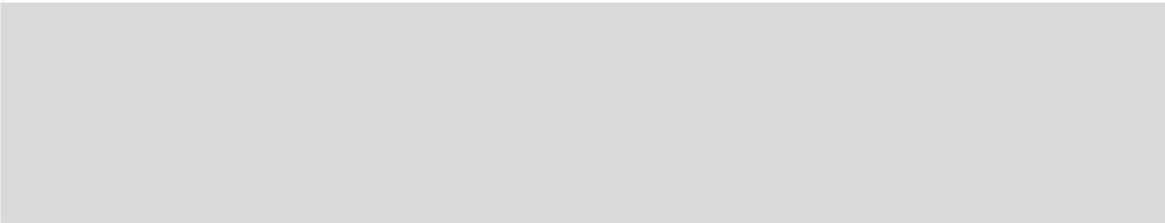




# Introduction to silicon seminar: Overview of recent market developments

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Metal Bulletin 1<sup>st</sup> Annual Silicon Seminar  
Singapore, 2<sup>nd</sup> April 2015



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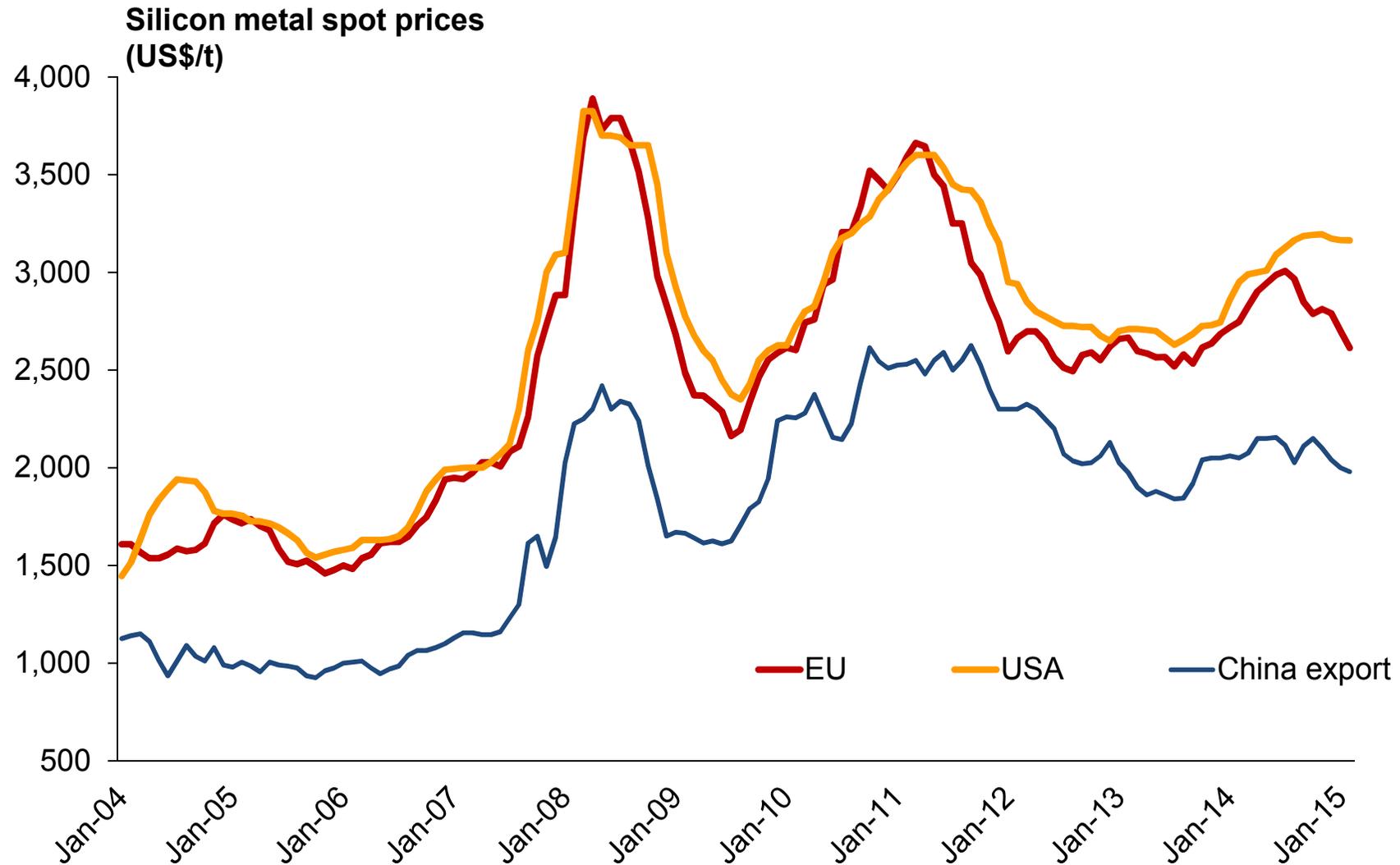
## For discussion...

