BRITISH SULPHUR | CONSULTANTS
A DIVISION OF CRU

Sulphuric Acid Market Outlook

The Outlook for Sulphuric Acid Demand for Fertilizers, Metal and Uranium

Joanne Peacock, CRU International/BSC

Creon – Moscow – December 2009

LONDON | BEIJING | WASHINGTON | RALEIGH | MINNEAPOLIS

CRU | THE INDEPENDENT AUTHORITY™
MINING | METALS | POWER | CABLES | FERTILIZERS | CHEMICALS

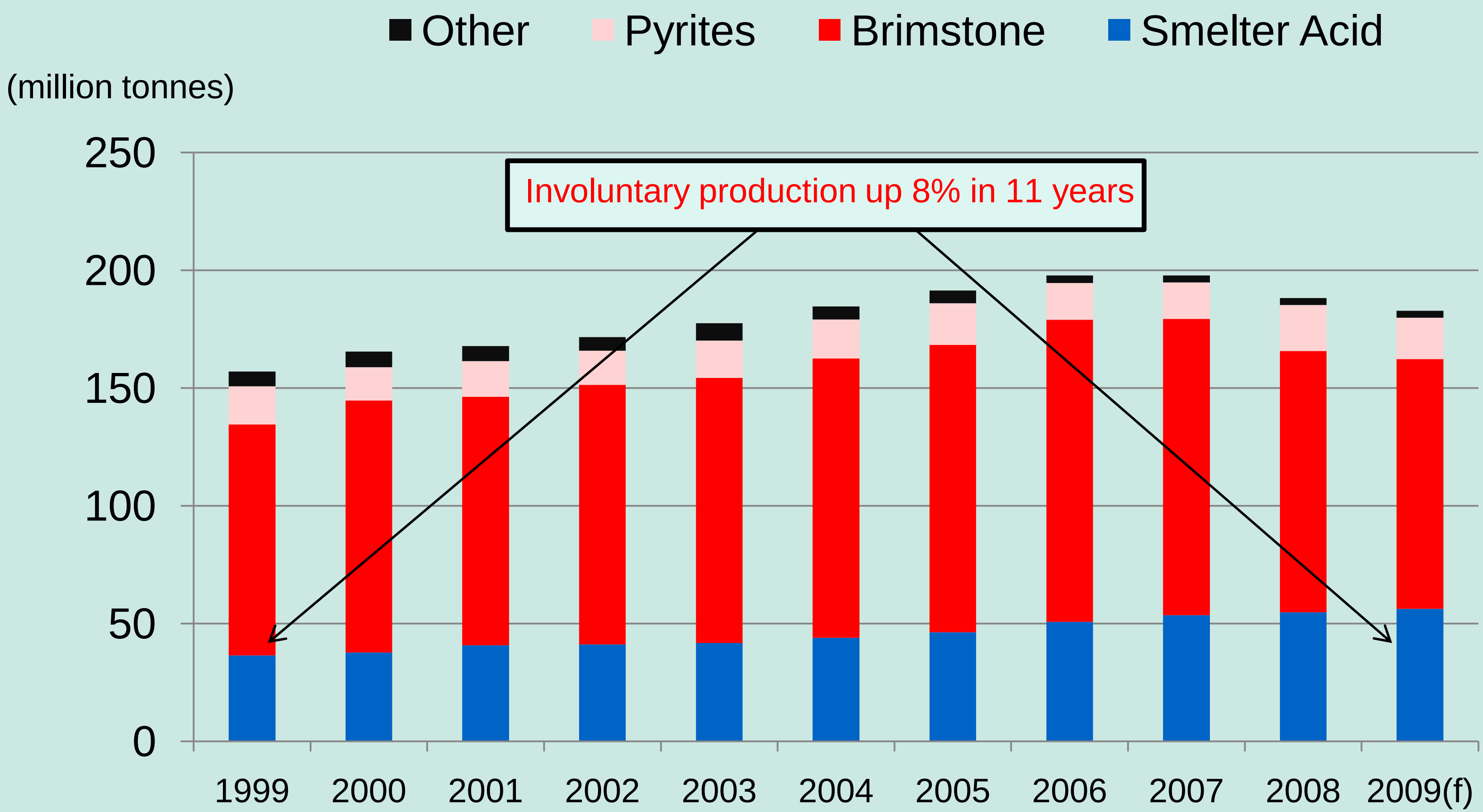
31 Mount Pleasant, London WC1X 0AD UK
Tel +44 20 7903 2132 Fax +44 20 7833 4973
www.britishsulphur.com
www.crugroup.com

This presentation will review:

- Global Overview and Recent Market Developments
  - Production
  - Consumption
  - Trade
  - Price
- The Demand Outlook for:
  - Fertilizers
  - Copper
  - Nickel
  - Uranium
- Key Conclusions

