

## Copper North Mining Corp – Copper News – Oct 30, 2017

We are sourcing additional information as to supply and demand that may interest our investors. The information is taken from newsletter and other industry databases. Investors should not rely on the information provided in this Copper News; rather, they should seek advice from investment advisors.

### 20 Year Copper (1998 -2016)

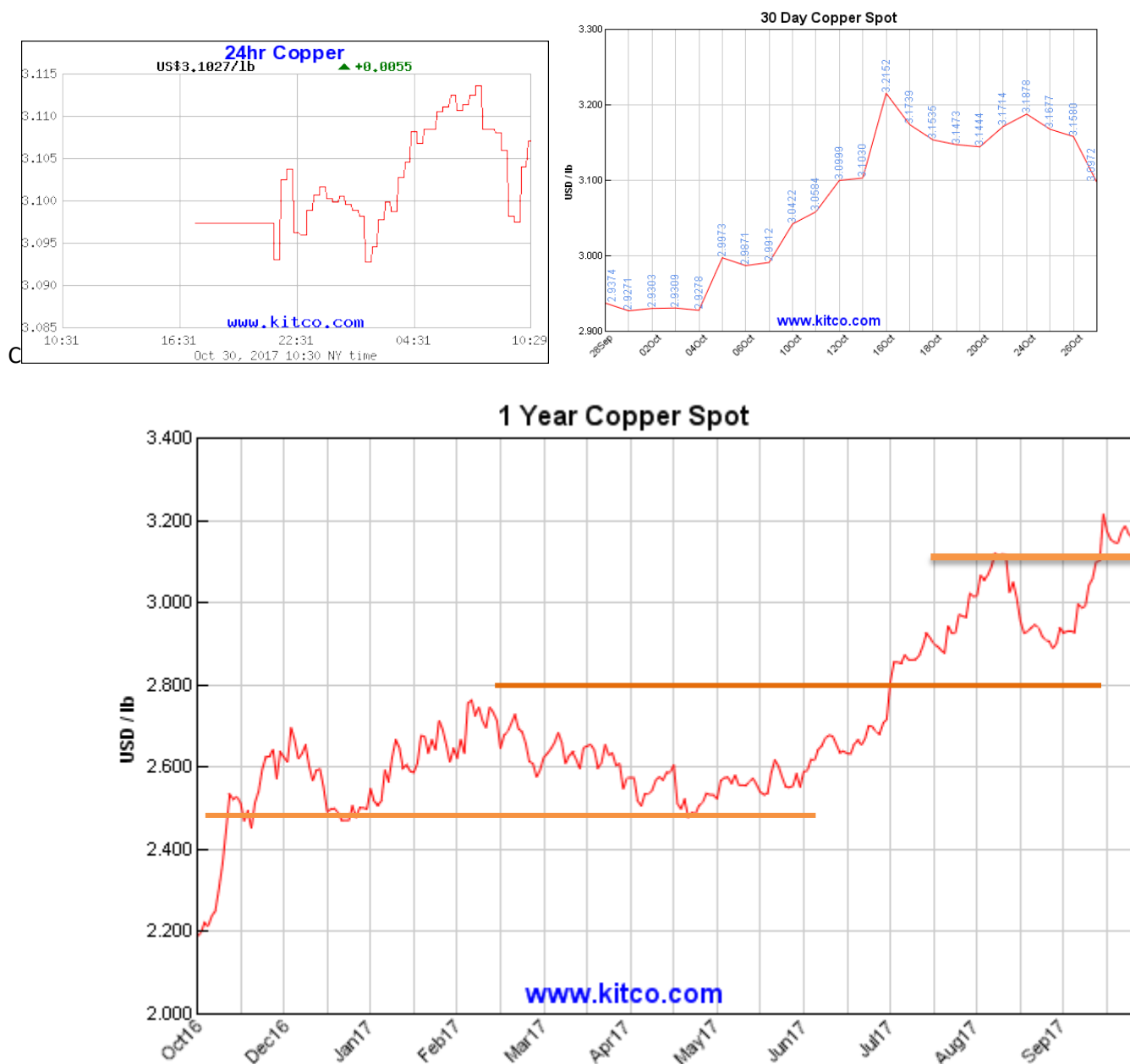


### New Copper Market 2017 – Copper Breaks Out Q4, 2016 and again at July 2017.

Copper breaks 5 year decline trend, recently breaking US\$2.30 and run up to US\$2.76 December Feb 13, 2017; now trading at US\$3.00/lb to 3.20/lb range.

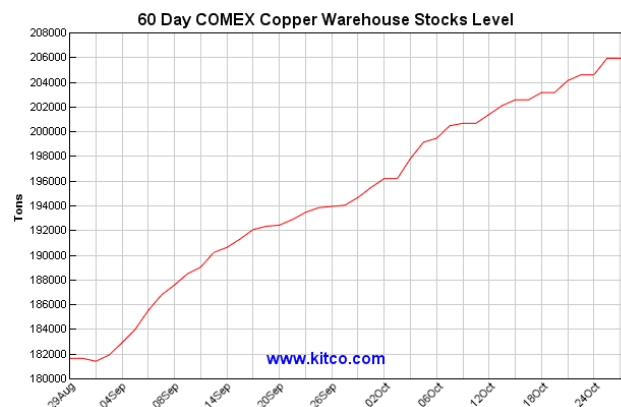
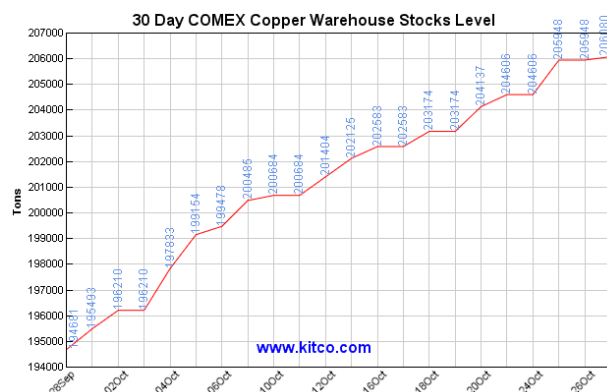
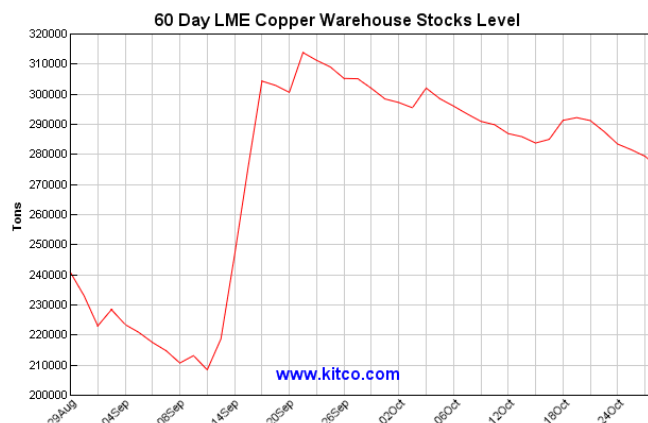
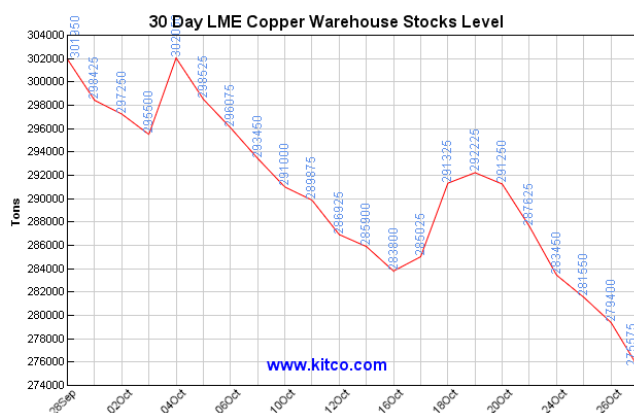
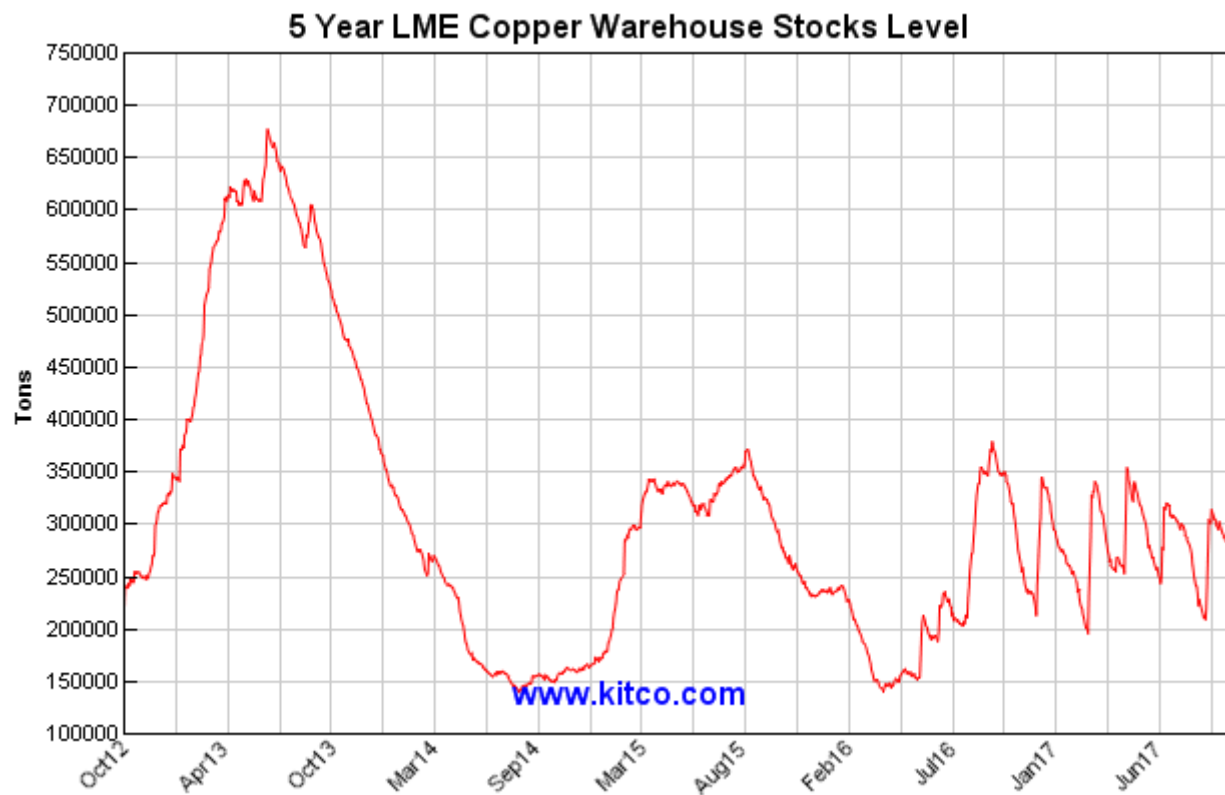


