

# 2022 Gas Market Outlook

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**The Institute of Energy Economics, Japan**

Hiroshi Hashimoto, Head of Gas Group  
Fossil Energies and International Cooperation Unit

# Executive Summary

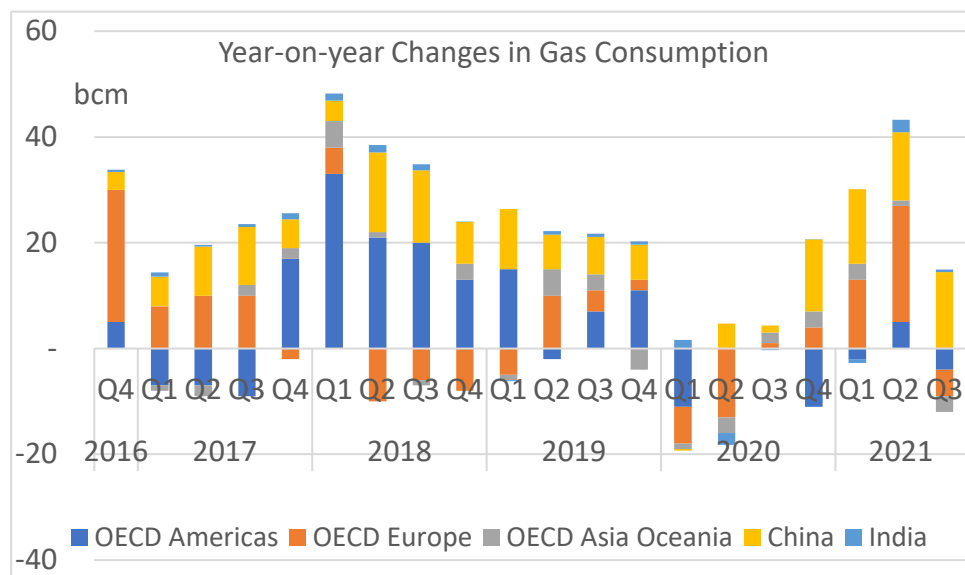
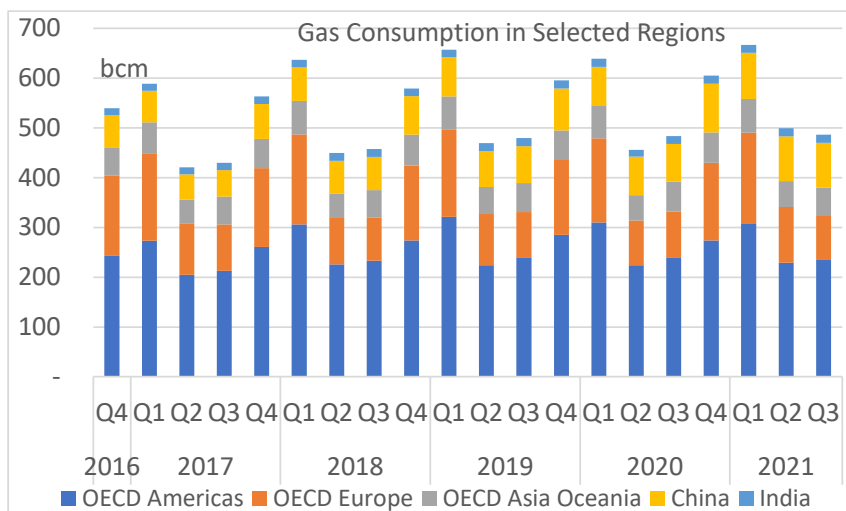
- ✓ Japan's average LNG import price is forecast to go up to USD 11.5 – 12.5 per million Btu in 2022 from estimated USD 9.98 in 2021.
- ✓ The global LNG trades are forecast to expand by 6% - 7% to 400 million tonnes in 2022 from estimated 375 million tonnes in 2021, with supply capacity forecast to be larger than demand at 413 million tonnes, assuming trouble-free operations of LNG production facilities.
- ✓ The global natural gas demand, recovering from a 2% decline in 2020 to an estimated 3.5% increase in 2021, is expected to grow by 1.5% in 2022. The pace and size of growth are still subject to uncertainty caused by the pandemic.
- ✓ The LNG industry has difficult challenges to cope with surges and volatility of prices caused by seasonal demand fluctuations and troubles at LNG production facilities.
- ✓ Enhancement of LNG market liquidity and improvement of terms and conditions, including better pricing indexes, as well as better management of price fluctuations will be more important for Japan's stable LNG procurement and development of emerging LNG markets in Asia.
- ✓ Regional and international cooperation in CO<sub>2</sub> and methane emission management as international initiatives have advanced.

# Natural Gas Demand Recovers from Sluggish 2020 in Major Regions

- The global gas demand recovered from a 2% decline in 2020 to an estimated 3.5% increase in 2021
- Demand recovery was amplified in the first three quarters of 2021 rebounding from the sluggish performance in 2020
- Simultaneous demand peaks of different regions in the Northern Hemisphere also contribute to demand / supply imbalances and volatility in spot prices

