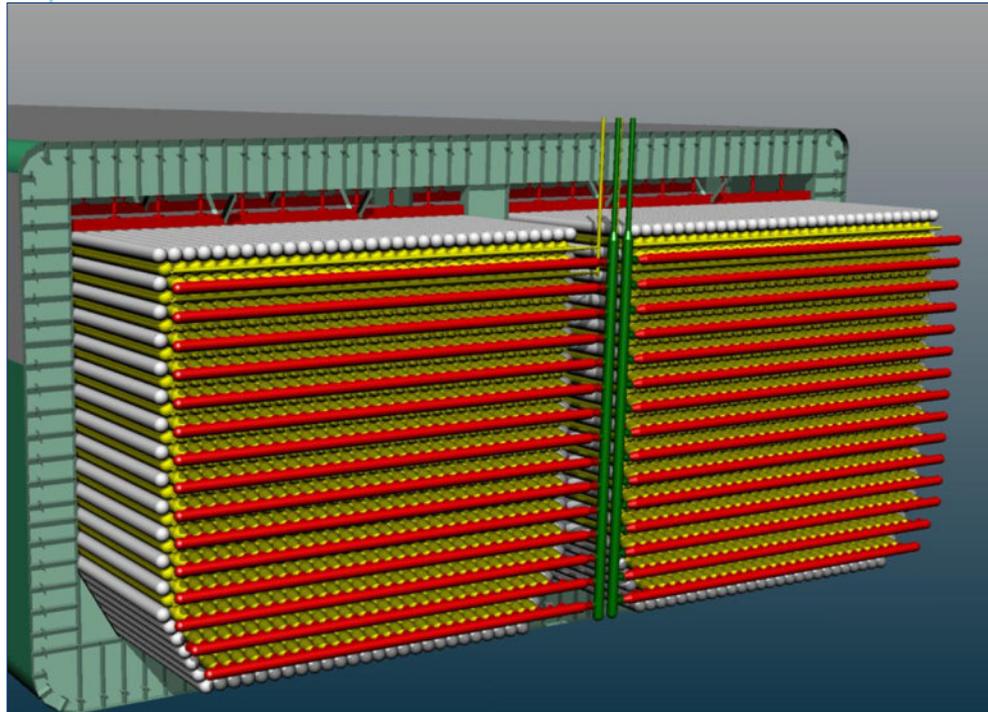
## GEV OPTIMUM TECHNOLOGY

- The closest packed system possible: long horizontal hexagonally stacked pipe
- Gas is stored at near ambient temperatures avoiding complicated cooling and liquid-push systems
- No specialised factory required
- Resulting ship is the **smallest and lowest cost CNG ship for any given gas volume**
  - Ratio of cargo hold vs gas stored of traditional CNG technologies = 8:1
  - **Ratio of cargo hold vs gas stored of Optimum Technology = 3:1**
- Optimum Technology's compact and cost effective design promises to revolutionise the marine transport of CNG

# LOW DENSITY VS HIGH DENSITY PACKING



# GEV OPTIMUM TECHNOLOGY



STACKING LONG PIPES HEXAGONALLY CREATES THE MAXIMUM AMOUNT OF CNG STORAGE IN A GIVEN SHIP ENVELOPE THUS THE "OPTIMUM SHIP"

- The Optimum Technology ship is the result of two decades of work on marine CNG technologies
- Based on the idea of simply stacking long lengths of pipe horizontally in a ship
  - Previous design attempts failed because the pipes would rub together as the ship flexed
  - This has been solved in a simple, innovative and novel way (patent pending)
- Containment system is close-packed high-strength steel pipe
  - (API 5L X80 - 16" OD / 0.525" wall thickness)
- A specialised factory is not required to build the containment system
- Ship and containment system can be fully constructed in a conventional shipyard
- Designed to meet all classification requirements for a CNG ship
- In-principle approval from the American Bureau of Shipping (ABS, AIP for a 200 MMscf ship)
- Significantly lower cost than other CNG ships

