Cautionary note

The companies in which Shell plc directly and indirectly owns investments are separate legal entities. In this LNG Outlook “Shell,” “Shell Group” and “Group” are sometimes used for convenience where references are made to Shell plc and its subsidiaries in general. Likewise, the words “we,” “us” and “our” are also used to refer to Shell plc and its subsidiaries in general or to those who work for them. These terms are also used where no useful purpose is served by identifying the particular entity or entities. “Subsidiaries,” “Shell subsidiaries” and “Shell companies” as used in this LNG Outlook refer to entities over which Shell plc either directly or indirectly has control. Entities and unincorporated arrangements over which Shell has joint control are generally referred to as “joint ventures” and “joint operations”, respectively. “Joint ventures” and “joint operations” are collectively referred to as “joint arrangements”. Entities over which Shell has significant influence but neither control nor joint control are referred to as “associates”. The term “Shell interest” is used for convenience to indicate the direct and/or indirect ownership interest held by Shell in an entity or unincorporated joint arrangement, after exclusion of all third-party interest.

Forward-Looking Statements

This LNG Outlook contains forward-looking statements (within the meaning of the U.S. Private Securities Litigation Reform Act of 1995) concerning the financial condition, results of operations and businesses of Shell. All statements other than statements of historical fact are, or may be deemed to be, forward-looking statements. Forward-looking statements are statements of future expectations that are based on management’s current expectations and assumptions and involve known and unknown risks and uncertainties that could cause actual results, performance or events to differ materially from those expressed or implied in these statements. Forward-looking statements include, among other things, statements concerning the potential exposure of Shell to market risks and statements expressing management’s expectations, beliefs, estimates, forecasts, projections and assumptions. These forward-looking statements are identified by their use of terms and phrases such as “aim”, “ambition”, “anticipate”, “believe”, “could”, “estimate”, “expect”, “goals”, “intend”, “may”, “milestones”, “objectives”, “outlook”, “plan”, “probably”, “project”, “risks”, “schedule”, “seek”, “should”, “target”, “will” and similar terms and phrases. There are a number of factors that could affect the future operations of Shell and could cause those results to differ materially from those expressed in the forward-looking statements included in this LNG Outlook, including (without limitation): (a) price fluctuations in crude oil and natural gas; (b) changes in demand for Shell’s products; (c) currency fluctuations; (d) drilling and production results; (e) reserves estimates; (f) loss of market share and industry competition; (g) environmental and physical risks; (h) risks associated with the identification of suitable potential acquisition properties and targets, and successful negotiation and completion of such transactions; (i) the risk of doing business in developing countries and countries subject to international sanctions; (j) legislative, judicial, fiscal and regulatory developments including regulatory measures addressing climate change; (k) economic and financial market conditions in various countries and regions; (l) political risks, including the risks of expropriation and renegotiation of the terms of contracts with governmental entities, delays or advancements in the approval of projects and delays in the reimbursement of shared costs; (m) risks associated with the impact of pandemics, such as the COVID-19 (coronavirus) outbreak; and (n) changes in trading conditions. No assurance is provided that future dividend payments will match or exceed previous dividend payments. All forward-looking statements contained in this LNG Outlook are expressly qualified in their entirety by the cautionary statements contained or referred to in this section. Readers should not place undue reliance on forward-looking statements. Additional risk factors that may affect future results are contained in Shell plc's Form 20F for the year ended December 31, 2021 (available at www.shell.com/investor and www.sec.gov). These risk factors also expressly qualify all forward-looking statements contained in this LNG Outlook and should be considered by the reader. Each forward-looking statement speaks only as of the date of this LNG Outlook February 16, 2023. Neither Shell plc nor any of its subsidiaries undertake any obligation to publicly update or revise any forward-looking statement as a result of new information, future events or other information. In light of these risks, results could differ materially from those stated, implied or inferred from the forward-looking statements contained in this LNG Outlook.

