Natural Gas Medium-term Outlook and Security Review

Jean-Baptiste Dubreuil
Columbia University, New York, 30 October 2018
Context – Gas markets in the next five years

- Gas demand is in the fast lane, thanks to its flexibility & ability to ease environmental problems

- Global gas markets are being re-shaped by three major structural shifts
  - China becoming the world’s largest natural gas importer
  - US gas production and LNG exports rising dramatically
  - Industry displacing power generation as the leading growth sector

- The gas industry’s future remains bright, but it is not without challenges
  - Gas price competitiveness & market reforms in emerging markets
  - Curbing methane leaks along the value chain
China dominates world gas consumption growth

World natural gas consumption growth for selected countries and regions, 2017-23

Global consumption passes the 4 tcm mark by 2022
China to account for almost 40% of growth driven by clean air policy target
The United States takes the lion’s share of the growth in global supply

Natural gas production growth for selected countries and regions, 2017-23

The United States accounts for almost 45% of global growth in natural gas production and 75% of growth in LNG exports
Strong growth in LNG imports is driven by Asia

LNG trade passes 500 bcm mark by 2023, reaching almost 40% of global gas trade from around a third today; Developing Asian markets account for almost half of LNG market by 2023

<table>
<thead>
<tr>
<th>Year</th>
<th>Other Asia and Pacific</th>
<th>Japan and Korea</th>
<th>China</th>
<th>Europe</th>
<th>Other Atlantic Basin and Middle East</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>2015</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>2017</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>2019</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>2021</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>2023</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>
Lessons learned from last winter’s supply issues

- China’s unprecedented demand growth led to winter supply shortages, which prompted policy and industry responses
  - Further increase and diversification of the natural gas supply portfolio
  - Strong infrastructure development with a focus on underground storage
  - New policy guidelines for natural gas targets

- Last winter events showed the resilience of Europe’s natural gas system
  - Importance of coordination policies’ implementation
  - Promoting network integration and cooperation
Midstream LNG market emerges thanks to contracts flexibility

Access to flexible supply is a prerequisite for a global and resilient LNG market. Portfolio players supply new buyers thanks to their access to long-term flexible supply.
LNG contracts flexibility update

2017 saw further development from new buyers with a preeminence of time flexibility over destination. This is enabled by the development of flexible primary supply.

### Time flexibility
*Share of short term volumes (up to 1 year)*

- **Share of short term volumes (up to 1 year)**
  - Signed before 2014
  - Signed in 2015
  - Signed in 2016
  - Signed in 2017

### Time flexibility
*Average duration (years)*

- **Average duration (years)**
  - Signed before 2014
  - Signed in 2015
  - Signed in 2016
  - Signed in 2017

### Destination flexibility
*Share destination free volumes*

- **Share destination free volumes**
  - Signed before 2014
  - Signed in 2015
  - Signed in 2016
  - Signed in 2017

*Excluding spot transactions*
Despite growing share of hub pricing in exports, oil indexation still dominates in import contracts, especially in Asia and Pacific region.
Timeliness of LNG supply is key for short-term issues

Number of days needed to receive and regasify an unplanned additional LNG cargo

- **Northeast Asia**
  - Flexible (uncontracted or contracted with flexible destination): 5 days
  - Technically available (including LNG at sea): 3 days
  - 1 LNG cargo equals... 5 hours of consumption

- **Southwest Europe**
  - Flexible (uncontracted or contracted with flexible destination): 4 days
  - Technically available (including LNG at sea): 3 days
  - 1 day of consumption

- **Latin America Pacific Coast**
  - Flexible (uncontracted or contracted with flexible destination): 6 days
  - Technically available (including LNG at sea): 4 days
  - 2 weeks of consumption

Need to complement (upstream) LNG with mid- and downstream mitigation measures
Sustainable investment and operating framework for LNG shipping is (part of) the hidden cost of LNG flexibility and trade growth.
Towards a tight LNG shipping market?

Sustainable investment and operating framework for LNG shipping is (part of) the hidden cost of LNG flexibility and trade growth
Main messages from Global Gas Security Review 2018

- Last winter’s supply shortfall in China triggered policy and investment decisions, and supply issues in Europe showed success of integration and emergency policy.

- LNG flexibility evolved with the development of secondary markets, emphasizing the role of portfolio players.

- Fixed destination and oil indexation from legacy contracts, however, still remain at large scale.

- Short-term LNG has to be part of a broader range of mitigation tools including network integration, underground storage, demand response, etc.

- Lack of investment in LNG shipping fleet could hamper market development and increase price volatility.