## Differences of demand in three quarters

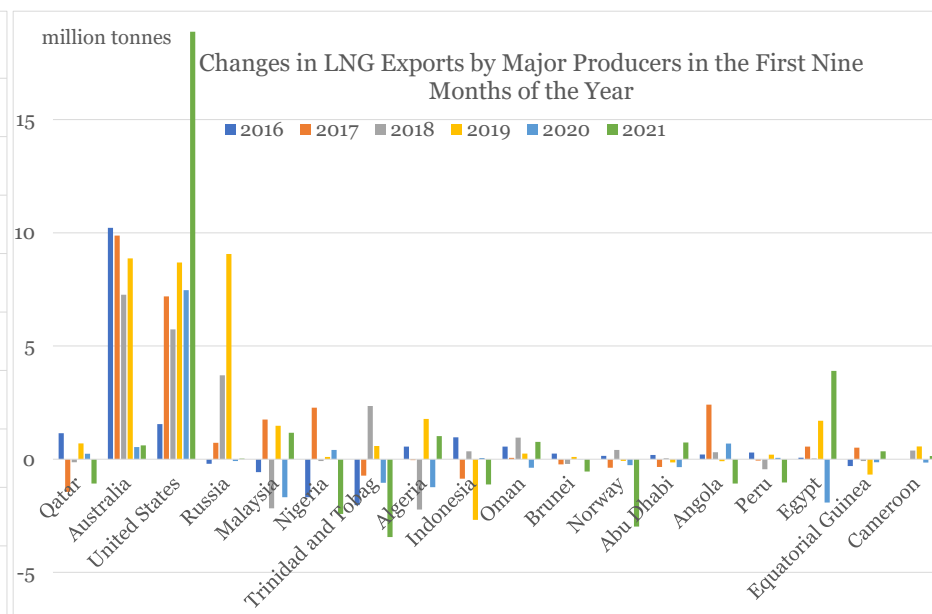
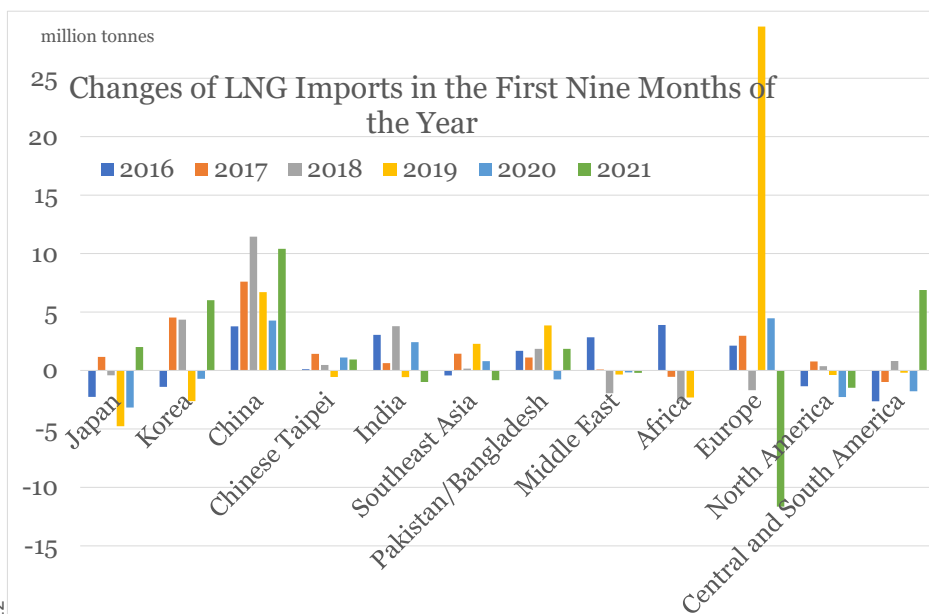
	2021/2020	2021/2019	2020/2019
	1Q-3Q	1Q-3Q	1Q-3Q
OECD Americas	-0.1%	-1.5%	-1.4%
OECD Europe	8.5%	3.0%	-5.1%
OECD Asia / Oceania	0.6%	-0.6%	-1.1%
China	18.0%	21.0%	2.5%
India	4.4%	2.3%	-2.0%



(Source) Based on data of IEA "Monthly Gas Statistics", China's NDRC, India's PPAC

# Global LNG Trades are Estimated to Have Grown by 5% in 2021

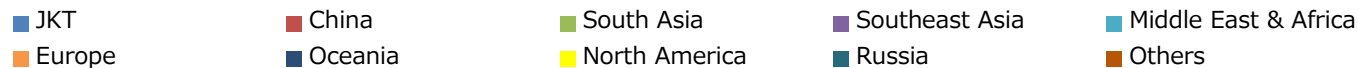
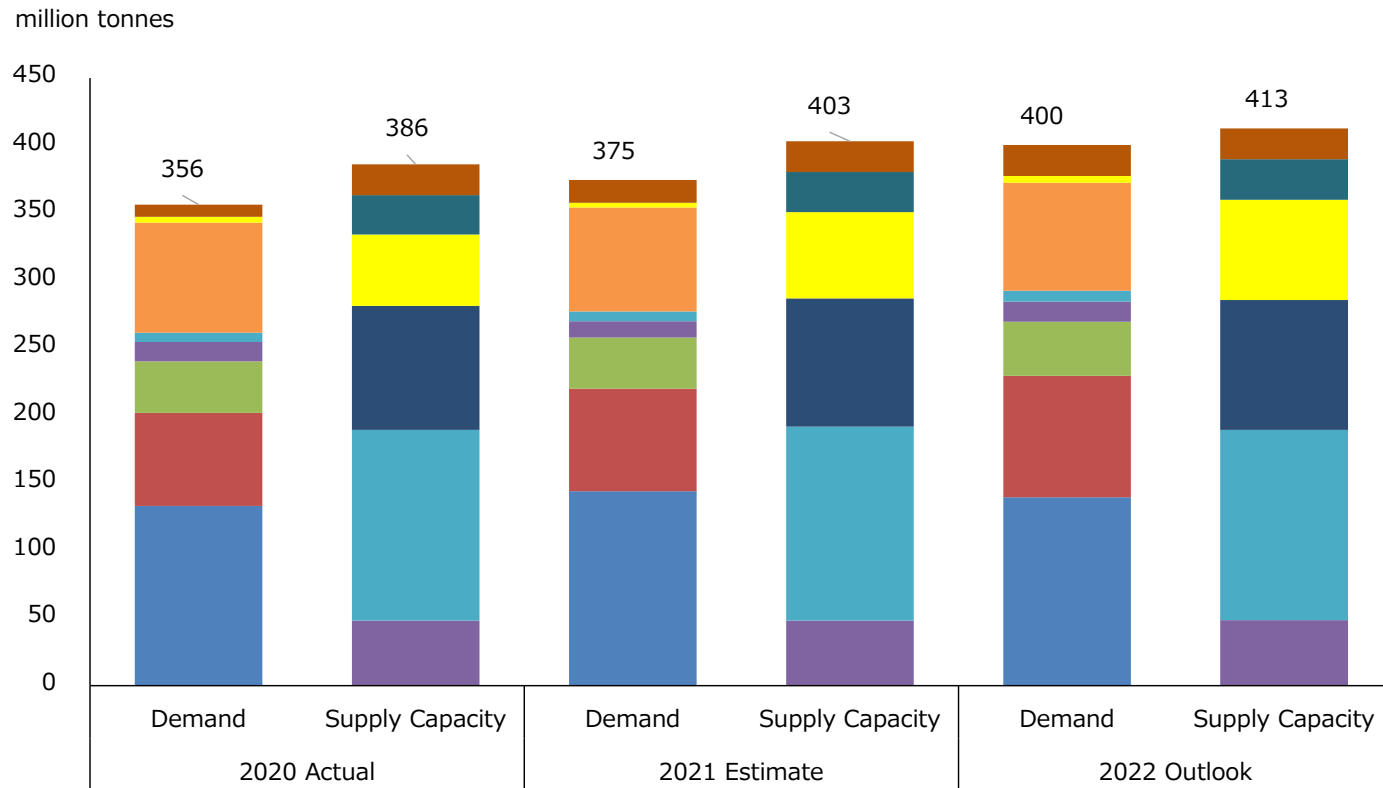
- LNG trades grew steadily in 2021, rebounding from the slowed growth in 2020
  - LNG import growth was driven by China, followed by Korea, Japan and South America, while Europe decreased LNG import
  - LNG export growth was dominated by the United States, followed by Egypt
  - Top exporters Australia and Qatar maintained their volumes
  - Some LNG exporters decreased volumes with production outages
  - Robust gas demand, production outages, and little growth of pipeline gas supply resulted in surges of spot LNG prices



