Power – it's getting serious

Presentation to Mine Africa December 2011

Rupert Soames, Chief Executive, Aggreko plc

Why listen to Aggreko?

- **One of the world's largest providers of generation capacity in developing economies**
- **Over the last five years**
  - > 1,000 MW of additional capacity brought on-line in Africa
  - > 1,000 MW of additional capacity brought on-line in Asia
  - > 800 MW of additional capacity brought on-line in Latin America
- **>$600m of new fleet investment in 2011 alone**
- **Currently delivering large scale power in 50 countries**
- **World-wide power fleet of around 8,000 MW**
- **One of the largest sponsors of research into power supply & demand in emerging countries**

aggreko

Aggreko in mining

- **Temporary power and temperature control**
- **Some key customers:**
  - BHP – Chile, W A
  - Vale – Mozambique and Brazil
  - Barrick – Africa & Carribean
  - Bisha – Eriteria
  - Ivanhoe – Mongolia
  - Rio Tinto – Australia
  - Xtrata - Australia
  - Anglo American – Australia & South Africa
- **Typical applications of temporary power and temperature control**
  - Project acceleration: guaranteeing power before permanent generation is available
  - Managing through temporary interruptions
  - Managing volatility in demand

Mine cooling, South Africa

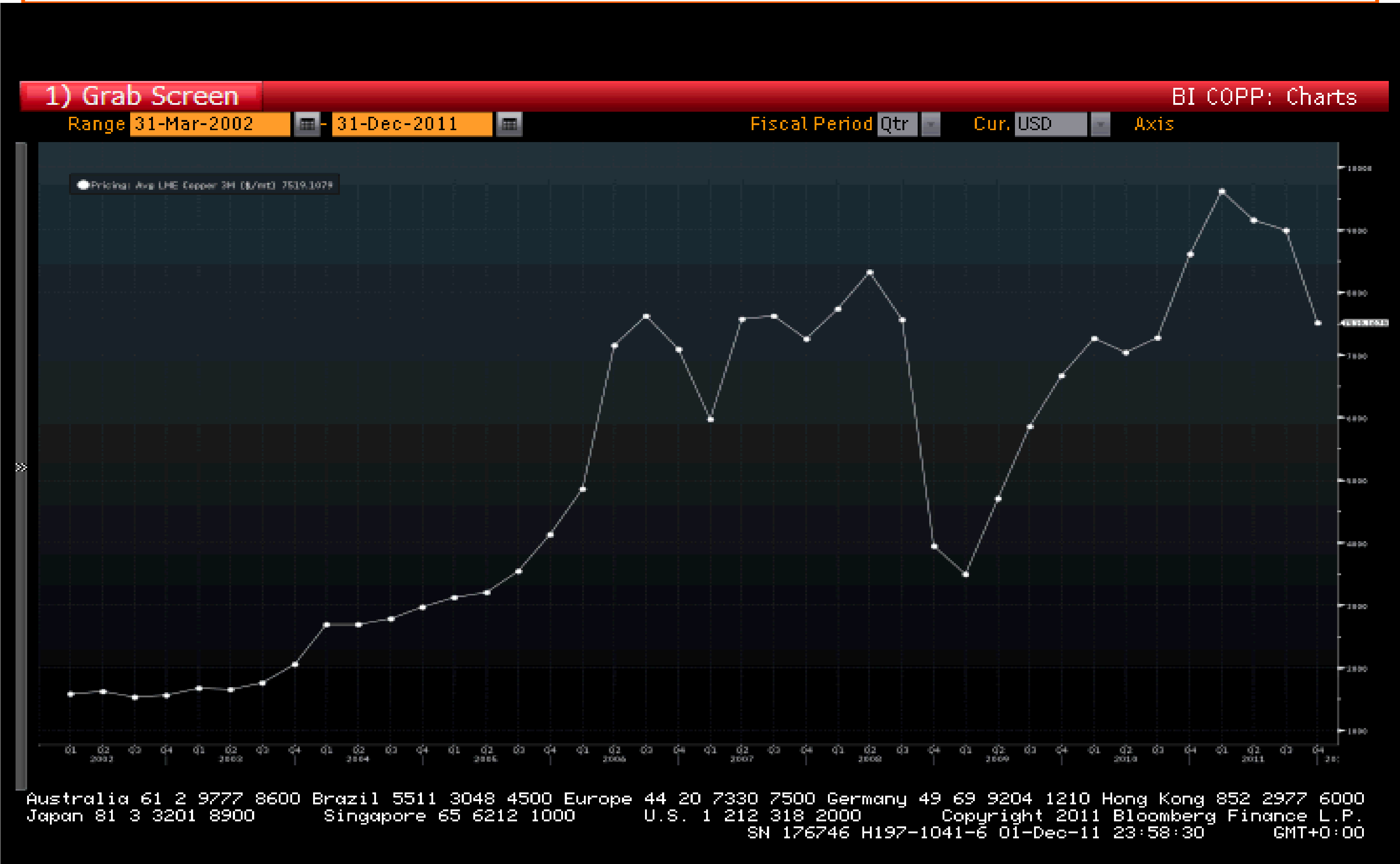
Mine power, Mongolia

Mine power, Australia

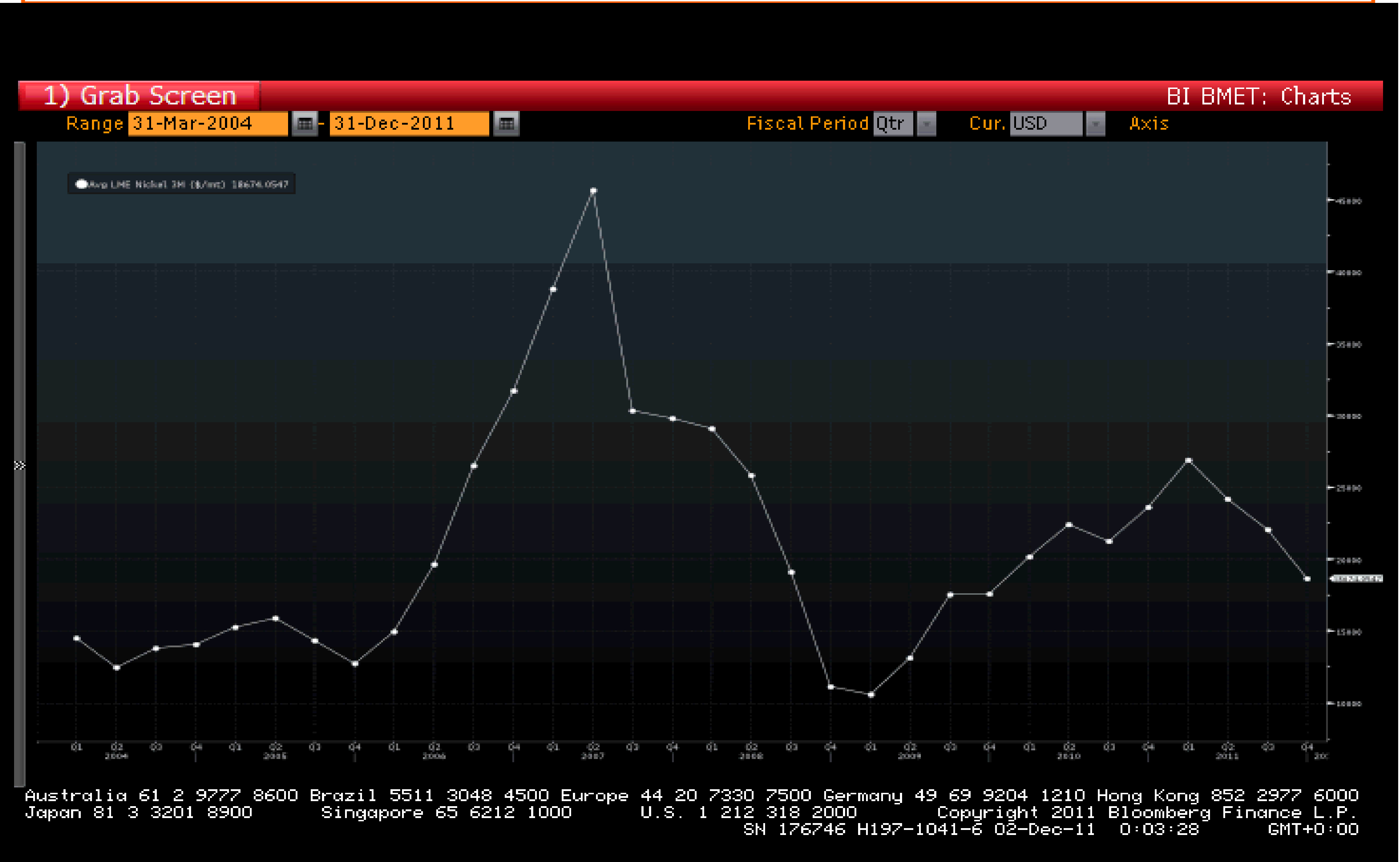
Grid Power: 100 MW at Embakasi, Kenya

Grid Power: 30 MW Gas at Batam, Indonesia

Volatility is a fact of life: copper 2004 - 2011

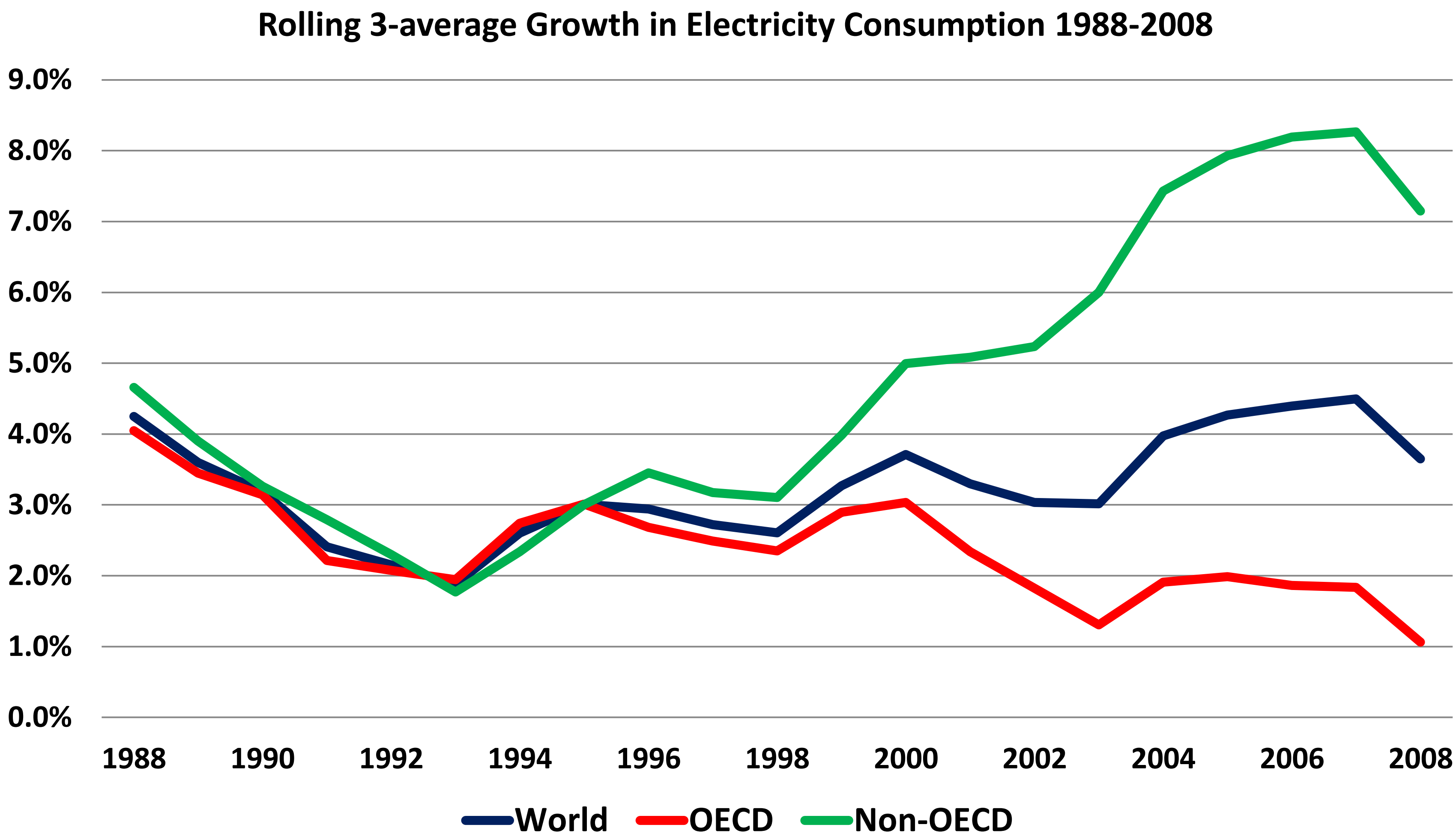


Volatility is a fact of life: nickel 2004 - 2011



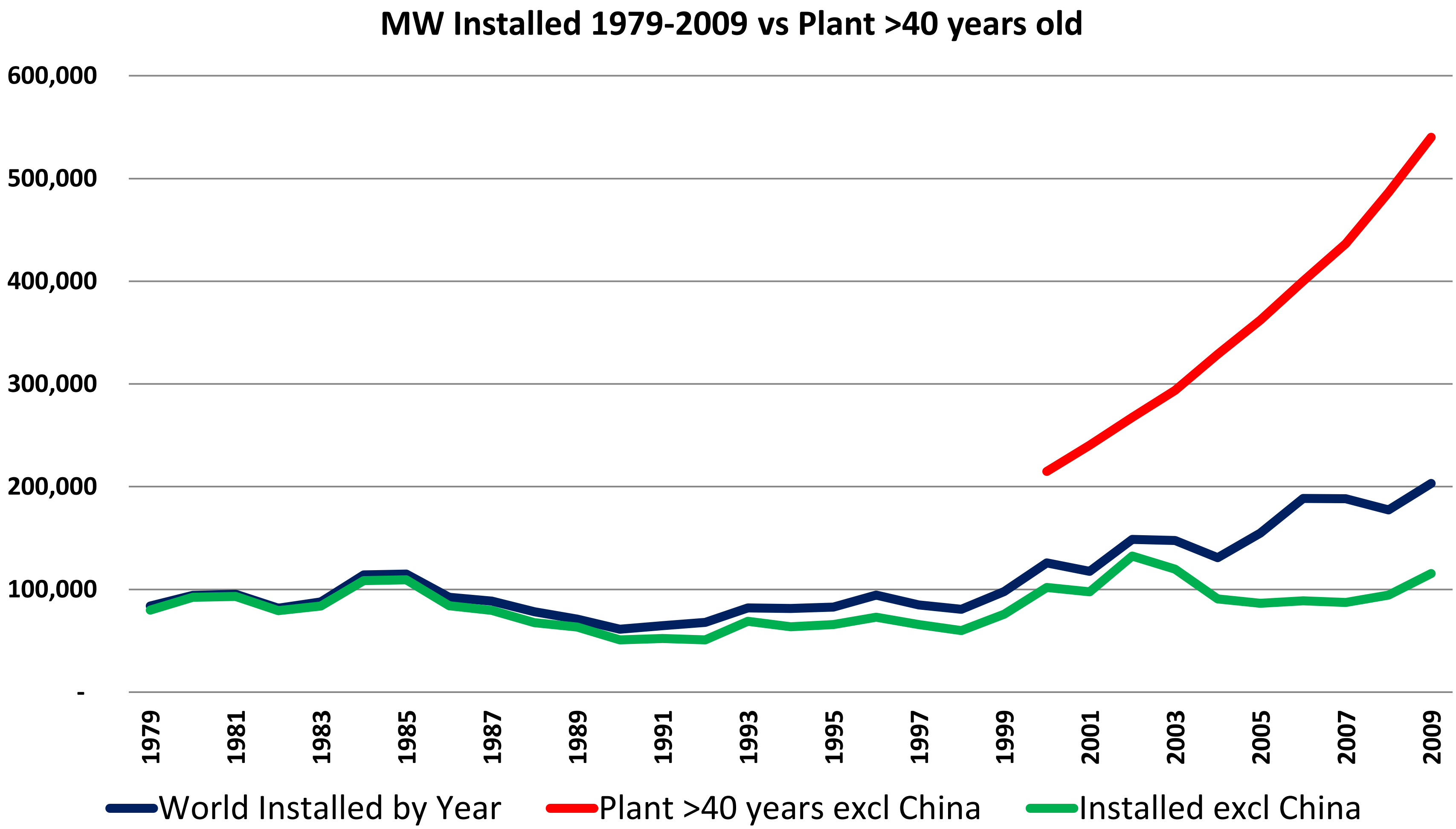
THE WORLD HAS A PROBLEM

Demand for power growing fast



