



Japan-Russia Cooperation in Oil and Gas Upstream in Eastern Russia: Current Status and Perspective

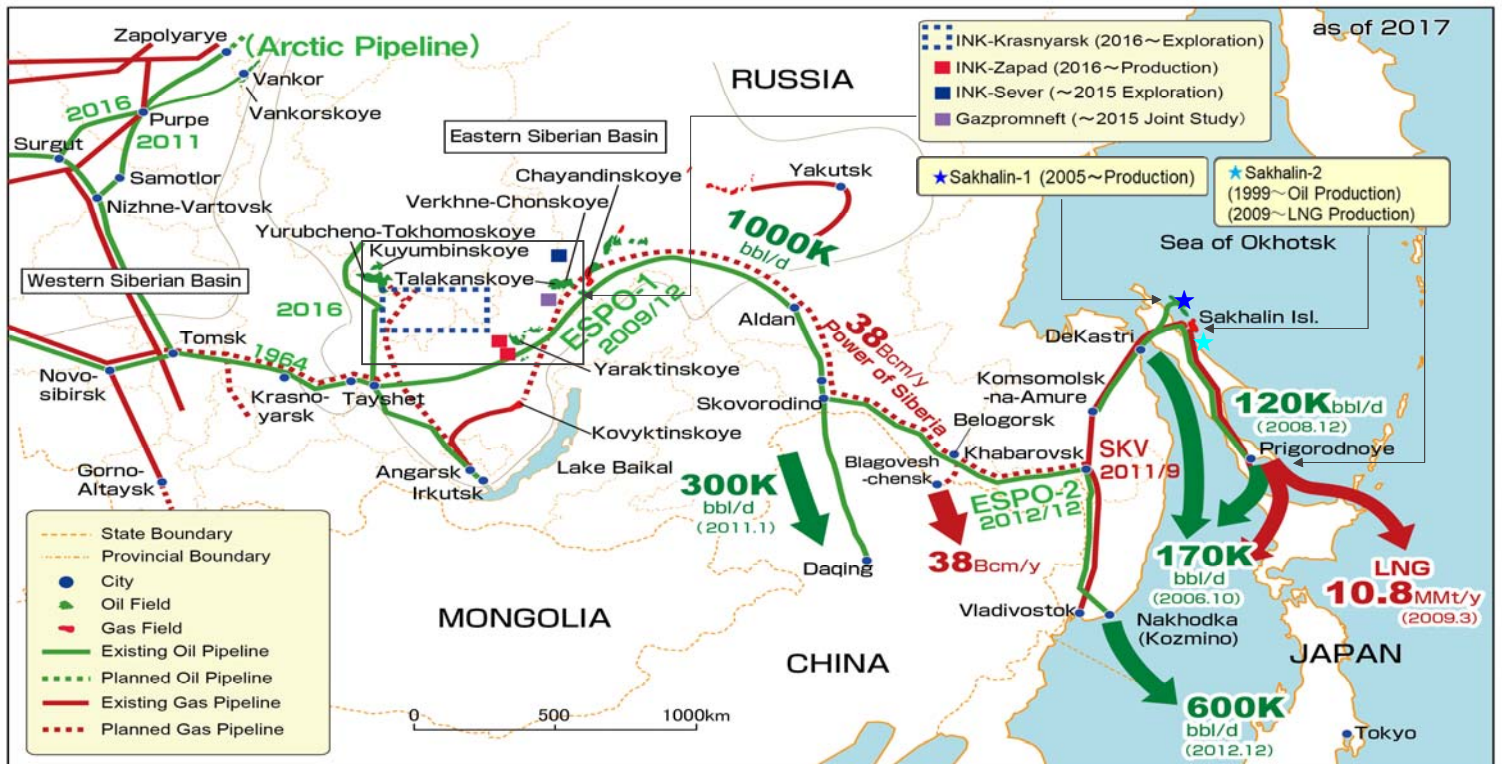
ロシア東部の石油・天然ガス資源開発における日露協力の現状と展望



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Drastic Increase of Oil & Gas Flow from Russia to Asia-Pacific region 1