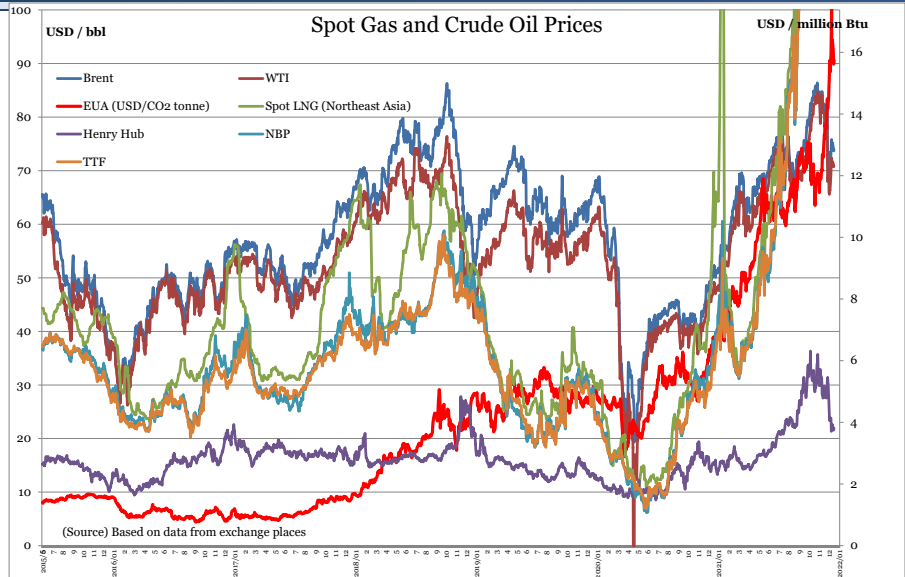
(Source) Based on customs statistics and Cedigaz LNG Services data

# LNG Demand and Supply Outlook

- The global LNG trades are forecast to expand by 6% - 7% in 2022 backed by increasing production and steady demand to 400 million tonnes driven by increasing production in the United States
- Supply capacity is forecast to be 413 million tonnes, assuming trouble-free operations of LNG production facilities.
- Poor operational performances coincident with seasonal demand fluctuation could amplify imbalances of demand and supply



# LNG/Gas Prices Incorporate Extreme Volatility

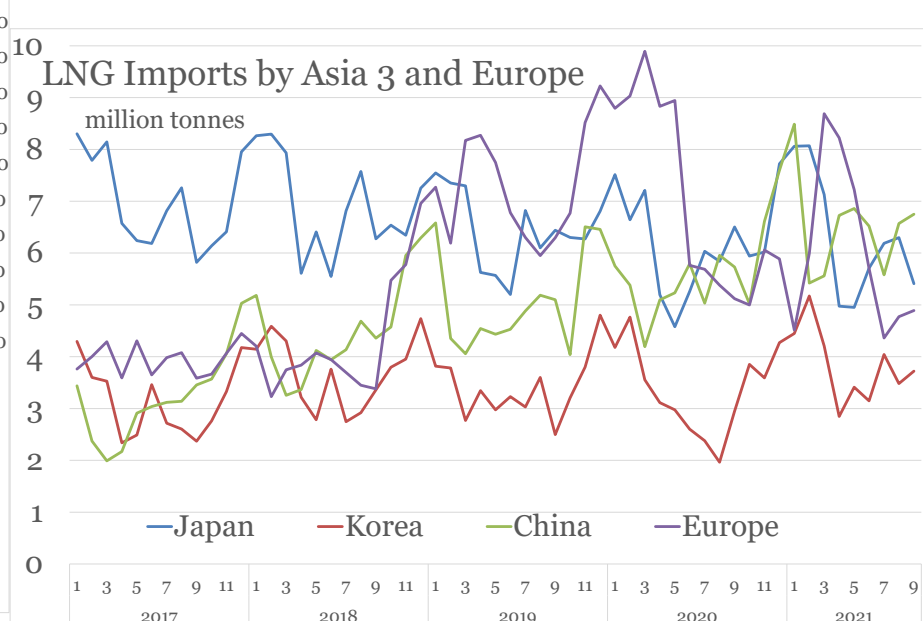
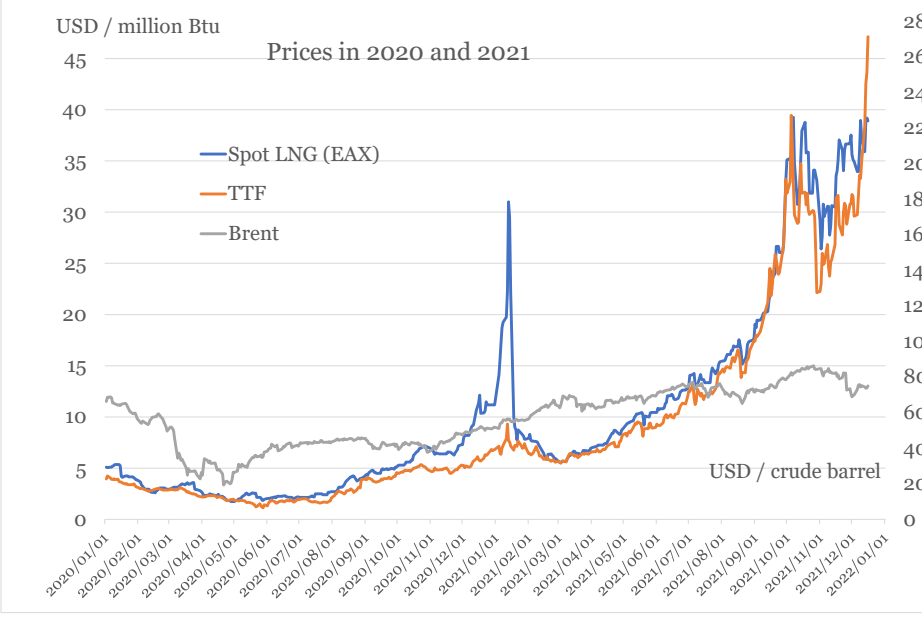


