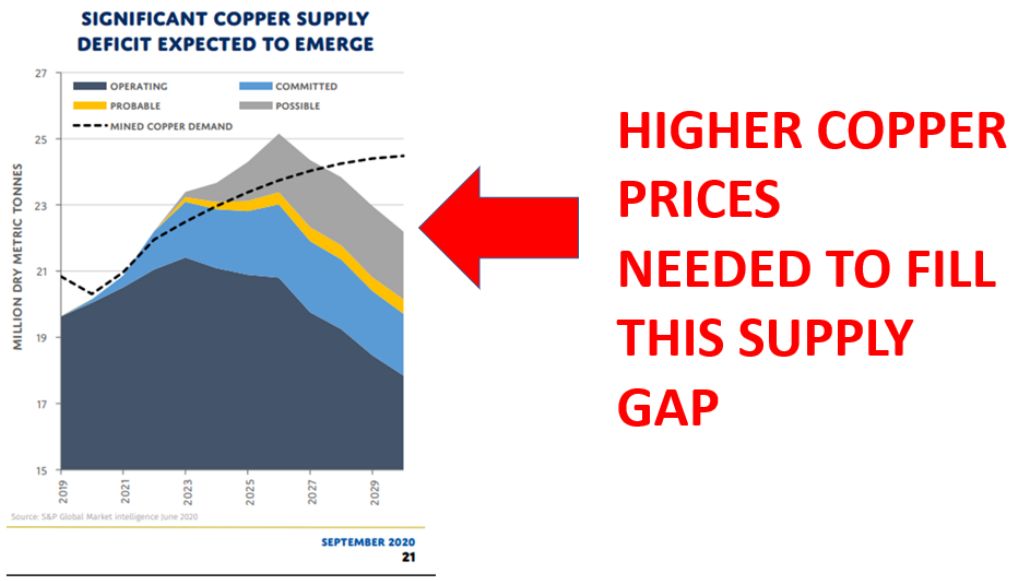
Copper Mining Stocks Investment Thesis And Strategy For The Next Decade

Copper is called the metal of the future. Investing wise, the key is to understand how supply and demand will shape prices, which will consequently drive copper miners' profits, stock valuations and our potential investing returns.

There are two key factors impacting copper:

- The possible faster growth in demand than expected,
- And the slowdown in supply as current copper prices don't incentivize new investments. And vice versa of course!



Potential future copper deficit – Source: S&P Global by Northern Dynasty

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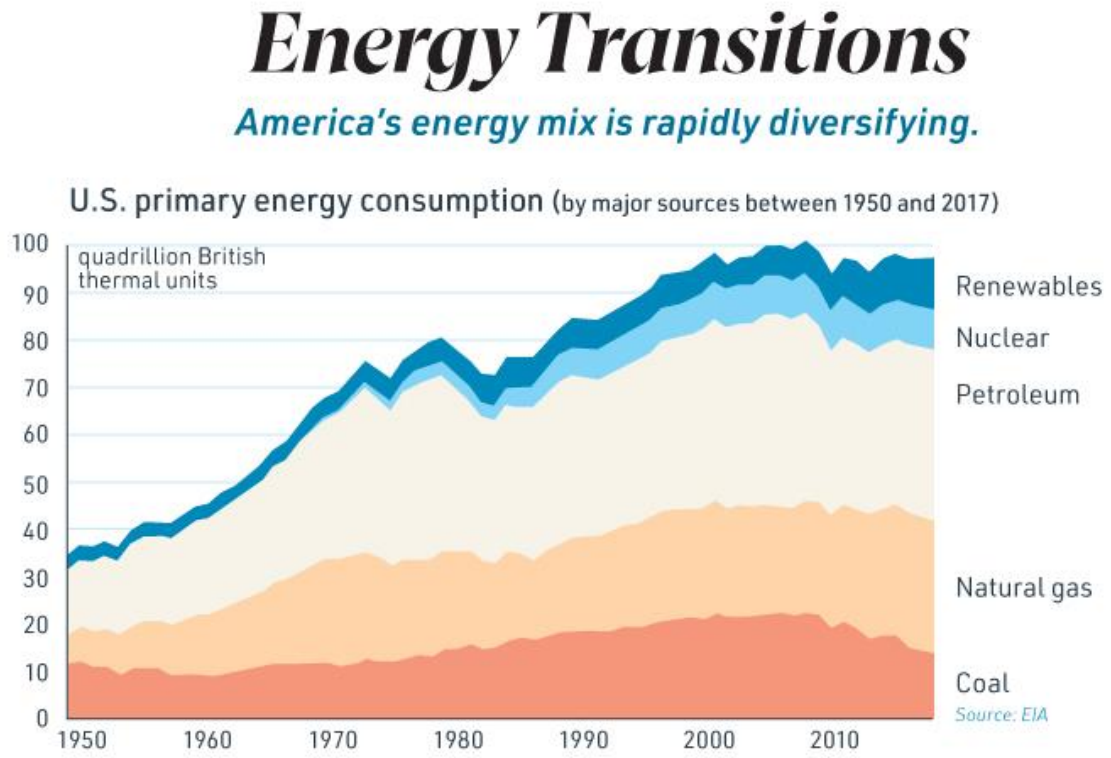
Estimating future demand growth for copper

Demand and supply are key. More demand for copper than expected, will have an extreme impact on copper prices and vice versa. Demand for copper isn't that sensitive to copper prices because if copper is at $3 or $4 per pound, the difference when making an electric vehicle is perhaps $100, but it all makes a huge difference for the profits of copper producers.

Copper and renewables, electric vehicles

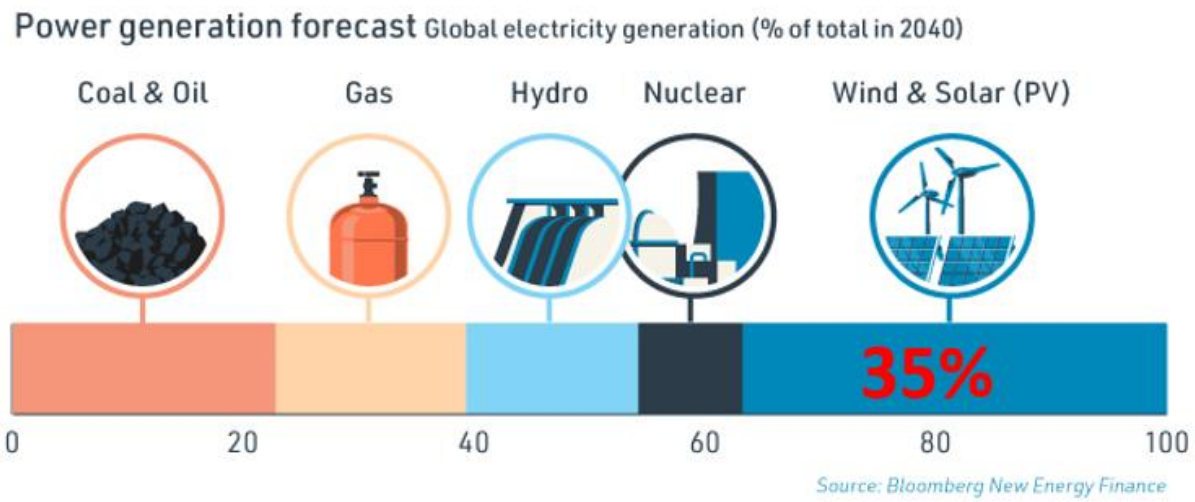
The talk of the day is renewable energy, electric vehicles, less CO2 emissions and an all in on technology. On top of that, the global middle-class population is still booming and there will still be a lot of construction going on over the coming 20 years. Thus, copper demand should continue to grow.

Energy transitions are not something new; human kind went from burning wood, coal, oil to more and more sophisticated energy sources thanks to technological improvements. As renewables become cheaper and cheaper, alongside being more environmentally friendly, a new energy transition is brewing.



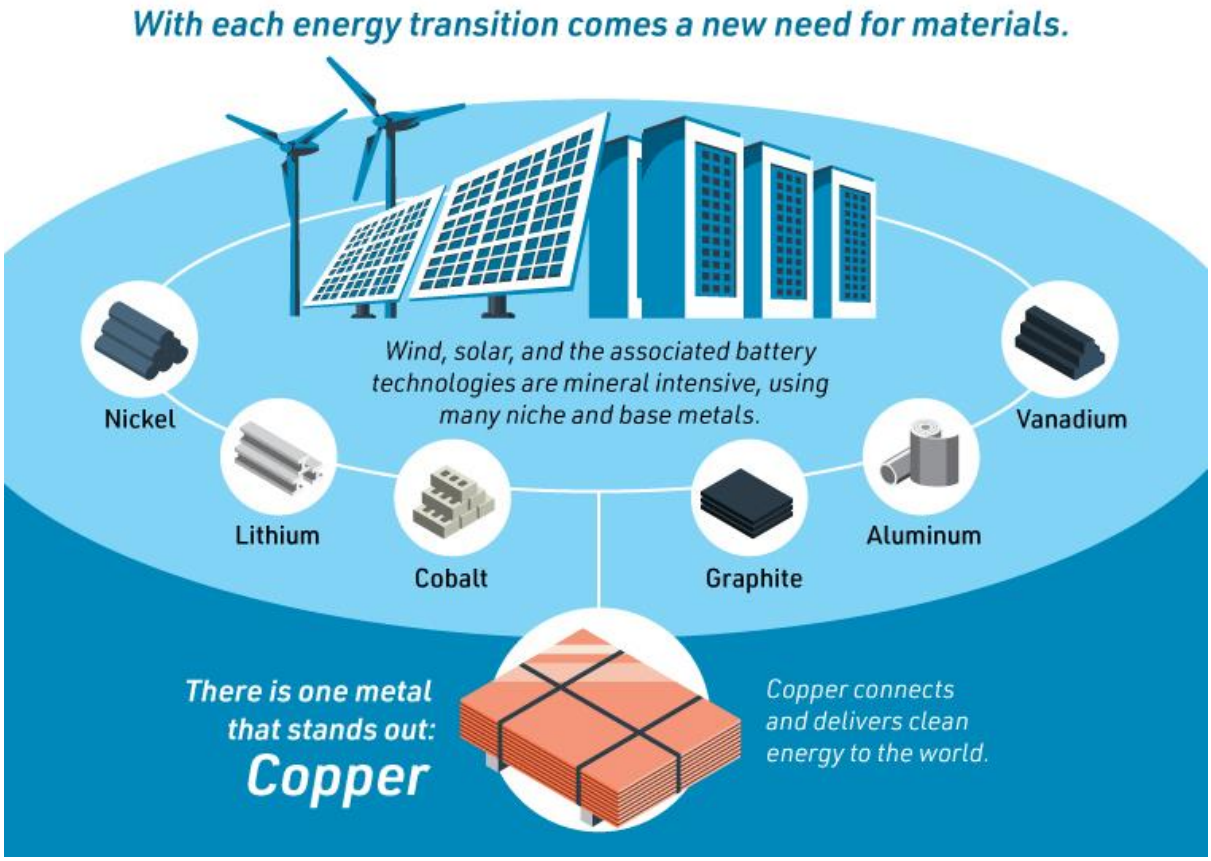
Copper as key factor for new energy transition – Visual Capitalist

It is expected that renewable energy could make 35% of the electricity generation by 2040.



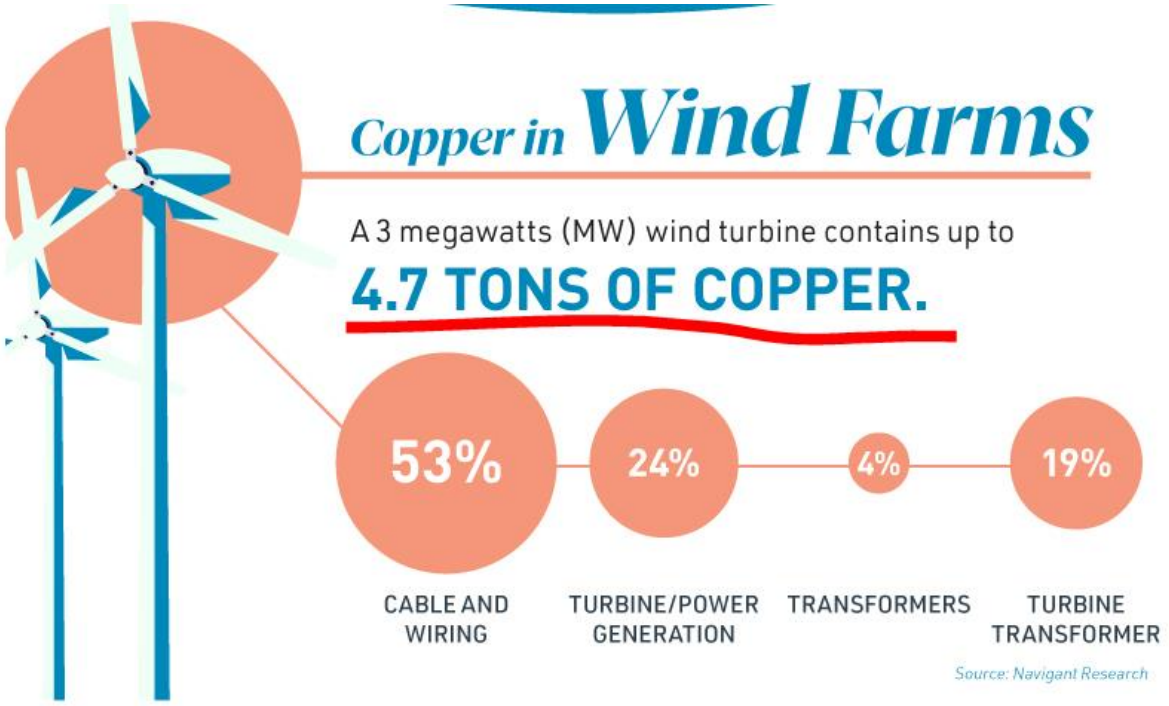
Electricity generation sources by 2040 – Visual Capitalist

The metal that connects all the above-mentioned trends is copper.



Copper is required in every segment of the energy transition – Visual Capitalist

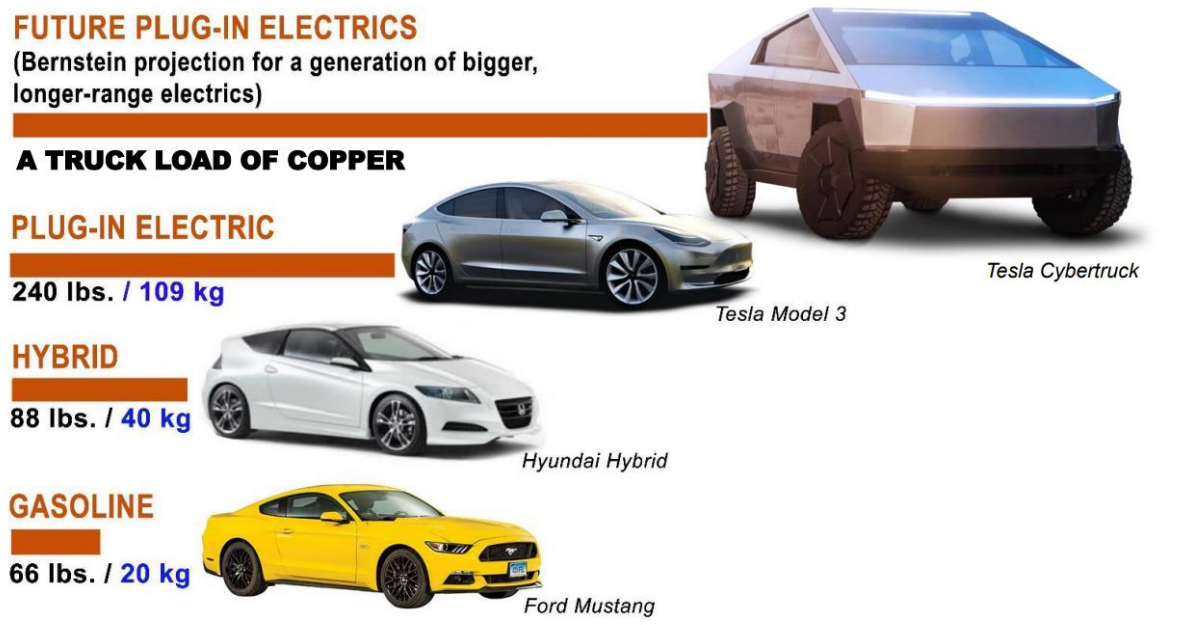
For example, a wind turbine requires 4.7 tons of copper for cables and wiring, the turbine, transformers etc. The offshore wind turbines require 3 times as much copper.



Copper in a wind turbine – Source: Visual Capitalist

As renewables take more and more market share, the whole system will require much more copper. Solar systems require 5.5 tons of copper per MW of installed capacity and energy storage systems require another 200kg for MW of storage capacity.

