

Securities Code

Tokyo 5020

# Supplementary Information

~ JX Group A to Z ~

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February 7, 2017



The Future of Energy, Resources and Materials

**JX Holdings, Inc.**

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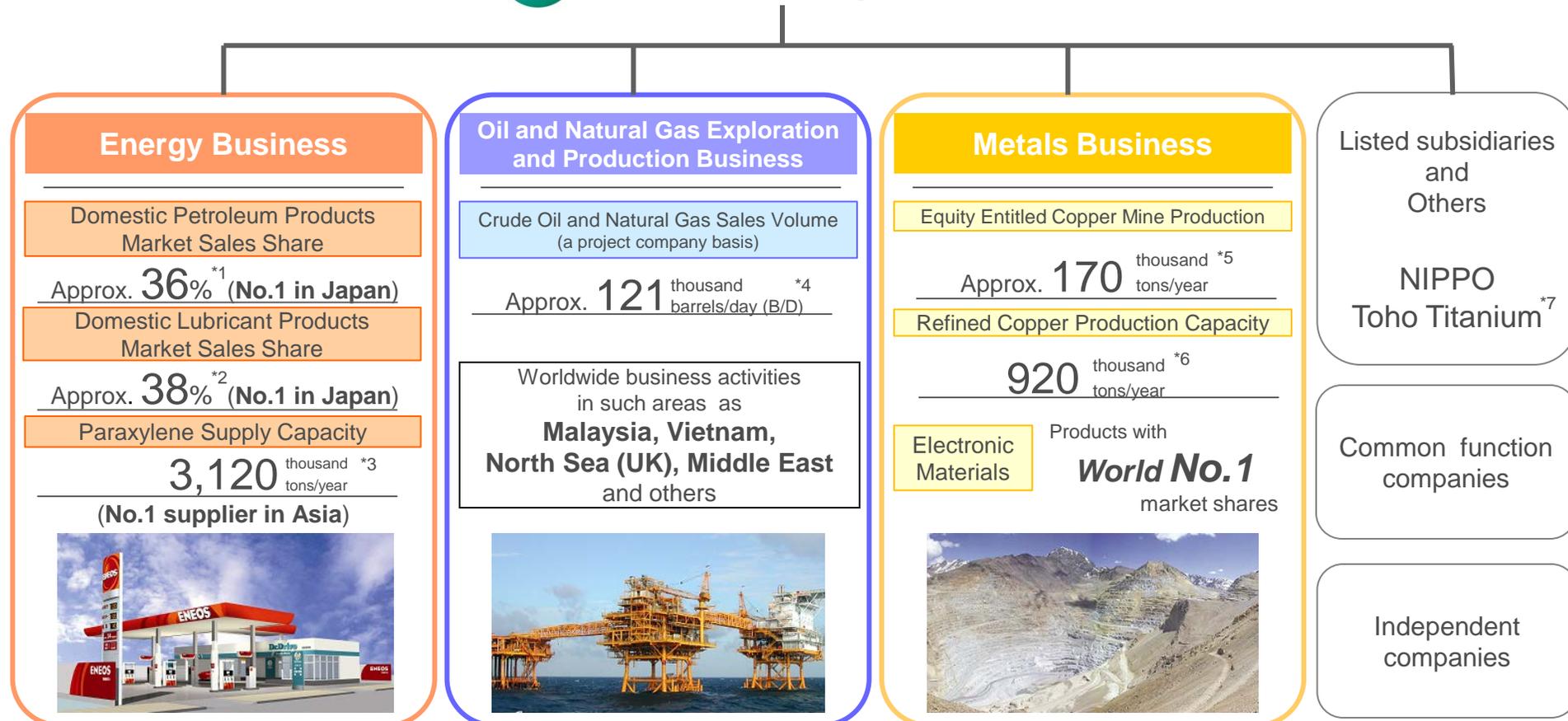
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# Summary of JX Group's Businesses



## JX JX Holdings, Inc.



### Energy Business

Domestic Petroleum Products  
Market Sales Share

Approx. **36%**<sup>\*1</sup> (No.1 in Japan)

Domestic Lubricant Products  
Market Sales Share

Approx. **38%**<sup>\*2</sup> (No.1 in Japan)

Paraxylene Supply Capacity

**3,120** thousand<sup>\*3</sup>  
tons/year

(No.1 supplier in Asia)



### Oil and Natural Gas Exploration and Production Business

Crude Oil and Natural Gas Sales Volume  
(a project company basis)

Approx. **121** thousand<sup>\*4</sup>  
barrels/day (B/D)

Worldwide business activities  
in such areas as  
**Malaysia, Vietnam,  
North Sea (UK), Middle East**  
and others



### Metals Business

Equity Entitled Copper Mine Production

Approx. **170** thousand<sup>\*5</sup>  
tons/year

Refined Copper Production Capacity

**920** thousand<sup>\*6</sup>  
tons/year

Electronic  
Materials

Products with  
**World No.1**  
market shares



Listed subsidiaries  
and  
Others

NIPPO  
Toho Titanium<sup>\*7</sup>

Common function  
companies

Independent  
companies

\*1 FY2015 actual \*2 FY2015 actual \*3 As of Mar. 2016

\*4 Crude oil equivalent (average daily production from Jan. to Dec. 2015 actual)

\*5 Equity entitled copper production contained in copper concentrate (FY2015 actual)

\*6 Pan Pacific Copper (67.8% equity stake) ; 650 thousand tons/year + LS-Nikko Copper (39.9% equity stake) ; 270 thousand tons/year (As of Mar. 2016)

\*7 Profit and loss of Toho Titanium is included in the Metals Business.



# Financial Results

## Financial Summary



(JPY billion)	FY2015			FY2016		
	1H	3Q (Apr.-Dec.)	Full Year	1H	3Q (Apr.-Dec.)	Full Year
	Actual	Actual	Actual	Actual	Actual	Forecast (Feb. 2017)
<b>Net Sales</b>	<b>4,552.6</b>	<b>6,689.0</b>	<b>8,737.8</b>	<b>3,669.8</b>	<b>5,777.4</b>	<b>8,130.0</b>
Energy	3,742.5	5,503.9	7,122.4	2,965.8	4,701.2	6,530.0
Oil and Natural Gas E&P	90.3	134.8	175.8	87.4	125.8	160.0
Metals	563.2	792.8	1,049.7	464.6	715.4	1,020.0
Others	156.6	257.5	389.9	152.0	235.0	420.0
<b>Operating Income (Loss)</b>	<b>(45.5)</b>	<b>(79.3)</b>	<b>(62.2)</b>	<b>47.5</b>	<b>170.9</b>	<b>270.0</b>
Energy	(91.0)	(141.7)	(141.4)	30.8	125.2	200.0
Oil and Natural Gas E&P	14.6	20.7	21.6	1.2	14.4	16.0
Metals	16.8	14.1	14.7	(5.3)	0.8	12.0
Others	14.1	27.6	42.9	20.8	30.5	42.0
<b>Ordinary Income (Loss)</b>	<b>(27.7)</b>	<b>(52.9)</b>	<b>(8.6)</b>	<b>71.0</b>	<b>191.4</b>	<b>300.0</b>
Energy	(72.4)	(115.5)	(97.1)	52.2	139.8	225.0
Oil and Natural Gas E&P	17.3	21.6	28.2	(2.0)	8.5	10.0
Metals	10.6	8.8	13.3	0.5	11.2	18.0
Others	16.8	32.2	47.0	20.3	31.9	47.0
<b>Profit attributable to owners of parent</b>	<b>(44.9)</b>	<b>(113.4)</b>	<b>(278.5)</b>	<b>25.4</b>	<b>94.5</b>	<b>150.0</b>
Energy	(54.0)	(90.5)	(82.9)	34.5	91.5	155.0
Oil and Natural Gas E&P	3.5	(11.2)	(191.2)	(15.2)	(18.7)	(43.0)
Metals	0.0	(43.2)	(47.9)	(2.4)	3.6	10.0
Others	5.6	31.5	43.5	8.5	18.1	28.0
Capex	151.0	227.0	320.0	158.2	223.8	380.0
Depreciation and Amortization	111.0	169.1	227.7	118.1	173.2	230.0



# Ordinary Income by segment

(JPY billion)	FY2015			FY2016		
	1H	3Q (Apr.-Dec.)	Full Year	1H	3Q (Apr.-Dec.)	Full Year
	Actual	Actual	Actual	Actual	Actual	Forecast (Feb. 2017)
<b>Ordinary Income (Loss)</b>	<b>(27.7)</b>	<b>(52.9)</b>	<b>(8.6)</b>	<b>71.0</b>	<b>191.4</b>	<b>300.0</b>
<b>Energy Business</b>	<b>(72.4)</b>	<b>(115.5)</b>	<b>(97.1)</b>	<b>52.2</b>	<b>139.8</b>	<b>225.0</b>
Petroleum Products	11.7	40.8	89.1	9.7	31.6	50.0
Petrochemicals	32.5	51.8	77.6	32.0	52.0	70.0
Inventory Valuation	(116.6)	(208.1)	(263.8)	10.5	56.2	105.0
<b>Oil and Natural Gas E&amp;P Business</b>	<b>17.3</b>	<b>21.6</b>	<b>28.2</b>	<b>(2.0)</b>	<b>8.5</b>	<b>10.0</b>
<b>Metals Business</b>	<b>10.6</b>	<b>8.8</b>	<b>13.3</b>	<b>0.5</b>	<b>11.2</b>	<b>18.0</b>
Resources Development	(5.5)	(18.3)	(24.2)	(21.1)	(26.8)	(30.5)
Smelting and Refining	3.0	8.0	13.3	11.3	20.5	18.5
Electronic Materials	10.9	16.0	21.9	8.4	13.4	17.5
Recycling and Environmental Services	2.7	3.8	5.0	2.4	2.9	4.5
Titanium	1.6	2.8	3.0	1.3	3.0	3.0
Inventory Valuation	(2.1)	(3.5)	(5.7)	(1.8)	(1.8)	5.0
<b>Others</b>	<b>16.8</b>	<b>32.2</b>	<b>47.0</b>	<b>20.3</b>	<b>31.9</b>	<b>47.0</b>



## Balance Sheets

	Dec. 2015	Mar. 2016	Dec. 2016
(JPY billion)	Actual	Actual	Actual
<b>Total assets</b>	<b>7,062.9</b>	<b>6,724.6</b>	<b>6,764.9</b>
Current assets	2,752.8	2,651.3	2,709.4
- Cash and deposits	254.3	492.7	263.1
Noncurrent assets	4,310.1	4,073.3	4,055.5
Property, plant and equipment	2,478.3	2,453.5	2,438.5
Intangible assets	127.4	117.4	109.7
Investments and other assets	1,704.4	1,502.4	1,507.3
<b>Liabilities</b>	<b>4,878.5</b>	<b>4,796.2</b>	<b>4,802.4</b>
Interest-bearing debt	2,703.1	2,581.4	2,540.4
Other liabilities	2,175.4	2,214.8	2,262.0
<b>Net assets</b>	<b>2,184.4</b>	<b>1,928.4</b>	<b>1,962.5</b>
Shareholders' equity	1,472.7	1,307.6	1,362.4
Accumulated other comprehensive income (loss)	265.0	191.3	176.5
Non-controlling interests	446.7	429.5	423.6



## Performance Indicators

	FY2015		FY2016
	3Q (Apr.-Dec.)	Full Year	3Q (Apr.-Dec.)
(JPY billion)	Actual	Actual	Actual
Cash flows from operating activities	130.8	555.0	100.7
(Working capital)	14.6	453.3	(298.9)
Cash flows from investing activities	(229.5)	(307.7)	(209.3)
Free cash flows	(98.7)	247.3	(108.6)
Dividend and others	(56.0)	(62.1)	(60.8)
Net cash flows	(154.7)	185.2	(169.4)
	Dec. 2015	Mar. 2016	Dec. 2016
	Actual	Actual	Actual
Net D/E Ratio (times)	1.41	1.39	1.48
Shareholders' equity ratio (%)	24.6	22.3	22.7



## Equity in earnings of unconsolidated subsidiaries and affiliates

	FY2015			FY2016		
	1H	3Q (Apr.-Dec.)	Full Year	1H	3Q (Apr.-Dec.)	Full Year
(JPY billion)	Actual	Actual	Actual	Actual	Actual	Forecast (Feb. 2017)
Energy	3.1	6.4	5.6	1.4	2.0	4.0
Oil and Natural Gas E&P	0.6	0.4	1.0	(0.3)	(0.6)	(1.0)
Metals	0.6	4.7	10.2	11.4	18.0	20.0
Resources Development	9.7	11.5	14.5	7.8	6.5	11.0
Smelting and Refining	(9.1)	(6.8)	(4.3)	3.6	11.5	9.0
Others	0.6	1.1	1.3	0.7	1.3	1.0
Total	4.9	12.6	18.1	13.2	20.7	24.0



# Historical Dubai Crude Oil Price

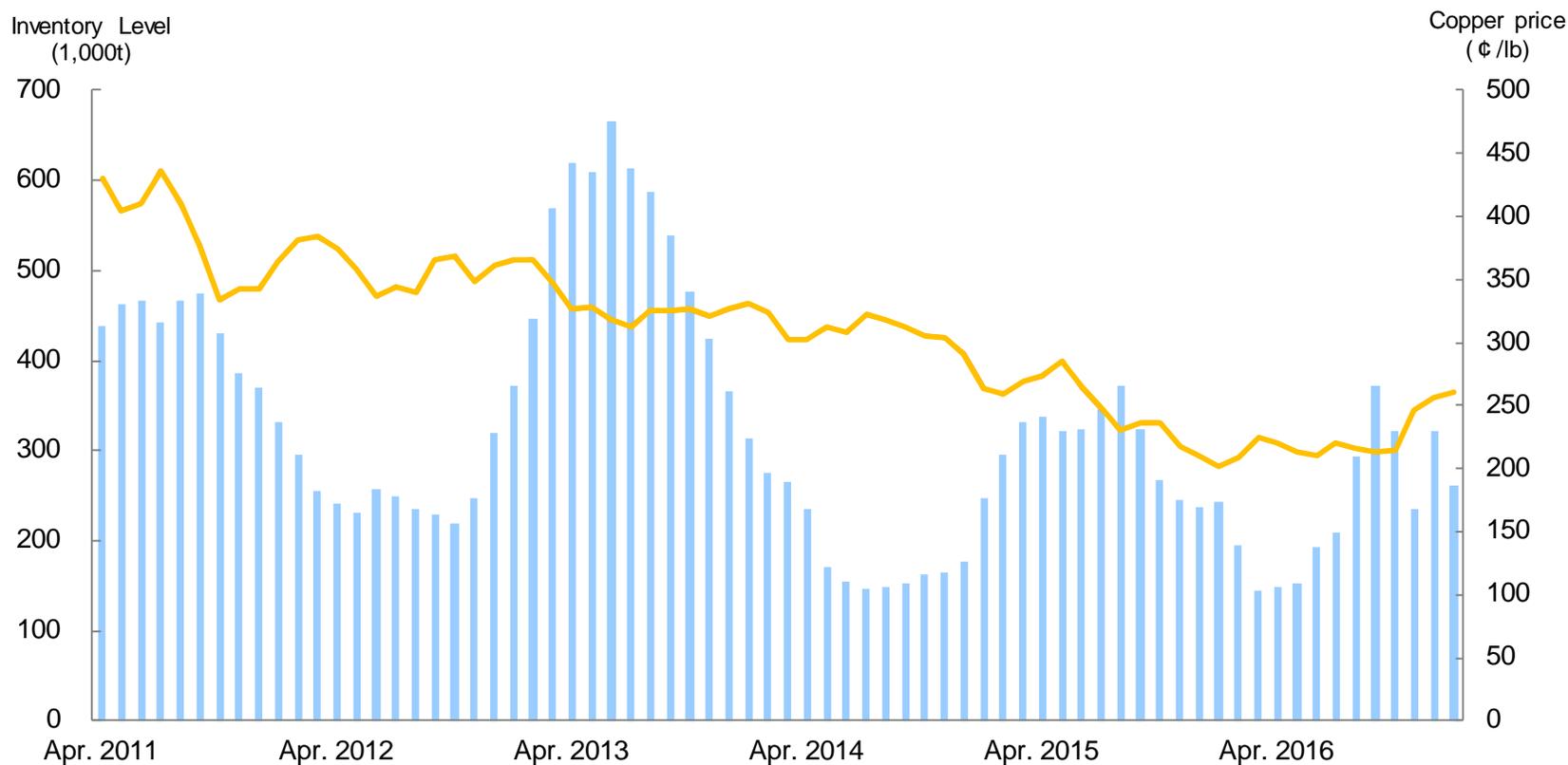
Average Price	(\$/bbl)											
	FY2011	FY2012	FY2013	FY2014	FY2015					FY2016		
					1Q	2Q	3Q	4Q	FY	1Q	2Q	3Q
Dubai Crude Oil	110	107	105	83	61	50	41	30	46	43	43	48





# Historical Copper Price and Inventory Level

Average Price	FY2011	FY2012	FY2013	FY2014	FY2015					FY2016		
					1Q	2Q	3Q	4Q	FY	1Q	2Q	3Q
Copper	385	356	322	297	275	238	222	212	237	215	216	240

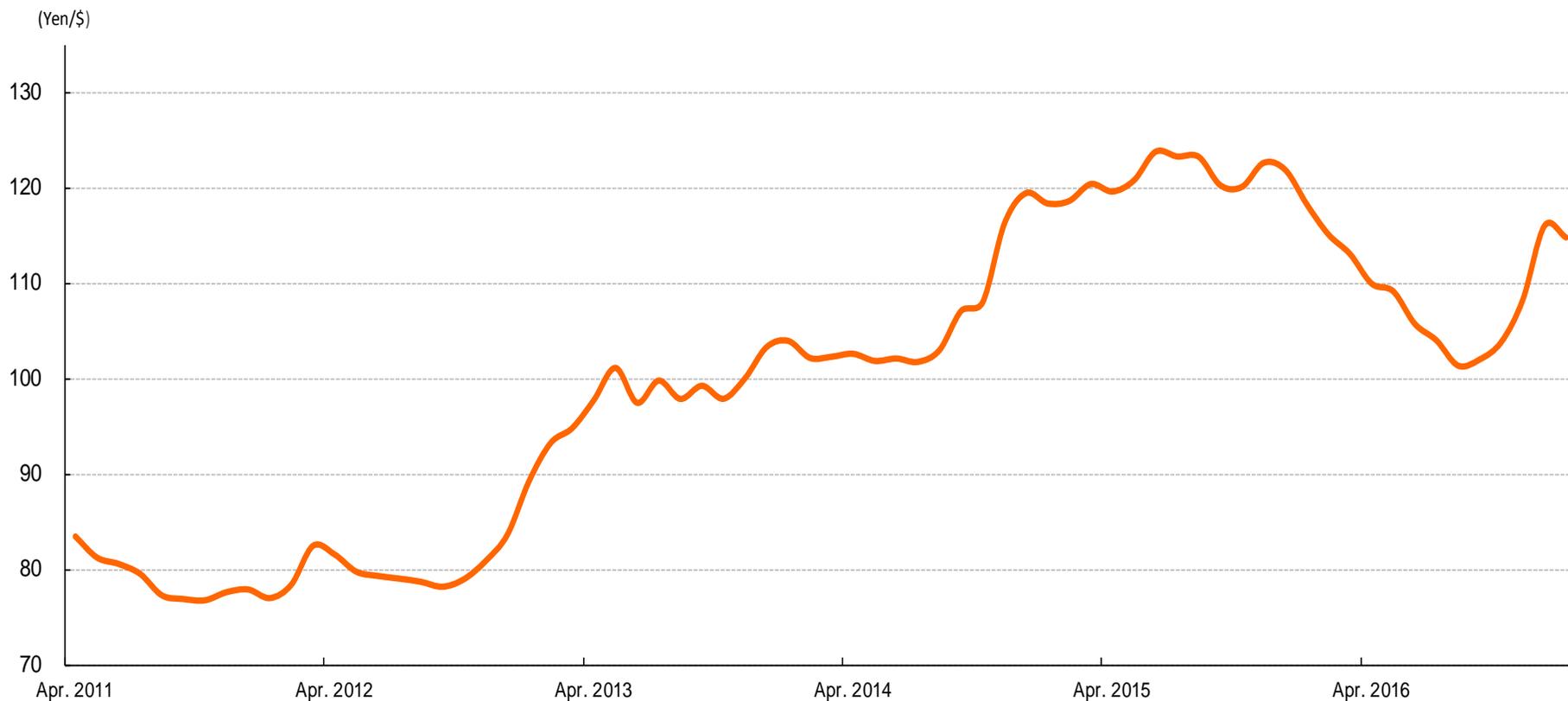


■ LME Copper inventory level (end of month)
 — LME Copper price (monthly average)



