



PLUSmining

Copper Market and Industry Outlook

Juan Carlos Guajardo B.
Executive Director

25 May 2016

13th Shanghai Derivatives Market Forum

Nonferrous Metals Subforum

Shanghai Futures Exchange (SHFE)

PLUSmining

Content

I. Introduction

II. Demand side

- China
- The dollar
- The oil price

III. Supply side

- Market cap
- Debts
- Cost and production cuts
- New supply
- Preference for copper

PLUSmining

Content

I. Introduction

II. Demand side

- China
- The dollar
- The oil price

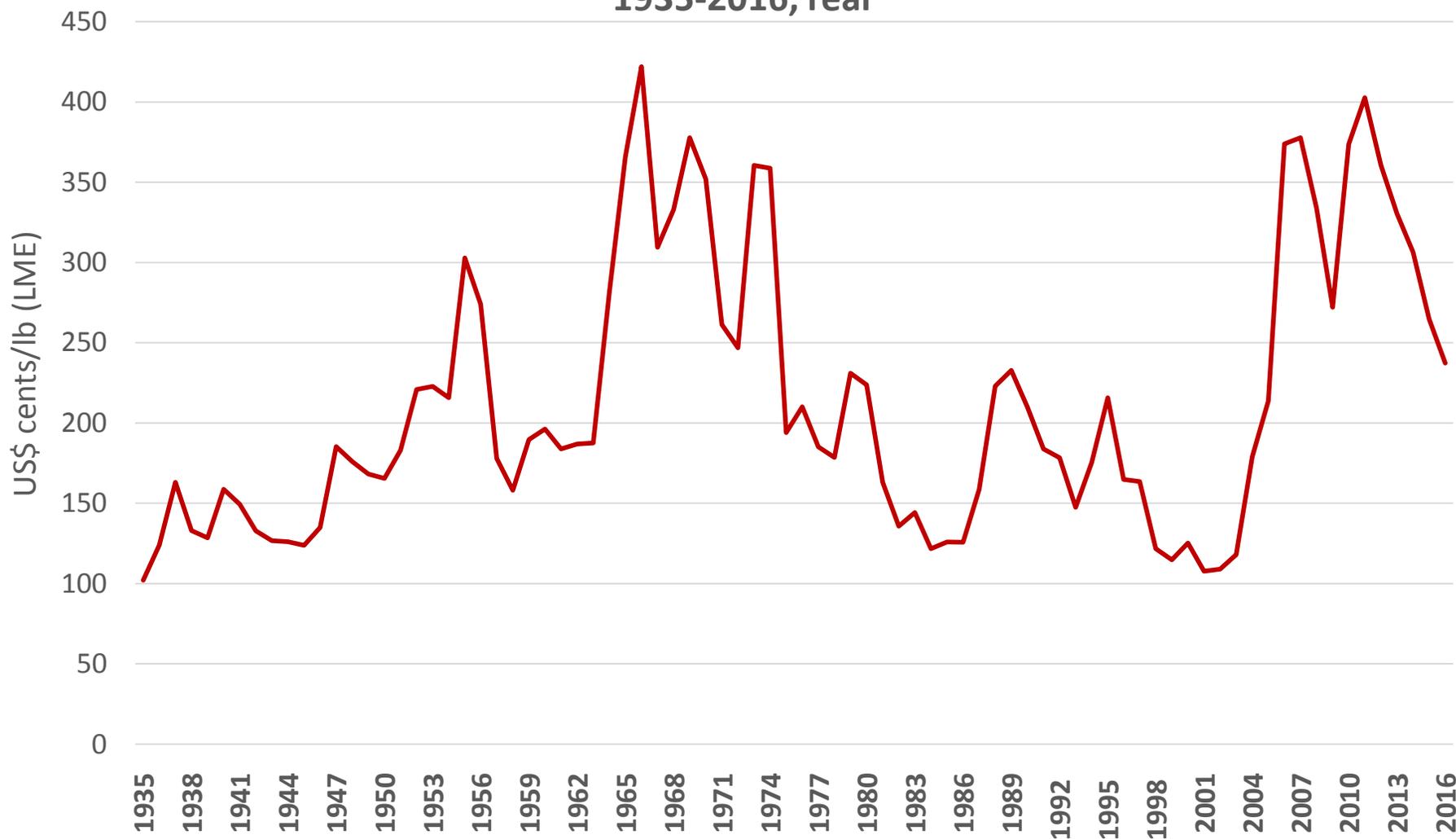
III. Supply side

- Market cap
- Debts
- Cost and production cuts
- New supply
- Preference for copper

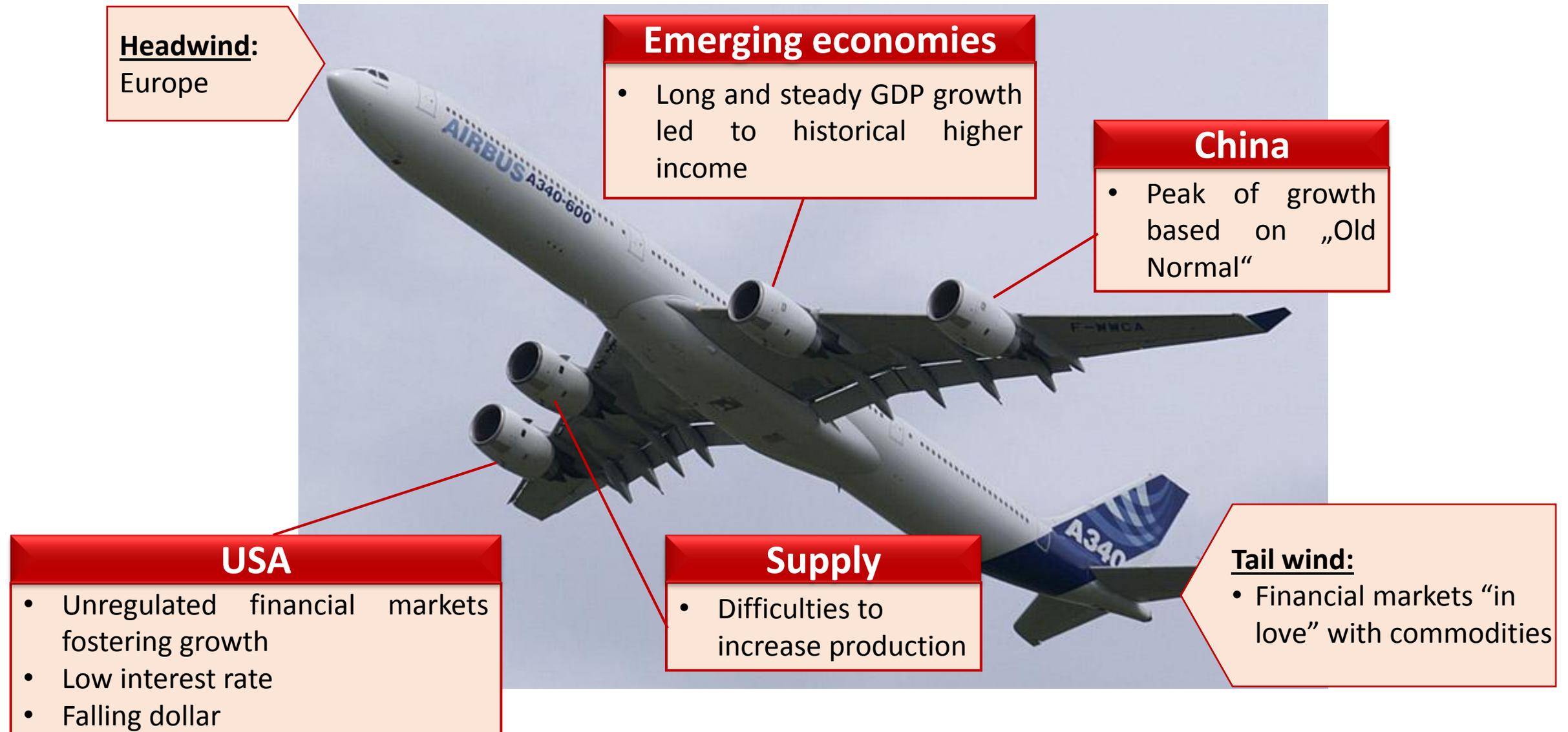
Copper's super cycles

- Cyclic behavior as all commodities
- Steep rise in the early 2000s
- Increasing volatility
- Last peak in 2011

Evolution of the copper price
1935-2016, real



Main drivers of the last upward supercycle



What has changed?

Emerging economies

- Structural weaknesses emerge, particularly large imbalances generated during the booming period

Tail wind:

- Lower oil price

USA

- Modest economic growth
- Rise in interest rate – Turning point?