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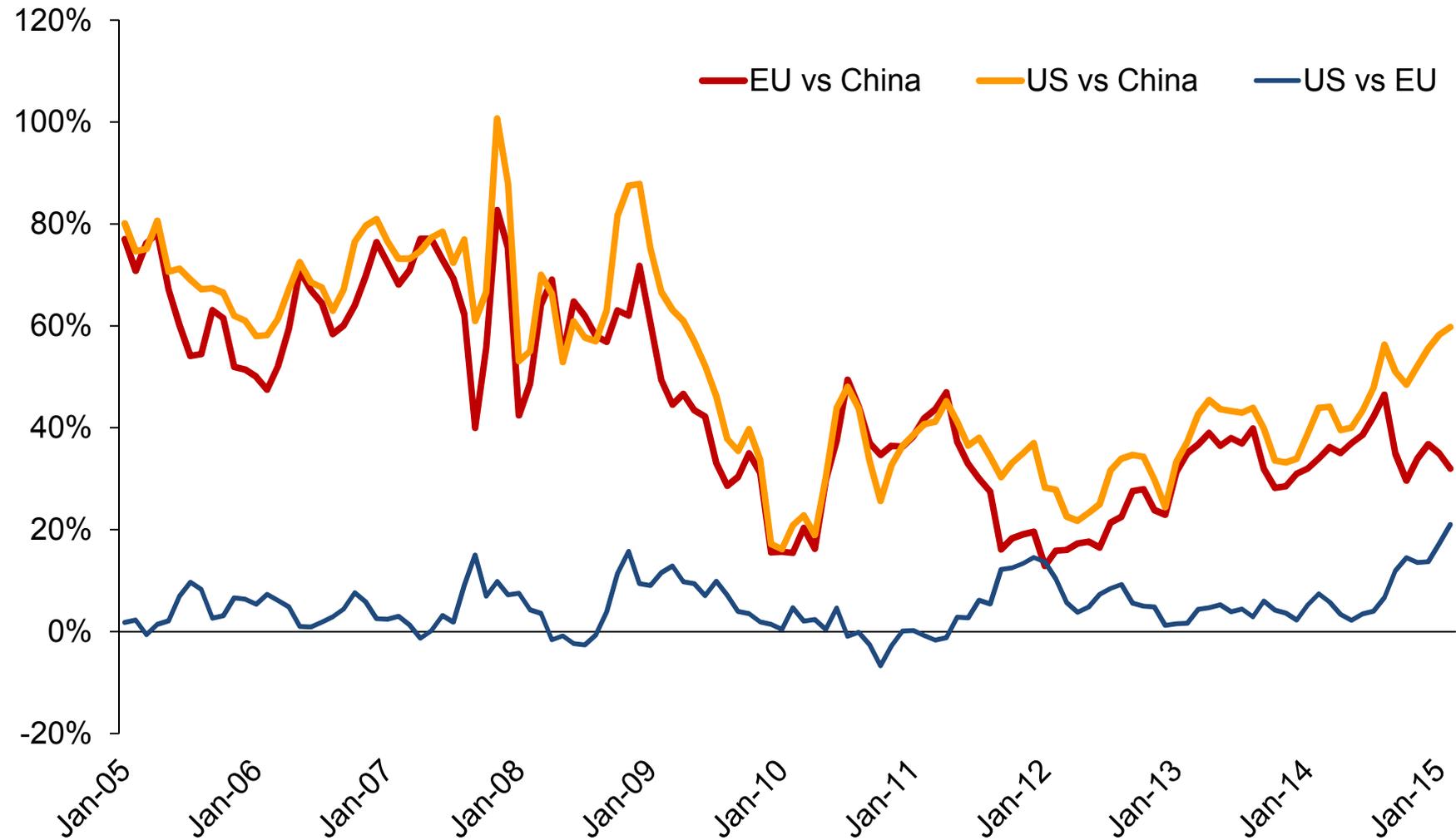
- Brief silicon metal market update
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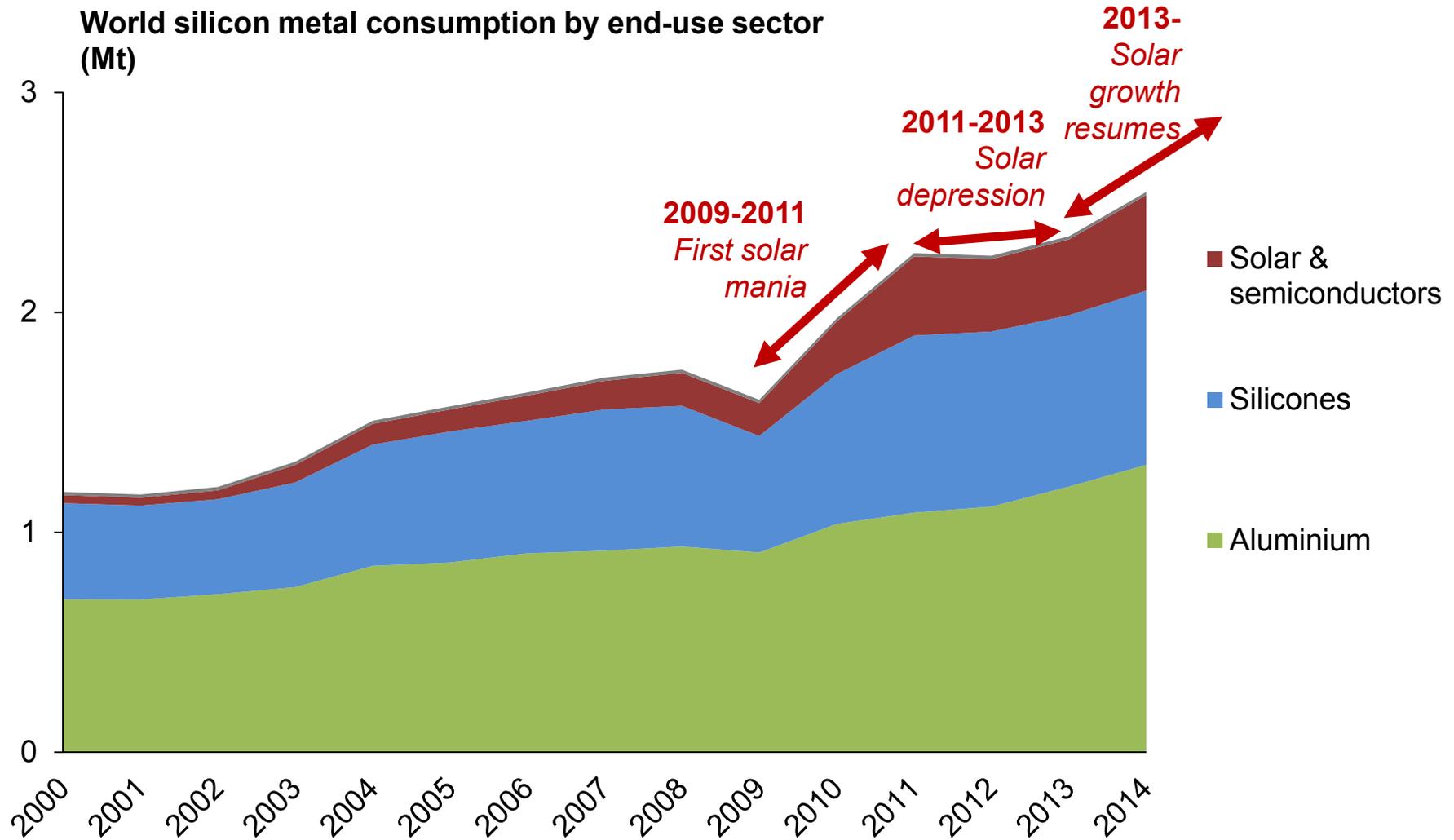
# Silicon metal spot prices – 10 year history



