Russia’s evolving LNG strategy

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Russian LNG strategy is part of Russia’s overall gas strategy

Efficient Chess:
• Defense
• Development
• Deterrence

Efficient Gas Strategy:
• Protecting Existing Markets
• Opening Up New Markets
• Preempting Competition
Global Gas Today

- Shale gale: LNG export plans
- Gas demand squeeze
- In search of markets
- Gas shortages—India and MENA
- Growing dependence on LNG
- Emerging new gas province
- Strong growth
- Japanese nuclear policy unclear
- Cost inflation abating?

Source: IHS

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It's getting tight in here!
More gas supply projects than demand

- With over 685 million ton per year of proposed capacity, the looming LNG supply overhang is unprecedented.
- Project sponsors racing against time to lock in necessary agreements while demand is still sufficient.
- To keep market in balance, only one in six of the currently proposed projects would need to advance to FID by 2020.
- Growth in potential LNG supply capacity is shifting market power from sellers to buyers.
- Downward price momentum is simultaneously constrained by rising project capital costs.
- Six countries add 90% of new supply. New LNG suppliers, such as the United States (Lower 48), Canada, Mozambique, and Tanzania as well as existing suppliers Russia and Australia that aim to gain a larger portion of the growing market.

Source: IHS CERA.
21011-2
Cyclical nature of (global) gas business becomes more apparent

- **2010-2011 Post-recession developments leading toward higher prices**
  - LNG supply growth slows; only four FIDs between 2006 and 2009 in low level of new supply
  - Japanese demand increasing amid concerns about restarting idle nuclear plants
  - Global prices have diverged
  - Exception: supply situation in North America keeping prices depressed there
  - Shipping constraints leading to regional constraints

- **2012-2014: Market continues tightening**
  - Long lead times to build liquefaction
  - New Australian supply delayed, incremental supply growth hits 2016 at earliest; delays expected
  - Shipping construction also time intensive
  - Global demand robust, but by end of 2014 shows signs of slowing down

- **From now on (faster than expected): pendulum will swing back**
  - Cyclical nature of this business means that rebound back toward looseness already visible on horizon
  - Another supply surge taking shape 2016/2017
  - But dramatic decline of oil price in the end of 2014 increases risks for high cost projects
  - Risk of cyclical over-investment – a boom-bust cycle?
Australia on its way to become number one global LNG producer by 2018, but is facing uphill cost battle

<table>
<thead>
<tr>
<th>Existing, committed, and potential liquefaction facilities in Australia (mt)</th>
<th>Existing</th>
<th>Potential</th>
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<tbody>
<tr>
<td>Darwin LNG Train 1</td>
<td>3.6</td>
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<tr>
<td>North West Shelf LNG</td>
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<td>Pluto LNG Train 1</td>
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<td><strong>Total existing</strong></td>
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</tr>
<tr>
<td>Australia Pacific LNG T1&amp;2</td>
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<tr>
<td>Prelude FLNG</td>
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<td>Floating</td>
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<tr>
<td>Queensland Curtis LNG T1&amp;2</td>
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<tr>
<td>Wheatstone LNG</td>
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<td><strong>Total committed</strong></td>
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<tr>
<td>Australia Pacific LNG T3</td>
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<td>Brownfield/Expansion</td>
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<td>Darwin T2</td>
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<td><strong>Total potential</strong></td>
<td><strong>70.5</strong></td>
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North American Liquefaction

Existing Regas
Potential Export Site
Existing Regas and Potential Export Site
Under Construction Export Site

Source: IHS
North American gas supply is plentiful and low cost

Breakeven Henry Hub Price for natural gas resources in 17 analyzed unconventional plays

- 10 years Consumption* (242 Tcf)
- 25 years consumption* (606 Tcf)
- 50 years consumption* (1,211 Tcf)

IHS estimates total resources at greater than 3,000 Tcf

Note: Proved, possible, and potential resources.
Mcf = thousand cubic feet.

