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Phenol

Asia's Rising Capacity and Changing Trade Flow

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Agenda

Phenol / Acetone

- **Rising Asian capacity led by China**
- **Phenol supply/demand**
- **Acetone supply/demand**
- **Prices and margins**

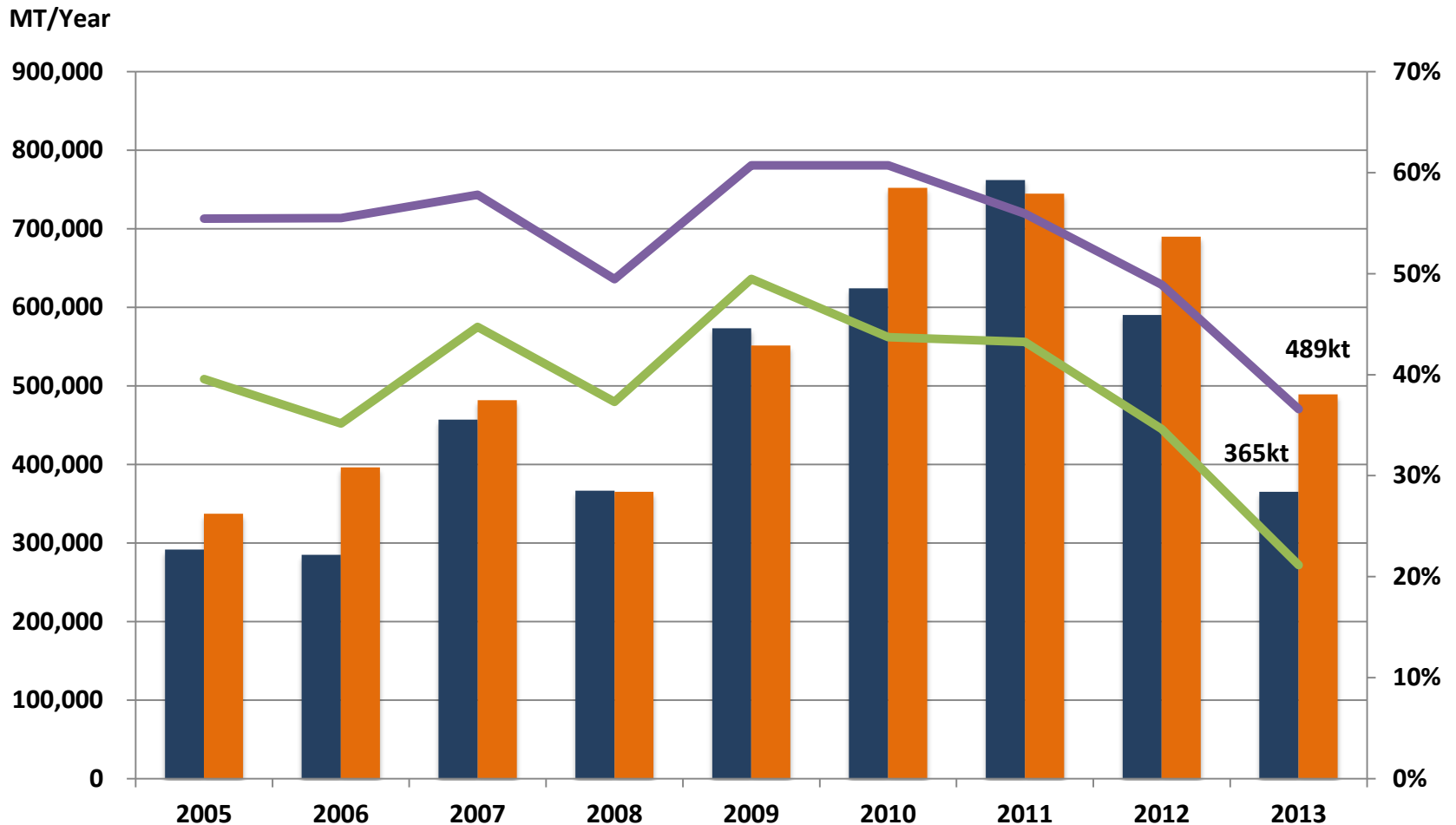
Bisphenol A (BPA)

- **Capacity expansion**
- **Prices and margins**

Potential Market

- **India**
- **Supply/demand**

China: High phenol/acetone import dependency until 2010



Source: ICIS China

■ Phenol Import Volume
 ■ Acetone Import Volume
 — Phenol Import Reliance
 — Acetone Import Reliance

■ Acetone Import Volume
 — Acetone Import Reliance

Asian Phenol/Acetone capacity May 2014

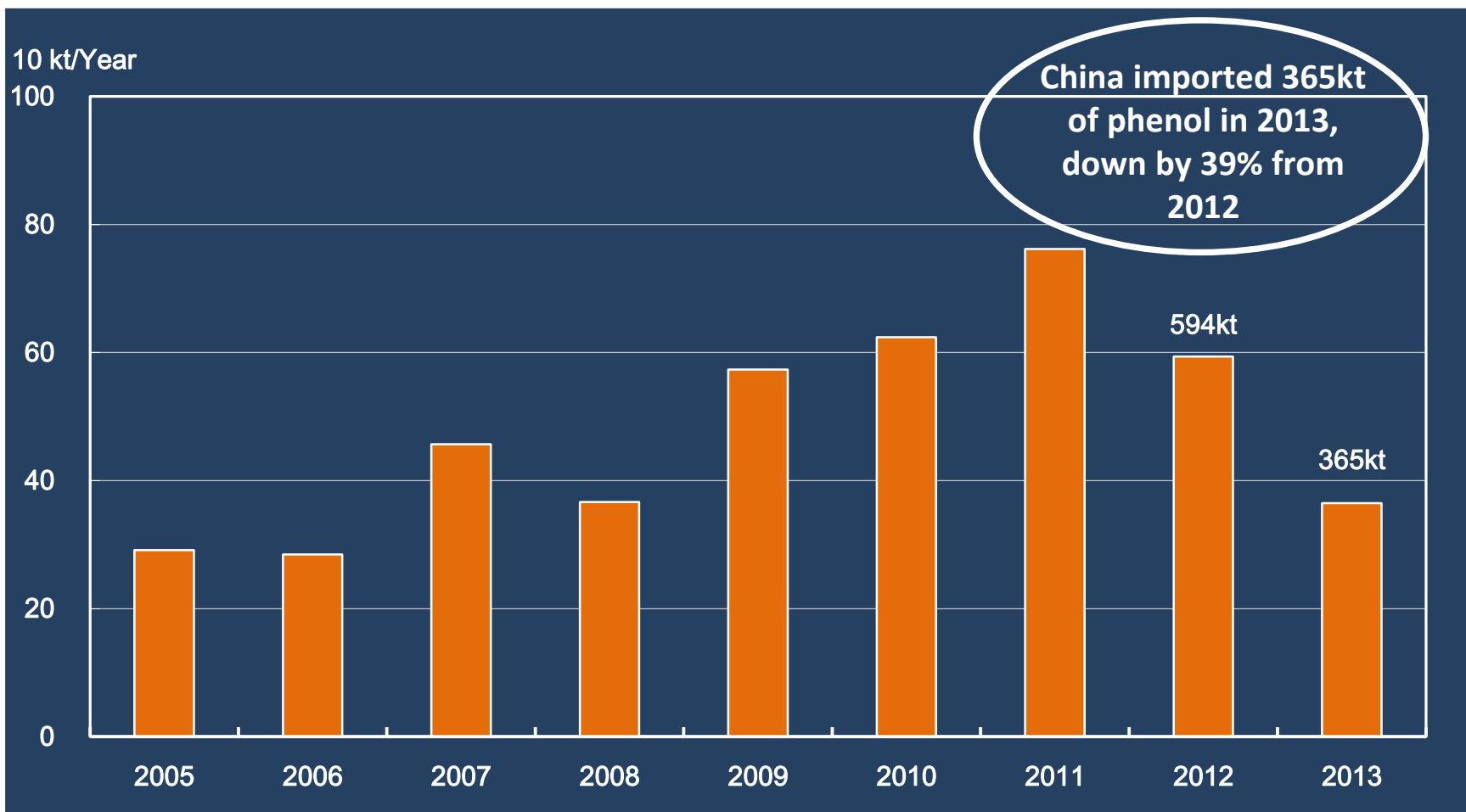
Unit: metric tonnes/year	Phenol	Acetone	Note
Asia excluding China, India	3.43 million	2.02 million	
China	1.65 million	1 million	
Subtotal (May 2014)	5.08 million	3.02 million	
Less plant closure	(250kt)	(90kt)	Mitsui Chemicals, Sept 2014
2014 Expansion	1 million	600kt	
Total by end 2014	5.83 million	3.53 million	
2015 Expansion	550kt	335kt	

Phenol/Acetone capacity expansion 2014-2017

Company	Location	Country	Phenol (kt/year)	Acetone (kt/year)	Start-up
Sinopec Yanshan	Beijing	China	(+) 125	(+) 75	Q3 2014
Kingboard	Huizhou	China	(+) 75	(+) 45	Q3 2014
Sinopec Mitsui (SSMC)	Caojing, Shanghai	China	250	150	Q3 2014
FCFC	Ningbo, Zhejiang	China	300	180	Early Q4 2014
Cepsa	Caojing, Shanghai	China	250	150	Q4 2014
Kumho	Yeosu	South Korea	300	180	H2 2015
PTT Phenol II	Map Ta Phut	Thailand	250	155	Q4 2015
Ineos	Nanjing, Jiangsu	China	400	250	End 2016
CNOOC Huizhou	Huizhou, Guangdong	China	220	130	2016/2017
PTT	Map Ta Phut	Thailand	(+) 50	(+30)	Q2 2017
			2.22 million	1.35 million	