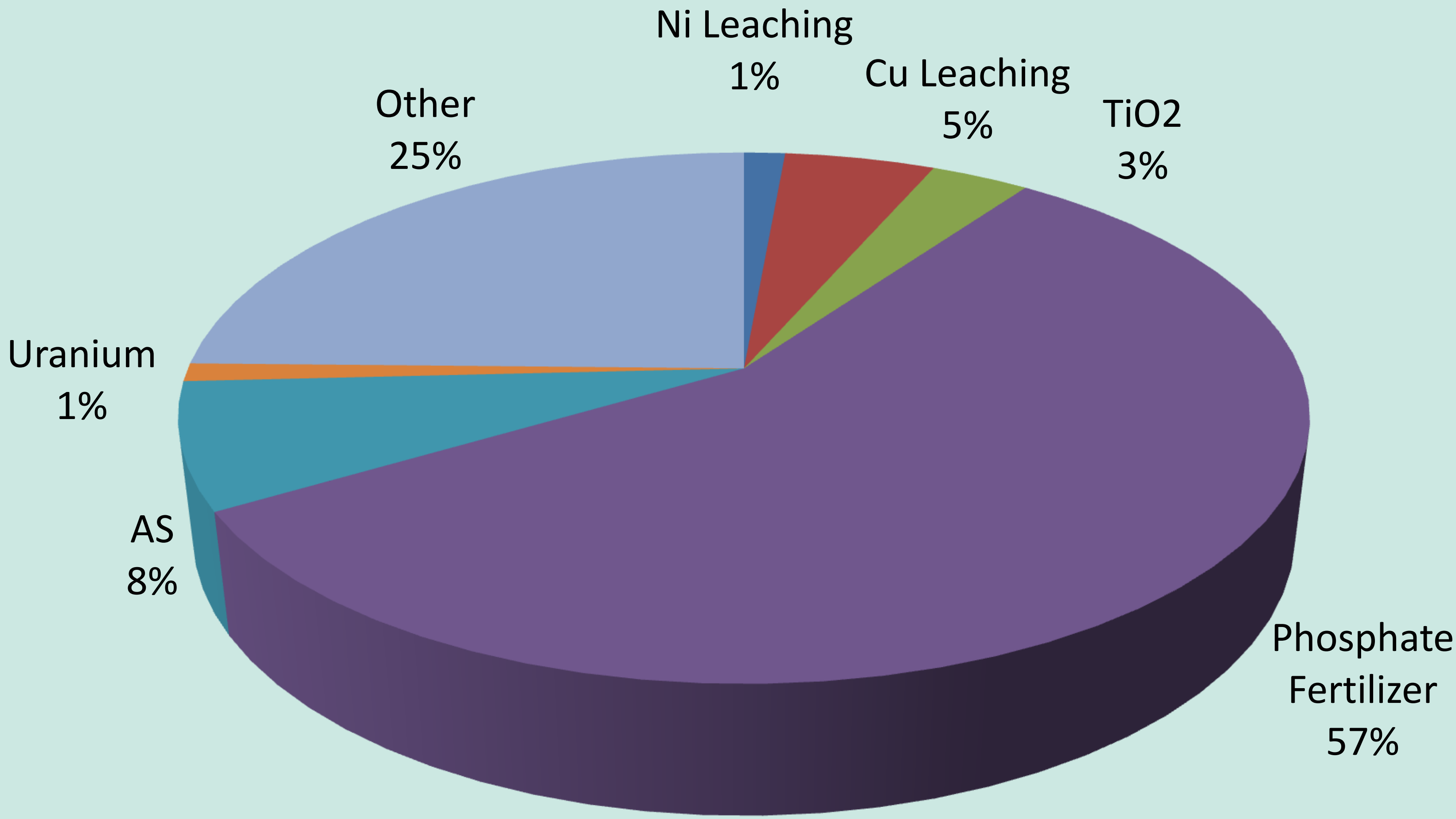
Global Acid Production 1999-2009

Involuntary acid market share rises from 23% to 31% causing a decline in voluntary production

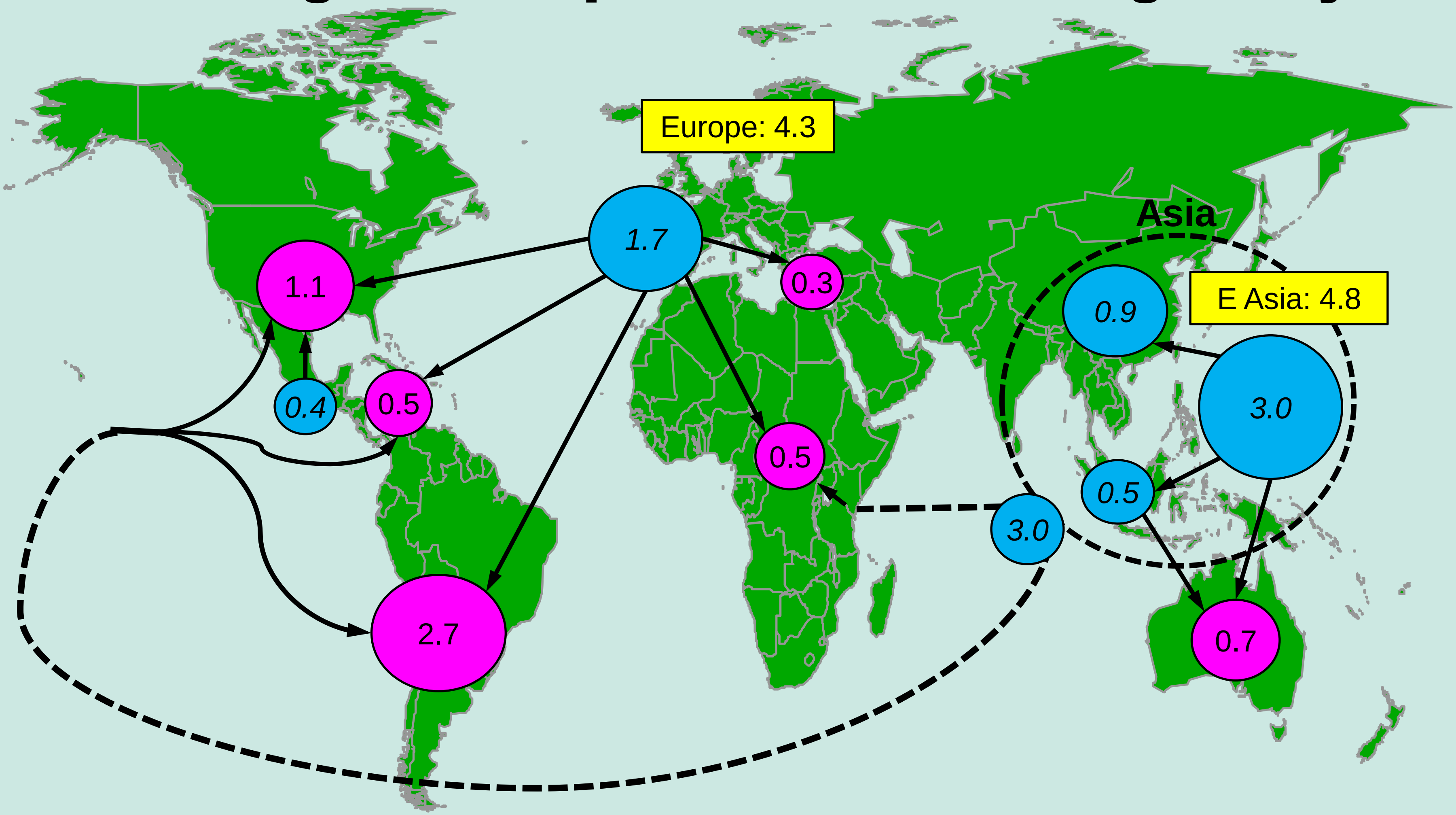


Global Acid Consumption 2008

Fertiliser industry dominates global demand - Base Metal and Uranium leaching represent a small proportion (6%)