※SKV=Sakhalin-Khabarovsk-Vladivostokパイプライン

※「シベリアのカ」パイプラインはかつてYKV(Yakutia-Khabarovsk-Vladivostok)と呼ばれていた。

Source: JOGMEC

East Siberia Pacific Ocean PL as the Driving Force



Section	Tariff@2015	Tariff@2016	Tariff@2017	USD/BBL
ESPO1 (for China)	1412RUB/t	2366RUB/t	2461RUB/t	5USD/BBL
ESPO1~2 (for Asia Pacific)	2237RUB/t			~12USD/BBL

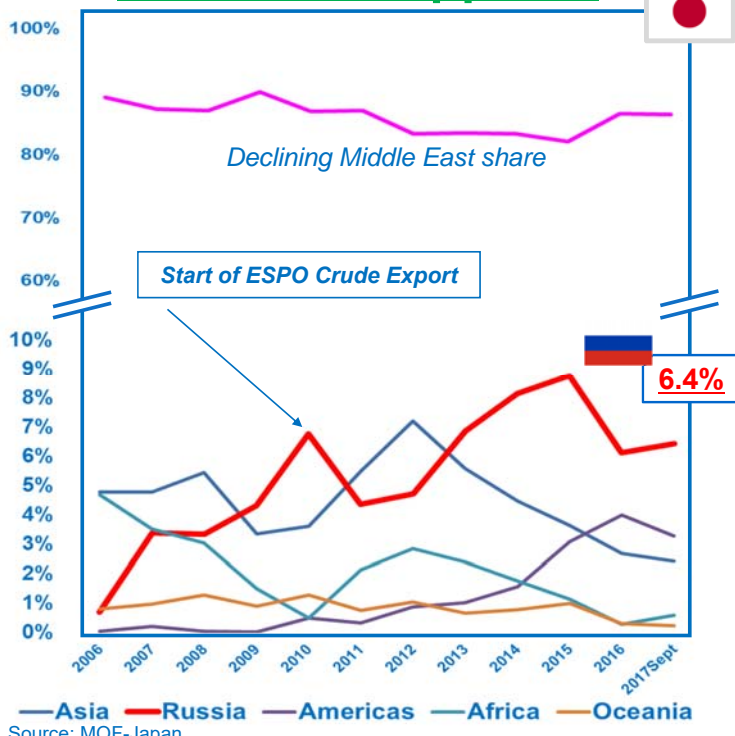
Year	Events	To Skovorodino	Skovorodino-Daqing	To Kozmino
2009	ESPO-1 & Kozmino Completion	600MBD	-	Using Railway transportaion
2010	Daqing Spur Completion		300kBD	
2012	ESPO-2 Completion		Planned expansion but delayed	
2013	SPA between Rosneft & CNPC	1MMBD		600kBD
2019	Planned Expansion by Transneft	1.6MMBD	600kBD	1MMBD

From 2015 to 2017: 100MBD additional → 400MBD
 From 2018 to 2037: 200MBD additional → 600MBD

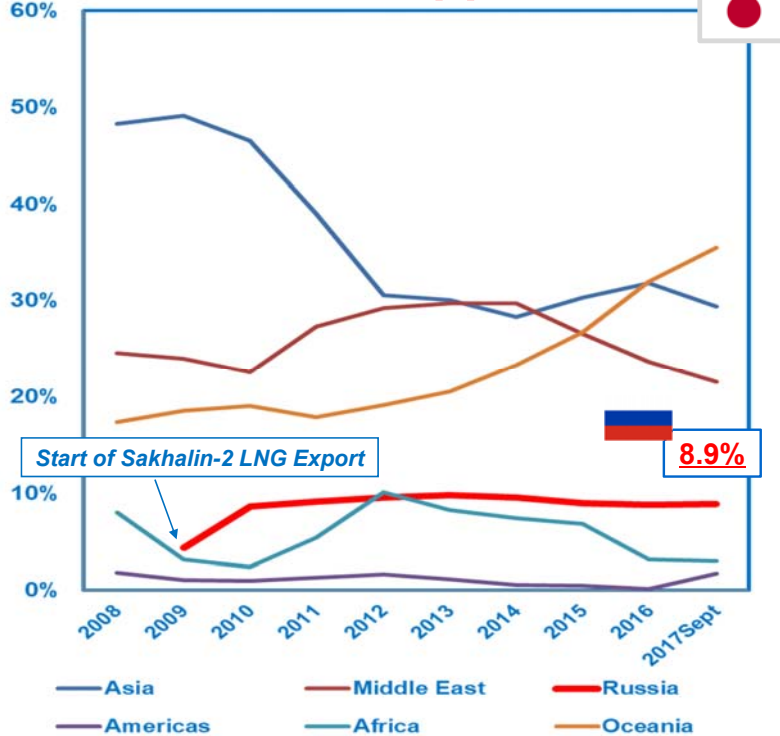
The Flow from Kozmino to China has been increasing from 2015

