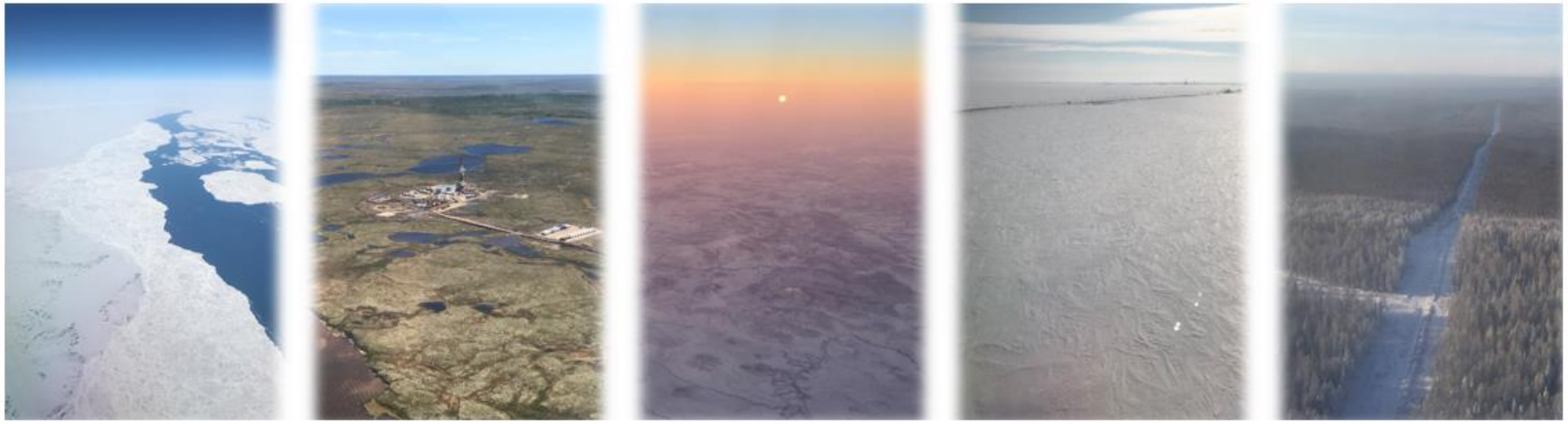
Global Gas Market

Challenges and Opportunities After the Russian Ukraine War



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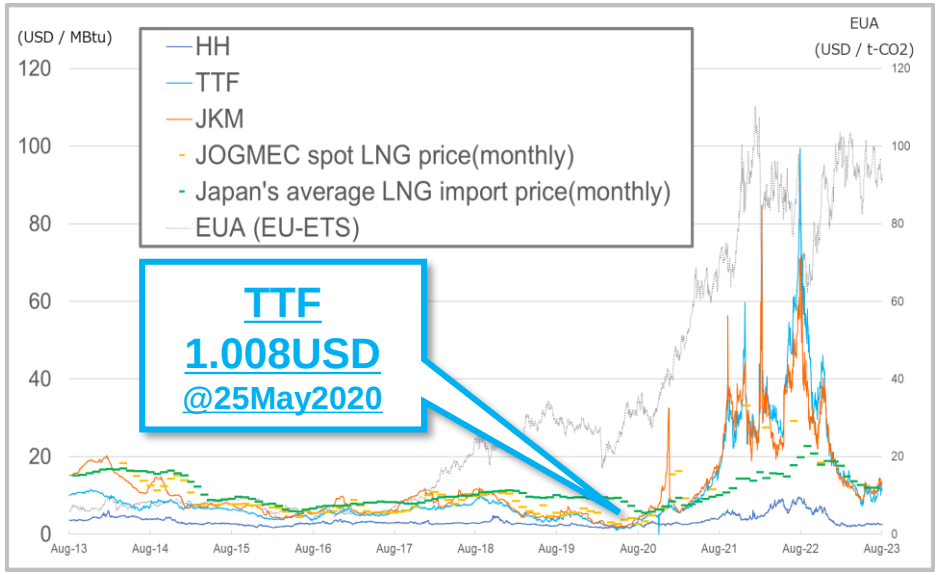
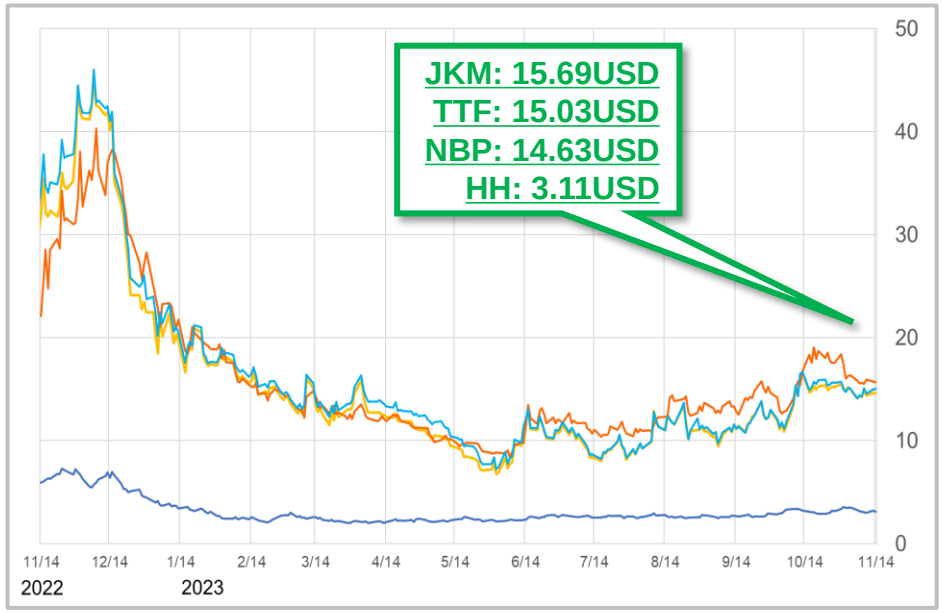
独立行政法人　エネルギー・金属鉱物資源機構

What is happening in global gas price?

