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How much LNG will come to Europe from Asia?

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- Recent situation and outlook by country

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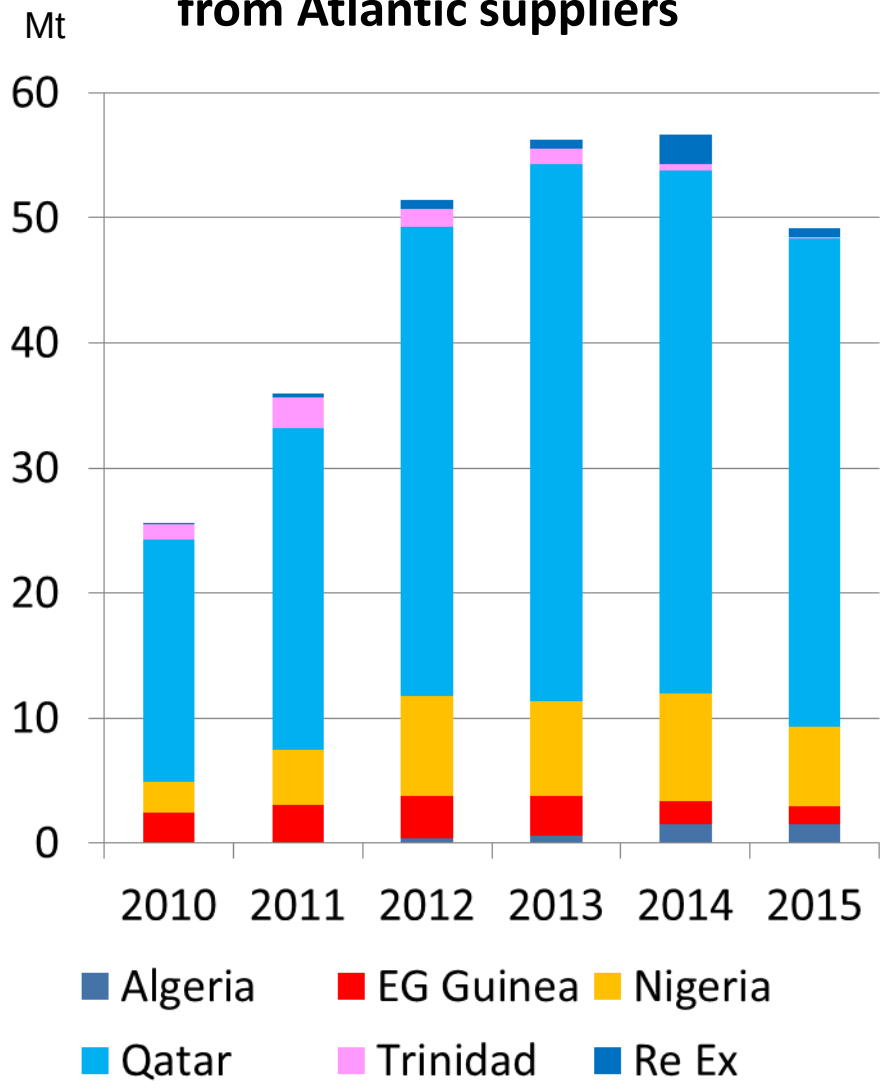
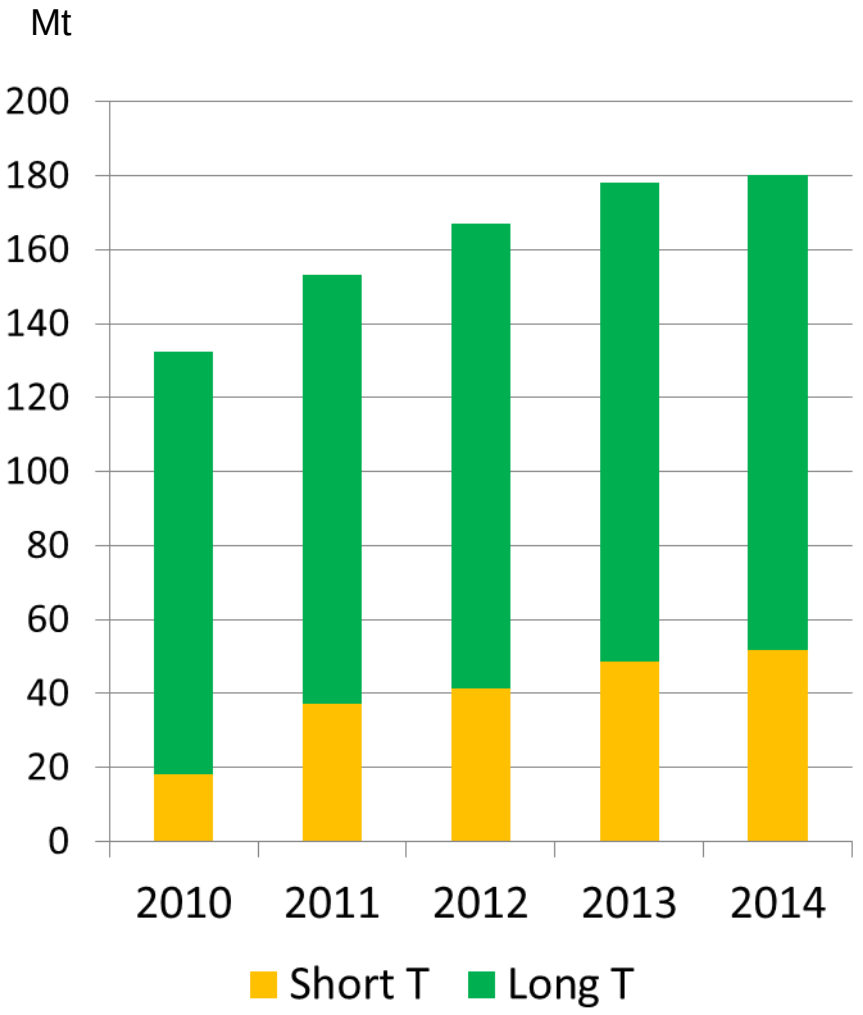
LNG market trends from 2010 to 2014