Shell's net carbon footprint

Also, in this LNG Outlook we may refer to Shell’s “Net Carbon Footprint” or “Net Carbon Intensity”, which include Shell’s carbon emissions from the production of our energy products, our suppliers’ carbon emissions in supplying energy for that production and our customers’ carbon emissions associated with their use of the energy products we sell. Shell only controls its own emissions. The use of the term Shell’s “Net Carbon Footprint” or “Net Carbon Intensity” are for convenience only and not intended to suggest these emissions are those of Shell plc or its subsidiaries.

Shell’s netZero Emissions Target

Shell’s operating plan, outlook and budgets are forecasted for a ten-year period and are updated every year. They reflect the current economic environment and what we can reasonably expect to see over the next ten years. Accordingly, they reflect our Scope 1, Scope 2 and Net Carbon Footprint (NCF) targets over the next ten years. However, Shell’s operating plans cannot reflect our 2050 netzero emissions target and 2035 NCF target, as these targets are currently outside our planning period. In the future, as society moves towards netzero emissions, we expect Shell’s operating plans to reflect this movement. However, if society is not net zero in 2050, as of today, there would be significant risk that Shell may not meet this target.

Forward-Looking NonGAAP measures

This LNG Outlook may contain certain forward-looking nonGAAP measures such as cash capital expenditure and dividends. We are unable to provide a reconciliation of these forward-looking nonGAAP measures to the most comparable GAAP financial measures because certain information needed to reconcile those nonGAAP measures to the most comparable GAAP financial measures is dependent on future events some of which are outside the control of Shell, such as oil and gas prices, interest rates and exchange rates. Moreover, estimating such GAAP measures with the required precision necessary to provide a meaningful reconciliation is extremely difficult and could not be accomplished without unreasonable effort. NonGAAP measures in respect of future periods which cannot be reconciled to the most comparable GAAP financial measure are calculated in a manner which is consistent with the accounting policies applied in Shell plc’s consolidated financial statements.

The contents of websites referenced to in this LNG Outlook do not form part of this LNG Outlook.

We may have used certain terms, such as resources, in this LNG Outlook that the United States Securities and Exchange Commission (SEC) strictly prohibits us from including in our filings with the SEC. Investors are urged to consider closely the disclosure in our Form 20F, File No 132575, available on the SEC website www.sec.gov.
Europe benefits from LNG industry flexibility in 2022

Russia’s invasion of Ukraine didn’t just affect Europe. It impacted energy markets across the world, contributing to severe energy price volatility and deep economic and political uncertainty—impacts which may alter energy market dynamics for the foreseeable future.

To replace Russian pipeline gas imports, Europe turned to liquefied natural gas (LNG), driving prices to record levels to attract cargoes. A contraction in Chinese gas demand, a drop in South Asian imports and new US LNG supply supported Europe’s need for LNG. As a result, LNG trade flows reversed in 2022 with the largest import growth seen in Europe and the biggest drop in Asia and South America.

Market volatility triggers energy security interventions – with lasting economic and emissions impacts

To ensure energy security, governments across the world intervened with policies to protect consumers from high energy prices. European policy makers prioritised LNG imports, resulting in quick build out of import infrastructure. Other levers that helped support Europe’s energy balance were fuel switching and gas demand destruction, choices which come with tough mid and long-term consequences, particularly on emissions.

Gas will be needed in the long term to balance energy systems as the world transitions to a lower-emission future. And for that, gas needs to be decarbonised, especially for use in hard-to-electrify sectors like industry, transport and heating.

Global gas and LNG markets expected to evolve as market dynamics point to a structural change

2022 can go down as the year that reshaped global energy markets. The events of the year triggered some structural shifts in market dynamics that may impact the long-term trajectory of the LNG industry. These include emergence of sustained demand for LNG in Europe, displacement of Russia’s lower cost gas reserve base, increased exposure to the US domestic gas market with new LNG supply concentrated among fewer exporters and a shifting policy landscape.