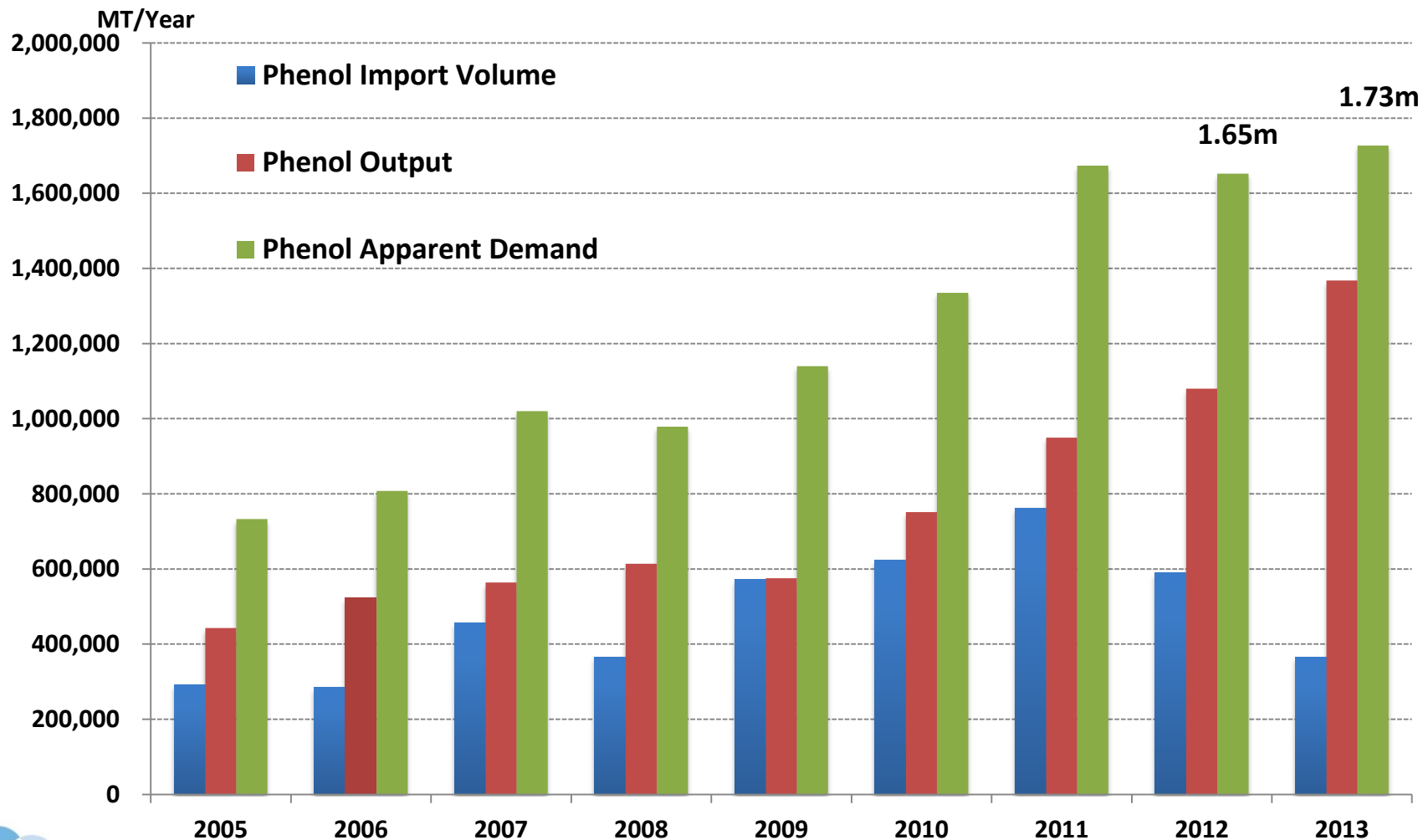
China's phenol import dependency may slump further

China's 2014 phenol imports may decline by 45% from 2013 (ICIS China)



China's slowing phenol apparent demand growth

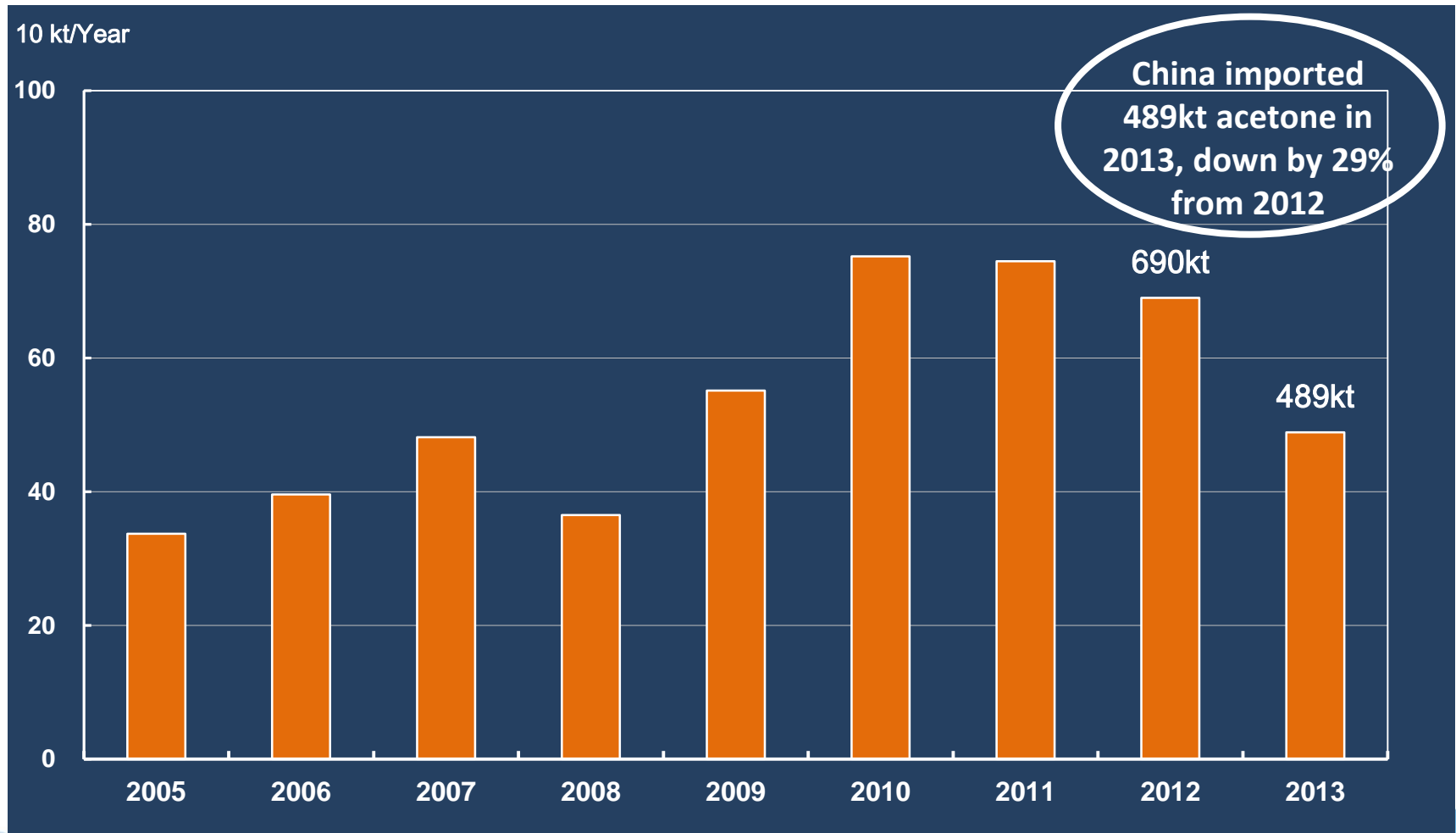
China's phenol apparent demand growth may slow to 1-1.5% in 2014