## Daily Spot, Six Month and One Year Copper Price and LME and COMEX Copper Inventories



### Copper Inventory Adjustments ( Note: table does not include private stocks of smelters, governments, etc.)

LME copper inventories decline from 380,000 tonnes August 2015 peak, to March 2016 low of approximately 145,000 tonnes, a five-year low . In fall 2016, LME inventories ran up to 380,000t in late Sept, it then fell to 159,000 tonnes to 212,000 tonnes Dec 11, 2016, subsequently rebounding and moved lower to 199,000 tonnes as of March 5<sup>th</sup>, 2017. Recently, LME inventory spiked to 354,650 tonnes, and is again in decline over several months only to spike approximately 60,000 tonnes and declined to current 213,175 tonnes; in late September, LME warehouses raised to 309,050 tonnes and subsequently decreased to 272,625 tonnes.



After LME runup LME and decline to down to 259,725 tonnes in April until the run up of 94,925 tonnes to 354,650 LME tonnes in early May 2017 before a further decline. The past weeks LME declined to 213,175

tonnes followed by rapid upward to 309,050 tonnes; Shanghai inventories increased in early October, and NYMEX continues slow rise to 206,080 tonnes.

### Weekly Inventories LME, Shanghai and NYMEX Warehouses.

Week Of	LME (65%)	Shanghai (23%)	NYMEX (11.5%)
Oct 23, 2017	-15,000tonnes	-4,775 tonnes	+1,544 tonnes
Oct 16, 2017	+3,825	+8,325	+2,216
Oct 9, 2017	-9,650	+1,191	+ 1,987
Oct 1, 2017	-3,800		+3,980
Sept 25, 2017	-11,800	-38,176	+1,876
Sept 18, 2017	+4,700	-25,429	+1966
Sept 11, 2017	+91,175	-6,100	+ 3,371
Sept 5, 2017	-10,325	-10,735	+4,238
August 28, 2017	-17,325	-3,863	+2,296
August 21, 2017	-30,525	-16,646	+721
August 14, 2017	-12,425	-3,687t	+3,032
August 7,2017	-14,550	+17,062	+2,641
July 31, 2017	-2,350	+11,932	+2,139
July 24, 2017	-6,050	+6,009	+2,034
July 17, 2017	-6,675	-8,858	+2,810
July 10, 2017	-1,775	-1,172	+ 2,139

*Production cut-backs, decline of mine head grades, reduced treatment and refining charges, and falling inventories, all suggest copper supply shortfalls in the making? Volatility largely reflects exchange rate fluctuation, hedge positions, and country supply risk.*

### HM Visagie Daily Notes

#### Oct 30, 2017

- In addition, Shanghai bonded zone reported lower Cu stocks last week. As of Oct2717, Cu stocks totaled 476,000 t--down 13,000 t on a weekly basis, SMM statistics showed.
- China's plan to upgrade its industrial sector with "smart" factories, green manufacturing and transport is expected to increase annual Cu demand by 232,000 t by 2025. The International Cu Association (ICA) found that the more efficient technologies require a larger amount of Cu in end-user products. Cu/km use in Chinese railways is likely to increase from the current 5.1 t to 6 t by 2025. Total Cu demand in China will be about 15 M t in 2025, consultancy Wood Mackenzie estimates.
- Codelco has offered European customers 2018 cathode supply at a premium of \$88/t over LME prices, up from a 7-year low of \$82/t in 2017. Codelco declined to comment when contacted by telephone. Codelco's offer is above that of European custom smelter Aurubis for the first time in 3 years.
- Europe's biggest Cu smelter, Aurubis, has 1.2 B euros (\$2.1 B) in its war chest to grow through acquisitions, its chief executive Jürgen Schachler told Reuters, boosted by low debt and improvements in internal processes. Aurubis outlined its new strategy, called Vision 2025 in Mar17, saying it planned to expand its output of other non-ferrous metals while also expanding its geographical footprint.
- At the 2017 SMM Nonferrous Metals Industry Meeting, an analyst from SMM said Cu price will rise in 2018 due mainly to shrinking supply. The average LME Cu price will range between USD 6,800-6,900/t, and SHFE Cu prices should average RMB 53,000/t.

#### **Oct 27, 2017**

- Cu processing fees are likely to edge down in 2018 to a 5-year low in the face of limited supply growth and expanding smelting capacity in China, industry sources indicated to Reuters ahead of annual talks that begin in London next week. Four mining and trader sources told Reuters they expected term 2018 treatment charges to come in around \$85-86/t and refining charges at 8.5-8.6 cents/lb, given plant capacity growth in China and a lack of major new mine supply.

#### **Oct 25, 2017**

- Chile will likely churn out 5.9 M t of Cu in 2018--up 7% from this year's estimated 5.5 M t Cu output that was curbed by a strike at the world's biggest Cu mine, a mining association said on Tuesday. But the National Mining Society (Sonami) warned that some 30 pending negotiations over expiring workers' contracts could change its 2018 forecast if fresh strikes hit the sector.
- The ICSG estimates the Cu market should see a deficit of 151,000 t in 2017 and a deficit of 104,000 t in 2018.
- **Antofagasta (ANTO.L)**, for Q317, reported an increase in quarterly production on a better performance at its Los Pelambres mine and said cash costs for the year will be lower than previous estimates. Highlights include:
  - Cu output in Q317 rose 3.3% to 180,000 t compared with Q217 while net cash costs rose 9.3% to \$1.18/lb.
  - Los Pelambres, produced softer ore and slightly better grades which led to higher production.
  - Despite the quarterly increase in net cash costs Antofagasta said the 2017 costs would be below the \$1.30/lb Cu. ANTO expects 2018 production to total between 705-740,000 t Cu. Production and spending estimates for the current year were unchanged.