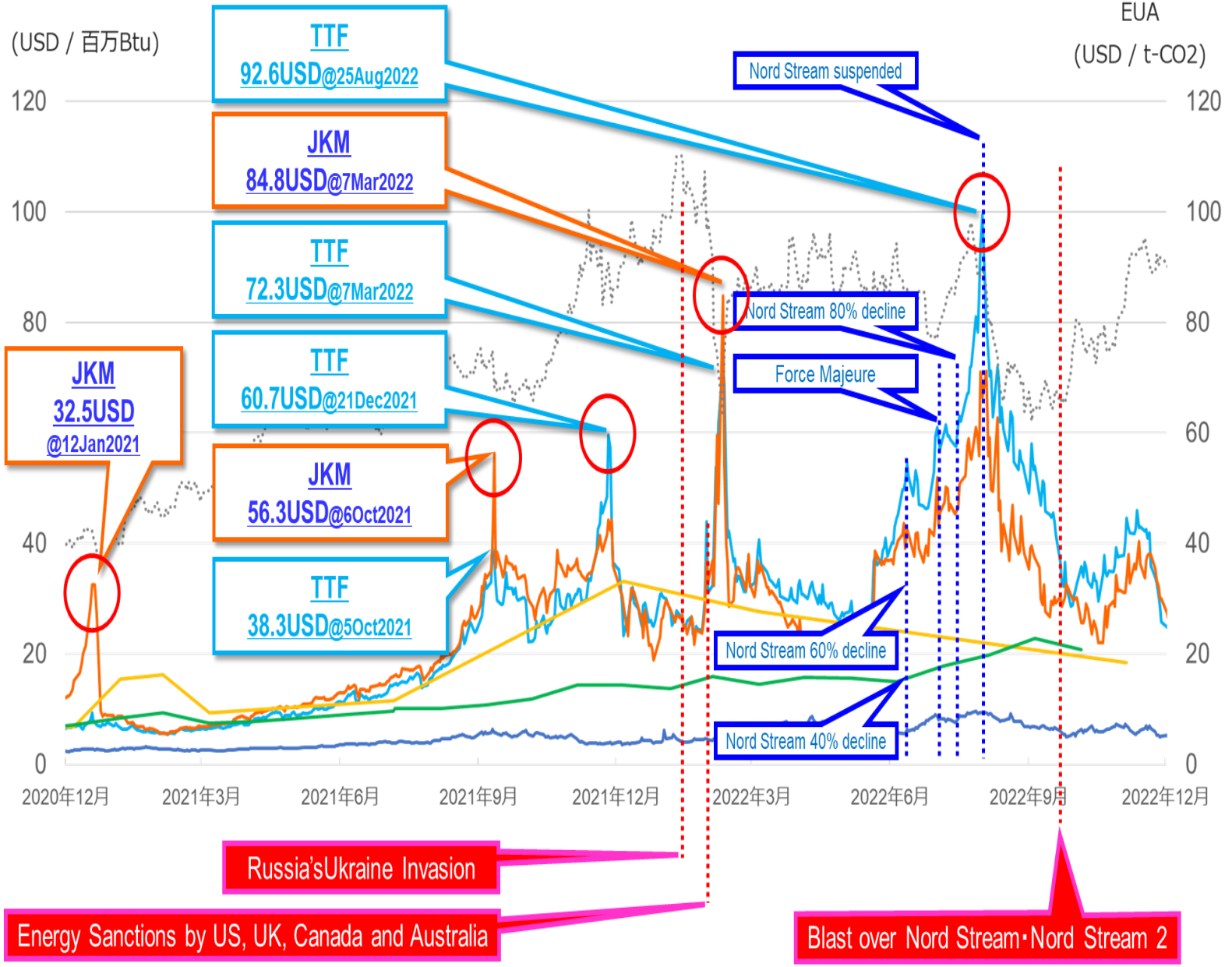
★Gas Price History in 10 years



★Gas Price History at present

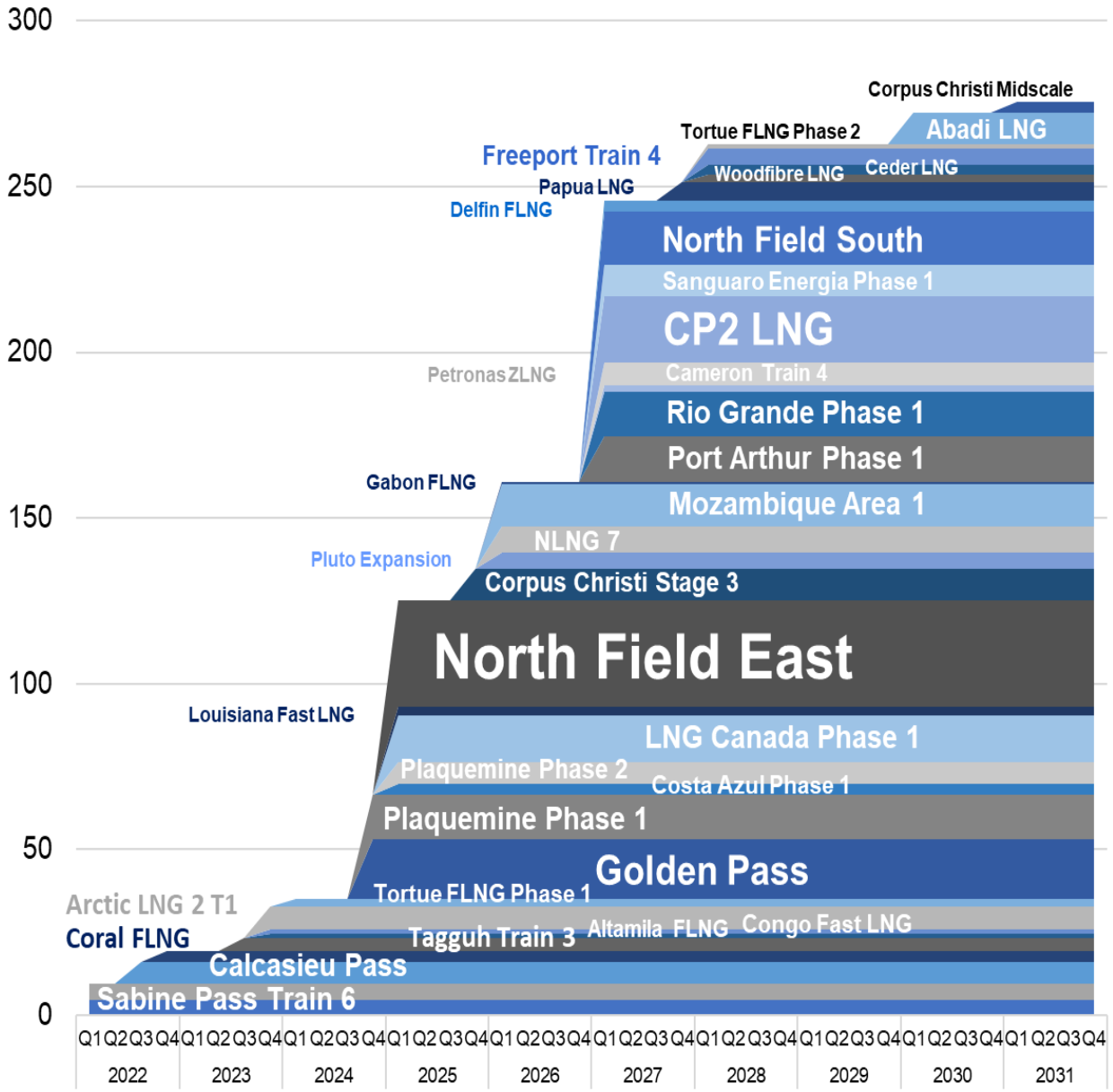


★Price Turbulence in Jan 2021, Sept 2021 and Ukraine Crisis

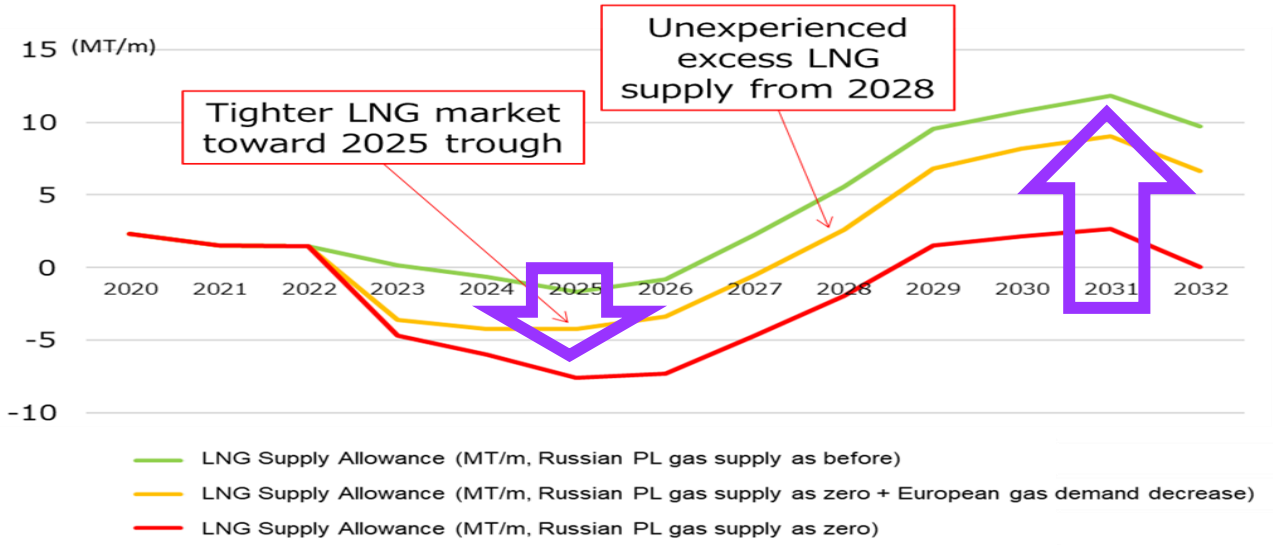


Mid and Long Term Outlook: Upcoming Ups and Downs

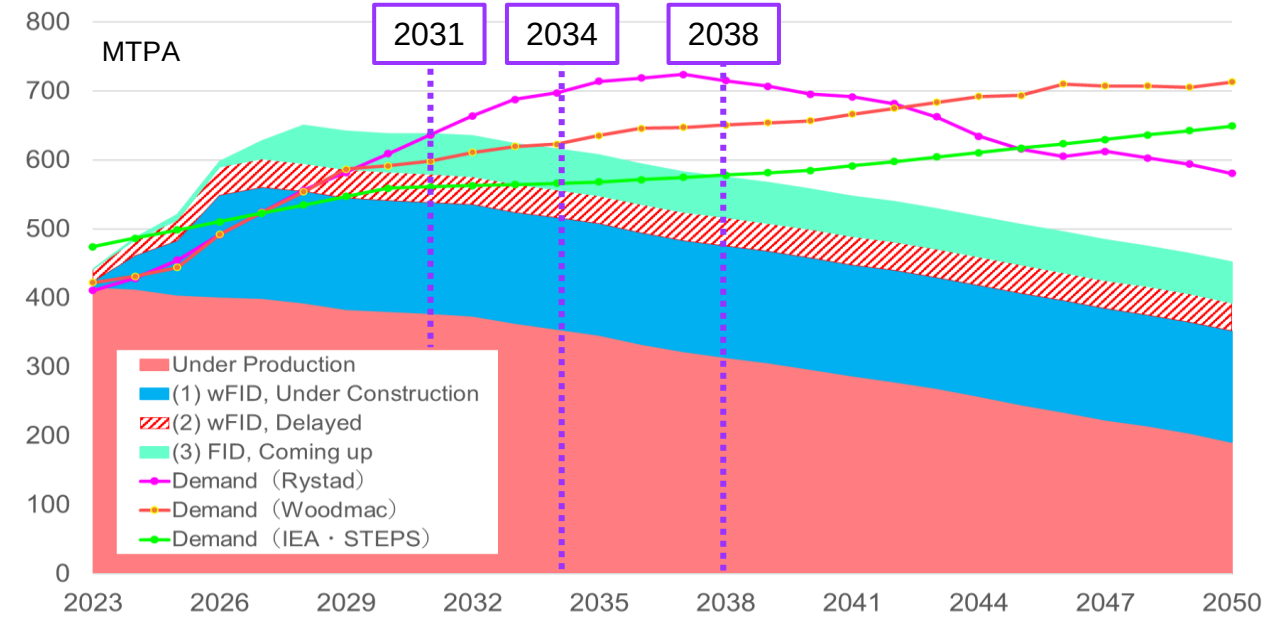
★Mid Term Supply Additions by FID Base



★Mid Term: upcoming valley and mountain



★Long Term: Demand & Supply gap starts from 2030s



'Great Game' in 21st Century: Both Producers & Markets try to diversify Routes & Sources

PL(Druzhba etc): 3.3MMBD

PL:201BCM/y

*Via Ukraine:142BCM/y

Yamal LNG: 16.5MMt/y(22BCM/y)

Arctic LNG-2: 19.8MMt/y(27BCM/y)

ESPO-PL: 1.0MMBD

Sakhalin-2LNG: 10.8MMt/y (15BCM/y)