* Basis 2012 consumption
Potential duration of the North American low-cost unconventional natural gas resource base

900 T Cf = 25.5 T cm

Cumulative North American Consumption (T Cf)

2010 2013 2016 2019 2022 2025 2028 2031 2034 2037

21 Years 22 Years 27 Years

No Demand Growth, No LNG Exports
IHS CERA Market Outlook
IHS Market Outlook Plus All US Lower-48 Projects
Three permitting tracks for LNG exports

Regulatory approval

- Export approval: DOE FTA
- Export approval: DOE non-FTA
- Environmental/siting permit: FERC or DOT

Project developed

- EPC contract
- Financing
- Gas supply
- Tolling agreements or SPAs

FID

Note: DOE = Department of Energy; DOT = Department of Transportation; EPC = engineering, procurement, and construction; FERC = Federal Energy Regulation Commission; FID = final investment decision; FTA = free trade agreement; LNG = liquefied natural gas; SPA = sales and purchase agreement.
Five US LNG projects with combined capacity of over 60 million ton have secured necessary approvals for exports

<table>
<thead>
<tr>
<th>Project name</th>
<th>Project sponsor</th>
<th>Planned capacity (mt)</th>
<th>Project type</th>
<th>DOE FTA application status</th>
<th>DOE Non-FTA application status</th>
<th>FERC filing status</th>
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<td>Lake Charles Exports</td>
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<td>Cove Point LNG</td>
<td>Dominion Cove Point LNG</td>
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<td>Cameron LNG</td>
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<td>Approved</td>
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</tbody>
</table>
US LNG Price Benchmark ($ per MMBtu)

Indicative LNG Costs from North America

- Henry Hub+: $4.00-5.00 per MmBtu
- Liquefaction: $2.25-3.50 per MmBtu
- Shipping: $1.00-2.50 per MmBtu
- Regas: $0.50-1.00 per MmBtu

TOTAL: $7.75-12.00 per MmBtu
North America…redefines the global cost curve for LNG

Global liquefaction (FOB) cost curve (proposed projects)

Just as shale gas has redefined the North American gas cost curve, it is also redefining the global LNG cost curve
Potential LNG exports out of US essentially set new competitive benchmark for European and Asian markets

- At Henry Hub price of $5/MMBtu, delivered cost to Europe (UK) is $10.15/MMBtu and to Asia (Japan) is $11.55/MMBtu

- “Equivalent oil price lines” show what oil price would be needed make a 12% slope contract to UK or 14.5% slope contract to Japan competitive with delivered cost of US LNG in each market

- Calculations on basis of US Sabine Pass, where flexible LNG export model can readily respond to pricing signals in global markets

For earlier generation of projects, it was Qatar LNG that set international bar …
Japan’s LNG market

Japan is almost exclusively dependent on LNG for its gas.

Japan is a key pillar of global LNG imports, its share once as high as 75% is now 37%.

LNG demand primarily driven by post-Fukushima demand increase in power sector.
Japan nuclear restart timing and volume highly uncertain

Of the 50 reactors available before the crisis, 20–25 are at risk of being decommissioned because of their age, location above an active fault line, politics, or for all three reasons.
Korea’s 2013 share of global LNG imports was 17% up from 15.4% in 2012.

Korea is the second largest LNG market in the world, but LNG continues to play a relatively small – though growing – role in the Korean energy mix. Its share of primary energy demand accounted for 19% of primary energy demand.

LNG demand primarily driven by demand in power sector. The price of LNG as a fuel source for power generation in Korea is usually less than oil.
By Road and by Sea: The New Markets for Natural Gas

Natural gas consumption in road fuels

Natural gas consumption in bunkers

Source: IHS CERA.
China is Expected to Become the Largest Natural Gas Consumer in the World by 2040

Base Case Outlook for Chinese Gas Demand

- **Other**
- **Transport**
- **Power**
- **Industrial**
- **Residential / Commercial**

Source: IHS CERA.