# Historical Exchange Rate

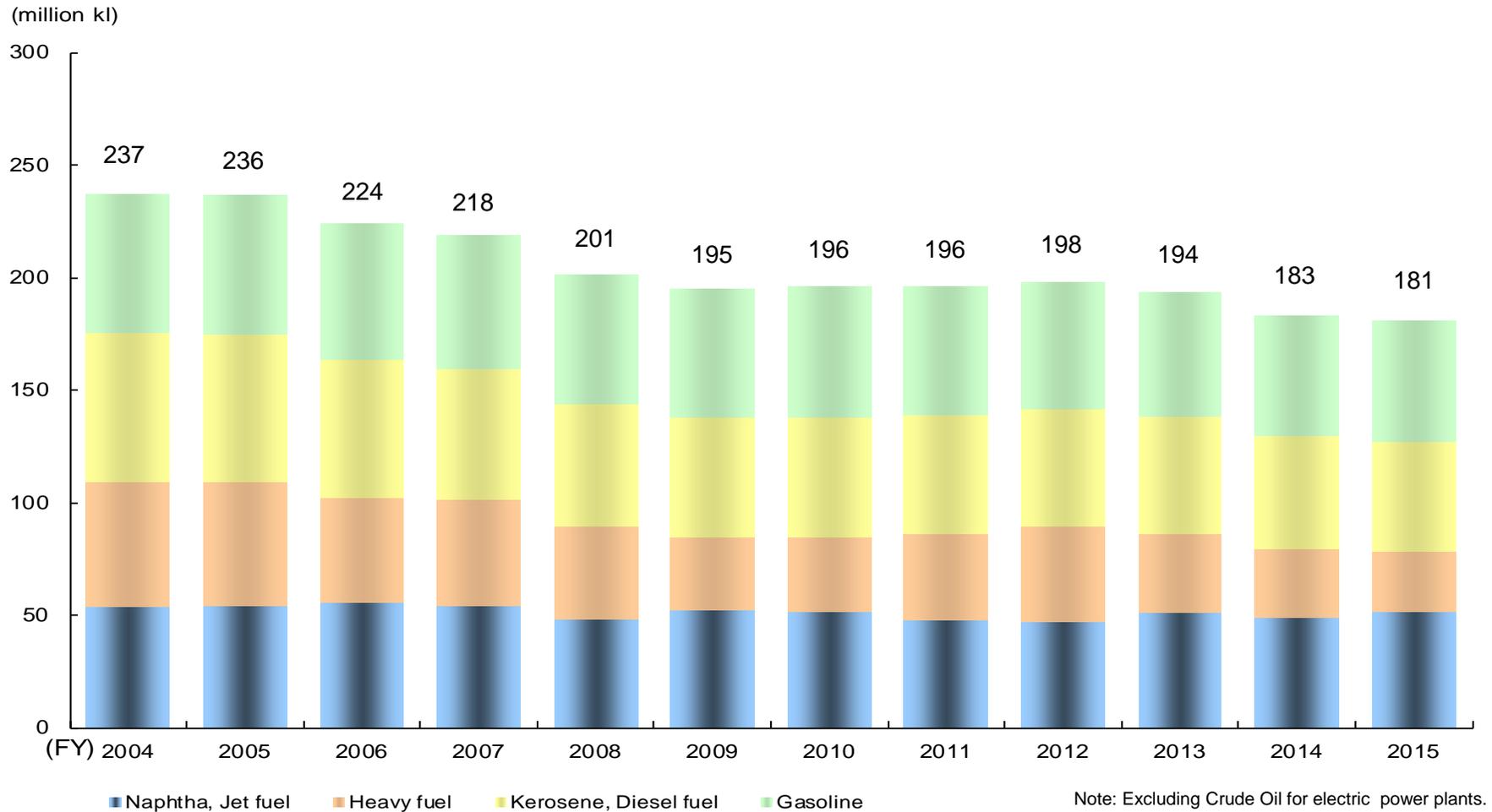
Average Price	FY2011	FY2012	FY2013	FY2014	FY2015					FY2016		
					1Q	2Q	3Q	4Q	FY	1Q	2Q	3Q
Exchange Rate	79	83	100	110	121	122	122	115	120	108	102	109



# Business Environment and Data - Energy Business -



# Domestic Petroleum Products Demands



Source: Petroleum Association of Japan and Company data

# JX Group's Market Share and Demand in Japan, Historical CDU<sup>\*1</sup> Utilization Rate

## Domestic Market Share

	FY2015 3Q(Apr.-Dec.) (%)	FY2015 (%)	FY2016 3Q(Apr.-Dec.) (%)
a) Gasoline	33.5	33.5	34.0
b) Kerosene	40.3	39.2	40.5
c) Diesel Fuel	36.7	36.7	36.5
d) Fuel Oil A	41.6	41.4	41.3
a+b+c+d	36.0	36.1	36.2
Total Domestic Fuel <sup>*2</sup>	35.3	35.6	35.9

## Domestic Demand

	FY2015 3Q(Apr.-Dec.) (1,000KL)	FY2015 (1,000KL)	FY2016 3Q(Apr.-Dec.) (1,000KL)	Changes vs. FY2015 3Q(Apr.-Dec.) (%)
a) Gasoline	40,486	53,127	40,202	99.3
b) Kerosene	8,592	15,946	8,989	104.6
c) Diesel Fuel	25,299	33,619	25,092	99.2
d) Fuel Oil A	8,082	11,871	8,381	103.7
a+b+c+d	82,459	114,562	82,664	100.2
Total Domestic Fuel <sup>*2</sup>	131,343	180,524	129,021	98.2

## CDU<sup>\*1</sup> Utilization Rate (Excluding the impact of periodic repair)

	FY2012	FY2013	FY2014	FY2015	FY2016 1Q	FY2016 2Q	FY2016 3Q
JX Group <sup>*3</sup>	88%	89%	91%	92%	93%	89%	93%

Source: Petroleum Association of Japan and Company data

### NOTES:

\*1 Crude Distillation Unit

\*2 Excluding crude oil for electric power plants

\*3 Excluding condensate splitters of Mizushima and Kashima

# Sales Volume by Product

	FY2015 3Q(Apr.-Dec.)	FY2016 3Q(Apr.-Dec.)	variation	Changes vs. FY2015 3Q(Apr.-Dec.)
	ten thousand KL	ten thousand KL	ten thousand KL	
<b>Gasoline</b>	1,355	1,368	+13	+1.0%
Premium	158	156	-2	-1.3%
Regular	1,189	1,203	+14	+1.2%
<b>Naphtha</b>	303	336	+33	+10.9%
<b>JET</b>	116	108	-8	-6.9%
<b>Kerosene</b>	313	334	+21	+6.7%
<b>Diesel Fuel</b>	924	916	-8	-0.9%
<b>Fuel Oil A</b>	336	346	+10	+3.0%
<b>Heavy Fuel Oil C</b>	443	409	-34	-7.7%
For Electric Power	295	255	-40	-13.6%
For General Use	148	154	+6	+4.1%
<b>Total Domestic Fuel</b>	<b>3,790</b>	<b>3,817</b>	<b>+27</b>	<b>+0.7%</b>
<b>Crude Oil</b>	146	63	-83	-56.8%
<b>Lubricants &amp; Specialities</b>	214	226	+12	+5.6%
<b>Petrochemicals (ten thousand ton)</b>	473	465	-8	-1.7%
<b>Exported Fuel</b>	827	947	+120	+14.5%
<b>LPG (ten thousand ton)</b>	28	15	-13	-46.4%
<b>Coal (ten thousand ton)</b>	526	399	-127	-24.1%
<b>Total Excluding Barter Trade &amp; Others</b>	<b>6,004</b>	<b>5,932</b>	<b>-72</b>	<b>-1.2%</b>
<b>Barter Trade &amp; Others</b>	1,578	1,679	+101	+6.4%
<b>Total</b>	<b>7,582</b>	<b>7,611</b>	<b>+29</b>	<b>+0.4%</b>

# Number of Service Stations (Fixed-Type) (As of the end of fiscal years)

	FY2013	FY2014	FY2015	FY2016 <sup>*5</sup> Dec 31
JX Group	11,017	10,783	10,548	10,385
EMG <sup>*1</sup>	3,379	3,481	3,410	3,386
Idemitsu Kosan	3,786	3,725	3,666	3,627
Showa Shell Sekiyu	3,442	3,317	3,193	3,151
Cosmo Oil	3,228	3,133	3,054	3,007
Others <sup>*2</sup>	1,096	836	837	824
Oil Companies	25,948 (74.8%)	25,275 (75.4%)	24,708 (76.4%)	24,380 (76.4%)
Private Brands and Others <sup>*3</sup>	8,758 (25.2%)	8,235 (24.6%)	7,625 (23.6%)	7,520 (23.6%)
Total	34,706	33,510	32,333	31,900

**Notes:**

\*1. Figures are total of Esso, Mobil and Tonen General Sekiyu until FY2013.

Since FY2014, figures are total of Esso, Mobil, Tonen General Sekiyu and Mitsui Oil & Gas.

\*2. Figures are total of Taiyo Petroleum, Kygnus Sekiyu and Mitsui Oil & Gas until FY2013.

Since FY2014, figures are total of Taiyo Petroleum and Kygnus Sekiyu.

\*3. FY2015 is estimated by JX Holdings.

\*4. Figures include only self-service retail outlets that are affiliated to oil companies.

\*5. Data except for JX Group is as of Sep 30, 2016.

## <Number of Company-Owned Service Stations>

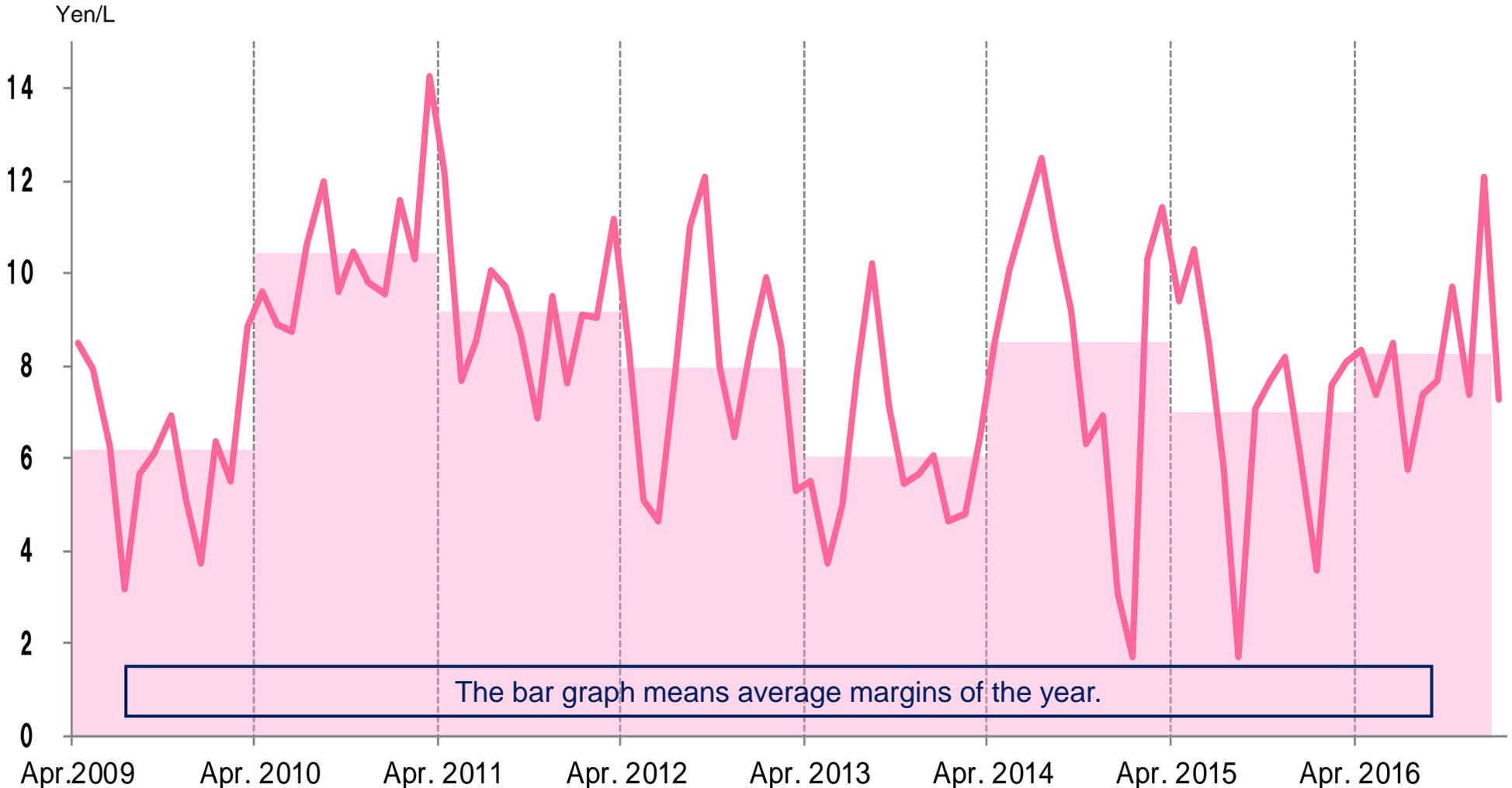
	FY2013	FY2014	FY2015	FY2016 <sup>*5</sup> Dec 31
JX Group	2,433	2,404	2,375	2,339

## <Number of Self-Service Stations>

	FY2013	FY2014	FY2015	FY2016 <sup>*5</sup> Dec 31
JX Group	2,654	2,752	2,805	2,840
Total for Japan <sup>*4</sup>	7,415	7,622	7,772	7,848



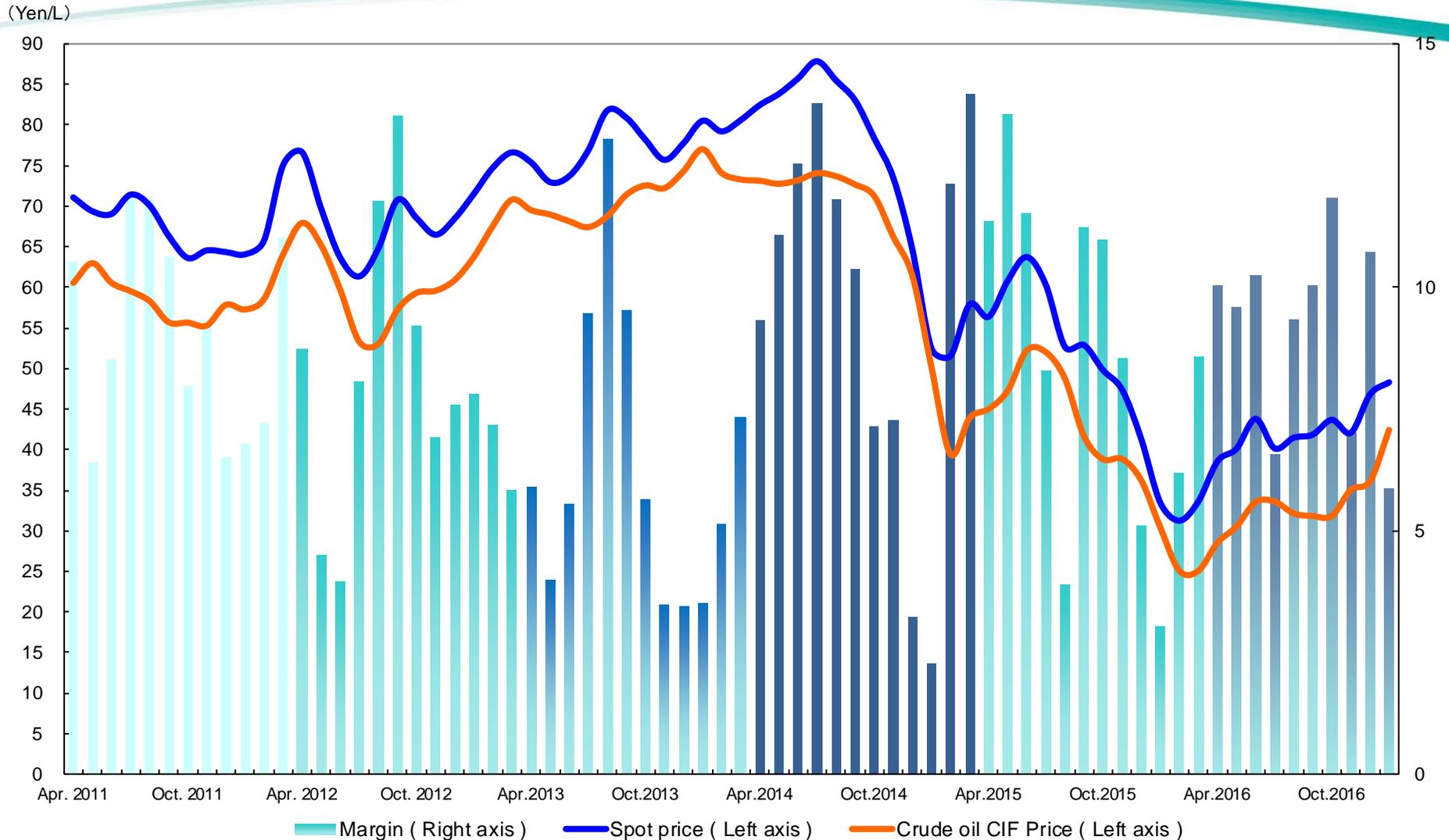
# Margins\* of Petroleum Products (Gasoline, Kerosene, Diesel Fuel and Fuel Oil A)



\* Margin = Spot Price – All Japan Crude Oil CIF (including petroleum tax and interest)



# Margins\* of Petroleum Products (Gasoline)

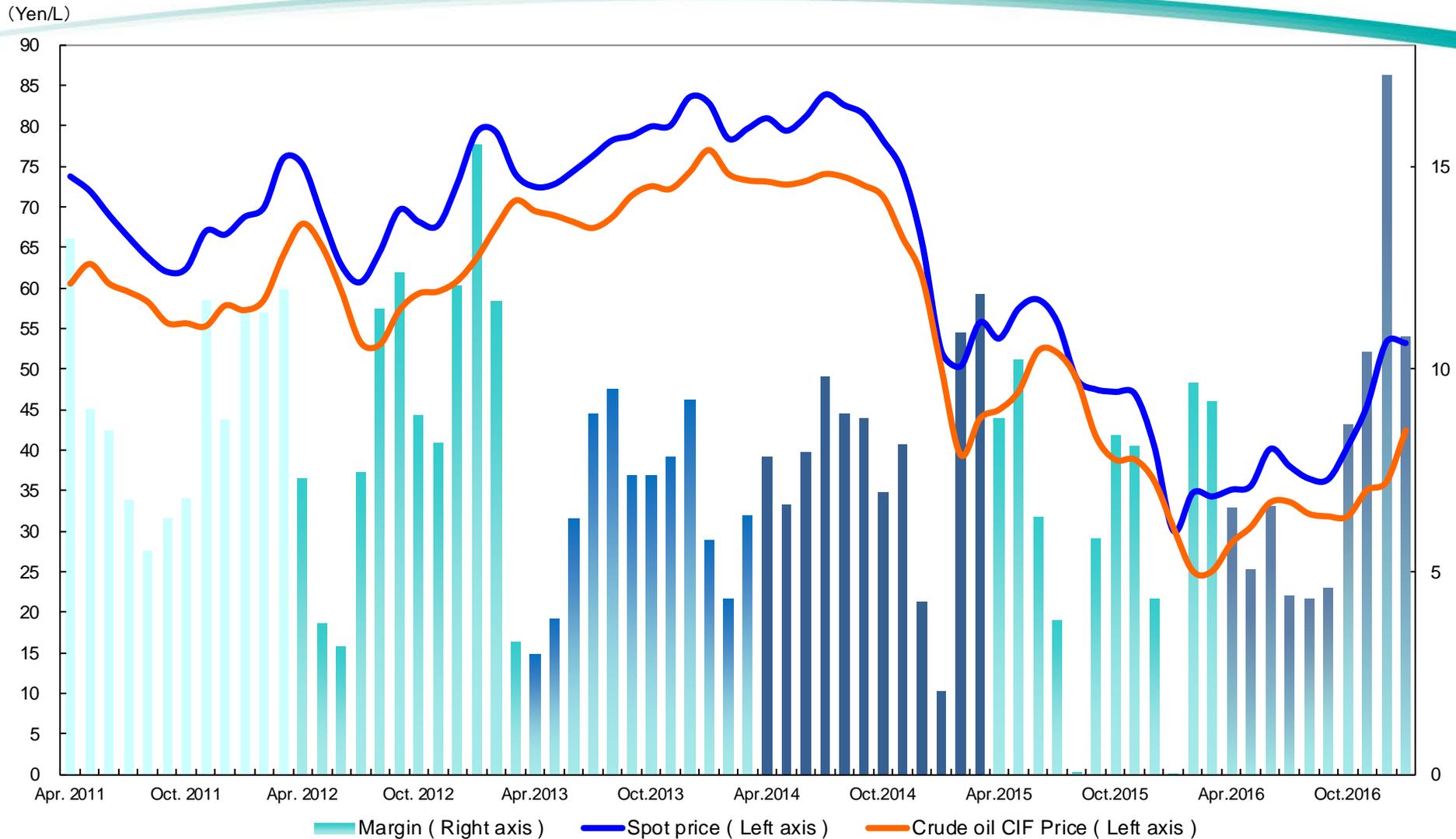


\* Margin = Spot Price – All Japan Crude Oil CIF (including petroleum tax and interest)