# COMPELLING ADVANTAGES OF MARINE CNG

## MINIMISES CAPEX

- Marine CNG is significantly cheaper than LNG - approximately 1/3 - 1/6<sup>th</sup> of the capital cost
- Marine CNG is re-deployable as ~ 85% of costs are in the ships. By contrast, LNG consists mostly of sunk costs in fixed liquefaction export facilities and LNG import facilities

## ALLOWS PHASING OF CAPITAL

- Marine CNG ships and fleets can be sized to fit the initial market, followed by future investments phasing in only when the markets materialise.
- Ships can be added incrementally (phased in) as the market demand volumes grow

## MINIMISES OPEX

- Marine CNG can be sized to suit the market with minimal oversized capacity and thus no wasted Capex or Opex
- Opex increases only as actual volumes increase. LNG Opex is 100% of plant capacity regardless of sales volumes needed.

## FLEXIBILITY / AVAILABILITY

- CNG ships have the flexibility to deliver gas over a broad range of volumes
- CNG has minimal fixed infrastructure – the ships can be re-deployed to new applications
- CNG Operations can be easily expanded by simply adding more ships and compression

## FASTER RESERVES RECOVERY

- Marine CNG can be operational within maximum 3-4 years vs LNG development taking 6-8 years.
- Monetisation of reserves can be accelerated by expanding the CNG fleet to meet growing market demands
- Ships can be re-deployed to other operations at end of field life

## PLATEAU DURATION GAS PRODUCTION

- CNG fleets can be sized to fit typical gas production curves with ships being re-deployed as the gas production rate naturally declines

# MARINE CNG TRANSPORTATION OPPORTUNITIES

## STRANDED GAS FIELDS

Too small or otherwise impractical for LNG

Too far or otherwise impractical for pipelines

Marine CNG offers an economic solution

## ASSOCIATED GAS PRODUCTION

Gas currently being flared - causing pollution

Gas currently being reinjected for disposal - incurring costs

Gas production required to financially support oil based development projects

## POWER PROJECTS

Gas fuel volumes too small to justify LNG regasification terminal

Replacing coal and liquid fuels to reduce carbon emissions

Requiring long term, low cost gas supplies to replace volatile liquid fuel prices

## CURTAILED GAS PRODUCTION

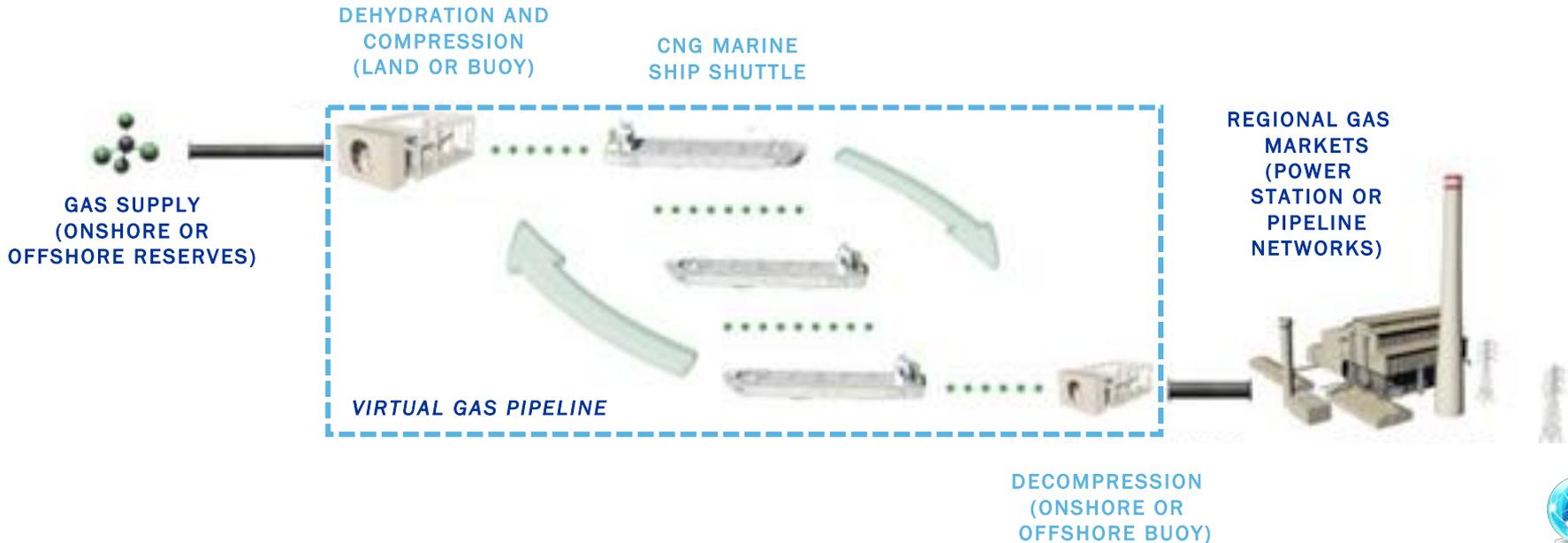
Inadequate facility or pipeline capacity to increase gas production