#### **Oct 24, 2017**

- Goldman Sachs has raised its 12-month Cu price forecast to US\$7,050 /t (\$3.19/lb) from its previous \$5,500/t (\$2.50/lb), with China expected to drive half of the global consumption growth over the next 5 years.

#### **Oct 23, 2017**

- China's State Statistics Bureau released data on Monday, showing:
  - Output of refined Cu reaches 774,000 t in Sep17 rising 6.8% on yearly basis. Refined Cu output from 9M17 reaches 6.608 M t, rising 6.3% on yearly basis.

#### **Oct 20, 2017**

- Traders say on Friday, the largest Cu smelting plant Aurubis offers its customer at \$86 /t for premiums of cathode Cu in 2018, the same price as 2017.

#### **Oct 19, 2017**

- China's electric vehicle (EV) production could touch 1 M units next year and 3 M units by 2020, said Xu Heyi, Chairman of carmaker BAIC Group, on Wednesday, likely exceeding a government-set target.
- Chile State Cu commission Cochilco forecasted on Wednesday an average global Cu price of \$2.95/lb in 2018, a sharp upward revision from its mid-year estimate of \$2.68/lb, due to greater demand in China. For 2017, Cochilco predicted an average Cu price of \$2.77/lb, markedly higher than its previous estimate of \$2.64/lb.

#### **Oct 18, 2017**

- Cu prices slipped on Wednesday due to profit-taking after the recent rally to 3-year highs but expectations of solid demand growth in top consumer China helped support sentiment and limit losses.
- Funds' net long Cu positions on the LME at 61,302 lots, or more than 1.5 M t, has risen about 13% since Oct.0217 and is at its highest level since the middle of Sep17.

#### **Oct 16, 2017**



- China's economy this year has shown signs of stabilizing and growing more strongly, and the momentum may continue in H217, the central bank governor said on Saturday. For Q217, China reported the economy expanded 6.9 % from a year earlier. China will pursue a proactive fiscal policy and a prudent monetary policy and aim to strengthen areas of weakness, deleverage and monitor and prevent risk in shadow banking and the real estate market, among other things, said Zhou, who spoke at a G20 summit meeting in Washington.
- Treatment and refining charges (TC/RCs) for copper concentrates rose in early Oct17 after smelters aggressively bid up processing fees with contract negotiations approaching. The MB Cu concentrates TC/RC index edged up to \$89.5 /dmt, \$0.0895/lb Cu from \$87.5 /dmt, \$0.0875/lb Cu two weeks ago. Smelters in and outside of China are bidding at and above the China Smelters Purchase Team's (CSPT) Q417 buying level of \$95/dmt, \$.095/lb Cu for late Oct17 and nearby shipments.

#### Oct 13, 2017

- China's imported unwrought Cu reached 430,000 t in Sep17, setting record-high since Mar17, rising 26.5% compared with Sep16, rising 10.3% compared with Aug17. The total imports, for 9M17, reached 3.44 M t--dropping 9% compared with 9M16.
- China imported 1.47 M t Cu ore and concentrates in Sep17--the highest since Mar17, when 1.63 M t was imported. Sep17's volumes were 2% higher MOM and 6% higher YOY, according to GAC data.
- Goldman Sachs analysts said the growth of EV could boost demand for base metals, but warned the supply chain may struggle to meet the need for batteries, potentially slowing the expected EV boom. In its base case scenario, the bank said Li production would need to quadruple within 10 years to feed EV demand. The bank said Ni demand could increase by 200,000 -300,000 t by 2025, and Cu by 0.85-1.25 M t, according to its base and bull case scenarios.

#### Oct 12, 2017

- Chile expects a moderate increase in the annual average Cu price through the remainder of 2017, but that would not be enough to push YTD average of \$2.71/lb to above \$3/lb for 2017. The price of Cu has risen dramatically in recent months on strong demand from China, the top consumer of the metal. The sharp increase bodes well for Chile, where depending on prices Cu-related activity can account for up to 15% of GDP.

#### Oct 9, 2017

- **Freeport McMoRan Inc (FCX.N)** shares took a hit Friday following news that the President of Indonesia has pressed the world's second largest copper miner to wrap-up a deal in which FCX gives a majority stake in its Grasberg mine to the country. FCX under a framework deal agreed in Aug17 to divest 51% of the mine. The deal is intended to replace an existing contract with a "special mining permit" and give Jakarta greater control over its mineral resources. But significant differences remain including on how Grasberg, will be valued and on the timing and structure of the required divestment, leading some analysts to raise doubts about the future of the agreement.
- The ICSG estimated the global refined Cu market recorded a deficit of 70,000 t in Jun17, pushing the supply/demand balance to a deficit of 75,500 t in H117. In H116, the refined market recorded a deficit of 405,000 t Cu.
- The DRC ordered Sinohydro Corp. and China Railway Construction Corp.'s local mining venture to stop exporting unprocessed Cu and Co and refine all its metals within the country. Sicominex must ship "only high-value products" as the government looks to "ensure the prompt repayment" of the country's continuing \$6 B minerals-for-infrastructure deal with China. The \$3.2 B mining project operated by Sicominex accounted for about a quarter of Cu-concentrate and 5% of Cu-cathode exports last year from DRC. Sicominex exported 115,000 t of Cu concentrate and 20,000 t of Cu cathodes in H117.

#### Oct 7, 2017

- Plans to reopen one of the world's biggest Cu mines, shut by a civil war on the Pacific Island of Bougainville in 1989, have run into trouble. There is a struggle over who will run the mine between Bougainville Cu Ltd - the previous operator now backed by the Autonomous Bougainville Government and the Papua New Guinea government - and a consortium of Australian investors supported by the head of the landowners who own the mineral rights. The 250,000 people of Bougainville are tentatively scheduled to vote on independence from Papua New Guinea in Jun19.

### Sept 30, 2017

- Cu rose to its highest in more than 2 weeks on Friday and was set to notch up its fifth consecutive quarterly gain on expectations of strong demand from top metals consumer China. The decline in inventories in warehouses monitored by the Shanghai Futures Exchange supported Cu prices. The inventories fell 38,167 t last week, the exchange said on Friday.

### Sept 29, 2017

- Indonesia's mining minister said on Thursday the local unit of **Freeport McMoRan Inc (FCX.N)** could request an extension of a 6-month negotiating period over rights to Grasberg which is due to end next month. FCX and the government announced a framework agreement for a new permit late last month, under which the Phoenix, Arizona-based company agreed to divest a 51% stake in Grasberg, among other terms, and could retain operational control over the mine up to 2041. A new tax regime for the mining giant is still being finalized by the finance ministry, while terms of the divestment were now being handled by the State-Owned Enterprise Ministry, Energy and Mineral Resources Minister Ignasius Jonan said on Thursday.

### Sept 28, 2017

- Months after being handed the mining portfolio Indonesia's minister secured majority local ownership of Grasberg - one of the world's biggest Au and Cu mines - following months of difficult negotiations with U.S. giant **Freeport-McMoRan Inc. (FCX.N)**. The deal showed other multi-nationals in the sector Jakarta intended to wrestle back mine ownership.

### Sept 26, 2017

- **Antofagasta Minerals (ANFO.L)** expects Cu concentrate TC/RCs to fall in the near term. ANFO's CEO said on Monday Cu concentrate TC/RCs will slide due to tightened Cu supply and increased Cu refining capacity in China. Chinese smelting pool is trying to increase TC/RCs.
- A considerable amount of motive batteries will be scrapped in China by the year 2020. The volume of motive batteries to be scrapped will exceed 248,000 t by 2020--20-fold of those in 2016. How to recycle such a large amount of scrapped batteries will become an important problem.
- The year of 2017 looks set to be the "tipping point" for electric vehicles, Arnoud Balhuizen, CCO at BHP, said on Tuesday. The impact will be felt strongly in Cu market, and its supply will fall short of demand as no new big Cu mines have been discovered in the last 20 years. The impact, however, may have been underestimated by the market, Arnoud Balhuizen said, as fully electric cars need 4 times as much Cu as cars powered by combustion engines.
- China imported 254,672 t of Cu cathode in Aug17--up 9.77% on a YOY, according to China Customs. The imports for 8M17 totaled 2,081,683 t--down 18.68% YOY. In Aug17, China exported 31,468 t of Cu cathode--down 45.04% YOY, and the exports for 8M17 were off 35.15% YoY to 217,565 t.