China

- “New Normal”
- Less commodities as collateral

Headwind:

- Cost deflation
- Financial markets abandon commodities

Supply

- Rising production
- Little production cuts



PLUSmining

Content

I. Introduction

II. Demand side

- China
- The dollar
- The oil price

III. Supply side

- Market cap
- Debts
- Cost and production cuts
- New supply
- Preference for copper

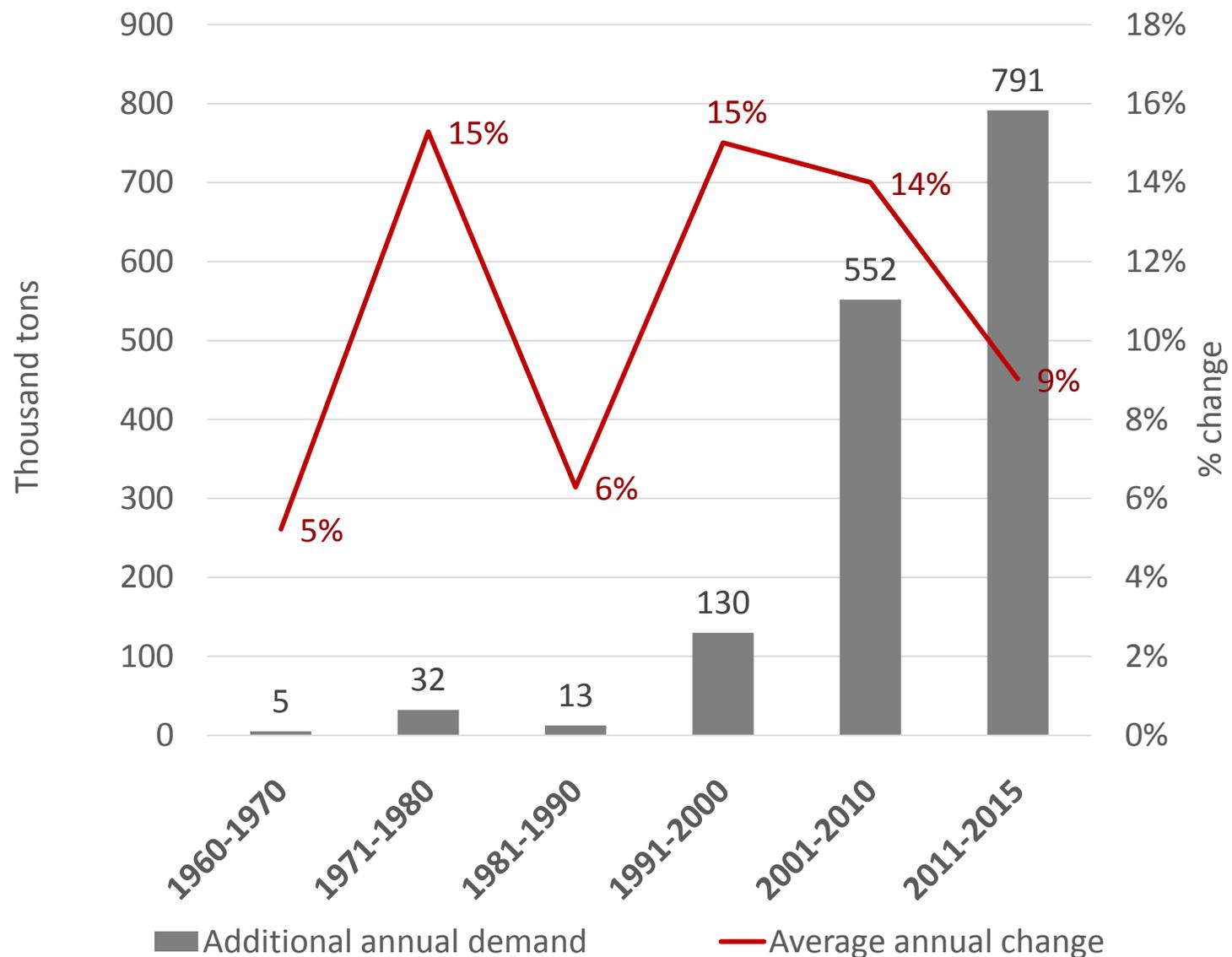
Chinese demand pattern is changing

- Declining demand growth rate
- Still increasing demand

Additional copper demand (in '000 tons) for every 1% increase in copper consumption

	1960	1990	2010	2014
United States	12.2	21.5	17.7	17.8
China	0.8	5.8	73.9	109.9
India	0.6	1.3	4.1	4.4

Average annual Chinese copper demand change per decade (in % and absolute numbers, 1960-2015)



PLUSmining

Content

I. Introduction

II. Demand side

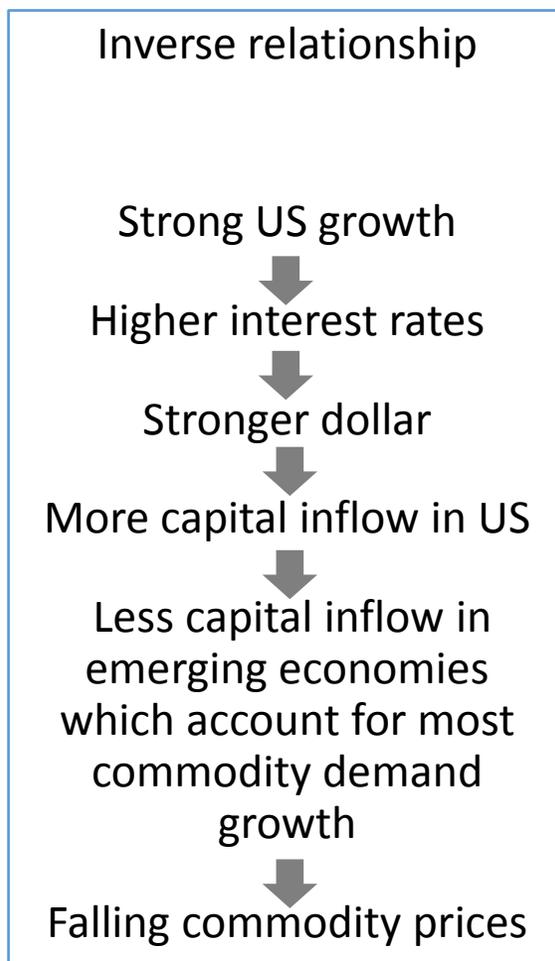
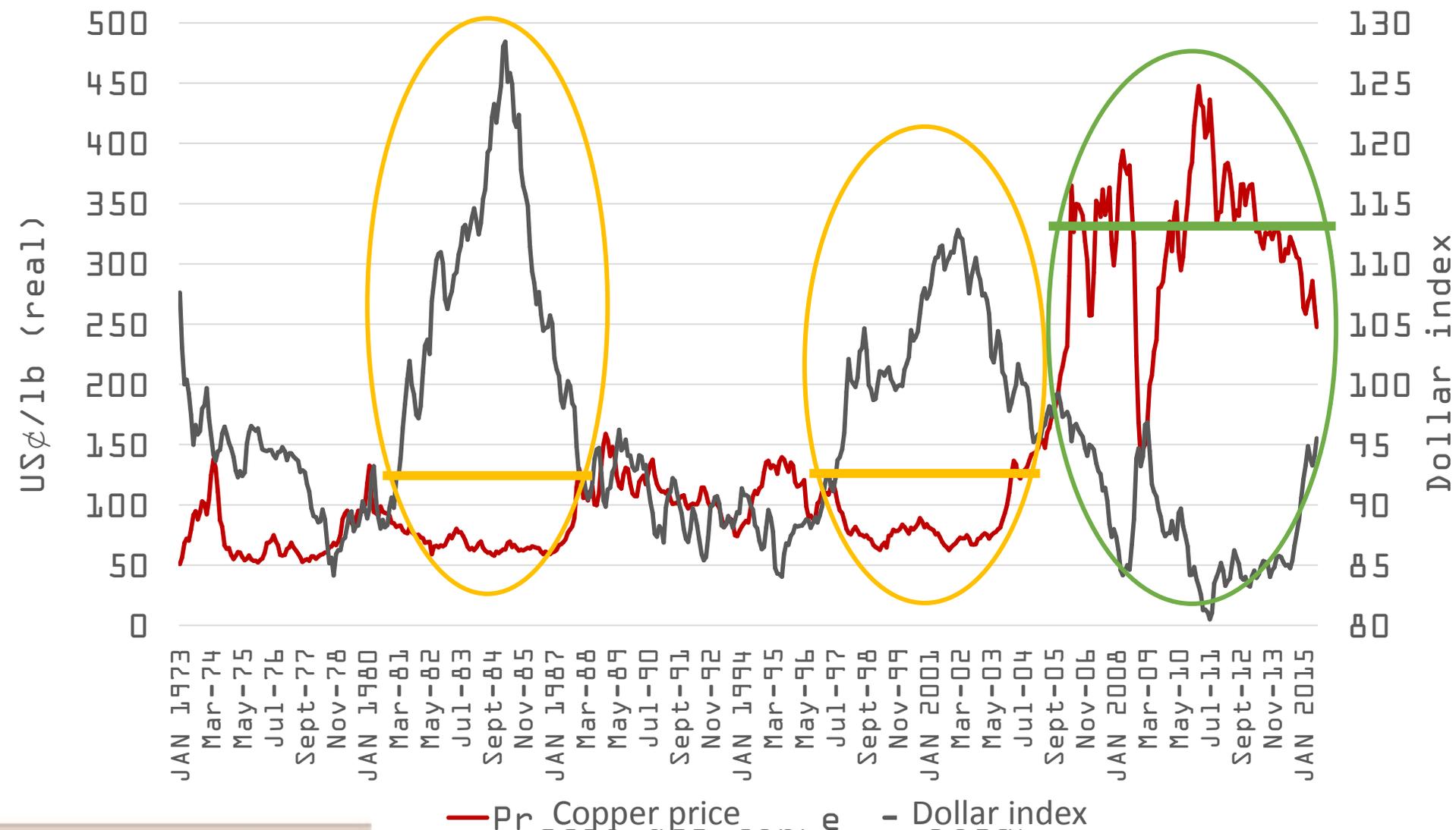
- China
- The dollar
- The oil price