LNG export volume to Asia from Atlantic suppliers



Short-term contracted to Asia



Waterborne, GIIGNL

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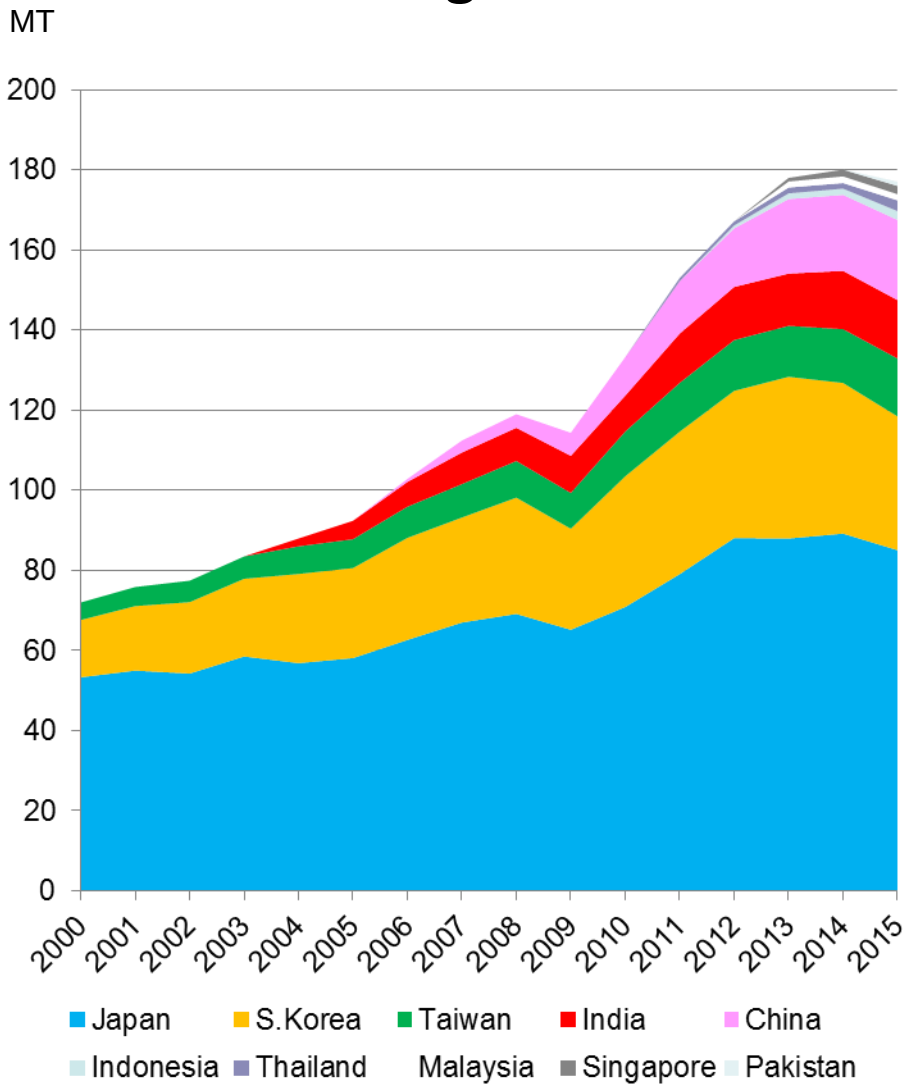
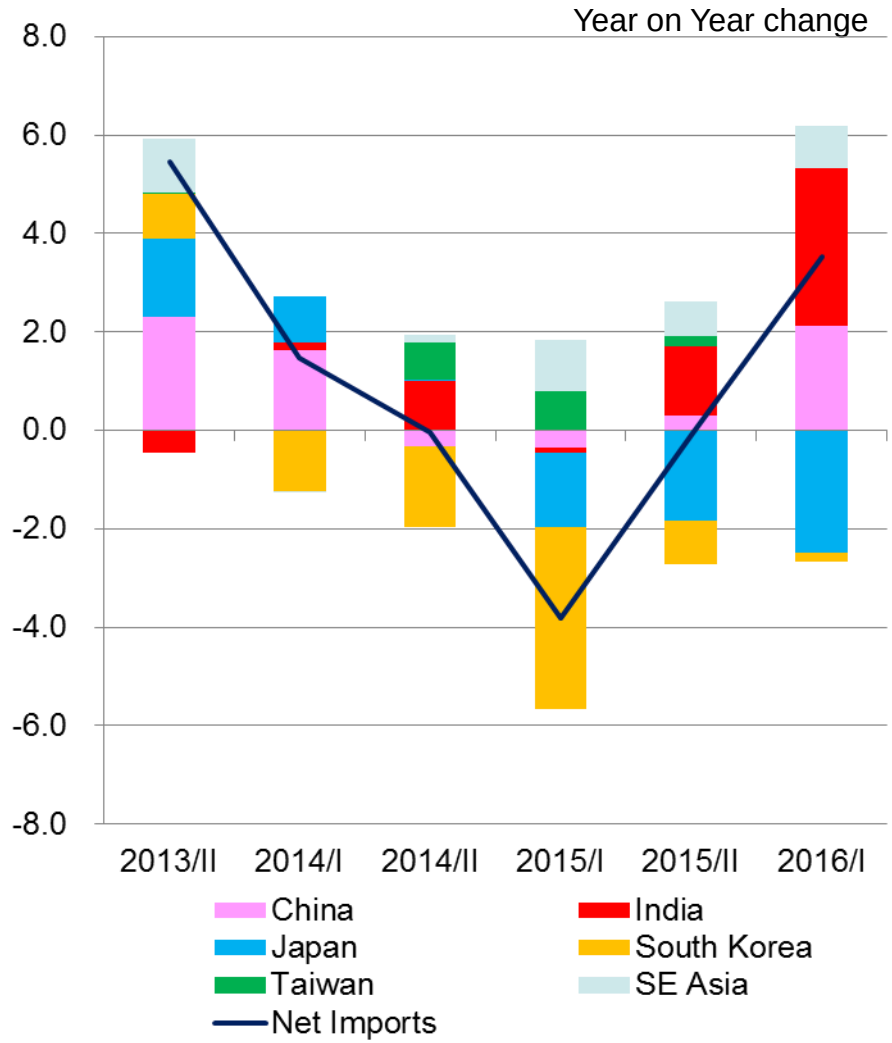
Trends in Asian LNG imports

Changes in LNG demand for Asian countries





GIIGNL

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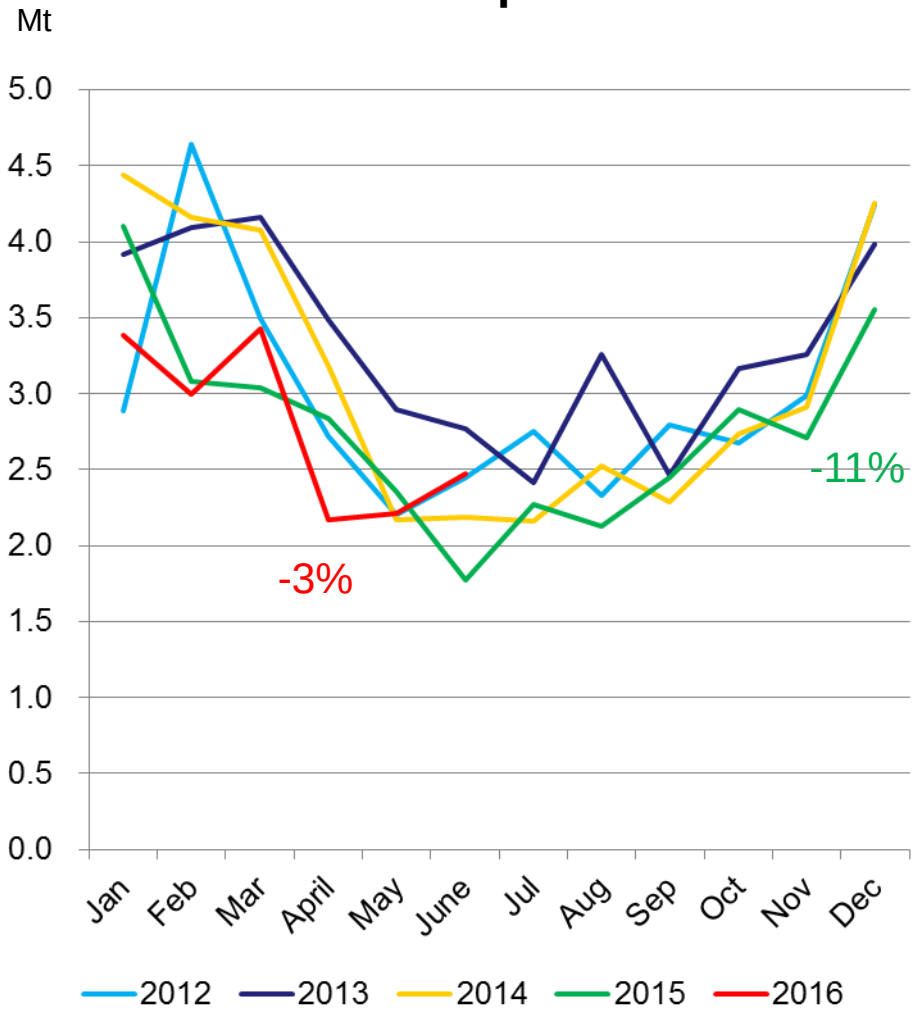
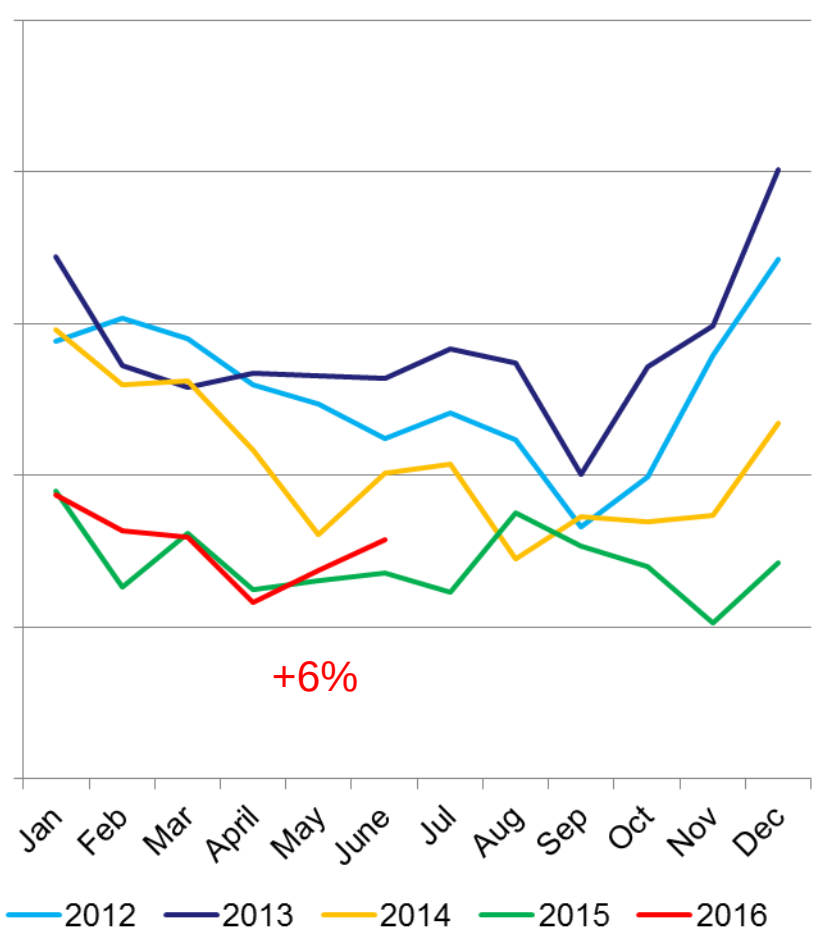
Waterborne, Trade statistics of each countries