Source : Trade statistics (Ministry of Finance, Japan)



# Margins\* of Petroleum Products (Kerosene)

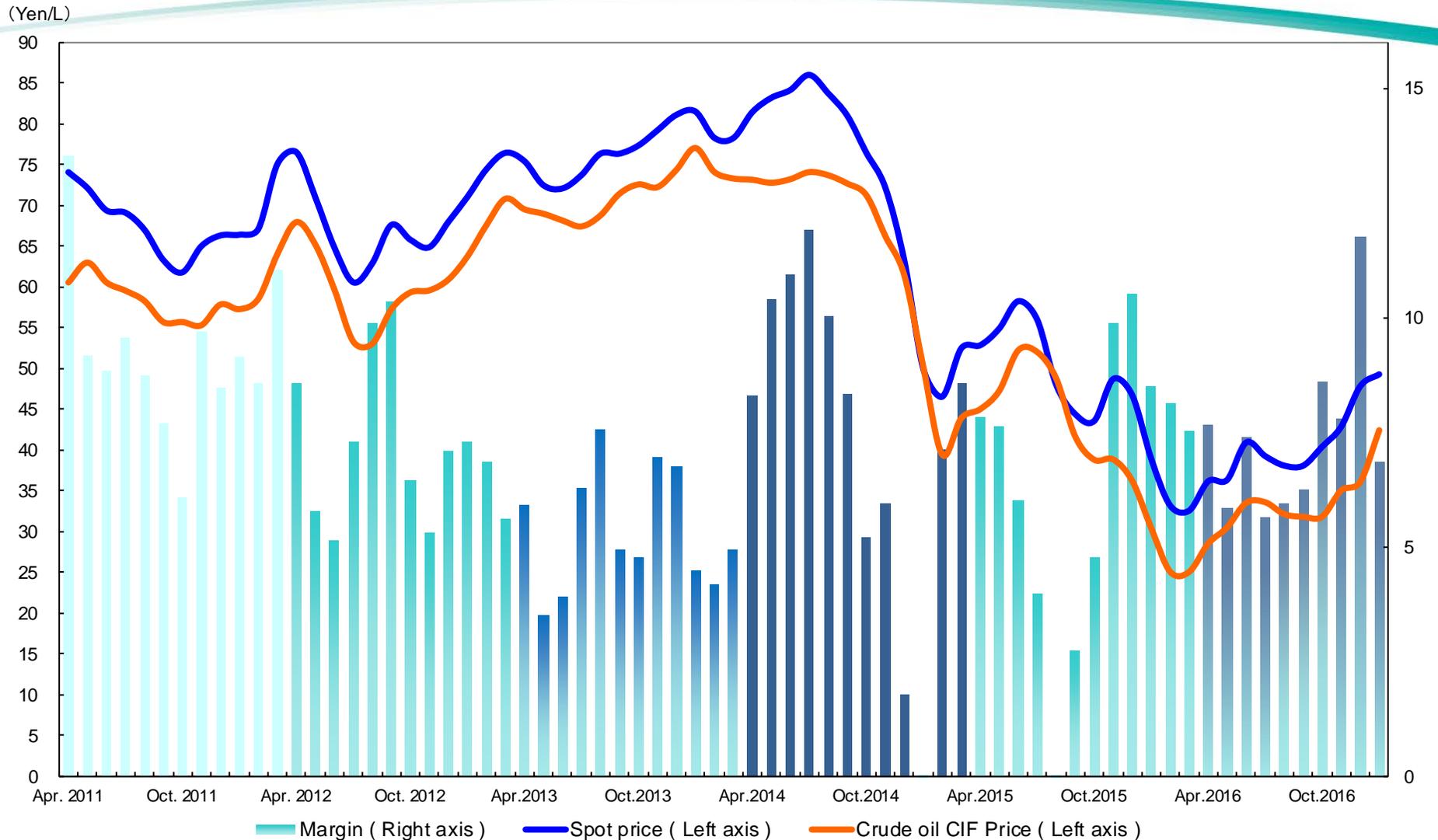


\* Margin = Spot Price – All Japan Crude Oil CIF (including petroleum tax and interest)

Source : Trade statistics (Ministry of Finance, Japan)



# Margins\* of Petroleum Products (Diesel Fuel)

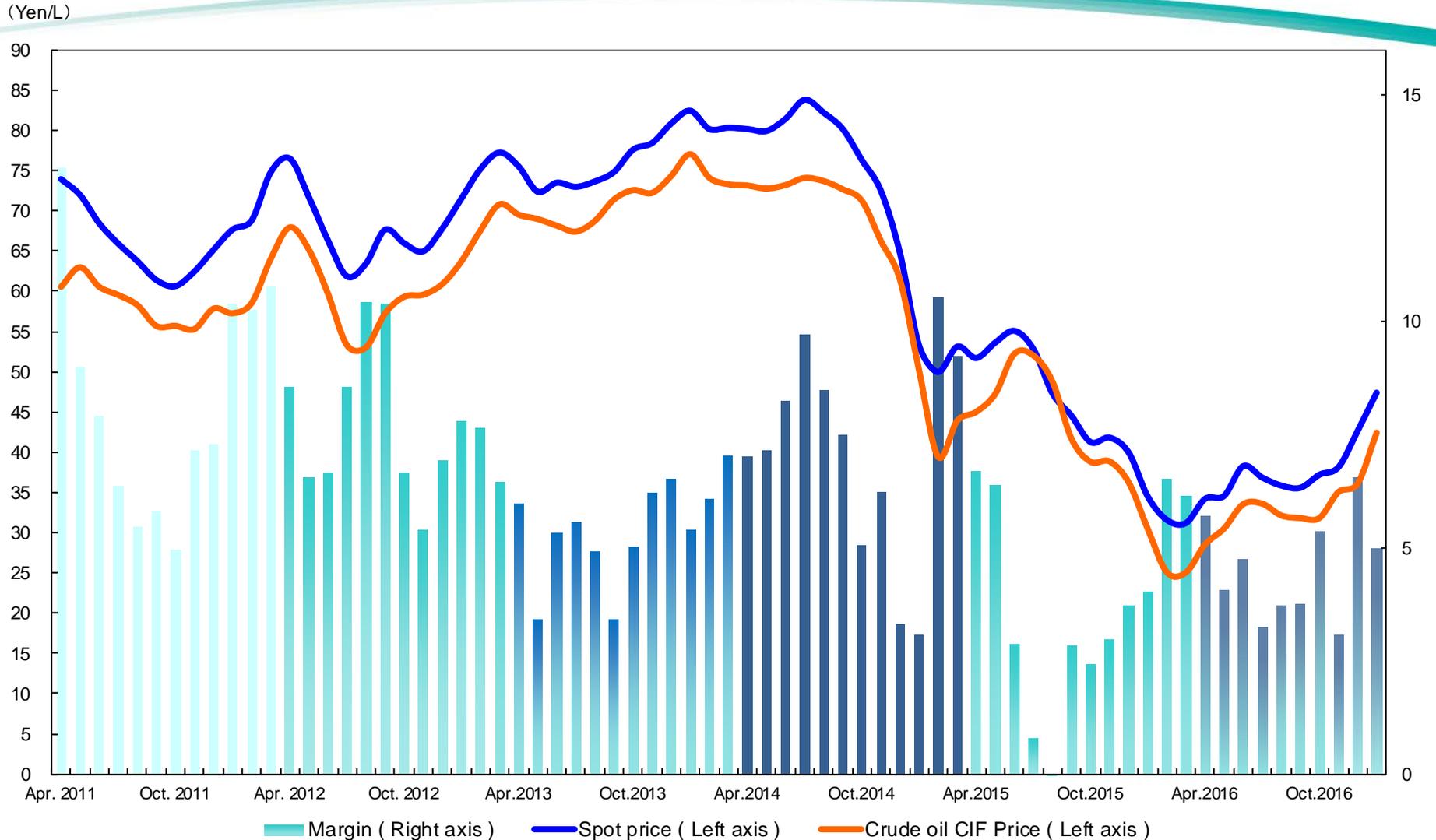


\* Margin = Spot Price – All Japan Crude Oil CIF (including petroleum tax and interest)

Source : Trade statistics (Ministry of Finance, Japan)



# Margins\* of Petroleum Products (Fuel Oil A)



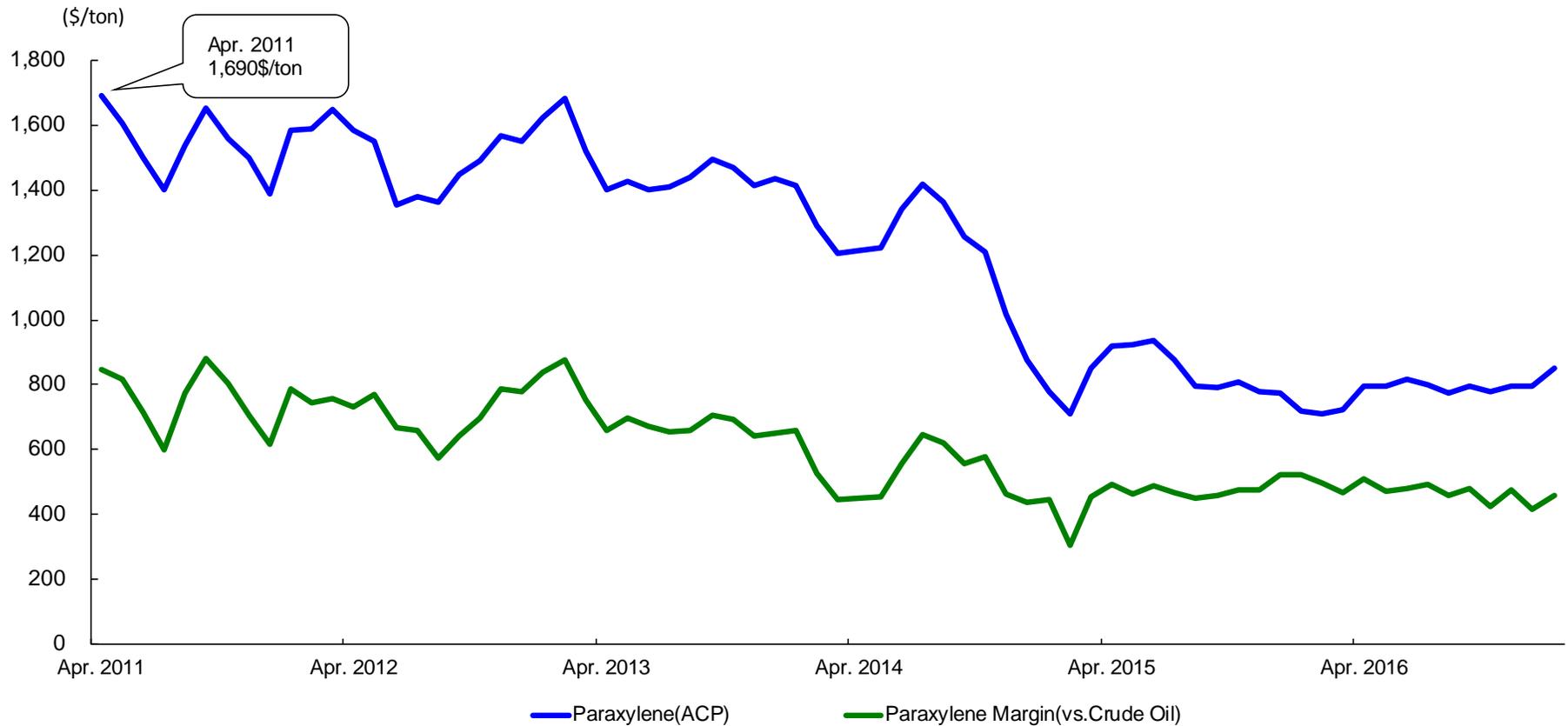
\* Margin = Spot Price – All Japan Crude Oil CIF (including petroleum tax and interest)

Source : Trade statistics (Ministry of Finance, Japan)



# Paraxylene Price and Margin (vs. Crude Oil)

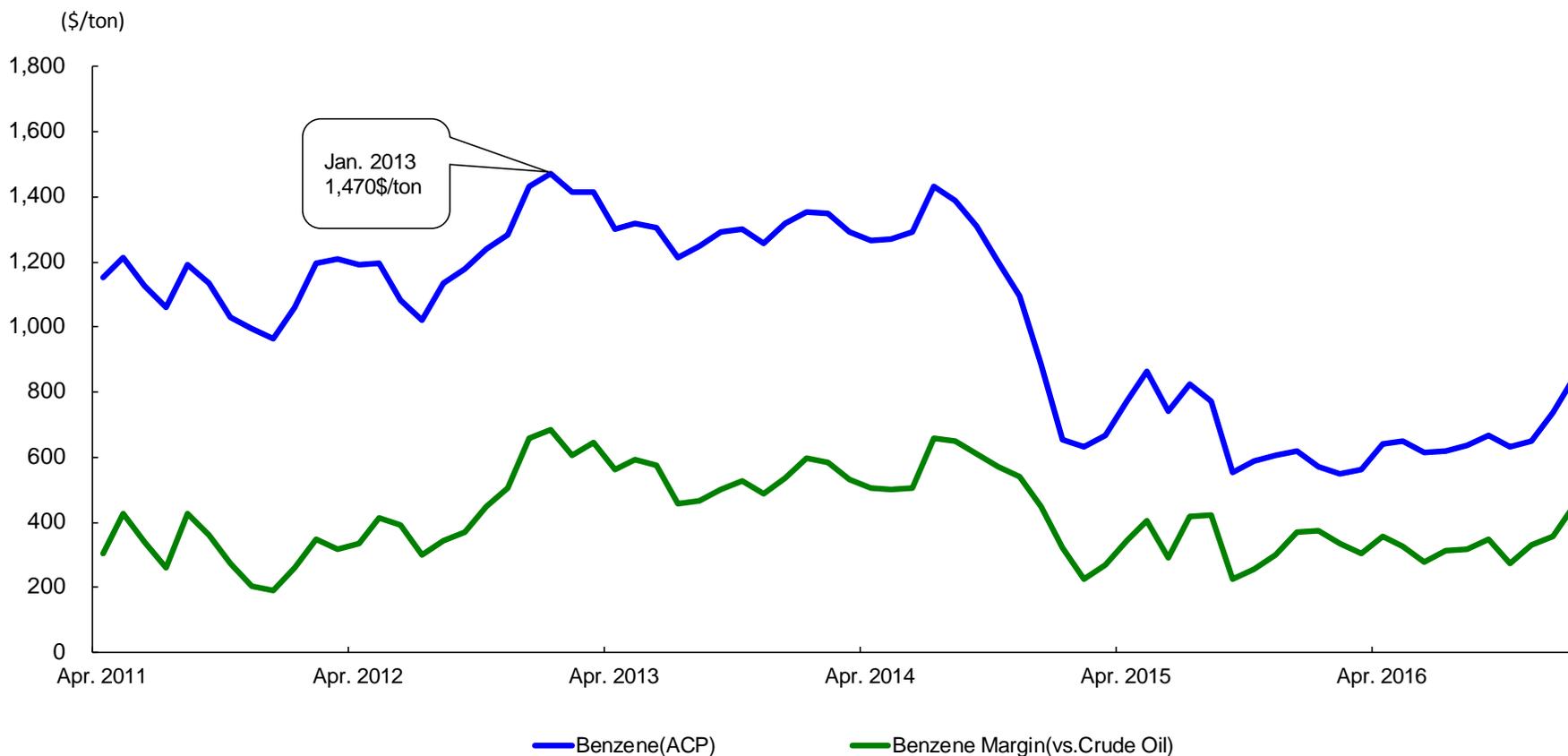
Average Price	FY2011	FY2012	FY2013	FY2014	FY2015					FY2016		
					1 Q	2 Q	3 Q	4 Q	FY	1 Q	2 Q	3 Q
Asian Contract Price	1,555	1,510	1,401	1,105	927	820	788	718	813	802	790	790
Margin (vs. Crude Oil)	754	732	639	498	481	459	492	496	482	488	476	439





# Benzene Price and Margin (vs. Crude Oil)

Average Price	FY2011	FY2012	FY2013	FY2014	FY2015					FY2016		
					1 Q	2 Q	3 Q	4 Q	FY	1 Q	2 Q	3 Q
Asian Contract Price	1,111	1,255	1,296	1,090	792	717	605	560	668	635	640	672
Margin (vs. Crude Oil)	310	476	535	483	346	355	309	339	337	321	326	320



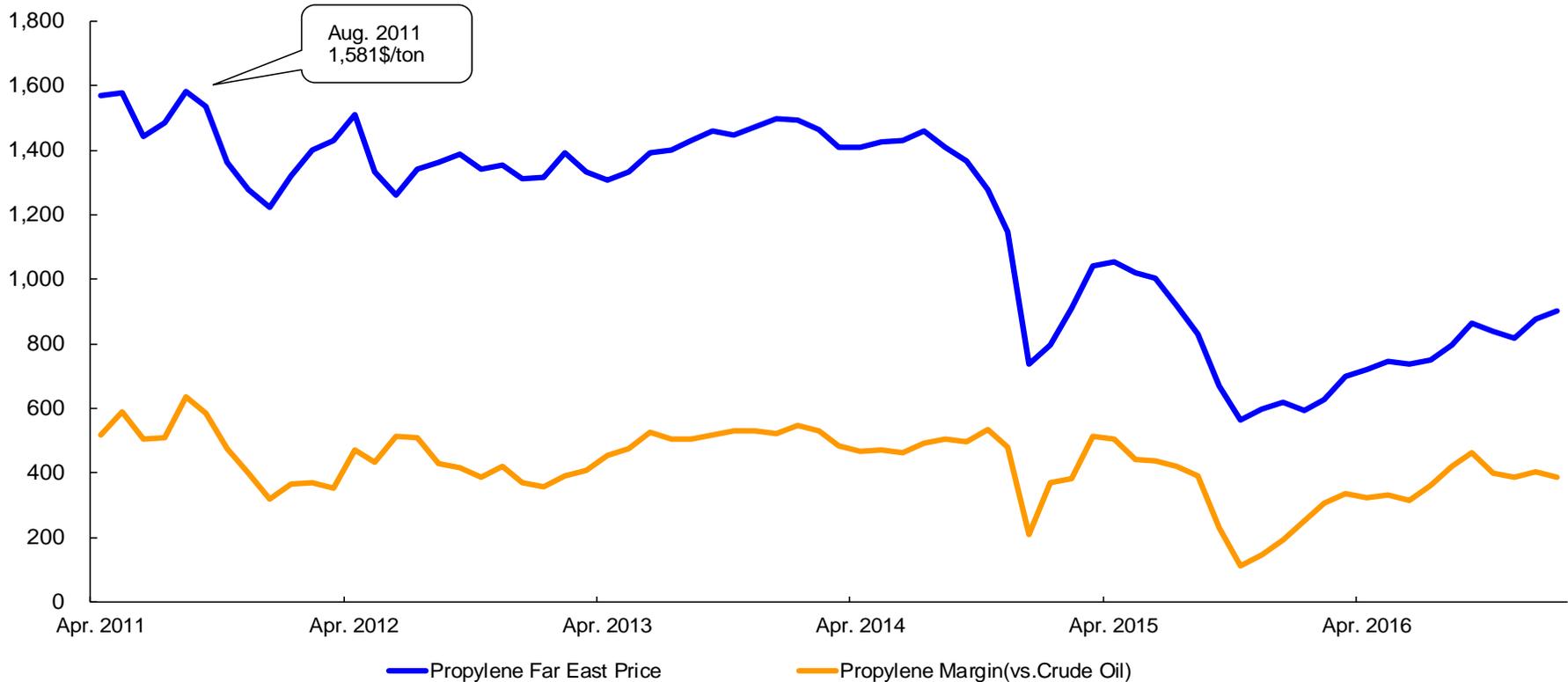


# Propylene Price and Margin (vs. Naphtha)

Average Price	FY2011	FY2012	FY2013	FY2014	FY2015					FY2016		
					1Q	2Q	3Q	4Q	FY	1Q	2Q	3Q
Far East Spot Price	1,383	1,353	1,426	1,201	1,025	807	595	640	767	734	804	845
Margin (vs. Naphtha)	362	426	511	449	461	347	149	297	314	323	415	397