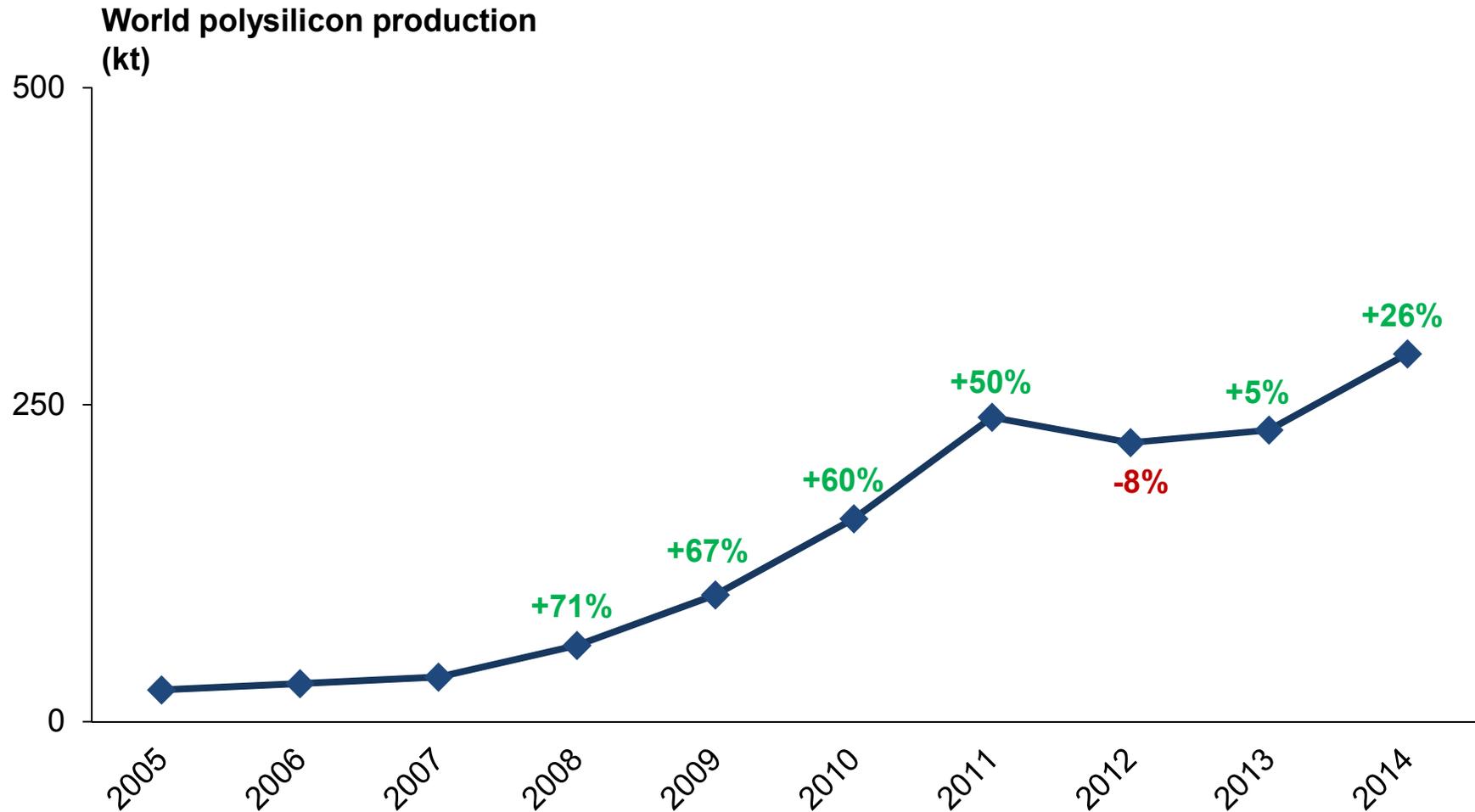
## Silicon metal spot price premiums – 10 year history



# The ups and downs of the solar industry have driven silicon metal demand trends since 2009 – solar is in a strong growth phase once more



## World polysilicon returned to double-digit growth in 2014 following two years of depression



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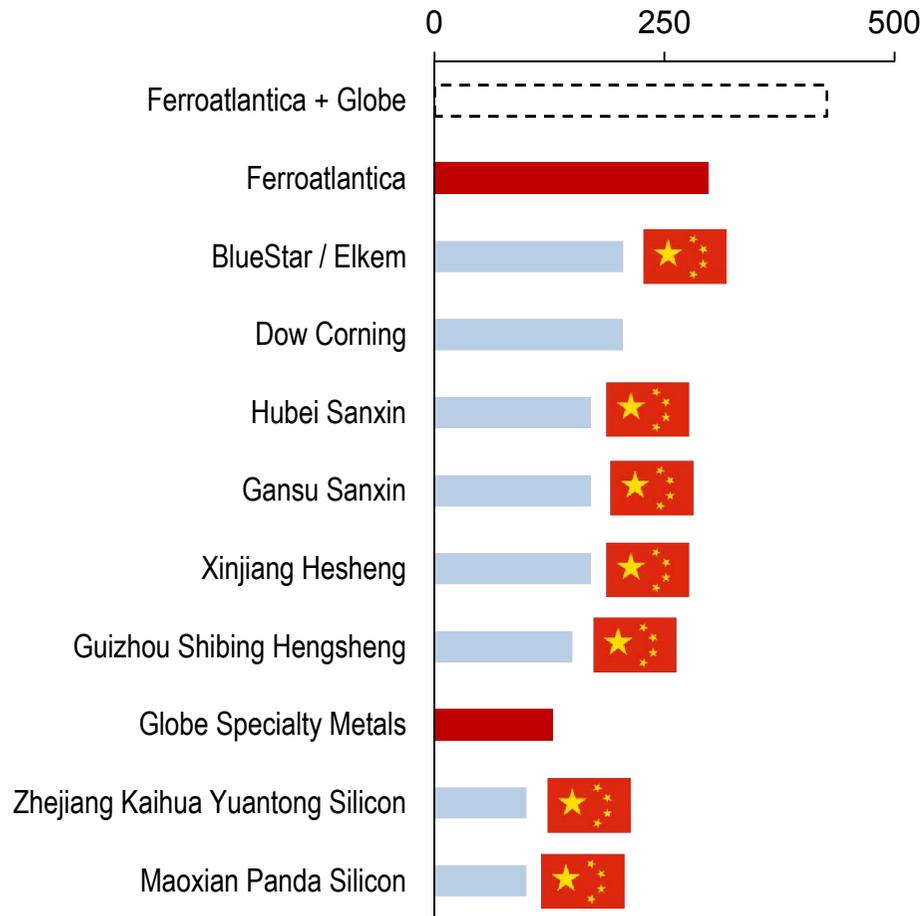
## Proposed Globe-Ferroatlantica merger: Summary of publicly-released information

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- New company has estimated value of US\$3.1bn
- Transaction expected to close in Q4-2015
- New company to be headquartered in London, listed in New York
- To be led by Alan Kestanbaum (Globe executive chairman); Joint CEOs will be Jeff Bradley (Globe CEO) and Pedro Larrea Paguaga (Ferroatlantica chairman and CEO)
- Expected cost savings of US\$65M per year; debt expected to fall by US\$30M over 3 years and cash flow to improve by US\$100M (more efficient management of working capital and other efficiency savings)
- Subject to approval by shareholders of Globe Specialty Metals (Ferroatlantica is not a listed company) and regulators in relevant jurisdictions

# The proposed merged company's silicon metal capacity would be twice that of the second-largest producer

World top-10 silicon metal producers by capacity (kt)