Sources: ICIS China, China Customs

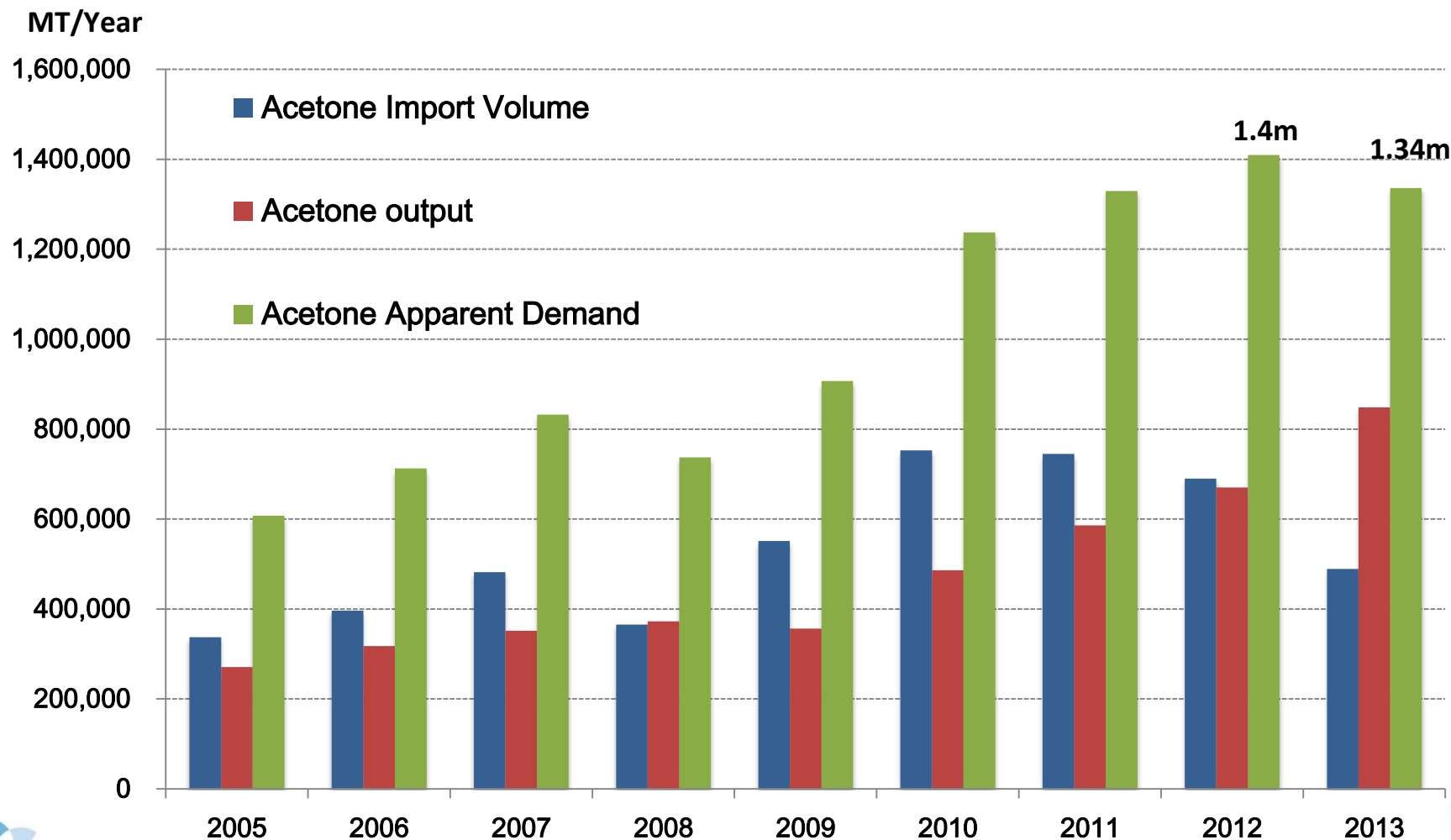
China's acetone import dependency may fall further

China's 2014 acetone imports may fall by 14% from 2013 (ICIS China)

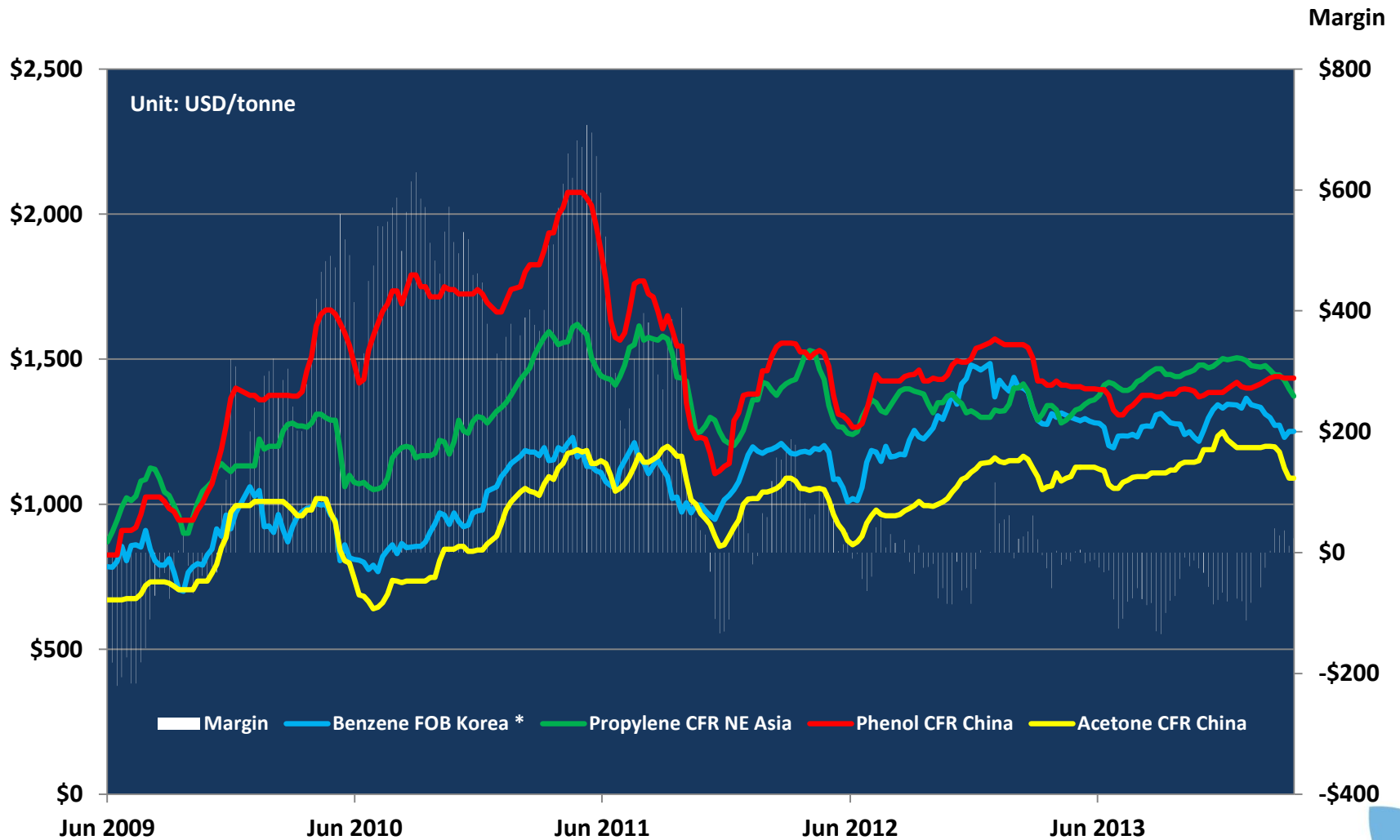


China's acetone apparent demand growth also slowing

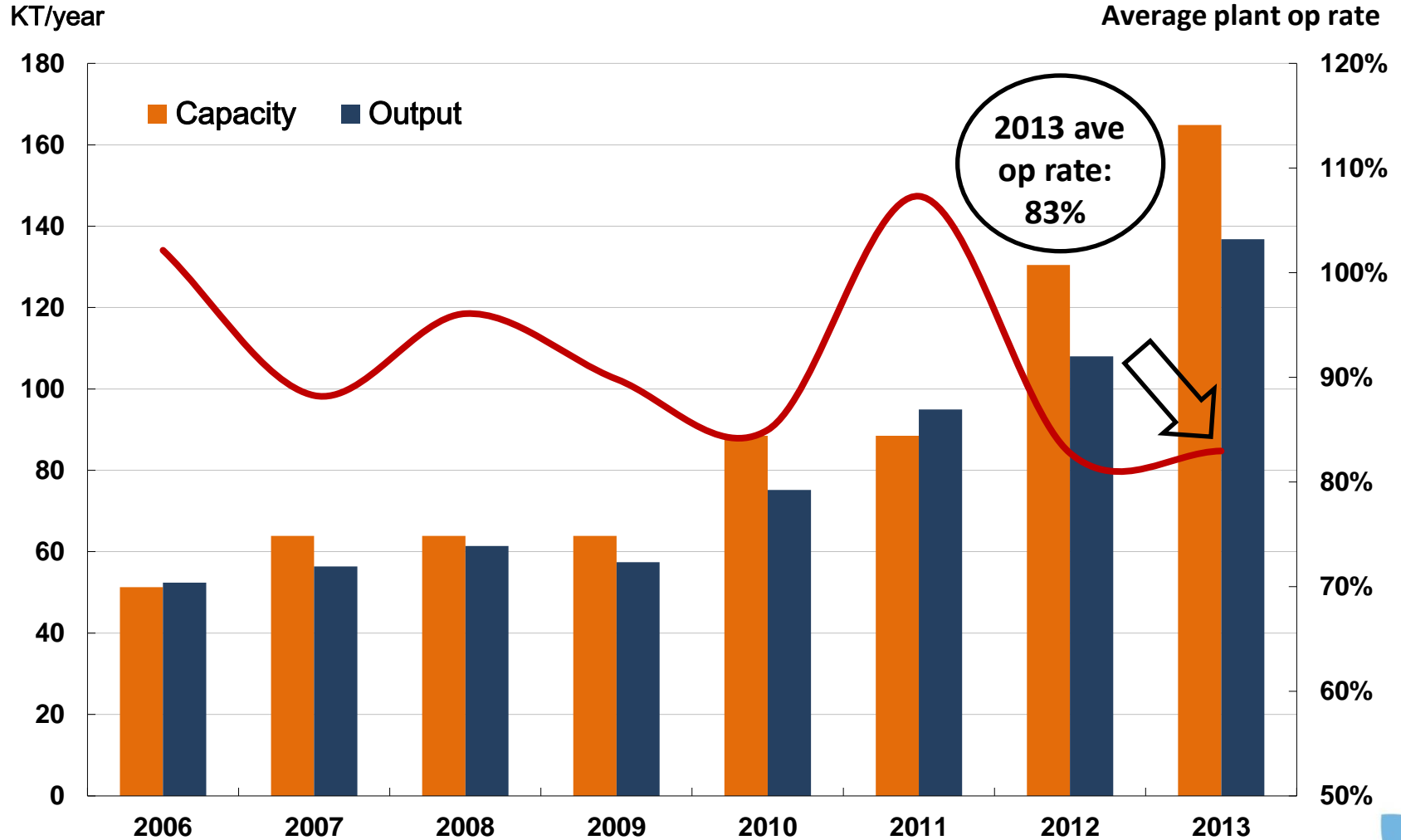
China's acetone apparent demand growth may slow to 1-1.5% in 2014



