Natural Gas

The Next 10 Years

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Why natural gas?

The global energy system increasingly relies on natural gas to meet its needs—and by 2040, even in a scenario where the world meets its climate goals, gas could be the #1 energy source in the world.

Gas is a deeply political fuel that interacts with several cross currents from foreign policy to geoeconomics, to sanctions and climate change. It is also a complex fuel that analysts so often get wrong.
The global market for natural gas is being **transformed**, but change is often evolutionary and multi-layered—broad generalizations can mislead rather than illuminate.

The next 10 years will be shaped by the rise of **four mega-players** and by a steady tension between gas as a solution and gas as a problem in the **energy transition**.
Profound transformation for gas markets
Gas has gained market share from oil and coal

Market share remains regionally uneven

There is an unprecedented boom in LNG supply

million tons of liquefied natural gas

Source: BP, Statistical Review of World Energy (June 2019); 2019 estimate from IHS Press release.
Record-level investment in new supply

million tons of liquefied natural gas (annual capacity)

Qatar: 44%  Australia: 71%  USA: 58%

Source: Company reports and industry press.
U.S. gas exports will rewire global gas system

More and more countries joining the LNG club

New LNG exporters

2008: Russia, Yemen
2009: Peru
2010: Brazil, Canada, Chile, Kuwait
2011: Netherlands, Thailand
2012: Israel, Malaysia, Singapore
2013: Angola
2014: Papua New Guinea
2015: Egypt, Jordan, Pakistan, Poland
2016: Malta
2017: Cameroon
2018: Argentina
2019: Colombia, Lithuania, Jamaica, Panama, Bangladesh

New LNG importers

Source: BP, Statistical Review of World Energy (June 2019); IGU, World LNG Report 2019; company reports.
But most gas (still) never crosses a border

Gas prices vary widely (unlike oil)

Oil prices

Gas prices

Source: EIA, World Bank, Petroleum Association of Japan, OPEC, Japan Customs, Platts, ICE UK, BAFA.
Most regions have a hybrid pricing system

GAS PRICE FORMATION BY REGION (2018)

- **Gas-on-Gas**
- **Oil indexed**
- **Regulated**
- **Other**

<table>
<thead>
<tr>
<th>Region</th>
<th>Gas-on-Gas</th>
<th>Oil indexed</th>
<th>Regulated</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>47%</td>
<td>19%</td>
<td>29%</td>
<td>4%</td>
</tr>
<tr>
<td>N. America</td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Europe</td>
<td>75%</td>
<td>24%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FSU</td>
<td>27%</td>
<td>65%</td>
<td>6%</td>
<td></td>
</tr>
<tr>
<td>L. America</td>
<td>17%</td>
<td>41%</td>
<td>14%</td>
<td></td>
</tr>
<tr>
<td>Asia</td>
<td>17%</td>
<td>67%</td>
<td>15%</td>
<td></td>
</tr>
<tr>
<td>Asia Pacific</td>
<td>22%</td>
<td>64%</td>
<td>12%</td>
<td></td>
</tr>
<tr>
<td>Africa</td>
<td></td>
<td>79%</td>
<td>6%</td>
<td></td>
</tr>
<tr>
<td>Mid East</td>
<td>3%</td>
<td>79%</td>
<td>15%</td>
<td></td>
</tr>
</tbody>
</table>

Slow and steady shift to gas-on-gas pricing

A multi-layered transformation

Market share
Gas’ global market share is rising, but penetration (and growth) is regionally uneven.

New supply
We are in the midst of an unprecedented supply boom, coupled with record-level investment in new supply.

Trade flows
North America will rewire trade flows in a market that is more complex and integrated.

Prices
Steady move to gas-on-gas pricing, but price disparities still exist, and most regions have a hybrid pricing system.
The mega-players, the energy transition
Four players will define the next decade

The Gas Mega-Players in 2018 and 2028

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Pipeline</td>
<td>223</td>
<td>304</td>
<td>28</td>
<td>112</td>
<td>105</td>
<td>150</td>
<td>73</td>
<td>133</td>
</tr>
<tr>
<td>LNG</td>
<td>68</td>
<td>68</td>
<td>68</td>
<td>40</td>
<td>20</td>
<td>20</td>
<td>48</td>
<td>97</td>
</tr>
</tbody>
</table>

Gas market more integrated and competitive

More integrated
Gas trade has mostly taken place within regions or within defined corridors. But Russia, the United States, Qatar, and China are all global players.

More competitive
U.S. market driven by private sector; large players in Russia and China are competing; only Qatar has consolidated position under QP.

But greater temptation to exert market power

Market structure

Move to gas-on-gas pricing and growing linkages between regions mean the market is more susceptible to efforts to exercise market power.