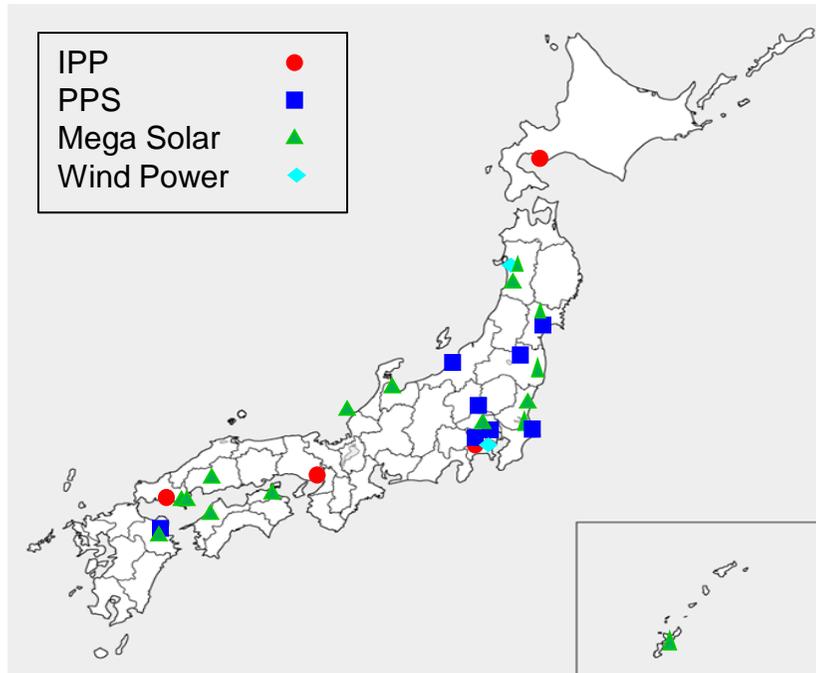
( \$/ton)

(\$/ton)



# Electricity Business

## ✓ Location of Electricity Business (As of Jan. 2017)



## ✓ Expansion of Electricity Business

### PPS

- Started receiving electricity from Kawasaki Natural Gas Power Generation Co., Ltd, joint venture with Tokyo Gas Co., Ltd.(2008)
- Established the Solvent De-Asphalting equipment and the power generation facility(10 thousand kW) at Kashima Refinery.(FY2015)
- Started home electricity retail business.( Apr 1,2016)
- Scheduled to establish the power generation facilities(11 thousand kW) in the Mizushima Refinery.(FY2018)

### Mega Solar

Started Operation		Started Operation	
Sendai	Feb. 2013	Oga	Mar. 2016
Kudamatsu	Mar. 2013	Asaka	Mar. 2016
Kasumigaura	Nov. 2013	Hiroshima	Mar. 2016
Iwaki	Jul. 2014	Hitachi	Mar. 2016
2nd Kudamatsu	Sep. 2014	Toyama	Jan. 2017
Akita	Oct. 2014	Sakai	Jan. 2017
Masaki	Feb. 2015		
Takamatsu	Feb. 2015	Start-up Plan	
Uruma	Mar. 2015	Gamagori	Mar. 2017
Oita	Mar. 2015		

### Wind Power

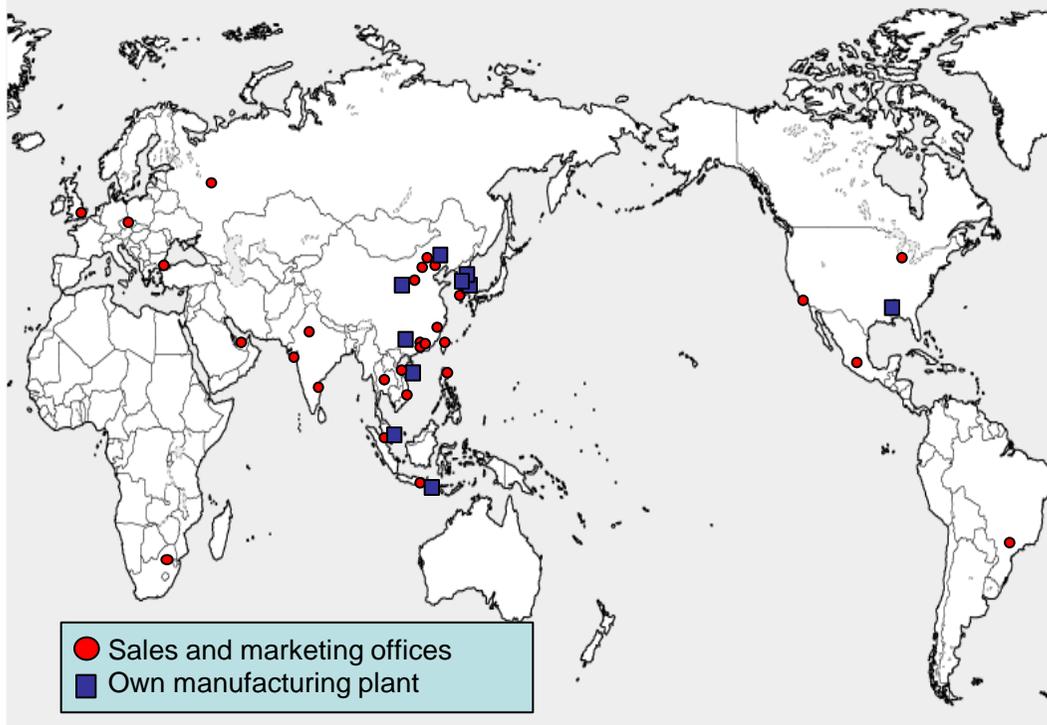
- Started operation of Wind Power at the Akita Oil Terminal.(2003)
- Started operation of Ohgishima Wind Power Station.(2010)

## ✓ Power Generating Capacity of each Business

IPP	4 stations	828 thousand kW
PPS	7 stations	762 thousand kW
Mega Solar	16 stations	41 thousand kW
Wind Power	2 stations	4 thousand kW
Total (equity basis)		1,635 thousand kW

# Lubricants Business

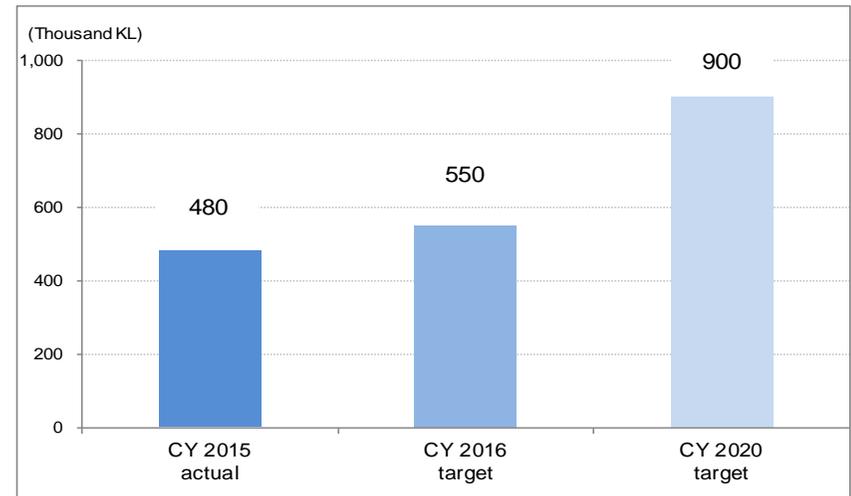
✓ Location of Overseas Lubricants Business (As of Jan. 2017)



✓ Expansion of Overseas Lubricants Business

- Established a lubricants marketing company in Dubai. (Jul. 2011)
- Lubricants manufacturing plant started its operation in Indonesia. (Apr. 2012)
- Started joint venture business for lubricants base oil with SK Group of South Korea. (Oct. 2012)
- Lubricants manufacturing plant started its operation in Vietnam. (Feb. 2014)
- Established a marketing office in Johannesburg. (Apr. 2014)
- Established a lubricants marketing company in India. (Aug. 2014)
- Established a lubricants marketing company in Mexico. (Jan. 2015)
- Established a marketing office in Manila. (May. 2016)

✓ Medium-Term Target of Overseas Lubricants Sales



➤ Expanding overseas business, especially in Asia.

Sales and marketing offices	29
Manufacturing plant	48
(Own manufacturing plant:10, Contractors:38)	



# Hydrogen Business

## ✓ Construction of Hydrogen supply system( As of Jan. 2017)

- Constructed 39 hydrogen supply places around four major urban areas as for prior construction.
- Furthermore, planning to open 1 supply place until the end of FY2016.

## ✓ Construction situation of hydrogen station of JX group

### ◆: Built-in type



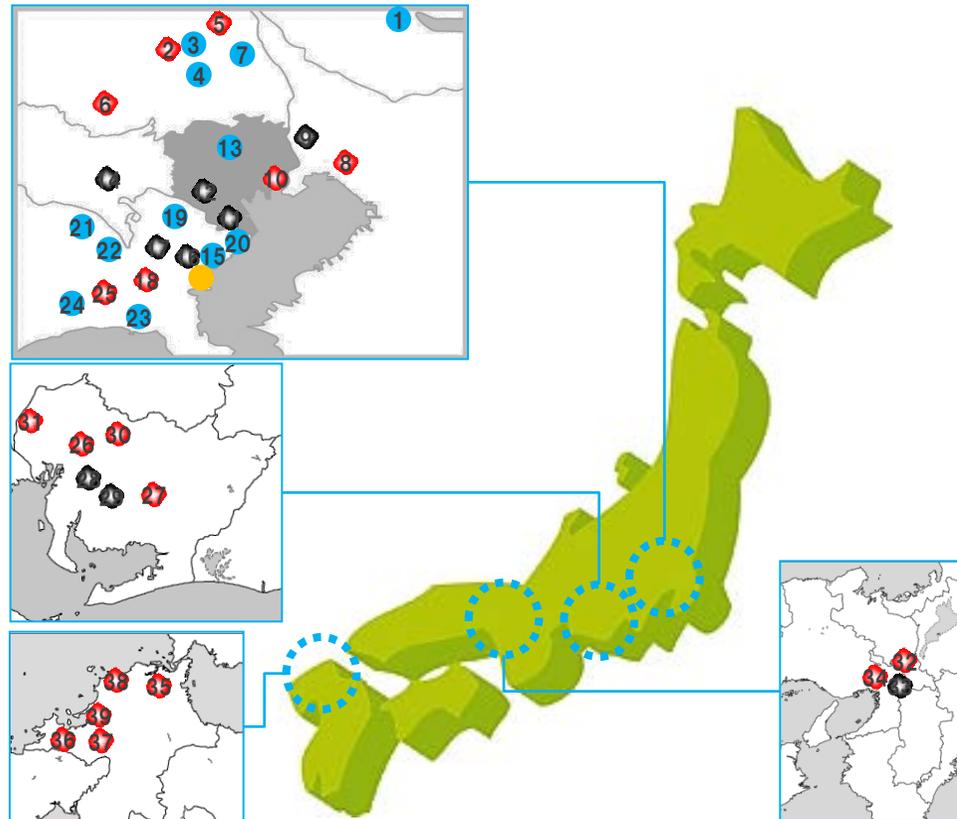
### ◆: Independent type



### ●: Portable type



### ●: Hydrogen plant and shipping facility



- 【Metropolitan area】25
1. Kasuga, Tsukuba city
  2. Dr. Drive Self Owada
  3. Minuma, Saitama city
  4. Midori, Saitama city
  5. Dr. Drive Self Kasukabe-Chuou
  6. Dr. Drive Self Sayama-Negishi
  7. Shinmeicho Koshigaya city
  8. Dr. Drive Self Takeishi inter
  9. Rokkoudai Matsudo city
  10. Dr. Drive Self Shiomi-Koen
  11. Meguroku, Tokyo
  12. Suginamiku, Tokyo
  13. Itabashiku, Tokyo
  14. Takakura, Hachioji city
  15. Osanbashi, Yokohama city
  16. Minami Yokohama city
  17. Asahiku, Yokohama city
  18. Dr. Drive Self Kamiida
  19. IKEA-Kohoku, Yokohama city
  20. Kawasakiku, Kawasaki city
  21. Chuouku, Sagamihara city
  22. Minami, Sagamihara city
  23. Shimotsuchidana, Fujisawa city
  24. Okazaki, Isehara city
  25. Dr. Drive Self Ebina-Chuou
- 【Aichi area】6
26. Dr. Drive Self Kaminokura
  27. Dr. Drive Self Okazaki-Hane
  28. Igaya, Kariya city
  29. Ozaki, Anjo city
  30. Dr. Drive Self Miyoshigaoka
  31. Dr. Drive Self Shipposhimoda
- 【Kansai area】3
32. Dr. Drive Self Hishikawa
  33. Hashiridani, Hirakata city
  34. Dr. Drive Self Ibaraki inter
- 【Kitakyushu area】5
35. Dr. Drive Self Yahata-Higashida
  36. Dr. Drive Self Ito
  37. Dr. Drive Self Dazaihu inter
  38. Dr. Drive Self Koga
  39. Dr. Drive Self Fukuoka-Kuko

# Sophisticated Methods of Energy Supply Structures

- Sophisticated Methods of Energy Supply Structures was established as control measures to introduce and expand non-fossil energy source and to utilize fossil fuel in July 2009.
- The Sophisticated Methods' former assessment criteria expired at the end of 2014
- To promote the effective use of crude oil while responding flexibly to these changes, METI announced the Sophisticated Methods' new assessment criteria. (Deadline Mar. 2017)

	First stage of the Sophisticated Methods of Energy Supply Structures	Second stage of the Sophisticated Methods of Energy Supply Structures																
Details	Aiming to increase Japan's ratio of cracking capacity to crude oil distillation capacity to 13% by fiscal 2013, each petroleum refining company was required to achieve improvement rates in three stages, in line with the current ratio.	Aiming to increase Japan's ratio of heavy oil cracking units to the capacity of crude distillation units in refineries to 50% by the end of March 2017, each petroleum refining company is required to achieve improvement rates in three stages, in line with the current ratio.																
Improvement rate	<ul style="list-style-type: none"> <li>• Nationwide ratio of cracking capacity to crude oil distillation capacity: 10% → 13%</li> <li>• Targets for each company are as follows:</li> </ul> <table border="1"> <thead> <tr> <th>Ratio of cracking capacity to crude oil distillation capacity at any time plans were presented</th> <th>Target improvement rate</th> </tr> </thead> <tbody> <tr> <td>Less than 10%</td> <td>45% or more</td> </tr> <tr> <td>10% or more to less than 13%</td> <td>30% or more</td> </tr> <tr> <td>13% or more</td> <td>15% or more</td> </tr> </tbody> </table>	Ratio of cracking capacity to crude oil distillation capacity at any time plans were presented	Target improvement rate	Less than 10%	45% or more	10% or more to less than 13%	30% or more	13% or more	15% or more	<ul style="list-style-type: none"> <li>• Nationwide ratio of heavy oil cracking units to the capacity of crude oil distillation units in refineries: 45% → 50%</li> <li>• Targets for each company are as follows:</li> </ul> <table border="1"> <thead> <tr> <th>Ratio of heavy oil cracking units to capacity of crude oil distillation units in refineries at any time plans were presented</th> <th>Target improvement rate</th> </tr> </thead> <tbody> <tr> <td>Less than 45%</td> <td>13% or more</td> </tr> <tr> <td>45% or more to less than 55%</td> <td>11% or more</td> </tr> <tr> <td>55% or more</td> <td>9% or more</td> </tr> </tbody> </table>	Ratio of heavy oil cracking units to capacity of crude oil distillation units in refineries at any time plans were presented	Target improvement rate	Less than 45%	13% or more	45% or more to less than 55%	11% or more	55% or more	9% or more
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Less than 10%	45% or more																	
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Less than 45%	13% or more																	
45% or more to less than 55%	11% or more																	
55% or more	9% or more																	

# Sophisticated Methods of Energy Supply Structures

## ~Petroleum Refining Capacity trends of Japan~



Company	Thousands of BD		
	As of the end of December 2008	As of the end of March 2016	Changes
JX Group	1,891	1,426	(465)
TonenGeneral Group	836	698	(138)
Idemitsu Kosan	640	535	(105)
Showa Shell Sekiyu Group	515	445	(70)
COSMO OIL	635	452	(183)
Others	417	361	(56)
Japan Total	4,934	3,917	(1,017)

\*1 includes Osaka International Refining Company, Limited, and the Mizushima refinery and Kashima refinery condensate splitters.

\*2 Figures for the TonenGeneral Group include Kyokuto Petroleum Industries, Ltd.

\*3 Figures for the Showa Shell Sekiyu Group include TOA OIL Co., Ltd., SHOWA YOKKAICHI SEIKYU CO., LTD., Seibu Oil Co., Ltd.

\*4 Others includes Fuji Oil Company, Ltd., Nansei Sekiyu K.K., Taiyo Oil Company, Limited, and Teiseki Topping Plant Co., Ltd.

\*5 Japan Total is based on documents of Petroleum Association of Japan

### ➤ JX Capacity Reduction Plan

Corresponded to Sophistication of Energy Supply Structure Act

Refinery	Due Date	Reduction Capacity	Completion
Toyama	March, 2009	(60) thousand B/D	<input checked="" type="checkbox"/>
Kashima	May, 2010	(21)	<input checked="" type="checkbox"/>
Oita	May, 2010	(24)	<input checked="" type="checkbox"/>
Mizushima	June, 2010	(110)	<input checked="" type="checkbox"/>
Negishi	October, 2010	(70)	<input checked="" type="checkbox"/>
Muroran	March, 2014	(180)	<input checked="" type="checkbox"/>
Subtotal		(465)	
Osaka	October, 2010	(115) Convert to exportation refinery	<input checked="" type="checkbox"/>
Total		(580)	



# Business Integration of JX and TonenGeneral Sekiyu

## Outline

### Purpose of Business Integration

Through business integration, establish a strong company group that is among Asia's most prominent and internationally competitive comprehensive energy, natural resource and materials company groups

### New corporate names

#### Integrated Holding Company

JXTG Holdings, Inc.