Phenol/Acetone margins squeezed on slowing demand, prompting producers to reduce plant op rates



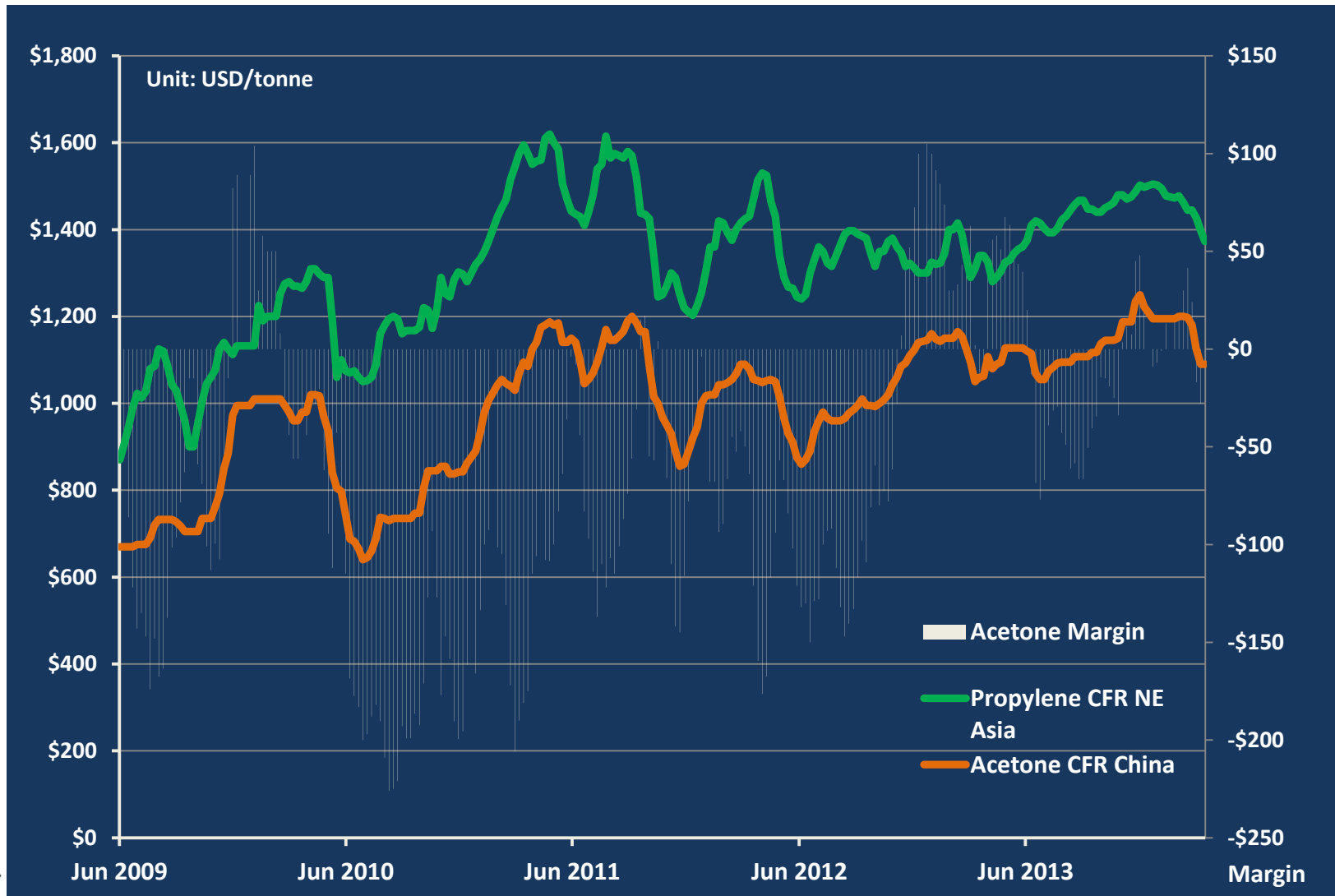
China's phenol/acetone plant op rates fall



Phenol margins largely negative since 2011



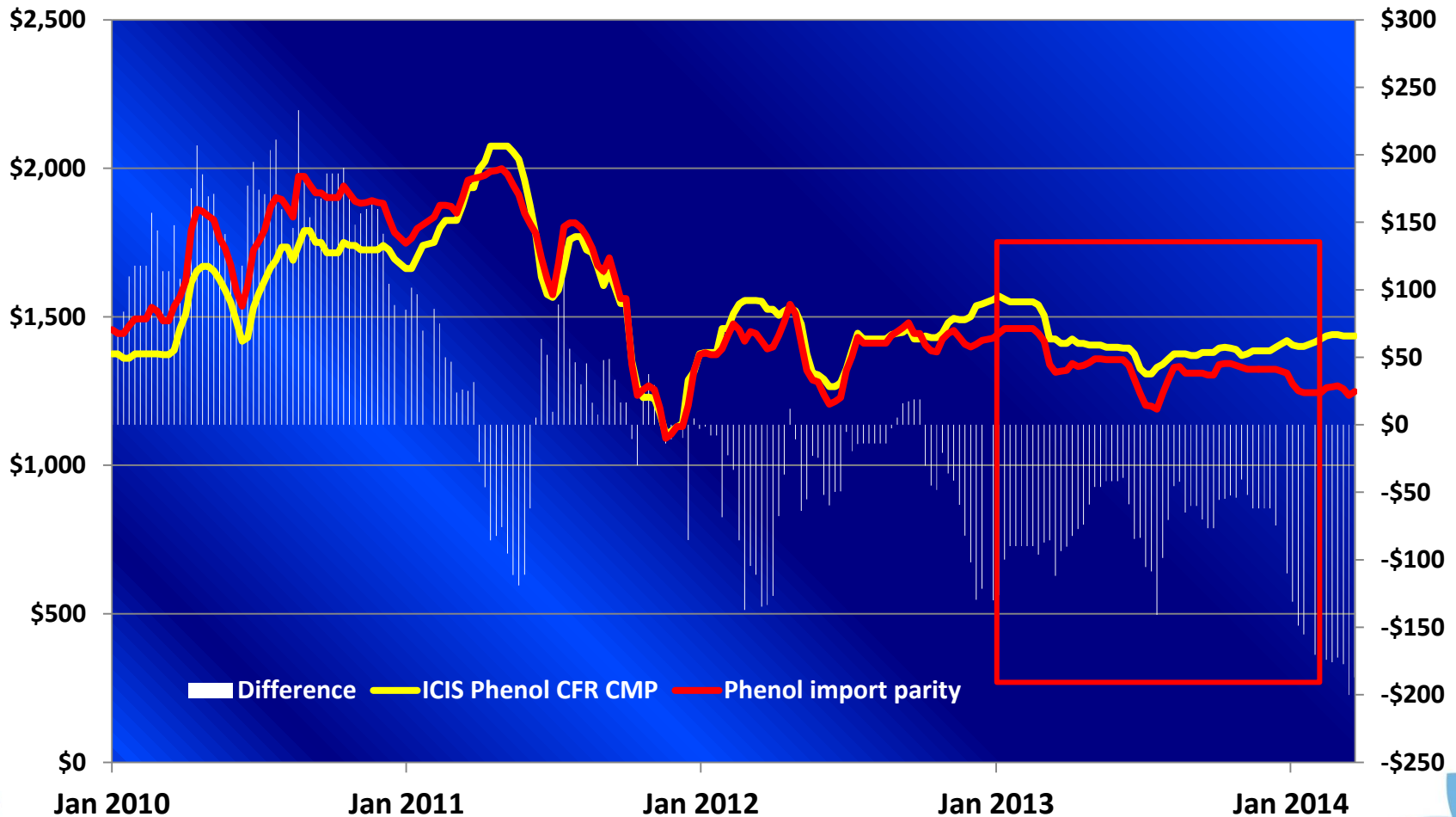
But lower plant op rates boost acetone margins