In the near-term, the global LNG market is expected to remain tight and exposed to supply and demand shocks, with limited new supply coming online. More investment in supply will be needed to meet future LNG demand.
Europe benefits from LNG industry flexibility in 2022
European LNG imports up by 60% to replace Russian gas
Lower Chinese imports helped balance the global LNG market

Total European primary energy demand (PJ)

<table>
<thead>
<tr>
<th>Year</th>
<th>Oil</th>
<th>LNG</th>
<th>Other gas</th>
<th>Coal</th>
<th>Nuclear</th>
<th>Hydro</th>
<th>Solar</th>
<th>Wind</th>
<th>Other renewables</th>
</tr>
</thead>
<tbody>
<tr>
<td>2021</td>
<td>35,000</td>
<td>20,000</td>
<td>15,000</td>
<td>5,000</td>
<td>3,000</td>
<td>2,000</td>
<td>1,000</td>
<td>500</td>
<td>1,000</td>
</tr>
<tr>
<td>2022</td>
<td>35,000</td>
<td>20,000</td>
<td>15,000</td>
<td>5,000</td>
<td>3,000</td>
<td>2,000</td>
<td>1,000</td>
<td>500</td>
<td>1,000</td>
</tr>
</tbody>
</table>

60% increase in LNG imports

Changes in global LNG trade 2022*

- 45 MT increase
- 15 MT decrease
- 7 MT decrease
- 16 MT increase

Source: Shell interpretation of Kpler, Wood Mackenzie 2022 data
Europe - EU 35 (includes Turkey & UK) * YoY year on year
Global gas and LNG prices continued to be volatile
Hitting record levels in 2022

Global gas prices $/MMBtu

<table>
<thead>
<tr>
<th>Year</th>
<th>JKM</th>
<th>TTF</th>
<th>HH</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>20</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>2016</td>
<td>25</td>
<td>30</td>
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<tr>
<td>2017</td>
<td>30</td>
<td>35</td>
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<td>2018</td>
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<td>2019</td>
<td>50</td>
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<tr>
<td>2020</td>
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<td>2022</td>
<td>80</td>
<td>85</td>
<td>90</td>
</tr>
<tr>
<td>2023</td>
<td>90</td>
<td>95</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Shell interpretation of ICE, CME, S&P Global Commodity Insights 2022 & 2023 data
TTF: Transfer Title Facility  HH: Henry Hub  JKM: Japan Korea Marker  NBP: National Balancing Point

JKM, the premium gas marker, prices seasonally increase through winter but do not exceed $12/MMBtu. TTF provides a floor.

Gas demand declines sharply during pandemic resulting in global prices converging with both TTF and JKM dipping below HH.

Global gas prices rise to record levels through H2 2021; extreme volatility remains through 2022 as Russia curtails pipeline gas supplies.
Drop in Russian gas supply was offset by LNG imports and demand destruction in Europe

**Russian pipeline imports**

<table>
<thead>
<tr>
<th>Month</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan</td>
<td>550</td>
<td>500</td>
<td>500</td>
<td>500</td>
<td>500</td>
</tr>
<tr>
<td>Feb</td>
<td>500</td>
<td>500</td>
<td>500</td>
<td>500</td>
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</tr>
<tr>
<td>Mar</td>
<td>450</td>
<td>450</td>
<td>450</td>
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<td>Apr</td>
<td>400</td>
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<td>400</td>
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<td>May</td>
<td>350</td>
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<td>350</td>
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<tr>
<td>Jun</td>
<td>300</td>
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<td>Jul</td>
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<td>250</td>
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<td>Sep</td>
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<td>Oct</td>
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<td>50</td>
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<tr>
<td>Dec</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: Shell interpretation of AGSI, TSO & Wood Mackenzie 2022 & 2023 data

**Change in European gas supply & demand**

- **Norway**: 7.1, 1.8
- **Dan pipes**: 2.2, 0.9
- **N. African pipes**: 81.8, 61.9
- **Russia pipe**: 0.7, 42.1
- **Exports**: 480, 2.2
- **Storage**: 19.4, 9.9
- **Power**: 20.6, 0.2
- **Residential**: 3.2, 0.2
- **Commercial**: 535, 535
- **Other**: 535, 535

**European & UK gas inventories**

- **5-Year average**
- **2022 Working gas capacity**
- **2022 Working gas capacity**
- **2023 Working gas capacity**