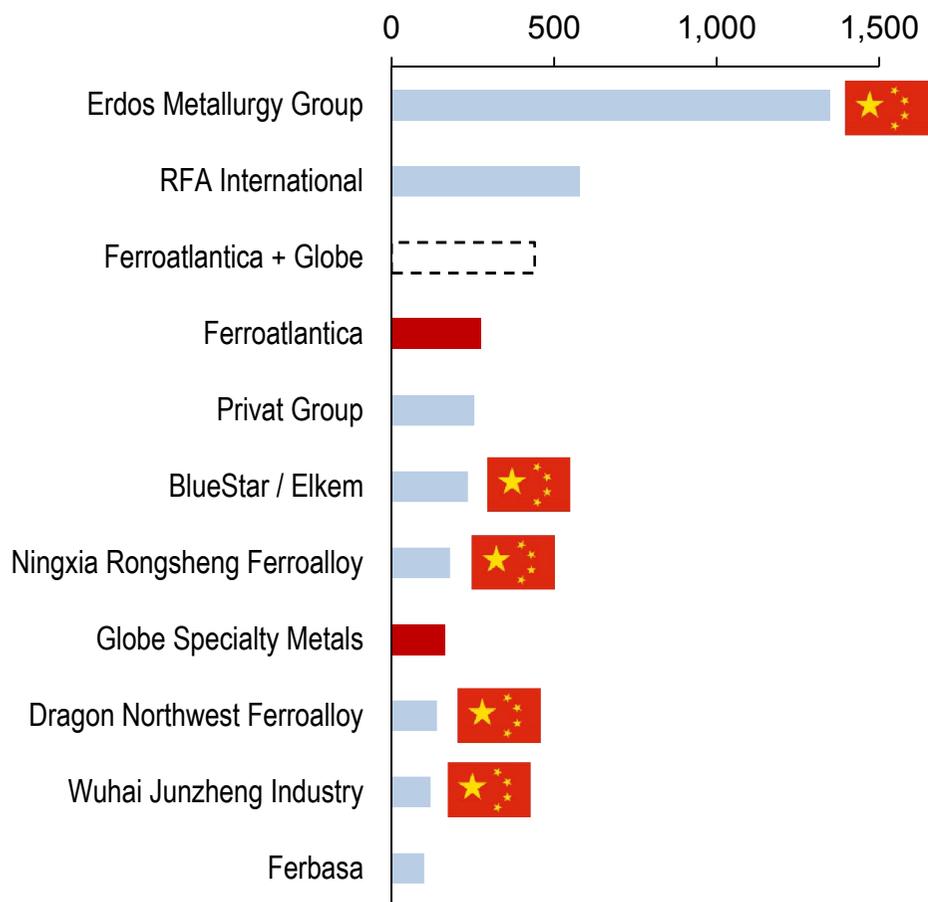
**Ferroatlantica** already world's biggest producer of silicon metal

**Globe** currently world's 8<sup>th</sup> biggest producer (3<sup>rd</sup> largest non-Chinese owned producer)

**New company** will have silicon metal capacity approx. twice the size of the second largest producer

# The proposed merged company will be the world's 3<sup>rd</sup> largest FeSi producer, behind Erdos and RFA

World top-10 FeSi producers by capacity (kt, basis 75% Si content)



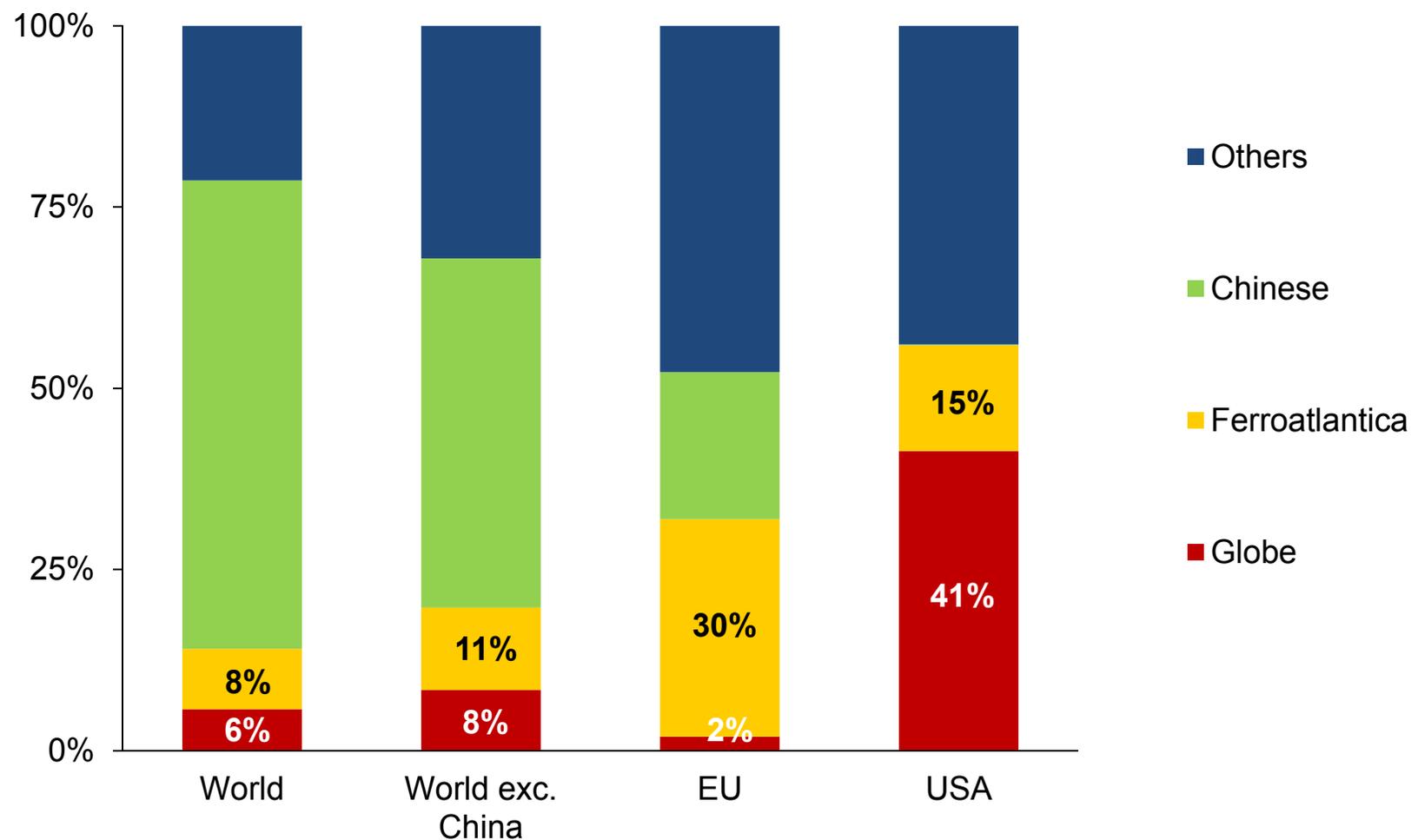
**Ferroatlantica** currently world's 3<sup>rd</sup> biggest producer of FeSi (2<sup>nd</sup> largest non-Chinese owned producer)

