Transforming into a Global Gas Company

Mark Gyetvay, CFO and Deputy Chairman of the Management Board

©2018 Baker Hughes, a GE company, LLC (“BHGE”). All rights reserved.
Key questions to answer

- How to successfully monetize over 3.3 trillion cubic meters of natural gas into commercially competitive LNG?
- How to reduce capital cost to a construct liquefaction plant in the $650 million to $750 million per million ton range?
- How to develop a viable logistical model to deliver LNG to key consumer gas importing regions?
- How to satisfy the changing dynamics of LNG trade?
Arctic LNG 2

Natural gas production at Utrennye field, bcm

Gas condensate production at Utrennye field, mmt

Jurassic layers development may increase gas reserves by 40%

Concept
- Utrennye feeder field for Arctic LNG 2
- New concept of LNG trains based on GBS platforms
- Three LNG trains at 6.1 mtpa each utilizing Linde liquefaction license
- GBS platforms built at LNG construction center (Murmansk)
- FEED in progress (expected completion late 2018)

Advantages
- Tax concessions approved per RF legislation, the same as for Yamal LNG
- Optimize and reduce CAPEX per ton of LNG liquefaction
- Low cost, onshore conventional natural gas
- Leverage existing infrastructure
- Minimize environmental impact
GBS LNG plant concept

Parameters for each GBS train
- GBS dimensions: 300 m x 152 m
- GBS weight: 440 thousand tons
- Overall LNG tanks volume: 213 thousand m³
- Mixed Fluid Cascade (MFC) process by Linde
- 4 gas turbine drives x 55 MW,
- 3 gas turbine drives the power plant 165 MW

<table>
<thead>
<tr>
<th>Concept of the future plant</th>
<th>Construct LNG trains based on gravity-based structures (GBS)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>GBS platforms will be fabricated and assembled at LNG construction center</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Implementation stage</th>
<th>Pre-FEED stage completed; FEED stage commenced in Q2 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FEED stage will define optimal layout of the LNG train</td>
</tr>
<tr>
<td></td>
<td>FEED estimated to be completed by the end of 2018</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Advantages of the chosen concept</th>
<th>Reduce construction and logistical costs as main LNG equipment is built and installed at the LNG construction center</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>High local content; reduced construction schedule risks; and minimized external risk exposure</td>
</tr>
<tr>
<td></td>
<td>Minimize scope of work in the Arctic area</td>
</tr>
</tbody>
</table>

GBS LNG concept will significantly reduce overall liquefaction cost
# LNG transshipment complex: Kamchatka peninsula

<table>
<thead>
<tr>
<th>Planned transshipment capacity</th>
<th>▪ 20 million tons per annum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>▪ Mokhovaya Harbor in Avacha Bay, in close proximity to Petropavlovsk-Kamchatskiy</td>
</tr>
<tr>
<td></td>
<td>▪ 4,000 nautical miles from Sabetta</td>
</tr>
<tr>
<td>Concept</td>
<td>▪ Moored LNG storage ship</td>
</tr>
<tr>
<td></td>
<td>▪ Option to sell FOB Kamchatka</td>
</tr>
<tr>
<td>Project status</td>
<td>▪ Pre-FEED to be completed by year-end 2017</td>
</tr>
<tr>
<td></td>
<td>▪ FEED to be completed in 2018</td>
</tr>
<tr>
<td></td>
<td>▪ Launch – 2022 and 2023</td>
</tr>
</tbody>
</table>
LNG transit via Northern Sea route subject to icebreakers commissioning

Icebreaking fleet is being renewed:
three new icebreaker types are being designed

**LK-60 nuclear icebreakers:**
- The ARKTIKA nuclear icebreaker was put afloat on June 6, 2016 (to be brought into operation in 2019)
- The SIBIR nuclear icebreaker was put afloat on September 22, 2017 (to be brought into operation in 2020)
- The URAL nuclear icebreaker (to be brought into operation in 2022)

**The LD nuclear icebreaker** – development of design documentation is underway.
Expected completion date – December 2017

**ARC 130-type LNG-fueled icebreaker** – at the design stage
Answers

By using technology and innovative solutions through collaborative partner relationships, such as the one we have with GE for gas turbines, we will successfully:

- Monetize our prolific resource base in the Yamal and Gydan peninsulas;
- Lower the cost of liquefaction;
- Increase the use of the NSR for full year navigation;
- Create a new trading hub and transshipment terminal at Kamchatka to serve the growing Asian Pacific region; and
- Adopt LNG marketing strategy with flexible duration terms, pricing and volumes.

✔ Energy Affordability ✔ Energy Security ✔ Energy Sustainability