February 2023
Continued lockdowns and lower economic growth led to a contraction in Chinese gas demand

Macroenvironment: GDP vs gas demand

Change in China gas supply & demand

<table>
<thead>
<tr>
<th>Year</th>
<th>Domestic prod</th>
<th>Pipeline imports</th>
<th>LNG</th>
<th>Transport</th>
<th>Industrial</th>
<th>Power</th>
<th>Res &amp; Comm</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2021</td>
<td>367</td>
<td>14</td>
<td>5</td>
<td>21</td>
<td>1</td>
<td>5</td>
<td>3</td>
<td>364</td>
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<tr>
<td>2022</td>
<td>364</td>
<td>14</td>
<td>5</td>
<td>1</td>
<td>3</td>
<td>6</td>
<td></td>
<td>367</td>
</tr>
</tbody>
</table>

China LNG imports: term vs spot

US LNG exports flowed to Europe
As TTF priced at a premium

JKM/TTF spreads
$/MMBtu

Spreads favour Asian deliveries

Spreads favour European deliveries

US LNG exports
MT

Jan-20  Jul-20  Jan-21  Jul-21  Jan-22  Jul-22

Cove Point  Cameron  Corpus Christi  Liquefaction capacity

LNG imports from US
MT (DES)


Asia  Rest of Europe  M East  N America  NW Europe  S America

Source: Shell interpretation of ICE, Kpler, S&P Global Commodity Insights and Wood Mackenzie 2022 & 2023 data
DES: Delivered ex ship
Europe’s demand for LNG impacted other markets
Fuel switching in South Asia as LNG price went up

LNG imports 2022 (YoY)
MT

Monthly exchange rate indices
Exchange rate (per US Dollar), Jan 2016 = 100

Gas fired generation Bangladesh, India & Pakistan
TWh

Source: Shell interpretation of Power Grid Company of Bangladesh (PGCB), Pakistan National Electric Regulatory Authority (NEPRA), Thomson Reuters, S&P Global Commodity Insights and Wood Mackenzie 2022 data
New US liquefaction helped balance global LNG supply

Global liquefaction utilisation

YoY change in net LNG exports

Top exporting countries

Source: Shell interpretation of S&P Global Commodity Insights and Kpler 2022 data
Global trade flows reversed in 2022
With structural demand seen emerging in Europe

Y-o-Y change in global LNG imports in 2021 (MT)

Y-o-Y change in global LNG imports in 2022 (MT)

Top LNG importers in 2022 (MT)

Source: Shell interpretation of Kpler and Wood Mackenzie 2022 data
Market volatility triggers energy security interventions – with lasting economic and emissions impacts
Immediate policy actions in 2022 to manage energy security and high energy prices

UK
- £2,500 price cap for home energy.

Germany
- Simplified licensing for LNG terminals.

Poland
- Tariff protection & market suspension authorised.

France
- €45bn ‘energy shield’ to limit energy prices.

Italy
- Fast track permits for floating storage & regasification unit (FSRU).

European Union
- Market correction mechanism and joint purchasing introduced.
- 90% mandatory gas storage levels imposed.
- 20 BCM/year of new transmission in 2022 (projects of common interests).
- €10bn in diversified gas imports (LNG & pipeline).

China
- Prompt construction of LNG terminals.

South Africa
- New gas generation capacity prioritised to end load shedding.

USA
- Methane Pollution Fee, major project permits to be streamlined and modifications to encourage development.

Chile
- $3bn (1% GDP) committed to fuel stabilisation fund.

Japan
- 20-year pool for gas generators energy transition costs.
- Direct government purchases of energy allowed.
- Strategic gas reserve established.

South Korea
- Tariff relief for gas customers.

Singapore
- Strategic gas storage volume requirement.
- Direct government purchases (gas & LNG).

Australia
- Gas and electricity price caps introduced.