Lack of proximate markets for gas as fuel supply

Gas production required to support economics

# INTEGRATED CNG PROJECT VALUE CHAIN

- In partnership with shipping, EPC and infrastructure funds, GEV's core focus will be to build, own and operate a virtual gas pipeline using proprietary CNG marine transportation.
- GEV will also consider participating in each stage of the CNG value chain including proven gas resources.



# ONSHORE - CNG LOADING AND OFFLOADING



## JETTY FACILITY

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CNG loading and offloading facilities are much simpler, much less expensive and have significantly smaller footprint than typical LNG liquefaction and regasification facilities.

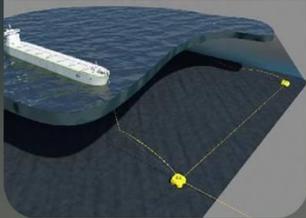
Offloading onshore, gas is discharged from the ship at a dedicated berth at a jetty. High pressure pipe and heat exchangers will manage the energy transfer resulting from the decompression of the gas.

# OFFSHORE - CNG LOADING AND OFFLOADING

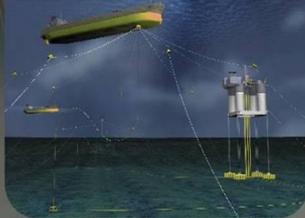
## OFFSHORE FACILITY

Offshore transfer of the gas to ships can be either by barge or platform based articulated loading arm(s) or by offshore buoy, depending on site-specific considerations (protected or unprotected waters).

SHALLOW  
WATER (SAL)



MODERATE  
WATER (STL)



DEEP WATER  
TANDEM



# MARINE CNG ADVANTAGES

Unlocks value of stranded gas reserves where LNG or pipelines are unfeasible due to economic, geopolitical or environmental issues

Highly scalable and fit-for-purpose to meet delivery volumes or market growth

No need for capital intensive regasification terminals or lengthy single-use pipelines

Simple, re-deployable technology/assets versus complex LNG facilities

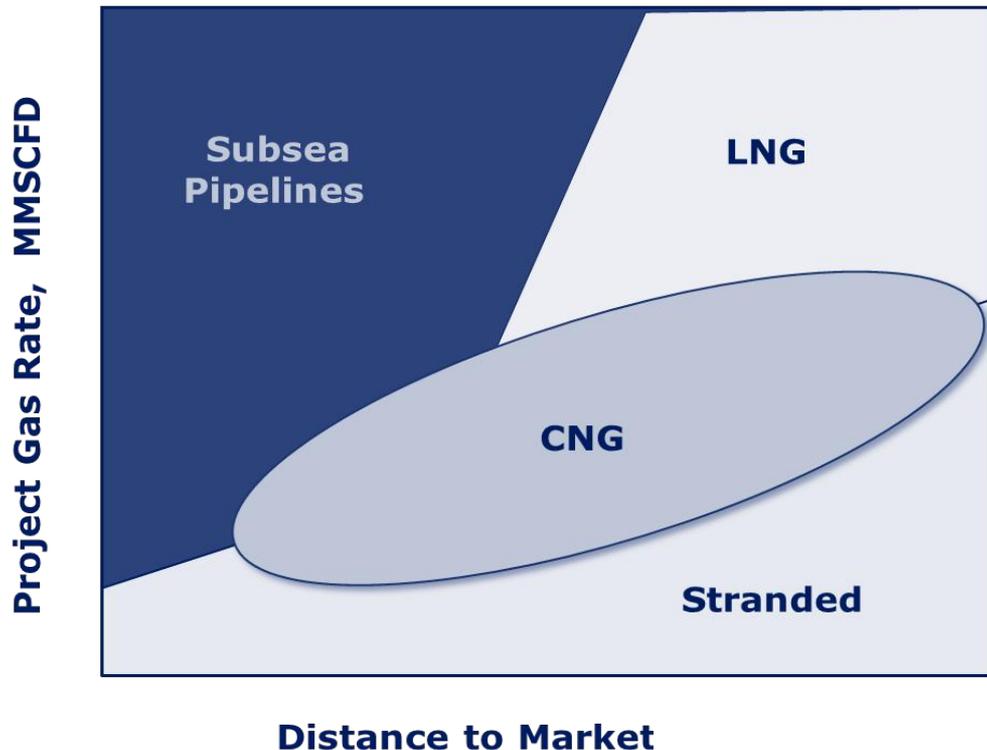
Greater arbitrage capability with flexibility to supply several markets in a region