Russia holds the Key for Japan's Energy Security

Crude Oil Suppliers

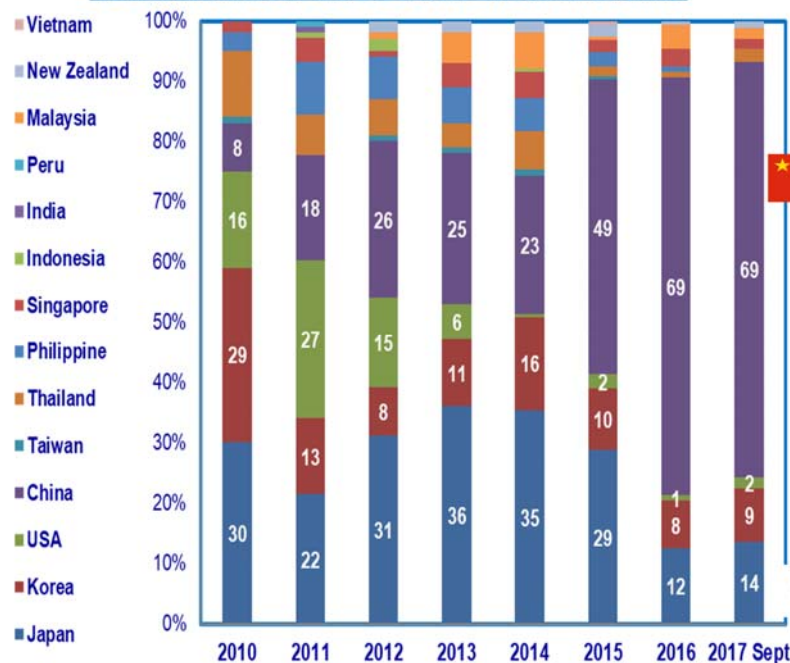


LNG Suppliers

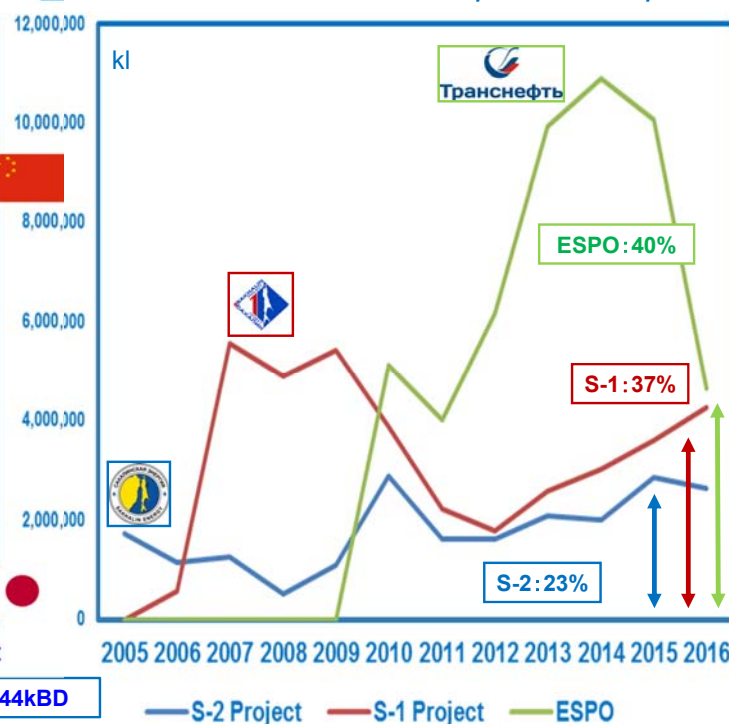


Russia holds the Key for Japan's Energy Security

Consumers of ESPO crude from Kozmino



Breakdown of Russia crude imported to Japan



306kBD → 304kBD → 326kBD → 420kBD → 490kBD → 614kBD → 854kBD → 644kBD

Source: JOGMEC, METI-Japan

Russia Takes over Crude Oil Market in Japan Steadily

Year	First Supplier	Second Supplier	Third Supplier	Fourth Supplier	Fifth Supplier	Sixth Supplier
2017 Sept	Saudi Arabia 39.9%, 2.1Tyen	UAE 23.9%, 1.2Tyen	Qatar 7.3%, 0.3Tyen	Kuwait 6.9%, 0.3Tyen	Russia 6.4%, 0.4Tyen	Iran 5.3%, 0.3Tyen
2016	Saudi Arabia 35.4%, 1.7Tyen	UAE 24.5%, 1.2Tyen	Qatar 9.2%, 0.5Tyen	Kuwait 7.6%, 0.3Tyen	Iran 6.7%, 0.3Tyen	Russia 6.1%, 0.3Tyen
2015	Saudi Arabia 33.4%, 2.7Tyen	UAE 25.3%, 2.1Tyen	Russia 8.8%, 0.7Tyen	Qatar 8.2%, 0.7Tyen	Kuwait 7.8%, 0.6Tyen	Iran 5.0%, 0.4Tyen
2014	Saudi Arabia 33.3%, 4.6Tyen	UAE 24.2%, 3.4Tyen	Qatar 11.0%, 1.5Tyen	Russia 8.1%, 1.1Tyen	Kuwait 7.3%, 1.0Tyen	Iran 4.8%, 0.6Tyen