Spare capacity

All the major players will have some form of “spare capacity,” three at the hands of governments and one in the hands of the private sector.

A gas market with lots of geopolitical wrinkles

Russia
Can it leverage partnerships into geopolitical gain?

Qatar
How will it pick partners? Market access, overseas assets, geopolitics?

China
How to boost energy security in a market dominated by the United States?

United States
How much to politicize LNG to boost exports and support energy security of allies; or through linkage to trade and sanctions?

Gas serves different needs in different markets

Natural Gas Consumption by Sector and Region (2017)

<table>
<thead>
<tr>
<th>Region</th>
<th>Power</th>
<th>Industry</th>
<th>Buildings</th>
<th>Other</th>
<th>Demand (mtoe)</th>
</tr>
</thead>
<tbody>
<tr>
<td>World</td>
<td>40.7</td>
<td>34.6</td>
<td>20.3</td>
<td></td>
<td>3,106</td>
</tr>
<tr>
<td>OECD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Americas</td>
<td>35.2</td>
<td>35.7</td>
<td>25.3</td>
<td></td>
<td>812</td>
</tr>
<tr>
<td>Europe</td>
<td>31.4</td>
<td>29.8</td>
<td>36.9</td>
<td></td>
<td>435</td>
</tr>
<tr>
<td>Asia Oceania</td>
<td>59.7</td>
<td>20.8</td>
<td>19.6</td>
<td></td>
<td>188</td>
</tr>
<tr>
<td>Non-OECD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Europe and Eurasia</td>
<td>48.0</td>
<td>25.8</td>
<td>17.3</td>
<td></td>
<td>542</td>
</tr>
<tr>
<td>Middle East</td>
<td>46.2</td>
<td>40.4</td>
<td>11.9</td>
<td></td>
<td>418</td>
</tr>
<tr>
<td>Asia (ex. China)</td>
<td>48.1</td>
<td>42.1</td>
<td>5.5</td>
<td></td>
<td>253</td>
</tr>
<tr>
<td>China</td>
<td>21.0</td>
<td>45.9</td>
<td>24.3</td>
<td></td>
<td>198</td>
</tr>
<tr>
<td>Americas</td>
<td>35.5</td>
<td>45.6</td>
<td>9.1</td>
<td></td>
<td>138</td>
</tr>
<tr>
<td>Africa</td>
<td>51.7</td>
<td>37.5</td>
<td>8.2</td>
<td></td>
<td>123</td>
</tr>
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**A simple schematic for gas in the energy transition**

<table>
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<tr>
<th>Natural Gas in the Energy Transition</th>
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<tbody>
<tr>
<td><strong>Gas can help advance decarbonization but is struggling to compete for market share.</strong></td>
</tr>
<tr>
<td>Examples: Coal-to-gas switching in India and SE Asia; gas in heavy-duty transport (trucks); gas in industry and electricity in sub-Saharan Africa.</td>
</tr>
<tr>
<td><strong>Gas can play a smaller role in decarbonization, plus it is struggling to compete for market share.</strong></td>
</tr>
<tr>
<td>Examples: In buildings (where not already used); in electricity systems with low-carbon alternatives; in passenger cars (as electric vehicles scale up).</td>
</tr>
<tr>
<td><strong>Gas can help advance decarbonization, plus gas is in a competitive position to defend or expand market share.</strong></td>
</tr>
<tr>
<td>Examples: Coal-to-gas switching in electricity and industry; oil-to-gas switching in electricity (e.g., Middle East); marine transport.</td>
</tr>
<tr>
<td><strong>Gas can play a smaller role in decarbonization but is in a competitive position to defend or expand market share.</strong></td>
</tr>
<tr>
<td>Examples: In electricity systems with low-carbon alternatives; in buildings (if gas is used now); in industry (until alternatives scale up).</td>
</tr>
</tbody>
</table>

Where will gas grow and where not

**Power**
Gas will grow versus coal where gas is cheap or helped by policy; but will be squeezed by renewables.

**Buildings**
Gas use driven by a few places; electrification, district heating, hydrogen, will challenge gas but displacement will be slow.

**Industry**
Strong role in petrochemicals; energy industry own use set by use of fossil fuels overall; few options for high-temperature process heat.

**Transport**
 Likely missed window for passenger vehicles (and heavy duty transport too); marine transport most promising market.

Conclusion

The global market for natural gas is being transformed, but change is often evolutionary and multi-layered—broad generalizations can mislead rather than illuminate.

The next 10 years will be shaped by the rise of four mega-players and by a steady tension between gas as a solution and gas as a problem in the energy transition.