Significantly lower capital requirements than LNG/FLNG

Lower carbon emissions as displacement for liquid fuels or coal



# MARINE CNG'S COMPETITIVE EDGE



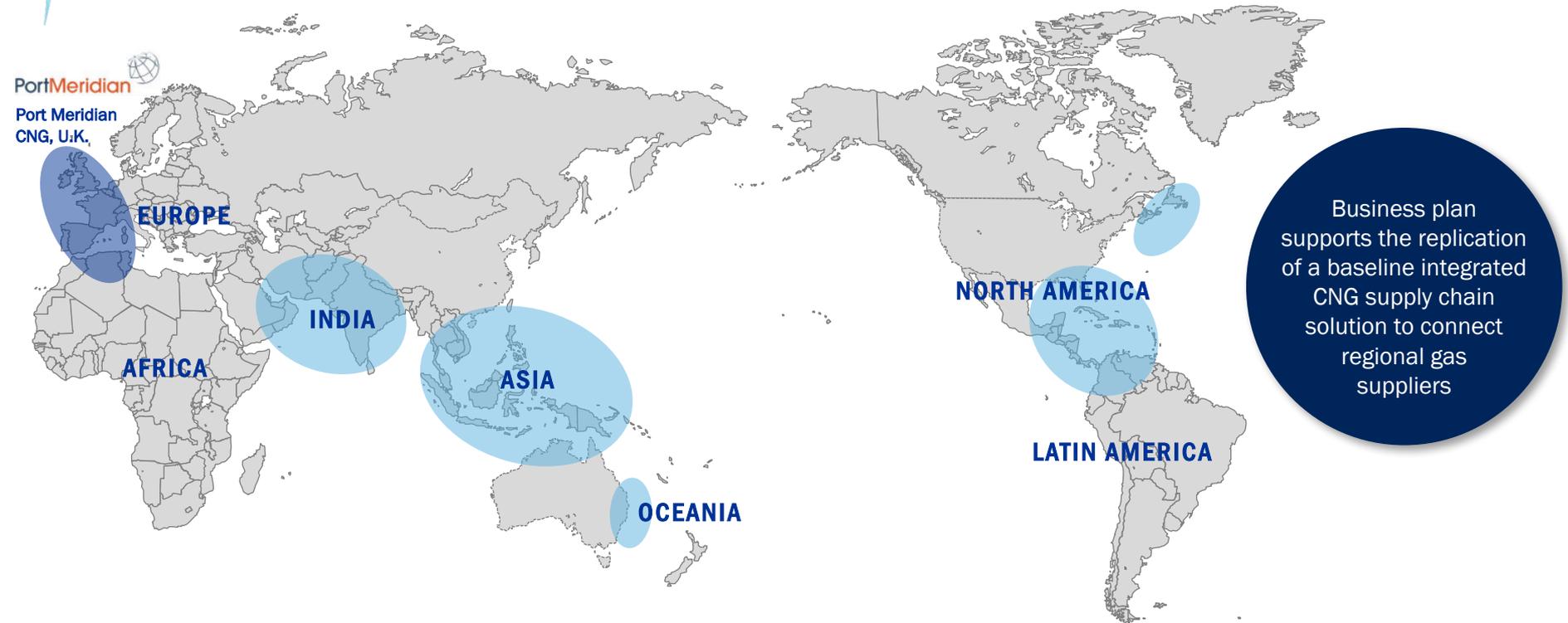
CNG can unlock stranded gas resources without competing directly with LNG