III. Supply side

- Market cap
- Debts
- Cost and production cuts
- New supply
- Preference for copper

Relationship between the US dollar and the copper price

Dollar index and copper Price, 1973-2016

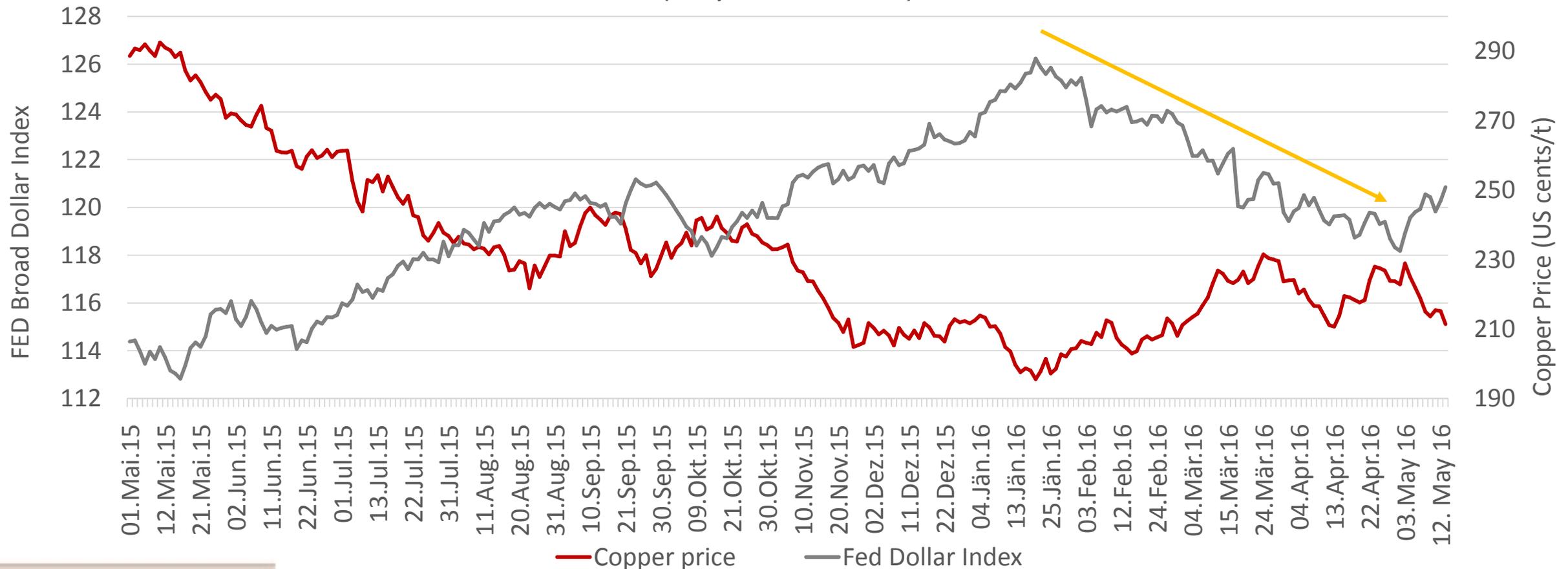


The dollar's performance

- The turning point of the last bear market occurred in 2011
- The dollar bull market accelerated around mid-2014 and seems to be coming to an end nowadays
- A dollar bear market still not to be expected, rather stabilization over the next two years

Dollar index vs. copper price

(May 2015 to date)



PLUSmining

Content

I. Introduction

II. Demand side

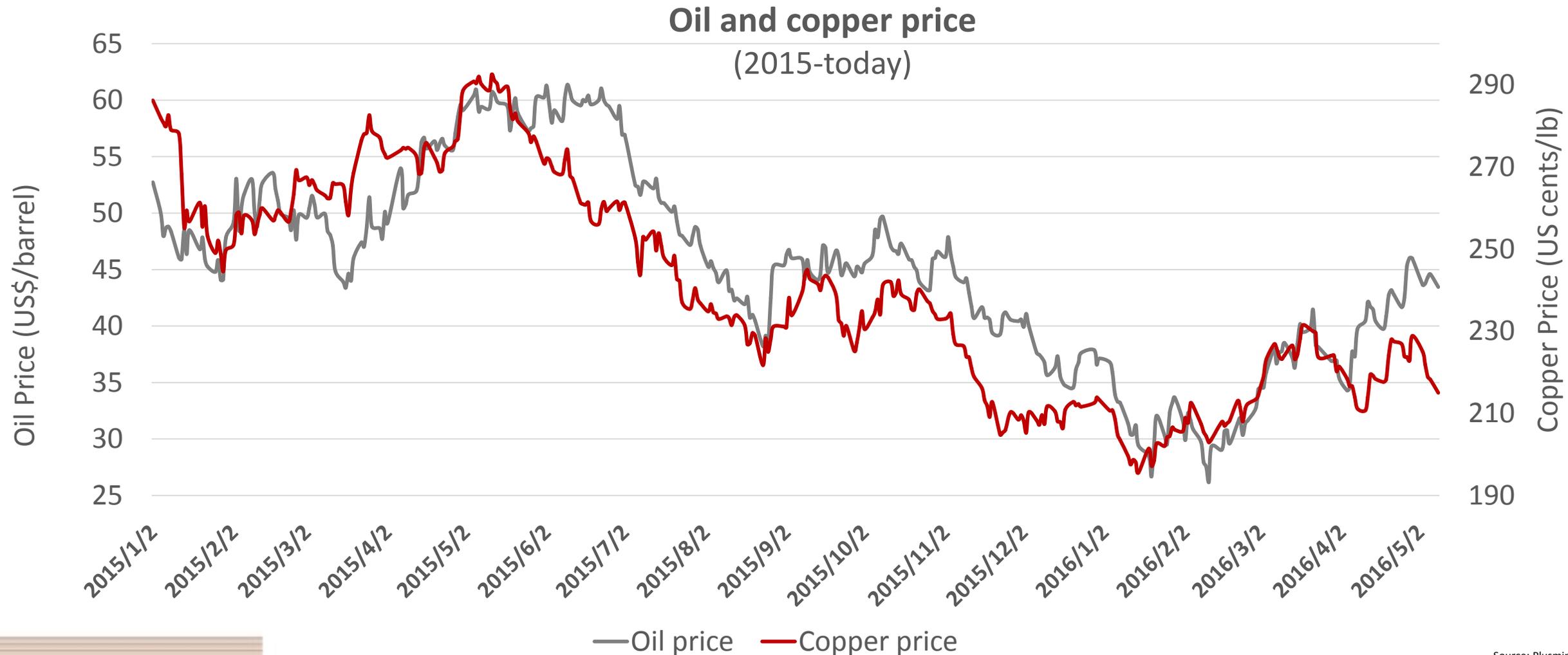
- China
- The dollar
- The oil price

III. Supply side

- Market cap
- Debts
- Cost and production cuts
- New supply
- Preference for copper

Relationship between the oil and the copper price

- Oil price were plummeting because of record production
- Oil price usually drags other commodity prices along