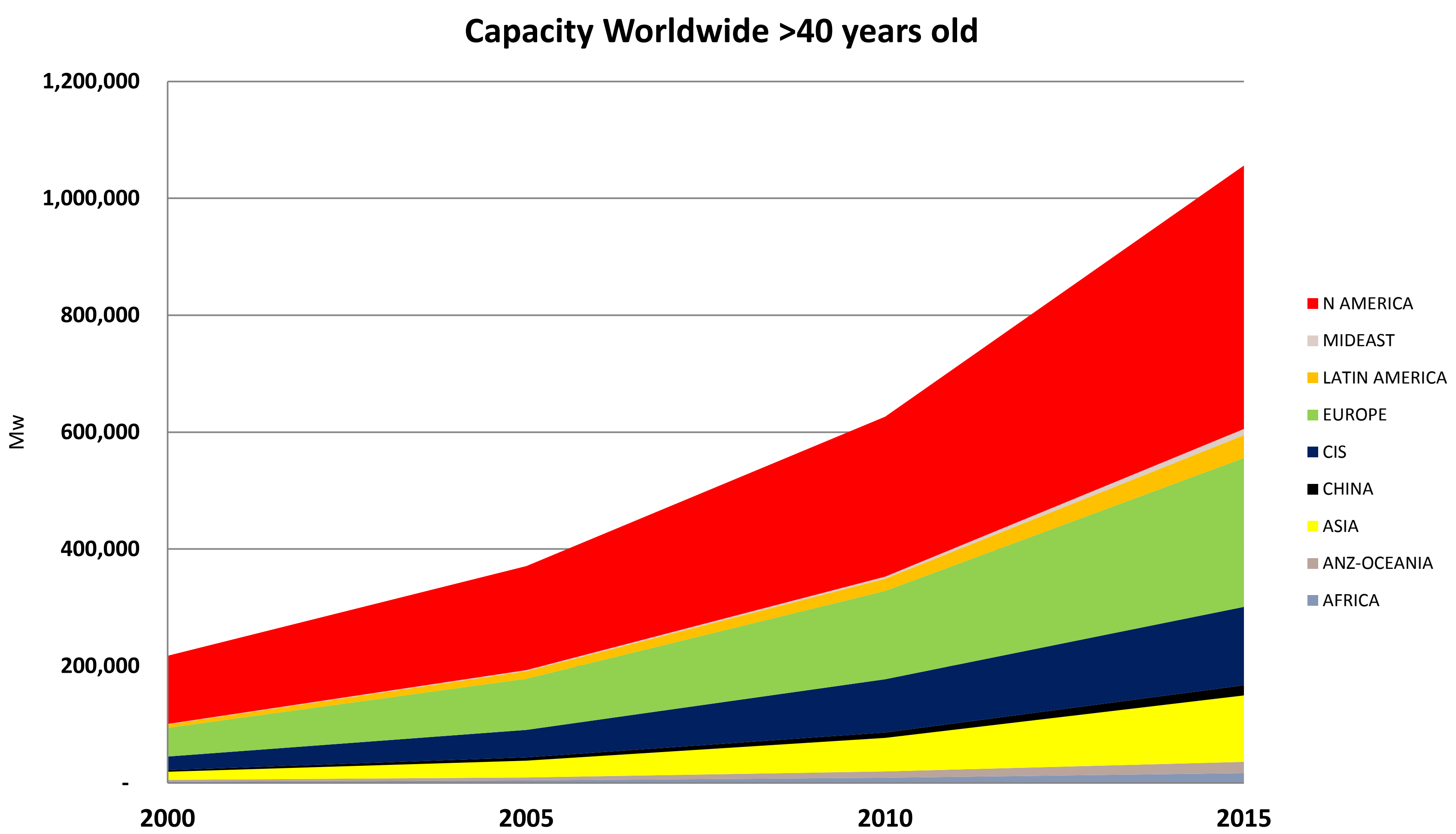
Source: IEA

Investment is not enough to meet new demand and ageing plant



Source: Platts

25% of World's Generating Capacity >40 years old by 2015



Source: Platts

Case Study: Sub-Saharan Africa

- **Demand continues to grow**
  - Annual average consumption growth 2000 – 2006: 5-7%

    source: EIA / World Bank
- **Supply is growing far more slowly**
  - Annual average capacity growth 2000 – 2006: 2% source: EIA
- **African manufacturing enterprises report power outages on an average of 56 days a year** source: World Bank
- **Lack of power the single greatest source of lost productivity in African business** source: World Bank

Case Study: Sub-Saharan Africa

- **Existing infrastructure deteriorating rapidly**
  - >25% of SSA's plant is not currently in operating condition
    source: World Bank