**Globe** currently world's 7<sup>th</sup> biggest producer (4<sup>th</sup> largest non-Chinese owned producer)

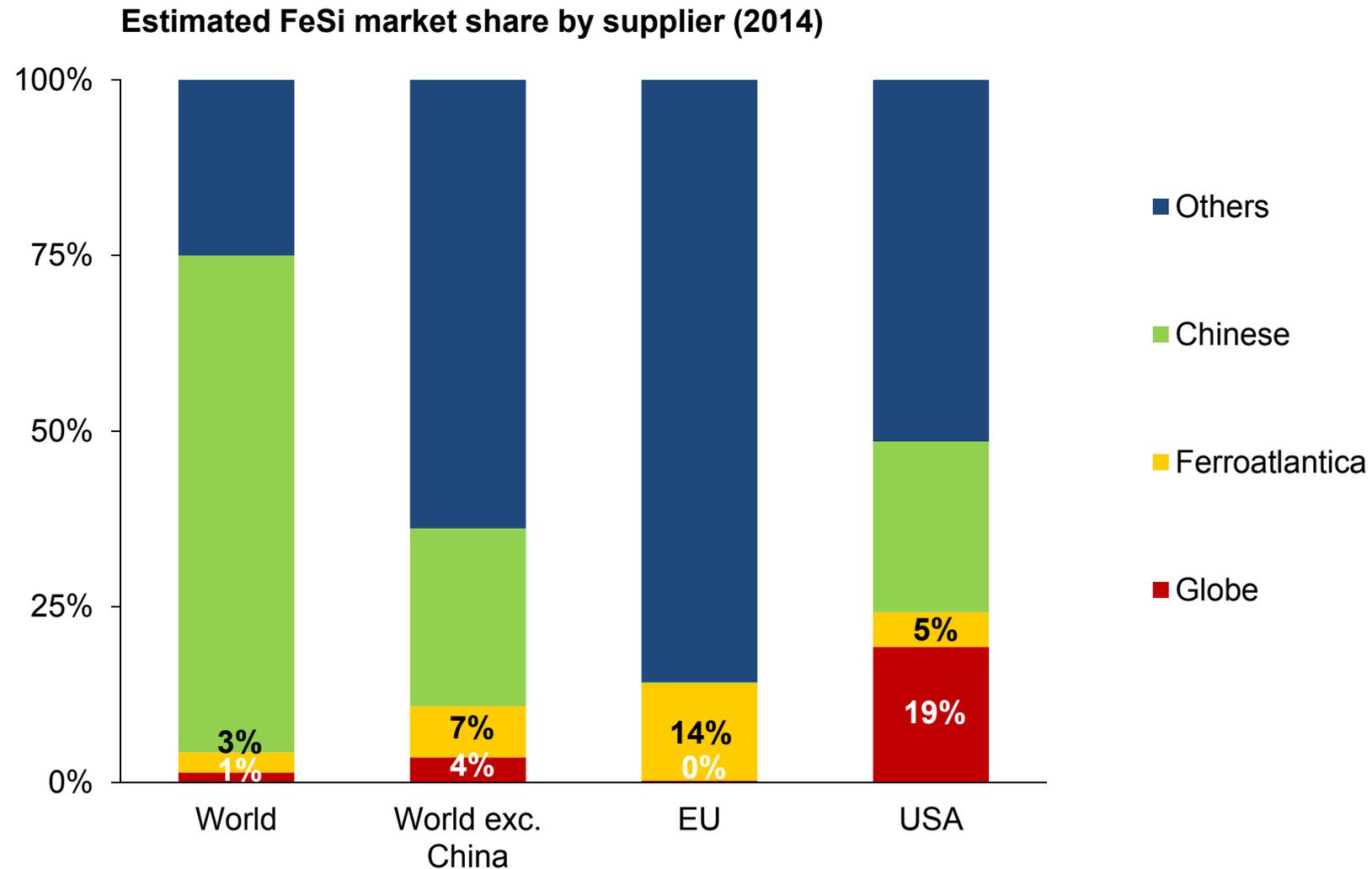
**New company** will be world's 3<sup>rd</sup> biggest producer of FeSi (2<sup>nd</sup> largest non-Chinese owned producer)

## The merged company's biggest impact on silicon metal market share will be in the USA

Estimated silicon metal market share by supplier (2014)



## The merged company will not have a substantial impact on FeSi market share in any major market



## The press have speculated that the proposed merger may have an impact on anti-dumping duties on silicon metal in the EU and USA...

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### ***“Globe, FerroAtlantica merger leads to monopoly and anti-dumping duties concerns”***

*Metal Bulletin, 27 February 2015*

*“Globe and FerroAtlantica’s planned merger has led to questioning over whether anti-dumping duties on silicon metal from China will stay in place, on concerns that the new company will have a monopoly on the silicon market....”*

*“This needs to be seen in conjunction with the anti-dumping duties in Europe and America. This is the biggest issue when considering the merger,’ a large buyer told Metal Bulletin....”*

*“With attention focused on the merged producers’ effective monopoly, many questioned whether the anti-dumping duties will stay in place. The question has been particularly pressing in Europe, where anti-dumping duties of 19% on imports from China are set to expire at the end of May....”*

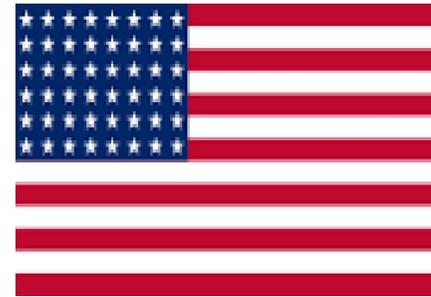
*“While previously many anticipated that the duties will be easily reimposed, some have suggested that the merger will mean the EU will have to look more deeply into whether the duties should stay in place.”*

...but this may well prove not be the case

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- EU anti-dumping duties against Chinese silicon metal expire May 2015, so a live and topical issue
- But proposed merged company would only increase its market share in EU very slightly compared with Ferroatlantica alone



- US anti dumping duties against Russian and Chinese silicon metal are not (ordinarily) scheduled for review until 2017/18

***However, silicon metal is a market containing some very powerful buyers, therefore these arguments are likely to be argued over very forcefully...***

## The press have also speculated that the proposed merger may have significant trade implications in the US FeSi market

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### ***“Merger said (to be) threat to Russian ferro-silicon market influence”***

*Metal Bulletin, 25 February 2015*

*“Globe Specialty Metals Inc’s planned merger with Grupo FerroAtlántica SA could see the combined company challenge the influence of Russian ferro-silicon on the domestic market, industry participants have speculated....”*

*“Sources at suppliers and consumers contacted by Metal Bulletin sister publication AMM were widely fascinated by the news that the two companies will merge, particularly in light of an ultimately unsuccessful trade action that Miami-based Globe took against Madrid-based FerroAtlántica subsidiary FerroAtlántica de Venezuela SA (FerroVen) regarding ferro-silicon imports....”*

*“Meanwhile, ferro-silicon market sources are already speculating whether the deal gives the two companies leverage to compete with Russian ferro-silicon in the US market after Globe’s petition to impose anti-dumping duties on Russian material proved unsuccessful....”*