### Sept 22, 2017

- WBMS said on its website global Cu supply deficit expanded noticeably during 7M17. Cu deficit was 197,000 t during 7M17, compared to 101,000 t in 2016.
- Chile's Cu output may jump 20% in the next 10 years, growing from last year's 5.50 M t to 6.60 M t by 2028, Chilean Mining Minister Williams said in an interview on Thursday. Investment at mines increased 32% this year to \$65 B, boding well for the country's mining industry. *Comment: Given Chilean past forecast, we would be surprised to see the target will be met.*

### Sept 21, 2017

- World Bureau of Metal Statistics (WBMS) said on its website global Cu supply deficit expanded noticeably during 7M17. Cu deficit was 197,000 t during 7M17, compared to 101,000 t in 2016.



- China's top Cu smelters have hiked the floor Q417 TC/RCs by as much as 10%--more than most traders had expected, in a sign of growing confidence about supplies ahead of 2018 contract talks. The China Smelters Purchase Team (CSPT) set the minimum level for TC at \$95/t and for RC at \$0.095/lb, at their latest meeting in Shanghai on Thursday, 2 sources close to the team said.

#### Sept 20, 2017

- Rising price, tightening time spreads and plunging warehouse stocks. The Shanghai Futures Exchange Pb contract is showing all the signs of a classic bull market. There is plenty of evidence to suggest that the futures market is accurately reflecting acute stress along the length of the country's physical supply chain.
- China's domestic refined Cu demand is expected to surpass the estimated demand of 2.75 M t in Q317 to 2.8 M t in Q417, as per the forecast by Jiangxi Cu Corp. Major Cu consumers in China is estimated to account for about 30 %, 25 %, 15 % and 13 % respectively by power, construction, home appliance and transport sectors. This is in account with China's national Cu demand estimation of 11.04 M t in 2017 with annual Cu demand growth in the four consumer sectors this year estimated to rise 4.5 %, 0.7 %, 4.6 % and 8 %, data from the producer showed. China's net refined Cu imports during Q417 is estimated at 0.730 M t, which is stable from the Q317 level, with a national refined Cu surplus of 20,000 t in Q417, up from a surplus of 10,000 t in Q317.

#### Sept 19, 2017

- China's top Cu smelters will seek to set a higher floor for TC/RCs for Q417, traders and analysts said, ahead of upcoming talks on 2018 supply contracts with miners. Traders expect the team, which includes Jiangxi Copper Co., Jinchuan Group and Tongling Nonferrous Metals Group, to set its new benchmarks higher than Q317 TC floor of \$86/dmt and RC of \$0.086/lb Cu. A source close to the team put current spot TCs at \$88/dmt.

#### Sept 18, 2017

- Zhou Sheng, International Copper Association (ICA)'s Zhou Sheng, President for China said China's Cu demand was 12.60 M t in 2016, with its share to global demand up from 20% in 2006 to 46% in 2016.
- Zhou Sheng, said, China's new energy vehicle output will reach 2 M by 2020. Each vehicle will have 40-50 kg Cu, and the weight of high-end new energy vehicle will reach almost 100 kg Cu, depending on battery and motor power.
- In 2016, China's power grid investment totaled 540 B yuan, over 60% of total power investment. China will invest 1.7 T yuan in power distribution during 2016-2020, which will further lift Cu demand. Besides, Cu use in power source side will also grow along with development of new energy vehicle market.
- According to the NBS, China's Cu output grew by 0.8% in Aug17. China produced 749,000 t Cu in Aug17.
- International Copper Association (ICA) data showed the construction industry topped the list of Cu downstream consumption markets, accounting for 22% of total Cu consumption. Infrastructure construction, transportation, industry, air conditioner and refrigeration, electronic information and other represent 20%,13%,11%,10%,5% and 19%, respectively, in the total.

#### Sept 11, 2017

- Shanghai bonded zone Cu inventories were 528,000 t as of Sep0817, compared to 524,000 t a week earlier.
- China imported 390,000 t of unwrought Cu and Cu semis in Aug17, flat at Jul17's level. The imports were up 11.4% from 350,000 t Cu in Aug16. China's imports of unwrought Cu and Cu semis totaled 3.01 M t during 8M17, down 12.7% on 8M16, according to China Customs.
- China's imports of Cu ore and concentrate were up slightly in Aug17. In Aug17, China imported 1.44 M t--up 3.1% MoM, and down 0.72% YoY, and the relatively stable import reflected stable ore supply from overseas mines. China's ore imports totaled 11.11 M t in 8M17--up 2.33% on 8M16.
- ICSG estimates the refined Cu balance for 5M17 a surplus of around 15,000 t Cu. Once adjusted for changes in Chinese bonded stocks the indicated surplus is 115,000 t Cu.

#### Sept 8, 2017



- Spot TCs for imported Cu concentrate moved higher this past week, and this attracted smelters to make purchases. Spot TCs were \$80-86/dmt as of Sep0817.
- According to the GAC, China in Aug17 imported 1.44 M dmt of Cu concentrate, up 3.1% MoM and down 0.72% YoY, and the relatively stable import reflected stable ore supply from overseas mines. China's ore imports totaled 11.11 M t from 8M17--up 2.33% on 8M16.

#### Sept 5<sup>th</sup> 2017

- Investments in modern transportation infrastructure are vital to the development of a thriving and sustainable economy in Yukon. These investments create middle class jobs and improve the quality of life for all residents. The Prime Minister, Justin Trudeau, and the Premier of Yukon, Sandy Silver, today announced over \$360 M in combined federal and territorial funding to improve road access in 2 mineral-rich areas: the Dawson Range in central Yukon and the Nahanni Range Road in southeastern Yukon.
- **BHP Billiton's (BHP.ASX)** boss of the Olympic Dam mine, Jacqui McGill said in an E-mail Olympic Dam mine produced Cu cathode for the first time using dump leaching technology. The technology is being assessed at its pilot plant in Adelaide, and is expected to be used at the 450,000 t/y mine in southern Australia to reduce cost.
- Goldman Sachs expects Cu prices to fall in the following 6-12 months, and will experience corrections in the near term. It reckons Cu prices are now 10% above rational price.

#### August 31, 2017

- Indonesia's government left no doubts as to who it believes got the better deal in its landmark agreement with **Freeport McMoRan Inc (FCX.N)** on the future of the Grasberg Cu mine. After FCX agreed to divest a 51% stake in Grasberg, the world's second-biggest Cu mine, Indonesia's Energy and Finance Ministries posted on social media "Freeport is obedient, Indonesia is a sovereign state". *Comment: We question investing in large projects in Indonesia given the government's effective nationalization of successful projects.*
- **Zambian electricity utility Copperbelt Energy Corporation (CEC) and Glencore's Mopani Copper Mines** have reached an agreement to restore full power supply to the mine from Wednesday, the president's office said on Wednesday. Details of the agreement, which was facilitated by the government, will be finalized over a 6-week period, presidential spokesman Amos Chanda said in a statement.

#### August 30, 2017 Declined major mine output in 2017.

- Cu ore output at world's top 10 Cu mining firms fell by 11.7% during H117 on a yearly basis, according to H117 financial reports. Output at those producers dropped by more than 10% in Q117 due to strikes, and their production recovered gradually in Q217 with the end of strikes, with the yoy output loss narrowing to 8.3%. According to the reports, only 2 of the 10 firms reported output growth on a yearly basis during Q117.
- The chairman of Codelco said on Tuesday that he is cautious about a recent rally in Cu prices, even as he is more optimistic in the medium- and long-term. "I'm a little skeptical...in the short-term," Oscar Landerretche said at a mining conference in Chilean capital Santiago. "It's true that all of the fundamentals are good in the medium- and long-term...but I would be very cautious."