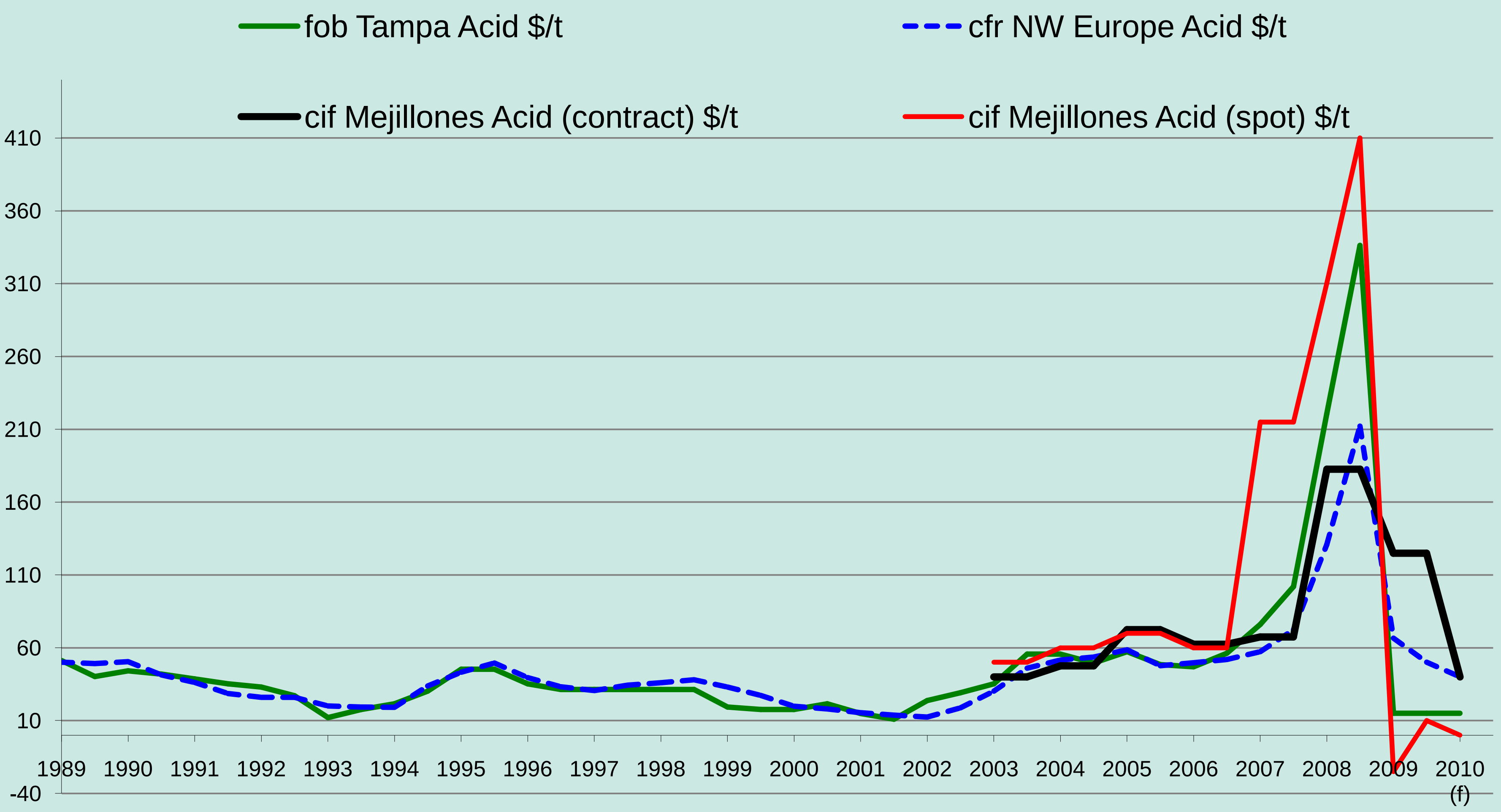


Global Sulphuric Acid Trade 2008
<5% of global output travels extra-regionally



Net Acid Imports (mt) Net Acid Exports (mt) Total Acid Exports (mt)

Sulphuric Acid Pricing 1989 – 2009



BRITISH SULPHUR | CONSULTANTS

A DIVISION OF CRU

Sulphuric Acid Demand Outlook – Phosphoric Acid

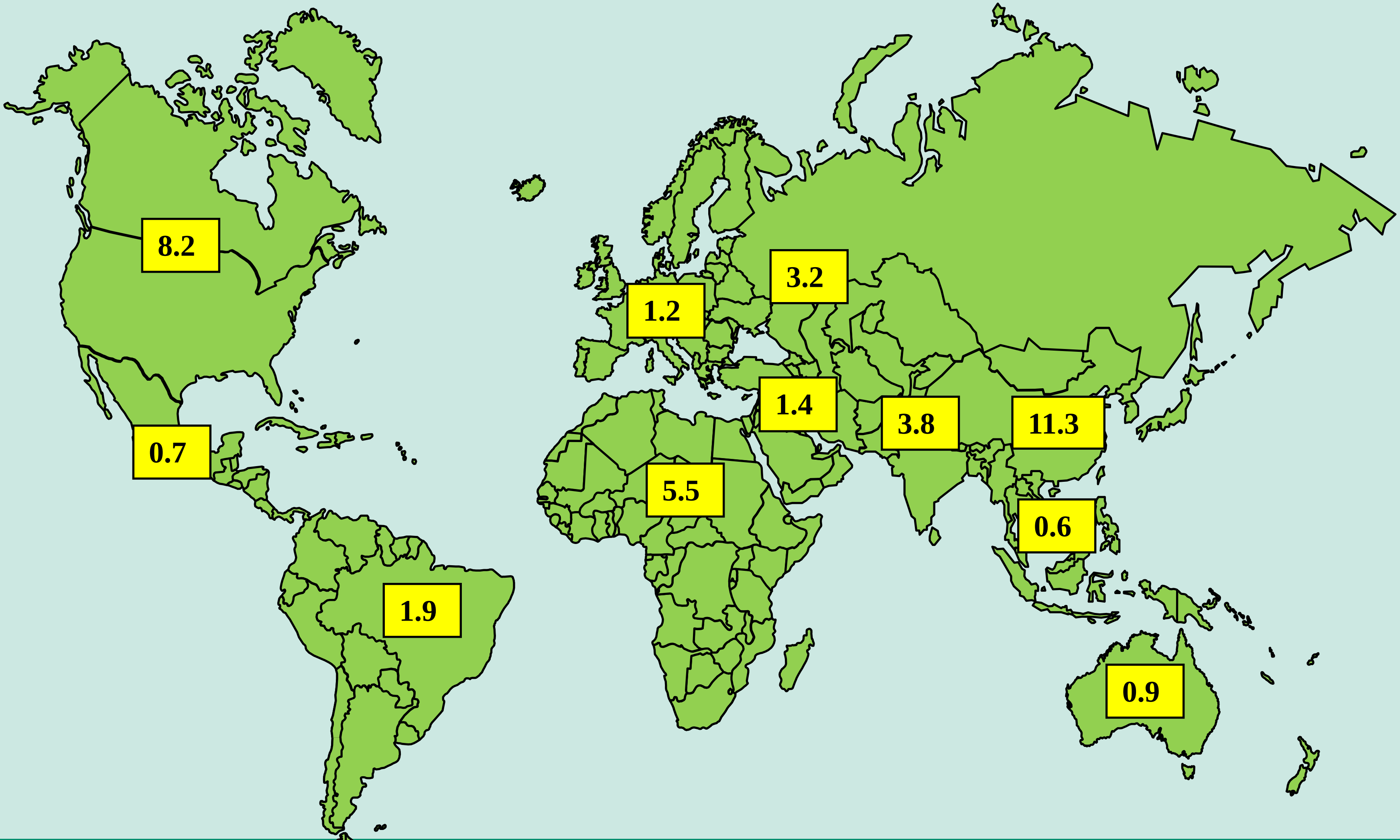
LONDON | BEIJING | WASHINGTON | RALEIGH | MINNEAPOLIS