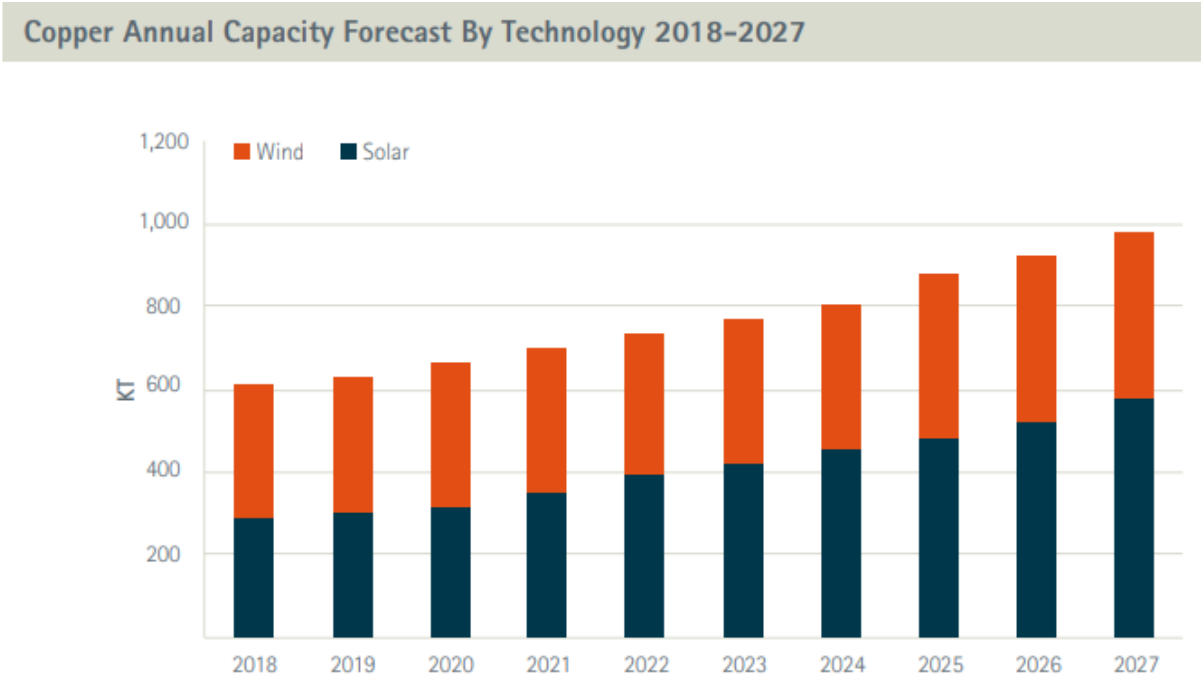
When it comes to electric vehicles, those use 3 to 5 times as much copper as internal engine combustion vehicles. Also, think of all the chargers out there, needing lots of copper if built and if we really all go EV.



Copper usage per car – Source: Ivanhoe mines

Numerical projections are still pretty conservative and nobody really knows what will the right numbers be in 2025 or 2029. Given the recent intensified discussions on renewables, I think real renewable future demand for copper will be higher than what is expected. The current expectations are based on conservative numbers of EVs getting to just a few percentage points of the market by 2030.

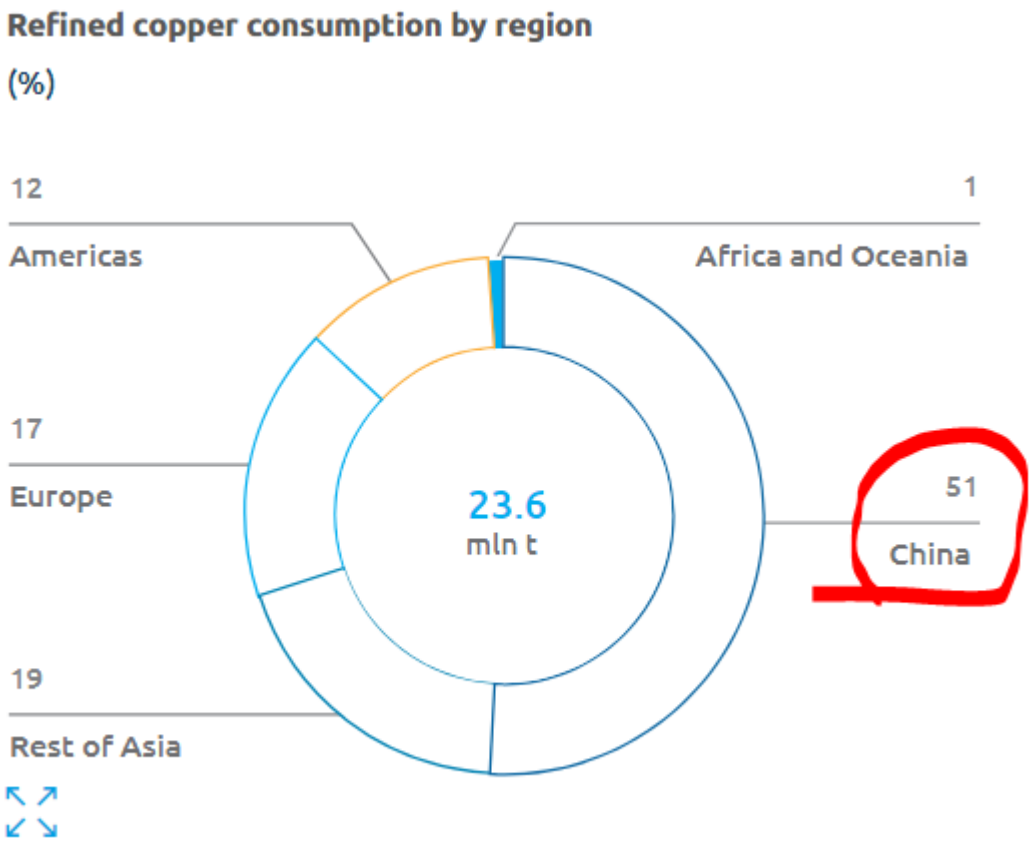
Thus, renewables and electric vehicles and the whole electrification process is a tailwind for copper. How big is it going to be? Time will tell, but I would estimate demand will be more than the additional 400 kt of increased demand, or 1.6% of global demand for copper, over the coming years.



Copper demand by technology - Source: Copper Alliance

Renewables are the hot story at the moment. The investment environment is crazy about them and consequently about copper too. However, I wouldn't get to excited about it, most is just about chasing hot investment trends where the price action reinforces the thesis.

Chasing trends and betting on higher copper prices will likely lead to volatility because a boom in renewables might just add a few percentage points in demand for copper. Trends that are much more important for copper over the long-term are the growing global middle class and over the short to medium term, construction and infrastructure demand from China. 51% of copper demand comes from China, so that is the key and will be the key for copper for a while.



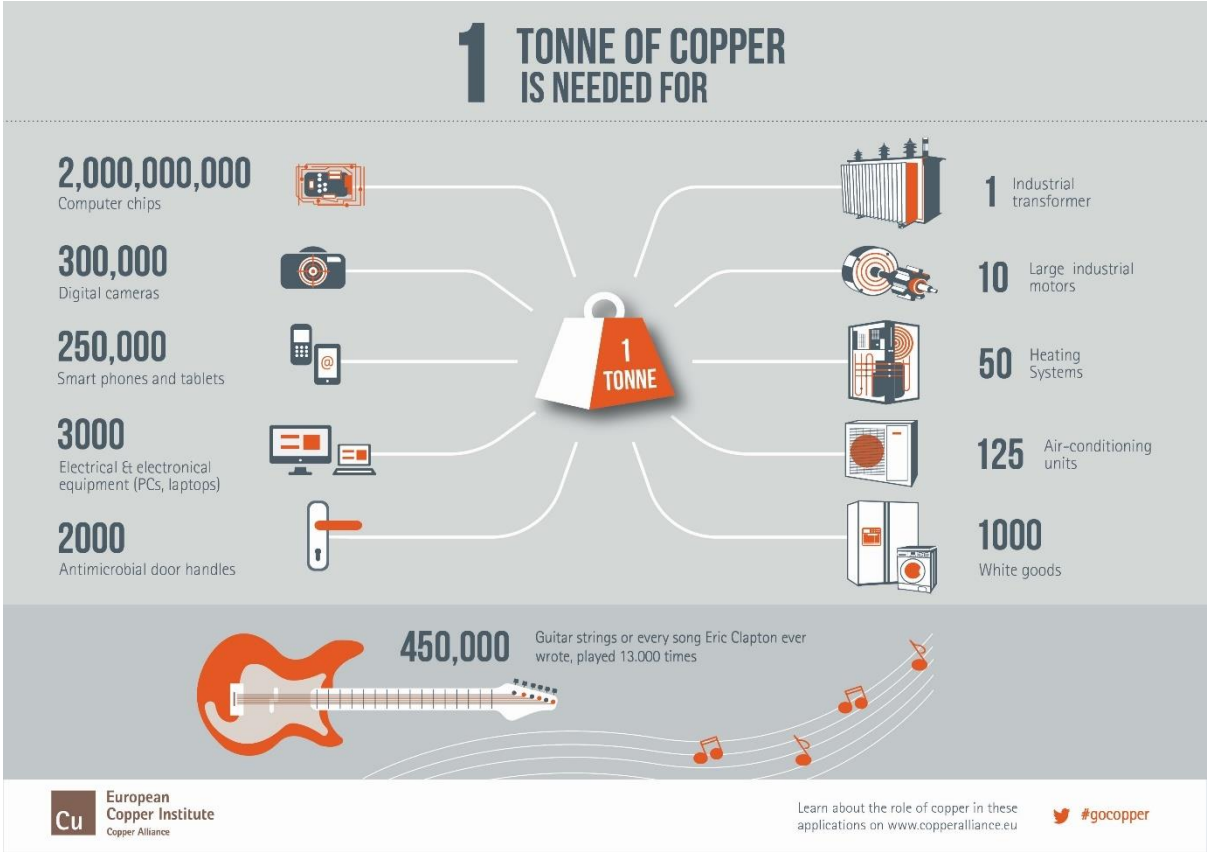
Copper consumption by region - Nornickel

Copper and the growing global middle class

The global population is still growing but more importantly, the global middle-class population is exploding.

Global middle class forecast – Source: BBC

This will have a huge impact on copper demand. Middle class means white goods, cars, air-conditioning, infrastructure, homes and more.



Copper usage per number of items – Source: European Copper Institute

If 2 billion new middle-class people buy just one item of white goods in the next decade, that will add 2 million tons of copper demand, just from white goods. If 200 million buy air-conditioning units, there is another 2 million tons of demand, that is 10% of current demand, not to mention infrastructure, cars, electric cars, homes, homes with electric chargers, solar installations etc.

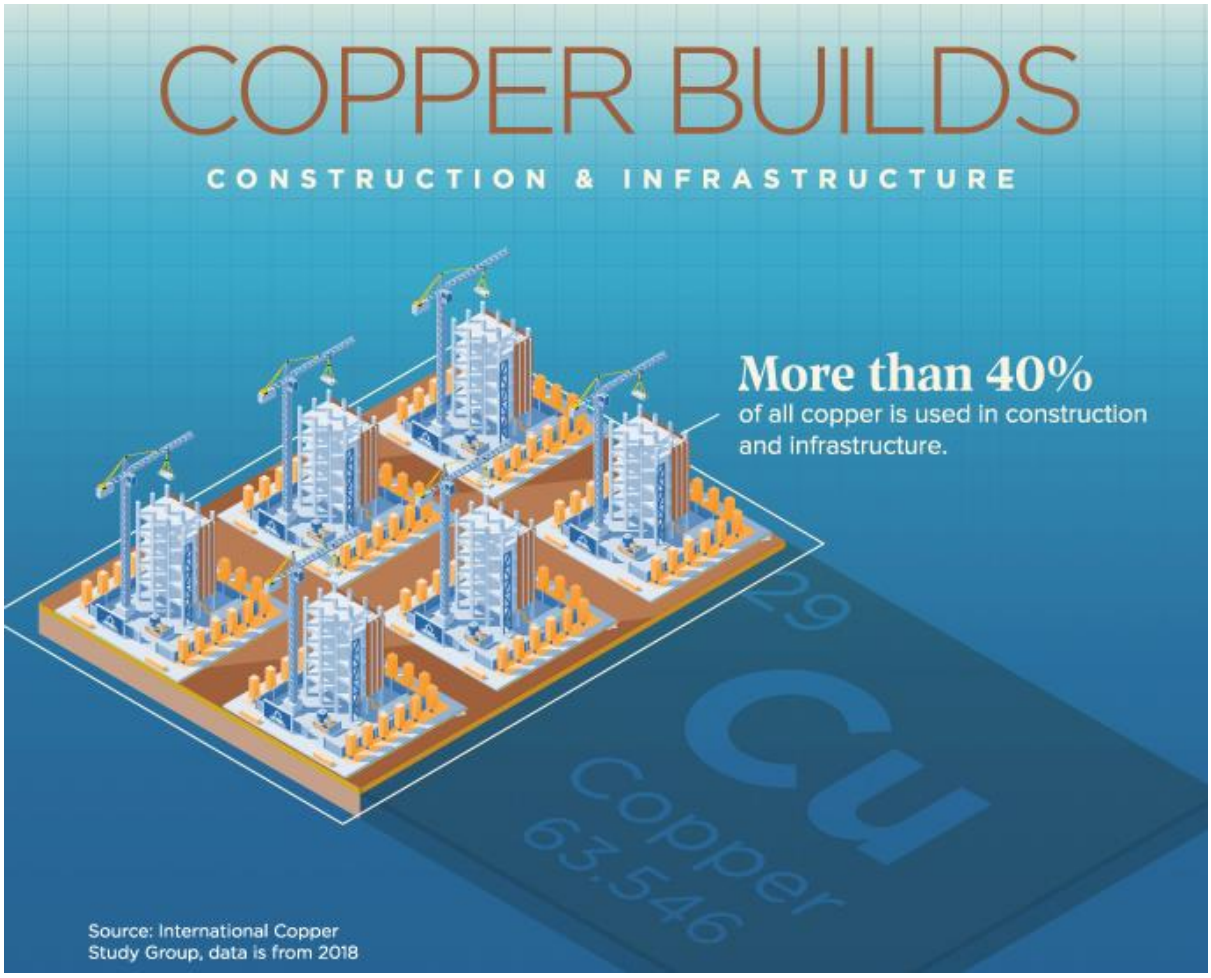
Asia is likely to be the new China for copper demand – Source: Brookings

Middle-class spending will likely double over then next decade, and then more later. This means more demand for copper.

Middle class expected spending – Source: Brookings

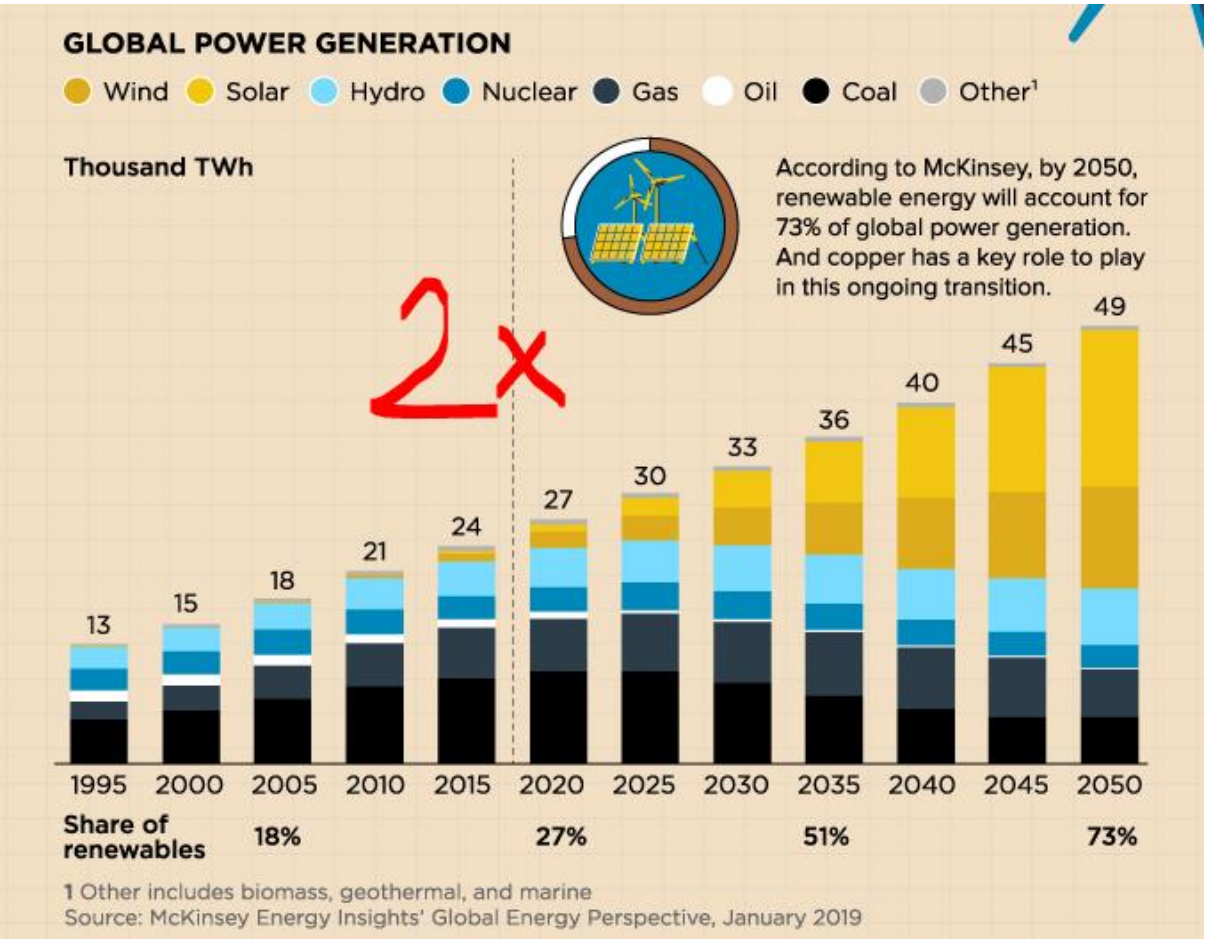
Further, middle class expansion done the Chinese way by burning a lot of coal is not a wonderful achievement. Less CO2 emission growth means more copper will be needed.