- Prices rose from extreme low in 2020 to at least two extreme highs in 2021
- Spot gas prices were consistently higher than crude oil prices in and after July 2021
- Simultaneous Northern Hemisphere winter demand peaks contributed to demand and supply imbalances and extreme prices

**Spot gas prices (assessment in Asia) and crude oil prices**

	Northeast Asia	Europe	USA	Brent
September 2021	33.10	33.18	5.87	13.64
August 2021	17.55	17.46	4.38	12.44
September 2020	5.10	4.56	2.53	7.35

(Unit) USD / million Btu (Source) Data based on ICIS, ICE, CME

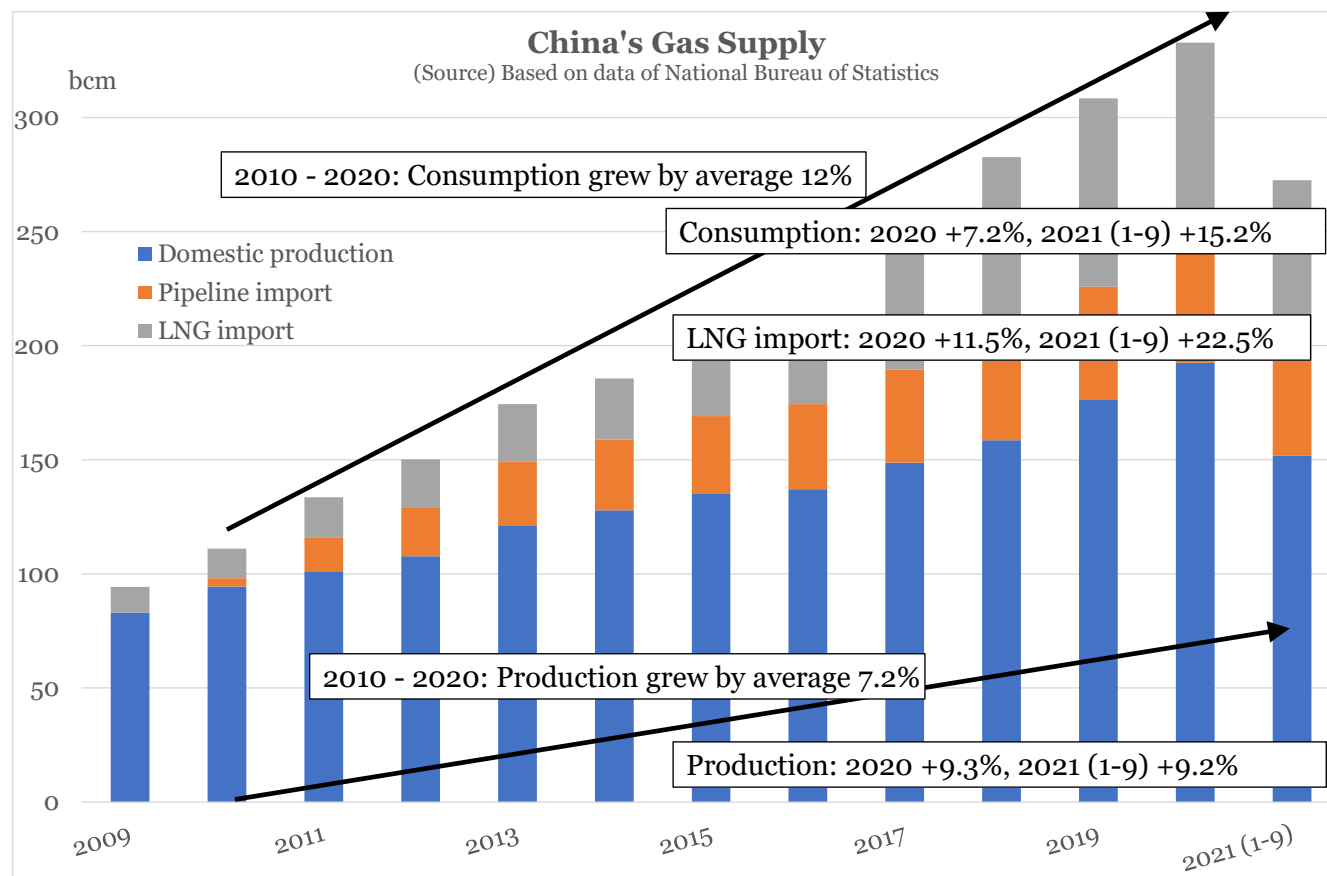


(Source) Based on data from exchange places, IMF exchange rates, and ICIS