CRU | THE INDEPENDENT AUTHORITY™

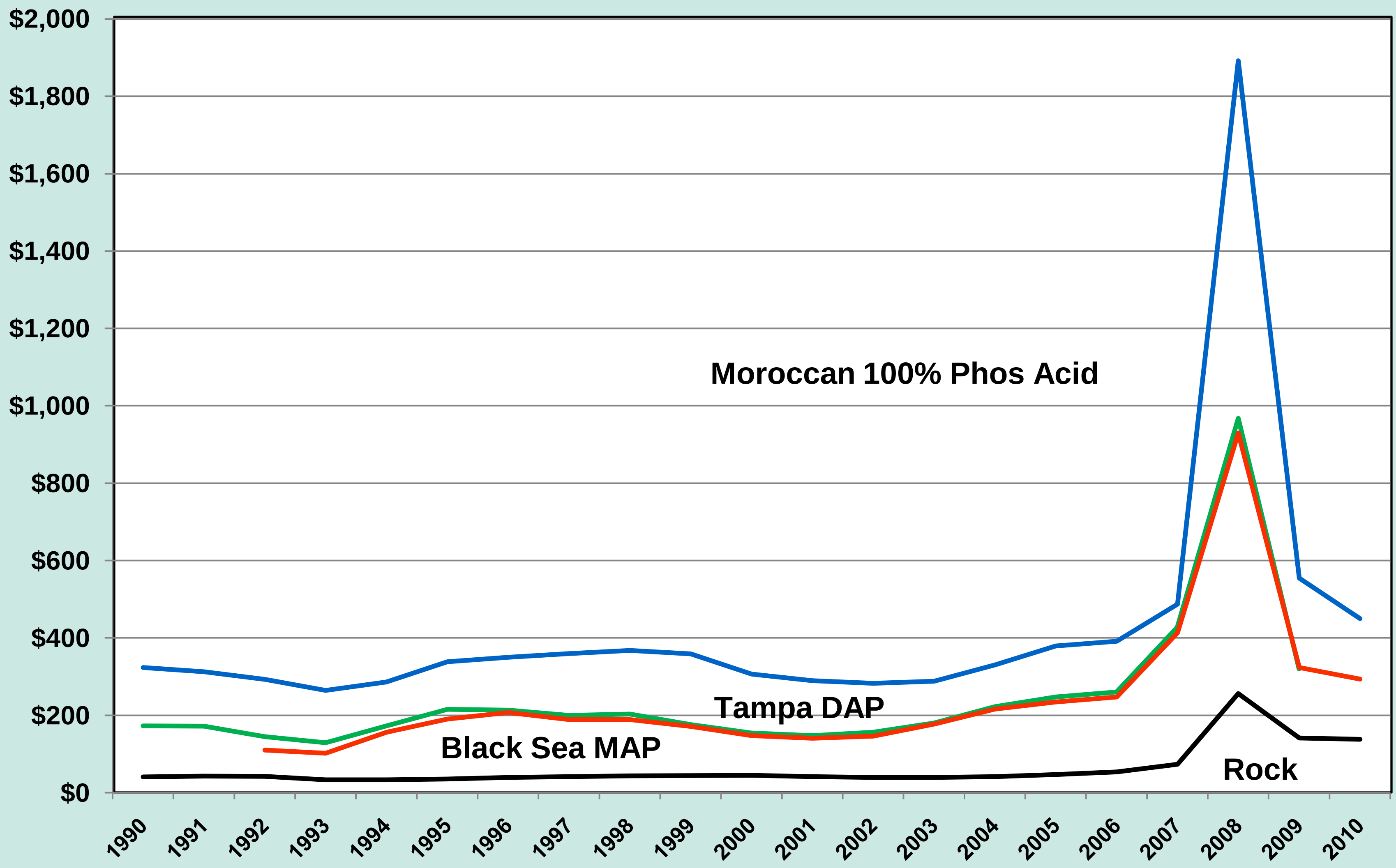
MINING | METALS | POWER | CABLES | FERTILIZERS | CHEMICALS

31 Mount Pleasant, London WC1X 0AD UK
Tel +44 20 7903 2132 Fax +44 20 7833 4973
www.britishsulphur.com
www.crugroup.com

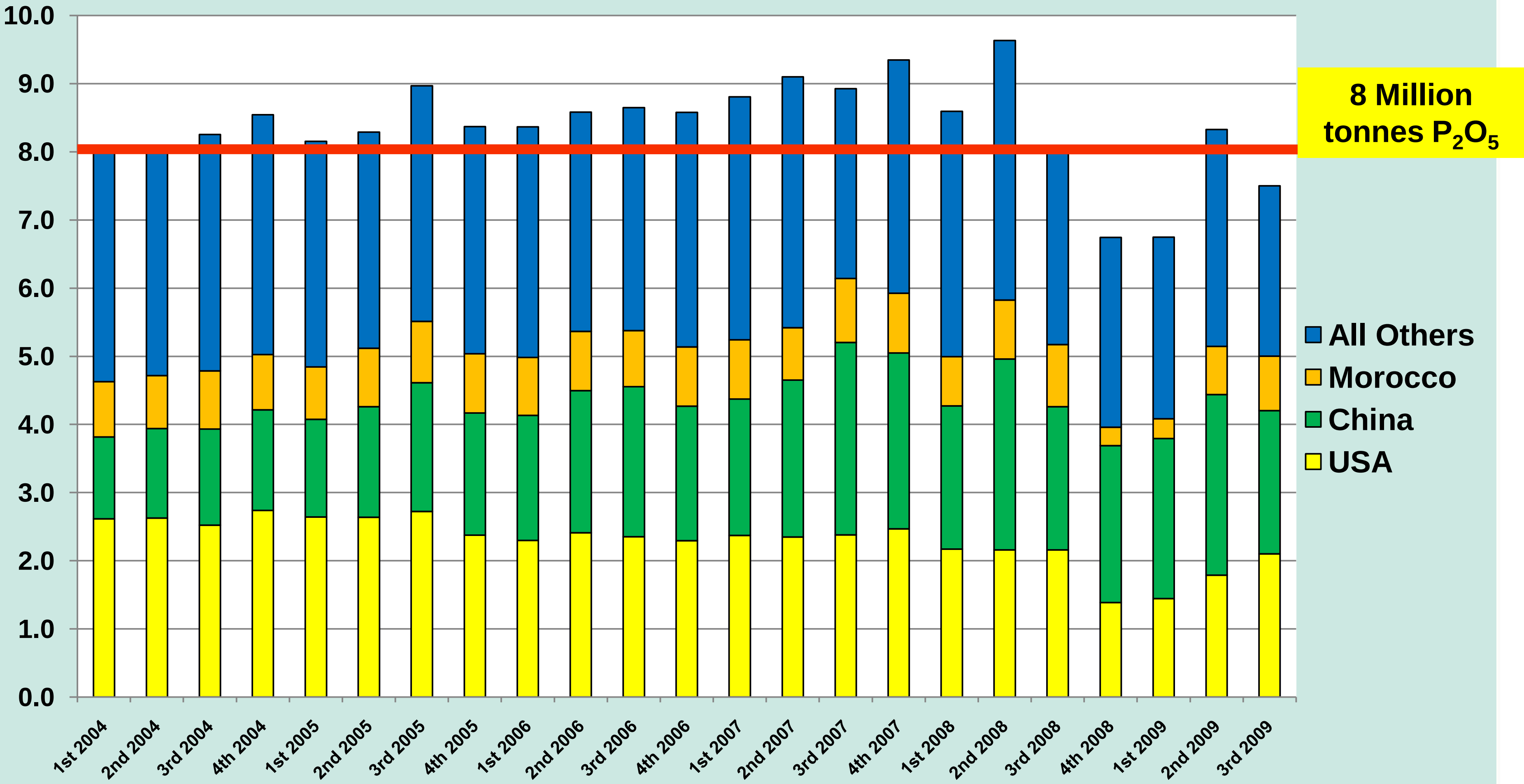
Phosphoric Acid & SSP Production - 2008
38.7 million tonnes of P_2O_5