715 BCM: Production

+138BCM@2040

Export Capacity: 339BCM

Nord Stream 55BCM/y

Nord Stream 2 55BCM/y

Turk Stream 31.5BCM/y

Blue Stream 16BCM/y

Power of Siberia 38BCM/y

Power of Siberia-2 30BCM/y

SKV+Far East New PL 30BCM/y

CAC 45BCM/y

120 BCM

▲14BCM@2030

607 BCM: Consumption +α

▲50BCM @2040

+251BCM@2030

282 BCM: Consumption

+373BCM @2040

Kazakhstan-China PL 0.4MMBD

Turkmenistan-China PL 30BCM/y→45BCM/y

81 BCM: Production

Shale LNG Sales Promotion

TANAP 16BCM/y

TAP 10BCM/y

BTC 1.0MMBD

SCP25BCM/y

20BCM/y

TAPI 30BCM/y

862 BCM: Production

+252BCM@2040

Export Capacity: 157BCM

19 BCM: Production

231 BCM

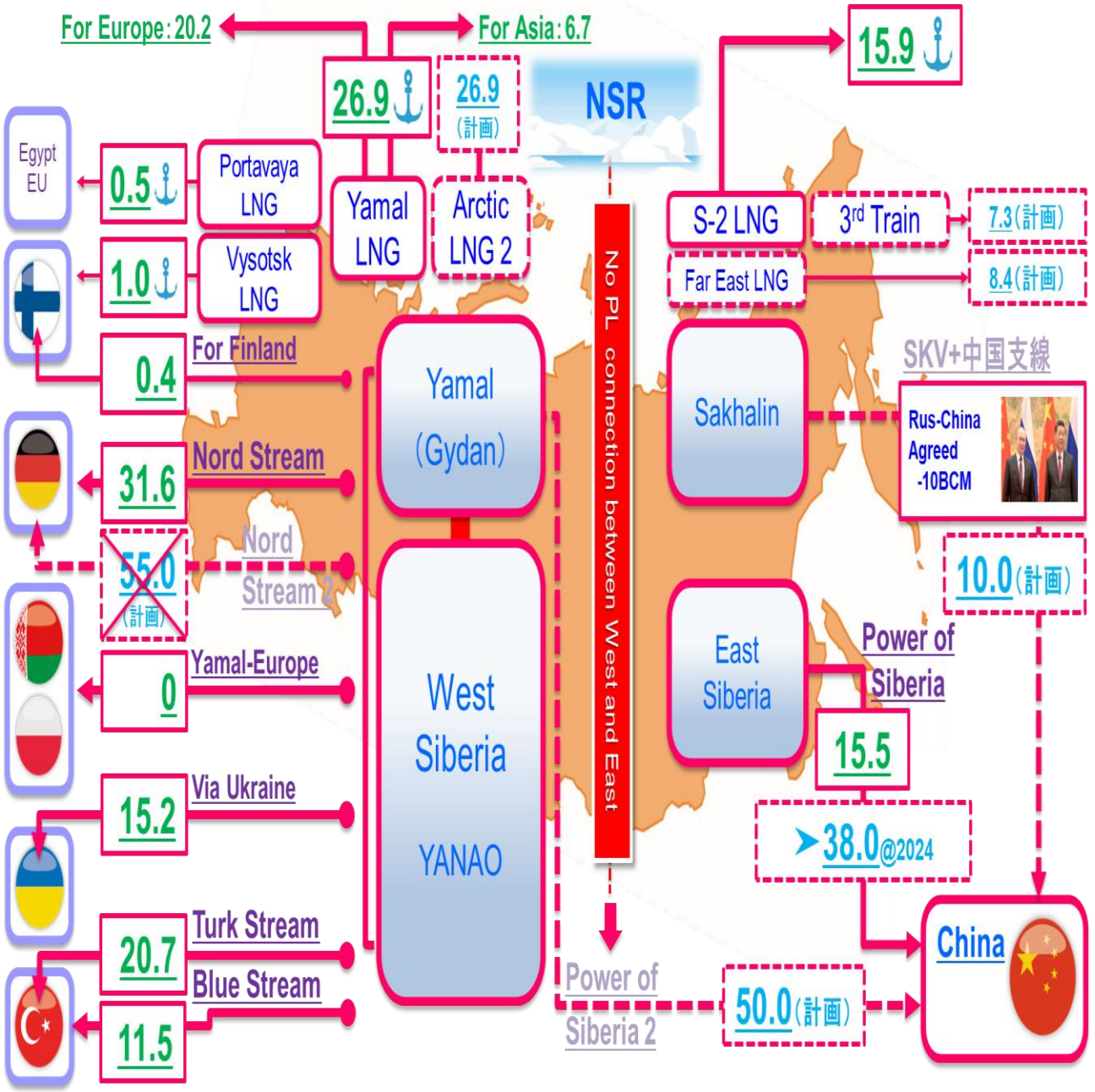
+69BCM@2030

62 BCM: Consumption

+134BCM@2040

Source: JOGMEC-Research

Changes of Natural Gas Flow from Russia

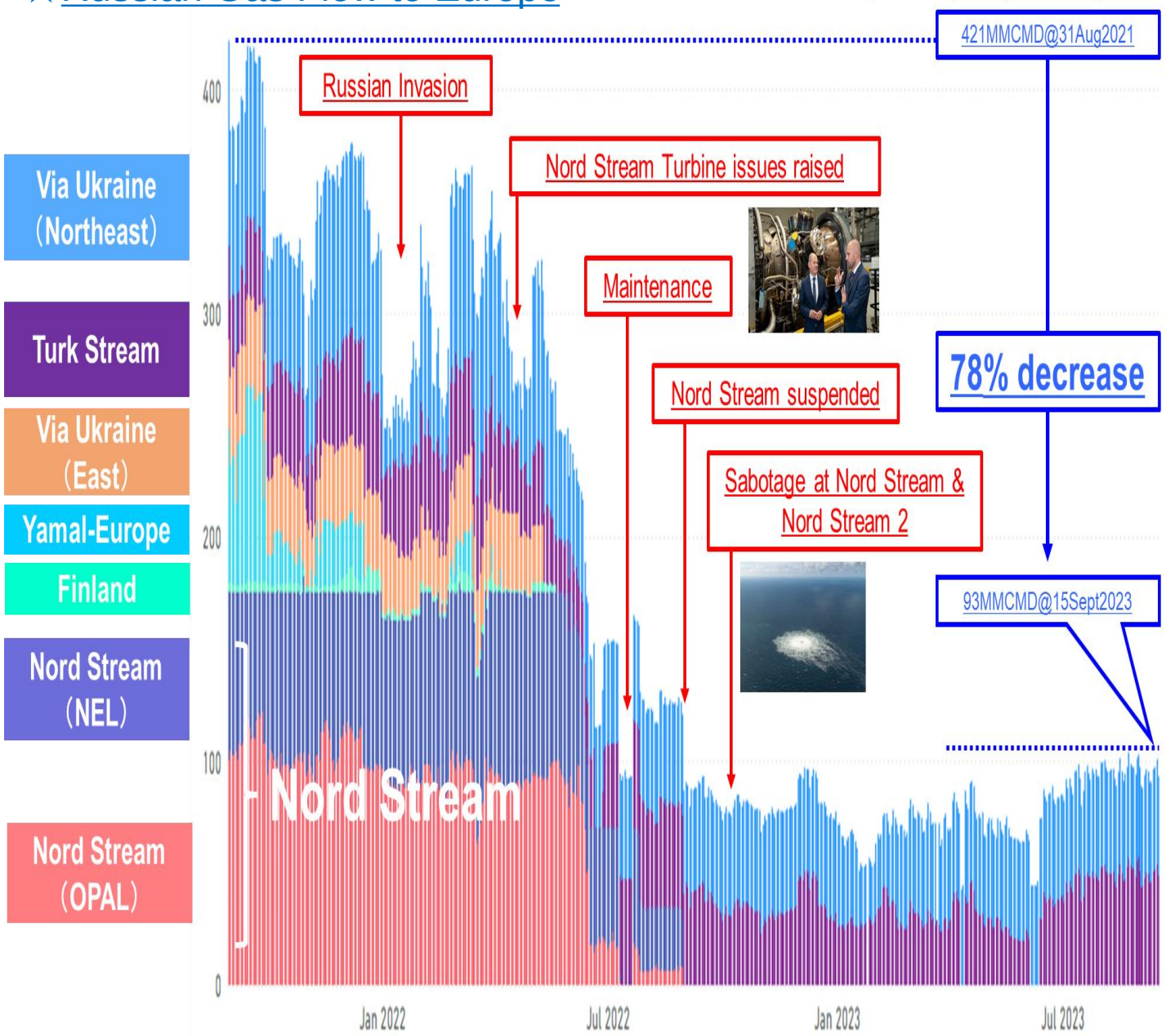


BCM	2021	2022	2023	Change
Toward WEST				
Vysotsk LNG	1.1	1.0	1.0	100%
Portavaya LNG	–	0.5	2.0	400%
Yamal LNG (for EU)	18.1	20.2	24.3	120%
PL for Finland	1.5	0.4	–	–
Nord Stream	59.2	31.6	–	–
Yamal-Europe PL	31.4	0	–	–
PL via Ukraine	25.9	15.2	13.6	▲11%
Turk Stream (for Turkey)	10.2	9.1	10.0	110%
Turk Stream (for EU)	4.6	11.6	13.7	118%
Blue Stream	16	11.5	13.2	115%
TOTAL	168	101.1	77.8	▲23%
Toward EAST				
S-2 LNG	14.4	15.9	13.2	▲17%
Yamal LNG (for Asia)	7.7	6.7	3.2	▲52%
Power of Siberia	10.4	15.5	22.7	146%
TOTAL	32.5	38.1	39.1	103%
PL	159.2	94.9	73.2	▲23%
LNG	41.3	44.3	43.7	▲1%
TOTAL	200.5	139.2	116.9	▲16%

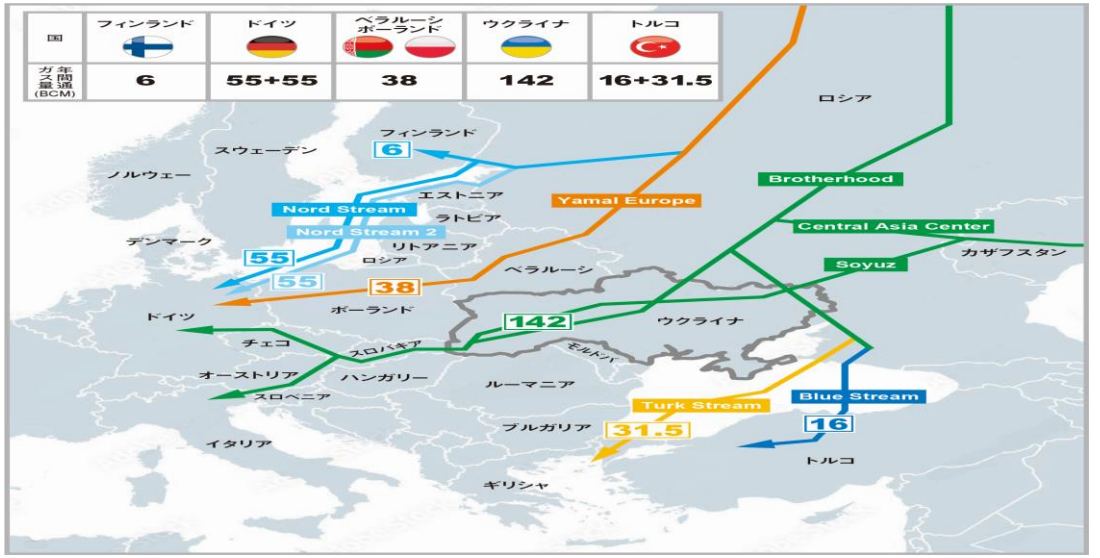
Is this under their calculation?: Russia is losing golden market

★Russian Gas Flow to Europe

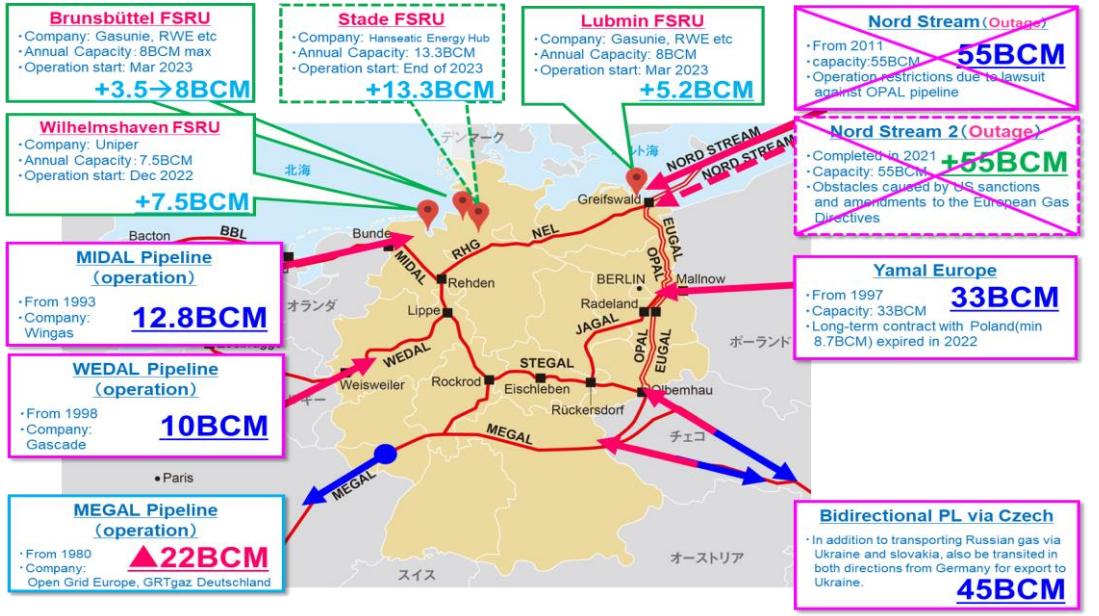
※Blue Stream (16BCM) is not included。



★Russian Gas Infrastructures to Europe

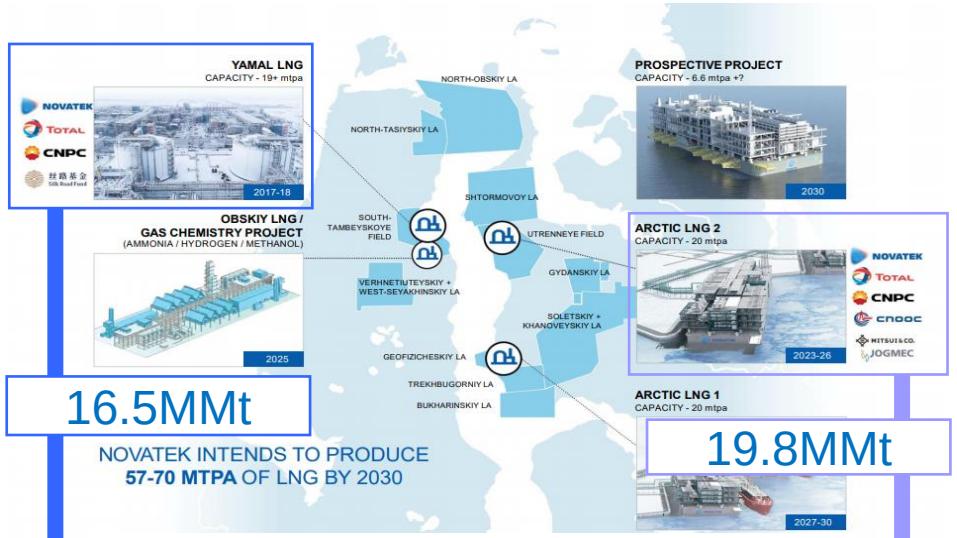


★Existing & Newly Built German Gas Infrastructures



Actual Utilization of the NSR fromYamal LNG project

★Yamal LNG & Arctic LNG-2



16.5MMt

NOVATEK INTENDS TO PRODUCE
57-70 MTPA OF LNG BY 2030

19.8MMt

★Upstream Stakeholders

Yamal LNG	
NOVATEK	51%
TOTAL	20%
CNPC	20%
Silk Road Fund	9.9%

Arctic LNG-2	
NOVATEK	60%
TOTAL	10%
CNPC	10%
CNOOC	10%
Japan Arctic LNG	10%

★Buyers of Yamal LNG Supply Contracts

Long Term Contracts concluded with Yamal LNG					
TOTAL	330万t	20%	Gazprom	300万t	18%
Naturgy	250万t	15%	ENGIE	100万t	6%
CNPC	300万t	28%	Shell	90万t	5%
(Silk Road Fund)	160万t		他、NOVATEKも販売。		