#### August 28, 2017

- China's TCs for imported Cu concentrate stabilized this past week, and was offered at \$79-85 /t on Aug2517, SMM data showed. Market participants saw sluggish transaction in imported Cu concentrate market. Offers for spot clean ore were closed to \$80 /t, with few trading at \$82-83 /t.
- Two of Chile's 3 main candidates in the Nov17 presidential election proposed broad changes for the mining sector at a forum on Friday hosted by the country's largest business organization. At the event organized by business group Sofafa in downtown Santiago, center-left candidate Alejandro Guillier struck a pro-business tone but said he would consider modifying free trade accords to promote the local smelting industry. *Comment: We believe political uncertainty will slow new mine develop in Chile.*

#### August 25, 2017

- China's TCs for imported Cu concentrate stabilized this past week, and was offered at \$79-85/t on Aug2517, SMM data showed. Market participants saw sluggish transaction in imported Cu concentrate market. Offers for spot clean copper concentrate were close to \$80/t, with few trading at \$82-83/t.
- Cu output in DRC rose 15% yoy in H117 to 553,800 t, and Co production surged 27% to almost 40,000 t, the central bank said. But despite higher commodity production, DRC's central bank forecast year-end inflation at 52.6%--up from an earlier projection of 48% and from last year's figure of 25%.

#### August 24, 2017

- Base metals rose as China's markets stabilized following a day of sharp pullbacks, as well as a recovery in the US dollar during Asian trade. Investors also have their eyes on the Jackson Hole annual meeting of central bankers, as they await fresh cues. After their recent run up to multi-year highs, metals are trading slightly below those peaks. Three-month Cu prices on the LME are up 0.7%, while Zn and Ni rose by 1.1% and 0.3% respectively.
- OZ Minerals Ltd (OZ.ASM) said on Thursday it would begin construction of its Carrapateena Cu mine in Australia, the country's largest undeveloped Cu project, which it estimated would cost \$724 M. Carrapateena, located about 160 kms from the Indian Ocean in South Australia state, would start producing in Q419, and yield an annual average of 65,000 t Cu and 67,000 ozs Au over 20 years.
- Barclays Capital estimates the Cu market is in an implied supply deficit of 156,000 t in 2017, which will ease to a shortfall of 114,000 t in 2018 then swing into a surplus in 2019. Barclays Capital estimates that 2.4 M t of Cu supply is at risk because of labor contract negotiations over the next 12 months. For the remainder of 2017, about 514,000 t Cu production is at risk. The bank estimates 612,000 t Cu of supply disruptions YTD, about 60% of its 2017 forecast.

#### August 22, 2017

- The Chilean government rejected, on Monday, a controversial \$2.5 B Cu and iron project proposed by privately-held Andes Iron, though the Company vowed to appeal. The project plan to produce 12 M t Fe and 150,000 t Cu annually. Chilean environmental protection minister Marcelo Mena indicated that the project would likely have a significant impact on a Humboldt penguin reserve.
- **BHP Billiton (BHP.L)** expects global economic growth to reach 3-3.5% in 2017. US will face uncertainties over economy in a medium term. For a long term, as Cu demand will keep stable increase, global Cu supply shortage will come ahead of schedule.
- Daye Non-Ferrous Metals Group was called to shut down its Tongxing Cu mine in Xinjiang's Hami, which locates at Lop Nur Wild Camel National Nature Reserve in China. Xinjiang requires the Cu mine to suspend mining, exploration, development and research and remove equipment and staff. Tongxing's mining permit in Hami will also be canceled and compensation is under way.

#### August 17, 2017

- **BHP (BHP.L)** has approved capital expenditure of \$2.46 B for the Spence Growth Option (SGO) at the Spence openpit Cu mine, in northern Chile, which will extend the mine life by more than 50 years.
  - The SGO project includes the design, engineering and construction of a conventional large-scale sulphide concentrator for both Cu and Mo with a 95,000 t/d nominal ore throughput capacity.
  - In the first ten years of operation, incremental production from SGO will reach about 185,000 t/y of payable Cu in concentrate and 4,000 t/y of payable molybdenum, with first production expected in F2021. The current Cu cathode stream will continue until the F2025.
  - The SGO project will convert 1.3 B t of M&I Resources to hypogene sulphide ore Reserves.
  - The project has an expected IRR of 16% and an expected payback period of 4.5 years from first production.
  - A new 1,000 t/s desalination plan will have to be built at Mejillones Bay, along with a 154 km water pipeline to the Spence mine. These will be built and operated by an undisclosed third party under a build, own, operate and transfer contract that has been separately awarded, with nominal, undiscounted value of lease payment obligations over the 20-year contract term totaling \$1.43 B.

CEO Andrew Mackenzie said, "Execution of the SGO will create long-term value for shareholders in one of our preferred commodities. The project significantly extends the life of our Spence operation and unlocks the potential of the large, quality resource. SGO has been extensively studied and we have made significant improvements to project cost and design so that it is able to compete in our portfolio of attractive development options."



## August 10, 2017

- Chile's Cu mine production fell 9% yoy in H117, heavily affected by the 44-day strike at Escondida. Output totaled 2.518 M t in Jun17, compared with 2.77 M t in H116, according to preliminary figures from Chile's Cu commission, Cochilco. This is the lowest first-half volume since 2005.

## Electric Vehicles

- The increasing popularity of electric vehicles means demand for Cu is rising, and that spells good news for the nation's Cu miners and investors. Coupled with the demand for Cu for use in new technologies, including renewable energy infrastructure, and the role it plays in pollution reduction, the red metal is looking at a buoyant future. Electric vehicle rotary motors use up to four times the amount of Cu as that in a traditional combustion engine, from around 20 kgs to 80 kgs.
- The production and use of electric cars is projected by global financial services firm Morgan Stanley (MS.N) to rise to 2.9% of 99 M new vehicles in 2020 and to 9.4% of 102 M new vehicles in 2025, from 1.1% of 86.5 M in 2017. By 2050, MS forecasts that 81% of 132 M new auto sales will be electric.
- **Glencore (GLEN.L)** raised its earnings guidance on Thursday and said it expected the increased take-up of electric vehicles and demand for storage to boost demand for its products. GLEN increased its full-year forecast for a profit measure called marketing adjusted EBIT by \$100 M to a range of between \$2.4-2.7 B.
- The rise of electric vehicles is driving **BHP (BHP.L)** to switch gears and invest heavily in its long-suffering Ni business. Eduard Haegel, division chief of BHP Ni West, said the company planned to spend more than \$43 M building a Ni processing plant near Perth, Australia as part of a broader plan to reposition the business around batteries.

## August 8, 2017

- Net bullish bets on Cu prices rose to the highest level ever during the week (end Aug0117) according to CFTC data going back to 2006. Bullish Cu bets by hedge funds and other speculative investors outnumbered bearish bets by 104,268, eclipsing the previous all-time high of 101,139 from late Jan17.
- According to China Customs, China imported 390,000 t of unwrought Cu and Cu semis in July, up 8.3% YoY. The imports fell 15.2% YoY to 2.62 M t in 7M17. China imported Cu concentrates of 1.4 M t in Jul17 down .71%. In 7M17 China imported 9.7 M t of Cu concentrate, up 3.5%.

## August 4, 2017

- Cu inventories in Shanghai bonded zone increased on a weekly basis as of Aug0417 according to SMM. Bonded zone inventories in Shanghai were some 518,000 t on Aug0417, compared to 515,000 t on Jul2817 and compared to 470,000 t on Jan0117.

## China's Nonferrous Metal Production In H117

- NBS statistics showed China's production of nonferrous metals increased in H117. Total output of 10 non-ferrous metals, Cu, Al, Zn, Pb, Sn, Hg, Ni, Sb, Ti and Mg, was recorded at 27.6 M t in H117--up by 7.2% yoy.
- In H117, Cu production totaled 4.36 M t--up by 8.1% yoy. The rise was the result of an upturn in the real estate sector and new producing projects coming on stream.

## July 28, 2017

- Cochilco forecasts average global Cu prices of \$2.64/lb in 2017, a slight upward revision from its previous estimate of \$2.60/lb, due to greater demand in China, a key market. Cochilco predicted 2017 Cu production in Chile of about 5.6 M t--a 0.8% rise from 2016 and roughly in line with its previous forecast in Apr17. In 2018, Cochilco added, Chilean Cu production should rise to 5.9 M t.
- India's major brass and Cu scrap prices climbed further on the Scrap Register Price Index as on Wednesday tracking the firmness in Cu futures prices at India's Multi Commodity Exchange on reports that China could ban imports of scrap metal by the end of next year.

