



## **2014 RICE GLOBAL E&C ANNUAL FORUM**

## LNG FROM THE NORTH: NOT QUITE THE SAME

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# Agenda

- Introduction
- Natural Gas Markets in USA and Canada
- USA vs Canada
  - LNG/ Shale Projects in USA and Canada
  - Key Regulatory Differences:
    - Project Execution
    - Land Regulations and Permitting
    - Canadian Standards
    - Remote Site Access/Severe Site Weather Constraints
    - Density of Population
  - First Nations
  - SNC-Lavalin Expertise
- Conclusion
- Q & A

### 2014 Rice Global E&C Annual Forum

## **INTRODUCTION**

# **SNC-Lavalin at a Glance**

- Founded in 1911
- World class engineering & construction firm
- Multidisciplinary, integrated solutions across all sectors
- 45,000\* employees executing projects in more than 100 countries
- Permanent offices in more than 50 countries
- International network established for almost 50 years
- Annual revenues 2013: CA\$ 10 BN\*
- Ranked by ENR among Top 10 Global Design Firms

## **SNC-Lavalin at a Glance**

#### **Key Markets**



#### **Resources, Environment & Water**

Oil & Gas Mining & Metallurgy Environment & Water



**Power** Nuclear Transmission & Distribution Hydro Thermal



#### Infrastructure Infrastructure Concession Investments Infrastructure Engineering Transportation & General Construction Operations & Maintenance

#### **Key Services**



Engineering



Construction



Procurement



Financing & Asset Management



Operations & Maintenance



\* includes newly acquired Kentz Corporation Ltd.

## **SNC-Lavalin Oil & Gas Global Presence**

OVER 18,500\* PROFESSIONALS OFFERING SOLUTIONS IN THE OIL & GAS SECTOR

> EXECUTION & HIGH VALUE ENGINEERING CENTRES

3

#### • Mumbai

• Vadodara

• Bogota

GLOBAL PROCUREMENT CENTRES

• HSE

• HR

• Quality

Marketing

• Finance

- Al Khobar
- Montreal
- Mumbai
- Shanghai

**OIL & GAS COMMON PROCESSES** 

#### • Estimating

- - SharePoint
- DMS
- PM+
- Procedures

\*including recently acquired Kentz Corporation Ltd.

## NATURAL GAS IN USA & CANADA

# **USA Natural Gas Market**

- Natural gas provides 23% of the marketable energy consumed in the USA;
- 97% of the USA gas supply comes from domestic sources and Canada;
- Overall value-added impact of \$172 billion on the U.S. economy (salaries, benefits, expenditures/ savings, tax revenue, royalties to landowners/ federal agencies);
- Proved Reserves: 322 Tcf (EIA 2012).

# **Canadian Natural Gas Market**

- Canada is the world's third-largest producer of natural gas, only after USA and Russia;
- Natural gas provides almost one-third of all energy used in Canada;
- Impact on Canada's economy is approximately \$106 billion;
- Production: 14 Bcf/day; Consumption: 8.4 Bcf/day; Export: 5.6 Bcf/day
- 13% of the natural gas used in USA is Canadian;
- Canada's proven natural gas reserves were between 700 and 1,300 trillion cubic feet (Tcf) as of 2010;
- Remaining established reserves: 71 Tcf (NEB 2013).

## LNG/ SHALE PROJECTS IN USA & CANADA

# LNG Export Terminals in USA



#### **PROPOSED TO FERC**

- 1. **Corpus Christi, TX**: 2.1 Bcfd (Cheniere Corpus Christi LNG) (CP12-507)
- Coos Bay, OR: 0.9 Bcfd (Jordan Cove Energy Project) (CP13-483)
- Lake Charles, LA: 2.2 Bcfd (Southern Union Trunkline LNG) (CP13-113)
- 4. **Cove Point, MD**: 0.82 Bcfd (Dominion Cove Point LNG) (CP13-113)
- 5. Astoria, OR: 1.25 bcfd (Oregon LNG) (CP09-6)
- Lavaca Bay, TX: 1.38 Bcfd (Excelerate Liquefaction) (CP14-71&72)
- Elba Island, GA: 0.35 Bcfd (Southern LNG Company) (CP14-103)
- 8. Sabine Pass, LA: 1.40 Bcfd (Sabine Pass Liquefaction) (CP13-552)
- 9. Lake Charles, LA: 1.07 Bcfd (Magnolia LNG) (CP14-347)
- Plaquemines Parish, LA: 1.07 Bcfd (CE FLNG) (PF13-11)
- 11. Sabine Pass, TX: 2.1 Bcfd (ExxonMobil Golden Pass) (CP14-517)
- 12. **Pascagoula, MS**: 1.5 Bcfd (Hulf LNG Liquefaction) (PF13-4)
- 13. Plaquemines Parish, LA: 0.30 Bcfd (Louisiana LNG) (PF14-17)

+ few others. Approx. Total : >185 MMTPA (>27 Bcf/day)

## **Canadian LNG Import and Proposed Facilities**



EXISTING IMPORT TERMINAL	
Project	Location
1. Canaport LNG	Saint John, New Brunswick
PROPOSED EXPORT TERMINALS	
Project	Location
2. Douglas Channel LNG	Kitimat, British Columbia
3. Kitimat LNG	Kitimat, British Columbia
4. LNG Canada	Kitimat, British Columbia
5. Pacific Northwest LNG	Prince Rupert, British Columbia
6. Prince Rupert LNG	Prince Rupert, British Columbia
7. Goldboro LNG	Guysborough County, Nova Scotia

<u>Update:</u> There are approximately 10 other terminals totaling 123+ MMTPA (18 Bcf/day)