PLUSmining

Content

I. Introduction

II. Demand side

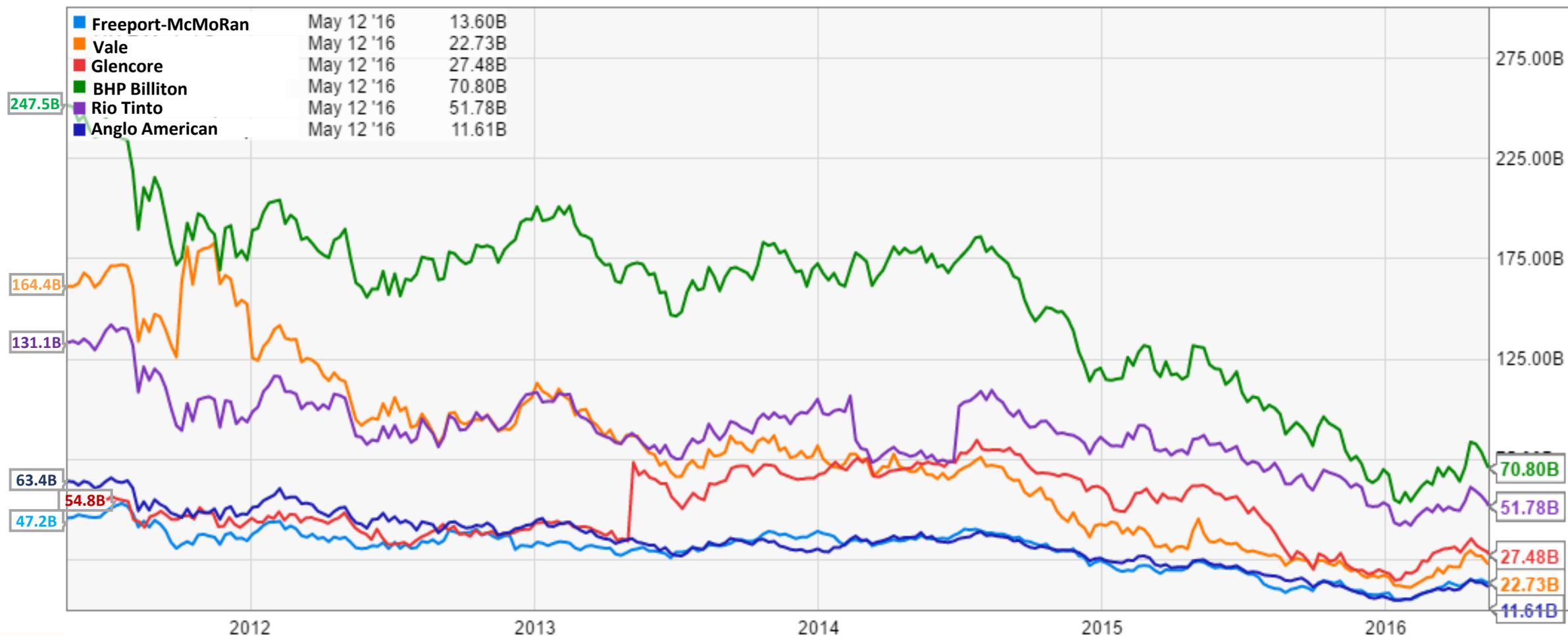
- China
- The dollar
- The oil price

III. Supply side

- Market cap
- Debts
- Cost and production cuts
- New supply
- Preference for copper

Mining companies' market value has been affected

- Since the peak of the boom in 2011, major mining companies have lost up to 86% (Vale) of their market value



PLUSmining

Content

I. Introduction

II. Demand side

- China
- The dollar
- The oil price

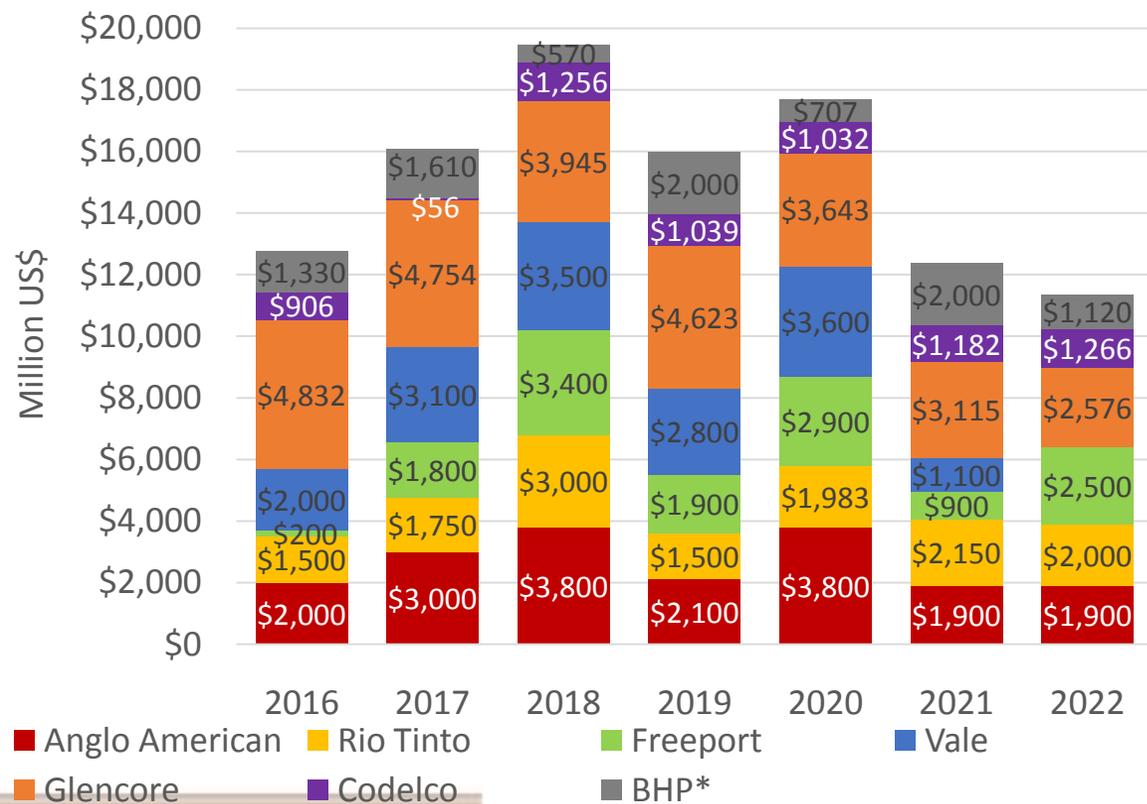
III. Supply side

- Market cap
- Debts
- Cost and production cuts
- New supply
- Preference for copper

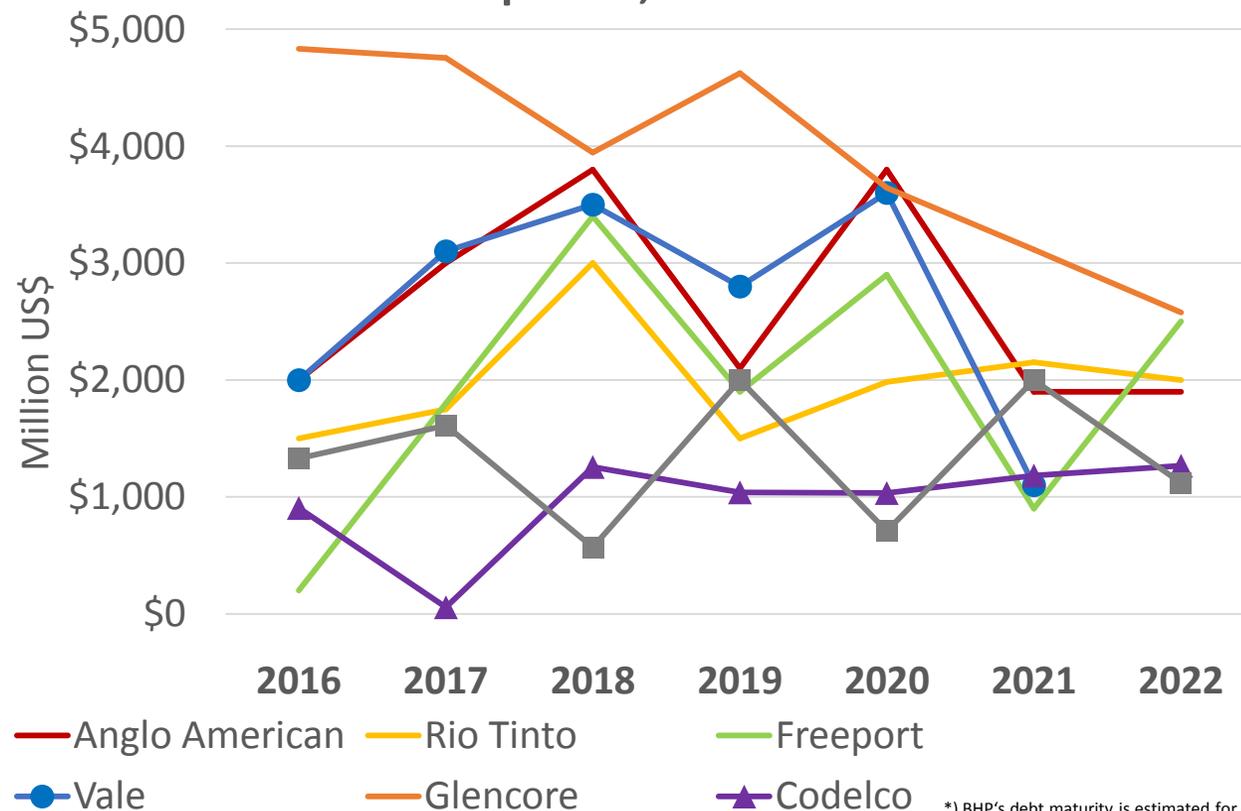
Will we see a wave of defaults in the mining industry?