## July 26, 2017

- China may ban imports of some scrap metal, including Cu, from the end of 2018, according to an industry association notice, which may lead to higher refined Cu imports into the world's largest consumer of the metal. The review of Cu scrap imports is part of a broader crackdown by China authorities on imports of foreign waste as it looks to cut pollution from heavy industries to clear its skies. The recycling branch of the China NonFerrous Metals Industry Association said on Tuesday that it had received a notice that at the end of 2018 imports of scrap metal including wire, motors and bulk scrap metal (Category 7) will be prohibited. SMM predicts China to import 1.27 M t of scrap Cu (Cu content) in 2017 based on a 1.2 M t of imports (Cu content) in 2016, including 750,000-900,000 t or 60%-70% of "category 7" scrap metals.

## July 24, 2017

- An estimated 5,000 workers at the giant Grasberg copper mine operated by **Freeport-McMoRan Inc's (FCX.N)** Indonesian unit will extend their strike for a fourth month, a union official said on Friday, in an ongoing dispute over layoffs and employment terms. The strike began in May17 after Freeport laid off some 10% of its workforce to cut costs. FCX said that mining and milling rates at Grasberg were affected by the strike. The escalating labor issue comes as FCX is snarled in a lengthy and costly dispute with Indonesia's government over rights to the Grasberg Cu and Au mine.
- Striking mining workers in Peru agreed to return to work by Monday after the government of President Pedro Pablo Kuczynski promised to name a task force to discuss labor laws with them, the Labor Ministry said on Friday. Unionized miners started the nationwide strike on Wednesday to protest what they described as proposed labor reforms that would make firing easier and workplaces less safe.
- Disruptions to Cu shipments from Canada and Chile have undermined expectations for rising global Cu supplies in H217, cutting the charges that smelters charge miners to process metal. Cu TC/RCs, a closely watched indicator of Cu supply, have turned lower in recent weeks. A drop in TC/RCs signals that smelters have been forced to drop their rates to attract feed, an indication of a scarcity of mine supply.

## July 21, 2017

- Union-represented workers and management at Antofagasta's Zaldivar Cu mine failed to reach a wage deal on Thursday and they agreed to extend government-mediated talks into next week. Last week, the union voted to strike, prompting the mediated talks and a new contract offer. But workers rejected that offer Thursday.

## July 20, 2017

- Mining companies across Peru are waiting to gauge to the impact of an indefinite mining industry strike called for 19 July in protest new labour laws. Peru's National Federation of Mining, Metallurgy and Steel Workers called on workers to stop working at midnight, but so far has not commented on the strength of support it has received. Around 40,000 miners from 110 affiliated unions were expected to take part in the action.
- Chilean authorities have approved a \$2.5 B expansion of BHP Billiton's Spence Cu mine, a local newspaper reported on Wednesday, though the Company has not yet decided whether to go ahead with the project. Chile's Environmental

Evaluation Service (SEA) has unanimously approved the project, which is the second largest mining investment under evaluation in the South American country, the El Mercurio newspaper said.

## July 17, 2017

- China's economy grew 6.9% in Q217 from a year earlier, faster than expected and in line with Q117 growth. China's factory output grew 7.6% in June from a year earlier, while fixed-asset investment expanded 8.6% in H117, both beating forecasts. Its property sector, a key metals user, also showed underlying demand remained resilient to government curbs.



### July 13, 2017

- Citibank expects Cu prices to top \$6,000/t due to supply deficit, and reach \$7,000/t before the end of 2017. Cu prices may even outstrip \$8,000/t by the end of 2020. China's demand will grow 3-4% in H217 due to grid upgrading and vehicle sales. This will drive up Cu prices.
- Goldman Sachs take a bullish outlook for short-term Cu price, which will challenge \$6,200/t, citing robust demand growth. But, supply surplus later will weigh down Cu price to \$5,500/t in 2018 and \$5,300/t in 2019.
- According to China Customs, China imported 2.23 M t of Cu in H117, a drop of 18.4% on a yearly basis. China's imports of unwrought Cu and Cu semis were 390,000 t in Jun17, flat on the month and down 7.14% on a yearly basis. China imported 1.51 M t of Cu scrap during 5M17--up 17.6% on a yearly basis. China's imports of Cu ore and concentrate rose 4.44% on a yearly basis to 1.41 M t in Jun17. Total Cu ore and concentrate imports were 8.28 M t in H117, a rise of 3.6% a yearly basis.

### July 11, 2017

- Indonesia says it will invite the head of **Freeport McMoRan Inc (FCX.T)** to Jakarta this month to try to settle a festering dispute over a new deal to operate the world's second-largest Cu mine. Indonesia says it will invite the head of FCX to Jakarta this month to try to settle a festering dispute over a new deal to operate the world's second-largest Cu mine. The conflict comes as FCX pushes back against parts of new government rules that require miners to adopt a special licence, pay new taxes and royalties, divest a 51% stake in their operations and relinquish arbitration rights.
- Chile's Finance Minister, said the Ministry raised the average Cu price forecast from \$2.20 to \$2.50/lb. Cu prices have slowly begun recovering from multi-year lows, and demand has shown signs of improving, while strikes and political disputes have tightened Cu supply.

### July 10, 2017

- CFTC (Jul0317) data showed hedge funds and money managers have reduced their net long positions in COMEX Au and Ag for the fourth straight week. The speculators raised their net long position in Cu futures and options. In Au the net long positions were cut by 38,956 contracts to 37,776 contracts and for Ag net long positions by 10,573 contracts to 1.854 contracts.
- Workers at the **Antofagasta Minerals (ANTO.L)** operated Zalvidar Cu mine in Chile are preparing to start strike action on Jul2017 unless contract negotiations are resolved, the union said. A vote is being held today and on Monday. ANTO acquired a 50% stake in Zalvidar from **Barrick Gold (ABX.T)** in late 2015. The mine produced 103,400 t Cu in 2016.

### July 7, 2017

- SMM said Cu TCs of spot imported concentrate into China fell slightly this past week as supplies tightened. Spot TCs were quoted at \$80-85/t on Jul0717. Mainstream quotes have been pushed down to \$80-84/t, but Cu smelters held floor price firm at \$85-86/t.
- DRC's government has formally requested financial support from international donors as it confronts a worsening economic crisis. Africa's top Cu producer has been hard hit by low commodity prices in recent years. It has only enough foreign currency reserves to cover about three weeks of imports and its franc currency has lost half its value in the past year. Western donors are reluctant to aid the government of President Joseph Kabila, who refused to step down when his constitutional mandate expired in Dec16. Kabila's government has been accused of widespread human rights abuses – charges it rejects.

### July 4, 2017

- Comex Cu strengthened Friday, as traders were covering short positions to close out June and crude continued to rise. The Comex most active month settled at \$2.711/lb--up from \$2.6955/lb on Thursday and up by 10¢ in the last week.

- Chile's Cu production fell by 1.7% to 469,196t in May17 compared with May16. Cu output in 5M17 was 2.11 M t, down 9.4% compared with May16. In 2016, production was 5.64 M t Cu, down by 3.6%.
- In May17 Chile's Mo concentrate production rose by 24.7% from May16 to 5,733 t. Production in 5M17 was 26,291 t or 10.8% higher 5M16. In 2016 Mo output was 56,596 t--a 7.8% increase over 2015.
- BofA Merrill Lynch revised its base metal forecast for Cu prices by 4.2% to \$5,434 /t (2017), and by 8.8% to \$5,510/t (2018); for Ni prices by 22% to \$9,494/t (2017), and by 22.2% to \$10,500/t (2018).
- US bank Morgan Stanley lowered its Cu outlook price for this year by 1% and left it unchanged for the next 2 years from its prior outlook as the effects of supply disruptions fade and demand weakens. Cu is forecast to average \$5,749/t (\$2.61/lb) this year. Cu is forecast to average \$5,484/t in 2018 and \$5,897/t in 2019, unchanged from the prior forecast.
- The ICSG predicted in Mar17 that the global Cu market would be in a supply deficit of 147,000 t in 2017 and a supply deficit of 169,000 t in 2018, while Morgan Stanley anticipates a deficit of 163,000 t in 2017 and a swing into a surplus of 210,000 t for 2018.