★New LNG transportation scheme from Arctic by NOVATEK

Year	2018	2019	2020	2021	2022	2023	Oct 2024
Destination	8.30MMt	18.5MMt	18.6MMt	19.6MMt	20.1MMt	19.6MMt	16.4MMt
France	34.9%	14.2%	27.5%	20.1%	26.2%	17.5%	29.9%
Belgium	7.0%	8.0%	22.7%	8.8%	16.9%	22.6%	19.6%
Spain	7.0%	7.0%	11.8%	13.3%	17.8%	25.4%	19.8%
Netherland	3.5%	9.5%	11.4%	8.6%	8.6%	3.7%	6.2%
UK	11.6%	3.4%	10.9%	10.7%	1.8%	–	–
Norway	–	54.0%	3.0%	24.4%	–	–	–
Portugal	–	–	2.5%	0.2%	1.1%	1.5%	0.9%
Italy	–	–	–	–	0.7%	0.3%	–
Kuwait	–	–	–	–	0.7%	0.4%	1.3%
Turkey	–	–	–	–	0.7%	2.6%	0.4%
China	7.0%	3.8%	8.1%	3.7%	19.1%	20.4%	16.8%
Taiwan	–	–	0.9%	1.4%	2.8%	2.2%	1.7%
Japan	–	–	0.8%	3.9%	0.3%	0.7%	0.4%
Korea	–	–	0.4%	3.4%	0.9%	0.4%	2.5%
Bangladesh	–	–	–	0.5%	–	–	–
Singapore	–	–	–	0.5%	–	0.3%	–
India	–	–	–	0.5%	1.4%	2.1%	0.4%
Indonesia	–	–	–	–	0.6%	–	–
Thailand	–	–	–	–	0.4%	–	–

注目される北極海航路利活用の実際

West bound:78.1%

- Most of flow has been delivered to Europe.
- Transshipment (Norway, Belgium & Netherland) includes the LNG export for China, indicating that East bound has difficulties to forecast delivery schedule.

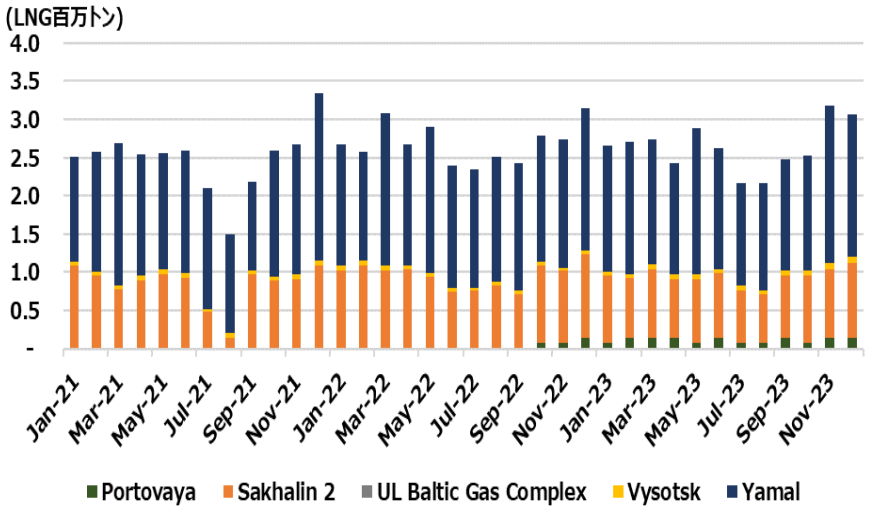
East bound：21.9%

- Transportation via the Northeast Passage (Bering Strait) has been limited to maximum of 10%.

Russian LNG Flow at present

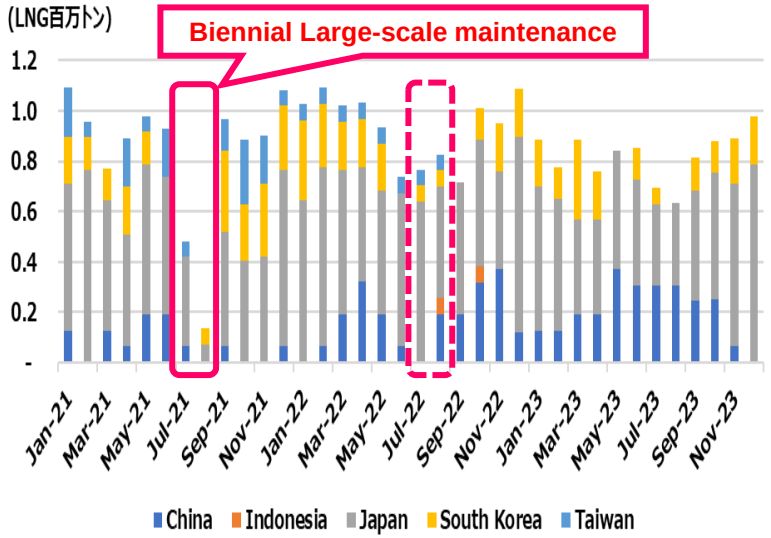
★Export Volume of Russian LNG

29.8MMt@2021 | 32.3MMt@2022 | 31.6MMt@2023



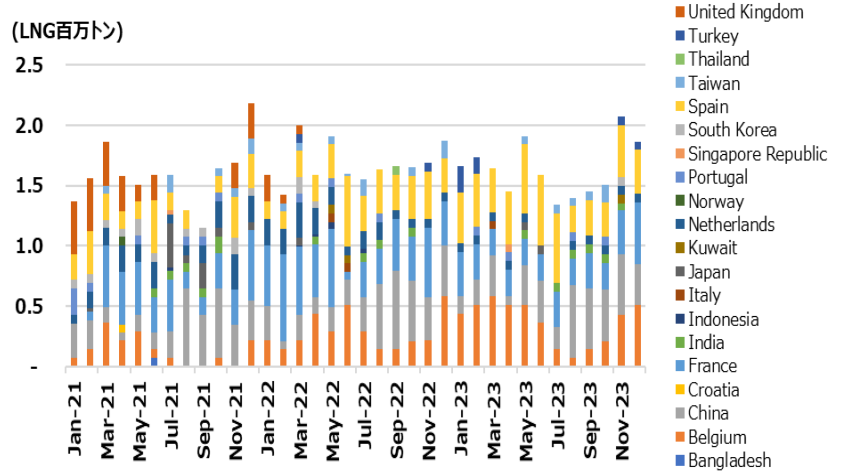
★Sakhalin-2 LNG

10.1MMt@2021 | 11.2MMt@2022 | 9.9MMt@2023



★Yamal LNG

19.0MMt@2021 | 20.1MMt@2022 | 19.6MMt@2023



★Russian LNG Share by Countries

	2022	2023		2022	2023
Japan	21%	19%	Indonesia	0.7%	-
China	18%	21%	Portugal	0.7%	0.9%
France	16%	11%	Finland	0.6%	0.5%
Belgium	11%	15%	Greece	0.4%	1.9%
Spain	11%	16%	Kuwait	0.4%	0.2%
Korea	6%	5%	Italy	0.4%	0.2%
Netherland	5%	2%	Sweden	0.2%	0.2%
Taiwan	3%	1%	Thailand	0.2%	-
UK	1.1%	-	Lithuania	0.2%	-
Turkey	0.9%	3%	Norway	0.04%	0.2%
India	0.9%	1%			

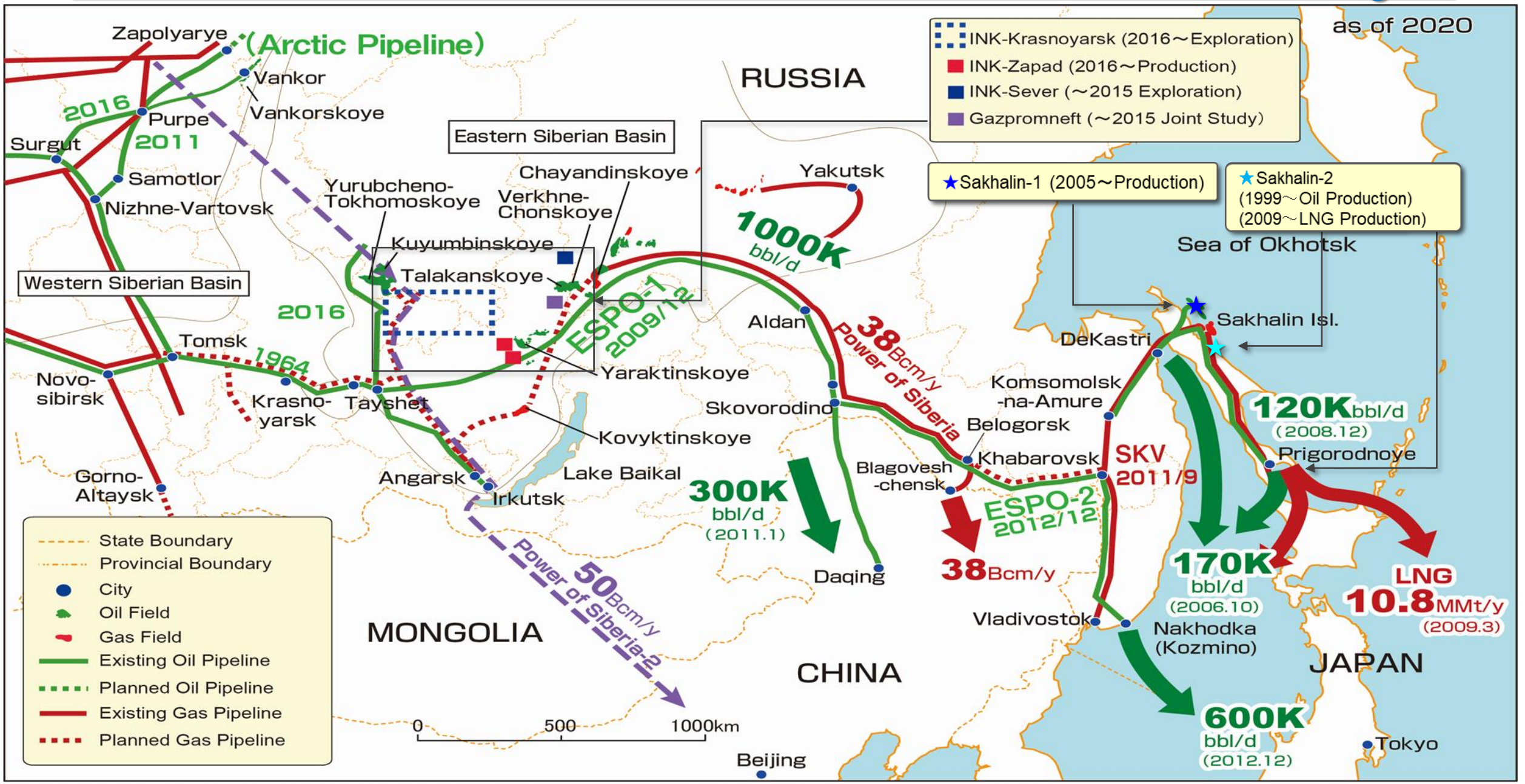
★S-2 LNG buyers

	2022	2023
Japan	60%	58%
China	18%	25%
Korea	16%	17%
Taiwan	5%	-%
Indonesia	1%	-%

★Yamal LNG buyers

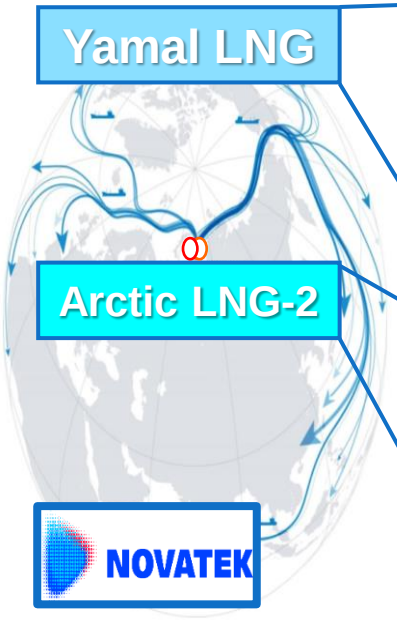
	2022	2023		2022	2023
France	26%	18%	Portugal	1.1%	1.5%
China	19%	20%	Korea	0.9%	0.4%
Spain	18%	25%	Turkey	0.7%	2.6%
Belgium	17%	23%	Kuwait	0.7%	0.4%
Netherland	9%	3.7%	Italy	0.7%	0.3%
Taiwan	3%	2.2%	Indonesia	0.6%	-
UK	2%	-	Thailand	0.4%	-
India	1.4%	2.1%	Japan	0.3%	0.7%