2013	Saudi Arabia 31.8%, 4.5Tyen	UAE 22.7%, 3.2Tyen	Qatar 12.7%, 1.7Tyen	Kuwait 7.3%, 1.0Tyen	Russia 6.9%, 1.0Tyen	Iran 4.9%, 0.7Tyen
2012	Saudi Arabia 33.0%, 4.0Tyen	UAE 21.8%, 2.7Tyen	Qatar 10.7%, 1.3Tyen	Kuwait 7.6%, 0.9Tyen	Iran 5.2%, 0.6Tyen	Russia 4.7%, 0.6Tyen
2011	Saudi Arabia 32.8%, 3.7Tyen	UAE 22.9%, 2.6Tyen	Qatar 10.5%, 1.2Tyen	Iran 8.7%, 1.0Tyen	Kuwait 6.8%, 0.8Tyen	Russia 4.4%, 0.5Tyen
2010	Saudi Arabia 30.3%, 2.9Tyen	UAE 20.6%, 2.0Tyen	Qatar 11.8%, 1.1Tyen	Iran 9.8%, 0.9Tyen	Kuwait 7.5%, 0.7Tyen	Russia 6.8%, 0.6Tyen
<i>ESPO PL's operation started in December, 2009</i>						
2009	Saudi Arabia 31.9%, 2.4Tyen	UAE 21.3%, 1.6Tyen	Qatar 11.9%, 0.9Tyen	Iran 11.2%, 0.8Tyen	Kuwait 8.5%, 0.5Tyen	Russia 4.3%, 0.3Tyen
2008	Saudi Arabia 29.0%, 4.6Tyen	UAE 24.3%, 4.0Tyen	Iran 11.6%, 1.8Tyen	Qatar 10.7%, 1.7Tyen	Kuwait 7.7%, 1.1Tyen	Russia 3.3%, 0.5Tyen
2007	Saudi Arabia 28.8%, 3.5Tyen	UAE 25.1%, 3.1Tyen	Iran 11.9%, 1.4Tyen	Qatar 10.5%, 1.3Tyen	Kuwait 7.3%, 0.8Tyen	Russia 3.4%, 0.4Tyen
<i>Export crude oil from Sakhalin-1 started in October, 2006</i>						
2006	Saudi Arabia 32.2%, 3.7Tyen	UAE 25.4%, 3.0Tyen	Iran 11.3%, 1.2Tyen	Qatar 10.0%, 1.2Tyen	Kuwait 7.3%, 0.8Tyen	Sudan 2.9%, 0.3Tyen