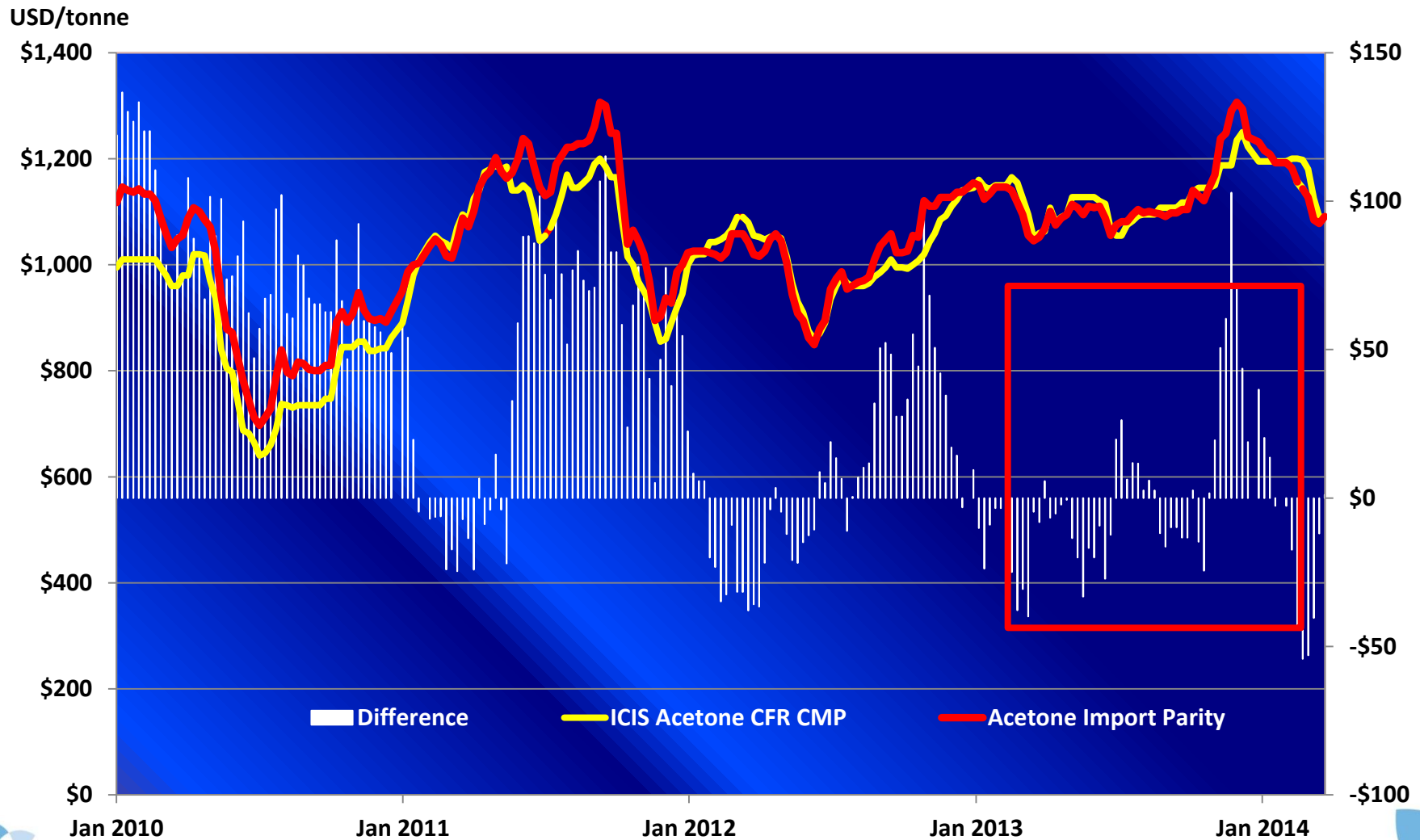
Phenol import parity largely negative since 2011

60-70% of phenol/acetone producers in China base their prices on Sinopec pricing

USD/tonne



Acetone import parity increasingly volatile

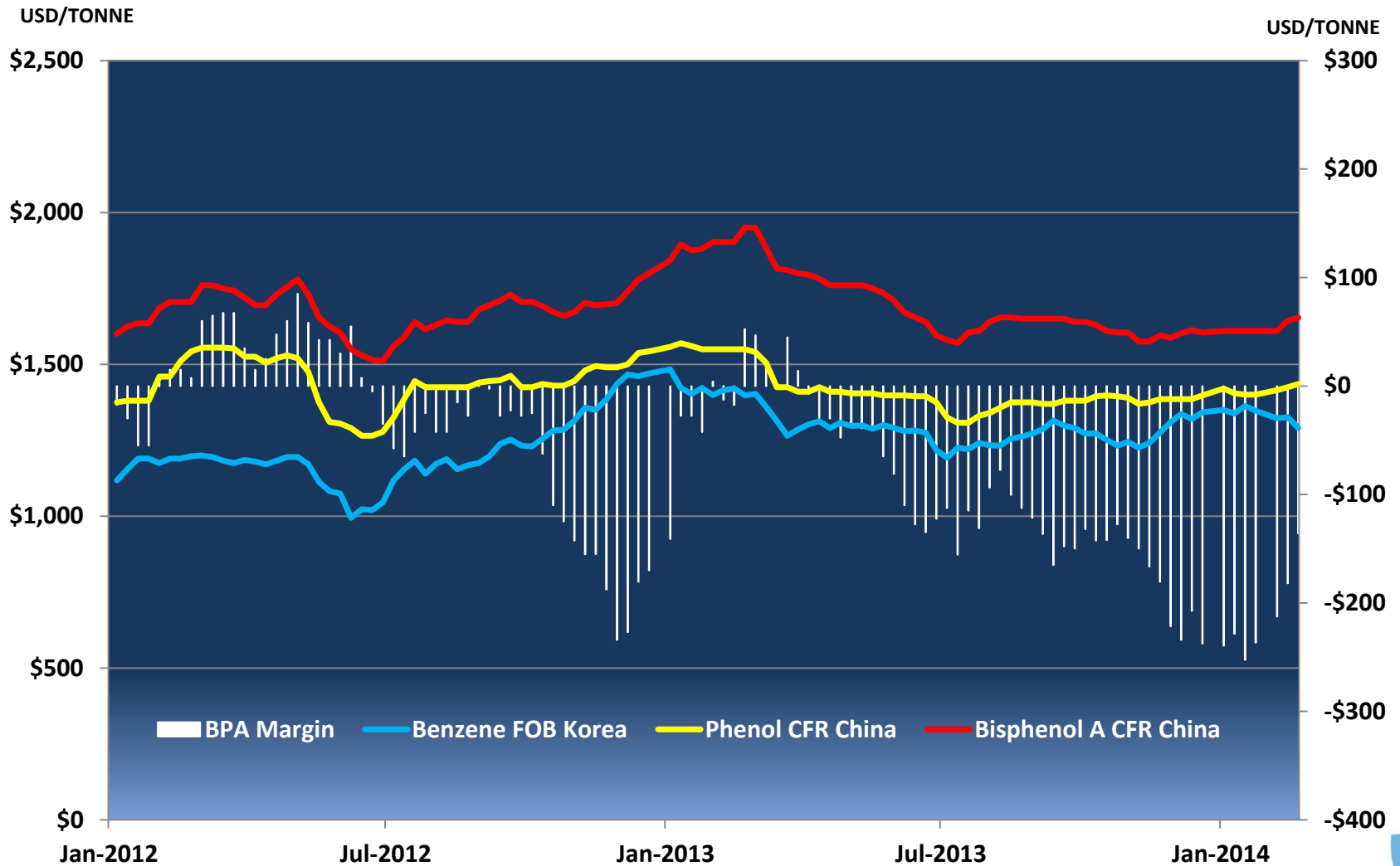


BPA capacity expansion 2014-2015

By end 2014, 725kt/year of new BPA capacity to consume 630kt/year of phenol and 210kt/year of acetone

Company	Location	Capacity (kt/year)	Start-up
Nanya Plastics	Ningbo, Zhejiang	150	End 2014
Changchun Plastic	Jiangsu	135	End 2014
Shandong Lihuayi	Shandong	120	2014
Sinopec-Sabic Tianjin	Tianjin	200	2014
Kingboard	Yangzhou, Jiangsu	120	2014
Subtotal (end 2014)		725	
Sinopec-Mitsui (SSMC)	Shanghai	150	2015
Bayer Shanghai	Shanghai	200	2015
Total (2014-2015)		1.08 m	