#### Integrated Energy Company

JXTG Nippon Oil & Energy Corporation

## Integration Effects

Aim to achieve in excess of 100 billion yen in profit improvements within 3 years after the Business Integration

Items	Per fiscal year
Supply, Distribution and Sales	28 billion yen
Manufacturing	40 billion yen
Procurement	15 billion yen
Efficiencies in IT and other	17 billion yen
<b>Total</b>	<b>100 billion yen</b>

To achieve further profit improvements, conduct refinery closure at the earliest timing

## Schedule

**Apr. 1, 2017**

The Business Integration Date

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Business Environment  
- Oil and Natural Gas E&P Business -



# Business Area





# Business Activities

	▼ Project Company	In Production ●	Under Development ●	Under Exploration ●
01 Japan	JX Nippon Oil & Gas Exploration Corp.	●	●	●
02 The U.S. Gulf of Mexico	JX Nippon Oil Exploration (U.S.A.) Ltd.	●		
	JX Nippon Oil Exploration (EOR) Ltd. / Petra Nova Parish Holdings LLC	●		
03 Canada	Japan Canada Oil Company / Mocal Energy	●		
04 Thailand	JX Nippon Oil & Gas Exploration Corp.			●
05 Vietnam	Japan Vietnam Petroleum Co., Ltd.	●	●	●
	JX Nippon Oil & Gas Exploration Corp.			●
06 Myanmar	Nippon Oil Exploration (Myanmar) Ltd.	●	●	●
07 Malaysia	JX Nippon Oil & Gas Exploration (Malaysia) Ltd.	●	●	●
	JX Nippon Oil & Gas Exploration (Sarawak) Ltd.	●		
	JX Nippon Oil & Gas Exploration (Deepwater Sabah) Ltd.			●
	JX Nippon Oil & Gas Exploration (Offshore Malaysia) Sdn. Bhd.			●
08 Indonesia	Nippon Oil Exploration (Berau) Ltd.	●	●	●
09 Australia	JX Nippon Oil & Gas Exploration (Australia) Pty Ltd.	●		●
10 Papua New Guinea	Merlin Petroleum Company / Southern Highlands Petroleum Co., Ltd.	●	●	●
	Nippon Oil Exploration (Niugini) Ltd.			●
	Nippon Papua New Guinea LNG LLC	●		
11 12 U A E · Qatar	Abu Dhabi Oil Co., Ltd.	●	●	
	United Petroleum Development Co., Ltd.	●		
	JX Nippon Oil & Gas Exploration (Qatar) Ltd.			●
13 The North Sea	JX Nippon Exploration and Production (U.K.) Ltd.	●	●	●



# Outline of Principal Oil and Natural Gas E&P Projects

Project Name/Company	Sales Volume (1,000BOED) * 1			Reserves (million BOE) *1 *2			Reference pages
	Apr.-Dec. 2016	Oil	Gas	As of the end of 2013	As of the end of 2014	As of the end of 2015	
(Gulf of Mexico(U.S.A.)) JX Nippon Oil Exploration U.S.A. Limited	3	2	1	16	17	16	37 ~ 38
(Canada) Japan Canada Oil Company Limited	13	13	0	260	283	155	39
(Vietnam and other) Japan Vietnam Petroleum Company, Limited, other	5	5	0				40 ~ 41
(Myanmar) Nippon Oil Exploration (Myanmar) Limited	6	1	5				42
(Malaysia) JX Nippon Oil & Gas Exploration (Malaysia) Limited JX Nippon Oil & Gas Exploration (Sarawak) Limited	33	3	30				43 ~ 46
(Indonesia) Nippon Oil Exploration (Berau) Limited	21	1	20	<Sub Total> 196	<Sub Total> 213	<Sub Total> 189	47
(Australia and other) JX Nippon Oil & Gas Exploration (Australia) Pty Ltd., other	2	2	0				48 ~ 50
(Papua New Guinea) Merlin Southern Highlands Petroleum Co., Ltd.	17	6	11	<Sub Total> 95	<Sub Total> 92	<Sub Total> 85	51 ~ 52
(United Arab Emirates, Qatar and others) Abudhabi Oil Co., Ltd., United Petroleum Development Co., Ltd. and others	13	12	1	57	48	43	53 ~ 54
(North Sea, U.K.) JX Nippon Exploration and Production (U.K). Limited	12	10	2	184	193	181	55 ~ 56
Total	125	55	70	808	846	669	

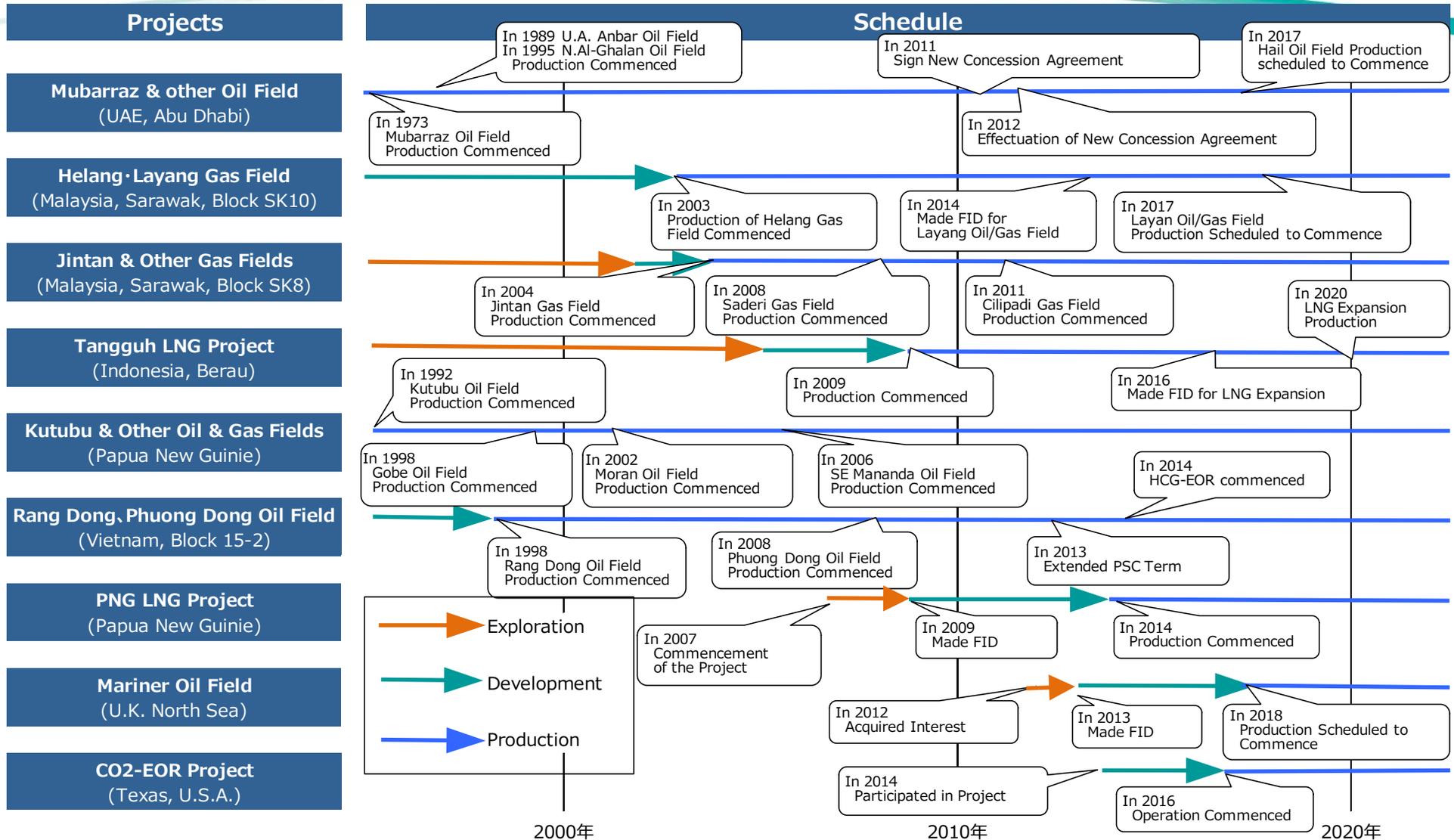
\*1 Project company basis.

\*2 Proved reserves and probable reserves, including reserves from projects currently under development.

(Please refer P57 about our reserve standard.)



# Production Schedule of Principal E&P Projects





Next Page

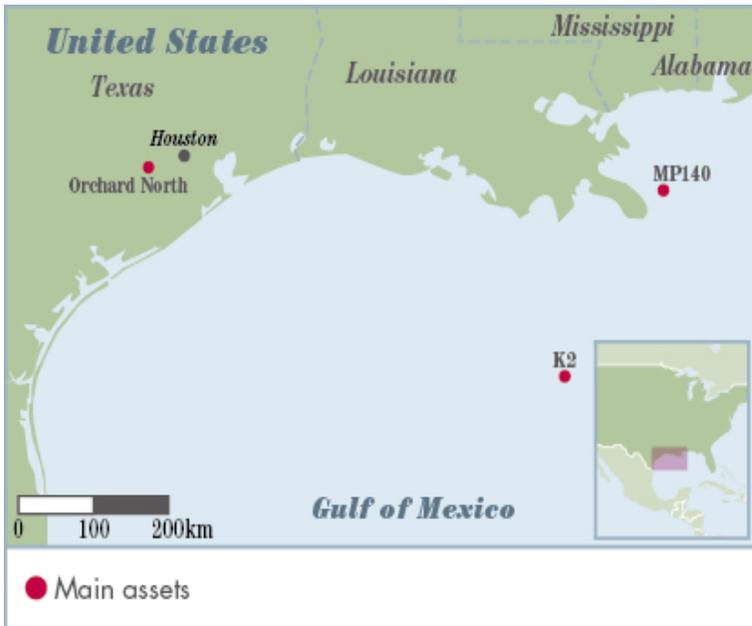
Principal Individual E&P Project Overview



# Principal Individual E&P Project Overview (U.S.①)

## Gulf of Mexico

Production



We hold assets in the Gulf of Mexico in the United States, which range from the continental shelf (less than 200meters in depth) to deep water area (more than 200 meter in depth).

	K2 (offshore)	Orchard North (onshore)	MP140 (offshore)
Company holding the Acreage	JX Nippon Oil Exploration(U.S.A.) Ltd.		
Shareholders(Holding Percentages)	JX Holdings (U.S.A.) Inc.(100%)		
Project Status	Production	Production	Production
Interest	11.6%	50.0%	35.0%
Partners	Anadarko(41.8%) ENI(13.4%) ConocoPhillips(12.4%) MCX(11.6%) EcoPetrol(9.2%)	Hilcorp(50.0%)	Fieldwood(65.0%)
Operator	Anadarko	Hilcorp	Fieldwood
Sales Volumes(Apr.~Dec. 2016)	3,000 boed (Oil 2,200b/d、 Gas 5.2mmcf/d)		

Production

### Mining Area under production : K2, Orchard North, MP140

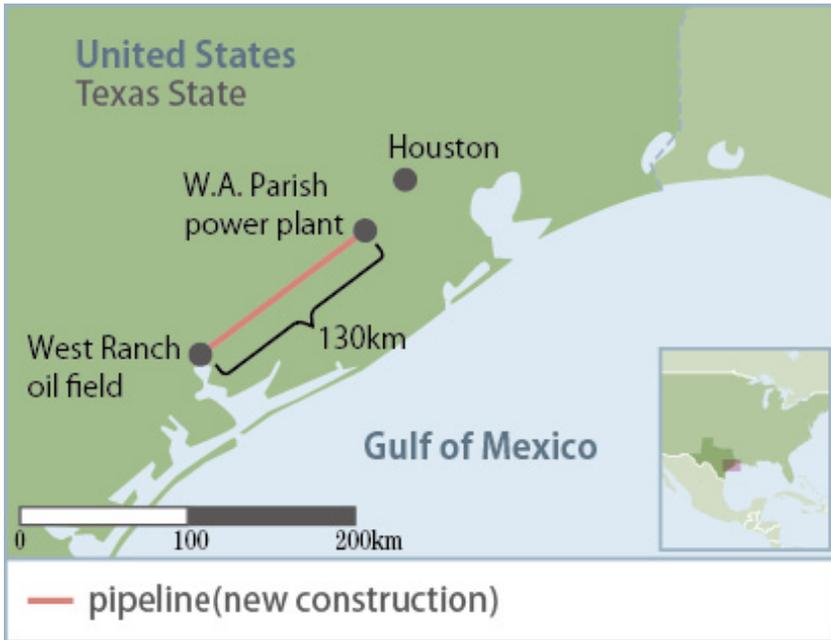
- In 1990, began exploration, development, and production operations at an onshore field in Texas and offshore blocks in both deep as well as shallow waters in the Gulf of Mexico.
- In 2007, acquired 11.6% interest in K2 from Anadarko.



# Principal Individual E&P Project Overview (U.S.②)

Texas

Development



Development

## CO2-EOR Project

- In July 2014, participated in CO2-EOR business.
- In December 2016, carbon capture system began operation.

Constructing carbon capture system that captures 90% of carbon dioxide (CO<sub>2</sub>) in the processed flue gas from an existing unit at the WA Parish power plant, and by pressing captured carbon dioxide in West Ranch oil field, trying to increase crude oil production.

EOR is expected to boost oil production at the field from around 300barrels per day to approximately 12,000 barrels per day (average for project terms).

	CO2-EOR Project
Operating Company of JX NOEX	JX Nippon Oil Exploration (EOR) Ltd.
Shareholders * 1 (Holding Percentages:Common Stocks)	JX Nippon Oil Exploration (U.S.A.) Ltd. (100%)
Project Status	Development
Interest	50.0%
Project Company	Petra Nova Parish Holdings LLC * 2

\* 1 JBIC holds preferred stocks issued by JX Nippon Oil Exploration (EOR) Ltd. other than the common stocks.

\* 2 JX Nippon Oil Exploration (EOR) Limited and a subsidiary of NRG Energy Inc. respectively hold 50% interest in Petra Nova Parish Holdings LLC. Petra Nova Parish Holdings LLC holds 50% interest in the West Ranch Oil Field through its subsidiary. (JX Nippon Oil Exploration (EOR) Limited indirectly holds 25% interest in the West Ranch Oil Field.)

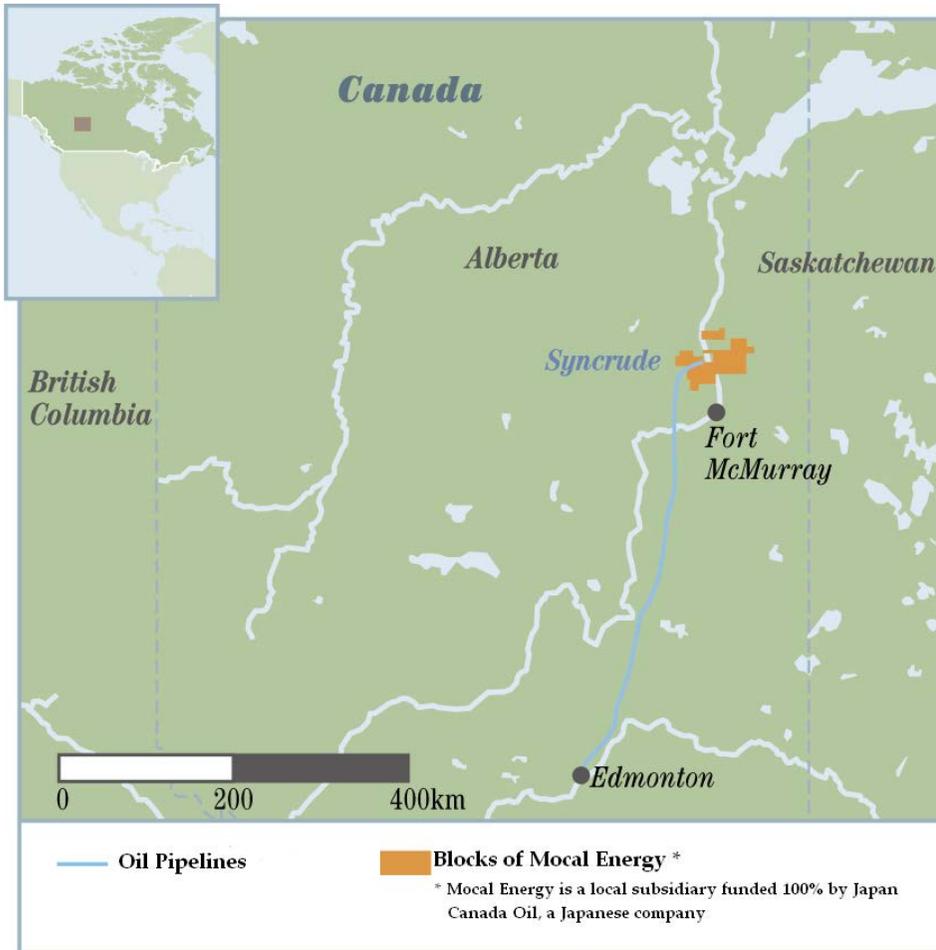


# Principal Individual E&P Project Overview (Canada)

Canada

Production

Development



	Syncrude Project
Company Holding the Acreages	Japan Canada Oil/Mocal Energy
Shareholders(Holding Percentages)	JX Nippon Oil & Gas Exploration (100%)
Project Status	Development / Production
Interest	5.0%
Partners	Suncor Energy (53.7%) Imperial Oil Resources (25.0%) Sinopec (9.0%) Nexen (7.2%)
Operator	Syncrude Canada
Sales Volumes(Apr. ~Dec. 2016)	12,700boed (oil 12,700b/d)

We are a partner in the Syncrude Project that produces synthetic crude oil from oil sand, the sand containing bitumen, huge deposits of which are found in Canada.

Production

- In 1978, Started Shipment of Synthetic Crude Oil.
- In 1992, acquired a working interest from PetroCanada.

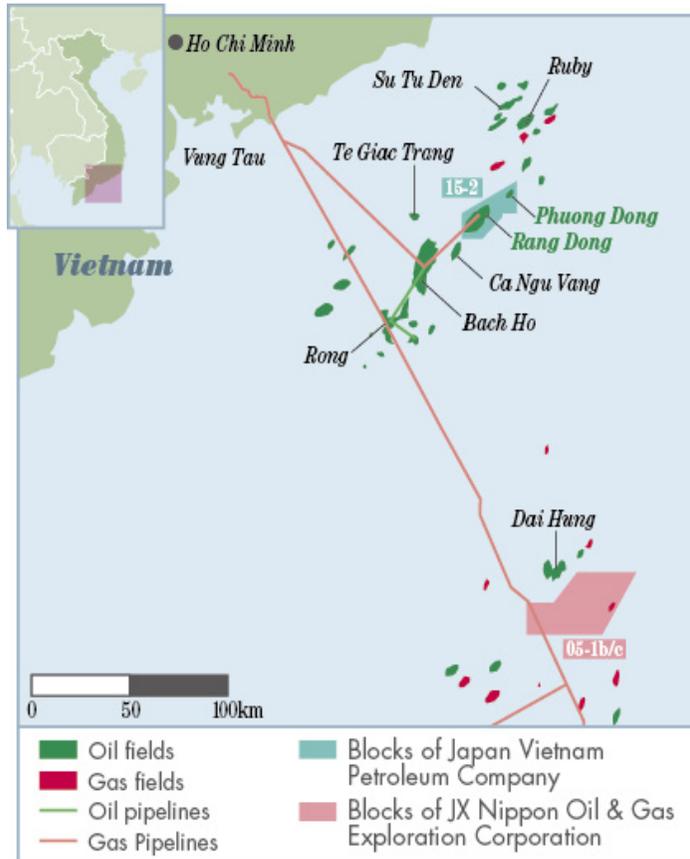
# Principal Individual E&P Project Overview (Vietnam ①)

Vietnam

Production

Development

Exploration



	Block 15-2		Block 05-1b/c
	Rang Dong Oil Field	Phuong Dong Oil Field	
Company Holding the Acreages	Japan Vietnam Petroleum Company		JX Nippon Oil & Gas Exploration
Shareholders(Holding Percentages)	JX Nippon Oil & Gas Exploration (97.1%) Mitsubishi Corporation (2.9%)		-
Project Status	Exploration/Development/Production		Exploration
Interest	46.5%	64.5%	35.0%
Partners	PVEP (17.5%) Perenco (36.0%)	PVEP (35.5%)	Idemitsu Kosan (35.0%) INPEX (30.0%)
Operator	Japan Vietnam Petroleum Company		Idemitsu Kosan
Sales Volumes(Apr. ~ Dec. 2016)	5,300 boed (oil 5,300b/d, gas 0.1mmcf/d)		-



## Principal Individual E&P Project Overview (Vietnam ②)

### Block 15-2 ( Rang Dong, Phuong Dong Oil Fields)

Production

Development

Exploration

Since the acquisition in 1992, the project has been one of our key operations. JVPC, our subsidiary, act as operator in the block. The Rang Dong Oil Field and The Phuong Dong Oil Field feature an unconventional fractured granite basement rock reservoir that is unique in the world. Our fracture evaluation technology is highly valued and receiving worldwide recognition. As part of our corporate activities, we have been promoting social welfare activities in Vietnam to improve the lives of the people of Vietnam.

- In 1992, JVPC acquired a working interest in block 15-2
- In 1994, JVPC discovered the [Rang Dong Oil Field](#) within block 15-2, and it began production in that field from 1998.
- In July 2008, Rang Dong Oil Field achieved a cumulative production volume of 150 million barrels.
- In August 2008, JVPC began production in the [Phuong Dong Oil Field](#).
- In November 2013, determined on term extension of the Rang Dong Oil Field (5 years).
- In July 2014, block 15-2 achieved a cumulative production volume of 200 million barrels.
- In October 2014, JVPC began HCG-EOR project.