Source: Shell interpretation of various government announcements 2022.
The power of effective policy making
Two terminals set up in six months for importing LNG to replace Russian gas

LNG capacity utilisation in Europe
Terminal use

Source: Shell interpretation of Wood Mackenzie 2022 data
Picture courtesy EemEnergyTerminal

New European regasification capacity
MT

Source: Shell interpretation of Wood Mackenzie 2022 data
Picture courtesy EemEnergyTerminal
Germany fires up coal plants to reduce the energy gap
At a cost to near-term air quality and impact on CO₂ footprint

**Power generation Germany**

<table>
<thead>
<tr>
<th>Year</th>
<th>MWh/day</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>65000</td>
</tr>
<tr>
<td>2021</td>
<td>55000</td>
</tr>
<tr>
<td>2022</td>
<td>45000</td>
</tr>
</tbody>
</table>

**Air quality in Rhineland**

- Poor air quality days PM$_{2.5}$

**German electricity CO₂ emissions**

<table>
<thead>
<tr>
<th>Year</th>
<th>Average CO₂eq/KWh</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>380</td>
</tr>
<tr>
<td>2021</td>
<td>400</td>
</tr>
<tr>
<td>2022</td>
<td>420</td>
</tr>
</tbody>
</table>

Source: Shell interpretation of ENTSOE, AQICN, Centre for Research on Energy and Clean Air; Nowotricity 2022 & 2023 data

*Duisburg/Bruckhausen  RES: Renewables  Safe WHO PM$_{2.5} = 15$ μg/m$^3$
Coal use rebounds in major Asian economies
With lasting impacts on global emissions

Coal utilisation in India
Monthly coal fired generation load factor

China coal use
Annualised coal use (MT)

Change in GHG emissions 2022
Rest of the world excluding India and China

Gas demand destruction hits European industrial sector
Limited investment in diversifying energy supply over the years takes a toll

**European industrial gas demand**

<table>
<thead>
<tr>
<th>Month</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>Average (2013-19)</th>
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<td>Apr</td>
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<td>May</td>
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<tr>
<td>Dec</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**Decrease in company production**

<table>
<thead>
<tr>
<th>Industry</th>
<th>% change 3Q 22 3Q 21</th>
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</thead>
<tbody>
<tr>
<td>Fertiliser</td>
<td>-40%</td>
</tr>
<tr>
<td>Chemicals</td>
<td>-20%</td>
</tr>
<tr>
<td>Steel</td>
<td>0%</td>
</tr>
<tr>
<td>Cement</td>
<td></td>
</tr>
</tbody>
</table>

**“Factory gate” price index**

<table>
<thead>
<tr>
<th>Country</th>
<th>Jan-20</th>
<th>Jan-21</th>
<th>Jan-22</th>
</tr>
</thead>
<tbody>
<tr>
<td>Korea</td>
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<td>Japan</td>
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</tr>
<tr>
<td>China</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>United Kingdom</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>


*Quarterly production change taken from select large company reports [European producers]*
Continued uptake of gas in transport
With increasing clarity on zero-emission pathways for gas-based fuels

**LNG order book**
- **Operating LNG vessels**
  - 355
  - Increase: 41%
- **LNG vessels on order**
  - 521
  - Increase: 30%

**LNG demand in the marine sector**
- MTPA

**Europe heavy-duty road transport**
- **LNG fuelling stations**
  - 635
  - (some with bioLNG)
- **LNG & bioLNG fuelled vehicles**
  - 39,600

**BioLNG production capacity**
- TW/Year

**Graphs and diagrams**
- Conventional vessel
- DF LNG vessel
- Future vessel
- H2 PATHWAYS
  - Hydrogen, ammonia, methanol

Source:
- Shell interpretation of Clarkson WTR, McKinsey & Company and EBA Statistical Report 2022
- PCTC: Pure car & truck carriers
- RoRo: RollOn/rollOff
- DF: DualFueled
- HFO: Heavy fuel oil
- VLSFO: Very low sulphur fuel oil
- MGO: Marine gasoil
For future energy security, gas needs to be decarbonised
Not all energy demand can be electrified

Natural gas end use

Developing potential of decarbonised gas trade

Shell interpretation of IEA Announced Pledges Scenario data 2022
MENA - Middle East and North Africa
Land, feedstock and policy support for developing domestic renewables
Global gas and LNG markets expected to evolve as market dynamics point to a structural change
Europe and China to compete for limited LNG volumes
Continued volatility expected in the near term