CNG technology offers a low cost alternative to access markets up to 3,500 km from the gas source

CNG solution provides a 'virtual pipeline' to link underexploited gas reserves to high value regional markets

CNG is more cost effective than LNG for many gas transportation applications and the majority of the project's assets can be re-deployed to serve new markets

# MULTIPLE CNG REGIONAL OPPORTUNITIES IDENTIFIED



“DESIGN ONE, BUILD MANY”

● CNG project announced

● Regional opportunities identified for gas supply or market customer

# FOUNDATION PROJECT ANNOUNCED: ATLANTIC CNG, U.K.

- Definitive agreement with Meridian Holdings Co. to secure UK port capacity & gas sale rights
  - Gas volume rights of up to 300 MMscf/d of port capacity at Port Meridian (circa 2.3Mtpa LNG equivalent)
  - Gas sale rights of up to 300 MMscf/d to Uniper Global Commodities SE (Mkt Cap EU 6.4B; UNO1 GY; BBB rated)
  - GEV acquires 5% equity interest in the Meridian terminal for USD 2M
- Roger Whelan appointed Project Director
- London office opened



- Secures **substantial market access to a liquid and transparent gas market** in the UK increasing reliant on imported gas
- GEV and Meridian will **target FID by the end of 2018** for both CNG transport & terminal
- **Discussions underway with three identified proven gas resources** located in the Atlantic that are suitable for the transport of gas as CNG
- **Gas Strategies Group appointed to review gas sourcing opportunities**
- **Front End Design Study underway for CNG loading and offloading**

**DELIVERED COST OF CNG TO THE UK MARKET IN LINE WITH EXPECTATIONS THAT NBP WILL TRADE IN A USD 4.50-6.50 MMBtu BAND NEXT 2-3 YEARS**

# UK GAS MARKET INCREASING RELIANCE ON IMPORTS

## UK GAS MARKET OVERVIEW (2016)

- Substantial market size with a liquid and transparent pricing mechanism through the National Balancing Point (NBP)
- Domestic gas production was over 90 bcm/year in 2000 and is expected to fall below 40 bcm/year by 2020
- 45% Domestic supply; 38% EU pipeline gas; 17% LNG imports
- 2016 gas demand up 13% YoY and a peak since 2011 as coal-fired power ramps down
- Rough gas storage facility continues to face operational issues and outages translating into 44% increase in 2016 net imports
- UK's imported gas supply includes: Norway with circa two thirds; increase supply from Belgium; piped Dutch gas; and Qatari export LNG

**FORWARD NBP VOLATILITY CAN BE MANAGED VIA UNIPER  
HEDGING PROGRAM OR FIXED PRICE FOB CONVERSION**

## OVERVIEW

### Approved proposal to develop a Deepwater Port 37km offshore, North West England.

- Unique technical fit for CNG delivery to Europe (APL buoy system connected to onshore gas processing facilities and UK grid).
- Competitive cost structure compared to existing UK onshore terminals (USD \$250 million for 750-1,000 MMscf/d capacity).
- Existing 20 year 750 MMscf/d gas sale agreement with investment grade Uniper Global Commodities.