For copper demand, the key is infrastructure and construction, as the middle class grows, as more infrastructure is built, more homes, demand for copper will grow.



Infrastructure and construction is key for copper – Source: Visual Capitalist

Energy demand is expected to double by 2050 and if that doubles, so will copper consumption. That is at least 2.5% yearly growth in demand, and if we go greener, copper demand growth might reach 3% per year.

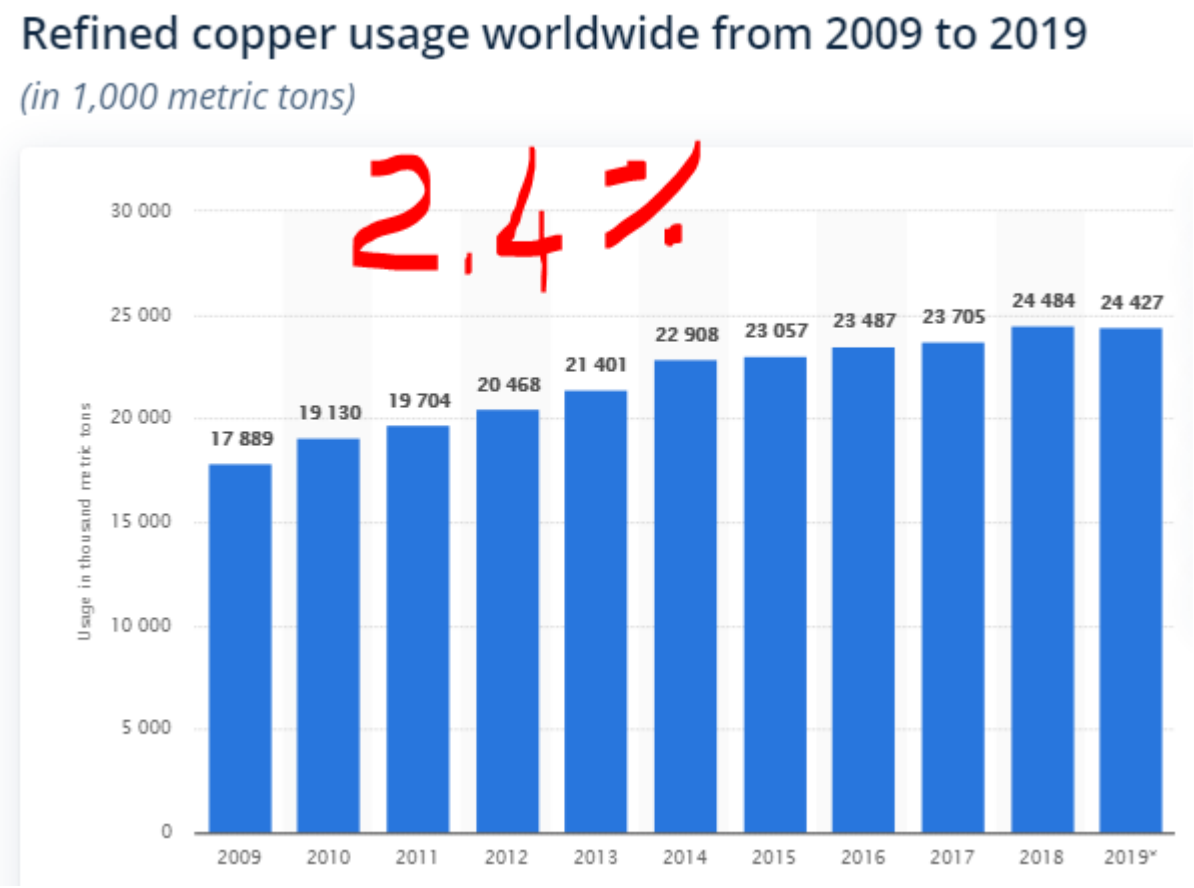


Energy generation forecast – Source: McKinsey Visual Capitalist

Let's see the projections on copper demand and figure out what projection is likely to be closer to reality.

Copper long-term demand projections

Over the last 10 years, copper consumption grew by 2.4% per year.

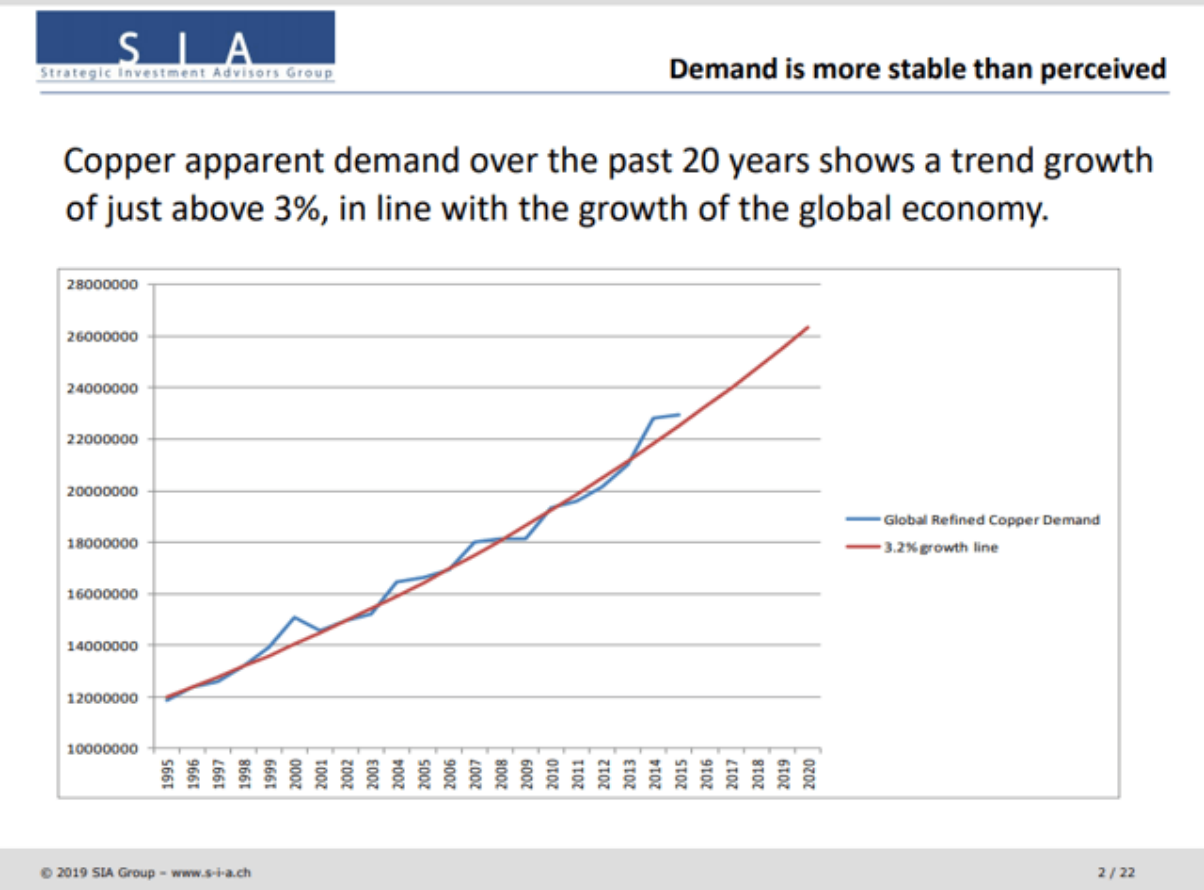


Copper consumption from 2009 to 2019 – Source: Statista

Copper demand growth was in line with global economic growth at around 2.5%

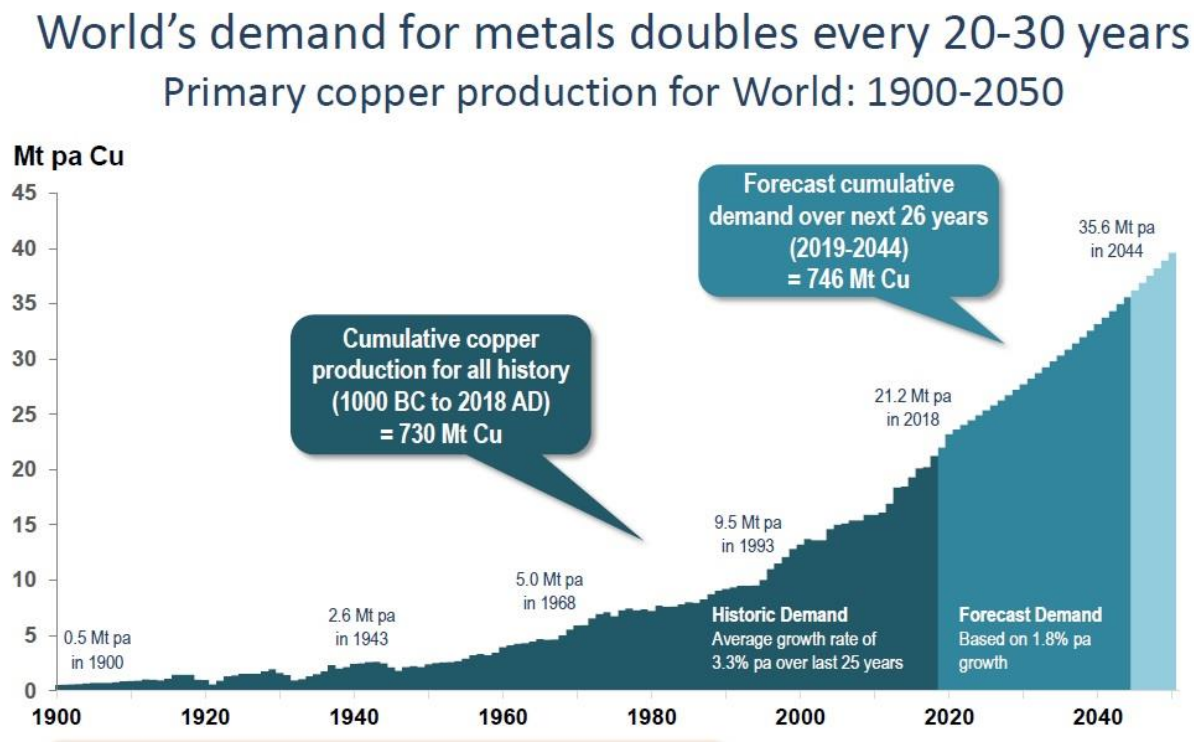
Global economic growth over the last 10 years – Source: [Worldbank]

Global economic growth is expected to be around 3% going forward which means we can expect similar copper demand growth, on a conservative basis. Perhaps we can add a few dozen basis points for the increase in demand coming from renewable sectors and electrification.



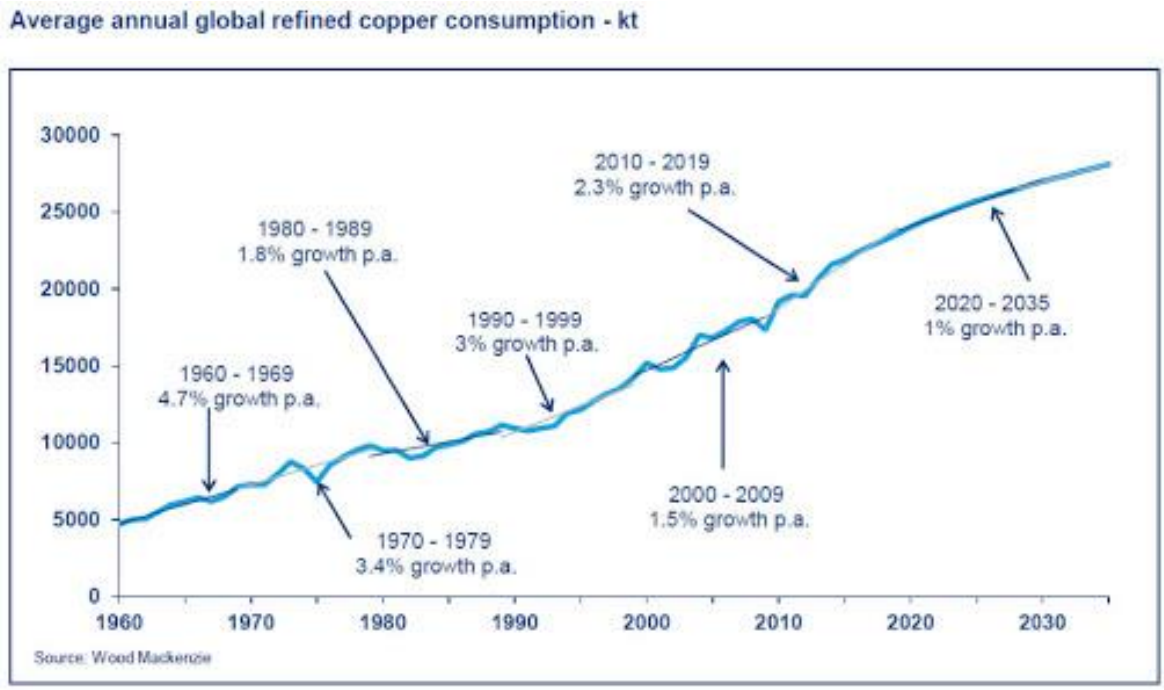
Copper demand is in line with economic growth - Source: SIA

If copper demand grows 3.5% per year over the next 10 years, demand in 2030 should be at 34.5 from the current 24.5 million metric tons. That is significantly more than most copper demand forecasts estimate and would push copper prices extremely high over the years.



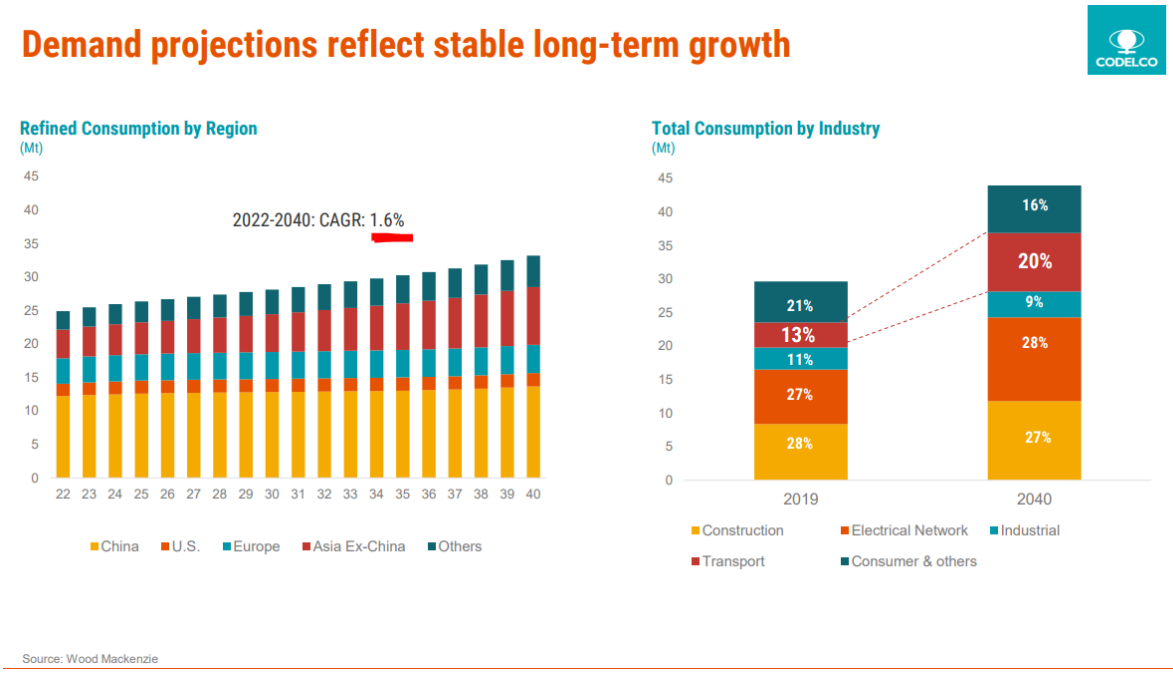
Historical demand growth was 3.3%, but forecasts see 1.8% growth in demand – Source: [Kinkora copper USGS]

If copper demand grows faster than the expected 1.8%, the copper supply gap might be much bigger than expected.