Drastic Increase of Oil & Gas Flow from Russia to Asia-Pacific region



Source: JOGMEC

Russia in haste to promote selling own gas to China, high dependency



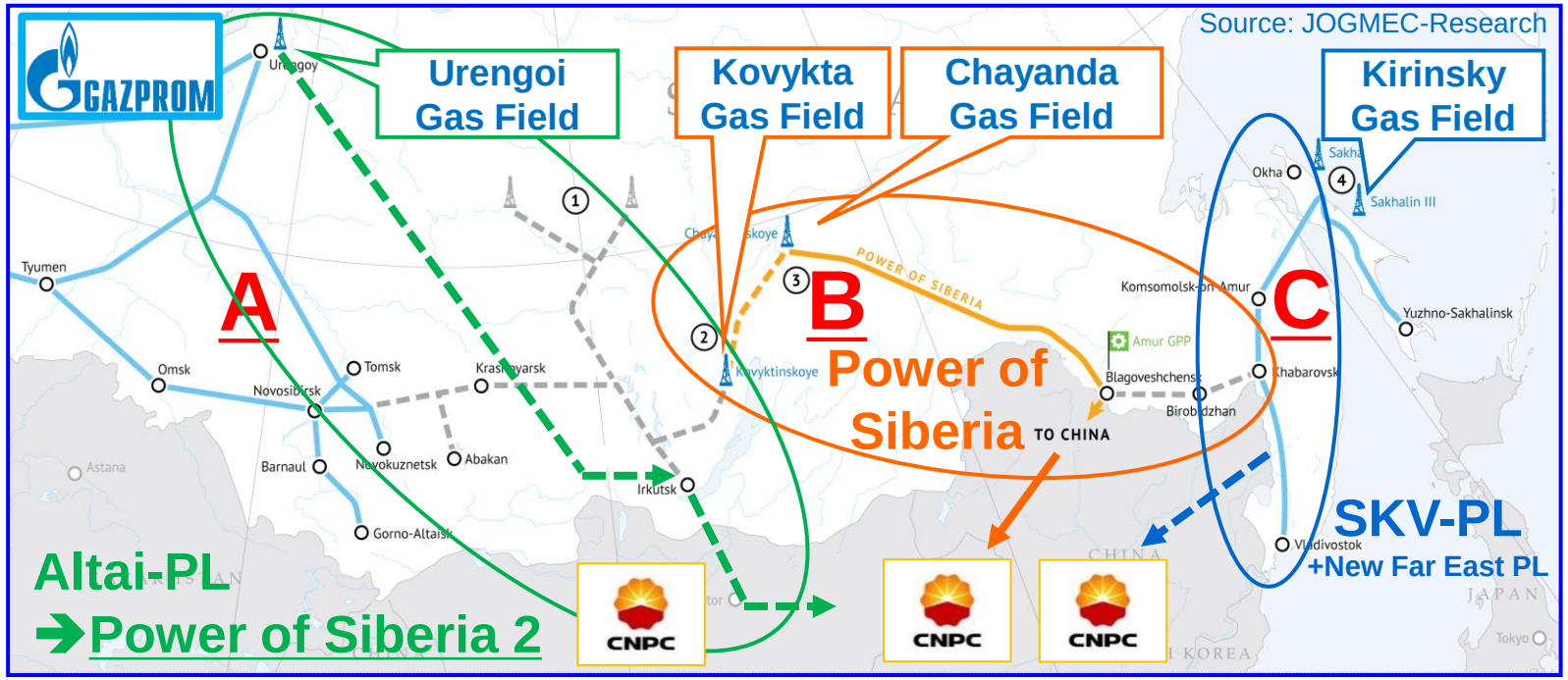
LNG Off-takers	Volume	LNG Off-takers	Volume
TOTAL	3.3MMt	ENGIE	1.0MMt
Gas Natural Fenosa	2.5MMt	Shell	0.9MMt
CNPC	3.0MMt (=4BCM)	Silk Road Fund	1.6MMt (=2BCM)
Gazprom Marketing	3.0MMt		

LNG Off-takers	Volume	LNG Off-takers	Volume
NOVATEK	11.8MMt	CNOOC	2.0MMt (=3BCM)
TOTAL	2.0MMt		
CNPC	2.0MMt (=3BCM)	Mitsui/JOGMEC	2.0MMt

Items	A: Altai-PL →Power of Siberia-2	B: Power of Siberia	C: New Far East PL (with SKV-PL)
Distance <A>	*2800km*	*2948km*	*1822km*
Diameter	*1420mm, 56in*	*1400mm, 56in*	*700mm, 28in-1220mm, 48in*
Capacity	*30BCM/y*	*60BCM/y*	*30BCM/y*
Total cost <B>	*from 14bilUSD*	*from 25→68bilUSD*	*from 11→25.8bilUSD*
Unit cost <B/A>	*from 5MM$/km*	*from 6→16MM$/km*	*from 6→14MM$/km*
Start operation	*NA, possibly later 2020*	*from 2019*	*from Sept, 2011*
Resource	*West Siberia*	*East Siberia*	*Sakhalin*
Tie-in point	*Through Mongol*	*Northeast China*	*Northeast China*
Issues	*-World Heritage -Compete with Turkmen gas*	*-Under construction without confirmation of detailed SPA*	*-Low operation rate -Limited demand*

Sanctions gives power for agreement

Time	Initiative	Content
In September 2007, Eastern Gas Program adopted		
Jan 2014	CNPC	Yamal LNG 20% purchase
From March 2014, US&EU Sanctions start		
May 2014	Gazprom	SPA with CNPC, Power of Siberia, 30years, 38BCM
Nov 2014	Gazprom	FA with CNPC, Altai-PL
May 2015	Gazprom	HOA with CNPC, Altai-PL
Sep 2015	Silk Road Fund	Yamal LNG 9.9% purchase
	Gazprom	MOU with CNPC, Far East PL



Russia's Miscalculation?: Fact that the European market cannot be replaced by others

Point 1
China & India cannot replace European market.

Point 2
EU's ban on LNG equipment export will have a critical impact on Russia.

PL+LNG Export 155BCM

EU is heading for Zero hydrocarbon from Russia by 2027

EU's embargo on LNG equipment
(5th Package@8th April)

LNG Export

PL Export

SKV+New Far East PL: 10BCM
Power of Siberia 2: 50BCM

Point 3
Russia will rush to build Power of Siberia 2 Pipeline in order to connect West & East.

Point 4
China will press Russia for gas price discount, but limits max volume up to 35BCM.

Demand Increase@2030 +73BCM

<Breakdown>
Doemstic: 30BCM
PL: —
LNG: 43BCM
※Not including TAPI-PL (Turkmenistan) import。

Demand Increse@2030 +123BCM

<Breakdown>
Domestic: 58BCM
PL: 35BCM
LNG: 30BCM

国内生産対輸入=47:53
内、輸入:PL対LNG=54:46

Comparison of Prices of PL & LNG suppliers in China

Presidential meeting
on 4th Feb 2022 in Beijing
on 21st Mar 2023 in Moscow
on 18th Oct 2023 in beijing

Average PL Price 7.77USD

Average 2.2USD Spread

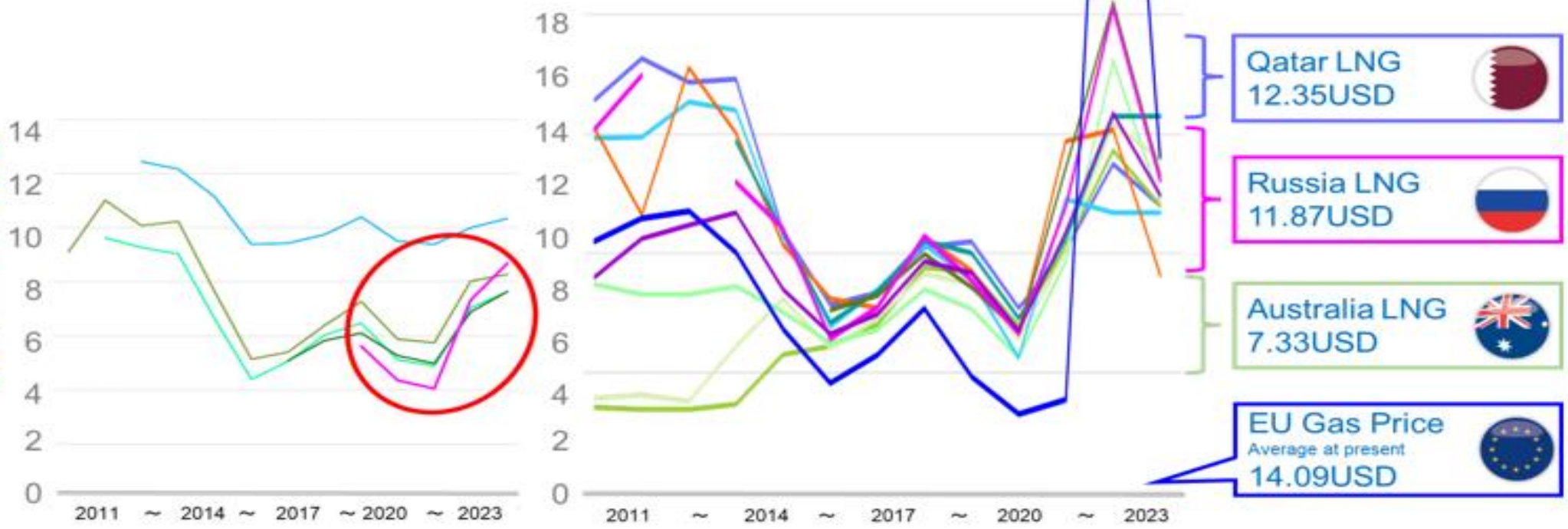
Average LNG Price 9.99USD

EU Gas Price
2022 Average
40.34USD

Myanmar PL 10.36USD

Central Asia PL 6.82USD

Russia PL 6.01USD



Qatar LNG 12.35USD

Russia LNG 11.87USD

Australia LNG 7.33USD

EU Gas Price
Average at present
14.09USD

- ✓ *Price of Russian PL gas (Power of Siberia) has been linked to LNG prices so that the PL gas became competitive. (Russian PL gas price + Domestic transit cost in China < LNG prices in Shanghai + Regasification cost)*
- ✓ *China could have realized the diversification of supply sources, routes (and forms) and price indexes.*
- ✓ *Russia had to make compromise on the price negotiation in 2014 and became the cheapest natural gas supplier at border level. History would repeat when the offered new PLs are to be build for China.*