Situation and outlook by country-*South Korea*

LNG import



LNG consumption for generation



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Kepco monthly data

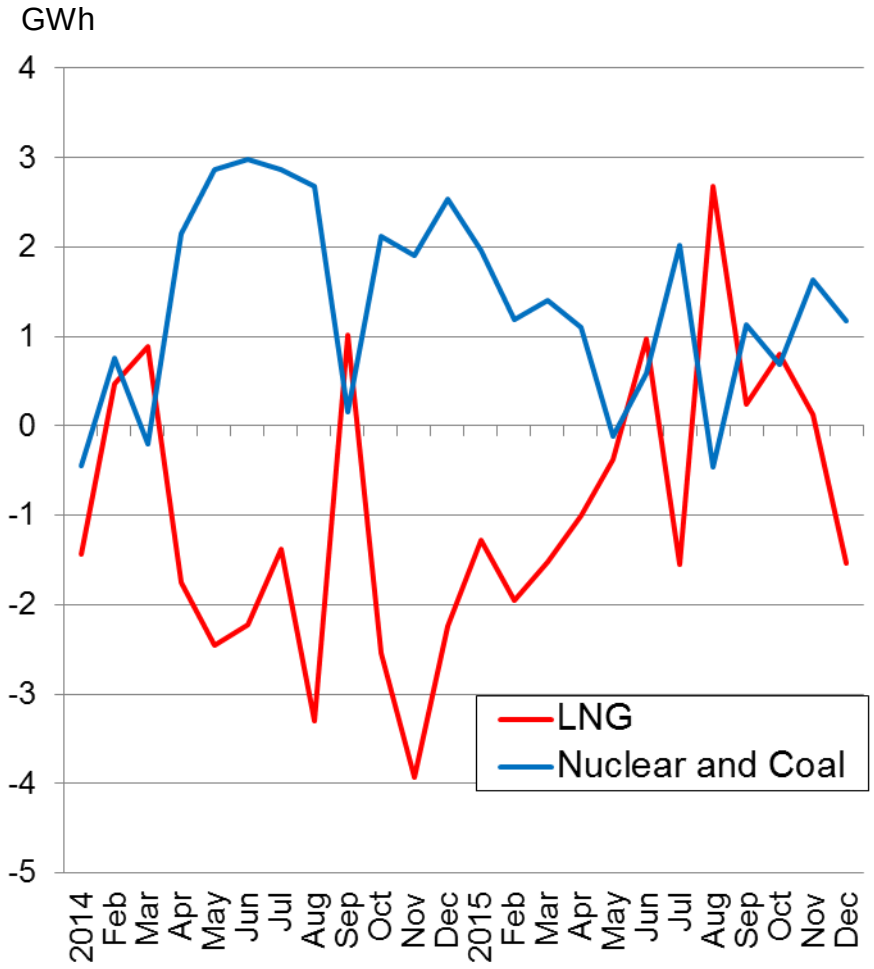
Situation and outlook by country-*South Korea*

Generation capacity

(GW)

	2011	2014	2015
Coal	24.2	26.2	26.2
Nuclear	18.7	20.7	21.7
Gas	20.6	21.0	29.4
Hydro	6.5	6.5	6.5
Oil	9.0	6.7	7.1
Renewable	-	4.5	5.5
Generation Capacity	76.6	93.2	94.2
Supply Capacity	77.2	89.4	87.9
Maximum demand	73.1	80.1	78.8
Surplus capacity	3.5 (4.8%)	13.1 (16.3%)	15.3 (19.4%)

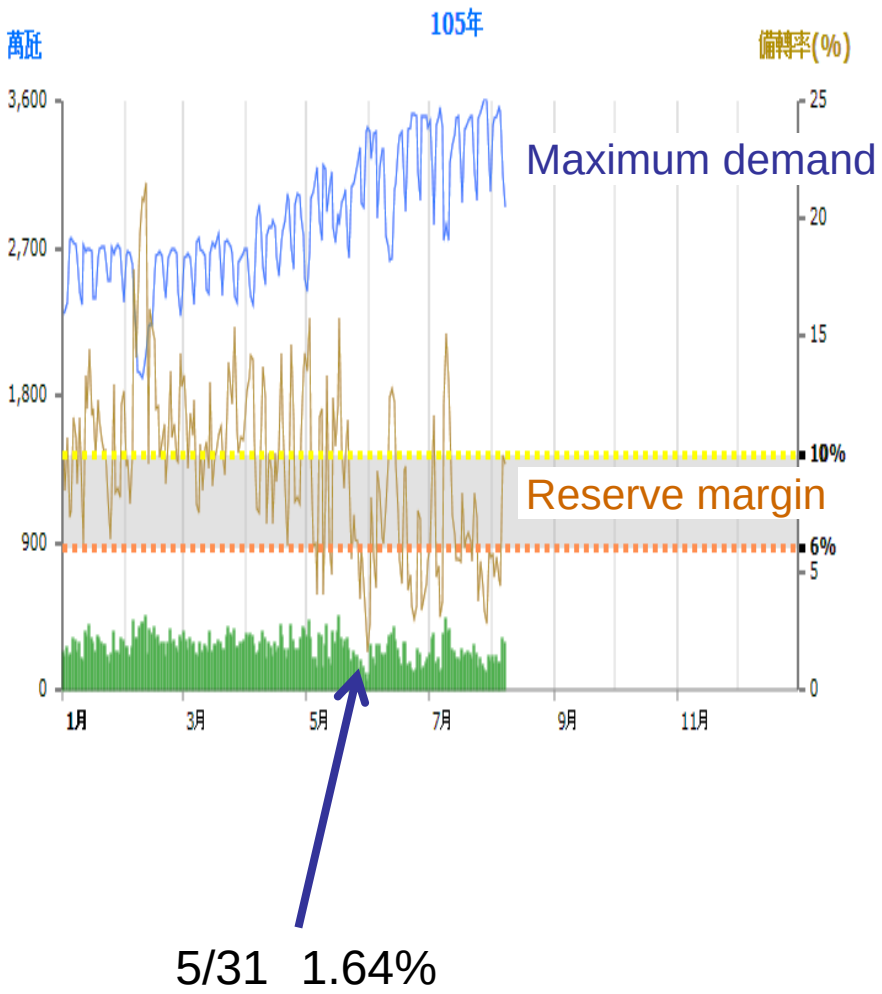
Changes in generation volume(yoy)