"Industrial" includes agricultural and feedstock use, "Power" includes power and heat generation.

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Russia’s Pivot to the East: Why?

• Security of demand concerns

• Opening up new markets

• Developing new gas provinces

• Developing new transportation routes

• Linking Russia’s eastern territories to rest of country
A beginning of a beautiful friendship...
May 2014: Putin secures $400 billion (or less?) gas deal

- Tough negotiations until last moment:
  - Contract for price of ~$360–380 per Mcm; apparently higher than price for Turkmen gas
  - Russia essentially achieves “European level” prices with China
  - Russia exempts East Siberian fields supplying the gas from Mineral Resources Extraction Tax: worth ~$20 per Mcm
  - China exempts Russian supplies from 13% value-added tax, easing burden for Chinese consumers

- Major deal
  - Touted as $400 billion overall value – at $100+ oil price
  - 38 Bcm per year for 30 years
  - Overall investment expected of ~$68 billion

- Devil in the details: deal enablers?
  - High costs pose challenge for Gazprom, but deal appears to have positive net present value, especially after a series of cost optimization measures
  - 30% citygate price increases in China in 2013 make Russian gas in NE provinces affordable for CNPC
  - Advance payment and/or loan from China discussed but Gazprom opts not to pursue this option at present
  - Chinese companies to acquire upstream stakes?

Photo source: www.kremlin.ru
Long and winding road: decade of Russia-China gas negotiations

Mar 21-22 2006: Putin visits China, Gazprom and CNPC sign protocol on gas supply at 60-80 Bcm per year

Oct 13 2009: Gazprom and CNPC sign FA on basic terms and conditions for natural gas supply from Russia to China (specifies volumes, directions, and start-up date, links price formula with oil basket index)

February 2010: First Turkmen gas arrives to China

May-Jun 2011: Multiple rounds of negotiations in anticipation of final deal to be signed at St. Petersburg Economic Forum, but no breakthrough

October 2012: Russia announces plans to build pipeline Yakutia-Vladivostok + Vladivostok LNG

2011-2012: Change of China’s political leadership; Plan of “western” route comes to dead end; China not interested in Western (Altay) route owing to plethora of alternative options of supply to western China via Central Asia and own conventional and unconventional potential

Oct 14 2004: Gazprom and CNPC sign agreement on Strategic Cooperation

Jun 24 2009: Igor Sechin, Russia’s Deputy Prime Minister, and Wang Qishan, Vice Premier of PRC, sign MOU on cooperation for natural gas

Sep 27 2010: President Medvedev visits China: Gazprom and CNPC sign extended major terms and conditions for natural gas supplies from Russia to China (setting key commercial parameters of supply via “western” route – volumes and timeframe, ToP level, build-up period, guaranteed payment level)

2010-2011: Multiple rounds of negotiations between Gazprom and CNPC focus on Eastern route with deliveries of 38 Bcm per year (and potentially up to 60 Bcm)

2013: Putin comes with state visit to China, seals gas deal worth $400 billion: 38 Bcm per year for 30 years with apparent average price of ~$380/Mcm

2014: Start of gas deliveries?

2004-2009: China in Central Asia

China makes the strategic decision to procure gas from Turkmenistan

February 2010: First Turkmen gas arrives to China

2013-2018: Change of China’s political leadership

Plan of “western” route comes to dead end; China not interested in Western (Altay) route owing to plethora of alternative options of supply to western China via Central Asia and own conventional and unconventional potential

Source: IHS
First phase of Russia’s Eastern Gas Program now proceeds full speed ahead

Eastern Russia’s Gas Pipelines and Selected Fields

- **Yurubcheno-Tokhomskoye (Rosneft)**
  - 2P RESERVES*: 160 Bcm
- **Sobinsko-Paiingskoye (Rosneft)**
  - 2P RESERVES*: 135 Bcm
- **Chayandinskoye (Gazprom)**
  - 2P RESERVES*: 1,450 Bcm
- **Sakhalin I-II (Chayvo, Odoptu, Arkulun-Dagi)**
  - RESERVES: 400 Bcm
- **Sakhalin III (Kirinskoye, South Kirinskoye, etc.)**
  - RESERVES: 180 Bcm

Existing gas pipelines
Planned/ proposed gas pipelines
Gas field
City

* Proved and probable reserves
Source: IHS Energy

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Why did China finally agree to a gas deal with Russia?