US Sanctions targeting Arctic LNG 2 and Northern Sea Route

Date	Events and Contents of Sanctions	US Targets
19th May 2023	**G7 Joint Statement in Hiroshima** 'We will continue to reduce Russia's revenue to finance its illegal aggression by taking appropriate steps to limit Russia's energy revenue and **future extractive capabilities**..' https://www.whitehouse.gov/briefing-room/statements-releases/2023/05/19/g7-leaders-statement-on-ukraine/	**Atomflot**, Gazprom Vnigaz, SNIIGGIMS, Gazpromneft Noyabrsk, Vygon Consulting, Gubkin Univ. etc. 
20th July 2023	DOS is designating multiple entities involved in expanding **Russia's ability to finish construction of key future energy projects**, as well as entities engaged in exploratory drilling throughout Russia. Russian shipping company that has provided **key logistical support to multiple Russian future energy projects**. https://www.state.gov/imposing-additional-sanctions-on-those-supporting-russias-war-against-ukraine/	**Nipigaz** SASCO 
14th Sept 2023	DOS is imposing sanctions on over 70 entities and individuals involved in expanding **Russia's energy production and export capacity**.. https://www.state.gov/imposing-further-sanctions-in-response-to-russias-illegal-war-against-ukraine-2/	5 entities & **2 FSUs** related to Arctic LNG-2
2nd Nov 2023	CONSTRAINING **RUSSIA'S FUTURE ENERGY PRODUCTION AND EXPORT CAPACITY** https://www.state.gov/taking-additional-sweeping-measures-against-russia/ https://www.state.gov/taking-additional-sweeping-measures-against-russia-3/	**Arctic LNG 2 LLC**
12th Dec 2023		3 entities related to Ust-Luga LNG
23rd Feb 2024	DOT imposed additional sanction related to Arctic LNG-2. https://home.treasury.gov/news/press-releases/jy2117	**NOVATEK Murmansk, Smart LNG, Zvezda Shipyard, JSC Sovcomflot**
1st May 2024	DOS imposed additional sanction related to Arctic LNG-2. https://www.state.gov/imposing-new-measures-on-russia-for-its-full-scale-war-and-use-of-chemical-weapons-against-ukraine-2/	**Red Box Energy Services (Singapore), AUDAX, PUGNAX** **CFU Shipping Co Ltd (Hongkong), Hunter Star, Nan Feng Zhi Xing** **Eko Shipping LLC, Transstroy LLC** **Modmer Trading Uluslararasi Ithavat Ve Ihravat Ltd Sirketi (Turkey)**
12th June 2024	DOS imposed additional sanction related to Arctic LNG-2. https://www.state.gov/taking-additional-measures-to-degrade-russias-wartime-economy/	**RusGazDobycha, Arktik SPG 1, Obsky Gas Chemical Complex** **Gazprom Invest, Arktik SPG, 7 ARC7LNG tankers** **蓬莱巨涛海洋工程重工有限公司 (China), LLC Murrmansk LNG** **YAMALDORSTROY (Vostok Oil Project related)**
23rd Aug 2024	DOS imposed additional sanction related to Arctic LNG-2. https://www.state.gov/taking-additional-measures-to-degrade-russias-wartime-economy/	**ZARA SHIPHOLDING CO, OCEAN SPEEDSTAR SOLUTIONS, 3 LNG tankers** **NOVATEK CHINA HOLDINGS CO LTD** **EKROPROMSTROY, WATERFALL ENGINEERING LTDWHITE FOX SHIP MANAGEMENT FZCO, 4 LNG tankers**
5th Sept 2024	DOT imposed additional sanction related to Arctic LNG-2. https://www.state.gov/further-sanctions-to-degrade-russias-ability-to-operationalize-the-arctic-lng-2-%20project/	**Gotik Energy Shipping Co, Plio Energy Cargo Shipping OPC PVT LTD** **2 LNG tankers**
30th Oct 2024	DOS imposed additional sanction related to Arctic LNG-2. https://www.state.gov/new-measures-targeting-third-country-enablers-supporting-russias-military-industrial-base/	**SMART SOLUTIONS LTD (related to GBS construction and transportation)** **LNG ALPHA SHIPPING PTE LTD, NEW TRANSSHIPMENT FZE, LNG BETA SHIPPING PTE LTD, LNG DELTA SHIPPING PTE LTD** **LNG GAMMA SHIPPING PTE LTD**

Shadow LNG fleet and its direction as of today

Stationary in Barents Sea

North Way号

Stationary in Kara Sea

Loaded 8th Cargo?

Loaded 7th Cargo?

Loaded 5th Cargo?

北極LNG-2

Transshipment Terminal （SAAM）

2nd and 3rd Cargoes in storage. 6th Cargo too?

Loaded 1st Cargo?

Transshipment Terminal （KORYAK）

4th Cargo in storage

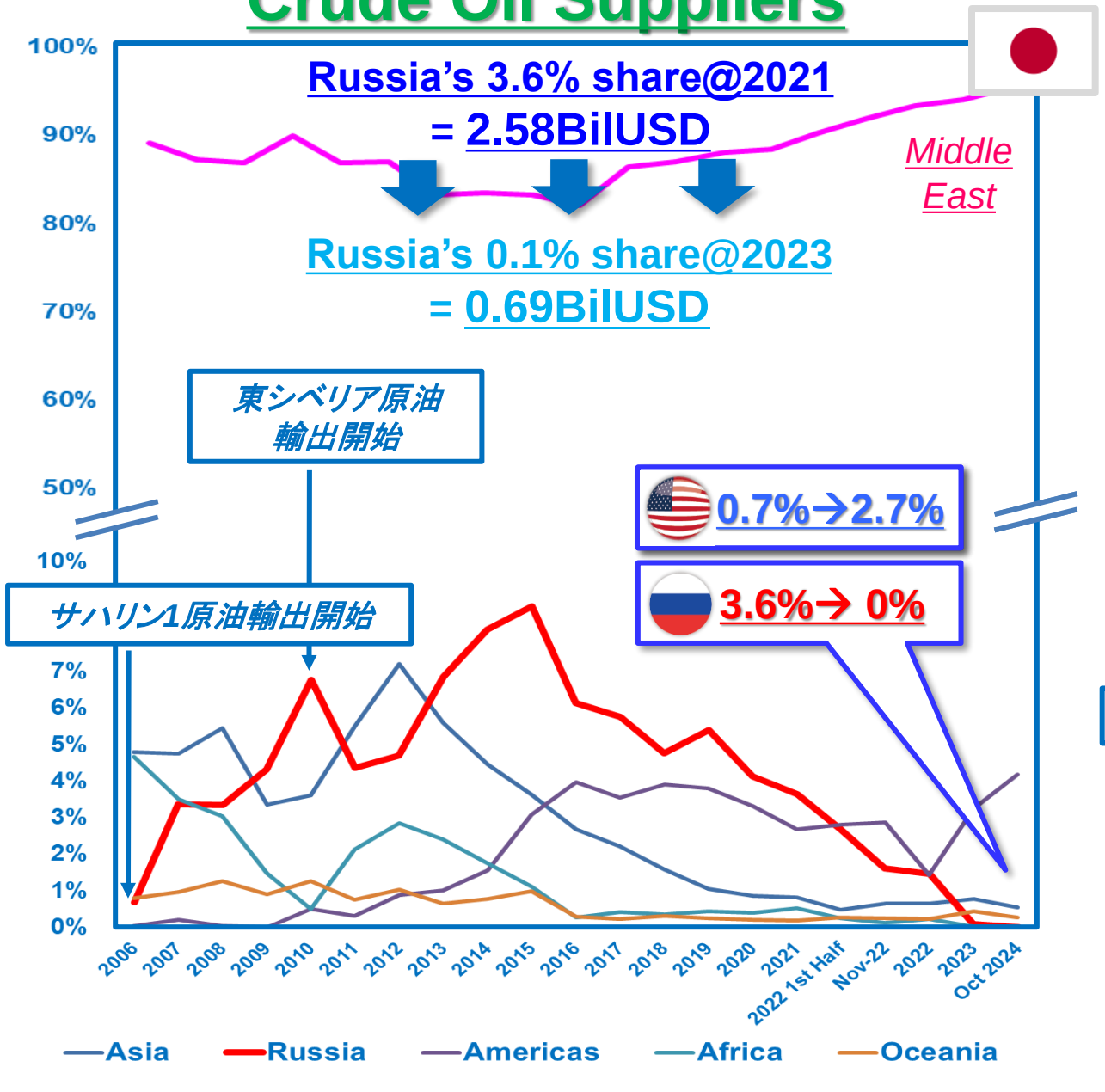
: While stationary, including STS and loading

: Underway

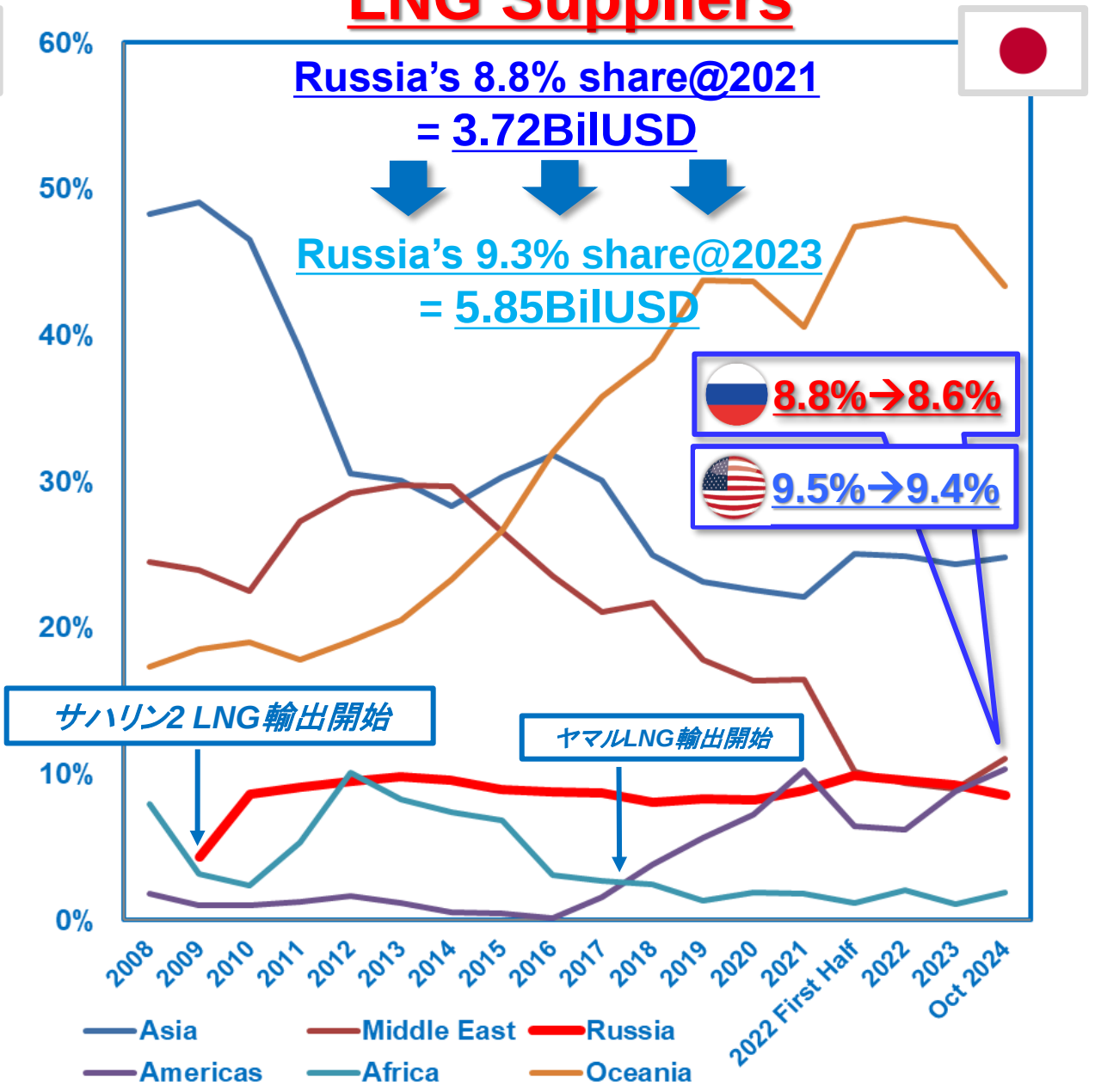
Russia held the Key for Japan's Energy Security