Kepco monthly data

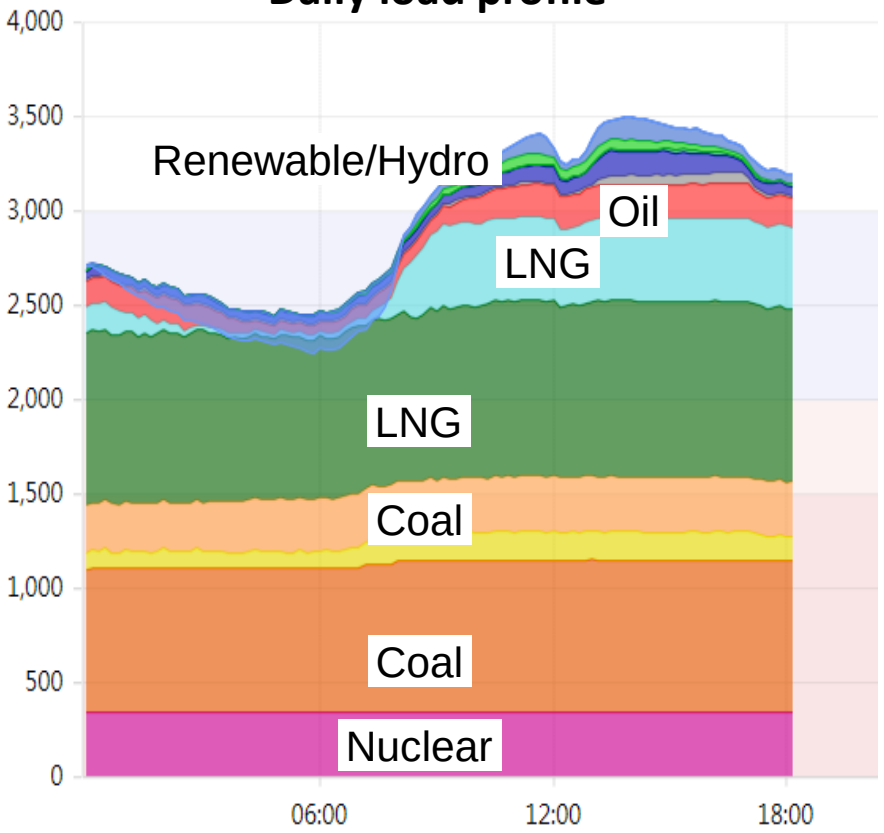
Situation and outlook by country-*Taiwan*

Reserve margin



5/31 1.64%

Daily load profile



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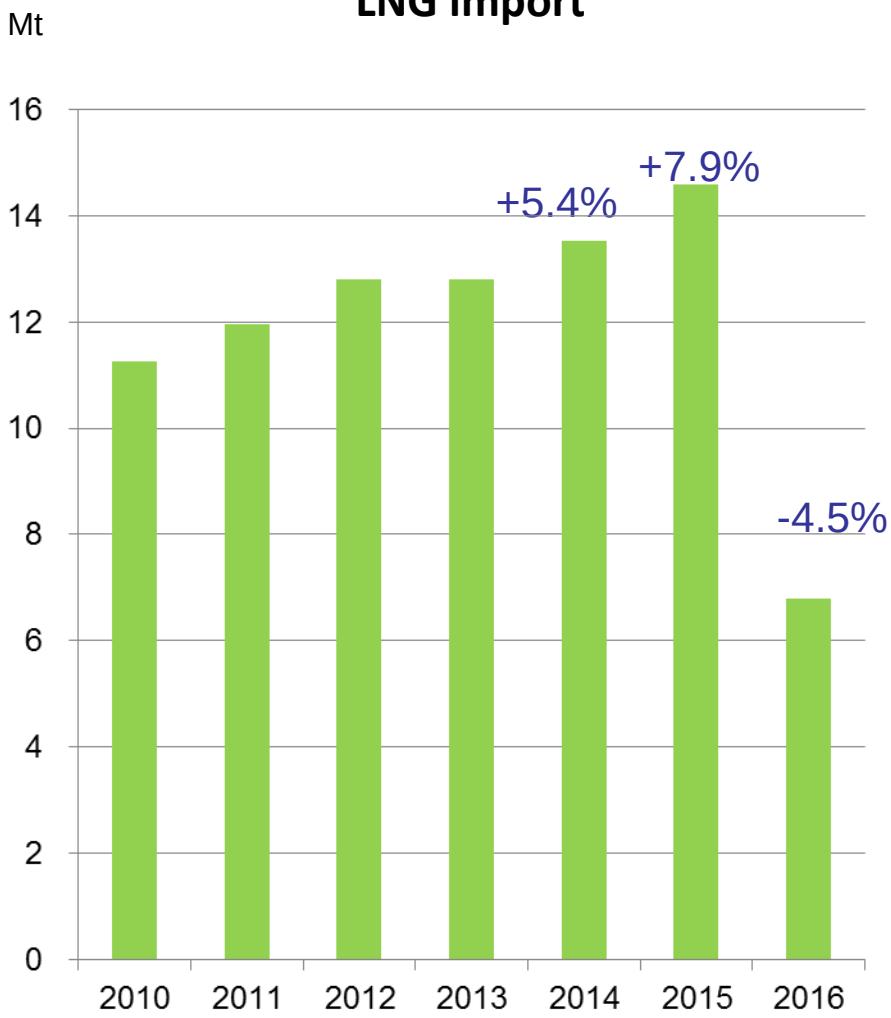
Tai power HP