Global LNG supply growth
MTPA

2023 LNG demand growth range
MTPA

LNG market swing factors

Supply reliability
Uncertain macroeconomic conditions and inflationary environment
LNG production performance remains uncertain across basins

Economic growth
Pace of China’s economic recovery from dropping its zero-COVID policy

Fuel substitutes
Material movements in price of fuel substitutes in either direction will impact gas and LNG demand, particularly in China

Weather events
Sustained above/below normal temperatures

<table>
<thead>
<tr>
<th>Year</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
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<tbody>
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<td>35.5</td>
<td>33.0</td>
<td>26.5</td>
<td>19.0</td>
<td>12.5</td>
<td>7.0</td>
<td>4.0</td>
<td>2.5</td>
</tr>
<tr>
<td>Economic</td>
<td>15.0</td>
<td>10.0</td>
<td>5.0</td>
<td>0.0</td>
<td>-5.0</td>
<td>-10.0</td>
<td>-15.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

LNG becomes a core energy supply source for Europe
Loss of Russian piped imports have structurally altered Europe’s gas market

Structural shift in Europe’s gas market

Security of supply driven
- Mandated storage targets
- New regasification terminals
- Price caps
- New price indices

Altered pipeline flows

US LNG as the marginal supplier

Europe gas balance
BCM

Source: Shell interpretation of Wood Mackenzie, S&P Global Commodity Insights 2022 & 2023 data
**China’s changing role in the global LNG market**

*From driver of growth to providing flexibility*

### Global LNG market structures

<table>
<thead>
<tr>
<th>Market</th>
<th>Old structure</th>
<th>New structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premium Market</td>
<td>N Asia</td>
<td>Europe &amp; N Asia</td>
</tr>
<tr>
<td>Residual Market</td>
<td>S Asia</td>
<td>S Asia</td>
</tr>
<tr>
<td>Balancing Market</td>
<td>Europe</td>
<td>China</td>
</tr>
</tbody>
</table>

### China gas market evolution

- **Characteristics of a global LNG “balancing market”**
  - **Domestic gas production**: 14%
  - **Regasification capacity**: 19%
  - **Pipeline gas imports**: 33%
  - **Gas storage**: 35%

### LNG imports

- **LNG’s balancing market**
- **LNG’s growth market**

<table>
<thead>
<tr>
<th>Year</th>
<th>Europe</th>
<th>China</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2017</td>
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<tr>
<td>2018</td>
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<td>2020</td>
<td></td>
<td></td>
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<tr>
<td>2021</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2022</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

About 80% of new LNG supply by 2030 from Qatar & US
Three independent commercial structures for LNG to co-exist

Long-term LNG SPA signings
MTPA

<table>
<thead>
<tr>
<th>Year</th>
<th>US SPAs</th>
<th>Qatar SPAs</th>
<th>Other SPAs</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>25</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>2021</td>
<td>50</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>2022</td>
<td>75</td>
<td>30</td>
<td>20</td>
</tr>
</tbody>
</table>

LNG supply growth 2025 - 2030

- US
- Canada
- Mexico
- Qatar
- Mozambique
- Other

Emerging commercial structure

Source: Shell interpretation of Wood Mackenzie and S&P Global Commodity Insights 2022 data
SPA: Sales and Purchase Agreement, does not include Heads of Agreement or Memoranda of Understanding
Growing role of US supply in global LNG market increases exposure to US gas market risks

**US LNG exports**

MTPA | Share of US gas production
--- | ---
200 | 25%
150 | 20%
100 | 15%
50 | 10%
0 | 5%

**US gas pipelines**

>95% of 2030 US LNG capacity concentrated in two states

**US gas demand**

BCF/d

- Industrial
- Power
- Res/Com
- LNG exports


*This is a representation of the US interstate pipeline network – actual may vary
Term LNG contracts reduce exposure to price volatility
Portfolio players stepping up to secure future supply