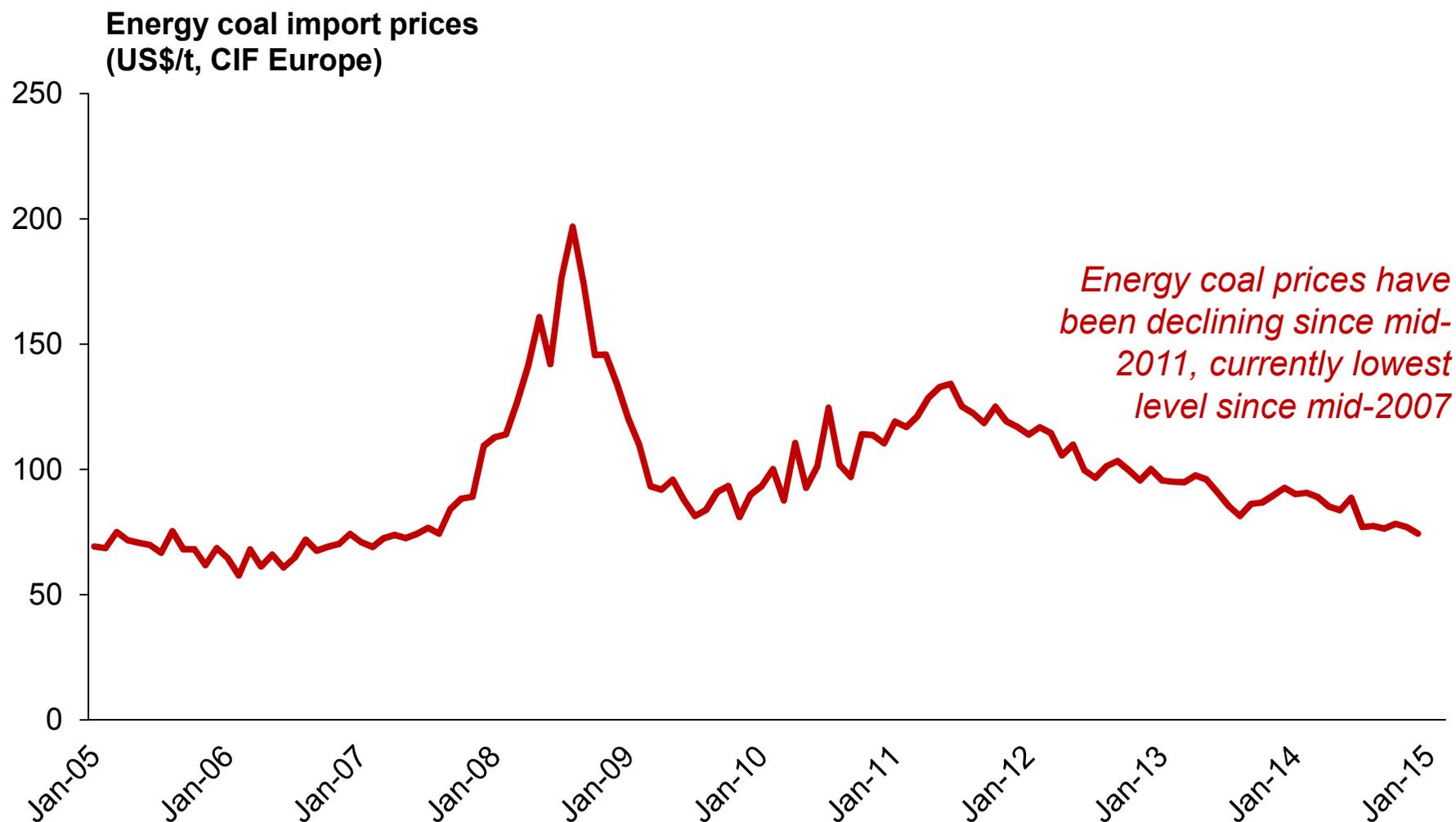
*“Who knows how this will play out, but my first thought is that the Russians will view this as more of a market threat than we will, as Chinese ferro-silicon importers,’ a second supplier source said. ‘My reasoning is that FerroAtlántica and Globe will surely file a joint complaint against Russian imports’....”*

## Proposed Globe-Ferroatlantica merger: Potential implications for supply of silicon raw materials

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- Globe vertically integrated into low-ash coal production (through ownership of Alden Resources)
- Only 2 major suppliers of low-ash coal to silicon metal industry worldwide (Alden “Blue Gem” seam in Kentucky/Tennessee, El Cerjon in Colombia)
- Potential shift in source of coal for Ferroatlantica & European competitors
- High-purity FeSi also produced with low-ash coal
- Ferroatlantica currently a major supplier of high-grade quartz to range of silicon metal and speciality ferrosilicon producers

## Low-ash coal prices have traditionally tracked prices for energy coal... will this remain the case?



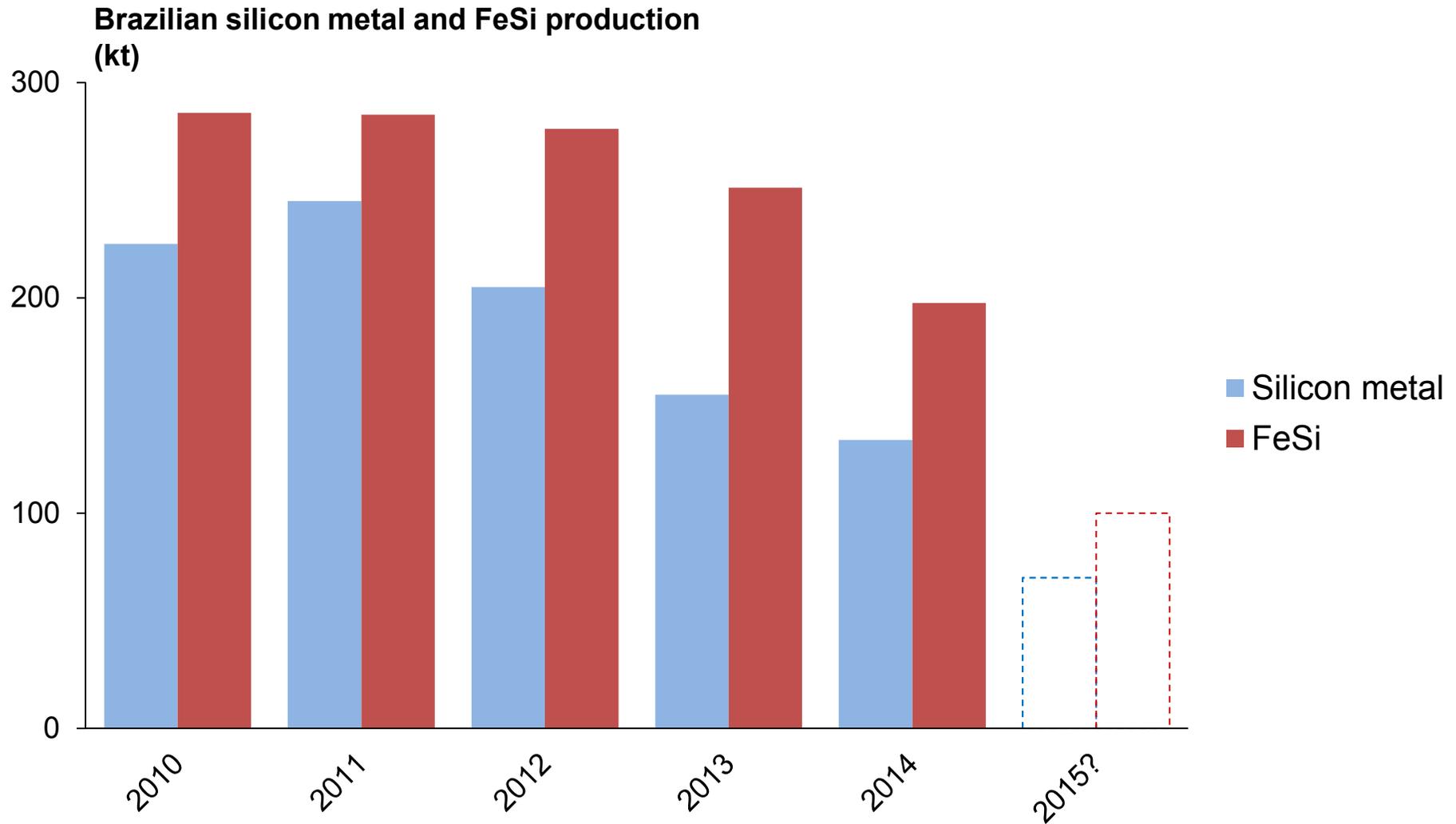
## Proposed Globe-Ferroatlantica merger: Notes on capacity