- Debt maturity peaks in 2018 for most major mining companies (except Glencore and BHP)
- In case prices do not recover within the next 2-3 years, some mining companies may be under pressure in 2018

Debt Maturity Profile of major mining companies, accumulated



Debt Maturity Profile of major mining companies, individual



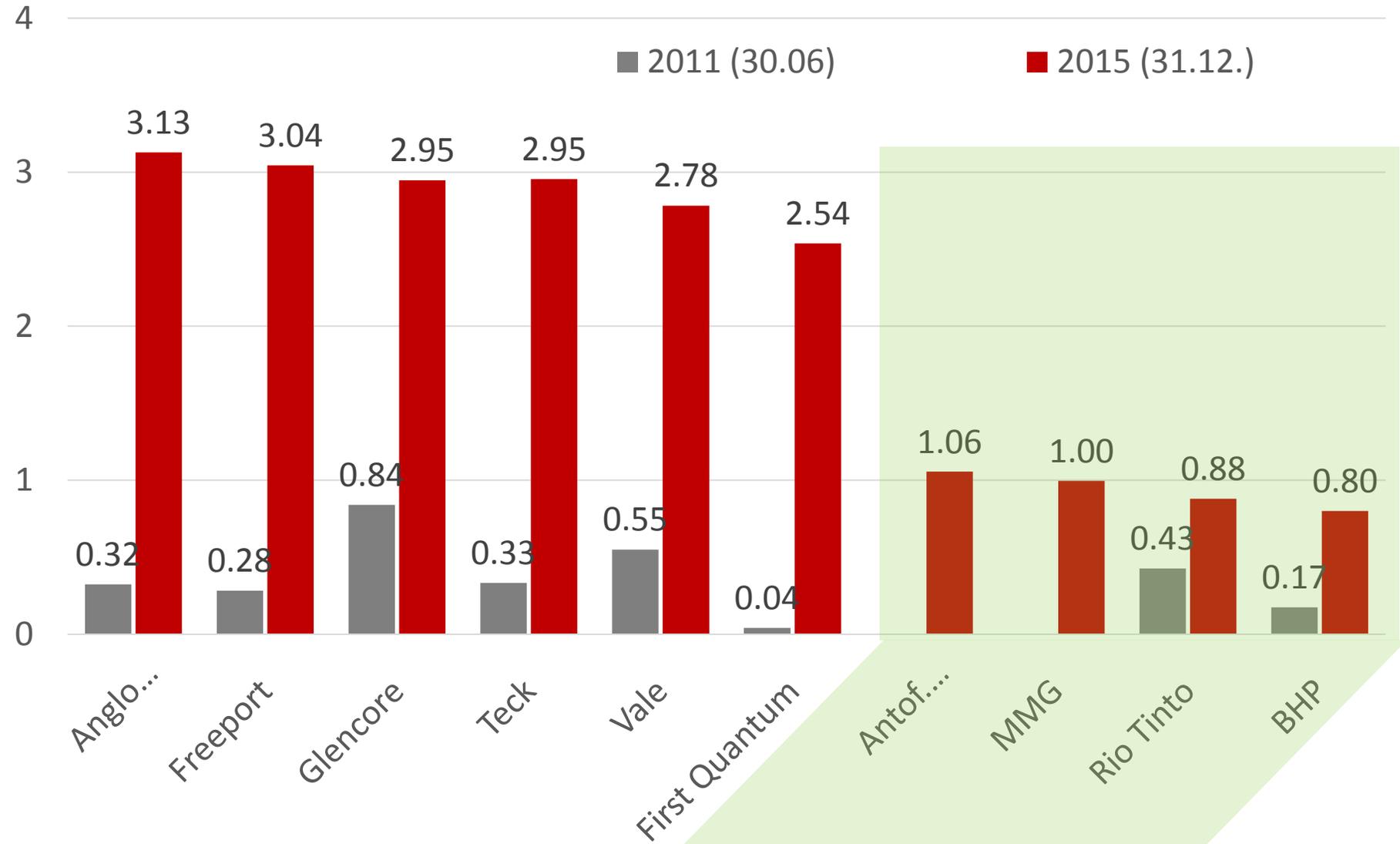
*) BHP's debt maturity is estimated for each year. There are no data for Vale for the year 2022.

Source: Plusmining based on information from the respective companies

Debt in the mining industry

Debt- Market cap ratio of major mining companies

- Large investments during boom generated some cases of highly indebted companies
- Major mining companies divided into two groups



PLUSmining

Content

I. Introduction

II. Demand side

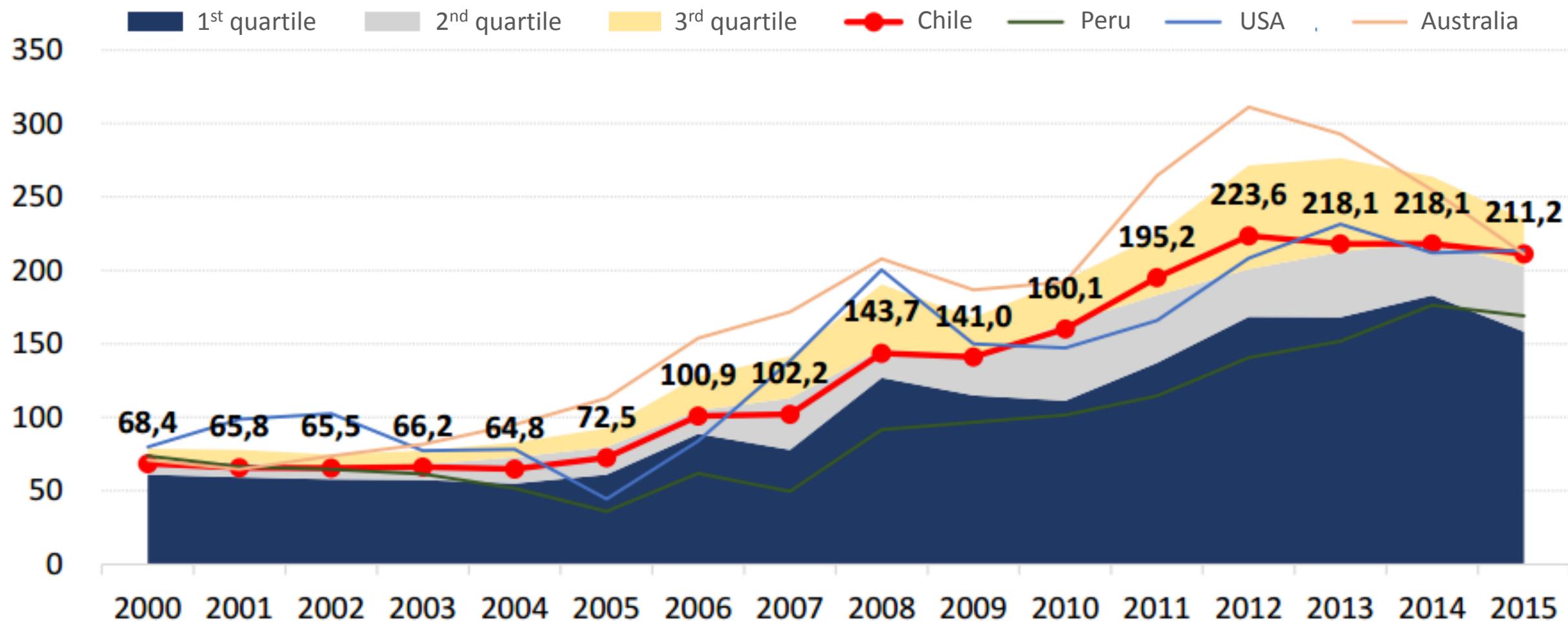
- China
- The dollar
- The oil price

III. Supply side

- Market cap
- Debts
- Cost and production cuts
- New supply
- Preference for copper