- Gas consumption growth in China essentially supply constrained
- Import dependency rapidly rising
- Extra gas demand created by recent coal-to-gas switching to fight pollution and improving air quality in coastal areas
- China’s growing exposure to global liquefied natural gas (LNG) markets: China is now world’s third-largest LNG importer
- Limited progress in shale gas development
- Russia the only source of a large scale moderately priced incremental supply for China in the medium term
Key implications of Russia-China “grand” gas deal for Russia

Deal reaffirms centrality of Gazprom as Russia’s chief gas exporter

- Gazprom will regain its role as key gas player Northeast Asian gas market
- But high costs of Eastern gas program increase Gazprom’s financial burden

Russia-China gas deal does not reduce (yet) gas volumes available to Europe

- No physical link between supply sources for Europe and supply sources for China
- Russia achieves much needed diversification of gas exports, but “in addition”, not “out of” existing gas export capacities
- Russia re-opens negotiations with China on additional 30 Bcm per year deliveries via Western (Altay) route with supply sourced in West Siberia, but prospects of this deal slim

Balance of Russian pipeline exports versus LNG to Northeast Asia

- Multiple options – pipeline and LNG – provide Russia opportunity to balance between different political powers and markets
- But creates critical questions on optimal allocation of limited financial and managerial resources and state aid
Russia’s evolving LNG strategy

• Russia is trying to upgrade and redirect its LNG strategy, originally aimed at North America but derailed by the advent of shale gas in the United States.

• Russia’s renewed push to become a large global LNG player has been based on two strategic adjustments:
  • the “Pivot to the East” to target premium LNG markets in Asia;
  • and putting Russian LNG into the market as quickly as possible, drawing on reserves that have already been explored and are ready for development.
Geography of Russia’s LNG projects

Source for the map: Masumi Motomura, JOGMEC, Presentation at Sakhalin Oil&Gas Conference, 2013
Russia’s big LNG ambitions

LNG is a high priority:
- Aim is to put Russian LNG into market as quickly as possible, using whatever reserves, technology, and logistics are ready at hand.
- Intense pressure is coming from the Kremlin for near-term results.
- Russian LNG projected costs are not low but are apparently competitive with other next generation LNG projects globally, at least in terms of cost of supply.

Russia has plans for 50+ mt of additional liquefaction capacity by early 2020s:
- Vladivostok LNG and Baltic LNG have succeeded Shtokman LNG as Gazprom’s main projects.
- Strong competition from independents
  - Yamal LNG (Novatek, Total, CNPC)
  - Sakhalin-1 (Rosneft, ExxonMobil)
- But can all projects be realized quickly?

Massive state support covers the spectrum:
- Tax incentives, LNG export liberalization, state investments into infrastructure, including ports, shipbuilding, and nuclear ice-breakers

Compromises are likely:
- Ambitious goal—for Russia’s LNG projects to be launched before 2020—is likely to result in even greater need for state support and more reliance on foreign service contractors and equipment.

Yamal LNG
- Low upstream costs, tax exemptions granted with strong political backing. The state is funding key port infrastructure, but economic transportation solutions remain untested.

Sakhalin
- The closest location to Japan and other Asian markets, Sakhalin-2 expansion with the third train has obtained Gazprom approval. Sakhalin-3 gas resources are probably sufficient but both the existing plant expansion and two trains of Vladivostok LNG, Sakhalin-1 gas require finding a commercial solution. Rosneft is striving for its own 5 mt LNG plant in Sakhalin.