Russia as a Reasonable LNG Supplier

1000yen/ton	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017 Sept	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	47.4	48.8	12.06
Russia	-	-	-	32.1	38.3	52.7	59.5	71.5	83.3	62.7	37.2	43.0	53.4	13.20
USA	36.2	36.7	41.3	40.7	55.5	54.2	65.9	-	85.4	47.9	-	69.9	53.4	13.20
Australia	38.8	42.0	61.4	42.9	52.2	61.2	65.6	75.6	86.3	63.4	41.0	47.6	56.5	13.97
Papua New Guinea	-	-	-	-	-	-	-	-	78.3	64.5	40.1	48.6	57.9	14.32
UAE	40.7	43.6	60.6	43.3	52.8	63.3	71.7	85.0	91.4	62.7	37.2	46.6	58.2	14.40
France	-	-	-	-	-	-	71.7	86.1	-	54.6	39.4	45.2	59.4	14.69
Indonesia	48.7	51.4	62.2	36.3	42.7	62.2	75.1	87.8	94.2	68.0	42.2	49.1	60.0	14.84
Brunei	35.2	38.4	69.3	50.3	52.7	63.1	72.9	84.0	92.3	69.9	43.0	49.4	60.0	14.85
Malaysia	39.1	47.2	68.2	46.0	53.7	64.1	73.6	86.6	93.5	67.4	38.3	46.1	60.3	14.92
Qatar	45.8	49.5	71.7	53.0	56.4	64.6	71.8	84.6	92.2	66.5	35.6	44.1	61.3	15.16
Trinidad Tobago	69.2	63.8	86.6	46.5	45.6	42.7	52.6	80.3	92.7	70.4	46.4	-	63.3	15.66
Brazil	-	-	-	-	-	-	63.9	-	-	-	-	-	63.9	15.80
Nigeria	72.9	63.9	91.7	56.0	38.1	54.8	66.9	81.4	90.5	67.0	41.9	45.6	64.2	15.88
Yemen	-	-	-	-	36.0	60.0	68.1	83.9	84.8	58.0	-	-	65.1	16.11
Algeria	60.8	61.6	94.8	-	34.3	58.5	70.6	79.9	91.9	58.8	41.8	-	65.3	16.14
Equator Guinea	-	58.9	87.9	56.9	58.4	71.2	75.4	87.7	99.6	64.6	39.4	46.3	67.9	16.78
Angola	-	-	-	-	-	-	-	84.4	86.6	-	-	41.7	70.9	17.54
Egypt	67.4	66.3	87.3	87.6	60.1	65.0	72.8	83.2	93.3	-	36.0	41.8	69.2	17.11
Peru	-	-	-	-	-	57.2	68.1	86.6	104.6	82.6	-	50.2	74.9	18.51
Spain	-	-	-	-	-	-	69.2	83.7	79.9	67.1	-	-	75.0	18.55
Norway	-	-	94.6	-	-	54.1	64.8	87.8	84.3	74.6	-	-	76.7	18.97
Belgium	-	-	-	-	-	-	74.1	-	94.9	-	-	-	84.5	20.90
Netherlands	-	-	-	-	-	-	-	-	101.2	-	-	-	101.2	25.03
Korea	-	-	-	-	-	-	-	-	-	52.9	34.0	33.8	40.3	9.96
Singapore	-	-	-	-	-	-	-	-	-	51.9	36.5	42.6	43.7	10.80

Earthquake 2011 and Fukushima

Source: MOF-Japan

*Conversion factor: 1USD=101.91yen (average from 2006 to 2017), 1t=39.7MMBTU

Rising LNG Projects in Russia targeting West & East

Projects	Partners	Resource	Proven Reserves	Start up	Capacity
Sakhalin-2 3rd Train		Luni Pil'tun-Astokh	17.7TCF	1+2 trains: 2009 +3rd Train: 2020 possibly	Present 9.6MMt +5MMt
Vladivostok LNG		Kirinsky (S-3) Chayandinskoye	26.3TCF (ABC1+C2) 42.4TCF (ABC1+C2)	Postpone after 2023	15MMt
Far East LNG		Odoptu Chaivo Arkutun-Dagi	17.1TCF	after 2020	5MMt
Yamal LNG		Yuzhno-Tambeyskoye	24.6TCF	2017 to 2019 1 train each year	16.5MMt (5.5+5.5+5.5)
Arctic LNG		Salmanovskiy Geofizicheskiy	27.1TCF (ABC1+C2) 7.5TCF (ABC1+C2)	After 2022	16.5MMt (5.5+5.5+5.5)
Shtokman LNG		Shtokmanovskoye	137.7TCF (ABC1)	Postpone	7.5MMt
Baltic LNG		West Siberia Yamal Peninsula	-	-	10MMt
Pechora LNG		Kumzhinskoye Korovinskoye	3.4TCF (ABC1+C2) 1.5TCF (ABC1+C2)	-	3MMt