Situation and outlook by country-*Taiwan*

LNG import

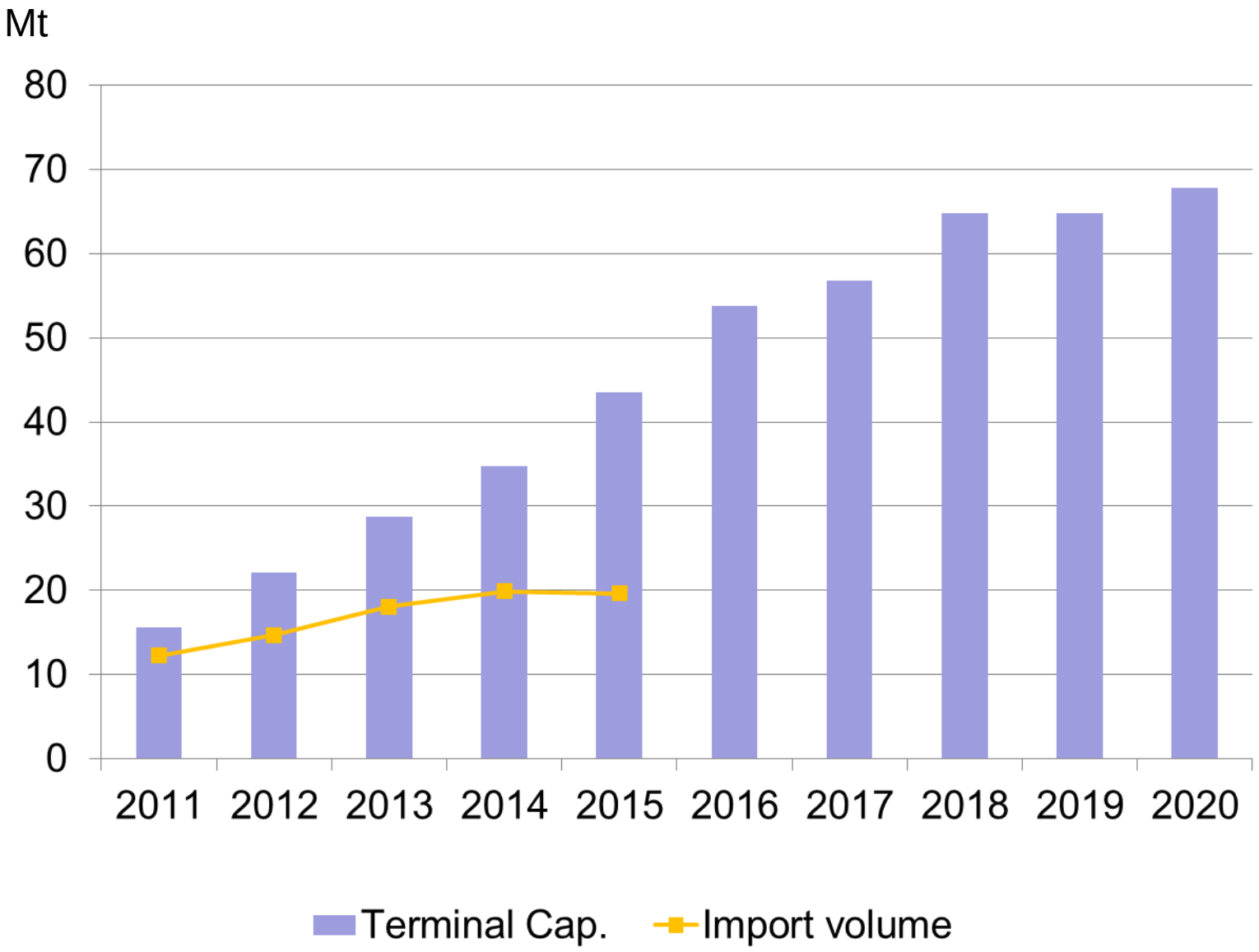


LNG terminal construction plan

Mt	2016	2018-19	2023	2030
Terminal	Taichung Yong an	Taichung	Yong an	No3
Plan	Existing	Exp.	Exp.	New
Capacity	13.5	1.5	1.7	3.3
Total Cap.	13.5	15.0	16.7	20.0

Taiwan custom

Situation and outlook by country-*China*



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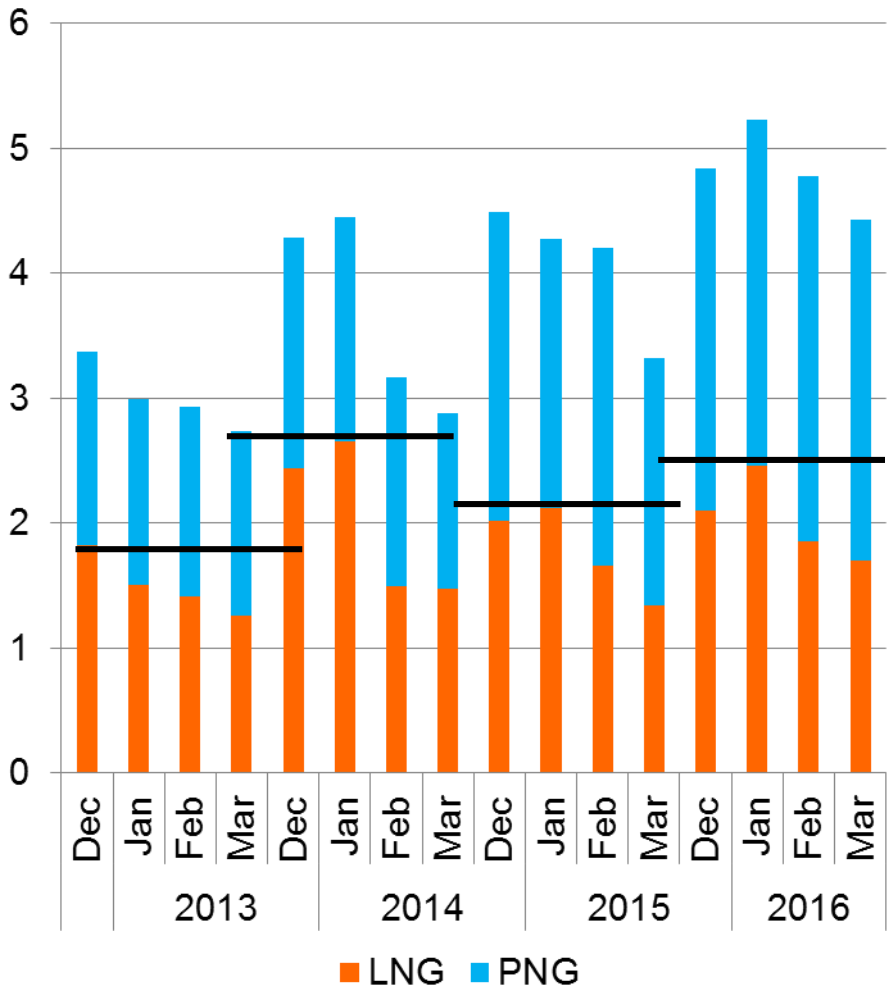
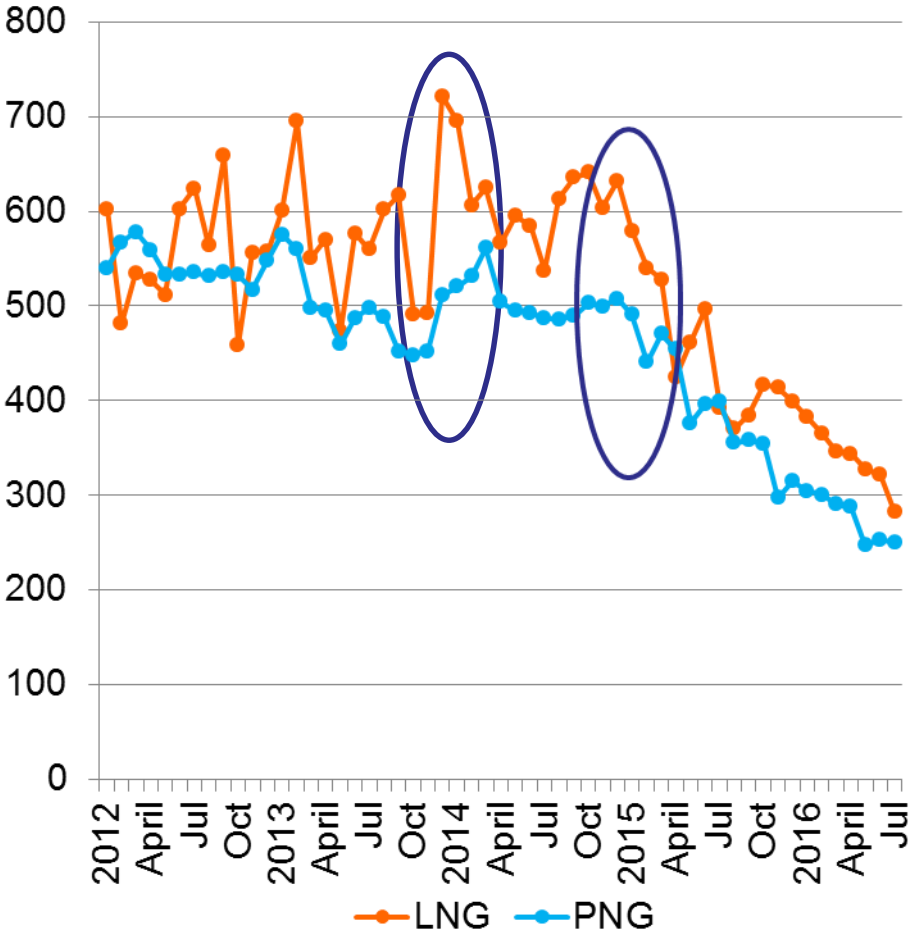
China custom, from various sources