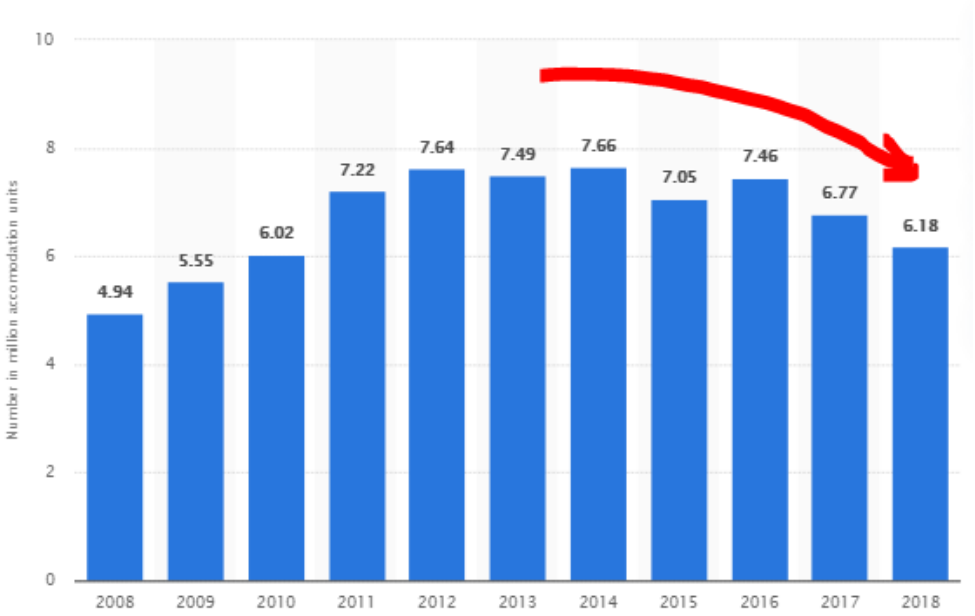
Wood Mackenzie copper demand forecast, usually 3% on average, forward just 1% growth – Source: [Amerigo]

Wood Mackenzie's Codelco forecast stands at 1.6% per year up to 2040 while on the above picture, demand growth over the next 15 years is just 1% from the same company, Wood Mackenzie.



Codelco forecast – Source: Wood Mackenzie

The reason behind the slow copper demand growth estimations is the Chinese switch towards a service economy. China makes 51% of copper demand thanks to its infrastructure and construction. If Chinese demand for copper slows down, so does global demand for copper. The number of newly build appartments in China has been declining, but it is still strong and keeps demand for copper high.



Number of accommodation units build in China – Source: Statista

On the other hand, infrastructure stimulus coming from not only China, but globally in an effort to revive the COVID-19 hit economies, might neutralize the negative effects from a Chinese economy switch to services.

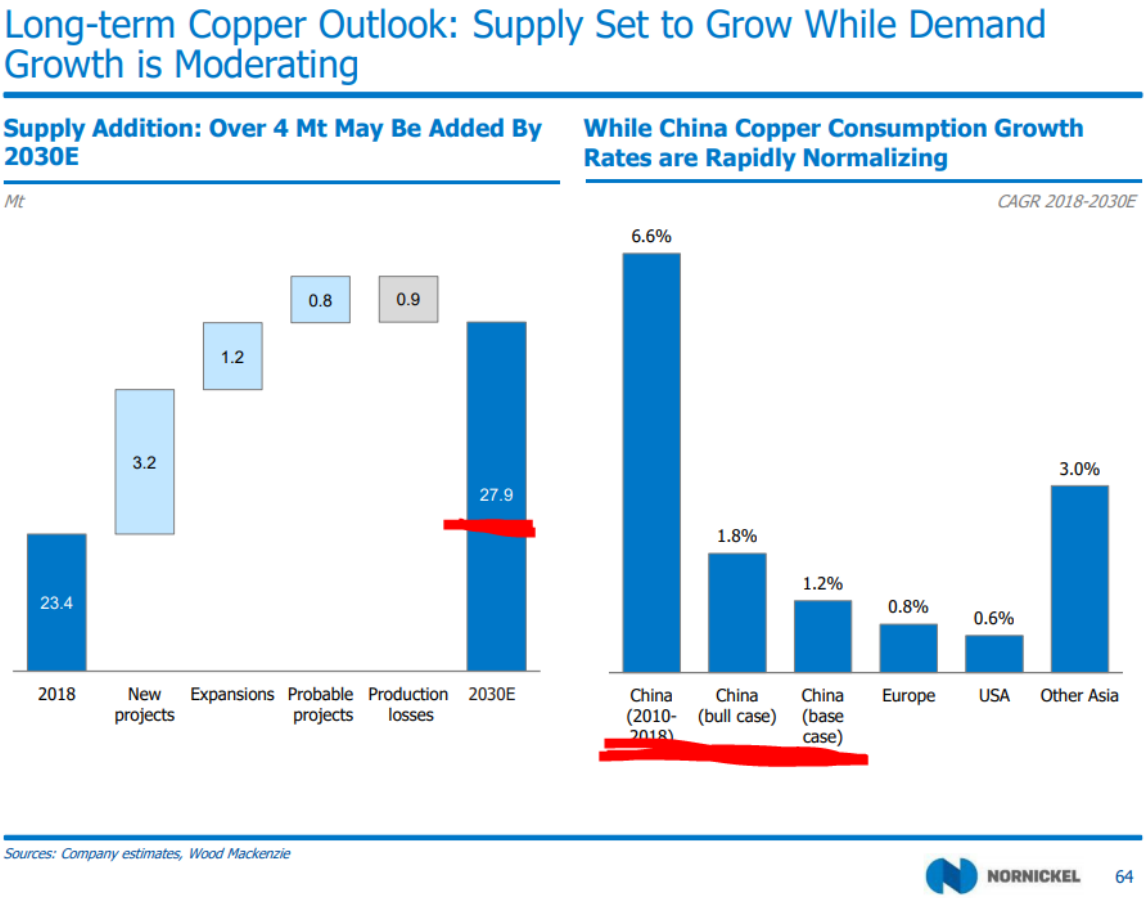
Economics

China Returns to Old Construction Playbook to Boost Growth

Bloomberg News
September 6, 2020, 11:00 PM GMT+2

Infrastructure at head of global stimulus - Bloomberg

Nevertheless, Chinese copper demand growth slowdown doesn't mean a decline, just slower growth on a high basis. Other Asia is however catching up with demand growth.



Copper supply and slowing down demand forecast – Source: Norilsk

Despite the COVID-19 situation, demand for copper has remained equal to 2019 levels over the first 7 months of 2020.

World Refined Copper Usage and Supply Trends

Thousand metric tonnes, copper

	2017	2018	2019	2019	2020	2020			
				Jan-Jul		Apr	May	Jun	Jul
World Mine Production	20,058	20,565	20,528	11,682	11,592	1,600	1,658	1,694	1,722
World Mine Capacity	23,993	24,062	24,139	14,416	14,508	2,058	2,134	2,073	2,113
Mine Capacity Utilization (%)	83.6	85.5	85.0	81.0	79.9	77.7	77.7	81.7	81.5
Primary Refined Production	19,485	20,023	20,017	11,464	11,729	1,665	1,725	1,725	1,704
Secondary Refined Production	4,063	4,035	4,028	2,371	2,246	310	336	337	320
World Refined Production (Secondary+Primary)	23,548	24,058	24,045	13,835	13,975	1,975	2,061	2,061	2,025
World Refinery Capacity	27,545	27,979	28,794	16,647	17,144	2,426	2,513	2,438	2,524
Refineries Capacity Utilization (%)	85.5	86.0	83.5	83.1	81.5	81.4	82.0	84.5	80.2
World Refined Usage 1/	23,705	24,484	24,427	14,186	14,230	2,073	2,070	2,202	2,161
World Refined Stocks End of Period	1,375	1,227	1,220	1,322	1,264	1,477	1,410	1,319	1,264
Period Stock Change	10	-148	-7	95	44	-61	-67	-91	-55
Refined Balance 2/	-156	-426	-382	-351	-255	-98	-8	-141	-136
Seasonally Adjusted Refined Balance 3/				-268	-170	6	22	-122	-97
Refined Balance Adjusted for Chinese bonded stock change 4/	-154	-485	-560	-382	-278	-143	-83	-146	-123

Copper demand and supply – Copper study group

As this COVID issue passes, stimuluses and other make things return to normal, copper demand will likely return to its normal course of growth between 1% and 2.5% per year even if it might take some time.

Copper demand conclusion

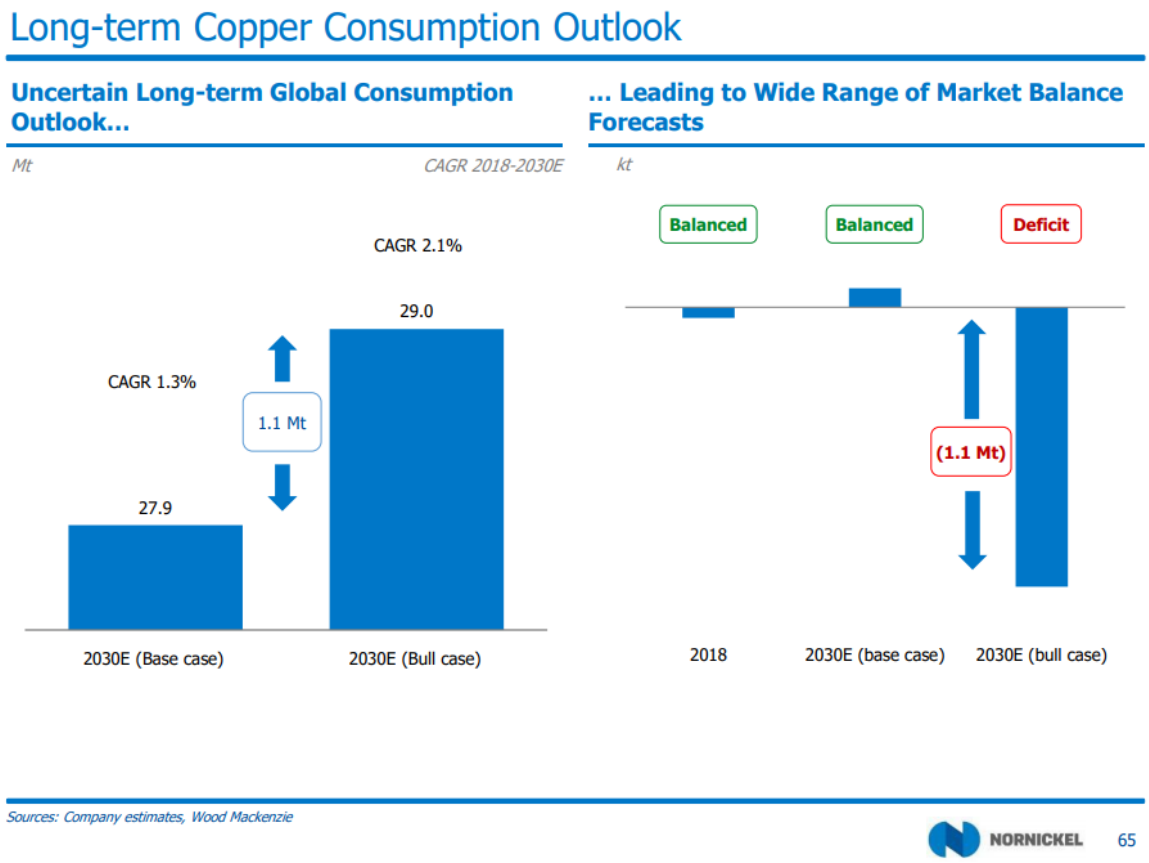
All in all, I don't really see 1% copper demand growth ahead as history and the outlook tells us demand growth will likely be at least 2%, especially thanks to the green energy, EV and middle class booms ahead. 2% is relatively certain level on global economic growth, while it could also be 3% per year on green energy and significant infrastructure stimulus spending globally.

However, I am certain nothing of the above will be linear. There will be years with 3% demand growth and years with declining demand. There might be a decline over the coming year, as many projects are and will be delayed, but things should pick up again.

The current demand is 24.4MT. If copper demand growth 1.5% per year over the next 10 years, in 2030 we will be at 28.3 MT.

At 2% growth we are at 29.74MT and at 2.5% we would be at 31.23MT. The difference between the 1 percentage point difference in estimations is 3MT, which could have a huge impact on copper investments. I for sure expect volatility.

The outlook for copper is in a wide range, perhaps the best answer is value investing.



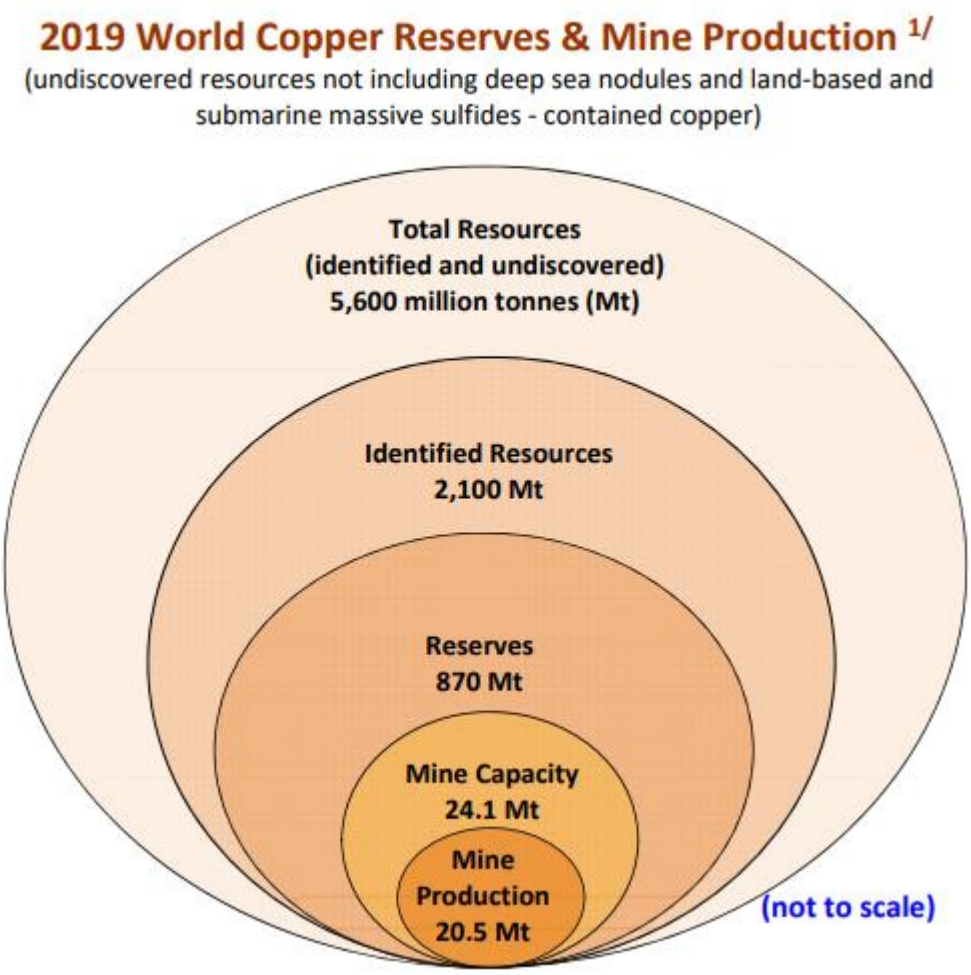
Copper balance – surplus and deficit scenarios by 2030 - Source: Norilsk

Value investing means investing with a margin of safety; if I can find an investment that will do well with 1% copper growth, the possible negative scenario, I will do fine no matter what. If copper demand is at 2%, I'll do much better than expected.

No matter the growth in demand, will it be 1%, 2% or 3%, perhaps more important is the growth in supply of copper. We have to see whether there is enough to supply for future demand, be it 28MT or 31 MT per year.