### Block 05-1b/c

Exploration

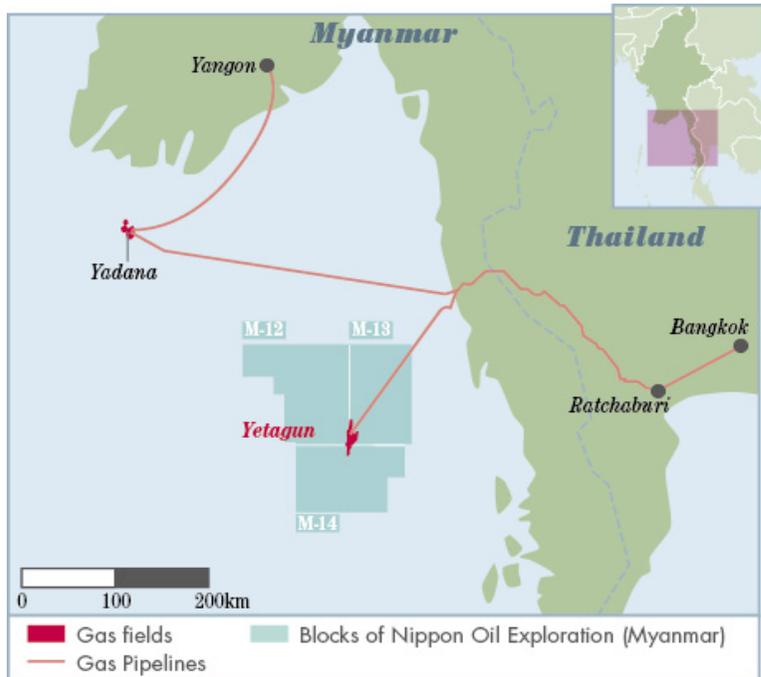
- In October 2004, acquired a working interest in [block 05-1b/c](#) offshore Vietnam.
- In February 2007, excavated test well No.1.
- In August 2010, excavated test well No.2, and discovered gas and oil.
- In August 2012, excavated appraisal well No.1.
- In June 2013, confirmed gas and condensate.
- In August 2014, discovered gas and condensate.

# Principal Individual E&P Project Overview (Myanmar)

Myanmar

Production

Exploration



We have been participating in the Yetagun project in Myanmar since exploration stage. After the appraisal activities and the construction of the production and shipping facilities, the project is now at a stable production stage.

	Block M-12, 13, 14
Company Holding the Acreages	Nippon Oil Exploration (Myanmar)
Shareholders (Holding Percentages)	JX Nippon Oil & Gas Exploration (40.0%) Mitsubishi Corporation (10.0%) Government of Japan (50.0%)
Project Status	Exploration / Production
Interest	19.3%
Partners	Petronas Carigali (40.9%) MOGE(20.5%) PTTEP International (19.3%)
Operator	Petronas Carigali
Sales Volumes(Apr. ~Dec. 2016)	6,300boed (oil 500b/d, gas 34.9mmcf/d)

- In 1991, NOEX Myanmar acquired a working interest in [blocks M-13/14](#) offshore Myanmar.
- The following year, acquired a working interest in [block M-12](#) and discovered the Yetagun Gas Field in that block.
- In 2000, production at the Yetagun Gas Field commenced, with the produced gas supplied to the Ratchaburi power plants in Thailand.
- In October 2014, began production in the Yetagun North Gas Field.

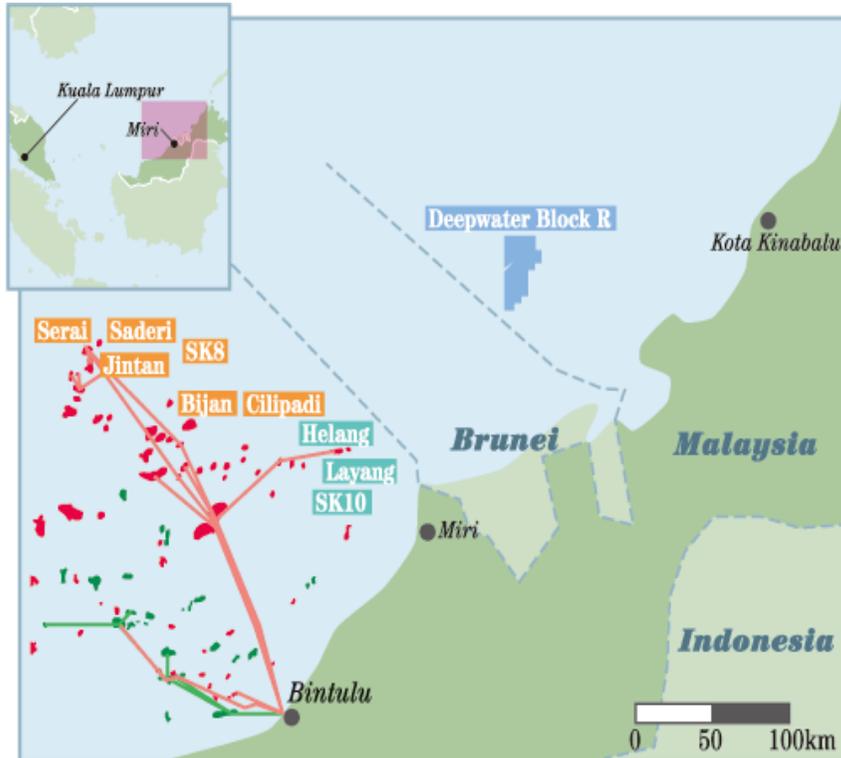
# Principal Individual E&P Project Overview (Malaysia ①)

Malaysia

Production

Development

Exploration



- Oil fields
- Gas fields
- Oil pipelines
- Gas Pipelines
- JX Nippon Oil & Gas Exploration (Malaysia)
- JX Nippon Oil & Gas Exploration (Sarawak)
- JX Nippon Oil & Gas Exploration (Deepwater Sabah)

	SK10 (Herang Gas Field, Others)	SK8 (Jintan, Cilipadi Gas Field, Others)
Company holding the Acreage	JX Nippon Oil & Gas Exploration (Malaysia)	JX Nippon Oil & Gas Exploration (Sarawak)
Shareholders (Holding Percentages)	JX Nippon Oil & Gas Exploration (78.7%) Inpex (15.0%) Mitsubishi Corporation (6.3%)	JX Nippon Oil & Gas Exploration (76.5%) Inpex (15.0%) Mitsubishi Corporation (8.5%)
Project Status	Exploration/Development/Production	Production
Interest	75.0%	37.5%
Partnaers	Petronas Carigali (25.0%)	Shell Oil and Gas Malaysia (37.5%) Petronas Carigali (25.0%)
Operator	JX Nippon Oil & Gas Exploration (Malaysia)	Shell Oil and Gas Malaysia
Sales Volume (Apr. ~Dec. 2016)	33,400boed (Oil 3,200b/d, Gas 181.5mmcf/d)	

# Principal Individual E&P Project Overview (Malaysia ②)

## Block SK10 (Helang Gas Field and others)

Since the acquisition of Block SK10 in 1987, the project has been one of our key operations. We act as the operator in the block. The natural gas from the block is exported in the form of liquefied natural gas (LNG) to various countries including Japan.

Production

Development

Exploration

### Mining Area under production : SK10 (Helang Gas Field)

- In 1987, acquired a working interest in Block SK10 offshore Sarawak, Malaysia.
- In 1990, discovered the Helang Gas Field, where production commenced in 2003.
- In 1991, discovered the Layang Oil and Gas Field.
- In 2014, decided to develop the Layang Oil and Gas Field.
- In 2017, scheduled to start production.

## Block SK8 (Jintan, Cilipadi Gas Fields and others)

Production

Development

### Mining Area under production : SK8 (Jintan, Saderi, Cilipadi Gas Fields)

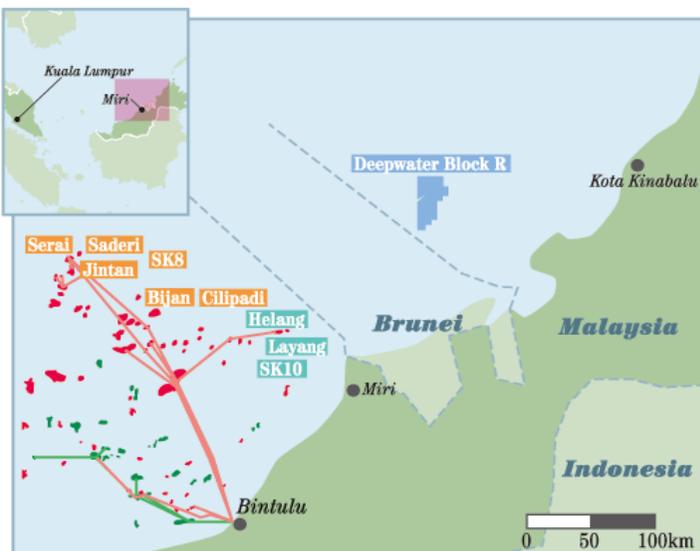
- In 1991, acquired a working interest in Block SK8 .
- From 1992 through 1994, the Jintan and other 6 gas fields were discovered in that block, and production of Jintan and Serai were commenced in 2004.
- In 2008, the Saderi Gas Field commenced production.
- In 2011, the Cilipadi Gas Field commenced production.



# Principal Individual E&P Project Overview (Malaysia ③)

Malaysia

Exploration



- Oil fields
- Gas fields
- Oil pipelines
- Gas Pipelines
- JX Nippon Oil & Gas Exploration (Malaysia)
- JX Nippon Oil & Gas Exploration (Sarawak)
- JX Nippon Oil & Gas Exploration (Deepwater Sabah)

	Deepwater Block R	Deepwater Block 2F
Company holding the Acreage	JX Nippon Oil & Gas Exploration (Deepwater Sabah)	JX Nippon Oil & Gas Exploration (Offshore Malaysia)
Shareholders (Holding Percentages)	JX Nippon Oil & Gas Exploration (51.05%) JOGMEC (48.95%)	JX Nippon Oil & Gas Exploration (100%)
Project Status	Exploration	Exploration
Interest	27.5%	40.0%
Partners	Inpex Offshore South Sabah(27.5%) Petronas Carigali(25.0%) Santos Sabah BlockR(20.0%)	Petronas Carigali (40.0%) Engie E&P (20.0%)
Operator	JX Nippon Oil & Gas Exploration (Deepwater Sabah)	JX Nippon Oil & Gas Exploration (Offshore Malaysia)

	Deepwater Block 3F
Company holding the Acreage	JX Nippon Oil & Gas Exploration (Offshore Malaysia)
Shareholders (Holding Percentages)	JX Nippon Oil & Gas Exploration (100%)
Project Status	Exploration
Interest	40.0%
Partners	Petronas Carigali (40.0%) Engie E&P (20.0%)
Operator	Petronas Carigali



# Principal Individual E&P Project Overview (Malaysia ④)

## Deepwater Block R

### Exploration

- In January 2012, acquired a working interest in [Deepwater Block R](#) deep sea, offshore Sabah, Malaysia.
- In April 2015, discovered oil.

## Deepwater Block 3F

### Exploration

- In December 2013, acquired a working interest in [Deepwater Block 3F](#) deep sea, offshore Sarawak, Malaysia.

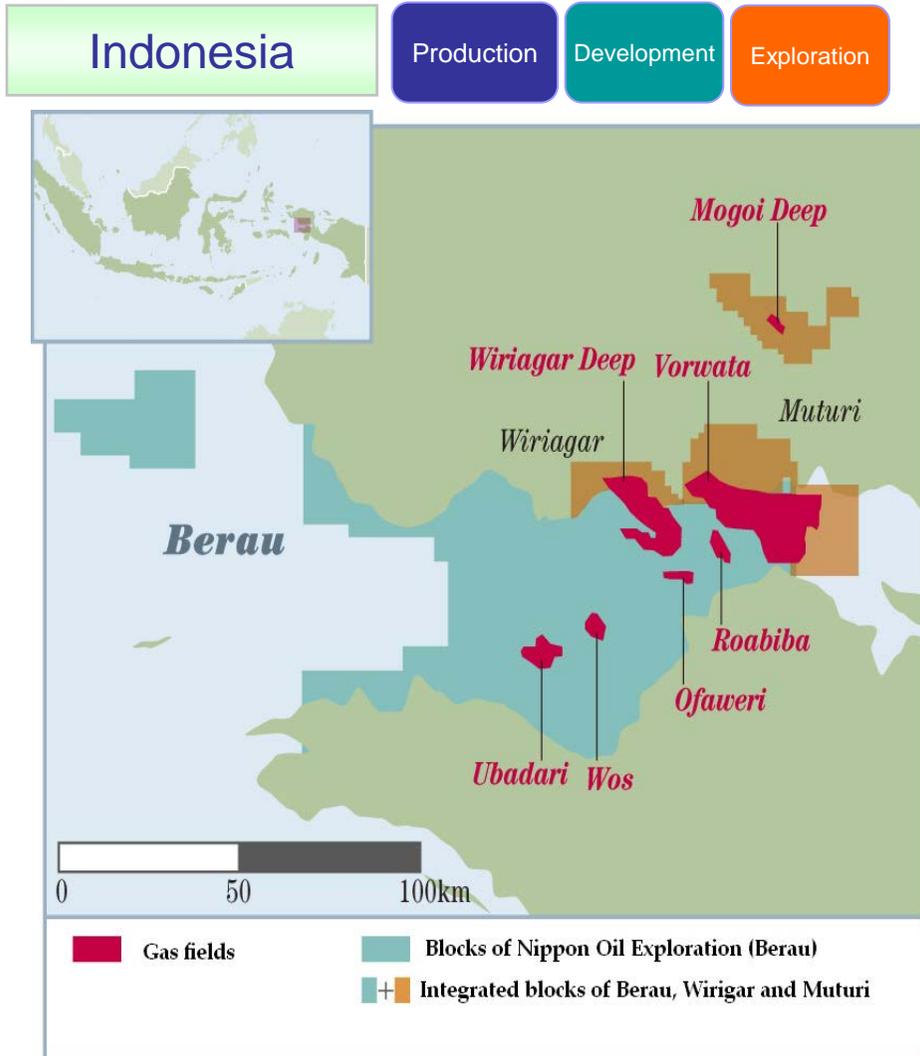
## Deepwater Block 2F

### Exploration

- In September 2013, acquired a working interest in [Deepwater Block 2F](#) deep sea, offshore Sarawak, Malaysia.



# Principal Individual E&P Project Overview (Indonesia)



	Tangguh LNG Project	
Company Holding the Acreages	Nippon Oil Exploration (Berau)	
Shareholders (Holding Percentages)	JX Nippon Oil & Gas Exploration (51.0%) JOGMEC (49.0%)	
Project Status	Exploration/Development/Production	
Interest	12.2%(After Unitization)	
Partners	BP(37.2%) MI Berau(16.3%) CNOOC(13.9%)	KG Berau / KG Wiriagar (10.0%) LNG Japan (7.3%) Talisman (3.1%)
Operator	BP	
Sales Volumes(Apr. ~ Dec. 2016)	20,200boed (oil 500b/d, gas 118.4mmcf/d)	

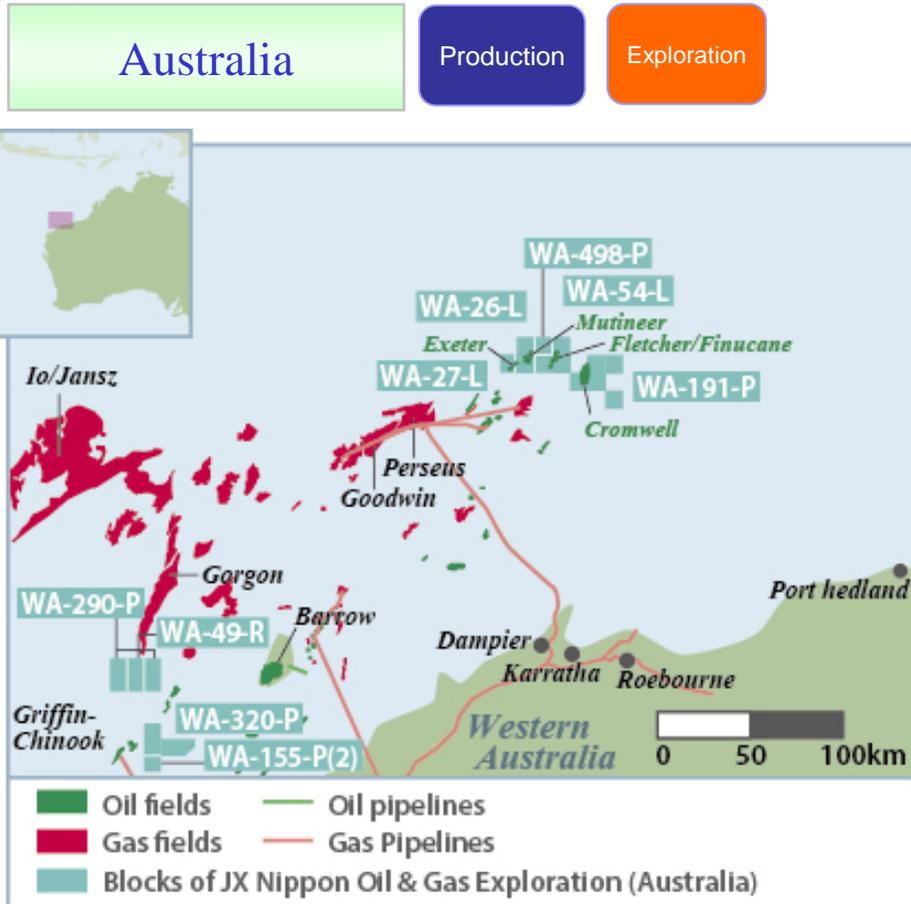
We have been participating Tangguh LNG Project since exploration stage and started LNG production in 2009. This is the second LNG project we have participated in, following the LNG Tiga project in Malaysia, and we are working to attain long-term and stable LNG production and revenue.

**Production** Project under production : Tangguh LNG Project

- From 1990, excavated three test wells, natural gas was discovered in the area. Subsequently, discovered natural gas in the Vorwata Gas Field, Wiriagar Deep structure, and other gas field.
- From December 2002, those with interests in the Berau, Wiriagar, and Muturi blocks agreed to become partners in unitizing the blocks and undertake development work cooperatively.
- LNG production commenced in June 2009, and the first cargo was shipped in July 2009.
- In July 2016, decided to expand Tangguh LNG Facility.  
In 2020, scheduled to start production.



# Principal Individual E&P Project Overview (Australia①)



Production Exploration

	Mutineer/Exeter Oil Field	Finucane South Oil Field Block WA-191-P
Company Holding the Acreages	JX Nippon Oil & Gas Exploration (Australia) Pty Ltd	
Shareholders(Holding Percentages)	JX Nippon Oil & Gas Exploration(100%)	
Project Status	Production	Exploration/Production
Interest	25.0%	25.0%
Partners	Santos (37.5%) Kufpec (37.5%)	Santos (37.4977%) Kufpec (37.5023%)
Operator	Santos	Santos
Sales Volumes(Apr. ~ Dec. 2016)	1,700 boed(Oil 1,700b/d)	

We are producing high-quality low-sulfur crude oil from Mutineer / Exeter oil fields. Revenue from the sales of the crude oil is used for new exploration activities within Australia and in May 2013, newly started production from Finucane South Oil Field.

Production Exploration

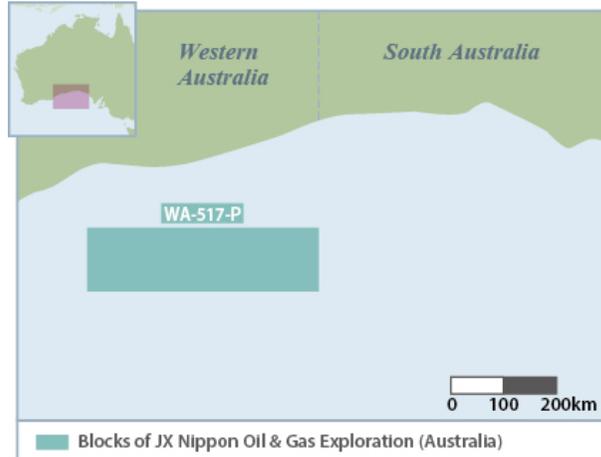
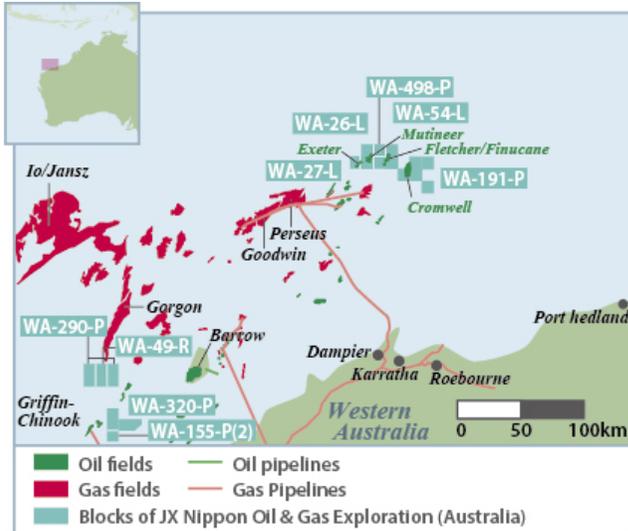
- In May 1997, acquired a working interest in Block WA-191-P (present Block WA-26/27-L)
- From 1997 to 2002, discovered Mutineer and Exeter Oil Fields
- In March 2005, oil production commenced in Mutineer and Exeter Oil Fields
- In May 2011, discovered oil in Finucane south structure.
- In May 2013, oil production commenced in Finucane South Oil Fields.