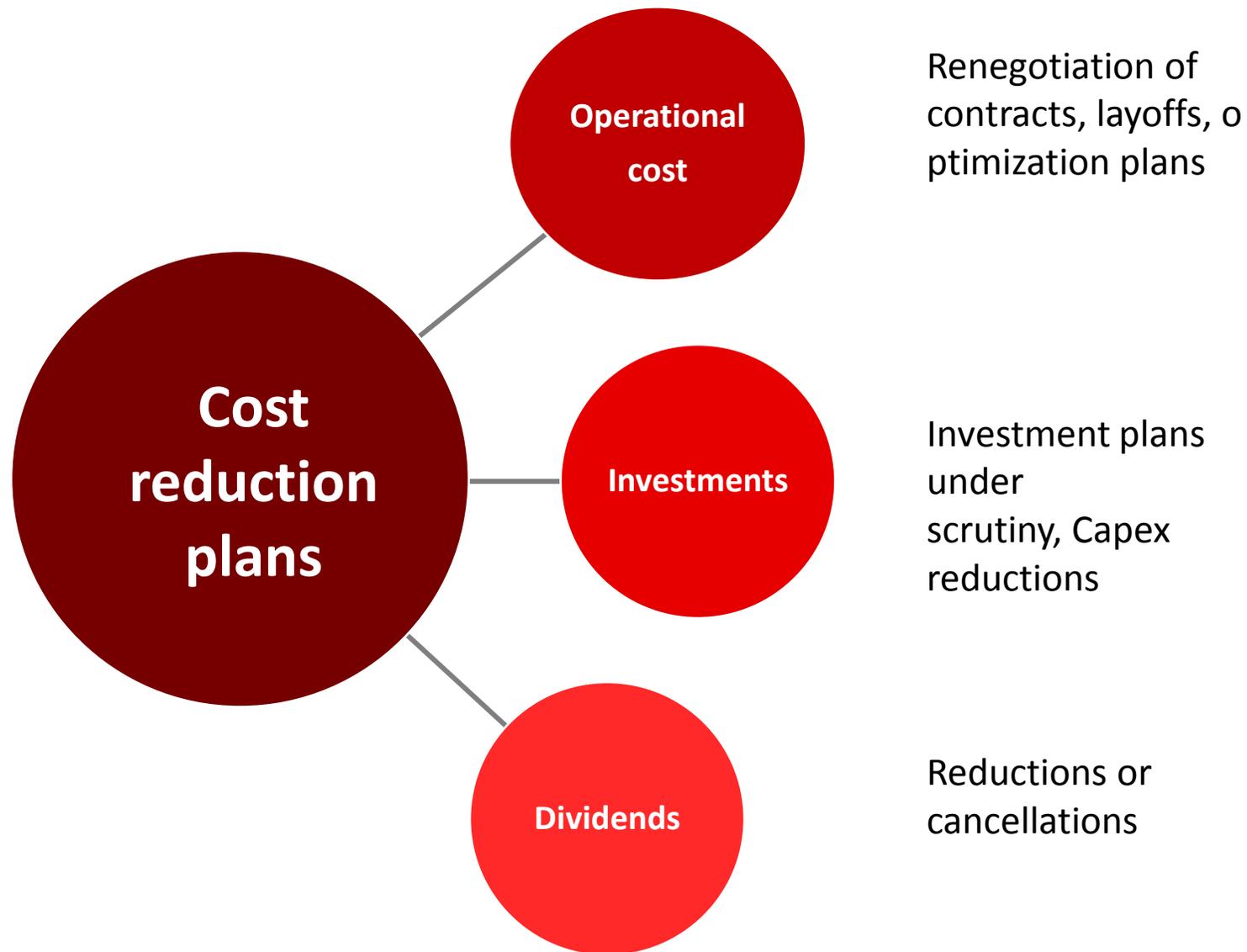
Cost evolution in copper mining

- Cash cost rose sharply during the last boom
- First effects of cost reductions to be seen



Measurements to preserve cash

- So far, measurements to preserve cash in the copper industry mainly consist in cost reduction plans
- Low oil price and strong dollar helped

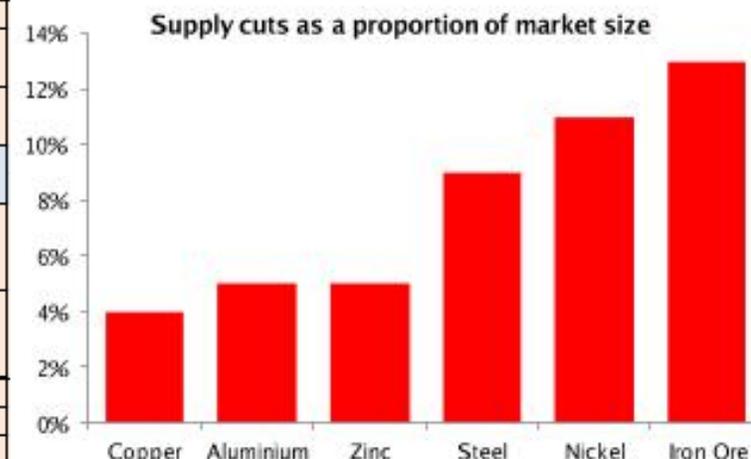


Measurements to preserve cash [cont.]

Copper production cut backs as of February 2016

Country	Mine	Operator	Process	Prod. (kt Cu)		Announce date	Action	Duration (company reports)
				2014	2015			
Australia	Mt Leyll	Vedanta	Concs	0	0	Nov-15	deferred decision to restart mine due to low copper prices (on C&M since Jan 2014)	NA
Botswana	Mowana	African Copper	Concs	10	5	Mar-15	C&M and in Nov liquidation	NA
Botswana	Boseto	Discovery Metals	Concs	22	3	1Q15	C&M	Cupric bought assets to develop new mine by 2018
Canada	Huckleberry	Imperial Metals	Concs	16	20	Jan-16	to suspend operations when milling of stockpile ends Aug 2016	Until improvement in the copper price
Canada	Minto	Capstone Mining	Concs	18	16	Jan-16	Underground mining will be paused in Q1 2016. Surface mining ends Aug 2016 and ore process continues till mid 2017	Depends on a number of factors, most notably the Copper market
Canada	Wolverine	Yukon Zinc	Concs	5	0	Jan-15	C&M	NA
Chile	El Abra	Freeport/ Codelco	SX-EW	166	147	end Aug 15	50% reduction of mining and stacking rates	Additional adjustments may be made as market conditions warrant
Chile	Collahuasi	Anglo American/ Glencore	SX-EW	25	22	end Sep 15	Cut in SX-EW production only (not concs.)	NA
Congo	Kamoto	Glencore	SX-EW	158	114	Sep-15	suspension of operations	18 month
Mexico	Aranzaru	Aura Minerals	Concs	7	1	Jan-15	C&M	remains on C&M in 2016
Namibia	Otjihase / Matchless	Weatherly	Concs	5	3	Sep-15	closure	To be reviewed when market conditions improve
Spain	Aguablanca	Lundin Mining	Concs	7	6	Oct-15	C&M	Until permits received and improved market conditions
USA	Miami	Freeport	SX-EW	26	20	end Aug 15	suspension of mining operations	Additional adjustments may be made as market conditions warrant
USA	Tyrone	Freeport	SX-EW	43	38	end Aug 15	50% reduction in mining rates	Additional adjustments may be made as market conditions warrant
USA	Ray	Asarco	Concs/ SX-EW	63/28		end Aug 15	40% cut in output (indefinite shutdown of concentrator/ reduction in stripping for leach) Prod reduced by approx. 30kt Cu	Adjustments may be made as market conditions warrant.
USA	Siemita	Freeport	Concs	88	86	Dec-15	50% reduction in operating rates announced in Sep 15. In Dec announced planned full shut-down	Planned shutdown
USA	Troy	Hecla Mining	Concs	2		Feb-15	C&M	NA
Zambia	Mopani	Glencore	Concs	110	92	Sep-15	suspension of operations	18 month
Zambia	Baluba	CNMC	Concs	17	10	Sep-15	C&M	NA
				Total	726	583	-143	excludes Ray as no data available yet for 2015
				Concs	308	242	-66	excludes Ray as no data available yet for 2015

- Copper production cuts so far only represent 4% of market size
- Reason: Very costly to shut down mines
- Hence preference for cost reductions