Copper supply analysis – not that easy

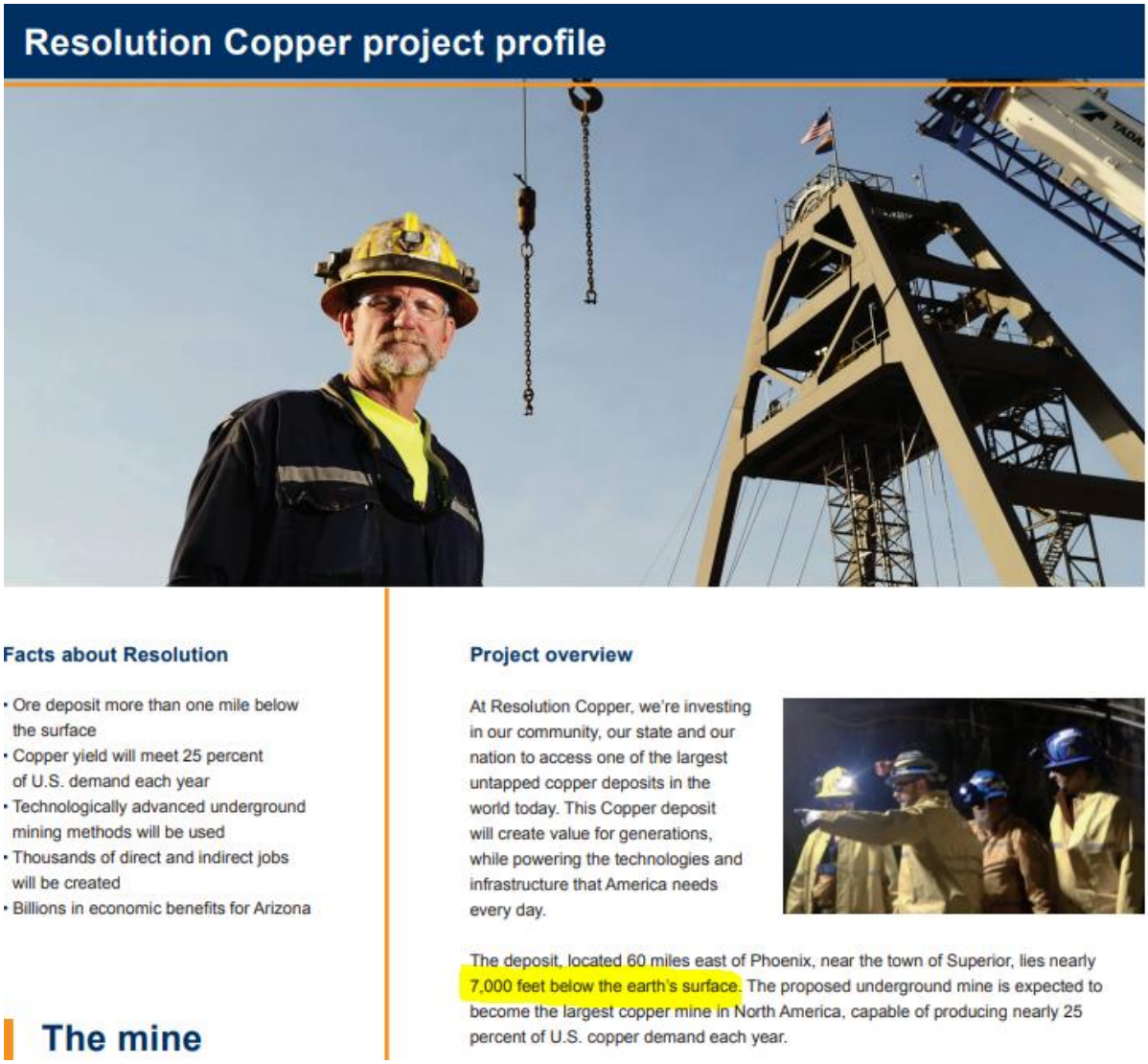
The first thing we have to clear is that there is plenty of copper in the ground. We can produce and satisfy current and future copper requirements for the next few decades based on reserves (viable copper ore), and likely for the next century and more based on resources (possibly viable for mining).



Source: International Copper Study Group

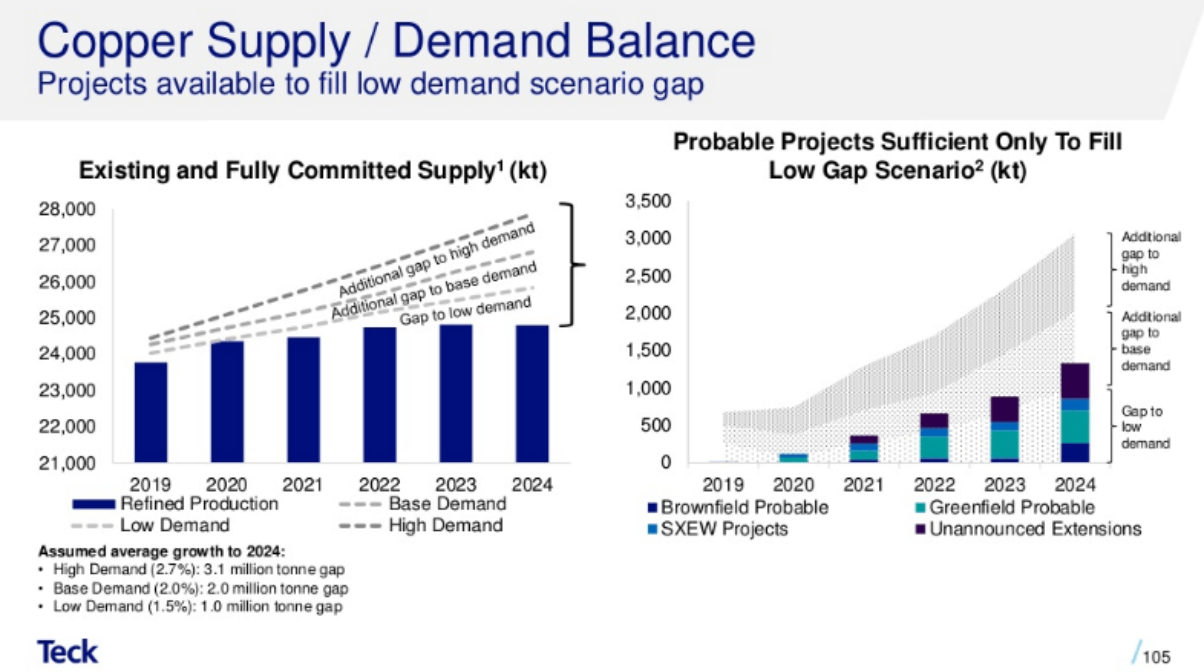
But, the problem with copper is that the easy to mine copper, has been mined already. To mine the copper reserves mentioned above, you need to go deeper, have more complex mining operations and the jurisdiction where the copper is often aren't a walk in the park.

For example, Rio Tinto and BHP own the Resolution copper project that could produce 0.5MT per year. They have already spend $2 billion on the project, don't expect to be in production before 2030, have to spend a lot of more money on it, and operations would be 7,000 feet below surface. To justify the project, copper prices should be higher than currently, which is also the key of the copper investment thesis.



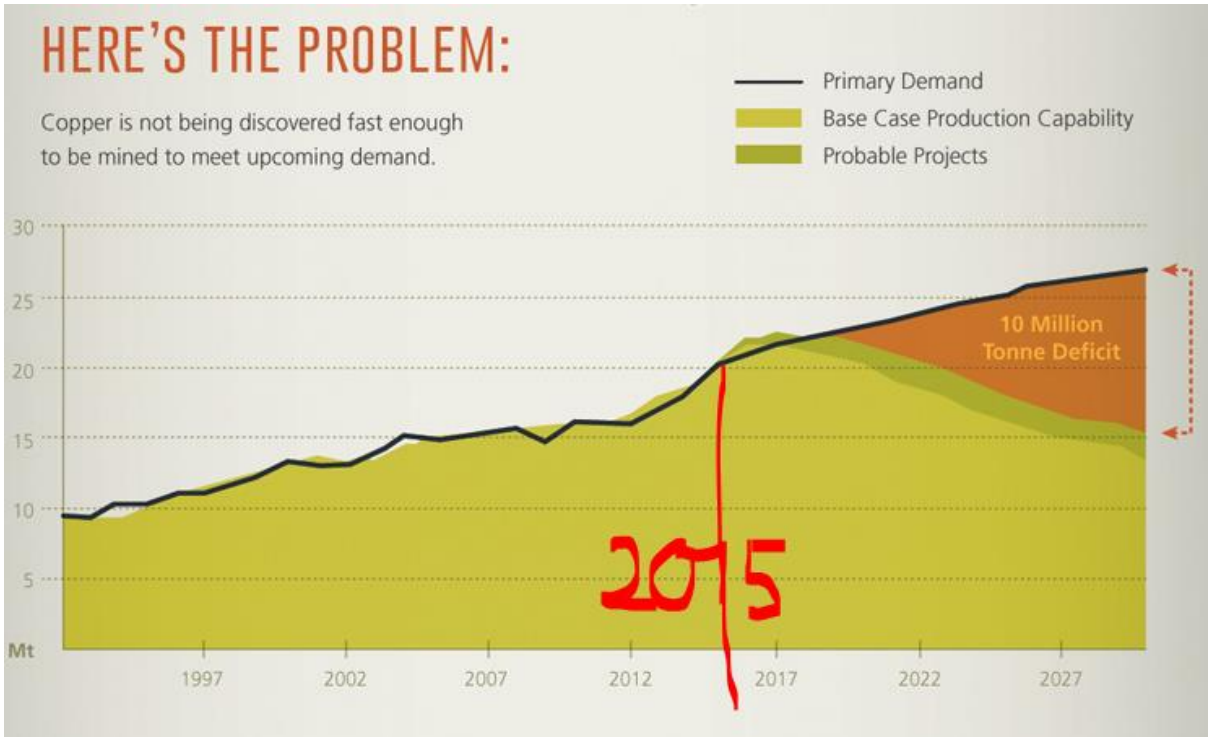
[Resolution copper]

The most common projection for copper supply from copper miners is one where you see a big supply gap forming relatively soon and then growing from 2022 onward no matter the copper environment.



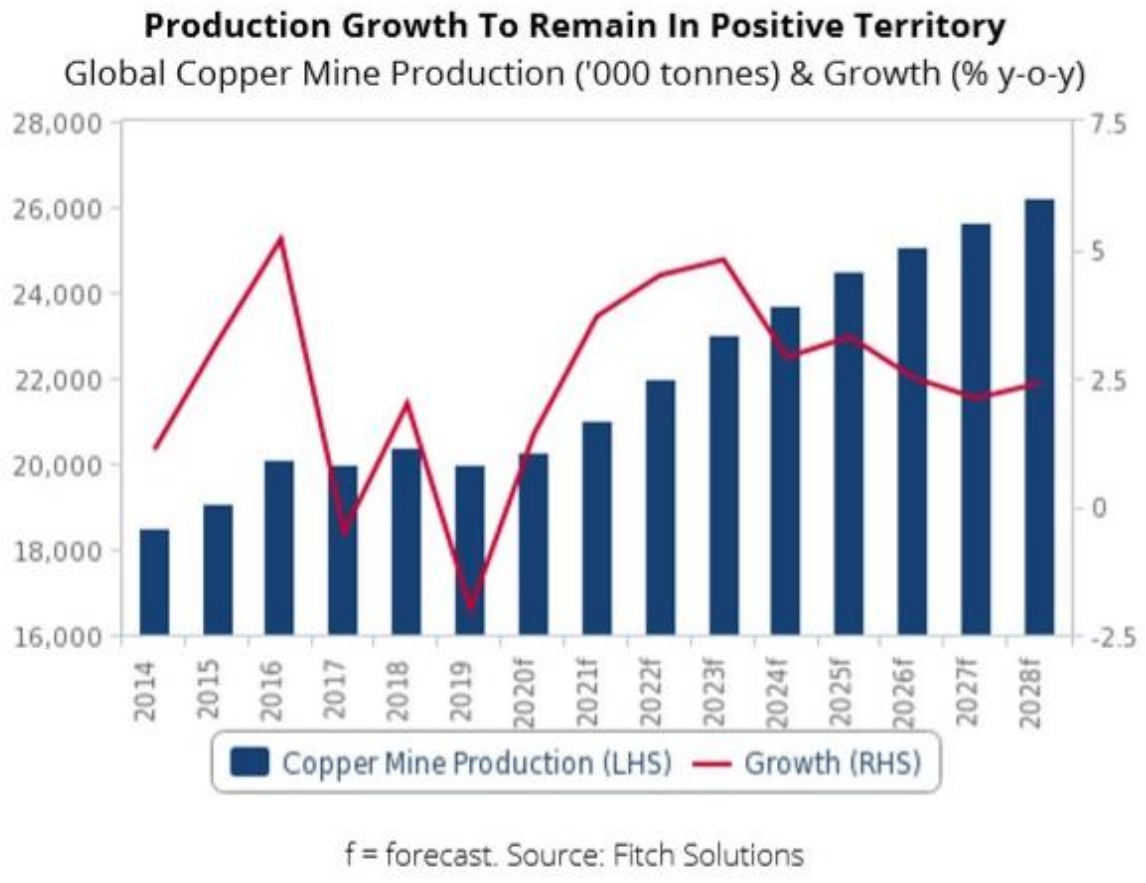
Copper miners copper supply forecast – Source: Teck

However, I must say I have been seeing the same projections over and over again over the last 6 years and a big deficit never actually happened. So, we must be very careful and check things in detail here.



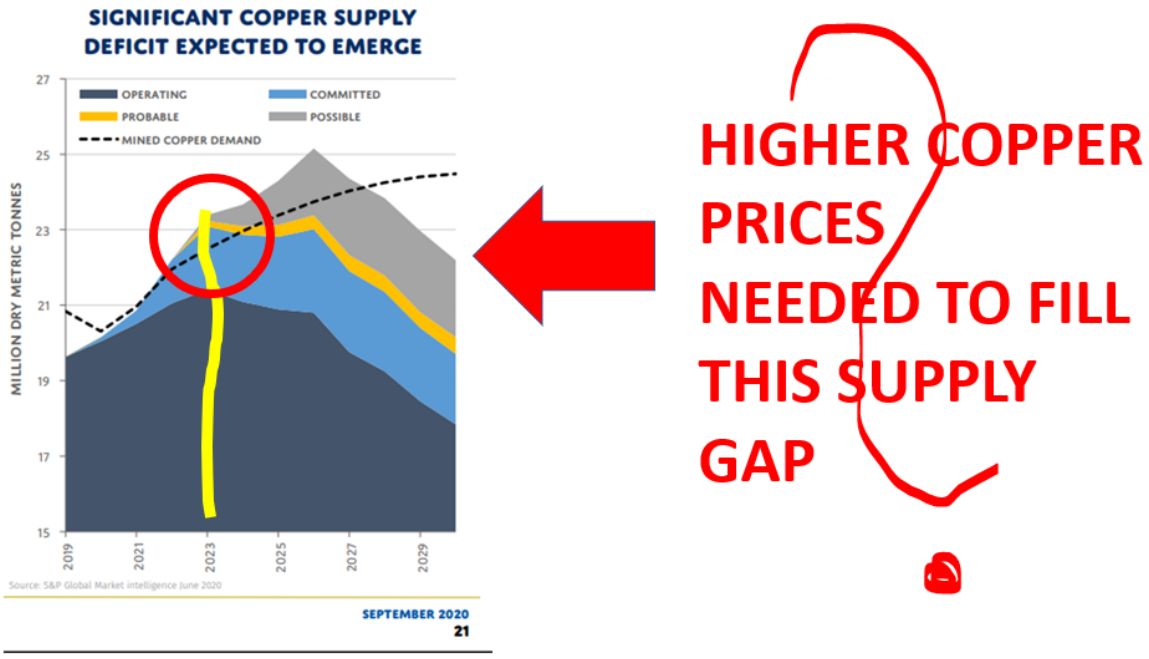
The copper supply gap forecast in 2015 – Visual Capitalist

For example, Fitch forecasts supply growth in line with demand growth. Something that would not create any kind of supply gap.