(Source) Based on trade statistics and Cedigaz LNG Services

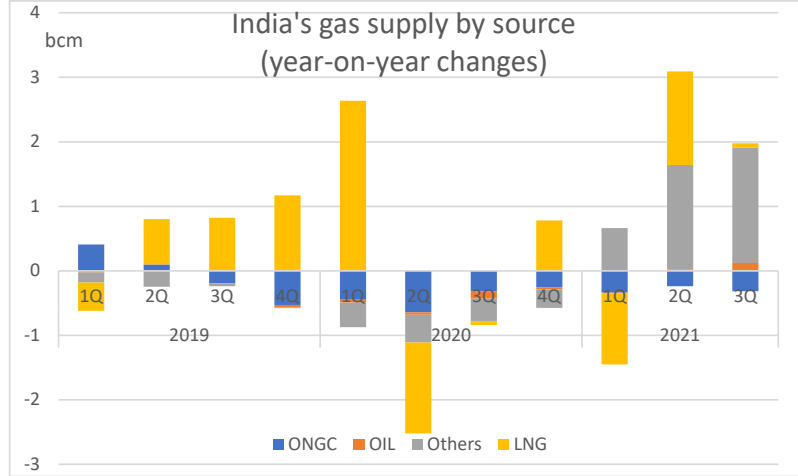
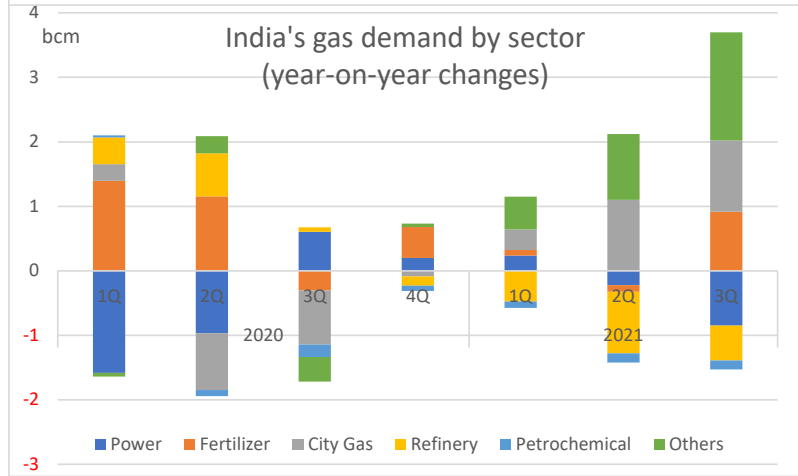
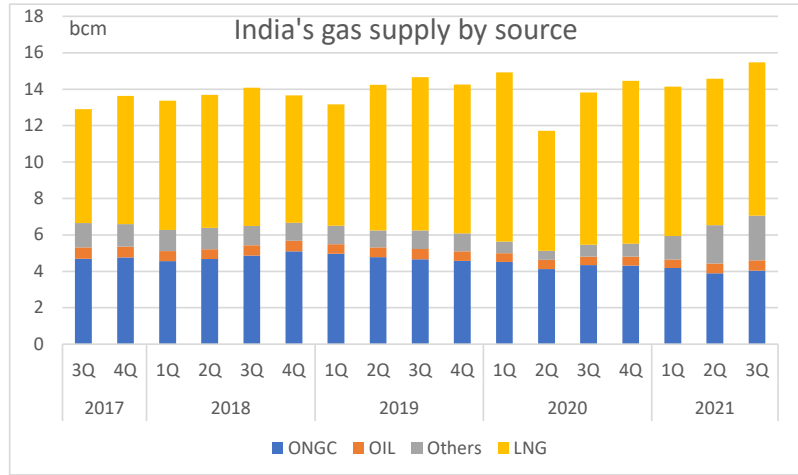
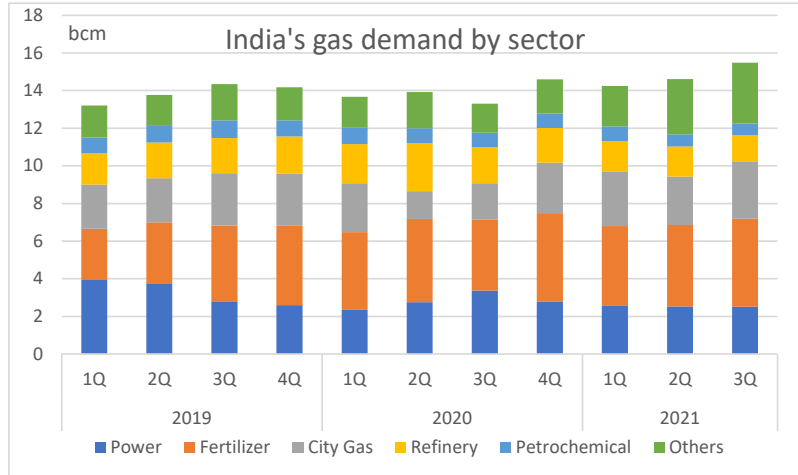
# China Has Steady Growth of Gas Market, Becoming Top LNG Importer

- Robust demand growth led to increases of domestic gas outputs and LNG import in 2021
- Natural gas is expected to contribute to cleaner air and GHG management
- Activities have been accelerated to procure LNG under long-term contracts, by not only the big three national companies but also emerging players
- The self-sufficiency ratio of natural gas has been below 60% since 2018