PLUSmining

Content

I. Introduction

II. Demand side

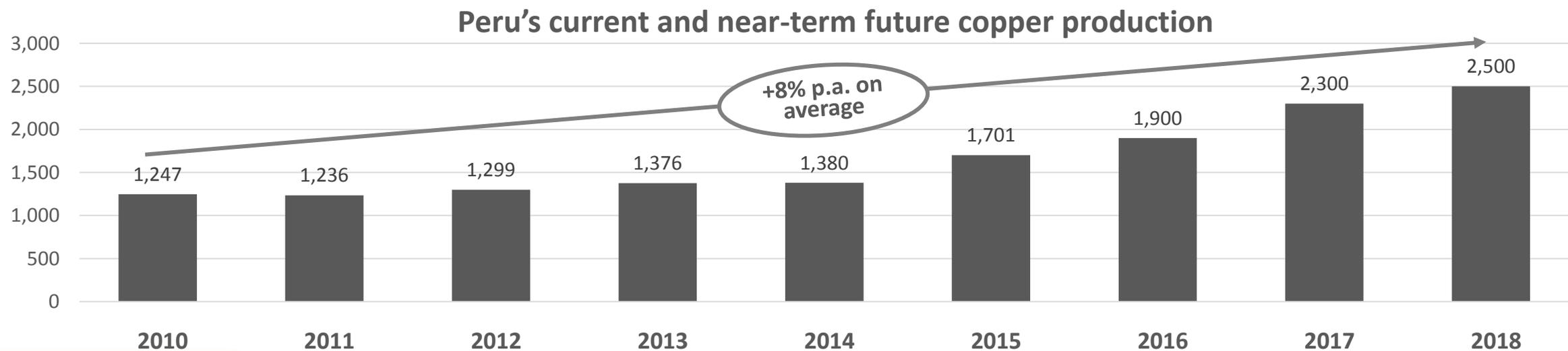
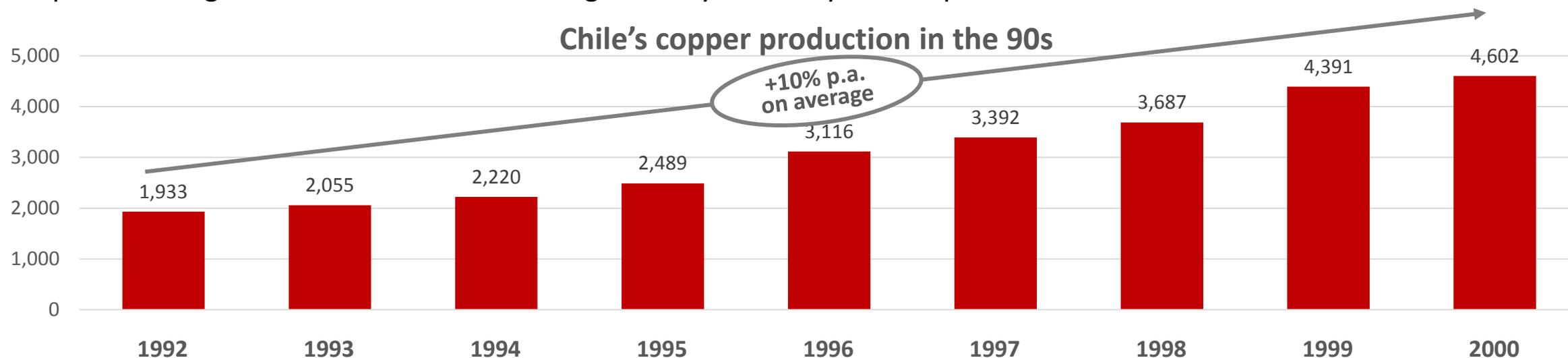
- China
- The dollar
- The oil price

III. Supply side

- Market cap
- Debts
- Cost and production cuts
- **New supply**
- Preference for copper

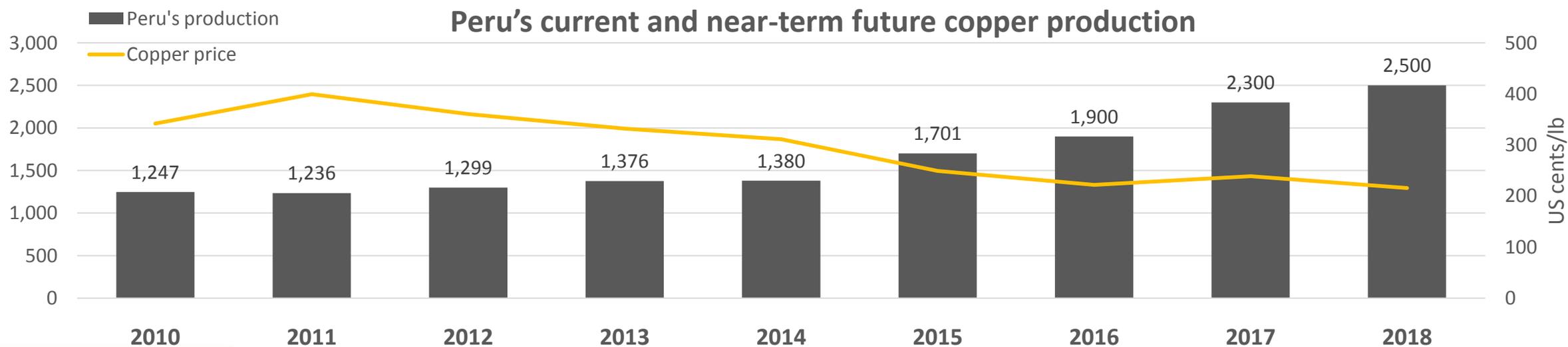
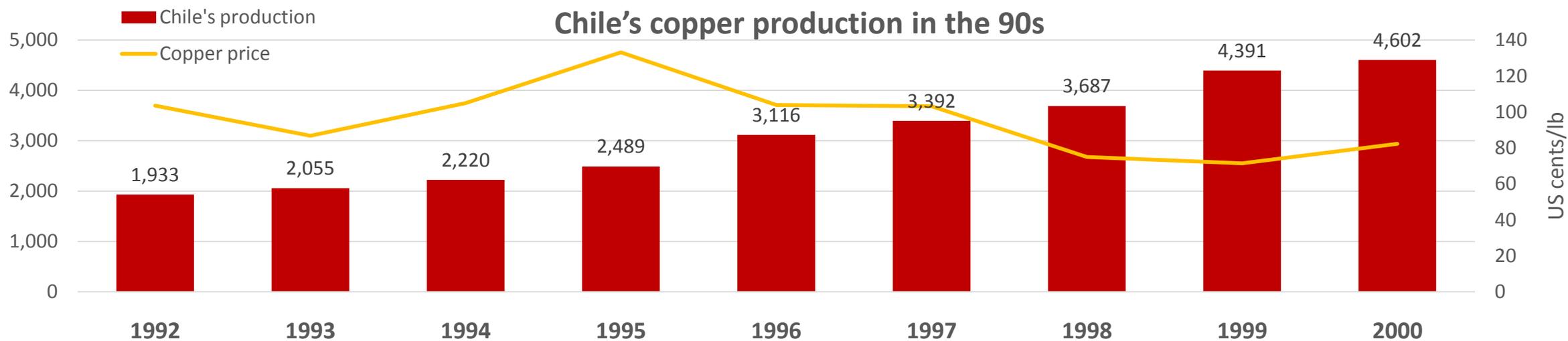
Peru's copper production is increasing rapidly

- The production growth in the Peruvian mining industry nowadays is comparable to that of Chile in the 90s



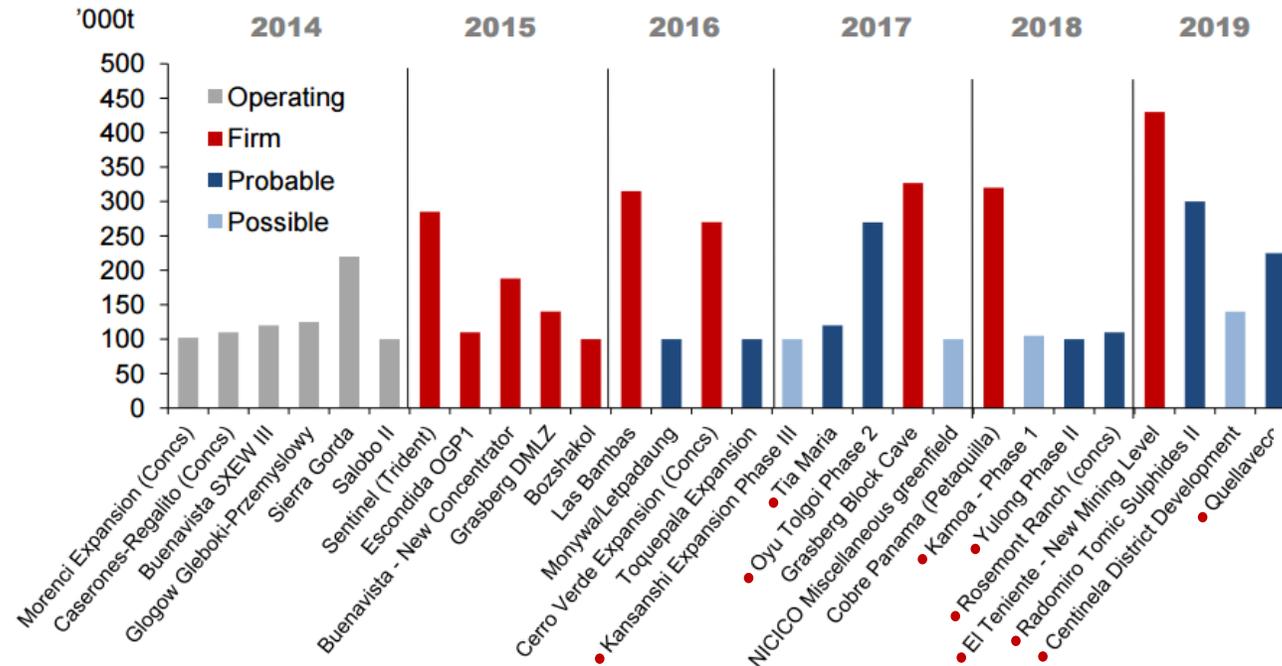
Peru's copper production is increasing rapidly [cont.]

