LNG Outlook
Medium & Long Term

Thomas Maurisse
Senior Vice President, LNG
Impact of COVID crisis on energy

World GDP and demand evolution
2020 vs. 2019 (%)

-4%    -5%    -9%    +2%    +13%

LNG and Renewables: key contributors to the energy transition
**KEY LNG FIGURES In 2020 – SUPPLY AT A GLANCE**

**2020 LNG Supply by Country**

<table>
<thead>
<tr>
<th>Country</th>
<th>Supply (Mt/y)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>78 MT</td>
<td>22%</td>
</tr>
<tr>
<td>Qatar</td>
<td>79 MT</td>
<td>22%</td>
</tr>
<tr>
<td>US</td>
<td>46 MT</td>
<td>13%</td>
</tr>
<tr>
<td>Russia</td>
<td>31 MT</td>
<td>8%</td>
</tr>
<tr>
<td>Malaysia</td>
<td>24 MT</td>
<td>6%</td>
</tr>
<tr>
<td>Nigeria</td>
<td>21 MT</td>
<td>6%</td>
</tr>
<tr>
<td>Indonesia</td>
<td>15 MT</td>
<td>4%</td>
</tr>
<tr>
<td>Algeria</td>
<td>11 MT</td>
<td>3%</td>
</tr>
<tr>
<td>Trinidad</td>
<td>11 MT</td>
<td>3%</td>
</tr>
<tr>
<td>Oman</td>
<td>10 MT</td>
<td>3%</td>
</tr>
<tr>
<td>Papua</td>
<td>8 MT</td>
<td>2%</td>
</tr>
<tr>
<td>UAE</td>
<td>6 MT</td>
<td>1%</td>
</tr>
<tr>
<td>Other</td>
<td>17 MT</td>
<td>5%</td>
</tr>
</tbody>
</table>

**2019 LNG trade: Record growth ~ +39 MT (+12%)**

- The US and Russia became top-3 and top-4 LNG exporters in 2019
- Record of FID taken with 5 projects accounting 63 MT

**2020 LNG trade: Resilient market despite COVID ~2% growth**

- 21 MT LNG plants commissioned in 2019
- Top output growth: US +11 MT, Australia & Qatar +2 MT, Russia +1 MT
- Record of FID taken in 2020: Energia Costa Azul (ECA) & Nigeria LNG T7

**Volumes from cargoes cancellation**

- US ~ -12 MT
- Egypt ~ -2-3 MT
- Australia ~ -1-2 MT

**Source:** IHS Waterborne Jan2021, Rystad 2021, Total Analysis
Gas will become the second-ranked source of energy globally.

**WORLD ENERGY DEMAND**

Mbep/d

- **Renewables**
- **Nuclear**
- **Natural gas**
- **Oil**
- **Coal**

* Sources: IEA World Energy Outlook 2020 (Sustainable Development Scenario) and Total Energy Outlook 2020
THE ADVANTAGES OF NATURAL GAS

AVAILABLE, RELIABLE ENERGY TO MEET GROWING DEMAND

THE FOSSIL FUEL WITH THE LOWEST GHG* EMISSIONS, A KEY ENERGY RESOURCE FOR FAST CLIMATE ACTION

GAS OFFERS CONSIDERABLE FLEXIBILITY FOR BOTH TRANSPORTATION AND USE, ESPECIALLY WHEN LIQUEFIED (LNG)

* Greenhouse gas
Central to the Energy Transition

Reduce GHG emissions and improve air quality

- 50%: 50 to 60% less CO₂ than coal for power generation.
  - Almost no air pollutants (NOx and SOx) or fine particulate matter.

- 5GT: Replacing coal in power generation would reduce emissions by 5 Gt/CO₂eq/year (10% of overall emissions related to human activities).

- Natural gas and LNG are supported by international organizations and local and national energy policies.

The use of LNG as a marine fuel is the best, immediately available solution in terms of energy transition to help reduce the environmental footprint of maritime transport.

Support the growth of renewable energies

Natural gas is an essential partner to allow renewables - inherently variable - to grow.

- An abundant, available resource with low emissions, natural gas is renewable energies greatest ally.

- Gas-fired power plants are quicker to start up again and can ramp up to full capacity twice as fast as coal-fired power plants.
  - This flexibility offsets the variability of renewables.

* Greenhouse gas
LNG, PIVOTAL TO ENERGY SECURITY

Quick way to address declining domestic production and/or meet sharp rises in energy demand in a country or region.