# India Sees Moderate Gas Market Growth

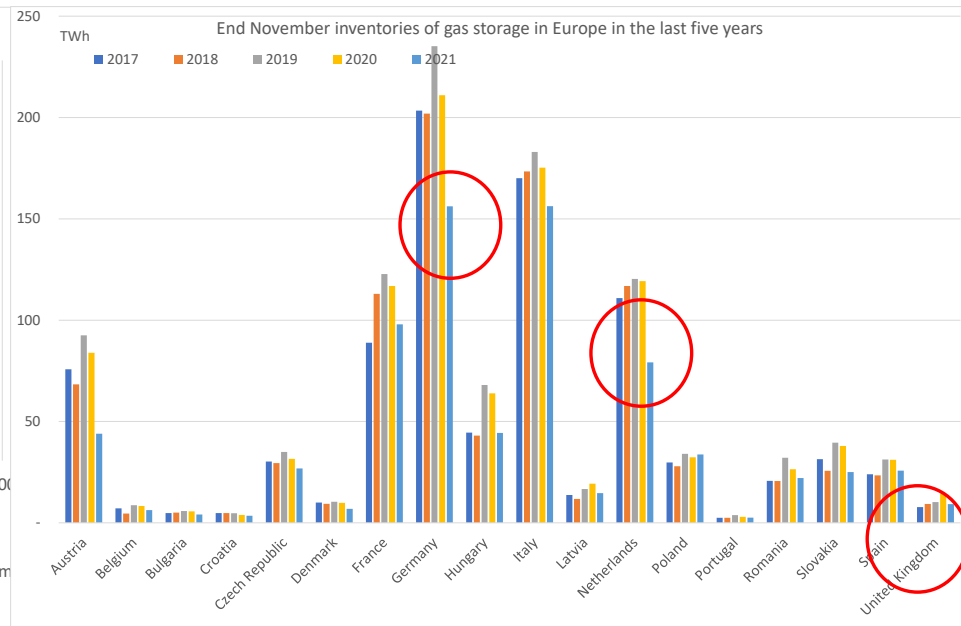
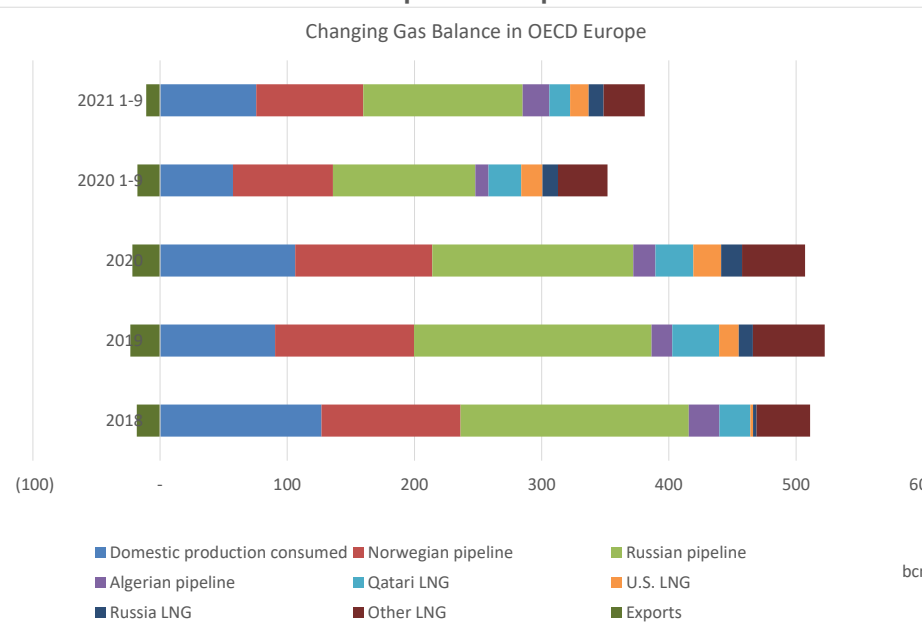
- India met its steady increase in gas consumption in 2021 with incremental production with LNG import staying at the same level
- Incremental gas production came mainly from private-sector companies
- Consumption was driven by the fertiliser sector, while growth was led by the city gas distribution and transport sectors





# Europe Fails to Procure Sufficient LNG to Meet Increasing Gas Demand

- LNG imports failed to fill the gap caused by steady increases in gas consumption and declining gas production in the region in 2021
- Gas demand increased with economic recovery and long-term decline of coal-fired power generation, as well as lower performances of renewables
- Although dependence on LNG has become heavier in recent years with composition of gas supply shifting significantly, LNG import declined in 2021
- Sizes and roles of gas storage vary between countries in the region, even though the low level of inventories has been often cited as one of the main causes of the price spikes

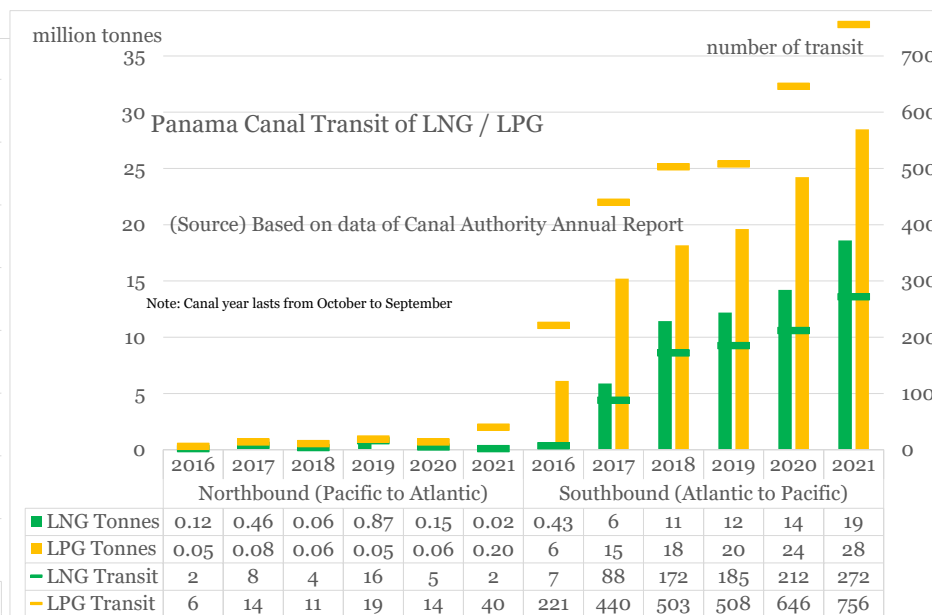
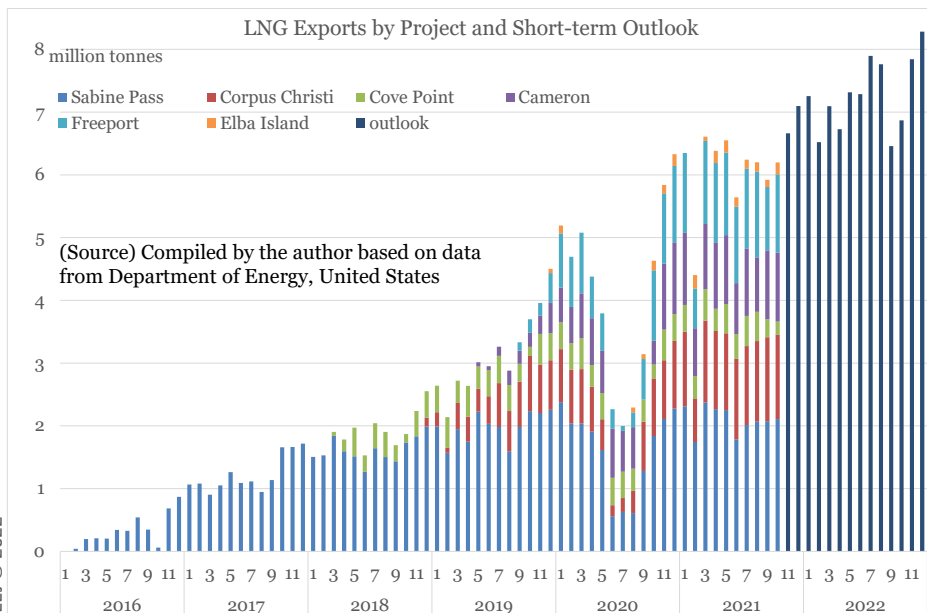