Source:MOF-Japan

Crude Oil Suppliers



LNG Suppliers



Russia is still as a Reasonable LNG Supplier for Japan

1000yen/ton	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024 Oct	Average	USD/MMBTU
Oman	53.2	48.8	65.4	33.6	32.3	39.5	48.9	57.3	62.7	51.9	44.1	47.8	52.1	49.9	46.3	54.4	96.5	98.1	83.8	56.1	**9.36**
Russia	-	-	-	32.1	38.3	52.7	59.5	71.5	83.3	62.7	37.2	42.9	53.7	52.7	41.0	56.7	98.6	97.6	96.0	61.0	**10.18**
USA	36.2	36.7	41.3	40.7	55.5	54.2	65.9	-	85.4	47.9	-	66.9	60.8	53.3	47.1	66.8	137.9	87.7	85.4	62.9	**10.50**
Australia	38.8	42.0	61.4	42.9	52.2	61.2	65.6	75.6	86.3	63.4	41.0	47.5	58.4	58.3	44.4	57.9	118.3	107.5	96.1	64.1	**10.70**
Malaysia	39.1	47.2	68.2	46.0	53.7	64.1	73.6	86.6	93.5	67.4	38.3	46.0	54.2	52.7	40.1	52.8	106.9	98.1	92.3	64.2	**10.72**
Brunei	35.2	38.4	69.3	50.3	52.7	63.1	72.9	84.0	92.3	69.9	43.0	48.9	57.9	58.7	44.1	52.0	97.9	98.9	94.0	64.4	**10.74**
Trinidad Tobago	69.2	63.8	86.6	46.5	45.6	42.7	52.6	80.3	92.7	70.4	46.4	47.0	58.5	-	-	-	80.0	68.9	75.2	64.2	**10.70**
Nigeria	72.9	63.9	91.7	56.0	38.1	54.8	66.9	81.4	90.5	67.0	41.9	47.3	48.1	38.9	37.5	68.2	126.0	-	104.4	66.4	**11.08**
Yemen	-	-	-	-	36.0	60.0	68.1	83.9	84.8	58.0	-	-	-	-	-	-	-	-	-	65.1	**10.86**
Indonesia	48.7	51.4	62.2	36.3	42.7	62.2	75.1	87.8	94.2	68.0	42.2	48.9	57.4	58.5	44.1	55.1	131.8	105.7	102.6	67.1	**11.19**
Qatar	45.8	49.5	71.7	53.0	56.4	64.6	71.8	84.6	92.2	66.5	35.6	44.2	57.4	58.4	41.4	52.3	139.6	119.3	97.8	68.5	**11.43**
UAE	40.7	43.6	60.6	43.3	52.8	63.3	71.7	85.0	91.4	62.7	37.2	46.4	59.9	57.1	44.1	57.4	190.9	131.1	96.7	70.3	**11.73**
Papua New Guinea	-	-	-	-	-	-	-	-	78.3	64.5	40.1	48.8	60.5	57.9	44.2	63.4	129.2	102.2	100.1	71.8	**11.97**
Angola	-	-	-	-	-	-	-	84.4	86.6	-	-	41.7	54.3	-	-	-	82.7	-	-	70.0	**11.67**
Algeria	60.8	61.6	94.8	-	34.3	58.5	70.6	79.9	91.9	58.8	41.8	71.1	-	40.8	-	75.7	152.4	-	77.1	71.3	**11.90**
Egypt	67.4	66.3	87.3	87.6	60.1	65.0	72.8	83.2	93.3	-	36.0	41.8	60.1	56.3	46.8	72.6	143.3	167.8	-	76.9	**12.83**
Peru	-	-	-	-	-	57.2	68.1	86.6	104.6	82.6	-	49.1	55.4	53.9	43.4	46.2	120.1	159.6	110.3	79.8	**13.31**
Equator Guinea	-	58.9	87.9	56.9	58.4	71.2	75.4	87.7	99.6	64.6	39.4	46.3	44.1	52.7	-	68.1	117.3	229.1	91.7	79.4	**13.24**
Mozambique	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	91.1	72.5	81.8	**13.64**
Korea	-	-	-	-	-	-	-	-	-	52.9	34.0	33.8	-	-	32.4	-	-	118.9	-	54.4	**9.08**
Singapore	-	-	-	-	-	-	-	-	-	51.9	36.5	42.6	58.6	-	-	223.1	88.0	-	108.9	87.1	**14.53**
France	-	-	-	-	-	-	71.7	86.1	-	54.6	39.4	45.2	59.7	-	-	171.3	-	-	-	75.4	**12.58**
Brazil	-	-	-	-	-	-	63.9	-	-	-	-	-	-	-	-	-	-	-	-	63.9	**10.66**
Spain	-	-	-	-	-	-	69.2	83.7	79.9	67.1	-	-	-	-	-	-	-	-	-	75.0	**12.51**
Norway	-	-	94.6	-	-	54.1	64.8	87.8	84.3	74.6	-	-	62.2	-	-	-	-	-	-	74.6	**12.45**
Netherlands	-	-	-	-	-	-	-	-	101.2	-	-	-	64.4	-	-	-	-	-	-	82.8	**13.81**
Belgium	-	-	-	-	-	-	64.8	-	101.2	-	-	-	-	-	-	-	-	-	-	83.0	**13.84**
China	-	-	-	-	-	-	-	-	-	-	-	-	-	31.9	-	-	167.6	113.4	118.3	107.8	**17.98**
Thailand	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	92.2	-	-	-	92.2	**15.38**
Canada	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	189.8	189.8	**31.66**
Cameroon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	93.3	93.3	**15.56**

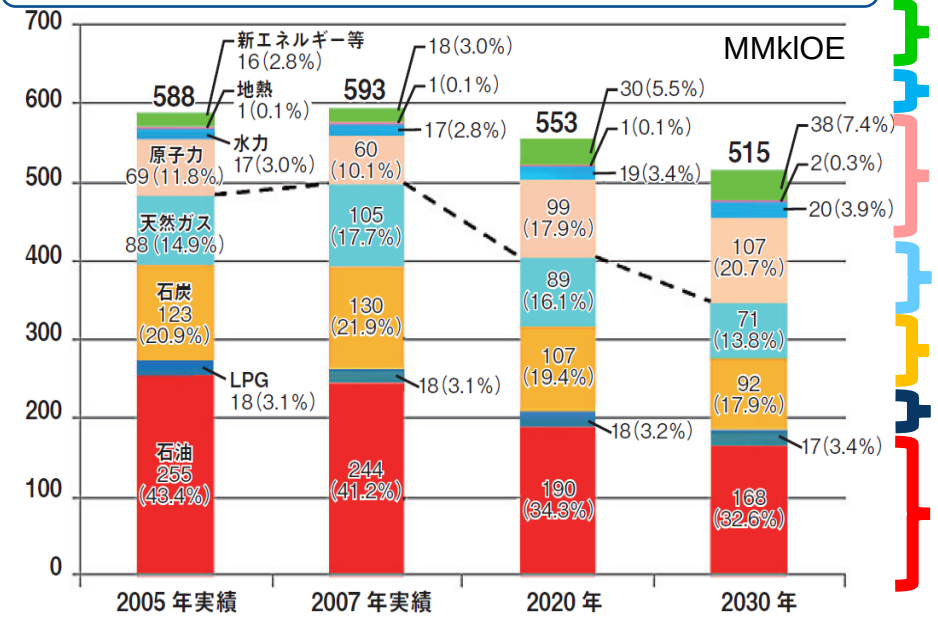
Earthquake 2011 and Fukushima

Source: MOF-Japan

*Conversion factor: 1USD=106.37yen (average from 2006 to July 2023), 1t=39.68MMBTU