Situation and outlook by country-*China*

Natural gas import volume (Winter)



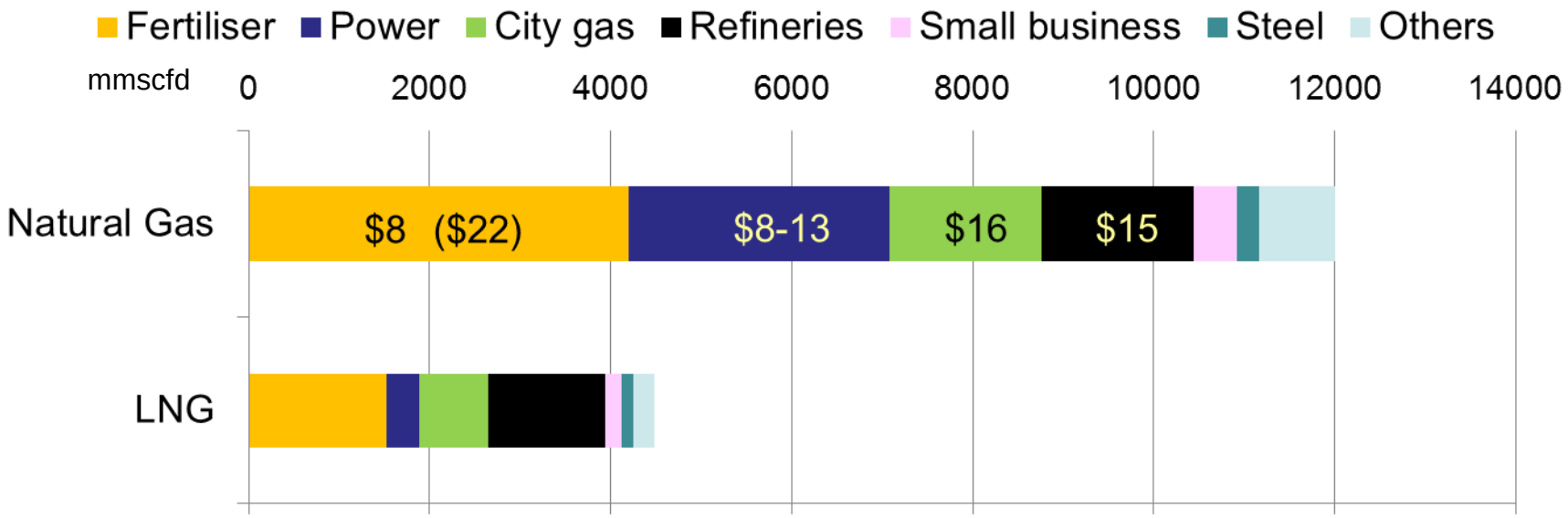
Natural gas import price

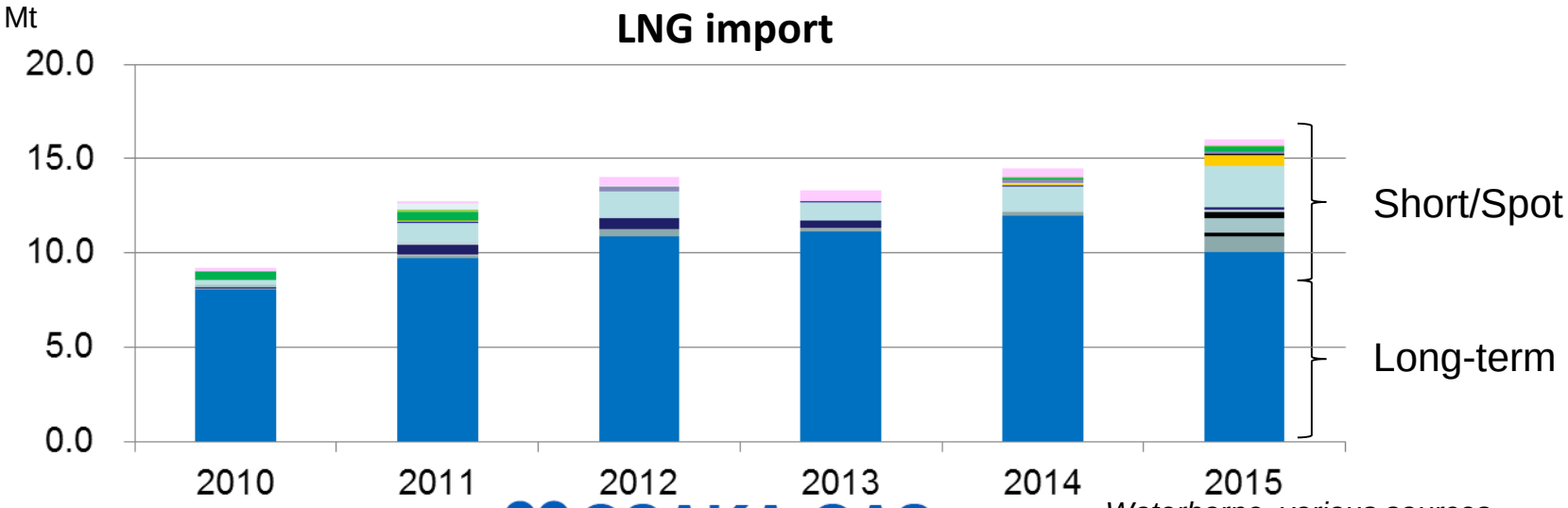


China custom

Situation and outlook by country-*India*

Natural gas consumption by sector and estimated price level



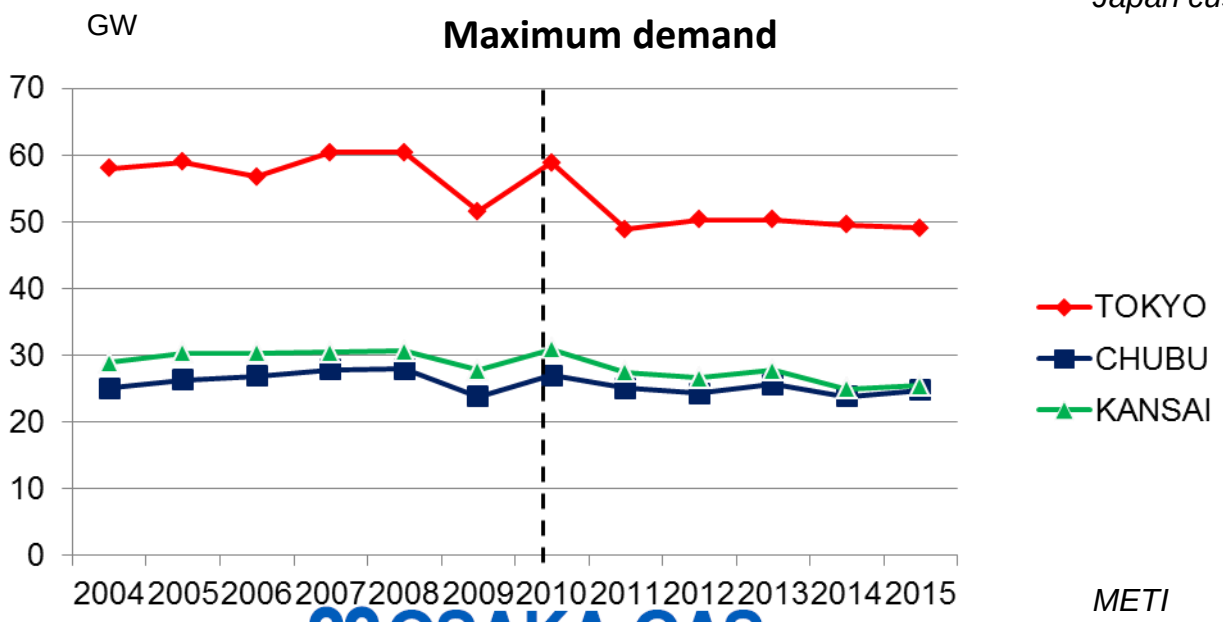


Waterborne, various sources

The Situation in Japan

	2010	2011	2012	2013	2014	2015	2016/1-6
LNG import (Mt)	70.0	78.5	87.3	87.5	88.5	85.0	41.0
	y-o-y	12.2%	11.2%	0.2%	1.2%	-3.9%	-5.3%
LNG demand for generation(Mt)	41.0	49.1	56.4	56.0	56.6	53.1	21.5 (1-5)
	y-o-y	19.8%	15.0%	-0.9%	1.1%	-6.1%	-4.9%
Electricity demand(TWh)	930	884	884	872	859	847	358 (1-5)
		-4.9%	0.1%	-1.4%	-1.5%	-1.4%	-2.4%