BPA margins under pressure



Source: ICIS Pricing

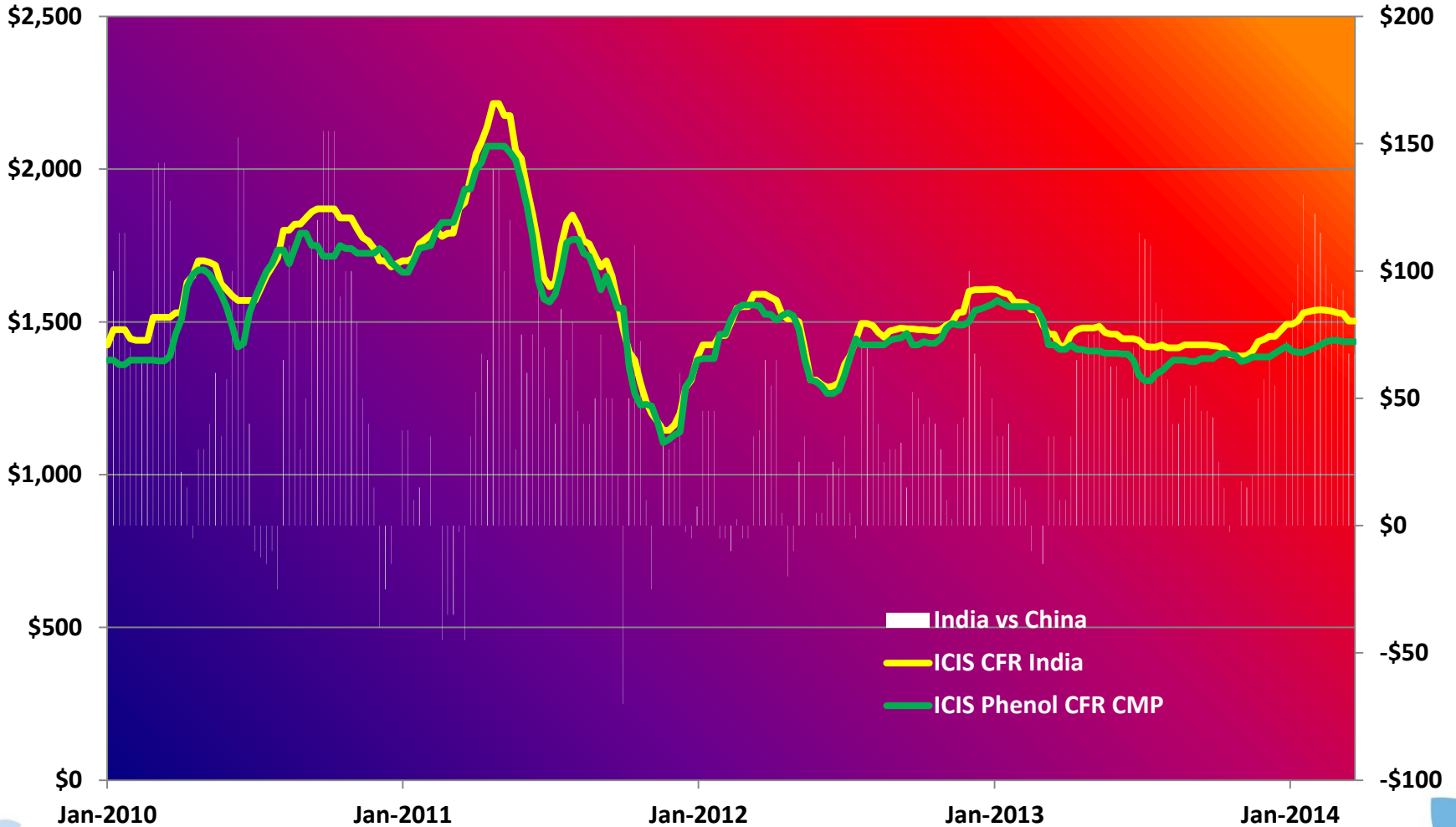
India: Phenol and acetone stats

Producers	Location	Phenol Capacity (kt/year)	Acetone Capacity (Kt/year)
Hindustan Organic Chemicals	Kochi (Southwest India)	42	25
SI Group India Ltd	Navi Mumbai (West India)	37	21

- India needs to import around 80% of the phenol & acetone it consumes
- No domestic capacity expansion planned in the immediate future
- Indian local phenol prices tend to follow international (China) trends
- Domestic benchmark price: ex-tank, Kandla port (more than 90% of phenol imports are discharged at Kandla, west coast of India)
- Usually prices are based on CIF + Basic Customs Duty + Costs = Import Parity Basis

India phenol prices tend to follow China prices

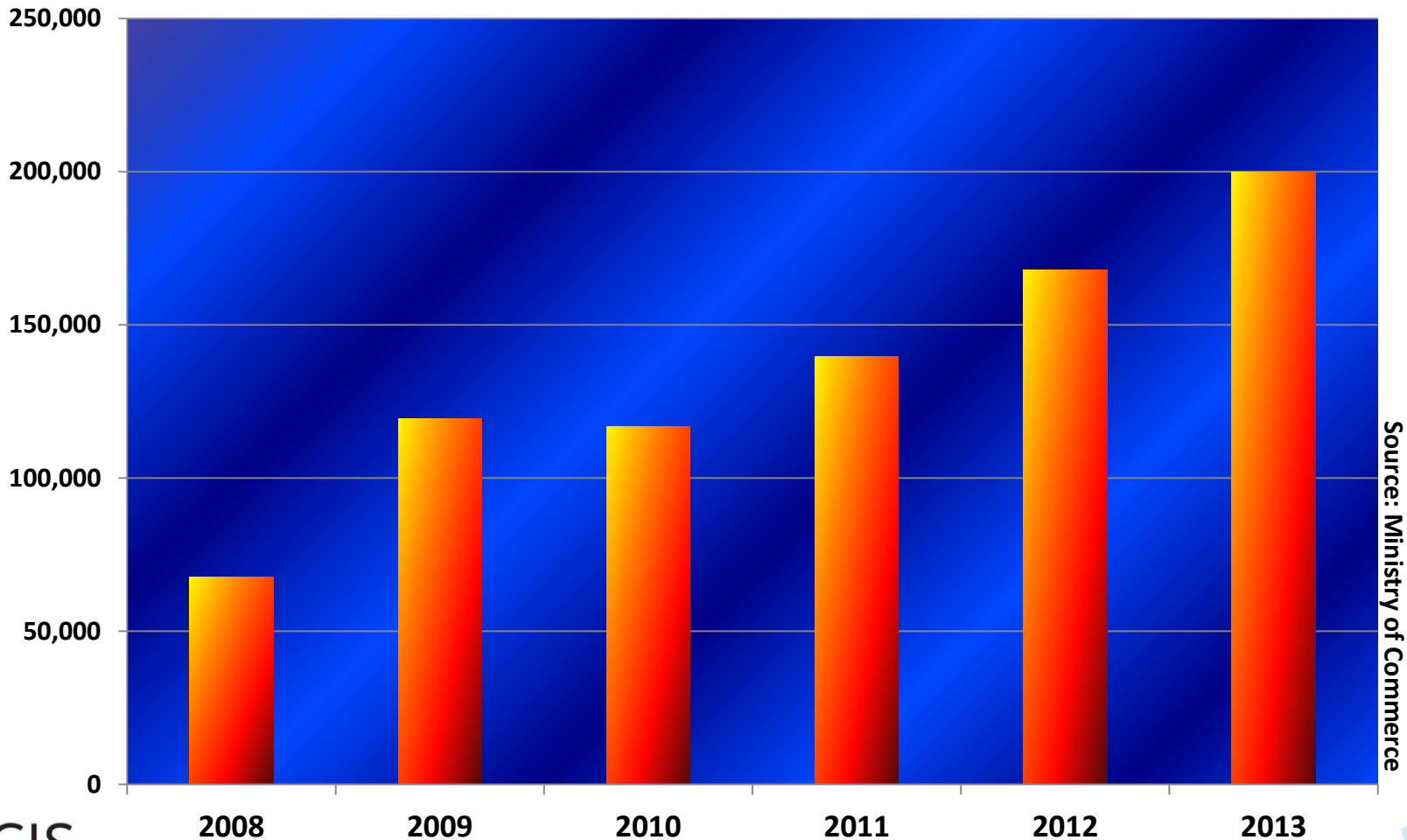
USD/tonne



India: Rising phenol import volume

Between 2011 and 2013, India's phenol import volume rose by 18-19% year on year

Phenol import volume (MT)