## **KEY REGULATORY DIFFERENCES**

# **Project Execution**

- Employment and labor laws
  - In many Canadian jurisdictions (provinces), only unionized workers are allowed on construction sites;
  - Project-specific agreements with unions are often used in Canada: 31.5% vs. 13.1% in the USA;
  - Labor rates are established by provincial decree in Canada; in USA, the Department of Labor sets minimum wage and overtime pay standards;

# **Project Execution**

#### Expertise: employees, contractors

- There is limited availability of regional skilled labor/ man camps;
- The import of non-Canadian workers is limited by federal and provincial regulations (Temporary Foreign Worker Program);
- The number of Professional Engineers is over 14 times higher in Canada than in the USA.
- Contractors must be aware of the lead-time required to schedule the most appropriate construction equipment and skilled operators required for a successful project;

# **Project Execution**

#### Transportation challenges

- Offshore modules may require UA stamps;
- Site-specific planning by qualified personnel is required, such as: avoiding unstable terrain, sensible habitat and soil units that are hard to reclaim, submitting a Historic Resources Overview and developing an integrated resource development;
- Difference in legal system, language, culture in Québec

# Land Regulations and Permitting

- **Project identification & proposal:** consultation and notification of stakeholders ; establishment of project eligibility under FNCIDA; building community support;
- **Project review and selection:** conduct cost-benefit analysis, legal risk assessment, environmental assessment;
- **Distribution/ approval of lease/ permit:** develop project-specific documents: the regulations; the tripartite agreement between the Government of Canada, the First Nations and the provincial government; and the land tenure instruments;
- **Duration of lease/ permit:** valid for 3 or 4 years from the time of issue (depending on the location of the territory)
- Permitting Results (September 2014):

#### USA

FERC / MARAD / USCG: 6 Approved totaling 68 MMTPA 14 Proposed (109 MMTPA)

#### Canada

NEB Export Application: 11 Approved totaling 100 MMTPA 3 Under Review (13 MMTPA)

## **Canadian Standards**

#### Public and Environmental Safety

- Construction & Operation: Provincial regulation (eg: Safety Standards Act, Environmental Management Act, Occupational Health and Safety, LNG Facility Risk Management etc)
- Export: Federally regulated; permit from National Energy Board required;
- Oil and Gas Activities Act: consultation and notification of stakeholders and First Nations;
- BC LNG Facility Permit Application and Operations Manual (July 2014);
- Technical Standards
  - CSA Standard Z662 <u>Oil and Gas Pipeline Systems</u>: transportation of oil & gas;
  - CSA Standard Z276 <u>LNG Production, Storage and Handling;</u>

# **Canadian Standards**

### Tolls and Tariffs

- Transportation tolls paid by shippers, including oil and gas producers, brokers, and local distribution companies (LCDs);
- Employment and use and of Professional Engineers
  - Engineers Canada provincial and territorial regulation bodies (eg: APEGBC etc).

## REMOTE SITE ACCESS & SEVERE SITE WEATHER CONSTRAINTS

## **Remote Site Access**

Seasonal variations in climate must be used to the best advantage to reduce impact to the vegetation and soils in the project areas.



## **Severe Weather Constraints**

#### USA

#### Lake Charles, LA:

- Ave. from 50°F to 82°F (62°F)
- Min. 41°F
- Max. 91°F
- Annual Rain 55 in.

### Canada

#### Prince Rupert, BC:

- Ave. 33 to 56°F (44°F)
- Min. 28°F
- Max. 62°F
- Rain 100 in.

#### Saguenay, QC

- Ave. 4 to 64°F (36°F)
- Min. -7°F
- Max: 76°F
- Rain 37in.

#### Halifax, NS

- 26 to 65°F (46°F)
- Min. 19°F
- Max. 73°F
- Rain 55 in.

## **DENSITY OF POPULATION**



Overall Average (People per square mile) Canada: 11/ sq. mi. USA: 97/ sq. mi.

LNG Plant Area (People per square mile) Canada: 5 / sq. mi; USA: 150 /sq. mi

## **FIRST NATIONS**

# First Nations must be Involved

- Many of the LNG plant sites and particularly the pipeline feeding the plants crosses First Nations territories;
- Recent ruling from Canadian Supreme Court granting large area title rights to First Nations bands and requiring their acceptance for economic development on the land.

# How First Nations can be Involved

- Partnership such as the Nishi Khon/SNC-Lavalin in NWT and recent First Nations Mining Corporation in Ontario; almost a dozen partnerships were created since 1994;
- Skills training and mentoring program;
- Aboriginal inclusiveness through employment and procurement;
- Environmental monitoring of projects by trained and qualified First Nations members.

### WHY SNC-LAVALIN?

# Why SNC-Lavalin?

- Executing projects in Canada since 1911
- Mega project experience
- Local construction management experience
- EPC lump sum experience
- Large local Engineering and Management pool
- Financial depth and capability
- Long term relationship with First Nations
- Expertise in Infrastructure, Power, Resources, Environment and Water

CONCLUSION

# WE CARE Values



WE CARE embodies SNC-Lavalin's key corporate values and beliefs. It is the cornerstone of everything we do as a company. Health and safety, employees, the environment, communities and quality: these values all influence the decisions we make every day. And importantly, they guide us in how we serve our clients and therefore affect how we are perceived by our external partners. WE CARE is integral to the way we perform on a daily basis. It is both a responsibility and a source of satisfaction and pride by providing such important standards to all we do.

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WE CARE about the health and safety of our employees, of those who work under our care, and of the people our projects serve.



WE CARE about our employees, their personal growth, career development and general wellbeing.

WE CARE about the communities where we live and work and their sustainable development, and we commit to fulfilling our responsibilities as a global citizen.



WE CARE about the environment and about conducting our business in an environmentally responsible manner.

WE CARE about the quality of our work.

Q & A

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