Alternative to gas pipelines and their drawbacks, such as cost, maintenance and geopolitical risks.

More environmentally friendly source of energy and ideally suited to partner renewable energies for their growth.

Increasingly competitive solutions thanks to joint initiatives by gas players to reduce technical and logistics costs, including less expensive liquefaction and regasification units, modular liquefaction trains, flexibility, optimization and trade-offs.
SUSTAINED LNG GROWTH ON THE LONG TERM

LNG DEMAND 2015-30
Mt/year

Annual Growth Rate:
~5% / year

+10% per year
2015-19 growth

+2% growth in 2020 vs 2020 despite the economic situation

LNG is supported by local and national energy policies in Asia

Source: Total Energy Outlook 2020 - Momentum
LNG future projects overview 2025-26 horizon

**Projects sanctioned in 2018**
- USA Projects
  - Corpus Christi T3 (5 Mtpa)
  - Golden Pass (16 Mtpa)
  - Sabine Pass T6 (5 Mtpa)
  - Calcasieu (10 Mtpa)
  - Cameron T4, Driftwood, Corpus Christi Exp., Port Arthur, Freeport T4, Plaquemines

**Projects sanctioned in 2019**
- Moz. Area 1 (13 Mtpa)
- Moz. Area 4 (15 Mtpa)
- Pluto LNG Exp. (5 Mtpa)
- Qatar New Mega Trains (4 trains, 31 Mtpa)
- Mozambique
- Nigeria LNG T7* (8 Mtpa)
- Papua LNG & PNG LNG T3 (8 Mtpa)

**Projects sanctioned in 2020 and early 2021**
- LNG Canada (14 Mtpa)
- Arctic LNG-2 (20 Mtpa)
- Arctic LNG-2 (20 Mtpa)
- Ob LNG (5 Mtpa)
- Moz. Area 1 (13 Mtpa)
- Moz. Area 4 (15 Mtpa)
- Pakistan LNG (5 Mtpa)
- Papua LNG & PNG LNG T3 (8 Mtpa)

**Projects with sanctions delayed in 2021+**
- LNG Canada (14 Mtpa)
- Arctic LNG-2 (20 Mtpa)
- Ob LNG (5 Mtpa)
- Moz. Area 1 (13 Mtpa)
- Moz. Area 4 (15 Mtpa)
- Pakistan LNG (5 Mtpa)
- Papua LNG & PNG LNG T3 (8 Mtpa)

*conditional FID
*export permit from Mexico is expected before year end to allow FID

**Project type**
- Greenfield / Brownfield
- <5 Mtpa
- 5-15 Mtpa
- >15 Mtpa

**Capacities sanctionned (Mtpa)**

Rest of World
Australia
Canada
Russia
USA

**TOTAL Classification: Restricted Distribution**
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WORLD LNG SUPPLY OUTLOOK

**World LNG Supply by region**

<table>
<thead>
<tr>
<th>Region</th>
<th>2019</th>
<th>2025</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>13%</td>
<td>14%</td>
<td>15%</td>
</tr>
<tr>
<td>AME</td>
<td>14%</td>
<td>25%</td>
<td>24%</td>
</tr>
<tr>
<td>Russia</td>
<td>8%</td>
<td>10%</td>
<td>12%</td>
</tr>
<tr>
<td>Asia</td>
<td>38%</td>
<td>29%</td>
<td>23%</td>
</tr>
<tr>
<td>ME</td>
<td>26%</td>
<td>21%</td>
<td>24%</td>
</tr>
</tbody>
</table>

**Top 5 LNG Exporters**

<table>
<thead>
<tr>
<th>Exporter</th>
<th>2019</th>
<th>2025</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qatar</td>
<td>67%</td>
<td>73%</td>
<td>73%</td>
</tr>
<tr>
<td>Australia</td>
<td>14%</td>
<td>25%</td>
<td>10%</td>
</tr>
<tr>
<td>Russia</td>
<td>8%</td>
<td>10%</td>
<td>29%</td>
</tr>
<tr>
<td>USA</td>
<td>24%</td>
<td>23%</td>
<td>12%</td>
</tr>
<tr>
<td>Malaysia</td>
<td>15%</td>
<td>21%</td>
<td>24%</td>
</tr>
</tbody>
</table>

Qatar, Australia, Russia, USA, and Malaysia are the top 5 LNG exporters.
Long term LNG supply / demand balance

Sources: IHS, Woodmackenzie, Poten, Total analysis (TEO 2020)
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