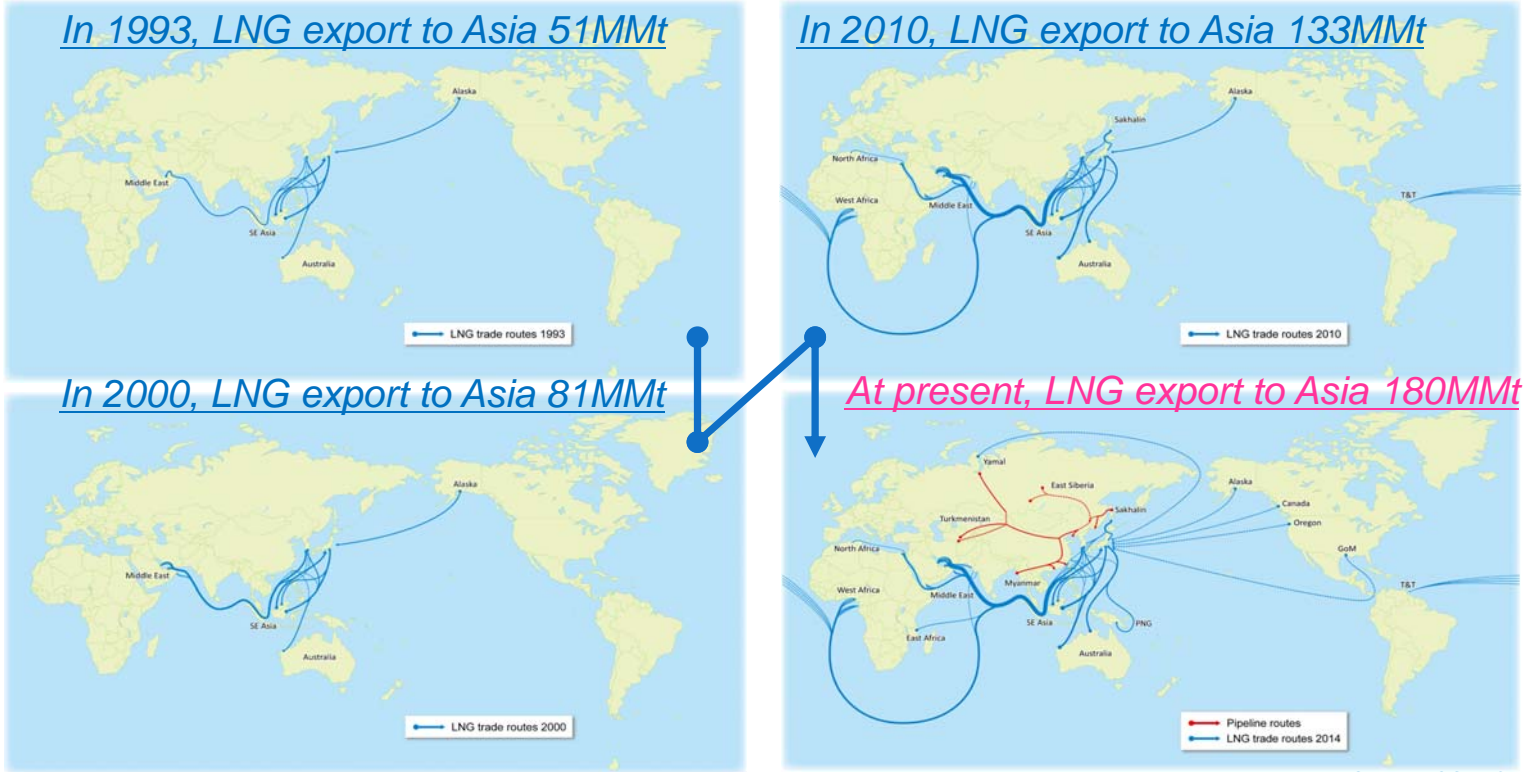
Expanding LNG trading, intensifying competitions