#### **June 23, 2017**

- TCs for imported Cu concentrates dropped marginally in China's market this past week. As of June 23, SMM TC offers for spot Cu were \$80-86/t, but little transaction was heard. It was hard to find offers at \$85/t, which stabilized at around \$83/t, as some traders lowered offers.

#### **June 21, 2017**

- For Q117, the ICSG estimated the global refined Cu market was in a 165,000 t. Global refined Cu production was 5.77 M t and global refined Cu usage was 5.60 M t. The surplus was mainly because of a decline in apparent demand from China. ICSG estimates a surplus of Chinese bonded stocks of around 310,000 t Cu. Global mine production is estimated to have declined by around 3.5%, with concentrate output dropping by around 3% and solvent extraction and electrowinning production falling by 6%.

#### **June 20, 2017**

- According to BMI's Cu outlook report, global Cu mine production, supported by markets and low operating costs, is forecast to increase by an average yearly rate of 4.1% between 2017 and 2021, as many major projects come on line. BMI said, "In terms of volume, we expect global Cu output to climb from 20-M t in 2017 to 23.7-M t by 2021."

#### **June 16, 2017 – China Production Continues Growth In Copper**

- According to the NBS, China's production of Cu rose 6.8 % to 727,000 t in May17, while the output of iron ore increased 3.8 % from a year ago. Base metals and iron ore output in the world's top metals producer showed an annual increase, except for Pb and Zn. May17 output was 727,000 t Cu, +6.8%, 2,830,000 t Al +4.2%, 406,000 t Zn -0.7%, 481,000 t Zn -9.9%, 107,480,000 t Iron Ore +3.8%.

#### **June 15, 2017 - Copper Demand and Electric Cars and Trucks**

- The number of electric vehicles on roads worldwide rose to a record high of 2 M last year, according to the IEA. That represented a doubling from the 2015 tally, but electric cars still only accounted for 0.2% of the global count.

#### **June 13, 2017**

- China's new energy vehicle (NEV) output increased in May, industry association Caam data show. NEV output rose by 38.2% yoy to 52,000 units in May17. Production of pure electric vehicles reached 44,000 units--up by 52.5% from a year earlier. But production of plug-in hybrids fell to 8,000 units, down by 9.3% yoy. NEV sales reached 46,000 units in May--up by 28.4% yoy. Sales of pure electric vehicles rose by 49% yoy to 39,000 units. Sales of plug-in hybrids were 7,000 units--down by 28.3% yoy. Production in 5M17 rose by 11.7% yoy to 147,000 units and sales were up by 7.8% at 136,000 units.
- According to a report commissioned by the International Copper Association, the number of electric vehicles hitting roads is set to fuel a nine-fold increase in Cu demand from the sector over the coming decade. Electric or hybrid cars



and buses are expected to reach 27 M by 2027--up from 3 M this year. The research predicts this increase will raise Cu demand for electric cars and buses from 185,000 t in 2017 to 1.74 M t in 2027.

- The IEA expects there is a "good chance" that electric vehicles in use globally could reach carmaker estimates of between 9 M and 20 M by 2020 and between 40 M and 70 M by 2025. While cars using internal combustion engines require up to 23 kg of Cu each, the ICA report found that a hybrid electric vehicle uses nearly double that amount at 40 kg of Cu, and a plug-in hybrid electric vehicle uses 60 kg. Depending on the size of battery, an electric bus can use between 224 and 369 kg of Cu. On top of this, each electric vehicle charger will add 0.7 kg of Cu and if they are fast chargers, they can add up to 8 kg of Cu each.

#### **June 1, 2017**

- Chile's Cu production fell by 1.8% in Apr17 compared with Apr16. Cu production, including concentrate, fines contained in cathode and blister anodes totaled 429,000 t--down from 437,000 t in Apr16 and 13.5% higher than Mar17. Cu output in 4M17 of 1.63 M t was down by 11.3% on the year, after a 6-week strike at the Escondida mine that ended in late March. Production amounted to 5.64 M t in 2016-- down by 3.6% from 2015.
- Cancelled Cu warrants on LME have risen to a 3-year high this week, with cancellations concentrated in Asian locations. Cancelled tonnage rose for 7 consecutive reporting days to 161,700 t on May3017--up from 102,875 t on May1817.
- China's refined Cu production rose by 5.2% in 4M17, to 2.85 M t from 2.71 M t a year ago. Cu output in Apr17 was up by 4.3% YOY to 724,000 t. Over the same period refined imports dropped by 33% to 300,000 t. China produced 8.2 M t of refined Cu last year, while global production totaled 23 M t.

#### **World Copper Mine Production Rises - ICSG**

- Global mine production of Cu increased in 2016, supported by rising output in Peru and fewer supply disruptions, preliminary data. Output rose by over 5 % to 20.2 M t last year--up from 19.1 M t in 2015, the report said. There were fewer disruptions caused by strikes, accidents or adverse weather conditions than in previous years.
  - Peruvian concentrate production increased by 38 % to 2.35 M t, adding 650,000t to 2016 global output. Projects such as US miner Freeport McMoRan's Cerro Verde mine and Las Bambas, owned by China's MMG, accounted for the country's expanded output.
  - But mine supply from Chile, fell by 3.8 % to 5.54 M t due to lower grades and lack of investment in the country's biggest mines have slowed output expansion since 2010. Production from DRC fell by 4.5 % last year, following the suspension of output by global trading and mining company Glencore.
- Global refined Cu production increased by 2.5 % to 23.4 M t, the ICSG said. Primary output was 3 % higher at 19.5 M t, although secondary production from scrap fell by 2 % to 3.8 M t.
- China was the main contributor to increased refined production, with output up by 6 % to 8.4 M t, followed by the US and Japan, where production was 7 % and 5 % higher, respectively.
- The global refined Cu balance recorded a 50,000 t deficit in 2016, mainly because of a 2.5 % increase in Chinese apparent demand, the report said.

#### **China's Five-Year Plan Could Boost Chinese Cu Demand: ICA**

- China's current Five-Year Plan, running from 2016 to 2020, could boost Chinese Cu demand by up to 15 %, the International Cu Association (ICA) said Monday. Aggregated Cu demand is expected to total 29.5 M t by the end of the current plan, its 13th, up from 25.6 M t at the end of its 12th Five Year Plan in 2015.
- With China expected to see at least 6.5 % annual growth in GDP and double the personal income of its citizens by the end of 2020, "the government will have to invest great resources in areas such as transportation, building infrastructure and energy," Richard Xu, the ICA's Asian regional director, said.
- The ICA predicts Cu demand to grow by 82% in the areas of power generation and 40 % in the power grid, totaling an extra 1.78 M t. The share of renewable power installations is set to grow to 40 % from 13 %, important for Cu as they use 4-12 times more Cu than traditional power generation, the ICA said.
- Cu demand is also set to benefit from a rise in the use of electric vehicles, expected to grow more than eightfold during the period. Electric cars use 3-4 times more Cu than gasoline and diesel engines.