Vladivostok LNG
- Sakhalin gas resources are sufficient to launch the project, but its long-term sustainability depends on East Siberian gas delivered by pipeline, so the project’s viability depended heavily on a pipeline deal between Russia and China; high pipeline costs for East Siberia gas are a concern.

Baltic LNG
- This project targets the bunker fuel market niche in Baltic Sea region and may also be useful for the “peak shaving” spot market in Europe.

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**Russia existing and planned LNG projects**

<table>
<thead>
<tr>
<th>Year</th>
<th>Sakhalin-2, Trains 1&amp;2</th>
<th>Sakhalin-2, Train 3</th>
<th>Yamal LNG</th>
<th>Vladivostok LNG</th>
<th>Baltic LNG</th>
<th>Sakhalin-1</th>
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<tbody>
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Notes: *Start dates based on public announcements by project operators, not an IHS projection
Source: IHS Energy © 2014 IHS

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LNG export liberalization

The so-called LNG export liberalization law took effect in Russia on 1 December 2013, breaking Gazprom’s complete monopoly on all gas exports (pipeline and LNG). The chief aspects of the new policy are as follows:

• **Two non-Gazprom projects benefit.** The immediate beneficiaries of the new policies, through better financing terms and ability to underwrite long-term contracts, goes to two non-Gazprom projects—Yamal LNG and Rosneft’s proposed new LNG plant on Sakhalin. The emergence of other non-Gazprom LNG projects is likely to be slow and limited to Rosneft’s planned joint ventures with international majors on the Russian shelf, with project start dates beyond 2030.

• **Competing exports?** The Russian government attempts to strike a practical compromise between the need to jump-start selected Russian LNG projects and the desire to avoid direct competition between Russian pipeline gas and LNG exports in key markets in Europe. But as currently passed, the law does not have a mechanism for segregating export markets, making possible some competition of Russian independent LNG versus Russian pipeline gas in the European gas market in particular.

• **No change to pricing of Russian gas in Europe in the short term.** IHS Energy does not expect that the limited competition between Russian independent LNG exports and Gazprom’s exports to Europe could change the existing market structures and/or prices in Europe in the near term. But the potential for a greater role of Russian non-Gazprom exports in fostering competition does exist in the longer term.
## Novatek’s Yamal LNG project: SWOT analysis

### Strengths
- South Tambey (and new Gydan) fields represent prolific resource base for NOVATEK’s LNG plant.
- NOVATEK supported by key figures in Russia’s leadership; unprecedented tax exemptions for project
- TOTAL’s entry brings onboard experienced liquefaction operator and LNG marketer.
- CNPC’s entry expected to bring in new financers and project’s first 3 mt offtake contract.

### Weaknesses
- Technological and logistical challenges (including pack ice and permafrost) may ultimately prove insurmountable
- Delays likely, exposing project to start of buyers’ market cycle
- NOVATEK newcomer to LNG development
- Costs may escalate if year-round evacuation of LNG becomes problematic
- Increased costs from specialized shipping fleet could harm profitability

### Opportunities
- Yamal LNG could take advantage of economies of scale by adding additional phases; resource base capable of supporting expansions
- High returns possible in long run if Arctic development works smoothly
- Solution for monetizing stranded reserves, including possibility of swaps
- Could allow commercialization of Russian gas on a more global scale

### Threats
- Still unclear whether project is technically and economically feasible
- Specifics of export regulation (like obligation not to compete with Gazprom pipeline gas in Europe) may create problems for swaps
- Project partner TOTAL already possesses large liquefaction portfolio, and could deprioritize Yamal
Yamal LNG enjoys specific incentives under state program to develop Yamal resources and related off-shore areas through 2035

- Yamal LNG project officially recognized as pilot project following approval of the Yamal state development program in October 2010
  
- **Federal tax concessions:** Federal Law No. 258-FZ, 21 July 2011
  
  - Mineral Resource Extraction Tax (MRET): exempted for first 12 years (or first 250 Bcm and 20 mt of gas and gas condensate, respectively)
  