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- Large number of plants in France, both silicon metal and FeSi, some of which are comparatively small
- Significant manganese alloy production in Spain
- Proposed new (Ferroatlantica) silicon metal plant in Canada
- Will become an extremely large CaSi producer (Spain + Argentina)
- Will control entire South African silicon metal & FeSi production
- Lower output in Brazil may affect market share calculations in 2015-16

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## Brazilian silicon metal and FeSi production has declined consistently since 2011. Output could well halve in 2015



## The electricity shortage in Brazil has been well publicised in the metals press

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***“Brazilian ferro-alloys companies stop as energy prices make production unviable”***

*Metal Bulletin, 9 February 2015*

*“Brazil’s ferro-alloys and silicon metal output has been reduced to just a handful of companies in early 2015, with most players unable to renew their energy supply contracts and the current high power prices making production unviable....”*

*“According to the association that represents the sector, Abrafe, only four of its 17 associates were still operative in the first week of February....”*

*“They are Ferbasa (ferro-silicon and ferro-chrome producer); Dow Corning (silicon metal); Anglo American (ferro-nickel, ferromanganese and ferro-niobium) and CBMM (ferro-niobium).....”*

# Most silicon metal and FeSi plants in Brazil are in the southern state of Minas Gerais, where the electricity situation is particularly bad



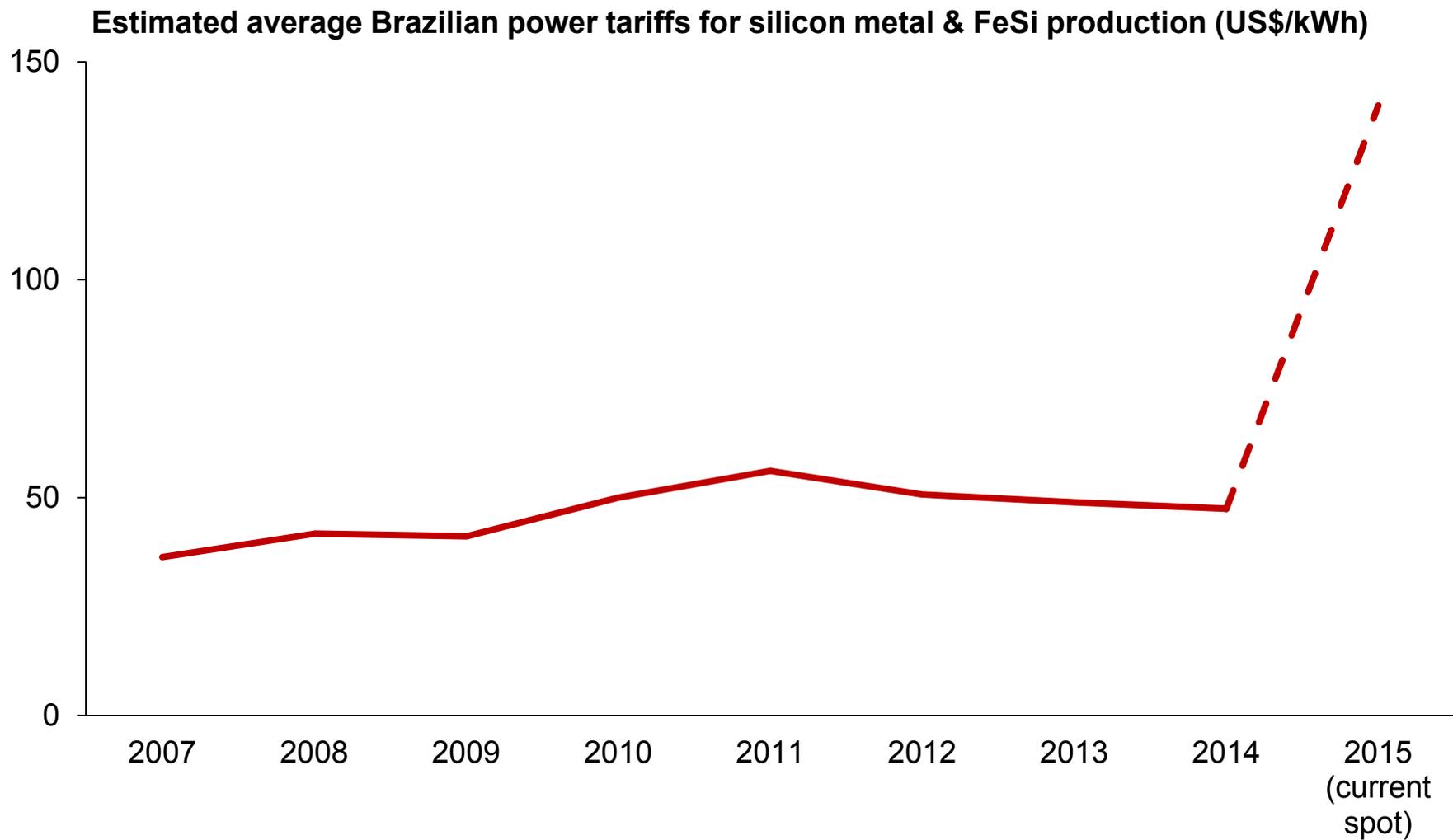
## *Location of main silicon metal and FeSi plants in Brazil:*