*Comment: Continued growth of Cu in China and increased Cu demand from India and other SE Asian economies will keep Cu demand growth strong.*

## Thomson Reuters Production of top 10 countries and producers (4 companies gained and 6 lost)!

TOP-10 COPPER PRODUCING COUNTRIES

Rank		Country	Production (000 t)	
2014	2015		2014	2015
1	1	Chile	5,750	5,764
2	2	China	1,694	1,659
4	3	Peru	1,339	1,654
3	4	United States	1,391	1,408
5	5	Australia	969	960
6	6	DR Congo	915	918
7	7	Russia	740	741
9	8	Zambia	693	705
8	9	Canada	694	690
13	10	Indonesia	379	587

Source: GFMS, Thomson Reuters

TOP-10 COPPER MINE PRODUCERS\*

Rank		Company	Production (000 t)	
2014	2015		2014	2015
1	1	Codelco	1,839	1,893
2	2	Freeport-McMoRan	1,470	1,547
3	3	Glencore	1,296	1,259
4	4	BHP Billiton	1,203	1,178
5	5	Southern Copper	665	745
7	6	KGHM Polska Miedz	506	562
6	7	Rio Tinto PLC	636	555
8	8	Anglo American	504	472
9	9	Antofagasta	455	400
10	10	First Quantum Minerals	380	366

\*Attributable basis – totals may differ from company reports  
Source: GFMS, Thomson Reuters

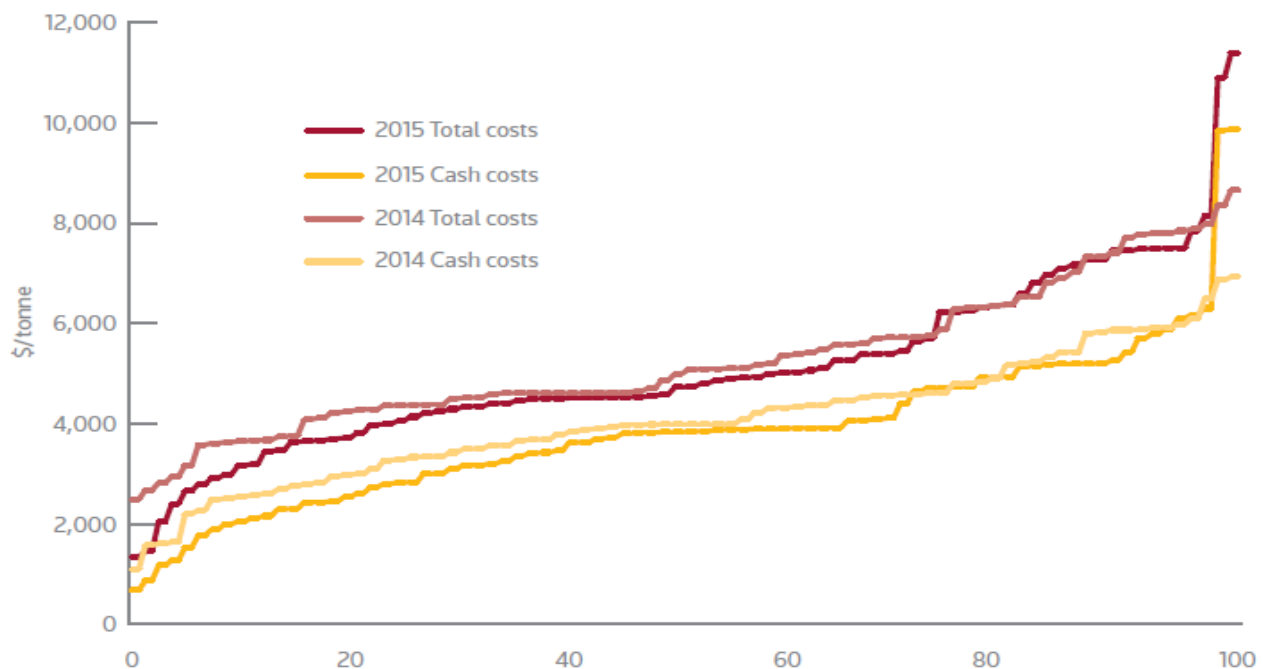
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The following table illustrates development projects. The capex estimates and timelines are an indicator of future mine development necessary to meet future global mine supply. Most of the projects are large capex and long timelines for production.

Thompson Reuters notes that the 2015 copper incentive price required to meet new mine supply demand is US\$3.14 per pound of copper. The new PEA for Carmacks Project will soon provide new information on C1 cash and Total costs of producing copper.

COST CURVES 2014 AND 2015



Source: GFMS, Thomson Reuters



*Note Carmacks capex to be revised downwards*

## MAJOR COPPER PROJECTS

Project	Company	Location	Process	Type	Capacity	Capex*	Start Date
Ajax	KGHM	Canada	Conc	New Project	50	795	2019
Agua Rica	Yamana	Argentina	conc	New Project	150	2,122	2021?
Aktogay	KAZ Minerals	Kazakhstan	SX-EW/Conc	New Project	104	2,300	Q4 2015/17
Andina	Codelco	Chile	Conc	Expansion	na	1,400	2022
Aynak	MCC	Afghanistan	Conc	New Project	200	3,000	Post-2020
Bozshakol	KAZ Minerals	Kazakhstan	Conc	New Project	75	2,150	Q1 2016
Bytrinsky	Norilsk Nickel	Russia	Conc	New Project	66	1,700	End-2017
Carrapateena	Oz Minerals	Australia	Concs	New Project	40	555	2019
Carmacks	Copper North	Canada	SX-EW	New Project	14	225	Q2 2018
Chuquibambilla UG	Codelco	Chile	Conc	Expansion	367	4,000	2018
Cobre de Panama	First Quantum	Panama	Conc	New Project	320	5,950	End-2017
Collahuasi	Anglo American/Glencore	Chile	Conc	Expansion	496	6,500	na
El Arco	Southern Copper	Mexico	Conc/SX-EW	New Project	190	2,600	2020
El Pachon	Glencore	Argentina	Conc	New Project	280	4,100	na
El Pilar	Southern Copper	Mexico	SX-EW	New Project	35	300	2018
El Teniente new mine level	Codelco	Chile	Conc	Expansion	432	5,100	2020/21
El Tesoro (Encuentro Oxidos)	Antofagasta	Chile	SX-EW	Expansion	50	636	Q4 2016
Esperanza (2nd concentrator)	Antofagasta	Chile	Conc	Expansion	140	2,700	Post-2019
Frieda River	Guangdong Rising Asset Mgmt	Papua New Guinea	Conc	New Project	125	1,700	na
Galore Creek	Teck/Novagold	Canada	Conc	New Project	154	na	na
Golpu (Stage 1)	Harmony (50%)	Papua New Guinea	Conc	New Project	80	2,600	2023
Haquira	First Quantum	Peru	Conc	New Project	190	na	na
Inca de Oro	Guangdong Rising Asset Mgmt/Codelco	Chile	Conc	New Project	50	na	na
Koksay	KAZ Minerals	Kazakhstan	Conc	New Project	80	na	na
Los Pelambres	Antofagasta	Chile	Conc	Expansion	95	1,600	Post-2019
Michiquillay	na	Peru	Conc	New Project	155	700	na
Olympic Dam	BHP Billiton	Australia	Conc/SX-EW	Expansion	225	na	2025
Oyu Tolgoi Underground	Rio Tinto	Mongolia	Conc	Expansion	250	4,400	2021
Project Corridor	Goldcorp/Teck	Chile	Conc	New Project	190	3,600	na
Pumpkin Hollow	Nevada Copper	United States	Conc	New Project	125	1,000	2019
Quebrada Blanca Phase II	Teck	Chile	Conc	Expansion	200	5,600	na
Quellaveco	Anglo American	Peru	Conc	New Project	225	na	na
Radomiro Tomic Sulphides	Codelco	Chile	Conc	Expansion	354	5,400	Post-2020
Roseby (Little Eva)	Sichuan R'way Invstmt/ Altona	Australia	Conc	New Project	39	232	2019
Rosemont	HudBay	United States	Conc	New Project	110	1,226	2020?
Schaft Creek	Teck/Copper Fox Metals	Canada	Canada	New Project	105	3,257	na
Sierra Gorda Phase II	KGHM/Sumitomo	Chile	Conc	Expansion	100	na	2020
Serrrote	Aura Minerals	Brazil	Conc	New Project	30	420	na
Taca Taca	First Quantum	Argentina	Conc	New Project	244	3,000	na
Tampakan	Indophil Resources	Philippines	Conc	New Project	375	5,900	na
Tia Maria	Southern Copper	Peru	SX-EW	New Project	120	1,400	na
Toquepala concentrator	Southern Copper	Peru	Conc	Expansion	100	1,200	Q1 2018
Toromocho	Chinalco	Peru	Conc	Expansion	75	1,320	na
Twin Metals	Antofagasta	United States	Conc	New Project	82	na	Post-2020
Victoria	KGHM	Canada	Conc	New Project	15	na	2021
Zafranal	Teck 50%/AQM Copper	Peru	Conc	New Project	54	na	na
Zone 5	Cupric Canyon Capital	Botswana	Conc	New Project	50	350	H1 2018

\*Recent CAPEX figures not yet available for some operations.

Source: GFMS, Thomson Reuters