  - Export tax exemption for LNG and gas condensate exports
  
  - Novatek licenses for the Gydan peninsula fields also exempted from MRET and export tax in October 2013
  
- **Regional tax concessions:** Regional Law No. 151-ZAO, 23 December 2010
  
  - Property tax
  
  - Corporate profit tax

Source: Novatek
Russian state co-financing construction and operation of Sabetta port and infrastructure that Yamal LNG will use

Source: Novatek
Yamal LNG’s key hurdle: Logistics of Arctic year-round transportation via Northern Sea Route remains a big bet

The Northern Sea Route dilemma

Pros +
- Direct transportation to Asian Markets via NSR
  - Halves time
  - Reduces fuel and freight costs
  - Escapes from Suez Canal transportation fees
  - Helps to avoid Somali pirates and related extra insurance charges

Yamal LNG’s proposed solution:
- Use Northern Sea Route for 5–6 months (from May–June to October–November) when Arctic-class LNG carriers can navigate through ice to Asia.
- Outside of summer navigation period, use Arc7 vessels to travel west to European market and/or to Asia via conventional Suez Canal route with reloading to larger LNG tankers in European ports.
- Arc7 is an Arctic-class carrier with capacity of 170,000 cubic meters.
- Design specification of Arc7 vessels would allow travel at 19.5 knots through open water and 5.5 knots through ice sheets 1.5 meters thick; with reduced speed, vessels are able to break through up to 2.3–2.4 meters of ice.
- BUT ARRANGING YEAR-ROUND EVACUATION OF LNG FROM YAMAL REMAINS UNPROVEN PROPOSITION

Cons –
- Nearly year-round complete ice coverage
- Shallow depths with significant shoals
- Potential lack of nuclear ice-breakers
- Lack of infrastructure
- Ecological risks

Legend

Ways to markets
- to Europe
- to Asia

Vessels
- Arctic-class LNG carriers
- LNG tankers

Prices and transportation costs
- Term versus spot prices in 2012 per million Btu (MMBtu)
- Expected transportation costs per MMBtu
First-ever passage of LNG carrier *Ob River* via Northern route in Nov 2012: two nuclear-powered ice-breakers required ...
Despite disadvantages of geography, projected cost of supply for Russia’s Arctic LNG projects suggests competitiveness in European and Asian markets.

Full cycle costs for proposed LNG projects to UK

Full cycle costs for proposed LNG projects to Japan

Source: IHS CERA © 2013 IHS

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Sakhalin-1
• Consortium plans to bring on stream third field, Arkutun Dagi, in 2014; with largest offshore platform in Russia, and one of biggest ice-resistant platforms in world
• Arkutun-Dagi platform installed in June 2012

Sakhalin-2
• First vessel of Sakhalin-2 navigates Northern Sea Route (“Arctic shortcut”) in 2012, reaching Murmansk

Sakhalin-3
• Gazprom’s Kirinskoye gas and condensate field project is first example of subsea production system technology in Russia,
• Contracted from US-based FMC Technologies
• Larger Yuzhno-Kirinskoye field slated to follow, in about 2018

Source: IHS CERA.
Sakhalin LNG: Location is key market advantage

Shipping Destinations | Japan - Tobata | Japan - Chita | South Korea - Incheon | China – Guangdong | India – Hazira | Mexico – Costa Azul
---|---|---|---|---|---|---
Shipping Cost ($/MMBtu) | $0.24 | $0.26 | $0.29 | $0.43 | $1.05 | $0.79
One-Way Distance (nautical miles) | 983 | 1,164 | 1,349 | 2,191 | 6,117 | 4,503
Round Trip Time (days) | 4 | 5 | 6 | 9 | 26 | 19
Loading LNG carrier at Prigorodnoye terminal of Sakhalin-2’s LNG plant
KOGAS agreed to buy 1.5 mt per year with an option to take a further 0.5 mt.