Highest expected copper supply growth - Source: Fitch

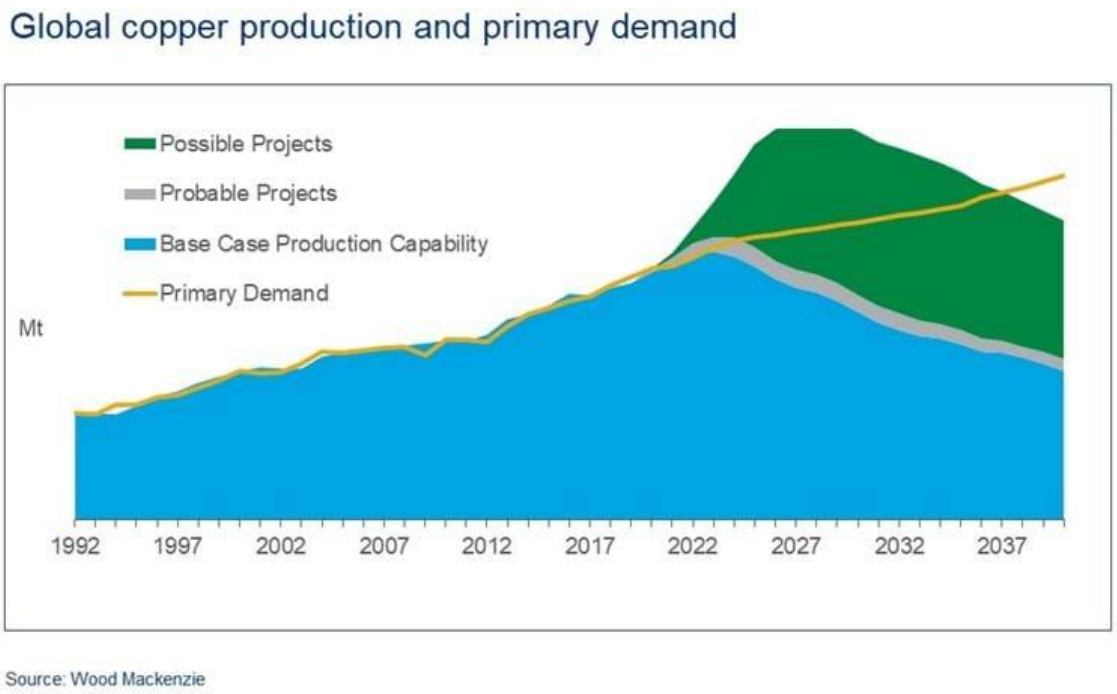
The presentation I used from Northern Dynastly at the beginning of this research shows how there is actually oversupply expected up to 2023 as new projects are being completed.



Potential future copper deficit – Source: S&P Global by Northern Dynasty

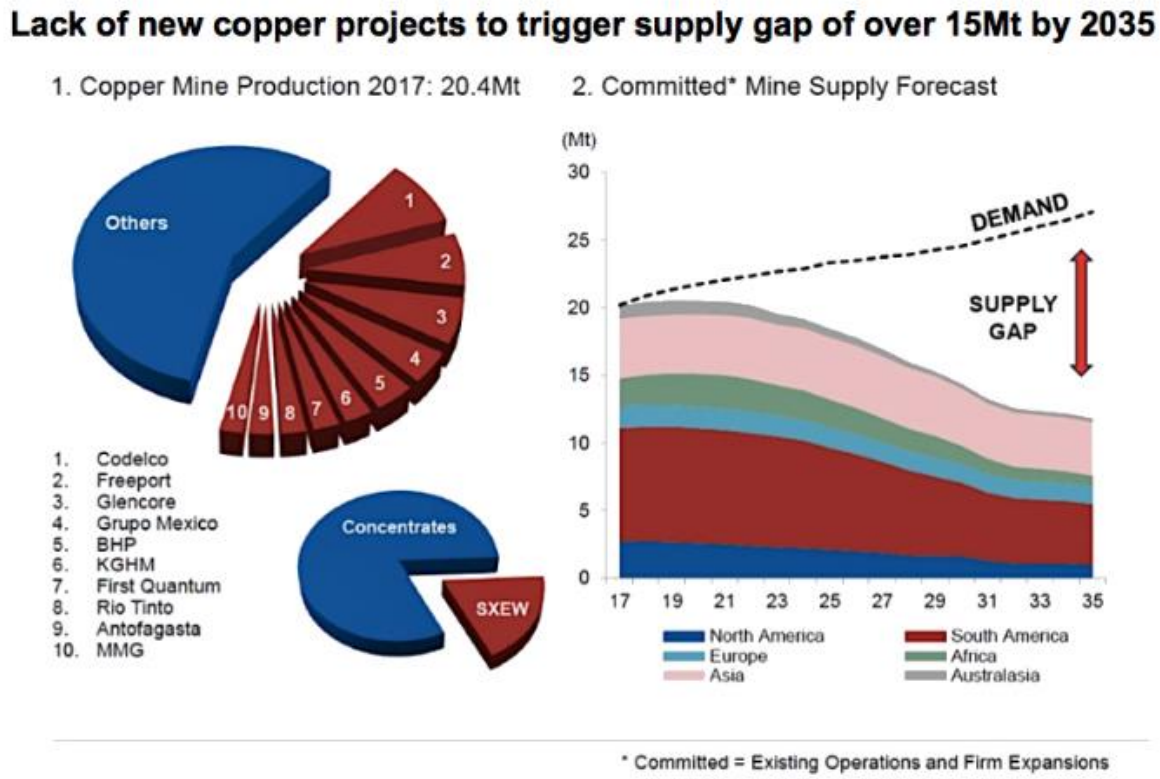
Only after 2024 could there be a supply gap that could push copper prices higher, if things evolve as planned.

What we have is a big difference between possible and probable projects forecasts. The latest Wood Mackenzie projection shows a supply gap opening by 2022 but possible projects could easily lead it into an oversupply situation.



Copper supply and demand – Source: Wood Mackenzie

CRU is usually the most bullish on copper with the supply gap expected to be 15MT by 2035.



CRU research – Source: Mining

Wood forecasts oversupply in 2021 and 2022 as commited projects come to life and hit the market. However, after 2022, there is not much new commited supply. Souther Copper (SCCO) had a plan to add 1MT of yearly production by 2025 but that has now been posponed to 2027 and perhaps even later. That is 4% of copper supply in 2025 and 2026 that is now certain it will not be there before 2027.

So, who is right here, Fitch , Wood Mackenzie, S&P Global, CRU, or copper miners in general? To give an answer to that, I have looked at every copper miner out there and calculated what is the current production level and what could be the production level by 2025.

Copper mine by mine supply situation and outlook by 2025 and beyond

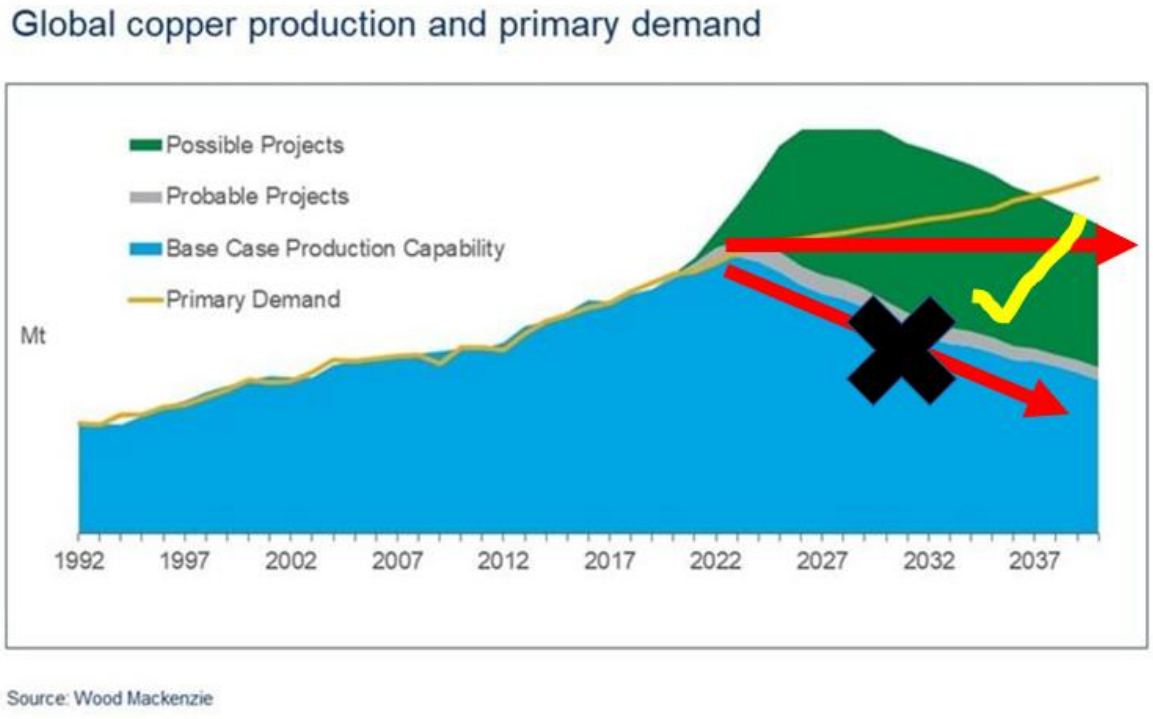
By 2025, copper supply should grow by 2.4MT from what is committed and being actually invested in, not promises. This is already supply growth of 2.2%. Thus, to see any kind of supply gaps forming, copper demand growth has to be above 2.2% up till 2025.

Going beyond 2025, I have SCCO adding 1MT around 2027, Wafi Golpu adding 0.15, 0.2 coming from Baimskaya perhaps and who knows what other projects will come online by then, it depends on copper prices. But, here I am already with another 1.35 MT being added. Mine optimizations, new near mine discoveries, might add to that and keep supply in line with demand.

Miner	2019	2025	later	Miner	2019	2025	later	Miner	2019	2025	later
TOTAL	11	12.3		TOTAL	15.38	17.2		TOTAL	20.52	22.94	
Codelco	1.7	1.7	=	Seabridge	0	0	KSM	Atalya	0.05	0.05	
BHP	1.7	1.7	+	Konkola	0.1	0.1		buenaven	0.05	0.05	
Rio	0.4	0.4	+	Zijin	0.4	0.5		Capstone	0.05	0.08	
Glencore	1.4	1.3	=	MMG	0.45	0.45		CAM	0.01	0.01	
FCX	1.5	1.9	=	KAZ M	0.3	0.35	0.2 Baim	Copper M	0.03	0.06	
Anglo	0.8	1.25	=	Boliden	0.15	0.15		Vale	0.4	0.5	
Antofagas	0.7	1	=	Lundin	0.23	0.3		Turquoise	0.2	0.5	
Norilsk	0.5	0.5	=	KGHM	0.7	0.7		ERO	0.04	0.04	
First Q	0.7	0.7		Ivanhoe	0	0.25		Excelsior	0.01	0.05	
SCCO	1	1	+1MT	OZ Min	0.1	0.1		Udokan	0	0.1	0.5
TECK	0.3	0.6		Hudbay	0.15	0.15		Solgold			?
GOLD	0.15	0.15		Jiangxi	0.35	0.35		Galore Creek			?
Newcrest	0.1	0.1	Wafi, 0.15M	China	1.5	1.5		other	4.3	4.3	?

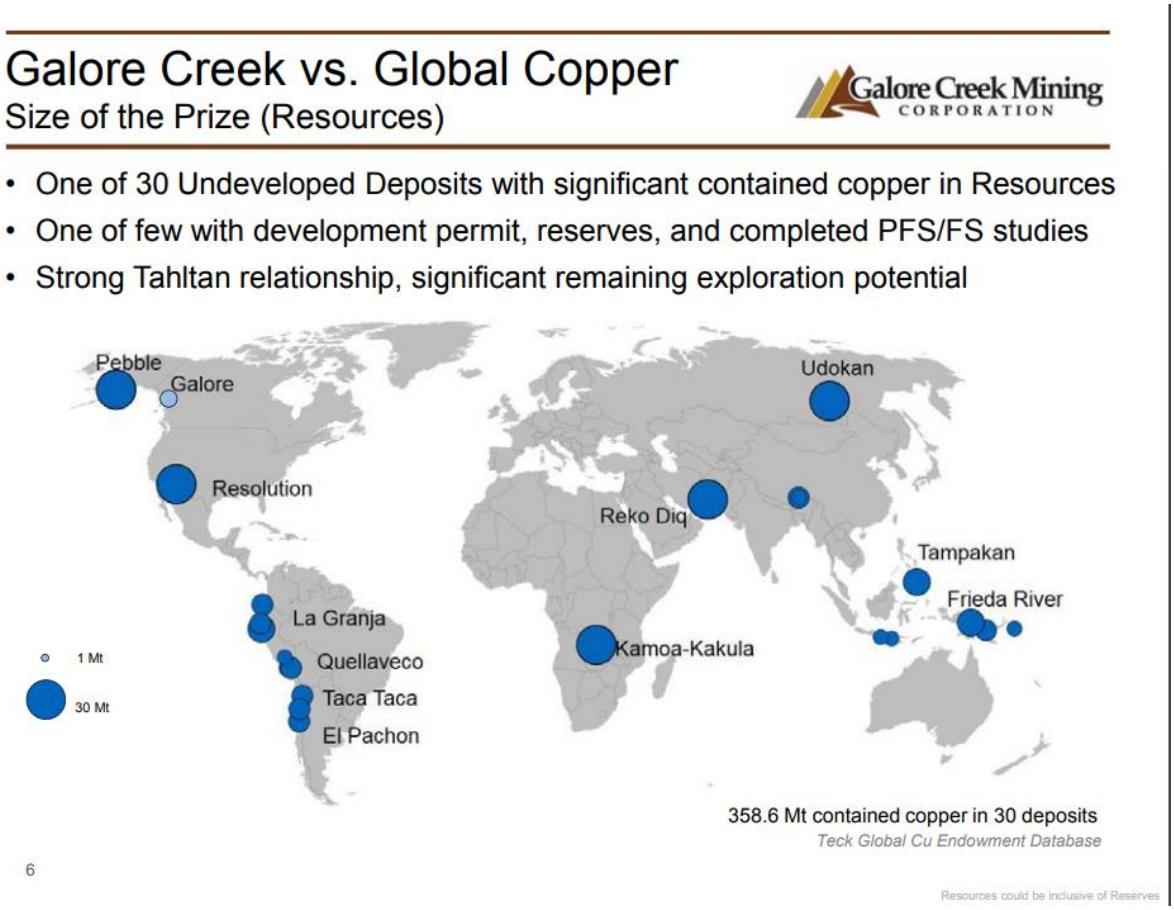
Source: Sven Carlin Research

Another thing that I found while looking at all the above miners and their production projections, is that they have the intention to keep mining beyond the current life mines and reserves. By using resources, that there is no point in turning into reserves now if you plan to mine those only beyond 2030 (drilling is expensive), I think supply will stay at current levels, not decline beyond 2025.



Supply will stay stable, not decline beyond 2025 – Thinking: Sven Carlin

What happens beyond 2025, depends mostly on copper prices and that depends on demand for copper. Higher prices might lead to faster development of the many potential projects out there that might consequently even have a negative impact on production.



Copper projects by size – Source: Galore Creek

Conclusion on copper supply and demand

If demand for copper grows at 2% per year, we will likely see a balanced supply and demand market for longer. Slower than 2% growth will likely lead to oversupply and faster than 2% demand growth might create deficits.

Of course, there can always be mining issues like huge strikes in Chile or other issues with like the current COVID-19 lockdowns that have impacted production, that can improve the situation for copper, but that is likely to be only a short-term option. Recycling is also important, a green energy boom might lead to higher recycling production too.

The margin of safety investing thesis would be to estimate 1% growth in demand and 2% growth in supply. This would lead to lower prices and subsequently, as low prices are the best cure for low prices, to cancelled projects and higher prices. So, it will all remain a cycle with copper.

The key is to understand the cycle, buy low and sell high. Let's check what kind of impact might the above have on copper prices and how to play the scenarios.

Impact on copper prices

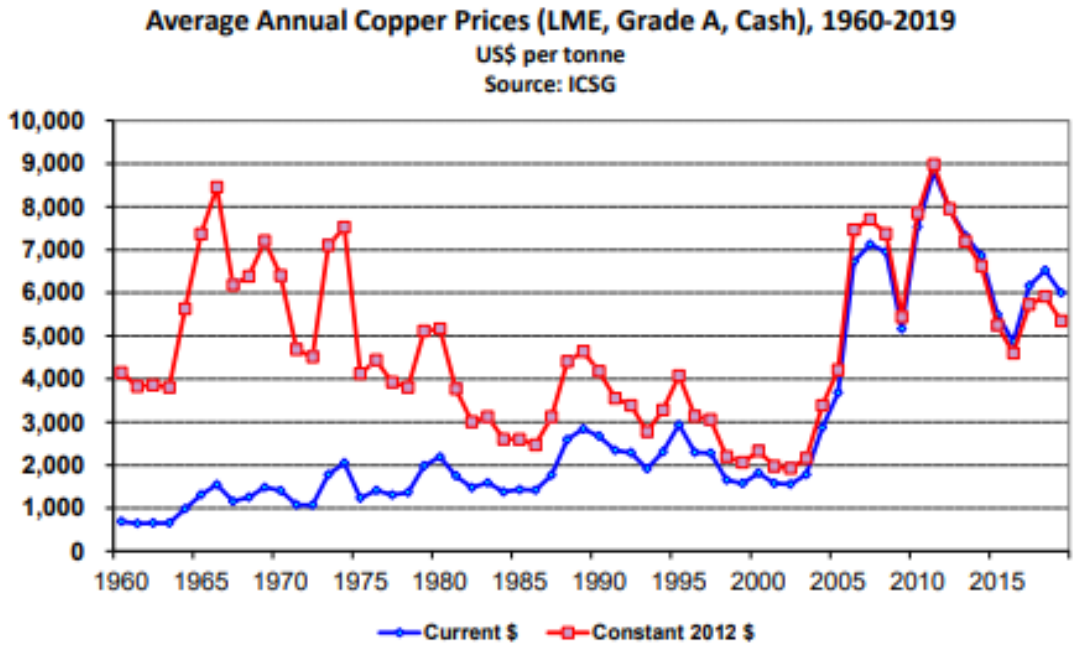
When it comes to copper prices and supply and demand, it is all a reflexive process and a very important one.