Japan: Outlook of Primary Energy Supply toward 2030

@2010FY before Earthquake & Fukushima



Renewable: 3%→7%

Hydro: 3%→4%

Nuclear: 12%→21%

Natural Gas: 15%→14%

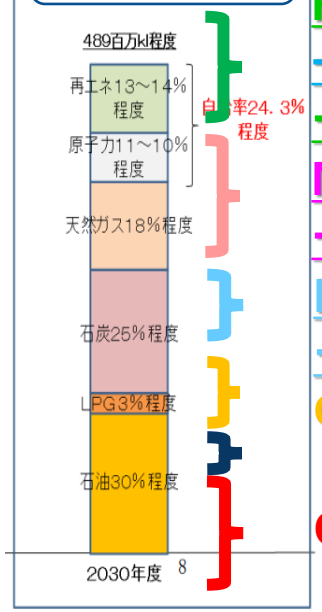
Coal: 21%→18%

LPG: 3%→3%

Oil: 43%→33%

68%

@2015FY



Renewable +Hydro: →13%-14%

Nuclear: →11%-10%

Natural Gas: →18%

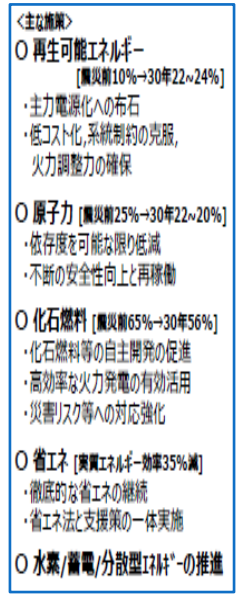
Coal: →25%

LPG: 3%→3%

Oil:→30%

76%

@2018FY: Supply for Electricity

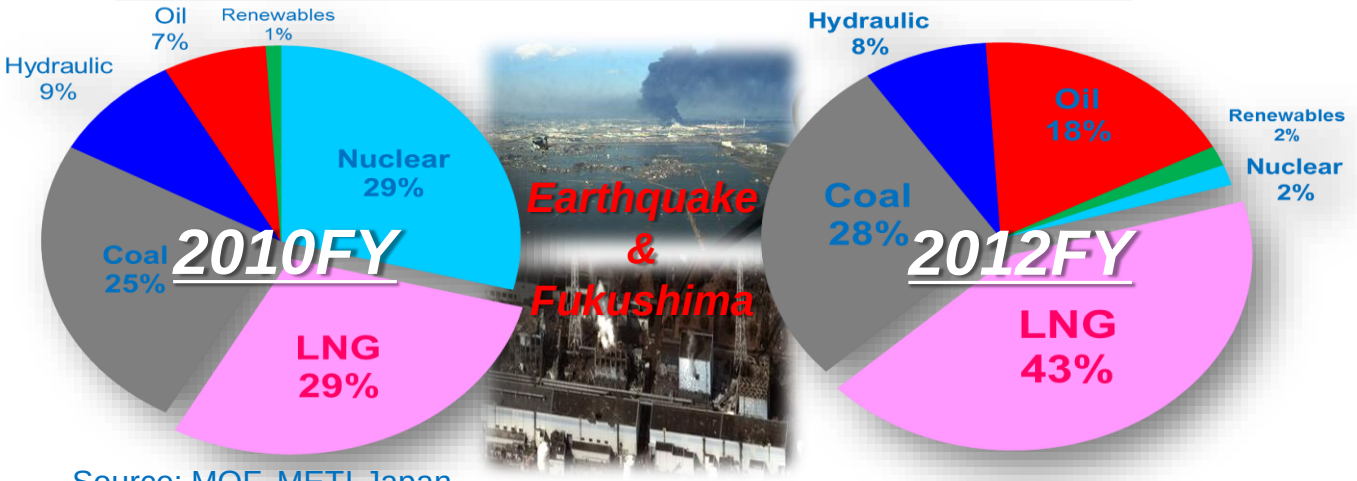


Renewable +Hydro: →22%-24%

Nuclear: →22%-20%

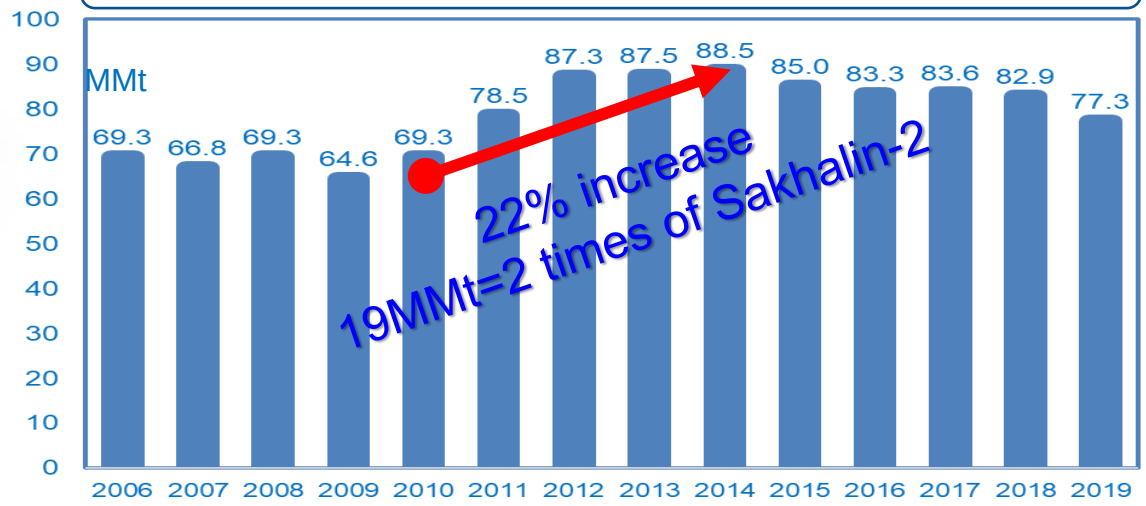
Fossil Fuel: →56%

Change of Electricity Supply by Source

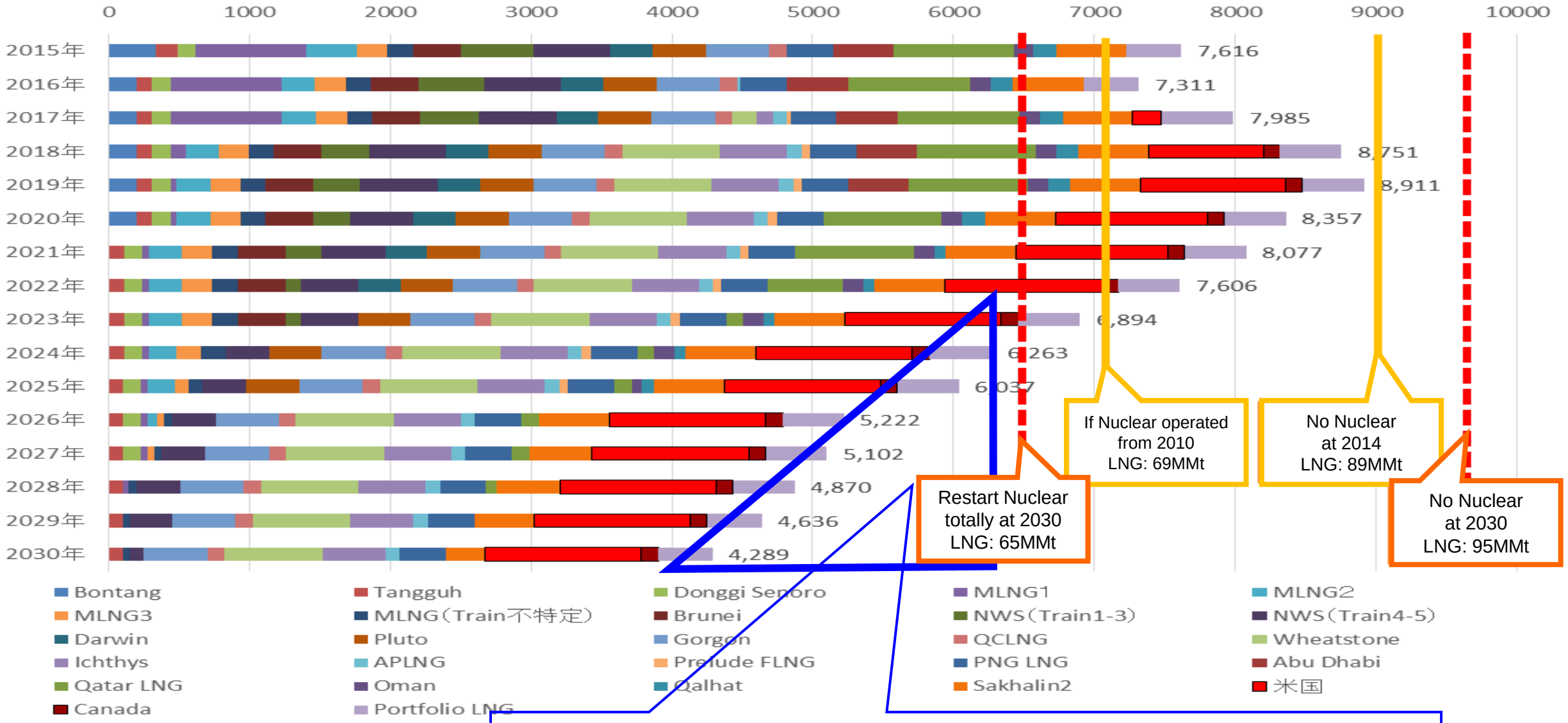


Source: MOF, METI-Japan

Increase of LNG Import after 2011



Japan: Outlook on LNG contracts, some room after 2023



If Nuclear operated from 2010
LNG: 69MMt

No Nuclear at 2014
LNG: 89MMt

Restart Nuclear totally at 2030
LNG: 65MMt

No Nuclear at 2030
LNG: 95MMt

4.63MMt＝ 6.3BCM@2025 16.30MMt＝22.2BCM@2028
12.78MMt＝17.4BCM@2026 22.10MMt＝30.1BCM@2030

Source: JOGMEC

Japan's New Energy Strategy under Intensive Discussion

The Japanese government revises its energy plan about every three years. The plan is formulated based on the Basic Energy Policy Law enacted in 2002. The one approved by the Cabinet in July 2018 set goals for Japan's energy mix to 2030 and presents scenarios to 2050 and nuclear remains a key energy source, accounting for 20-22% of the country's electricity generation up to 2030. New 6th Basic Energy Plan was approved in response to the global de-carbonization trends in October 2021, stipulated Japan's new energy mix toward 2030 as follows;

Items	Year 2019	For 2030 Former Target (5th Basic Energy Plan)	For 2030 Present Target (*Ambitious outlook@6th Plan*)	For 2050
Energy Efficiency Target	▲16.55MMkl	▲50.3MMkl	▲62MMkl	???
Electricity Generation Mix	1.0650TkWh		0.93 to 0.94TkWh	???
Renewables	18%	22 to 24%	36 to 38%	???
Hydrogen/Ammonia	0%	0%	1%	???
Nuclear	6%	20 to 22%	20 to 22%	???
LNG	37%	27%	20%	???
Coal	32%	26%	19%	???
Oil etc	7%	3%	2%	???
Reduction of GHG Emissions	-14%	-26%	-46% and more to -50%	**Net Zero**

Source: Advisory Committee for Natural Resources and Energy, METI

Framework for Formulating the 7th Basic Energy Plan

Cabinet Office

The 11th GX Executive Meeting (13th May 2024)

GX2040 1st Leaders' Panel (2nd July 2024)

GX Executive Meeting

GX2040 Vision Proposal

Ministry of Economy, Trade and Industry

Resources and Fuel Subcommittee
- LNG, Oil and Coal
- e-fuel
- CCS

Electricity and Gas Industry Subcommittee
- Electricity
- City Gas

Energy Conservation and New Energy Subcommittee
- H2

Comprehensive Resource and Energy Research Committee Basic Policy Subcommittee

The 7th Basic Energy Plan

Ministry of the Environment

Global Warming Countermeasures Plan Follow-up Special Committee

Global Environment Subcommittee

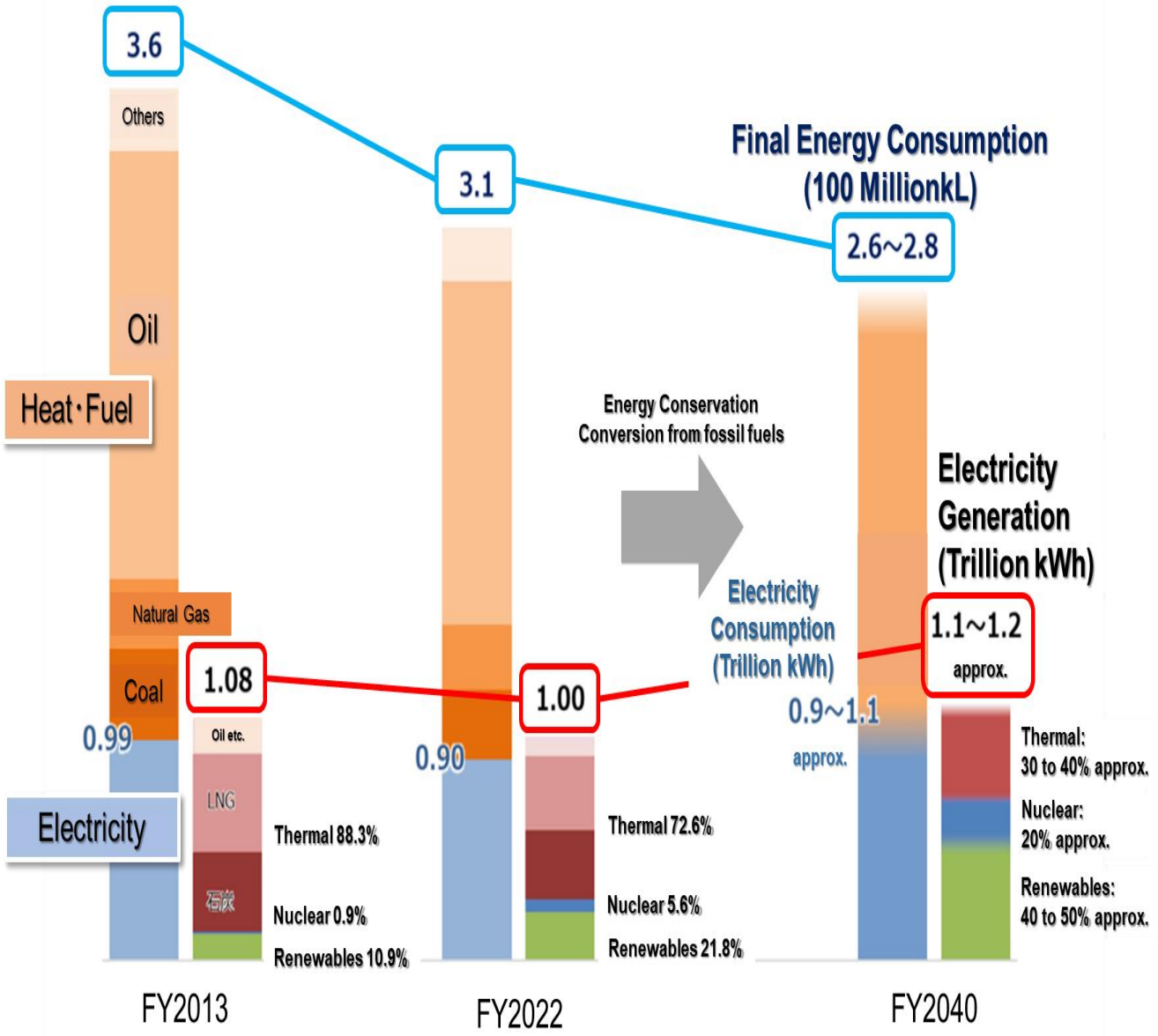
Global Warming Countermeasures Plan

The Japanese government will submit its 2035 target NDC (Nationally Determined Contribution) to the UN Framework Convention on Climate Change (UNFCCC) by February 2025.

<9 to 12 months prior to COP30 (November 2025)>

Framework for Formulating the 7th Basic Energy Plan

Image of Energy Demand and Supply Outlook



Billion kL	FY2013	FY2022	FY2040
Final Energy Consumption			
TOTAL	**0.36**	**0.31**	**0.26 to 0.27**
Industry	0.17	0.14	0.14 to 0.15
Service	0.06	0.05	0.04 to 0.05
House-use	0.05	0.05	0.04 to 0.05
Transport	0.08	0.07	0.03 to 0.04
Primary Energy Supply			
TOTAL	**0.54**	**0.47**	**0.42 to 0.44**
Renewables	0.05	0.07	0.11 to 0.13
Nuclear	-	0.01	0.05
Hydrogen etc	-	-	0.02
Natural Gas	0.13	0.10	0.08 to 0.09
Oil	0.23	0.17	0.09 to 0.12
Coal	0.14	0.12	0.04 to 0.05
Energy Sufficiency	**6.5%**	**12.6%**	**30 to 40%**

*Hydrogen etc: including NH3, Synthetic fuels and Synthetic methane.

Thank you for your attention

Q&A

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