Source: PFC
KOGAS agreed to buy 1.5 mt per year with an option to take a further 0.5 mt.
Though Sakhalin 2’s first two trains required large price tag for an integrated development of its scope, project benefits from substantial liquids revenues.

- Additionally, shipping costs low due to proximity to end markets.
Pricing and Cost Summary: Sakhalin 2 LNG Train 3

- Gazprom and other potential partners in third train would enjoy brownfield economics if they move forward with third train at Sakhalin 2 LNG
- Most likely source of feedstock gas for would be Kirinsky field, with high liquids content; significant condensate revenues result in below-zero upstream breakeven price
- Train 3 would likely see more favorable pricing terms compared to earlier trains: recent contract signings in $0.1485 \times$ (times the oil price) range
- **BUT** Gazprom committed Kirinskoye gas to Vladivostok LNG!

### Reference Case Pricing ($/MMBtu$)

<table>
<thead>
<tr>
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<th>$/MMBtu</th>
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<tbody>
<tr>
<td>Upstream (IRR=15%, $90/b)</td>
<td>-0.67</td>
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<tr>
<td>Liquefaction (IRR=12%)</td>
<td>3.35</td>
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<tr>
<td>Breakeven FOB Cost</td>
<td>2.68</td>
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<tr>
<td>Weighted Average Shipping Cost</td>
<td>0.51</td>
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<tr>
<td>Breakeven CIF Price</td>
<td>3.19</td>
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### Market Pricing ($90/b) ($/MMBtu$)

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<tr>
<td>Market CIF Price</td>
<td>13.37</td>
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<tr>
<td>Breakeven CIF Price</td>
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<tr>
<td>Margin</td>
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</tbody>
</table>

Source:  
Reference Case Pricing ($MMBtu)

- Upstream (IRR=15%, $90/b) = -0.67
- Liquefaction (IRR=12%) = 3.35
- Breakeven FOB Cost = 2.68
- Weighted Average Shipping Cost = 0.51
- Breakeven CIF Price = 3.19
- Margin = 10.18

- Market Pricing ($MMBtu$)
  - Market CIF Price = 13.37
  - Breakeven CIF Price = 3.19

Breakeven Price vs. CIF Market Price

(Upstream IRR=15%, Liquefaction IRR=12%, $90/b)
Overview of Gazprom’s 15 mt Vladivostok LNG plant

- Gazprom formally approved “investment rationale” for Vladivostok LNG in February 2013; first train scheduled to come online in 2018
  - **Not a FID** (“FID” Russian style)
  - Gazprom creating SPV to start commercial negotiations with potential buyers
- Shareholder structure and offtake contracts not yet finalized
- Gazprom did not announce cost of proposed 15 mt plant
  - But costs of Japan Far East Gas Co.’s pre-FEED for 10 mt plant estimated at $7.3 billion
- Major investments needed in project’s upstream and supporting infrastructure, so major obstacles to completion
### SWOT Analysis of Vladivostok LNG

#### Strengths
- Located in close proximity to attractive, stable Asian markets
- Japanese shareholders suggest that marketing to Japan would occur “expeditiously”
- Gazprom’s involvement could ensure more expedient project delivery, especially if Vladivostok LNG prioritized over local distribution
- Potential feedstock sources Chayanda and Kovykta have large reserves

#### Weaknesses
- Massive infrastructure investments required
- Costs for the newly proposed 15 mt plant will be far above original estimates of $7-10 billion, even without investments in upstream feedstock or infrastructure
- Foreign partner likely needed to share costs of project

#### Opportunities
- Potential to enjoy economies of scale if Vladivostok LNG subsequently expanded to 25 mt per year
- With Shtokman LNG put on hold indefinitely, Gazprom’s major ambitions for LNG largely centered upon Vladivostok

#### Threats
- Costs may become prohibitively high, as delays and cost escalations likely
- Local environmental activism could threaten development, though Vladivostok not as ecologically fragile as Russia’s Arctic projects