Gas supply sources to Europe  
(Source) Based on data of IEA

European underground gas inventories  
(Source) Based on data of GIE

# United States Continues Dominating Incremental LNG Outputs

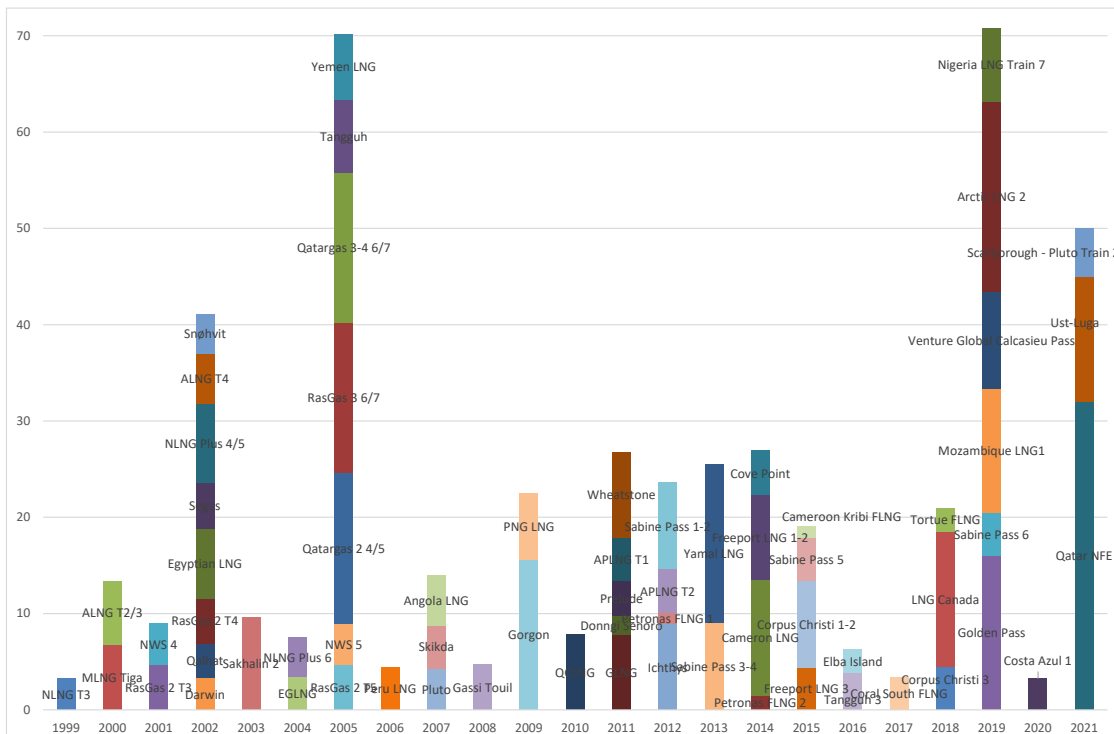
- The United States dominated growth of LNG exports in 2021
- The Energy Information Administration (EIA) revised the country's short-term LNG export outlook upward in October and November 2021 to 74 million tonnes in 2021 and 87 million tonnes in 2022
- LNG export outlets have diversified in Asia, Europe, and others to enhance connections and interactions between different regional markets
- The United States exported more than 6 million tonnes of LNG per month stably except for maintenance periods in 2021, in sharp contrast with very low operational rates in summer 2020 when cargoes were canceled because of low international prices
- The LNG industry did not agree with arguments to restrain LNG exports
- Both new and existing LNG projects pursue CCS and better management of GHG emissions



# Close Eyes on LNG Production Investment and Construction Progress

- Two major FIDs in 2021 to expand LNG production
  - The largest FID in the history in Qatar
  - An FID to develop a new gas field (Scarborough) and expand liquefaction (Pluto Train 2) in Australia

FIDs in LNG Production (By FID Year)



(Source) Based on Company Announcements

Projects	Project promoters	Capacity	Production	FID
<b>United States</b>				
Golden Pass	QatarEnergy, ExxonMobil	15.6	2024 ---> 2025	2019
Corpus Christi Stage 3	Cheniere Energy	10	2024	2020 ---> 2021
Plaquemines	Venture Global LNG	20	2023 ---> 2024	2020 ---> 2021
Freeport (T4)	Freeport LNG	5	2022 ---> 2024	2020 --->
Lake Charles	Energy Transfer	16.45	2025 --->	2020 --->
Port Arthur (T1-2)	Sempre Energy	13.5	2024 ---> 2025	2020 ---> 2021
Rio Grande	NextDecade	27	2023 ---> 2024	2020 ---> 2021
Magnolia LNG	LNG Limited	8	2022 --->	2020 --->
Driftwood LNG	Tellurian	27.6	2023 --->	2020 --->
Texas LNG Brownsville	Texas Brownsville LNG	2	2023 ---> 2025	2020 ---> 2021
Jordan Cove	Pembina Pipeline	7.8	2024 --->	2020 --->
Gulf LNG Pascagoula	Kinder Morgan	11.5	2024 --->	2020 --->
Port Arthur (T3-4)	Sempre Energy	13.5	-	2021 --->
<b>Mexico</b>				
Energía Costa Azul Phase 1	Sempre Energy	3.25	2024 ---> 2024	2020 1Q ---> 4Q
<b>Canada</b>				
LNG Canada	Shell, Mitsubishi, Petronas, etc.	14	Mid 2020s	2018
Kitimat	Chevron, Woodside	18		2022 ---> X
Woodfibre LNG	Woodfibre Natural Gas	2.1	---> 2025	2020 ---> 2021
Goldboro	Pieridae Energy Canada	10	2025 ---> 2026	2020 ---> 2021
<b>Qatar</b>				
North Field East	QatarEnergy	32	2024 ---> 2025	2020 ---> 2021
<b>Australia</b>				
Pluto Train 2	Woodside	5	2025 ---> 2026	2020 ---> 2021
<b>Mozambique</b>				
Mozambique LNG 1	TotalEnergies, Mitsui, PTT, ONGC, etc.	32	2024 ---> 2026	2019
Rovuma LNG	ExxonMobil	15	2024 --->	2020 --->
<b>Mauritania / Senegal</b>				
Tortue FLNG	bp	2.5	2022 ---> 2023	2018
<b>Indonesia</b>				
Tangguh Train 3	bp, etc.	3.8	2021 ---> 2022	2016