“The cure for low prices, are low prices”

Low copper prices don’t incentivize investments, which subsequently leads to lower supply and higher prices. Higher prices incentivize investments that later lead to oversupply and lower prices. This creates the common cycles with copper but also other commodities.

Low copper prices in the 1990s and early 2000s didn’t incentivizes investments. Chinese demand growth took the sector by surprise because it takes years to ramp up a mine and copper prices went above $4 per pound.

High copper prices during the 2006 to 2012 period, led to high investments that are still coming online and creating a situation of balance and even oversupply, which lowers copper prices.



Historical copper prices – Source: ICSG

Current copper prices are relatively low and don’t really incentivize too much investing which means that we might see another boom in the coming decade. You see above that there are long-term cycles and short-term cycles. Catching the short-term cycle correctly is already a big thing for investors. The secret is to buy low and sell high.

Impact on long and short-term copper prices

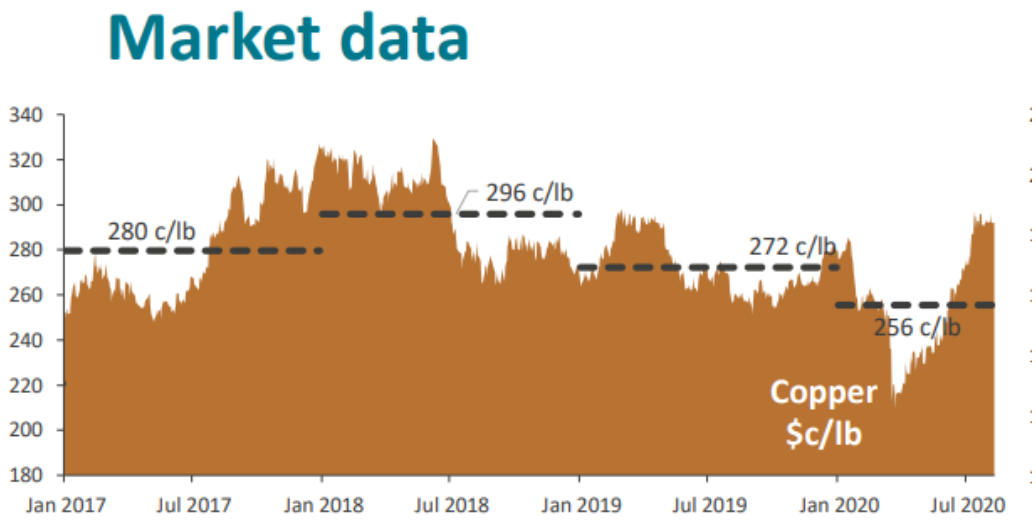
How to know when to buy and sell? Well, when things look ugly and the outlook is bleak, there is always the cost of production that gives a margin of safety and an indication of where we are in the cycle.

If copper prices are low, mines go on care and maintenance because nobody likes to lose money. So, when copper prices hit the level of C1+sustaining capex for 90% of the market, it looks like a great time to buy. The current level seems to be around $2.2 and will likely remain there over the next 5 years given the likely balance ahead in supply and demand.

Copper price and cost of production – Source: MMG

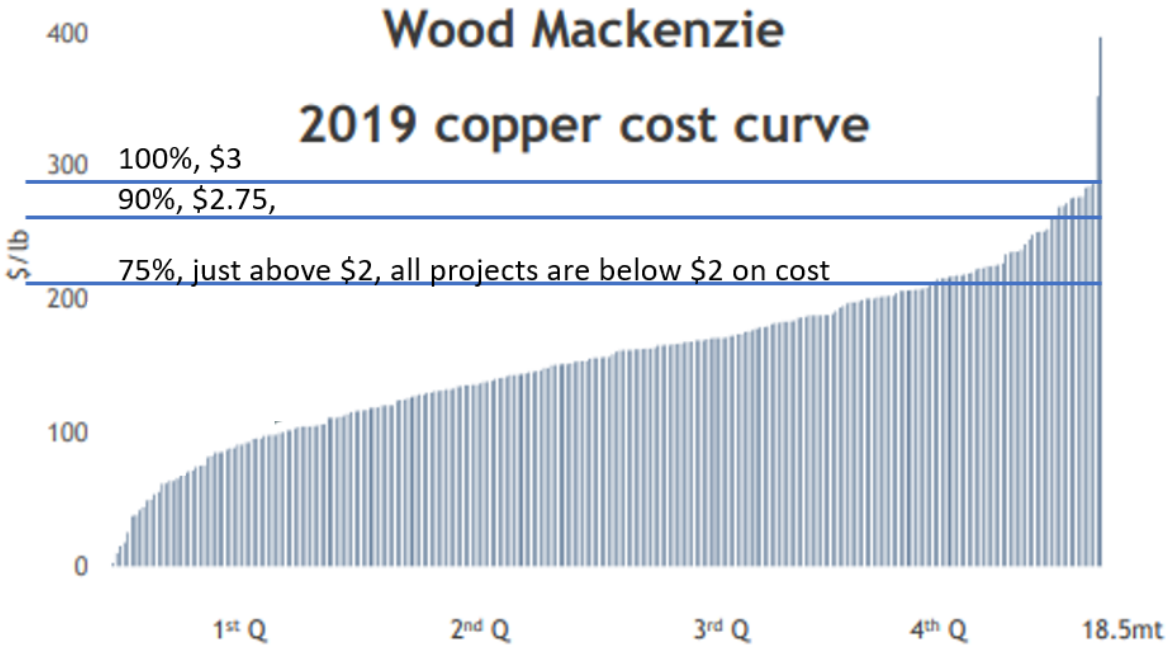
Thus, a buying opportunity that is low risk and high reward should be made with copper between $2 and $2.5 while long-term valuations have to be made using $2.75 copper.

Over the last 5 years, prices have been on average around $2.75 which should confirm the above. As we are likely to see a balanced market for the next 5 years, $2.75 should be the price in a balanced market.



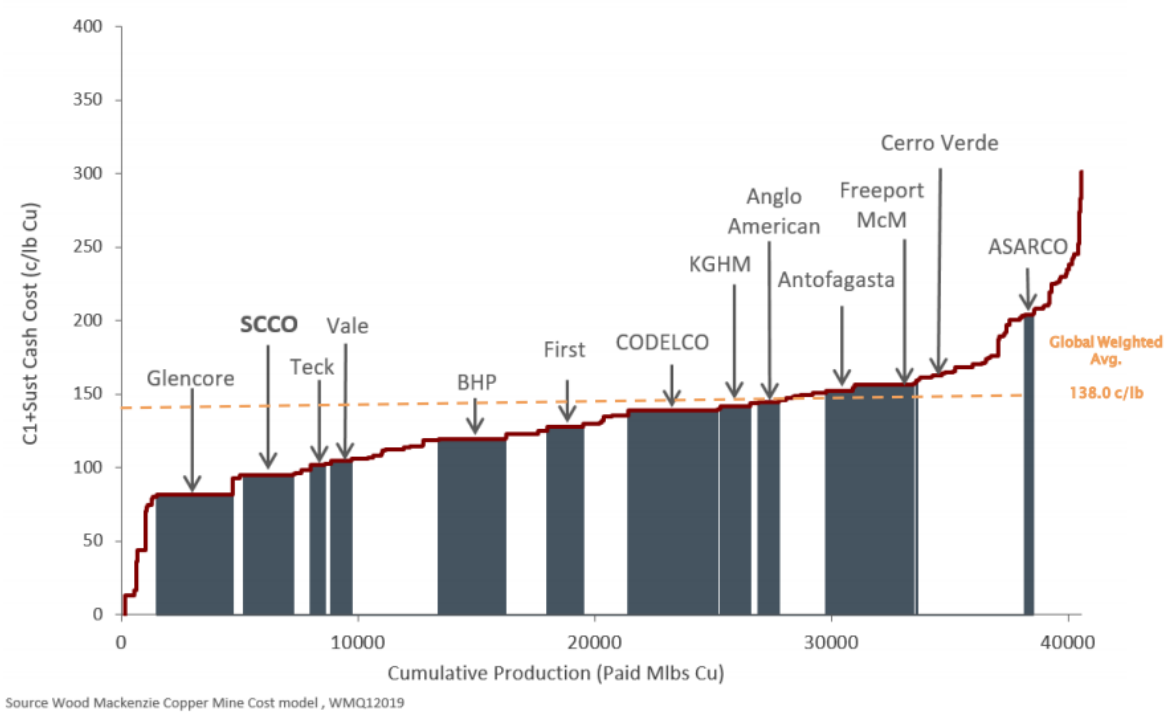
Copper prices – Source: Antofagasta

Temporary, due to production hiccups, we might see higher prices like we are seeing now, but the most probable outlook is for prices to revert to the mean, at least for the coming 5 years. Anything can happen, but we are looking here for a low risk, high reward situation.



Copper mining cost curve – Source: Wood Mackenzie

If we look at just the cash cost plus sustaining capital, thus not including investments, debt, taxes, royalties etc., then the cost of production is much lower and to stop supply, copper should be below $2.

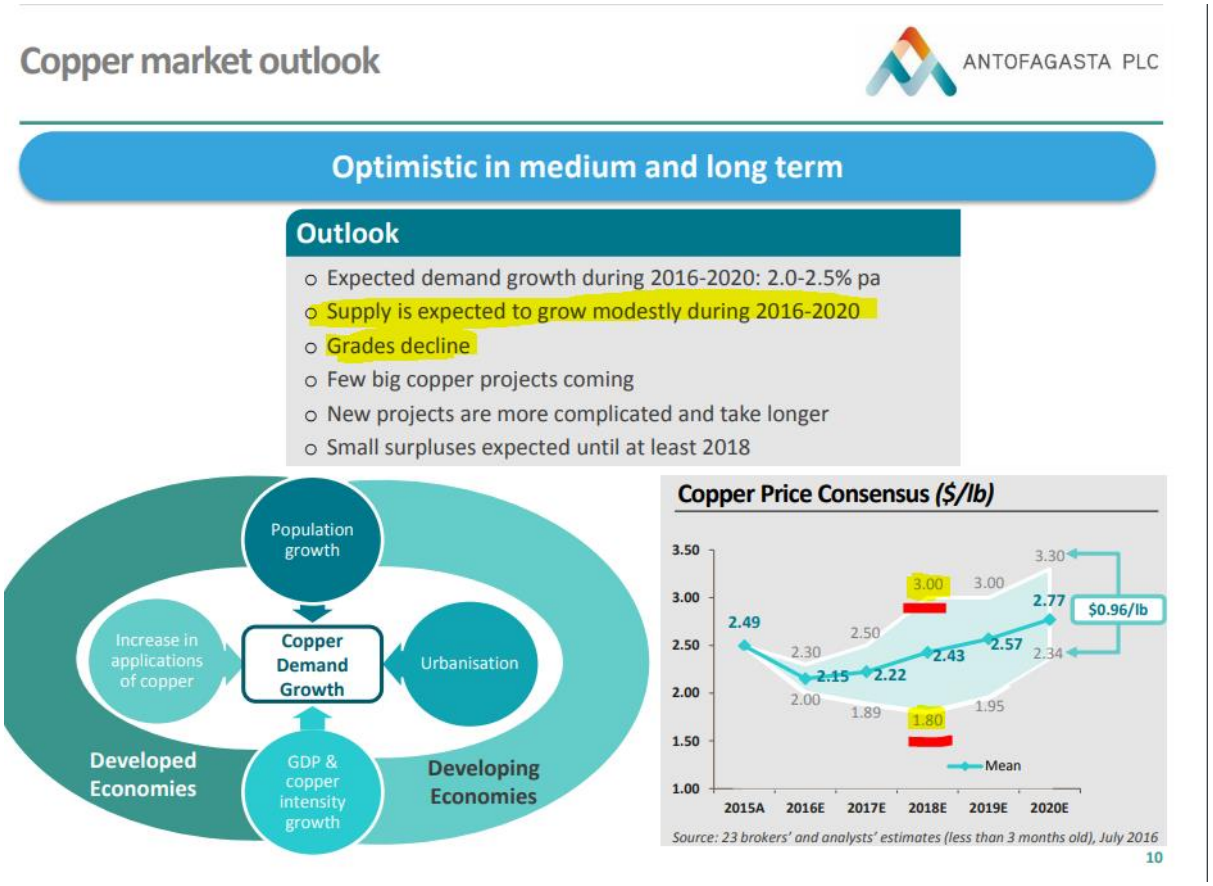


Cash cost plus sustaining capital – Wood Mackenzie

And $2 is the low we have seen copper prices reach over the last years.

Copper price over the last 15 years – Source: Macrotrends

I'll show a 2016 Antofagasta presentation with copper price projections. The ranges are from below $2 to $3 up to 2020.



Copper outlook 2016 – Source: [Antofagasta]

The $3 projections were right for 2018, but wrong for 2020. I think it is impossible to make projections, but what we can do is use ranges to see when the investing risk is low and the reward is high.

Given the cash costs of production, the likely market balance ahead with possible oversupply, I would say a low risk copper investment should be made when copper is below $2.5. Plus, there has to be a strategy where you can go bigger if copper goes lower.

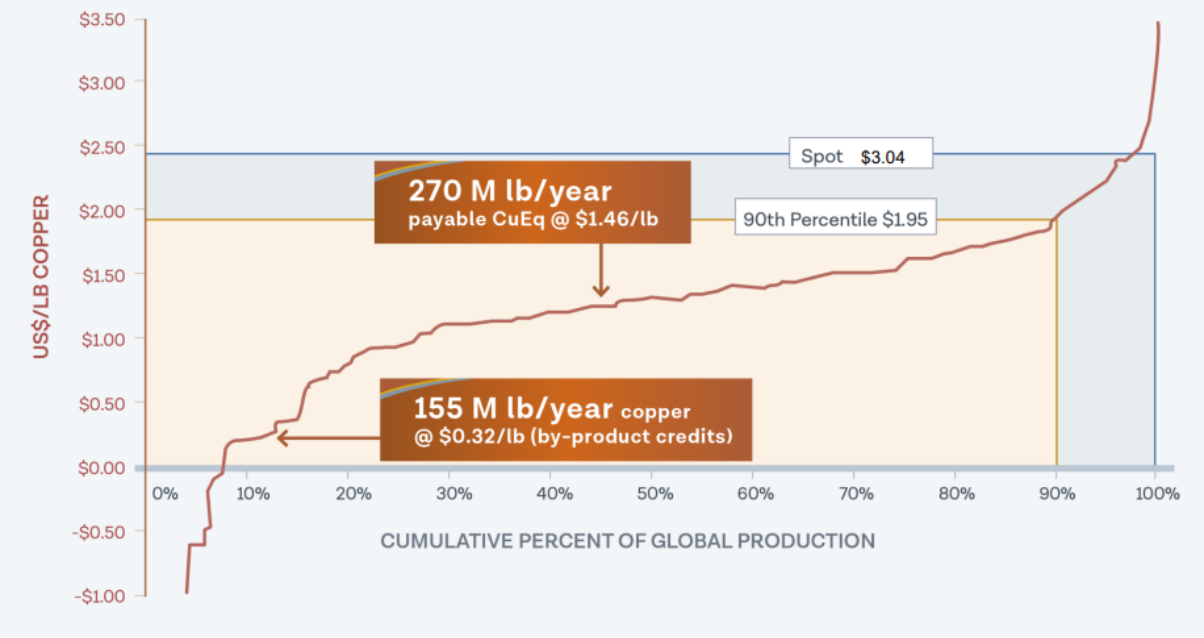
$2.5 first buy

$2.25 second buy

$2 third buy

Short term copper price impact

The current situation is the following, spot prices are high and could decline if supply outstrips demand as cash costs are way below $3.09 which is the spot price as I am writing this.



Source: RBC Capital Markets

The price is set by the marginal producer, so a small increase in demand can push prices for the whole sector to even $3.5 or higher. The opposite is also true.