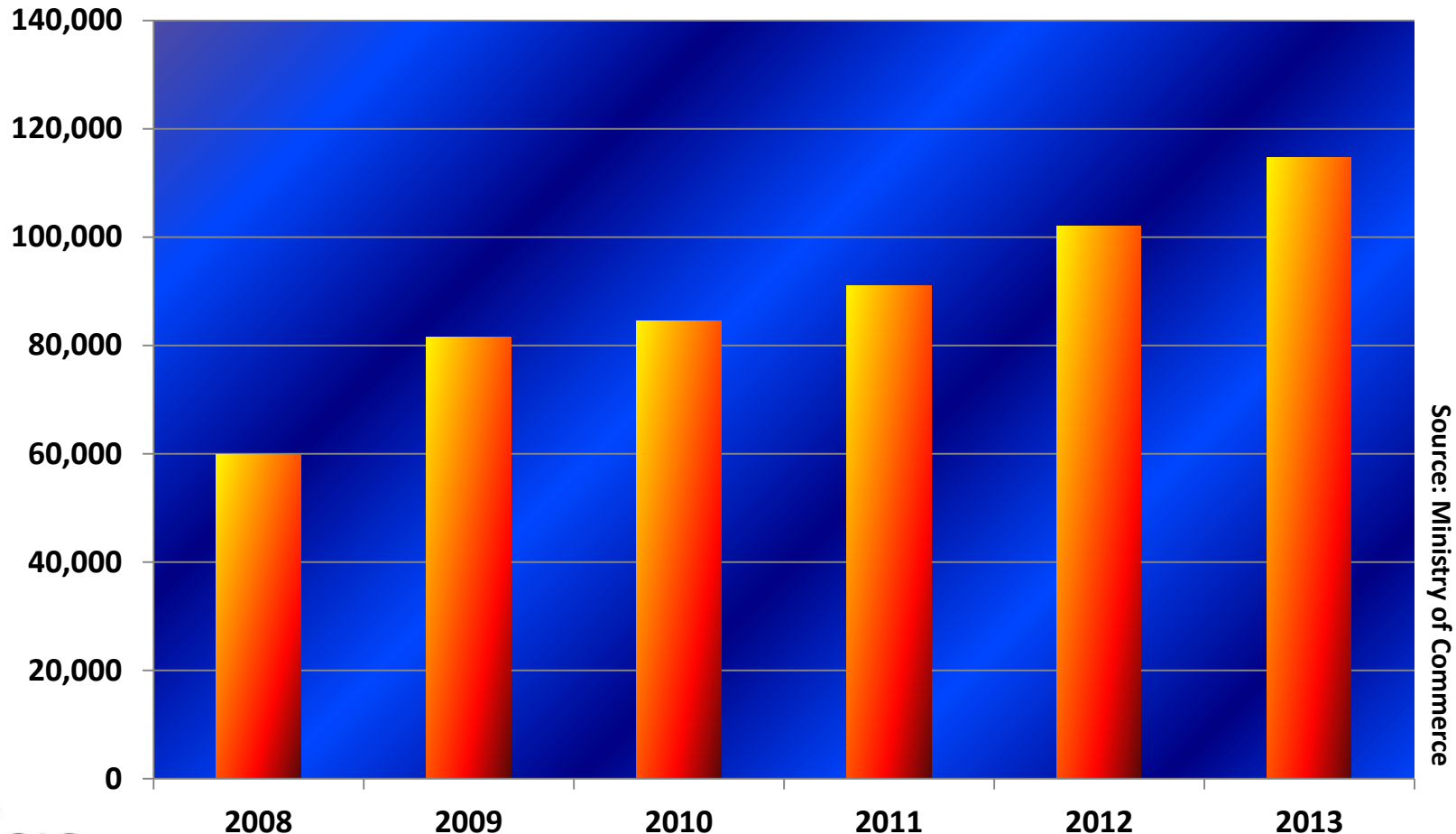


Source: Ministry of Commerce

India: Rising acetone import volume

Between 2011 and 2013, India's acetone import volume rose by about 10% year on year

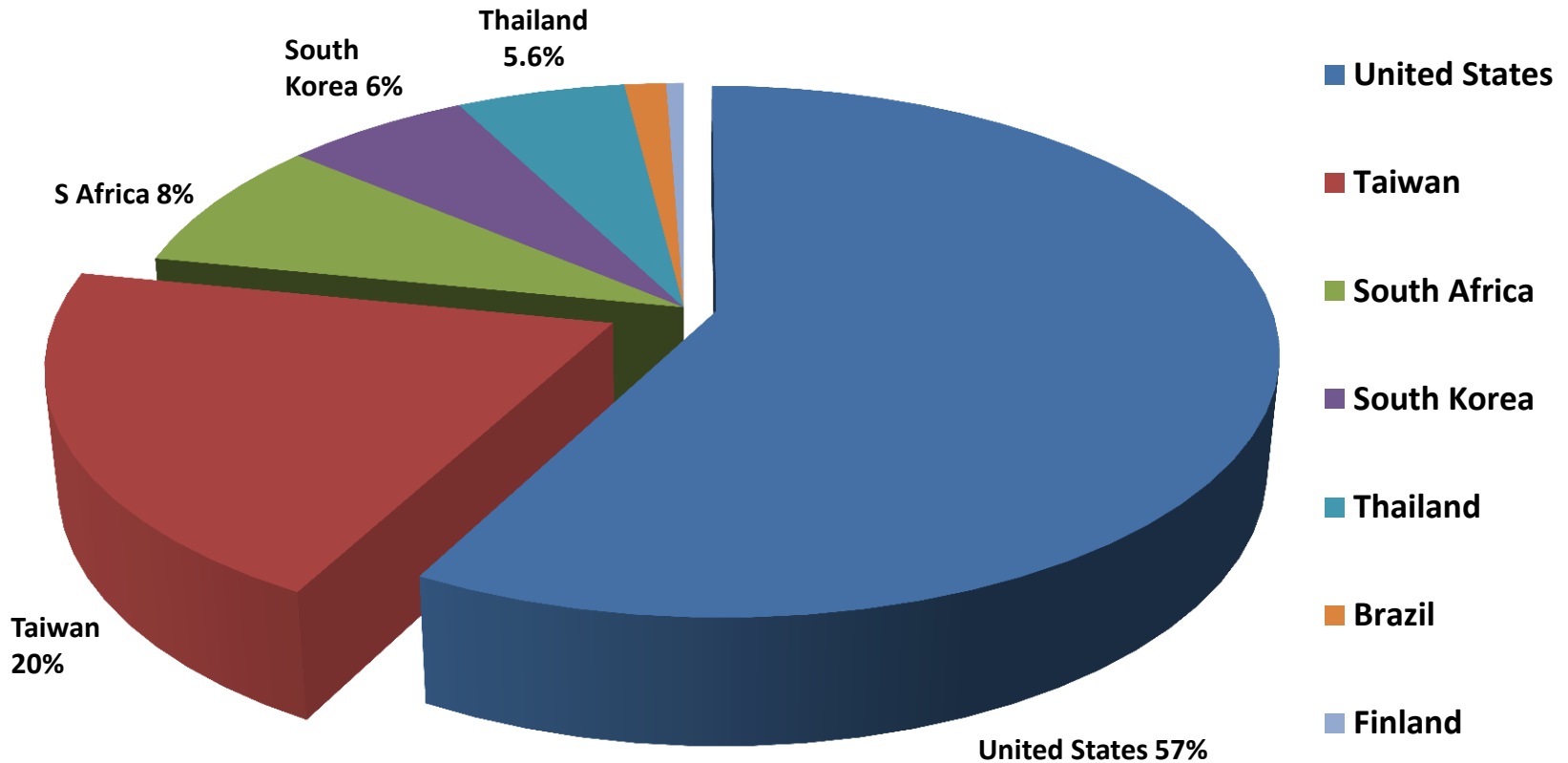
Acetone import volume (MT)



Source: Ministry of Commerce

India: ADDs and duties determine product flow

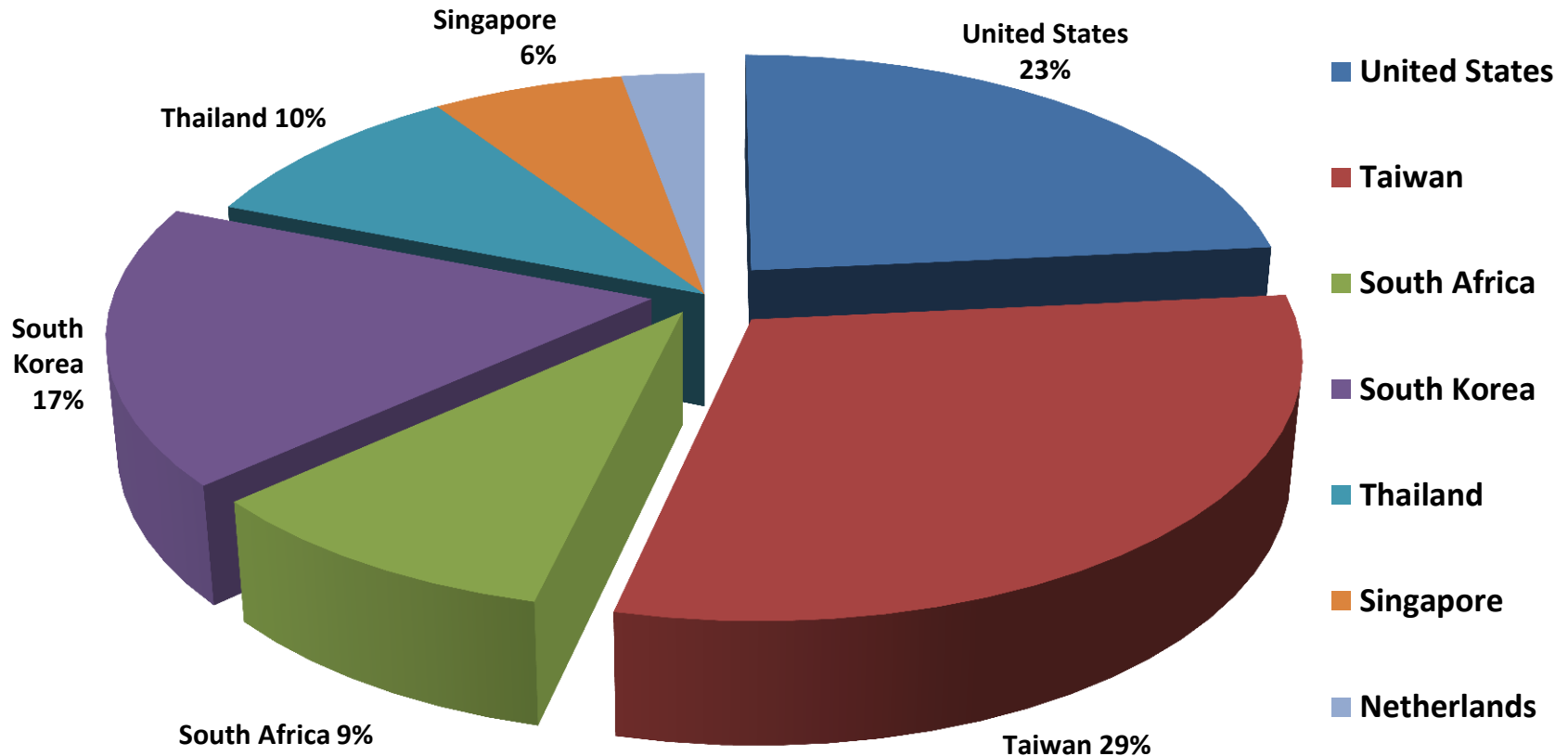
In 2012, the US was the top supplier of phenol to India, accounting for 57% of imports