Phosphate Prices Return To Normal



Phosphoric Acid Production beginning to rebound

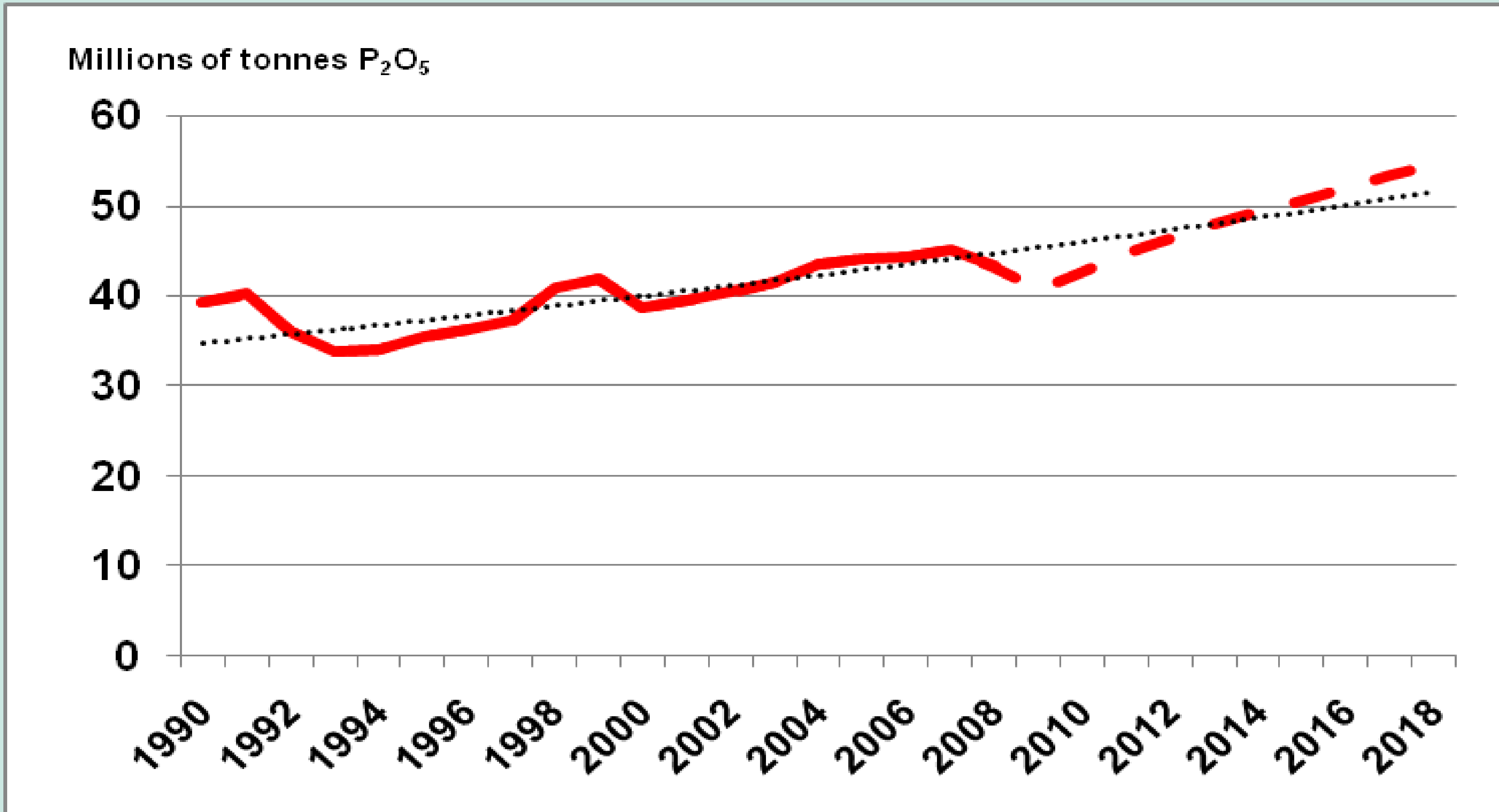


New Phosphoric Acid Capacity Growth Slowing

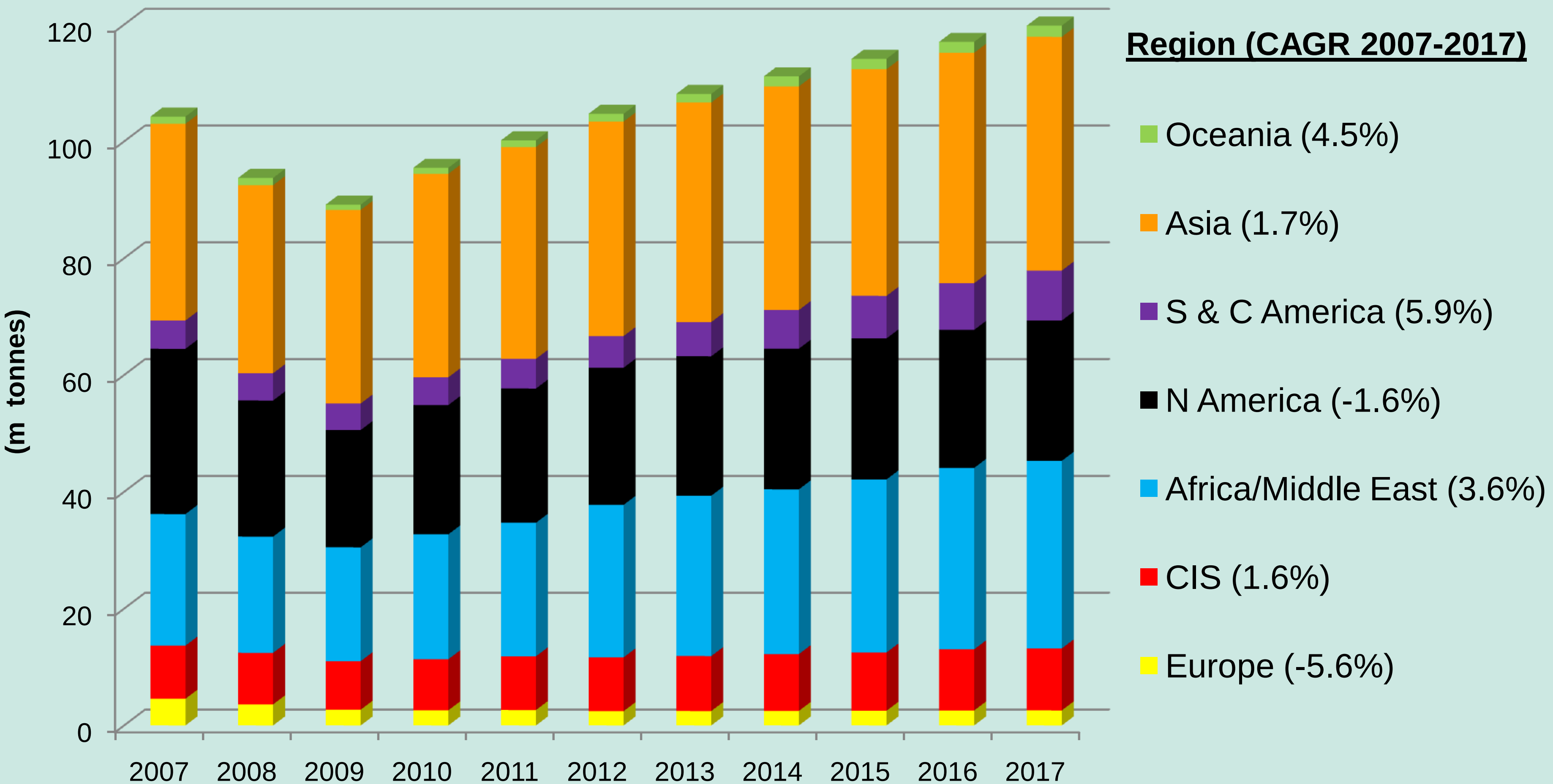
<u>Total New Capacity 6.8 million tonnes by 2012</u>