### Designed for 750 MMscf/d delivery to the UK National Transmission System (NTS), accepts CNG or LNG vessels

- Permitted for 2 NOV(APL) STL mooring. First mooring installation earmarked for GEV CNG supply.
- New 55 km pipeline to the NTS and Onshore Facilities for nitrogen injection heaters and metering & connection to the NTS.
- Land purchased and construction commenced at onshore facilities: nitrogen injection, heaters and metering, connection to the NTS.
- FEED for Phase 1 in early 2018- FID YE 2018 - Installation over 2019-2021.
- Höegh LNG partnership for 2nd Phase LNG APL buoy and FSRU operations (2022+)

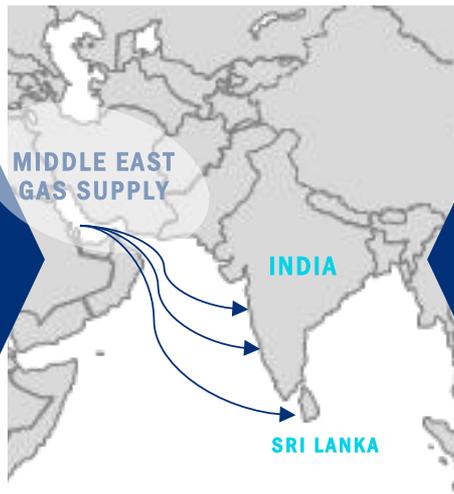


## UNIPER CONTRACT

- **20 year Gas Sale Agreement in place with Uniper Global Commodities SE**
- Shipper's "put" option - day ahead nomination of up to 750 MMscf/d on the NTS for gas volumes shipped via Port Meridian.
- Priced at UK NBP index, with **Uniper Investment Grade guarantee**
- Amendment of contract extends deadline for **FID to year end 2018 and First Gas to January 2022**

# INDIAN SUB-CONTINENT A MAJOR GROWTH MARKET FOR GAS

- Indian government's goal is to increase the energy mix from 6.5% natural gas to 15% supported by a nationwide gas grid and setting up gas infrastructure
- India's energy demand increased by 3.7% year-on-year in 2016, while imports increased by 5.7%, led by LNG, LPG and gasoline
- India's LNG imports surged 27% YoY in 2016
- Installed gas-fired generation remains idle due to high cost of imported LNG
- Foreign companies now committing to significant investment in gas infrastructure assets – India closing the gap to be 'investment grade'



- Country Manager appointed for India & Sri Lanka with a strong network of downstream and upstream markets
- Multiple marketing trips has confirmed major Indian energy groups are seeking economic supply of gas
- Delivered CNG will be very cost competitive with current delivered LNG cargoes
- CNG can offer flexible terms on long-term contracts vs LNG
- CNG infrastructure will be a fraction of LNG receiving terminals being commissioned or proposed for 2020 delivery

SHIFT FROM COAL TO GAS WILL EXPAND THE MARKET AND INCREASE THE IMPORTATION OF GAS FROM 21MTPA TO 70MTPA

# CNG OPTIMUM – THE BEST WAY TO SHIP NATURAL GAS





# APPENDICES

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- Inventors - CV's
- “Freeze or Squeeze”
- Energy Conversion Table

# SeaNG INVENTORS TO REMAIN WITH GEV CANADA

## DAVID G. STENNING, P.ENG.

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With over thirty years of experience in the international energy industry, David has had the opportunity to play leadership roles in engineering, managing and executing challenging projects. He began his career designing and constructing offshore platforms for the Arctic; including the first two Arctic offshore drilling structures. This early experience taught that with the right attitude, expertise and team even the most difficult problems can be solved. David subsequently consulted to several energy companies, working on projects for developing offshore oil and gas reserves, primarily in northern seas.

More recently, David co-invented and led the development of specialised CNG ships which compete with LNG ships in regional markets. As Manager of Marine CNG at Enron International he was charged with leading the Marine CNG team. This required the development of new ship designs and resolving many technical and regulatory challenges. David continued this work at the Williams Company as Director of Marine CNG. In 2005, he co-founded SeaNG which acquired the CNG technologies developed at Enron and Williams. As President and COO, David continued the technical and commercial development and SeaNG became one of the leading companies in Marine CNG. David was an early advocate for marine CNG and remains so today.