Japan custom, METI



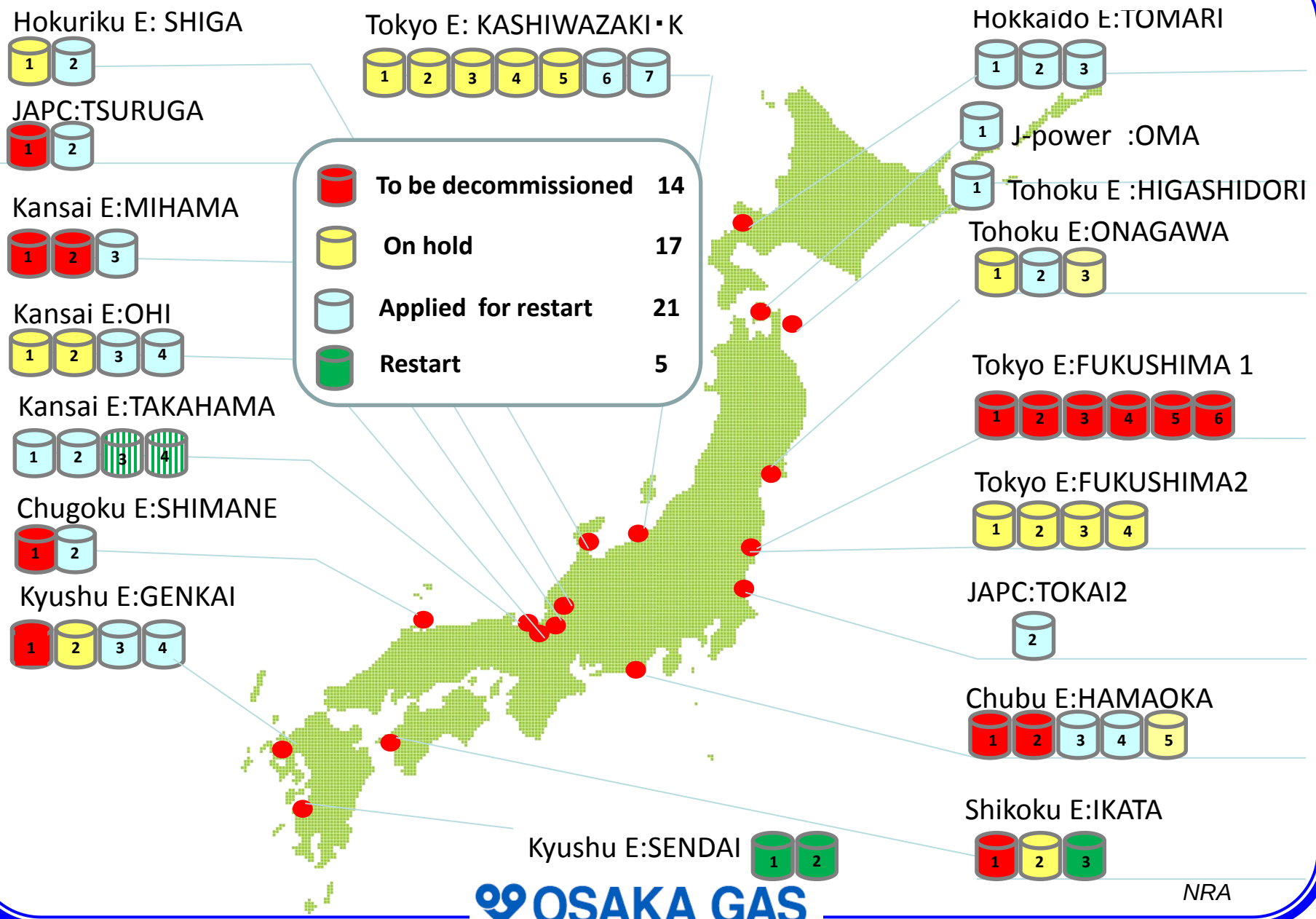
METI

Upgrading and new construction of LNG power

Power Plant	Type	Capacity	Year	Efficiency	Fuel	
Yoshinoura 1,2	CC	502	2012-13	51%	LNG	New
Joetsu 1	ACC	2,380	2012-14	58.5%	LNG	New
Himeji 2	MACC2	2,886	2013-15	60%	LNG	Replacement
Kawasaki 2	MACC	500	2013	58.6%	LNG	Replacement
	MACC	1,370	2016	61.0%	LNG	Replacement
Kashima 3	ACC	1,260	2014	58.0%	City gas	Replacement
Hachinohe 5	ACC	416	2015	57%	LNG	Fuel change
Shin-sendai 3	MACC	980	2015-16	60%	LNG	Replacement
Yokohama 7, 8	ACC	377	2015-16	56%	LNG	Replacement
Chiba 3	MACC	1,500	2016	58.0%	LNG	Replacement
Aioi		750	2016		LNG	Fuel change
Sakaide 2	CC	289	2016	57%	LNG	Replacement
Shin-oita 3	MACC2	459	2016	60%	LNG	Replacement