# Principal Individual E&P Project Overview (Australia②)

Australia

Exploration



	WA-290-P WA-49-R	WA-320-P
Company Holding the Acreages	JX Nippon Oil & Gas Exploration (Australia) Pty Ltd	
Shareholders (Holding Percentages)	JX Nippon Oil & Gas Exploration (100%)	
Project Status	Exploration	Exploration
Interest	15.0%	10.0%
Partners	Quadrant (30.25%) Santos (24.75%) OMV(20.00%) Tap(10.00%)	Quadrant (40.665%) OMV (39.557%) Tap (9.778%)
Operator	Quadrant	Quadrant

	WA-498-P	WA-517-P
Company Holding the Acreages	JX Nippon Oil & Gas Exploration (Australia) Pty Ltd	
Shareholders (Holding Percentages)	JX Nippon Oil & Gas Exploration(100%)	
Project Status	Exploration	Exploration
Interest	25.0%	50.0%
Partner(Operator)	Santos (75.0%)	Santos (50.0%)



# Principal Individual E&P Project Overview (Australia③)

## Block WA-290-P,Block WA-49-R

Exploration

- In April 2011, excavated test well "Zola-1", and discovered Gas
- In July 2013, excavated appraisable well "Bianchi-1", and discovered Gas

## WA-498-P

Exploration

- In April 2014, acquired working interests in WA-498-P.

## Block WA-320-P

Exploration

- In June 2013, acquired working interests in Block WA-320-P

## WA-517-P

Exploration

- In August 2015, acquired working interests in WA-517-P.

Some working interests in Australia are under sales procedure.



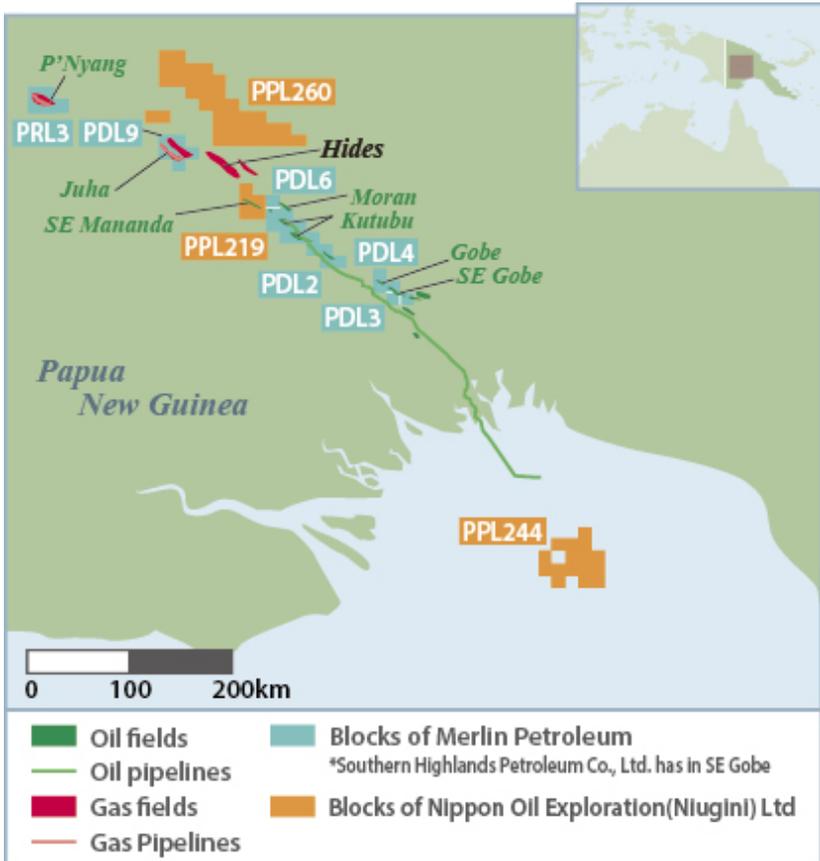
# Principal Individual E&P Project Overview (Papua New Guinea ①)

## Papua New Guinea

Production

Development

Exploration



	Kutubu, Moran, Gobe oil fields, Others	PNG LNG Project
Company Holding the Acreages	Merlin Petroleum Company (79.0%) Nippon Oil Exploration (Niugini) Pty LTD (30.7%) Southern Highland Petroleum (80.0%)	Nippon Papua New Guinea LNG LLC (79.0%)
Project Status	Exploration / Development / Production	Production
Interest	8.6%~73.5%	4.68%
Partners	Oil Search ExxonMobil Santos PNG Government, Landowners	ExxonMobil (33.20%) Oil Search (29.00%) Santos (13.53%) PNG Government, Landowners (19.58%)
Operator	Oil Search, ExxonMobil	ExxonMobil
Sales Volumes (Apr.~Dec. 2016)	17,500 boed (oil 6,200b/d, gas 68.1mmcf/d)	



# Principal Individual E&P Project Overview (Papua New Guinea ②)

## Kutubu, Moran, Gobe oil fields and others

### Production

- In 1990, Japan Papua New Guinea Petroleum acquired Merlin and acquired original exploration rights of Merlin in Papua New Guinea. Subsequently, development, and production activities have been undertaken in the [Kutubu, Moran, Gobe, SE Gobe, and SE Mananda oil fields](#).
- In 2008, acquired additional equity of oil field from AGL Energy.

### Exploration

- In April 2011, excavated test well “Mananda-5” in [Block PPL219](#), and discovered oil.

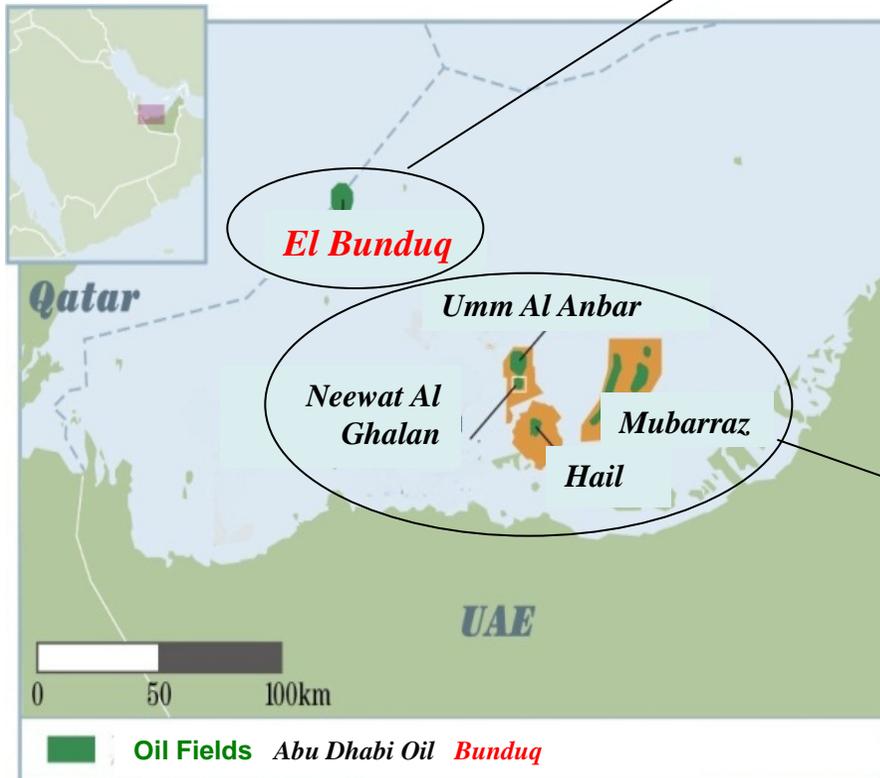
## PNG LNG Project

### Production

### Project under development : PNG LNG Project

- We have been involved in PNG LNG Project since the beginning of the project. In December 2009, we made a Final Investment Decision on the Project, and the development work is in progress with the goal of starting shipments in 2014. PNG LNG Project has the full support of the PNG government, and we expect it to contribute to our revenues in the future.
- In December 2009, PNG LNG Project was made a final investment decision to proceed with the development.
  - In May 2014, PNG LNG Project ships first LNG cargo.

# Principal Individual E&P Project Overview (UAE, Qatar ①)



	El Bunduq
Company Holding the Acreages	United Petroleum Development (Bunduq Company Limited)
Partners	JX Nippon Oil & Gas Exploration (45.0%) Cosmo Energy Exploration & Production Co., Ltd. (45.0%) Mitsui Oil Exploration Co., Ltd.(10.0%)
Project Status	Production
Interest	100.0%
Operator	Bunduq Company Limited

- In 1970, United petroleum Development acquired a working interest in El Bunduque Oil Field.
- In 1975, oil production commenced in [El Bunduq oil field](#).
- In 1983, oil production was resumed by a secondary recovery scheme using water injection.
- In 2006, El Bunduque achieved a cumulative production volume of 200 million barrels.
- In 2015, United petroleum Development acquired the rest of working interest in El Bunduque Oil Field from BP.

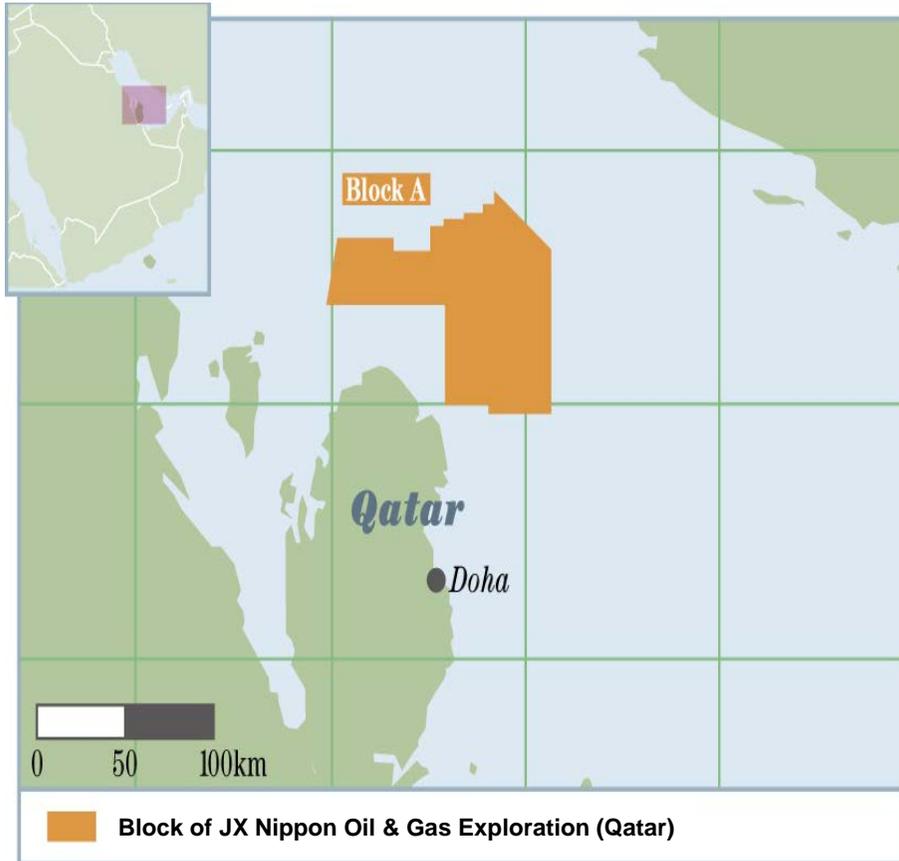
	Mubarraz, Umm Al-Anbar, Neewat Al-Ghalan, Hail
Company Holding the Acreages	Abu Dhabi Oil
Partners	JX Nippon Oil & Gas Exploration (32.2%) Cosmo Abu Dhabi Energy Exploration & Production Co., Ltd.(64.4%) Chubu Electric Power Co., Inc.(1.7%) Kansai Electric Power Co., Inc.(1.7%)
Project Status	Development / Production
Interest	100.0%
Operator	Abu Dhabi Oil

- In 1967, acquired a working interest in block of Mubarraz.
- In 1973, oil production commenced in [Mubarraz Oil Field](#).
- In 1989, oil production commenced in [Umm Al Anbar Oil Field](#).
- In 1995, oil production commenced in [Neewat Al Ghalan Oil Field](#).
- In 2009, 3 fields achieved cumulative production volume of 300 million barrels.
- In 2012, Effectuation of New Concession Agreement.
- In 2017, scheduled to start production in [Hail Oil Field](#).

# Principal Individual E&P Project Overview (UAE, Qatar ②)

Qatar

Exploration



## Project Company

JX Nippon Oil & Gas Exploration (Qatar) Limited (55%)  
(%) = JX Group Shareholding

## Interest in Individual Fields

100%

## Operator

JX Nippon Oil & Gas Exploration (Qatar) Limited

## Exploration

- In May 2011, acquired a working interest in [Block A](#) (Pre-Khuff), offshore Qatar .
- In March 2012, established interest in Block A (Pre-Khuff), offshore Qatar officially came into effect.
- In December 2016, excavated test well No2.



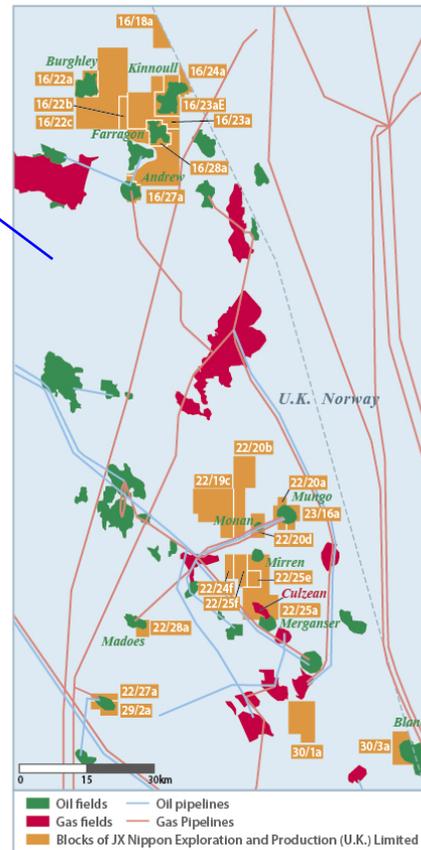
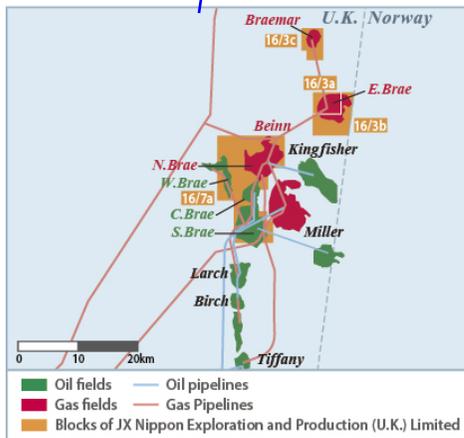
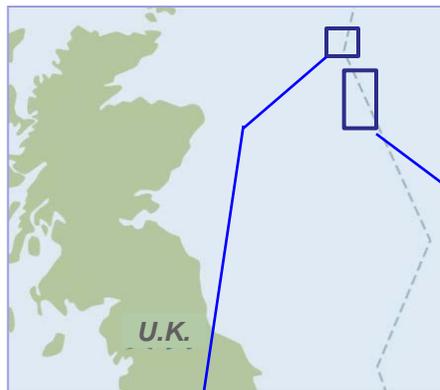
# Principal Individual E&P Project Overview ( U.K. ① )

## U.K. North Sea ①

Production

Development

Exploration



We have over 10 fields currently producing oil and gas as well as such projects as Culzean gas field and Mariner Oil Field underway.

	Brea, Andrew, Blane, Kinnoull and other fields	Culzean gas field
Company Holding the Acreages	JX Nippon Exploration and Production (U.K.) Ltd.	
Shareholders(Holding Percentages)	JX Nippon Oil & Gas Exploration (100%)	
Project Status	Exploration/Production	Development
Interest	4.0%~27.39%	18.01%
Partners	BP, Repsol Sinopec, Marathon and others	Maersk(49.99%) BP(32.00%)
Operator	BP, Repsol Sinopec, Marathon and others	Maersk
Sales Volumes(Apr.~Dec. 2016)	11,500 boed (oil 9,700b/d, gas 10.6mmcf/d)	

### Production

**Mining Area under production : Andrew, Kinnoull, Brae, Mirren / Madoes, Blane Oil and Gas Fields etc.**

- From 1994 to 2002, acquired a working interest in individual blocks.
- In December 2012, acquired some interest in production of plural assets from ENI.
- In December 2014, Kinnoull started production

### Development

**Mining Area under Development : 22/25a Culzean gas field.**

- In March 2011, confirmed the presence of a significant hydrocarbon accumulation.
- In December 2012, acquired the additional interest from ENI.
- In August 2015, decided to develop.
- In May 2016, sold part of working interest.
- In 2019 Production scheduled to commence.

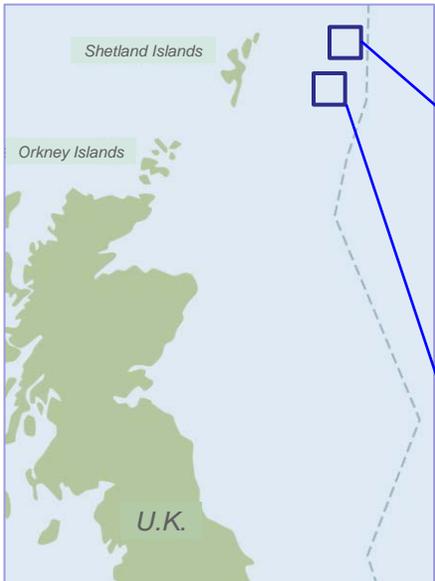
### Exploration

- In June 2016, sold a working interest in the Utgard Gas and Condensate Field.

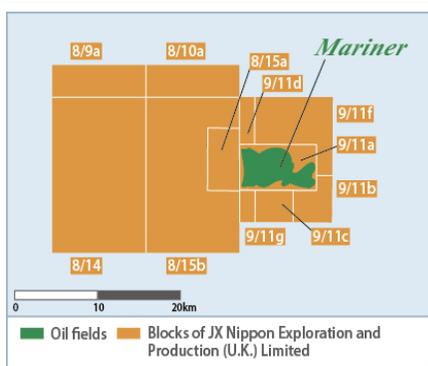
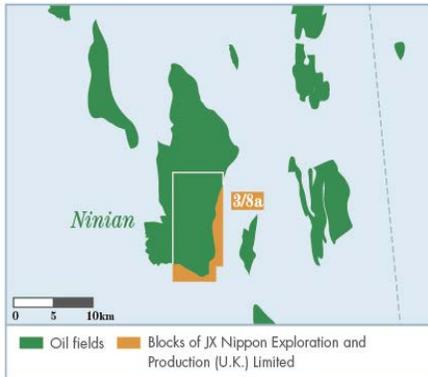
# Principal Individual E&P Project Overview ( U.K. ② )



## U.K. North Sea ②



Production Development Exploration



Exploration

**New blocks are acquired in 2014 by 28<sup>th</sup> round of governmental open tender .**

These areas are next to developed Mariner oil field, in the case when oil and gas field were found, we expect developing cost reduction by using facilities in this oil field.

	Mariner Field	North Sea Northern Area 8/9a, 8/10a, 8/14, 8/15b, 9/11f, 9/11g	Ninian Field
Company Holding the Acreages	JX Nippon Exploration and Production (U.K.) Ltd.		
Shareholders(Holding Percentages)	JX Nippon Oil & Gas Exploration (100%)		
Project Status	Development	Exploration	Production
Interest	20.00%	20.00%	12.94%
Partners	Statoil (65.11%) Siccar Point(8.89%) Dyas (6.00%)	Statoil (65.11%) Siccar Point(8.89%) Dyas (6.00%)	CNR(87.06%)
Operators	Statoil	Statoil	CNR

Development

### Mining Area under Development : Mariner Oil Field

- In December 2012, acquired the explorational interest in Mariner Oil Field from ENI.
- In February 2013, decided to develop.
- In August 2016, sold part of the working interest.  
In 2018 Production scheduled to commence.



# JX Group's Reserve Standards

JX Group's criteria for evaluating reserves conforms to the PRMS (Petroleum Resources management System) Standards, drafted by the SPE (Society of Petroleum Engineers), WPC (World Petroleum Congress), AAPG (American Association of Petroleum Geologists), and SPEE (Society of Petroleum Evaluation Engineers).

JX Group's reported reserves are in line with reserves as defined by the PRMS Standards. The degree of certainty of the reserve values is categorized, in order, as either Proved, Probable, or Possible. Following trends common at other industry firms, JX Group's has used Proven and Probable reserves to arrive at its total reserves.