- **<u>Morocco</u>** **375,000 tonnes @ Jorf Lasfar in 2012**
- **<u>Tunisia</u>** **330,000 tonnes @ Skhira in 2011**
- **<u>Tunisia</u>** **180,000 tonnes @ M'Dilla in 2012**
- **<u>Saudi Arabia</u>** **1.5 million tonnes @ Ras az Zawr in 2010/11**
- **<u>Brazil</u>** **150,000 tonnes @ Araxa in 2011**
- **<u>Brazil</u>** **230,000 tonnes @ Uberaba in 2012**
- **<u>Vietnam</u>** **162,000 tonnes @ Dinh Vu in 2009/10**
- **<u>Australia</u>** **150,000 tonnes @ TBD in 2012**
- **<u>China</u>** **3.7 million tonnes @ TBD before 2012**

Long-Term Phosphate Fertilizer Consumption growing 2.4% or about 1.1 million tonnes P_2O_5 per year



Sulphuric Acid Demand – Phosphoric Acid, by Region, 2007-2017



Data: British Sulphur Consultants

BRITISH SULPHUR | CONSULTANTS

A DIVISION OF CRU

Sulphuric Acid Demand Outlook – Copper, Nickel, Uranium

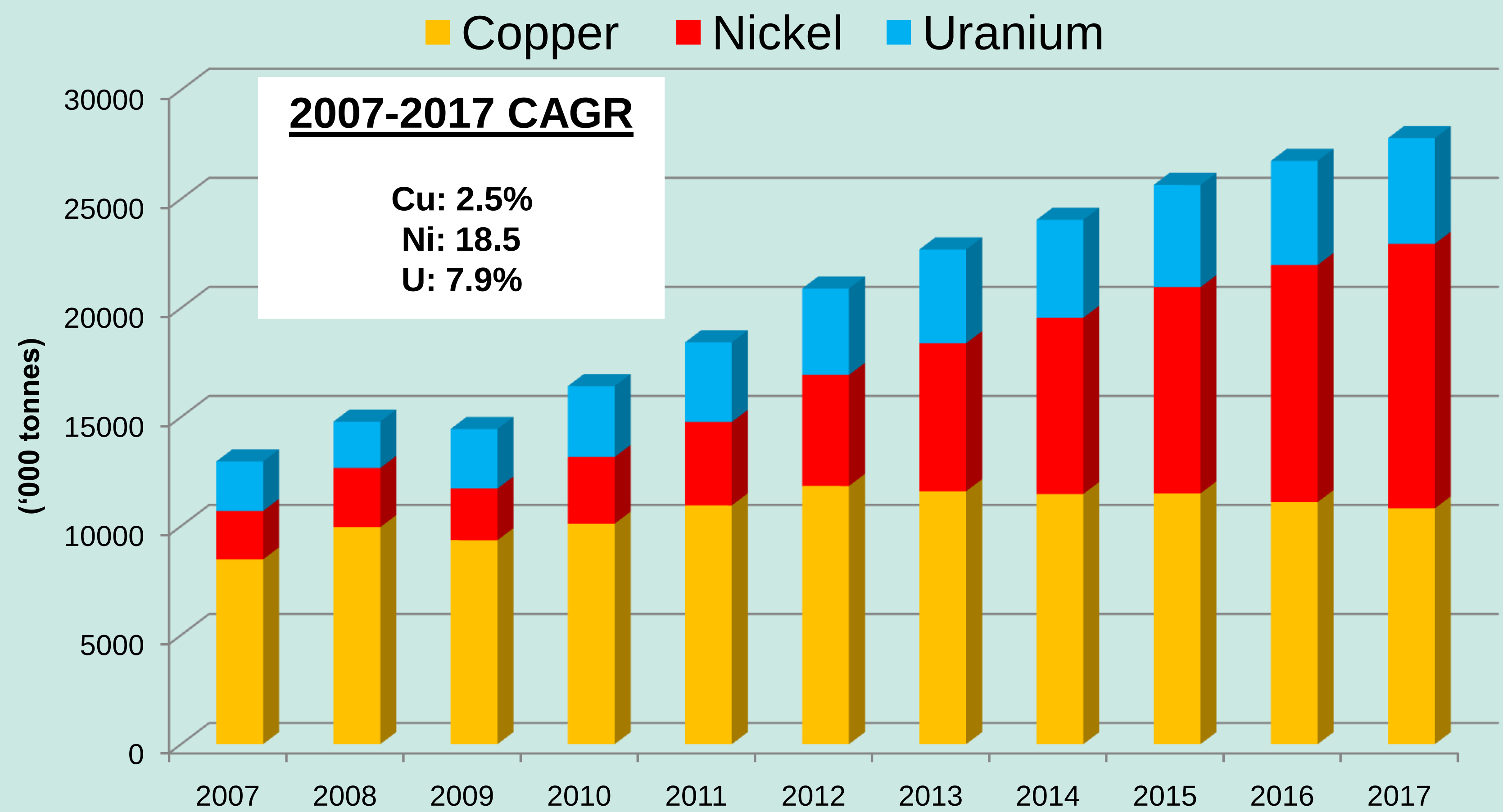
LONDON | BEIJING | WASHINGTON | RALEIGH | MINNEAPOLIS