Various sources

Status of existing nuclear power plants



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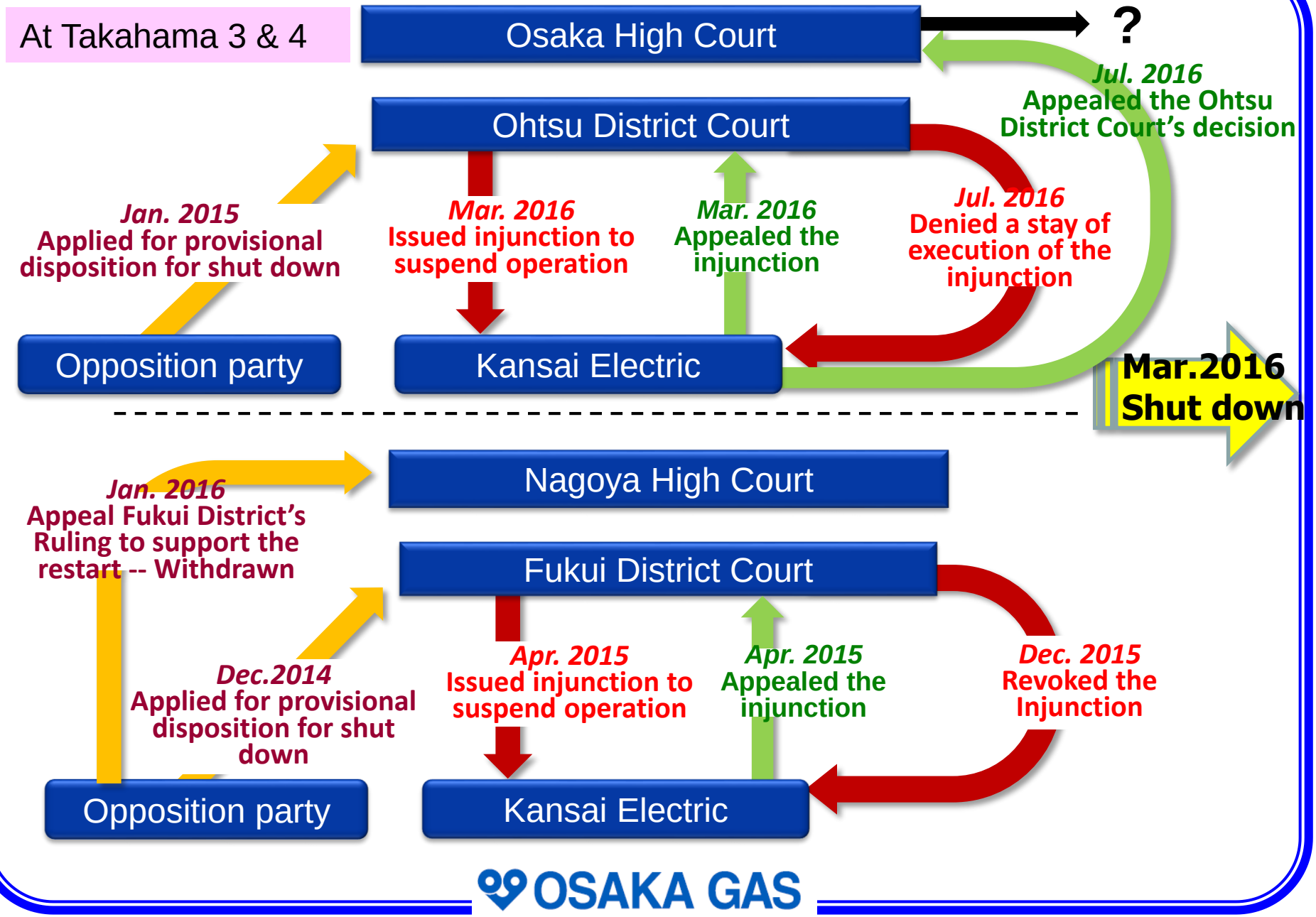
Opposition campaign against nuclear power on court



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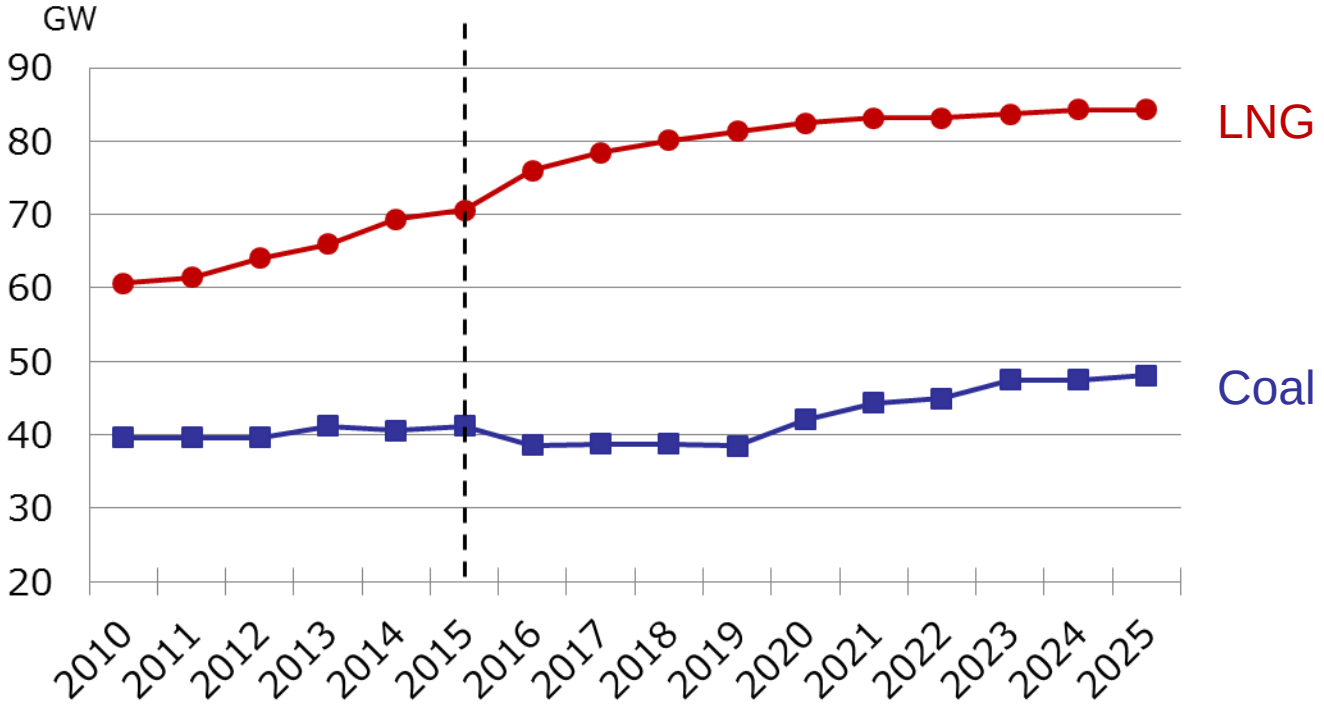
Outlook for generation capacity



FY (GW)	2005	2010	2012	2013	2015	Apr-16	2030 target
Photovoltaic(rt)	1.4	3.6	5.7	7.0	8.4	8.7	64
Photovoltaic			1.6	7.3	21.7	25.5	
Wind	1.1	2.4	2.7	2.7	3.0	3.0	10
Hydro	na	na	na	na	0.4	0.4	
Biomass	2.2	2.4	2.3	2.4	1.6	1.7	6.0-7.3
Geothermal	-	-	-	-	0.01	0.01	1.6

METI, various sources

Three challenges for Asia up to around 2025

- Over-commitment by Asian importers for medium-terms.
  - If the demand trend continues
  - Conventional LNG contracts are highly inflexible when it comes to volumes.

- LNG glut in the international LNG market.
  - Stagnated Asian demand creates an oversupply.
  - Seek a chance to resell the volume even if it generates a loss?

- Henry Hub-linked US LNG
  - Contracted volume to Asia.
  - Surplus volume contracted with portfolio players.

→ **Divert to Europe from Asia?**

Impact of U.S. LNG contracted to Asia

- Limited impact on the JLC price and individual players
  - Major structural changes unlikely in Asian market, limiting the number of new importers
  - Henry Hub-linked LNG just one of their procurement portfolios
  - Its share of the total procurement will remain low

- Reduction of over-contracted volume
  - With the flexibility of US LNG

- Solution to LNG glut in the international market
  - Start-up of the US LNG projects will be ensured by Asian buyers' long term commitment
  - The US LNG projects will contribute as a stable supply source in the future

Thank you very much
for your kind attention