  - Amount of installed plant >40 years old will increase by 70% in next 6 years
    source: Platts
- **Transmission & Distribution as much a problem as generation**
  - Average age of transmission infrastructure in SSA ~44 years, some >60 years
    source: World Bank
  - Example: new 100 MW gas plant operating at approximately 50% capacity due to transmission constraints
    source: Orca Energy
  - Example: new 500 MW hydro plant delivering <50% of plan to capital city due to transmission constraints

$158bn required – at current access rates

World Bank Africa Infrastructure Country Diagnostic (AICD)

	MW 2005	MW Refurb	MW new	MW 2015	Cost $bn	Reported Financing	
SAPP	17,136	28,029	31,297	76,462	$ 64	$ 2	3%
EAPP	22,132	1,369	23,045	46,546	$ 40	$ 6	15%
WAPP	4,096	5,530	15,979	25,605	$ 47	$ 2	4%
CAPP	260	906	3,856	5,022	$ 7	$ 1	14%
Total	43,624	35,834	74,177	153,635	$ 158	$ 11	7%

Scenario: current rates of access + population growth + historic consumption growth

Output: $158bn of investment required over 10 years 2005-2015

Source World Bank, Africa Energy

Case Study: UK - $300bn required over next 10 years

- **~ 25% of current capacity coming out of service in next 10 years**
- **Demand likely to increase by 50% by 2050**
- **Renewables need to increase from 7% of capacity to 30% by 2020**
- **Estimated gross impact of climate change policies on UK Electricity Bills**
  - Consumer: 33%
  - Business: 43%

Source: DECC, OFGEM

International Capital Markets will set the rules

- **Poor countries cannot rely on Global Institutions to finance their power infrastructure. They don't have enough money.**
  - World Bank funding capacity ~ $2bn; Africa needs ~$158 bn
- **Governments and Utilities don't have enough money**
- **New and replacement generation capacity will need to be financed by international capital markets**
- **Capital markets have enormous choice as to where to invest**
  - Hugely sensitive to project and country risk
- **Risk aversion and past history of poor returns mean that many resource-rich countries will not be able to access international capital markets for long-term infrastructure finance**

Consequences for the Mining Sector

- **Grid power in many developing markets is going to become increasingly unreliable as demand exceeds supply**
- **In conflict between giving energy to people and energy to corporates, people power will increasingly win**
  - Miners will have to self-provide
- **Volatility of metals & minerals prices will not reduce**
- **Power requirements need to be given careful thought**
  - How fast can it be mobilised
  - How much do we need permanently, and how much peaking?

aggreko