Global LNG prices
$/MMBtu

LNG term contract coverage
% of forecast LNG demand under term contract

Long-term LNG SPA signings
MTPA

Source: Shell interpretation of ICE, Wood Mackenzie, China and Japan Customs and S&P Global Commodity Insights 2023 data
LIC = Japan Landed Cost (weighted average cost of LNG imports) CLC = China Landed Cost (weighted average cost of LNG imports)
Investment needed to meet forecast LNG demand
Conflicting energy transition scenarios can deter investors & policy makers

Global LNG supply vs demand forecast range
MTPA

AETI.5 = Accelerated Energy Transition-1.5degree; APS = Announced Pledges Scenario; NZE: Net Zero Emissions by 2050 Scenario - Note: depiction of IEA scenarios has been adjusted for format
Progress on developing lower emission LNG technologies
While adopting more transparency & accuracy in emissions reporting

Progress on quantifying & compensating emissions

Progress on certified natural gas
17% of US natural gas supply in 2022, equivalent to around 1,000 US LNG cargoes certified using the MIQ methane emissions certification standard.
Chevron and Project Canary announced a pilot project to certify well-to-well gas production at five US sites using the TrustWell™ Certification programme.
Equitable Origin independently certified around 12% of North American gas production.

Using Artificial Intelligence to reduce emissions
Shell used AI to modify operations at an existing LNG plant to reduce annual emissions by ~ 130,000 tonnes for a single train of process units, when operating at full capacity.

First GIIGNL-aligned GHG-neutral LNG cargo
First delivery of a GHG-neutral LNG cargo aligned to GIIGNL’s Monitoring, Reporting and Verification (MRV) and GHG Neutral Framework.

Technologies developments in 2022

CCUS with LNG plants up by 28%
Carbon capture utilisation & storage (CCUS) projects adoption continued in 2022 with six LNG projects with a total LNG capacity for of 67.5 MTPA announcing plans.

Hydrogen-powered gas turbines
GE Gas Power and Shell Global Solutions are collaborating to develop 100% hydrogen powered gas turbine technology for LNG production, without the use of diluent.

LNG/hydrogen hybrid engine
Hyundai Heavy Industries Group has successfully tested South Korea’s first combined LNG/hydrogen-powered engine.

Harnessing cold energy
JGC Japan Corporation has begun technical development on capturing carbon through applying unused cold energy captured at an LNG liquefaction plant.

Recovering boil-off gas
Samsung Heavy Industries successfully tested a new system which enables LNG-powered ships to reliquify and collect boil-off gas.

Source: Shell interpretation of various news announcements.
Europe benefits from LNG industry flexibility in 2022

- European LNG imports up by 60% to replace Russian gas
- Global gas and LNG prices remain volatile, hitting record levels in 2022
- Drop in Russian gas supply was offset by LNG imports and demand destruction in Europe
- Continued lockdowns and lower economic growth led to a contraction in Chinese gas demand
- Europe’s appetite for LNG impacted other markets
- New US liquefaction helped balance global LNG supply
- Global trade flows reversed in 2022

Market volatility triggers energy security interventions – with lasting economic and emissions impacts

- Immediate policy actions in 2022 to manage energy security and high energy prices
- The power of effective policy making—two terminals set up in six months for importing LNG to replace Russian gas
- Germany fires up coal plants to meet the energy gap
- Coal use rebounds in major Asian economies
- Gas demand destruction hits European industrial sector
- Not all energy demand can be electrified—For future energy security, gas needs to be decarbonised
- Continued uptake of gas in transport

Global gas and LNG markets expected to evolve as market dynamics point to a structural change

- Continued volatility expected in the near term
- Loss of Russian piped imports have structurally altered Europe’s gas market
- Changing role of China—from an LNG growth market to flexible market
- Three independent commercial structures for LNG to co-exist
- Increasing role of US supply in global LNG market increases exposure to US gas market risks
- Term contracts reduce exposure to price volatility
- Portfolio players stepping up to secure future supply
- Investment needed to meet forecasted LNG demand
- Progress on developing lower emission LNG technologies