CRU | THE INDEPENDENT AUTHORITY™

MINING | METALS | POWER | CABLES | FERTILIZERS | CHEMICALS

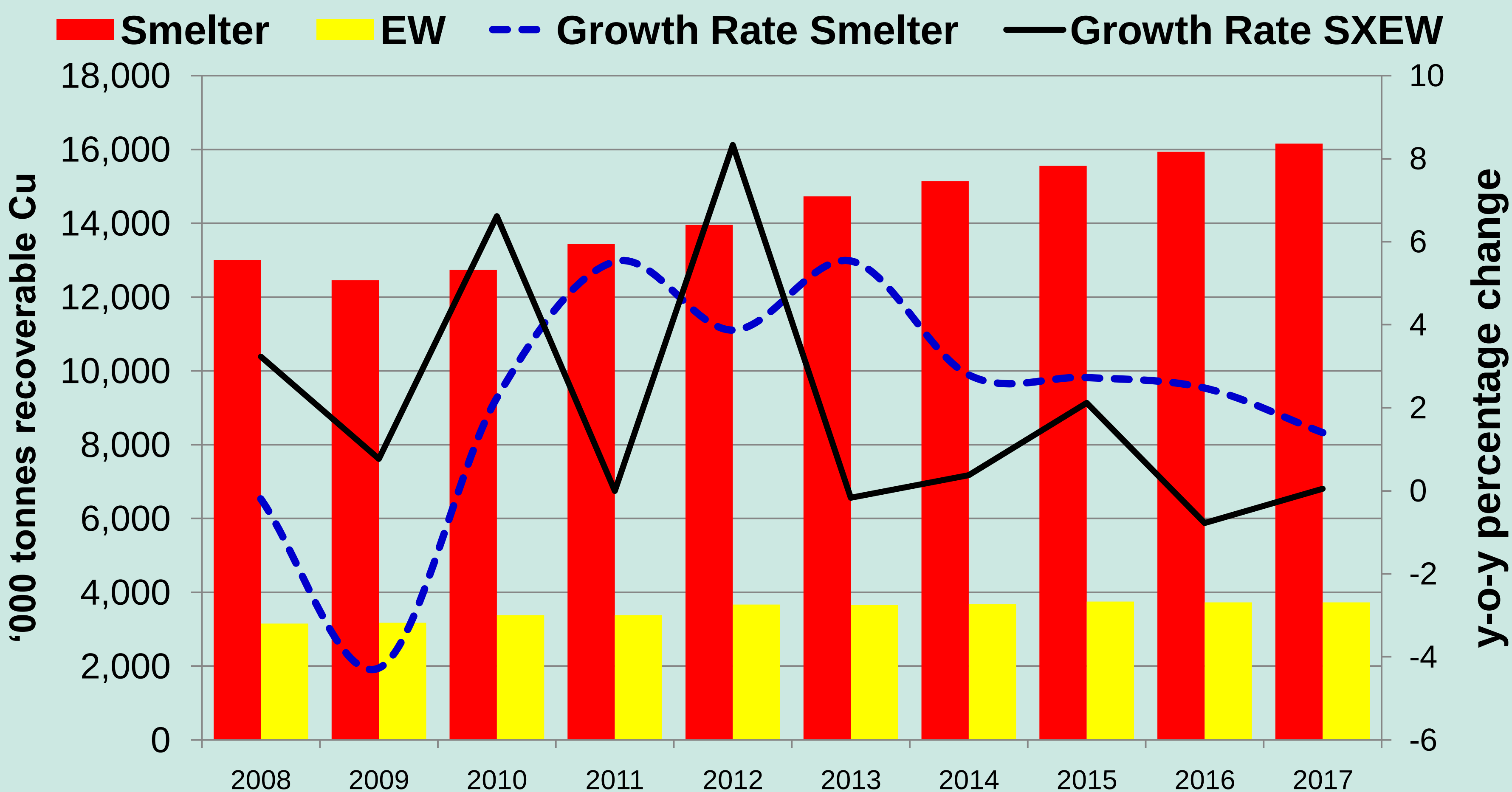
31 Mount Pleasant, London WC1X 0AD UK
Tel +44 20 7903 2132 Fax +44 20 7833 4973
www.britishsulphur.com
www.crugroup.com

Forecast Sulphuric Acid Demand – Copper, Nickel and Uranium, 2007 - 2017



Global Copper Production Forecast, 2008-2017

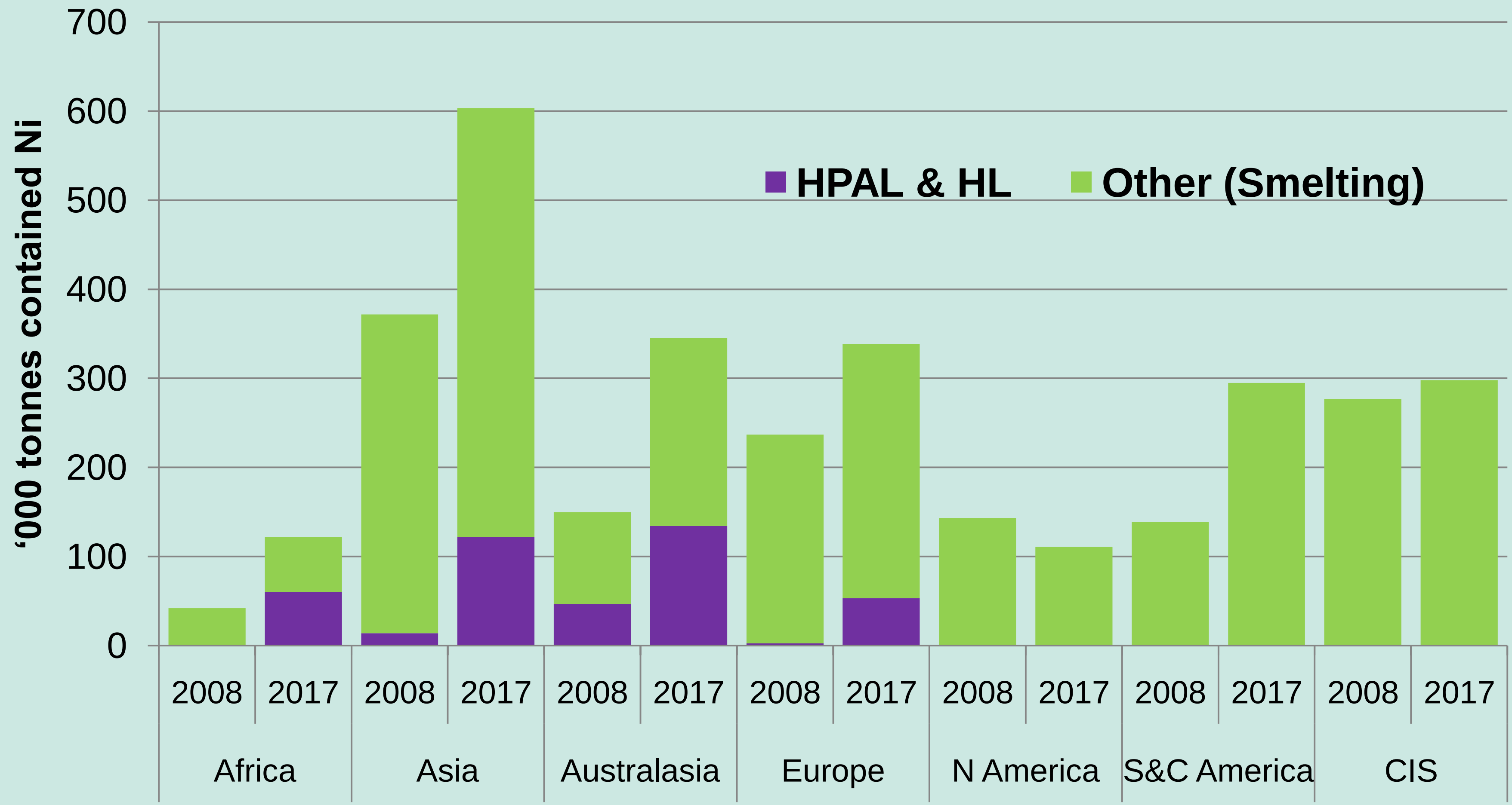
Production from EW declining as ore bodies deplete