## ● Global Methane Pledge

- The United States, the European Union, along with more than 100 nations launched the Global Methane Pledge on 2 November 2021
- A collective goal to reduce global methane emissions by 30% by 2030 from 2020
- The European Bank for Reconstruction and Development (EBRD), the European Investment Bank (EIB), and the Green Climate Fund have committed to support the Pledge through both technical assistance and project finance. The International Energy Agency (IEA) will also serve as an implementation partner

## ● International Methane Emissions Observatory (IMEO)

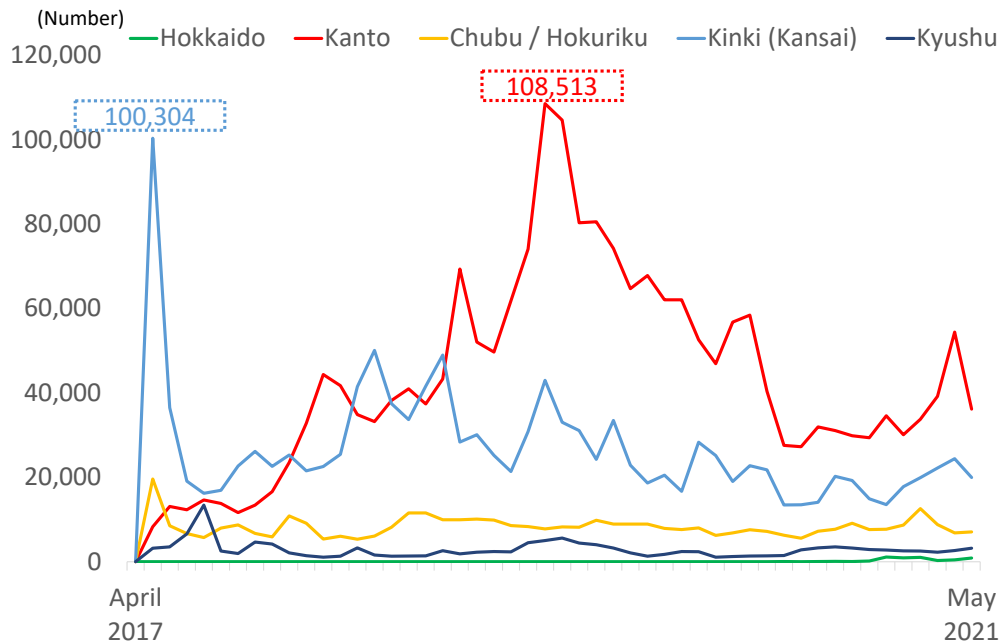
- The United Nations Environment Programme (UNEP) with support from the European Union launched IMEO on 31 October at G20 Summit
- IMEO will initially focus on methane emissions from the fossil fuel sector, and then expand to agriculture and waste sectors

## ● The European Commission's (EC) proposal to reduce methane emissions

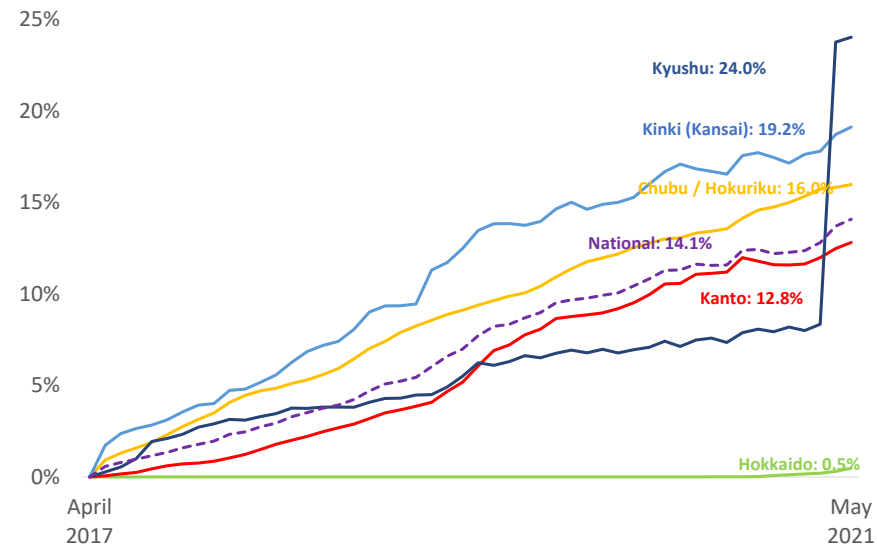
# Retail Gas Liberalisation in Japan Focuses on Metropolitan Areas

- There were 4.02 million customer switchings between April 2017 and May 2021
- There has been fierce competition to acquire retail customers in Kanto and Kinki
- Kanto had a record 108 thousand switching in a single month of April 2019
- Increasing switching-backs to the former incumbents have been observed
- Kinki has the largest share of non-incumbents in the residential gas sales

Monthly number of customer switchings



Share of new entrants in the residential gas sales



(Source) Based on data of METI

# Concluding Remarks

- LNG trades are forecast to continue expanding in 2022
- While the balances of LNG and gas markets during the ongoing Northern Hemisphere winter are susceptible to weather conditions and performances of LNG production facilities, prices are expected to stay high
- As low levels of underground gas inventories are expected in Europe, prices in different regions are also expected to maintain bullish trends and have potential volatility
- The importance of procurement of LNG under long-term contracts, as well as investment in LNG production, has been reaffirmed
- Progresses of already sanctioned projects are also in focus
- Ways to determine assessed spot LNG prices should be also examined
- Discussions are expected to heat up on energy transitions and roles of natural gas and LNG in the pathway
- Ordinary citizens are expected to recognise issues related to natural gas prices and supply and demand further and better