## **Definition of Proved Reserves:**

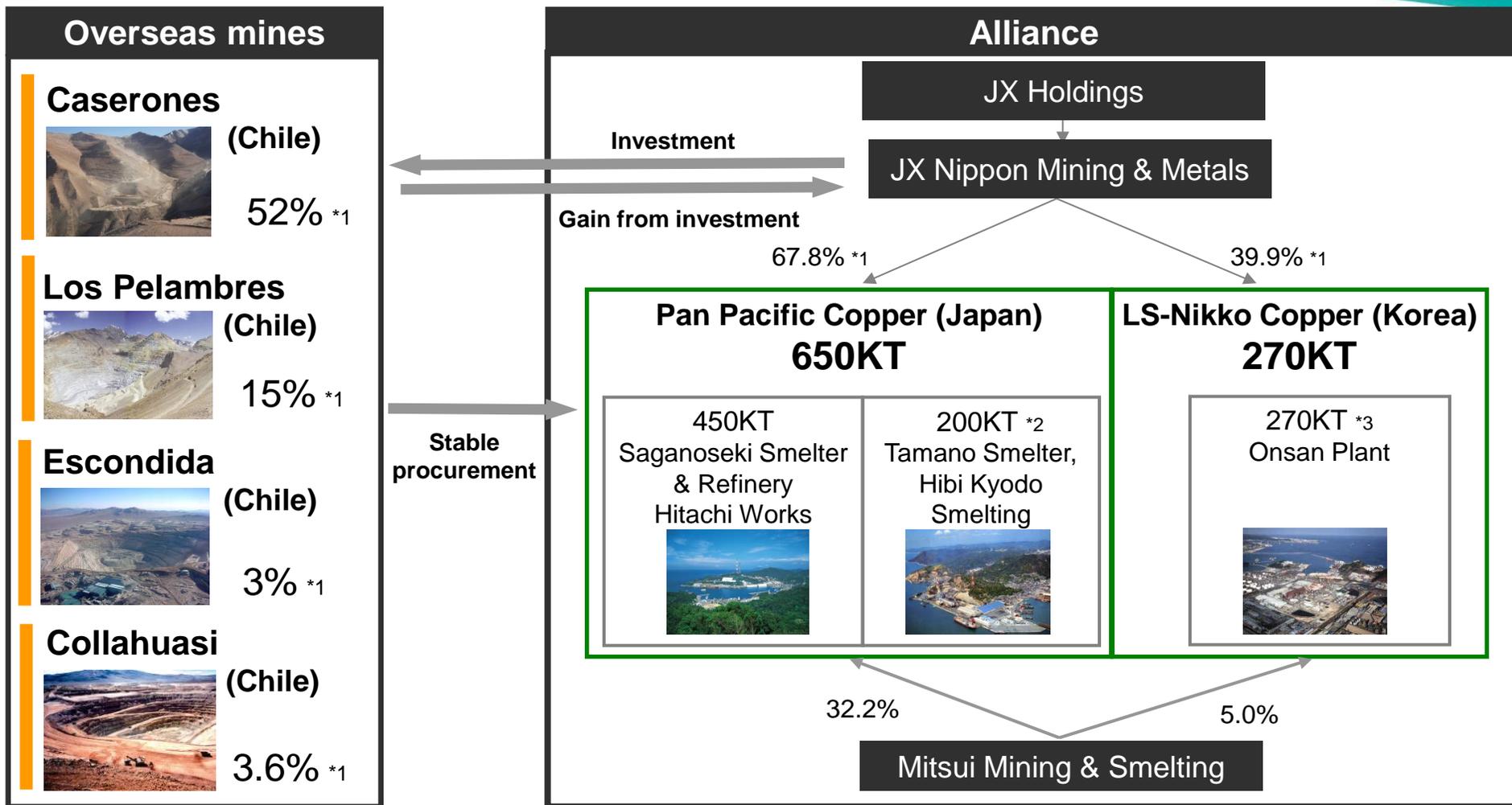
Reserves judged to have a high level of certainty from analysis of geoscience and production/petroleum engineering data, based on economic conditions, operational methods and laws and regulations assumed by JX Group in light of discovered reservoirs—there is at least a 90% probability that actual recovered volume will equal or exceed estimates of oil and natural gas deposits reasonably evaluated as commercially recoverable.

## **Definition of Probable Reserves:**

There is at least a 50% probability that additional oil and natural gas reserves will equal or exceed actual recovered volume of the total of estimated proved and probable reserves. While these additional reserves are evaluated in the same manner as proved reserves, the probability of recoverability of probable reserves is lower than proved reserves, but higher than possible reserves.

# Business Environment and Data - Metals Business -

# Copper Business



\*1. Shares indirectly owned by JX Nippon Mining & Metals

\*2. Allocated to PPC. Total Capacity is 290KT. \*3 Total Capacity is 680KT. JX has 39.9% equity.

# Overseas Copper Mine Development

## Caserones Copper Mine (Chile)



**Acquisition date** May 2006

**Acquisition price** \$137 million

**Initial investment** \$ 4.20 billion

In July 2011, project finance(\$1.1billion) and long-term loan(\$0.3billion) were concluded.

**Ownership** (As of Dec. 2016)

**Pan Pacific Copper (PPC)\* 77.37%**

- Jointly established by JX Nippon Mining & Metals (67.8%) and Mitsui Mining & Smelting (32.2%)
- Mitsui & Co., Ltd. 22.63%

**Mine life** From 2013 to 2040 (28 years )

**Total production (28years)**

Copper : 3,550kt From Copper Concentrate 3,140kt

From SX-EW Process 410kt

Molybdenum : 87kt

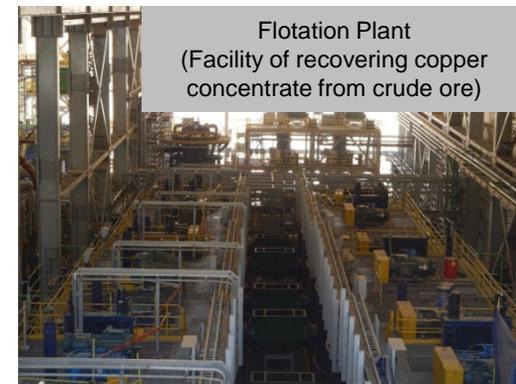
**Production plan**

In Mar. 2013, started to SX-EW Copper Cathode Production

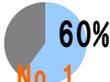
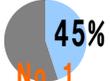
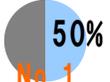
In May. 2014, started to Copper Concentrate Production



		first 10 years	average (28years)	total (28years)
Copper	Copper Concentrate	150 kt/year	110 kt/year	3140 kt
	SX-EW Process	30 kt/year	10 kt/year	410 kt
	total	180 kt/year	120 kt/year	3550 kt
Molybdenum		3 kt/year	3 kt/year	87 kt

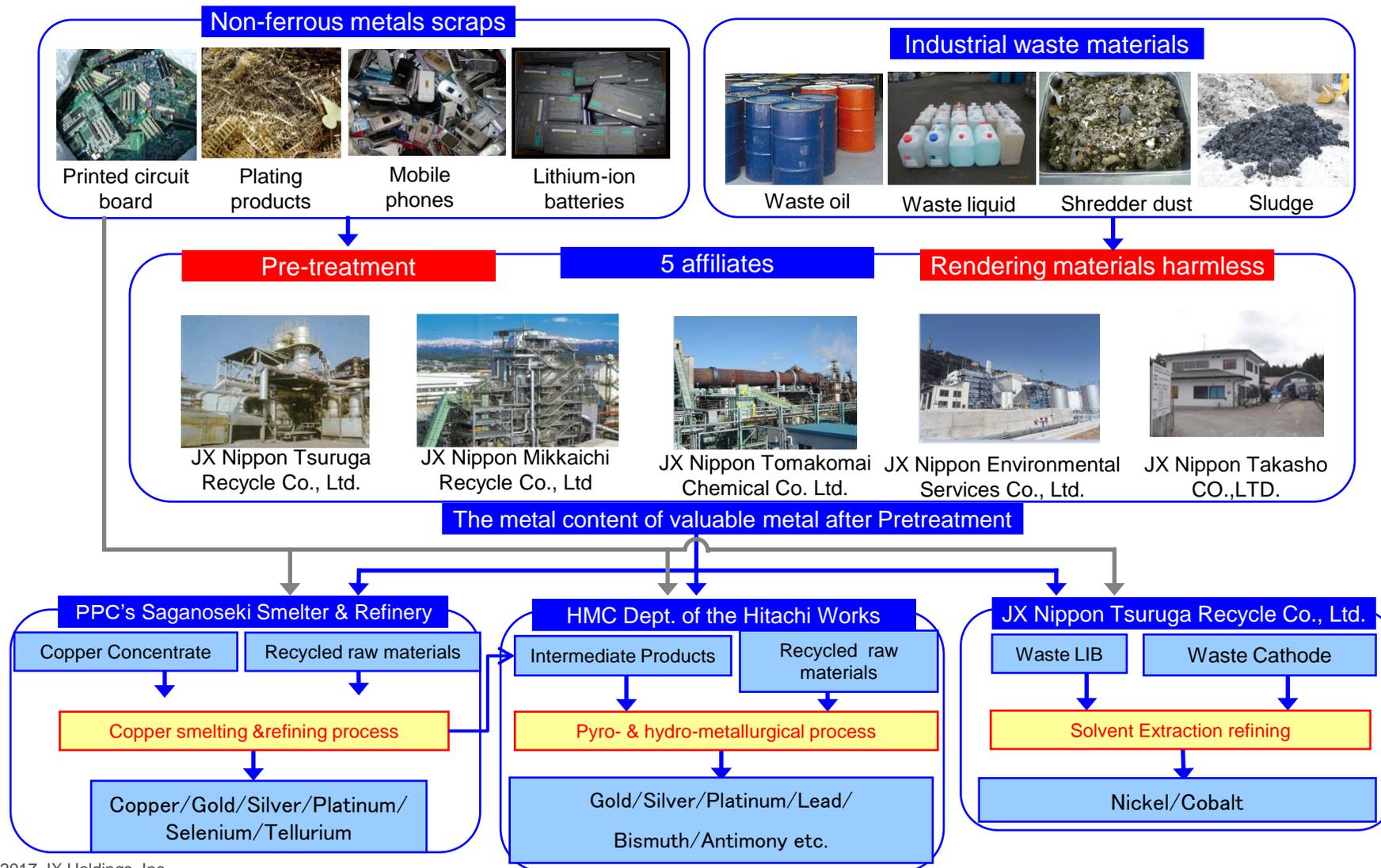


## Electronic Materials

Main products	Global market share	Primary applications	End-use applications				
			PCs	Mobile phones / Smart phones	Digital, Avs	Telecom infra/ Data canter	Auto mobiles
 Treated rolled copper foil	 70% No. 1	Flexible printed circuit boards	○	⊙	⊙		○
 Semiconductor targets	 60% No. 1	CPUs, memory chips, etc.	⊙	⊙	⊙	○	○
 ITO targets for FPDs *	 30% No. 1	Transparent electrodes	⊙	⊙	⊙		○
 HD media targets	 60% No. 1	HDD (Hard disk drives), etc.	⊙		○	○	
 Phosphor bronze	 20% No. 1	Connectors	○	⊙	○		○
 Corson alloy (C7025)	 45% No. 1	Lead frames, Connectors	⊙	○	○	○	○
 Titanium copper alloy	 70% No. 1	High-class connectors, etc.	○	⊙	○		○
 In-P compound semiconductors	 50% No. 1	Optical communication devices High-speed IC			○	⊙	○

\* Flat Panel Displays

# Recycling and Environmental Services



# Copper Production of JX Group's Mines

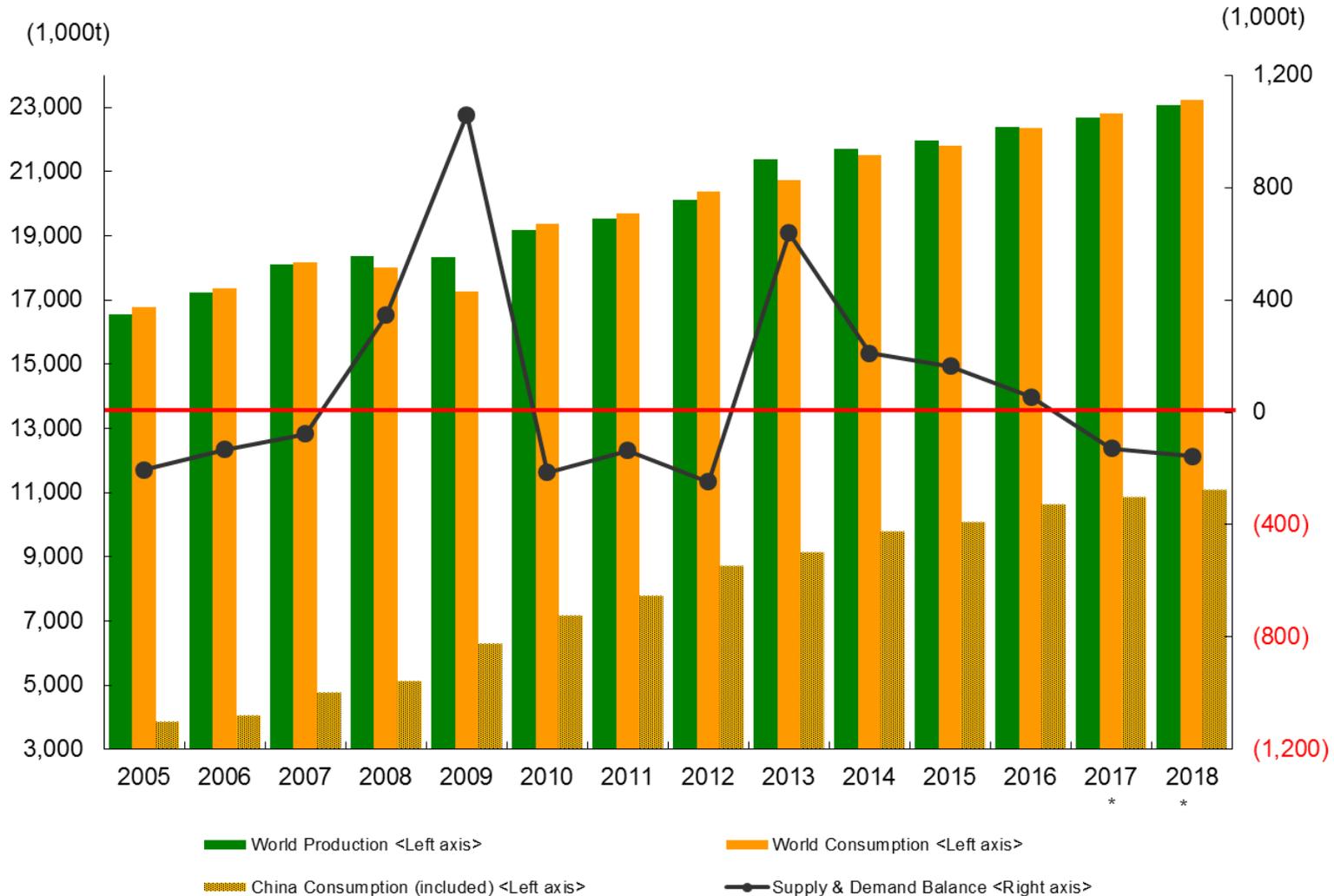
(Thousand Ton)		*2	2015	2015	2016			2016
			1-3Q	Full	(1Q)	(2Q)	(3Q)	1-3Q
			Actual	Actual	Actual	Actual	Actual	Actual
Caserones	Copper concentrate		34	52	17	19	29	65
	SX-EW copper cathode		22	31	8	9	9	26
	Total		56	83	25	28	38	91
Los Pelambres	Copper concentrate *1		285	367	90	87	96	273
Collahuasi	Copper concentrate *1		286	419	110	122	125	357
	SX-EW copper cathode		19	22	2	1	1	4
	Total		305	441	112	123	126	361
Escondida	Copper concentrate *1		667	799	175	182	148	505
	SX-EW copper cathode		238	326	85	85	71	241
	Total		905	1,125	260	267	219	746

\*1 Payable copper contained in concentrate

*2	1-3Q	Full
Caserones/Los Pelambres	Apr.-Dec.	Apr.-Mar.
Collahuasi/Escondida	Jan.-Sep.	Jan.-Dec.



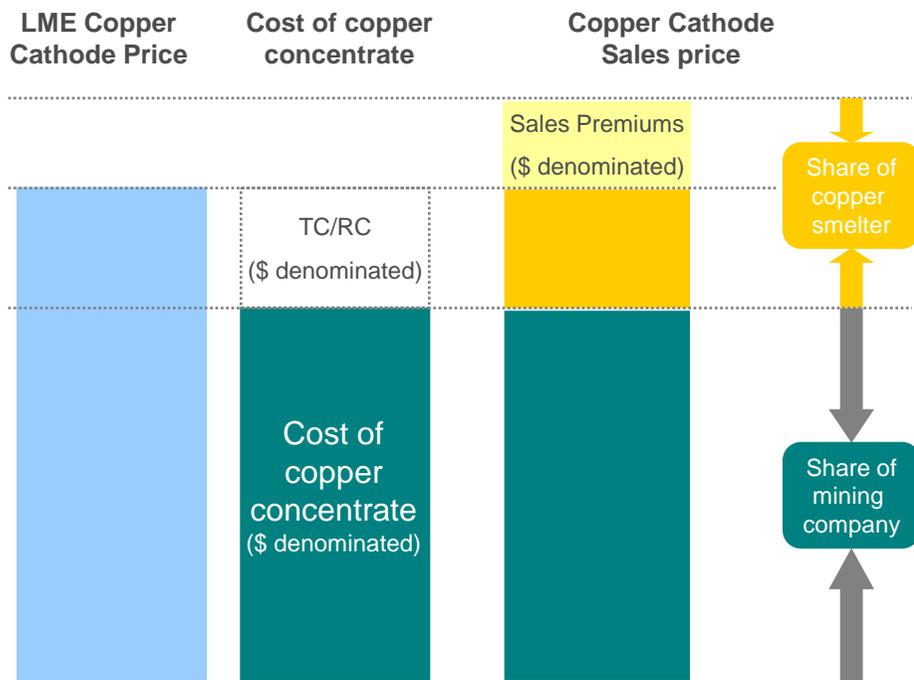
# World's Copper Cathodes Supply & Demand





# Earnings Structure of Copper Smelting and Refining Business

## Earnings Structure of Copper Smelter & Refinery



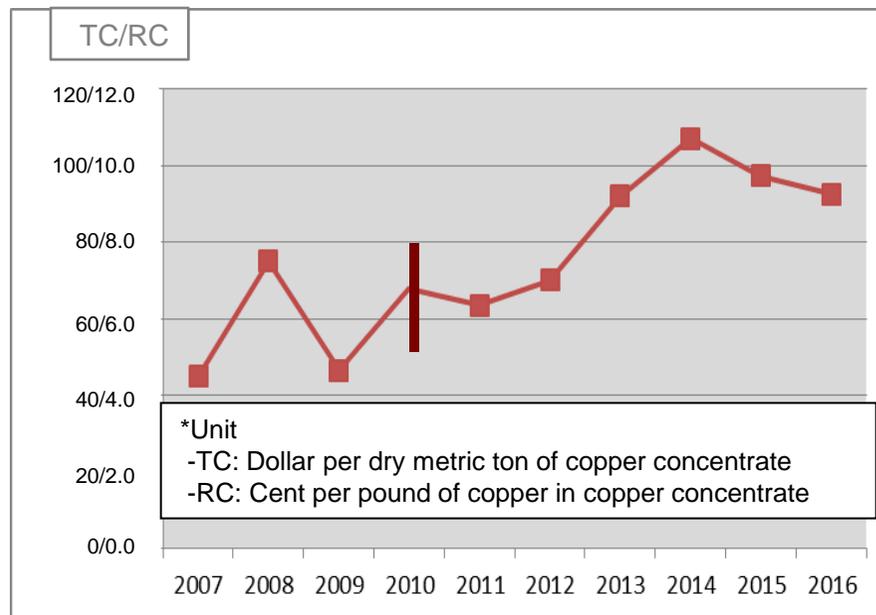
### Cost of copper concentrate :

The price of copper concentrate, which custom smelters pay to mining companies, is LME copper cathode price less TC/RC, which is smelting and refining margins. TC/RC under long-term contracts is normally determined through annual negotiation between copper smelters and mining companies.

### Copper cathode sales price :

Actual sales price of copper cathode produced by copper smelters is LME price plus sales premium, which is established by reference to various factors including importation costs, qualities and others.

## Trends of Base TC/RC (negotiation each year-end)



\* For 2010 year-end, several types of agreement have been made depending on negotiating parties, contractual period, etc..