Data: CRU Analysis

Regional Nickel Production, 2017 versus 2008

Growth in acid demand is forecast in four regions



Data: CRU Analysis

Forecast Sulphuric Acid Use for Nickel Leaching

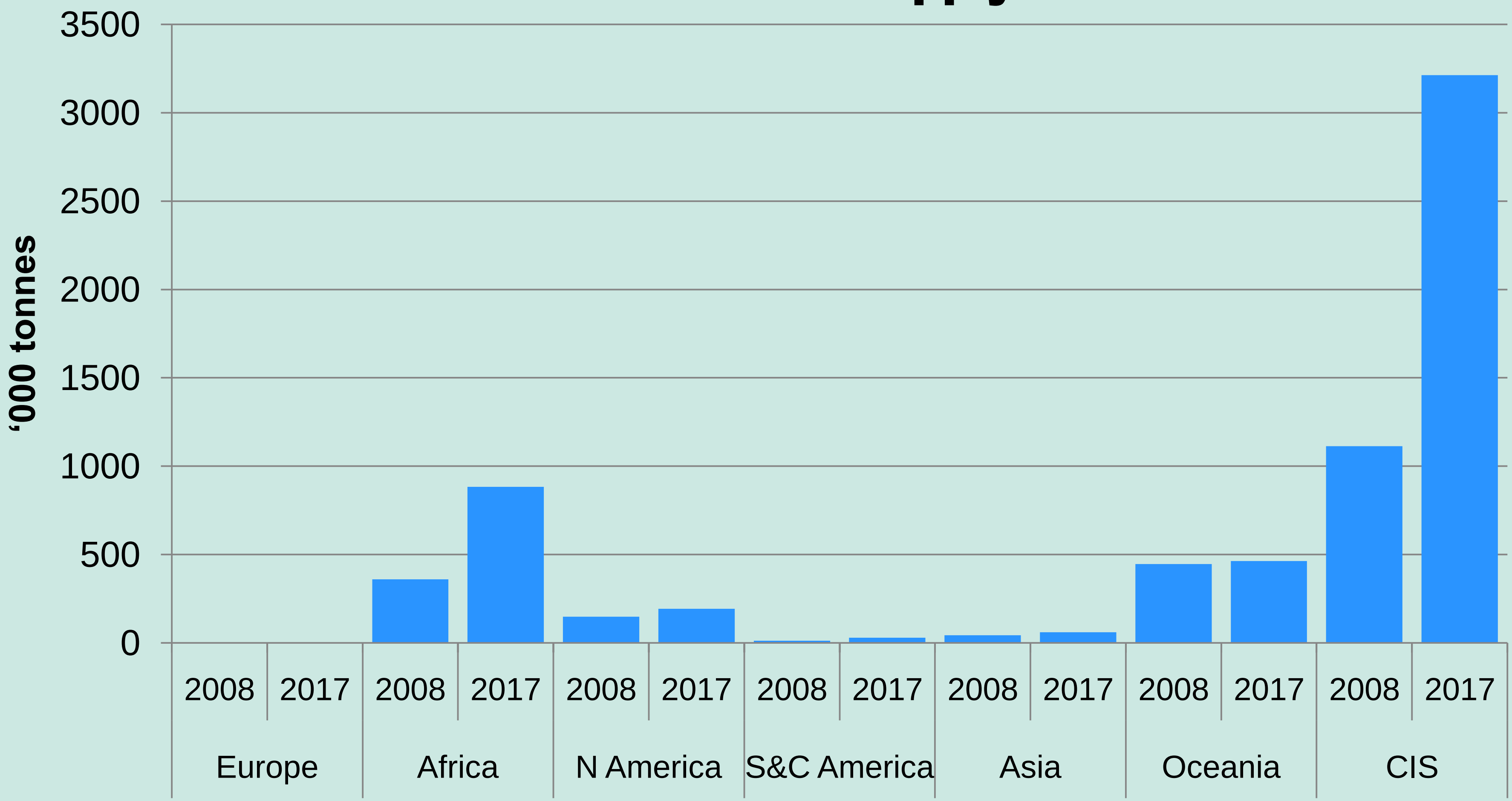
By 2013, nine HL/HPAL projects in operation adding 4mt acid demand

Operation	Country	Technology	Ni Prod 2013, '000 tpy	H_2SO_4 Cons. t/t of Ni prod. (Data: CRU)	H_2SO_4 Cons. '000 t
Murrin Murrin	Australia	HPAL	31	32	1,008
Coral Bay	Philippines	HPAL	20	26	520
Moa Bay/Fort Saskatchewan	Cuba	HPAL	42	25	1,050
Goro	New Caledonia	HPAL	55	26	1,452
Talvivaara	Finland	Bio HL	33	8	264
Ramu River	PNG	HPAL	31	36	1,107
Ambatovy	Madagascar	HPAL	18	30	545
Caldag	Turkey	HL	16	49	784
Taganito, Mindanao	Philippines	HPAL	1**	26	26
Grand Total			**248**	**29***	**6,756**

Data: CRU Analysis/BSC **Note**: *Average ** Start up, full capacity = 30ktes

Sulphuric Acid for Uranium, 2017 versus 2008

Strong growth forecast in Africa and CIS, exceeding local smelter acid supply



Sulphur Burning Projects – Uranium

Regional acid deficits will lead to further investment in sulphur burning capacity

Country	Company	Location	Start-up Date	Status	Capacity '000 t
CIS:					
Russia	TVEL	Chita*	2009	Operational	180
Kazakhstan	Kazatomprom/ Uranium One	Stepnogorsk (Replacement)	2010	Firm	180
Kazakhstan	Kazatomprom/ Uranium One	Zhanakorgan	2011	Firm	500
Africa:					
Malawi	Paladin Energy	Kayelekera†	2009	Firm	76
Namibia	Rossing	Swakopmund	Unknown	On Hold	396
Niger	Areva	Imouraren	2013	PreFS	202
South Africa	Various	Rand	Unknown	PreFS	Unknown
Namibia	Various	Swakopmund	Unknown	PreFS	Unknown

KEY CONCLUSIONS

- The production of sulphuric acid on an involuntary basis continues to grow.
- Demand for sulphur and sulphuric acid for fertilizers will recover and is forecast to remain steady.
- Demand for sulphuric acid for copper leaching appears to be reaching its peak; some copper producers are now turning to sulphur burning for strategic and commercial reasons.
- New demand for acid for nickel and uranium leaching will be mainly met by elemental sulphur.
- In the longer term, a rationalisation of sulphuric acid production capacity in some acid –producing regions will be required, whilst re-investment continues to take place elsewhere.

THANK YOU!

Sulphuric Acid

Ten Year Forecast and Market Analysis Service

Joanne Peacock
Tel: +44 20 7903 2121
Email: joanne.peacock@crugroup.com

LONDON | BEIJING | WASHINGTON | RALEIGH | MINNEAPOLIS

31 Mount Pleasant, London WC1X 0AD UK
Tel +44 20 7903 2132 Fax +44 20 7833 4973
www.britishsulphur.com
www.crugroup.com