In 1993, LNG export to Asia 51MMt

In 2010, LNG export to Asia 133MMt

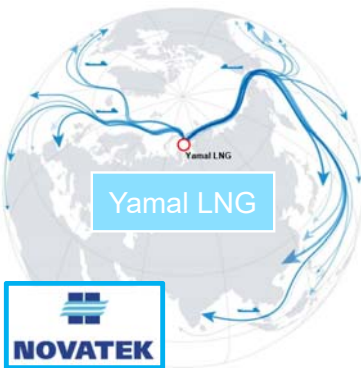
In 2000, LNG export to Asia 81MMt

At present, LNG export to Asia 180MMt

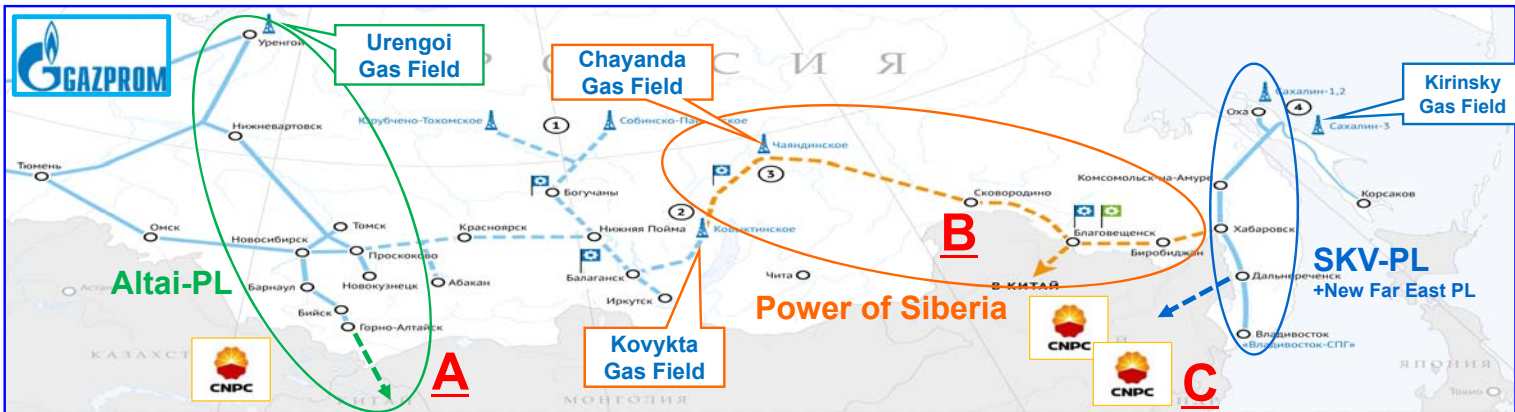


Source: JOGMEC

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



Buyer and/or Stakeholder	Volume	Items	A: Altai-PL (Power of Siberia-2)	B: Power of Siberia	C: New Far East PL (with SKV-PL)
TOTAL	3.3MMt	Distance <A>	2800km	4300km	1822km
Gas Natural Fenosa	2.5MMt	Diameter	1420mm, 56in	1400mm, 56in	700mm, 28in-1220mm, 48in
CNPC	3.0MMt (=4BCM)	Capacity	30BCM/y	60BCM/y	30BCM/y
Gazprom Marketing	3.0MMt	Total cost 	from 14bilUSD	from 25→70bilUSD	from 11→25.8bilUSD
ENGIE	1.0MMt	Unit cost <B/A>	from 5MM\$/km	from 6→16MM\$/km	from 6→14MM\$/km
Shell	0.9MMt	Start operation	NA, possibly later 2020	from 2019	from Sept, 2011
Silk Road Fund	1.6MMt (=2BCM)	Resource	West Siberia	East Siberia	Sakhalin
		Tie-in point	Xinjiang Uyghur	Northeast China	Northeast China
		Issues	-World Heritage -Competes with Turkmen gas	-Under construction without confirmation of detailed SPA	-Low operation rate -Limited demand





Thank you for your attention

Q&A

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