## JOHN P. FITZPATRICK, P.ENG.

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John has over thirty years of experience as a structural engineer specialising in the analysis, design, construction and deployment of unusual structures, including several major structures in the oil & gas industry. In addition to his extensive analysis experience, notably in the field of Arctic structures and marine CNG, he has also consulted internationally, performed third party reviews on behalf of the US Minerals Management Services, and been called as an expert witness. As a member of the Canadian Standards Association (CSA) design standards committee on offshore structures, John participated in the development of Canada's design codes for offshore structures and also in the development of ABS rules and guidelines for CNG ships.

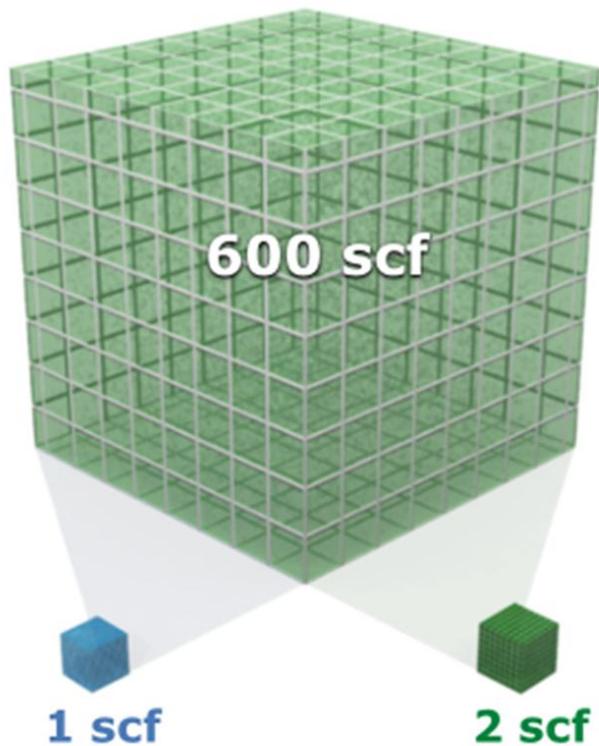
John's recent focus has been on developing ships to carry compressed natural gas. He has participated in the technical development of these ships beginning with Enron International and the Williams companies. John continued this development at SeaNG where he was Director of Engineering. After leaving SeaNG, John continued his efforts to find the optimum ship design. This work resulted in a new CNG ship design (patents pending) - being the Optimum Technology ship.

John has an engineering degree from the University of Galway. He has published and presented peer reviewed papers on the topics of offshore structures, ice mechanics and ships.

# FREEZE OR SQUEEZE

LIQUEFY  
**LNG**  
EXPENSIVE

600:1  
-162°C



COMPRESS  
**CNG**  
INEXPENSIVE

300:1  
275 BAR

# ENERGY CONVERSION TABLE

FROM	TO
1 million tonnes of LNG per year (mtpa)	~1.35 billion m3 of natural gas per year
	~48.0 billion scf of natural gas per year
	~130 MMscf per day
100 MMscf/d of natural gas <sup>1)</sup>	~0.76 mtpa of LNG
200 MMscf/d of natural gas <sup>1)</sup>	~1.53 mtpa of LNG
300 MMscf/d of natural gas <sup>1)</sup>	~2.30 mtpa of LNG
1.0 million tonne Fertilizer Plant <sup>2)</sup>	~0.56 billion m3 of natural gas per year
	~0.42 mtpa of LNG
	~55 MMscf/d of natural gas
1,000 MW Combined Cycle Power Plant <sup>2) 3)</sup>	~1.36 billion m3 of natural gas per year
	~1.0 mtpa of LNG
	~130 MMscf/d of natural gas

- Notes
- 1: based on conversion rates from <http://www.bp.com/content/dam/bp/pdf/energy-economics/statistical-review-2016/bp-statistical-review-of-world-energy-2016-approximate-conversion-factors.pdf> (also attached)
  - 2: based on conversion rates from [http://agnatural.pt/documentos/ver/natural-gas-conversion-pocketbook\\_fec0aeed1d2e6a84b27445ef096963a7eebab0a2.pdf](http://agnatural.pt/documentos/ver/natural-gas-conversion-pocketbook_fec0aeed1d2e6a84b27445ef096963a7eebab0a2.pdf) (also attached, but relevant page shown below)
  - 3: based on 90% utilisation factor.



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