*In Para:  
CCM (Dow Corning)*

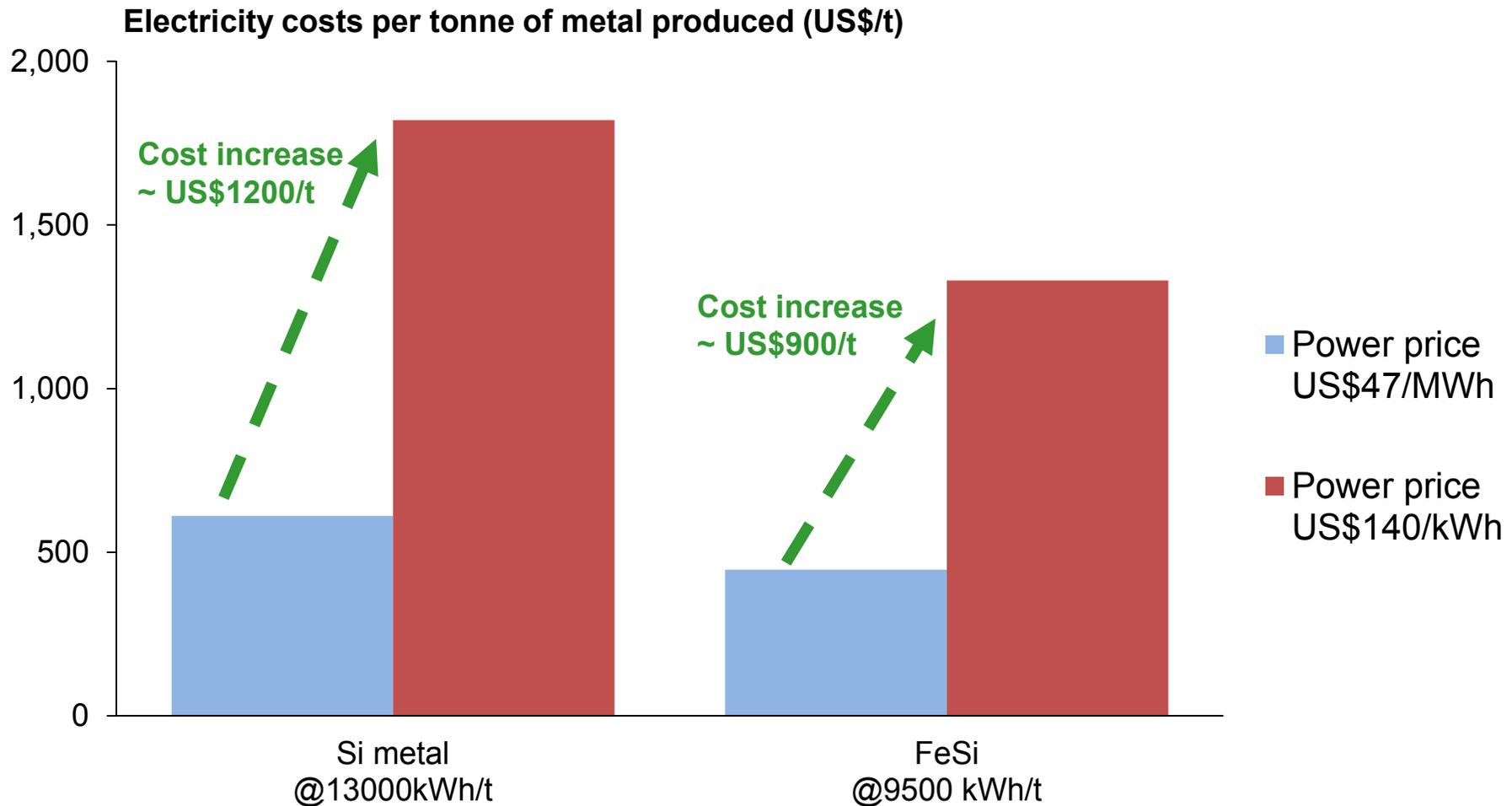
*In Bahia:  
Ferbasa*

*In Minas Gerais:  
CBCC (Dow Corning)  
RIMA Capitaó Eneas  
RIMA Varzea da Palma  
Minasligas  
LIASA  
Nova Era  
Italmagnesio  
Bozel*

# Almost all Brazilian silicon metal and FeSi producers are now facing spot power tariffs around 3x higher than previous contract prices

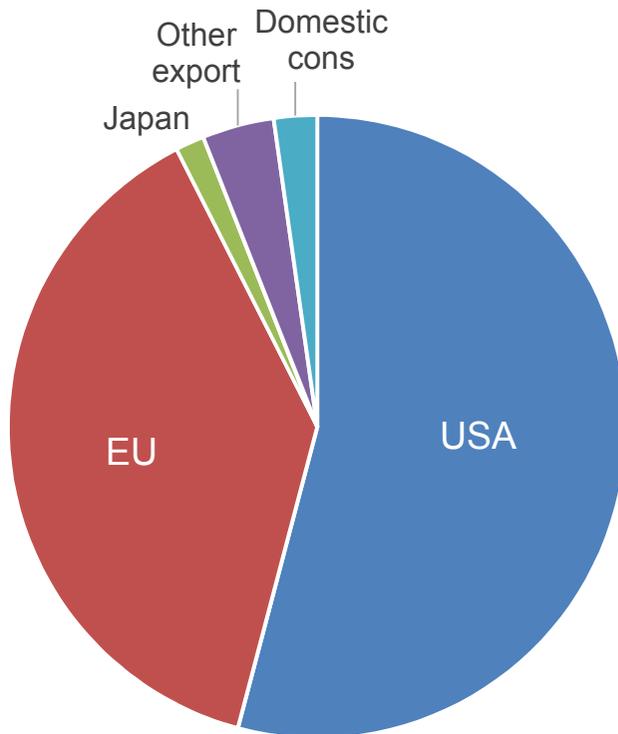


# The change in power costs in Brazil is enormous, making most silicon metal and FeSi production totally uncompetitive

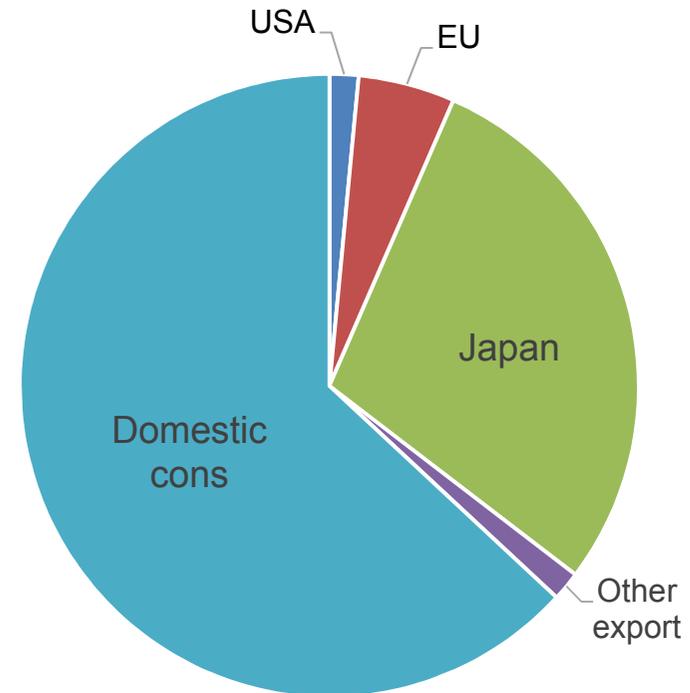


# Reduced Brazilian silicon metal output impacts the US and EU markets the most...most Brazilian FeSi is sold domestically and to Japan

**Brazilian silicon metal shipments by destination, 2014**



**Brazilian FeSi shipments by destination, 2014**



## Brazil electricity situation and its impact: Conclusions

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- Reduced output from Brazil is a key reason for the comparatively good price level for silicon metal & FeSi in the US & EU markets over the past year ....expect this to intensify in 2015
- Power situation in Brazil unlikely to improve significantly in 2015 or 2016
- Anti dumping duties in US and EU heavily restrict choice of potential suppliers to replace lost Brazilian silicon metal....rising price premium over Chinese-dominated markets is the result
- Closure of Globe-Ferroatlantica merger in Q4 2015 may coincide with peak of Brazilian capacity shutdowns
- Japanese high-purity FeSi customers may be forced to find alternative suppliers



**Thank you for your attention**



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