Top 7 phenol suppliers to India by country in 2012. Source: the Ministry of Commerce

India: ADDs and duties determine product flow

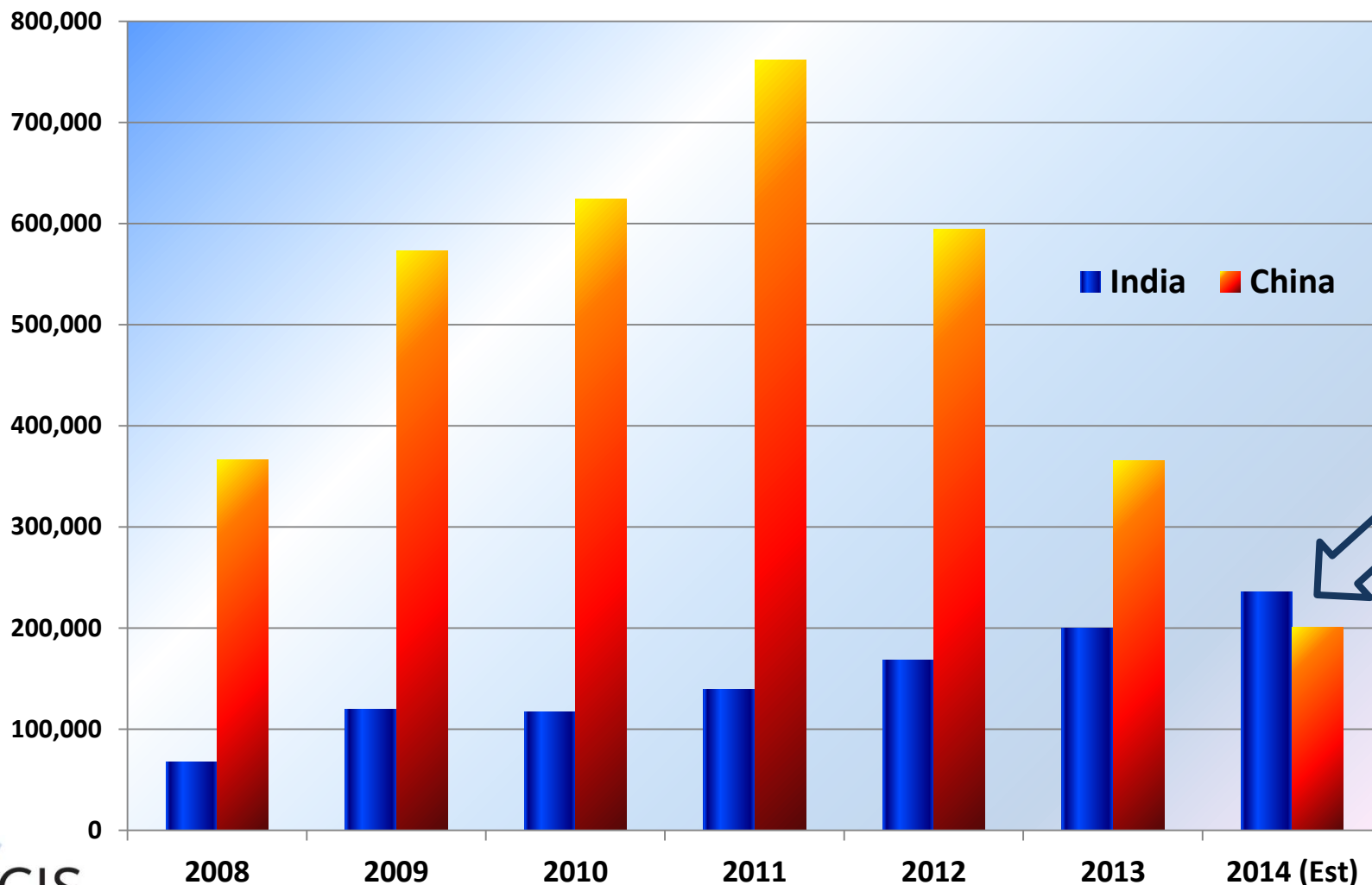
In 2013, Taiwan was the top supplier of phenol to India, overtaking the US and accounting for 29% of imports.



Top 7 phenol suppliers to India by country in 2013. Source: the Ministry of Commerce

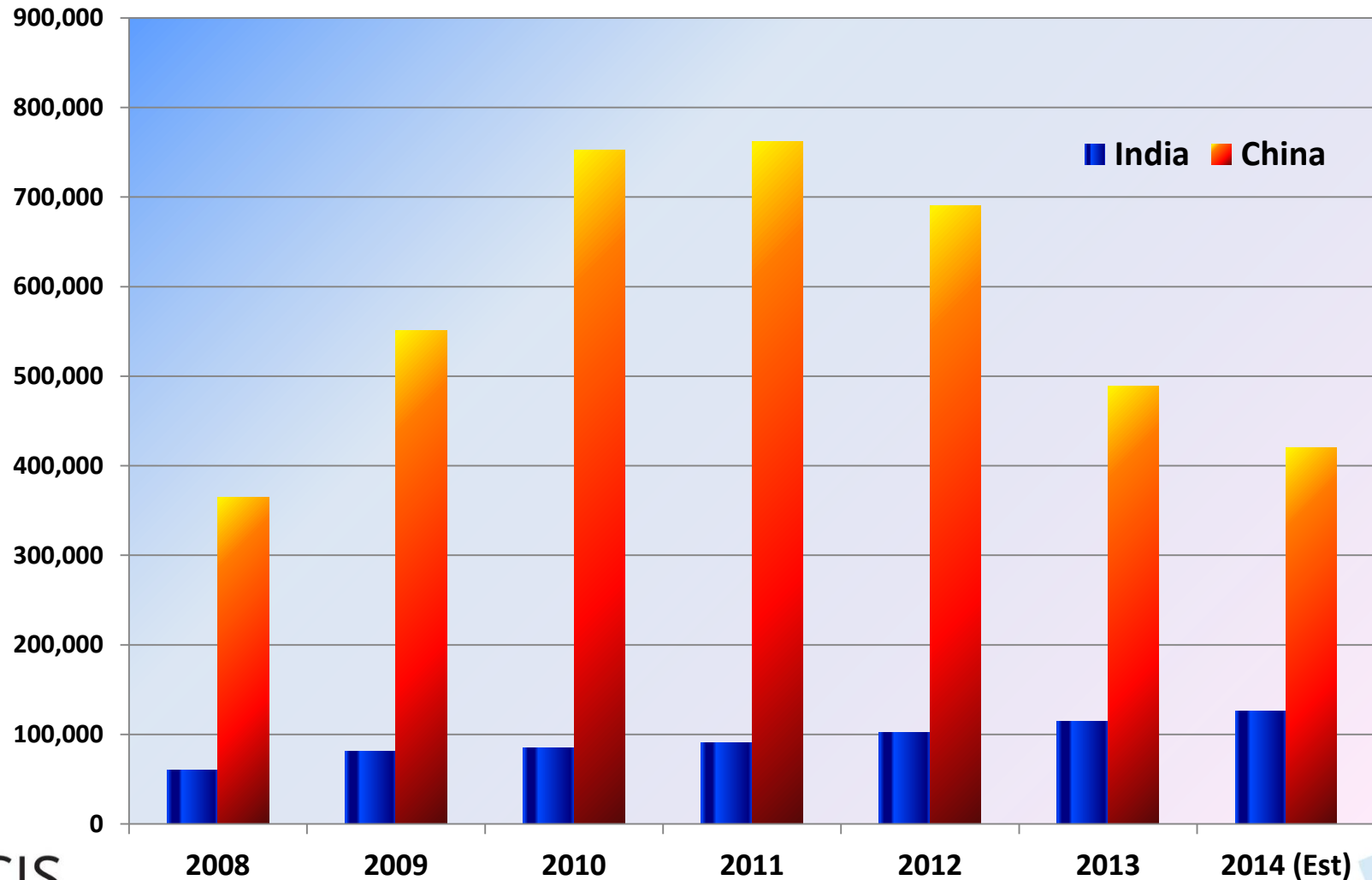
India's phenol imports may catch up with China in 2014

Unit: MT



India's acetone imports outpaced by China

Unit: MT



Conclusion

- Phenol to remain in oversupply in the next three years, as phenol capacity expansion outpaces downstream capacity increase
- Asian phenol makers' margins to stay squeezed
- Asia's phenol/acetone plant op rates to stay low on poor economics; older plants may be idled
- Phenol exports from China may increase
- Exporters to target growing markets such as India



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