- Such sharp increases by major producers may momentarily influence the global copper price



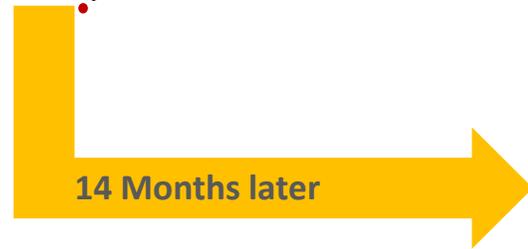
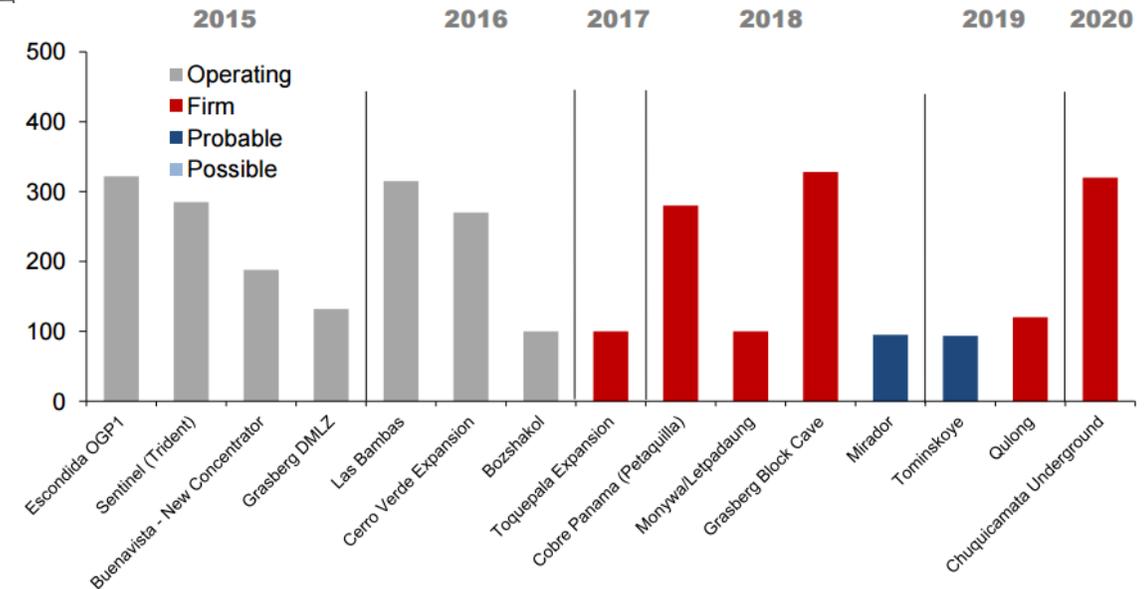
Greenfield, Brownfield and expansion projects in copper mining

Projects initiating operations: Status January 2015
(Projects with planned capacity >100kt/y)



- Many difficulties with new projects
- Investment programs revisions led to the delay or cancellation of many projects

Projects initiating operations: Status March 2016
(Projects with planned capacity >100kt/y)



Copper projects in Chile

Net changes of the portfolio of projects

(Projects within the next 10 years)

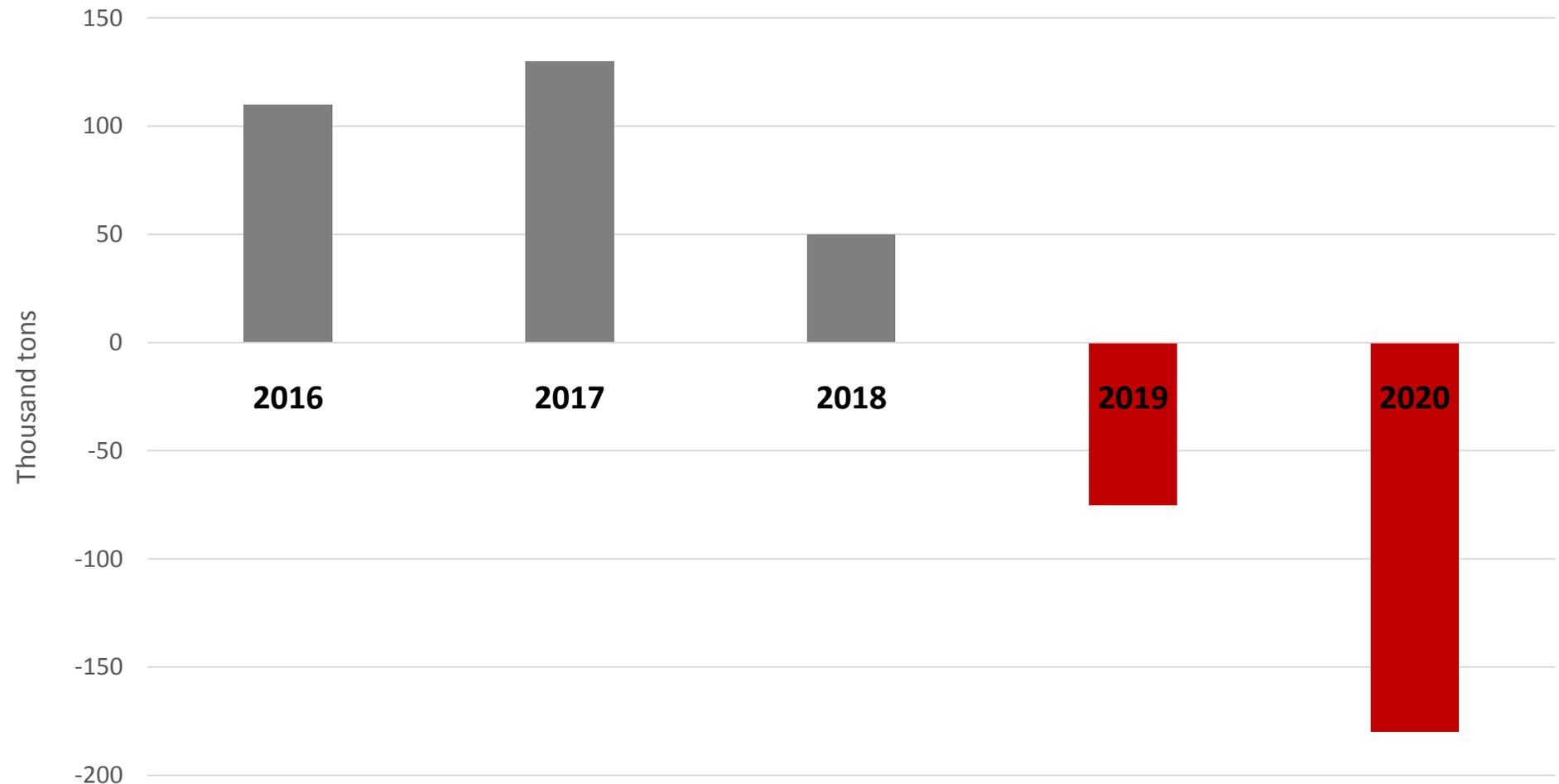
	2013-2014	2014-2015	2015 – 1Q16
Number of projects	+4 projects	-11 projects	-7 projects
Investment	-US\$7,705 million	-US\$27,561 million	-US\$20,341 million

The number of copper projects was reduced from 31 to only 23. Apart from copper projects, there are currently 7 gold projects (+1 since 2015) and 5 iron ore projects in the Chilean project portfolio.

Copper supply and demand - outlook

- Deficit to be expected from 2019 onwards
- Together with other influencing factors such as USD cycle, will have a positive (upward) impact on price

Copper market balance forecast
(Supply – demand)



PLUSmining

Content

I. Introduction

II. Demand side

- China
- The dollar
- The oil price

III. Supply side

- Market cap
- Debts
- Cost and production cuts
- New supply
- Preference for copper

Major mining companies' preference for copper

- Mining companies giving up diversification strategies
- Many decided to focus or to prioritize on copper
- Confirms the advantageous market situation to be expected for copper producers in the medium and long term
- Economy driven more and more by energy and less by fossil fuels

Anglo American

- Drastic simplification: Platinum, copper and diamonds

Freeport McMoRan

- Clear focus on copper in new strategic plan

Rio Tinto

- Elected former chief executive of copper unit, Jean-Sebasti n Jacques, as new CEO
- Developing greenfield and brownfield copper project amongst strategic goals

BHP Billiton

- Preference for copper and oil in their potential hunt for assets

South32

- Mentioned copper as possible growth opportunity



PLUSmining

Copper Market and Industry Outlook

Juan Carlos Guajardo B.
Executive Director

25 May 2016

13th Shanghai Derivatives Market Forum

Nonferrous Metals Subforum

Shanghai Futures Exchange (SHFE)