We have already discussed how the current hot topic is renewables. Consequently, investment managers, in order to have a good story for their clients, rush to buy copper. However, they buy it for the wrong reasons because they buy chasing into a trend and don't think about fundamentals. Copper will be hot, but perhaps just not yet (I love the opportunities that are created by greedy investment managers placing short-term bets).

Fund managers buying copper

Wilkes said fund managers with access to record low interest rates were using debt to place bullish bets on the price.

Coming out of the pandemic and associated lockdowns, the 'green' story continues apace, as investors seek profit from environmental, social and governance metrics.

Max Layton, managing director at Citi research, said of sustainability that the bulk of the questions he fielded from clients were all geared around the move toward a greener economy.

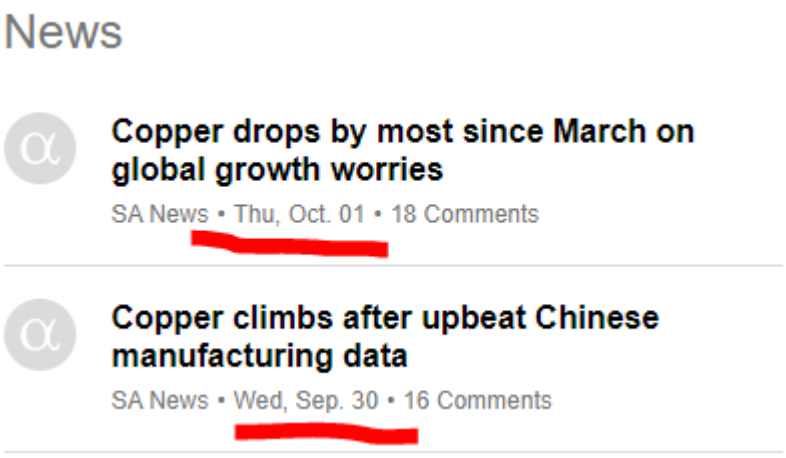
"[Copper is the] flavor of the day...copper is a standout across [the metals] complex. To me, [is the metal with the] highest probability of deficit."

Still, JP Morgan analyst Natasha Kaneva, said that although the bank was bullish on the outlook for copper -- with a peak price of $7,000-$7,500/mt near term, supply would recover from pandemic levels and head into a surplus of around 165,000 mt in 2022/23.

"The future is green...most likely 2025 [onward]," Kaneva said.

Source: SPGlobal

You can never make smart investment decisions if you chase trends, just look how copper related headlines change day by day.



Copper news on a forum

On what moves short term copper prices, there are many situations. Norilsk's 2019 yearly overview gives a good indication.

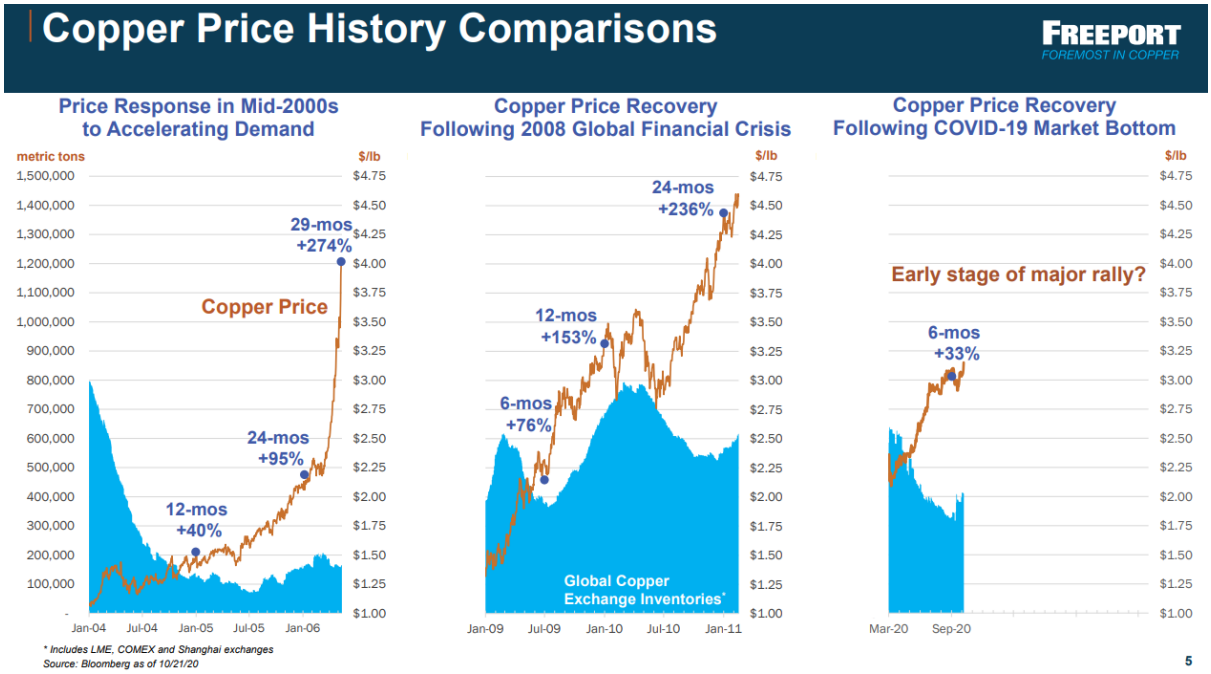
London Metal Exchange copper price in 2019 (USD/t)

Source: LME, Company data

1/ Research groups forecast increasing market deficit
2/ Freeport announces reduced output from its Grasberg mine in Indonesia
3/ Codelco reports a decrease in copper output
4/ Heavy rains halt production at some Chilean mines
5/ Glencore shuts down a number of mines in Africa
6/ Trade talks between the USA and China continue
7/ Falling copper cathode imports to China
8/ The USA imposes import tariffs on Chinese goods worth USD 200 bn
9/ Chinese countersanctions, tariffs on US goods
10/ Reports of declining production in Chile
11/ Strike at Chile's Chuquicamata mine
12/ Chuquicamata strike ends
13/ Increas in copper concentrate imports to China
14/ Extra US tariffs on Chinese imports worth USD 325 bn
15/ Research groups report increasing market deficit
16/ National strike in Peru
17/ News of a reduction in electric grid investment in China
18/ Brief strike at Chile's Escondida mine
19/ The USA and China sign a preliminary trade agreement (phase 1)

Copper price impact – Source: Norlisk Annual Report 2019

Impossible to predict is a certainty, the only thing it is possible is to look at long-term fundamentals. When I look at long-term fundamentals, I don't see Freeport's new copper bull market hopes of a major new rally.



Copper price rally outlook: FCX

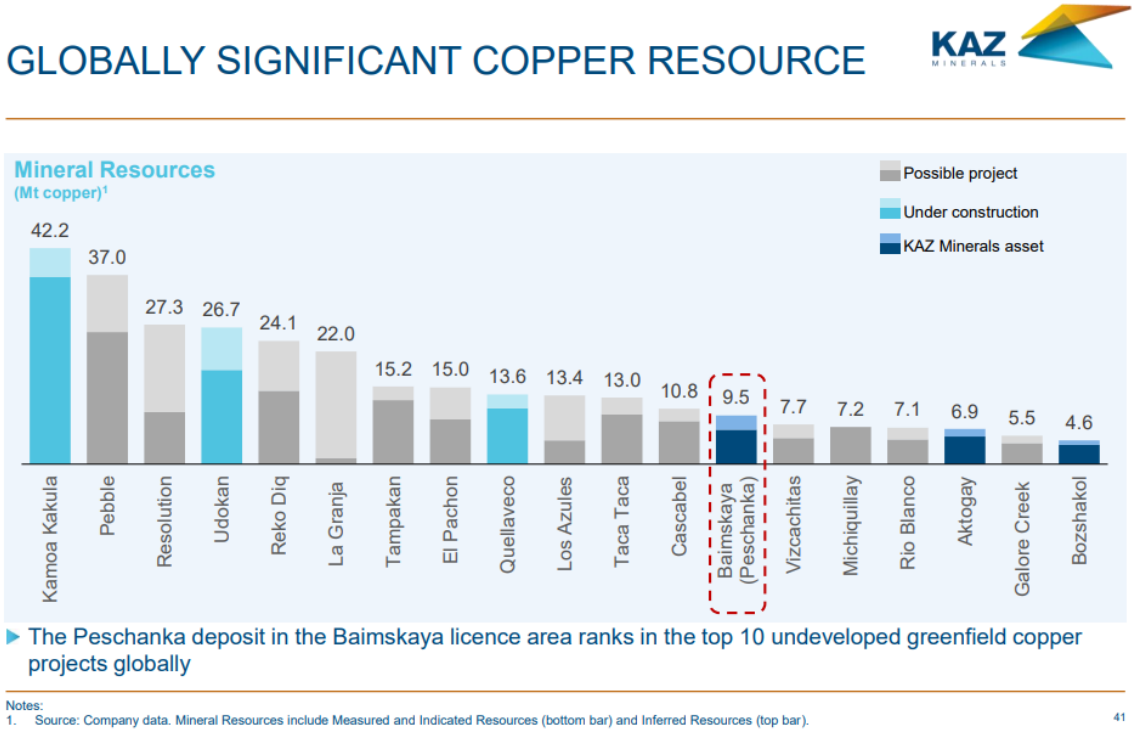
For me, investing is about low risk and high reward. For that I have to be patient and wait for the right opportunity.

Copper, the strategy

Now, if current copper prices are not sustained and fall back to $2.75, or even $2.5, there will be low incentive to boost production and it takes years to ramp up something. So, we might see some deficits down the road which could create interesting investment opportunities.

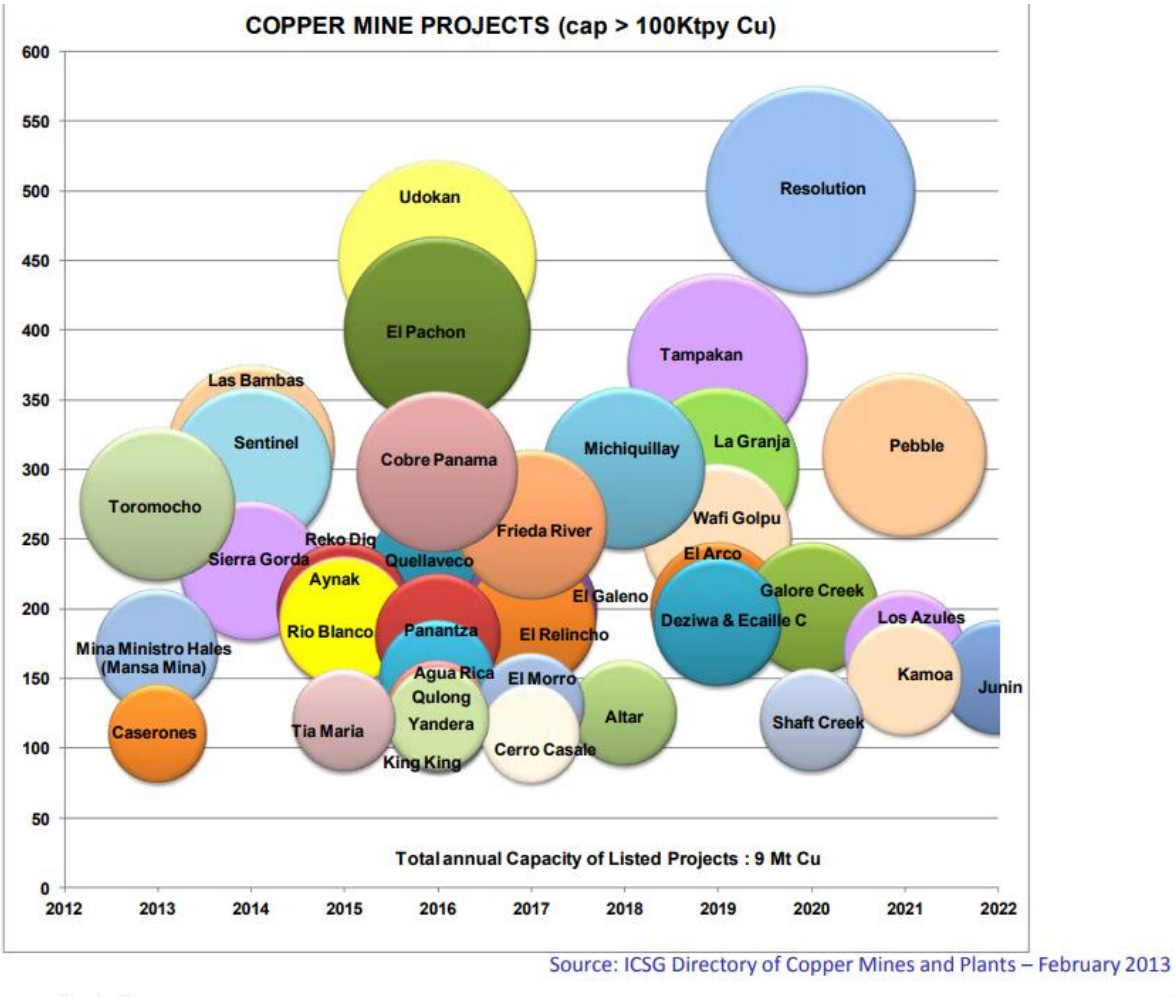
If deficits emerge already, then I'll miss the train but that is ok too. However, if there is oversupply over the coming years, then buying at low copper levels might be the smart thing to do.

If copper prices remain high, there might be many new projects coming online and creating oversupply later, which would postpone an investment opportunity. Therefore, patience is required.



Possible copper projects 2020 – Source: Kaz Minerals

On top of the above, there are many projects that have all kinds of issues and are not considered currently, but are there. For example: El Pachon, Tampakan, La Granja etc.



Copper projects 2013 – Source: ICSC

So, it all depends on the price of copper. I'll be patient and wait for the big opportunity when I'll swing for the fences.

How to invest in copper

Nobody knows where will copper prices go and be in the long-term. This has significant impact on various copper investments:

- Exploration stock – huge volatility on copper prices as project value goes from zero to infinity – timing is a big issue because a company eats up cash until it can sell or finance the project – means also dilution.
- Producing miner – cost of production, life of mine and debt are the key, plus jurisdiction, growth opportunities and general quality.

Stock	Mkt cap	FCF	FCF YIELD	LIFE of mine	debt	Debt to FCF	Mining costs	Production	RISK	Upside	Down	CHECK AT
FCX	$22	$1.5	6.8%	35 y	$9	6	$1.2		Cu	$44 - 100%	$7 – 70%	<$10
IVN	$4	DRC mining, overvalued from every metric, high risk, a bet on whatever.								$5 - 20%	$0.5 - 90%	<$1
TECK	CAD $10	CAD $2	20%	25y	$6	3	$1.4 $75 USD		Coal, LOM copper	$22 – 200%	$3.5 – 50%	<$10
KGHM	$5	$0.4	8%	20y	$1.5	3.5	$1.7	0.7 Mt	copper	0%	50%	never
GLEN	$30	$5	16.6	15y	$19	4.5	$1	1.37Mt	mix	$60 – 100%	50% - $15	<$30
LUNMF	$4.29	$0.45	10%	15y	0	0	$1.5		copper	$8 100%	$2.5 – 50%	<$4.29
FIRST QUANTUM	C$8.3	C$2	20%	25y	C$10	6.5	$1.3	0.8 Mt	legal	C$20 - 150%	C$4 – 50%	<C$5
OZ Minerals	A$4.9	$0.28	5.7%	15y	0	0	$0.7	0.1 + AU	growth	A$4.9 - 0	A$2.5 – 100%	<A$2
Ero Copper	C$1.6	C$0.8	5%	40y			$0.65	0.04 Mt	Deep UG			
Zijin Mining	$24	$1	4.5%	??	$7	7	$2	0.7 + Au	China, DRC	$24 - 0	$8 – 70%	<$8

Stock	Mkt cap	FCF	FCF YIELD	LIFE of mine	debt	Debt to FCF	Mining costs	Production	RISK	Upside	Down	CHECK AT
SCCO	$37	$2	5.4%	50	$6	3	$0.8	1Mt	No 3rd party technical reports	Grow – 100%	50% - copper	$37
KAZ	$3.8	$0.5	13%	25	$4	8	$0.8	0.3Mt	Growth and debt	Up on coper 100%	70% down on copper and loans	$2 – sold!
BOLIDEN	SEK 70	SEK 5	7%	20	SEK 4	0.8	$0.5	mix	currency	Grow 50%	Down 50%	SEK 40 Good!
HUDBAY	$1.3	$0.18	13.8%	15	$1.2	6.66	$1	Cu Au	Debt, permit	100% gold	50%	$0.7 for trade
ANTO FAGASTA	$13.39	1.3	10%	30	$2 – net 0	1.5	$1.25	0.49Mt to 0.65	Tax, Chile	100%	50%	$9

The more debt a company has, the more volatile will its stock be. Also, the higher the production costs, the bigger is the increase in profits when copper prices go up.

I personally prefer low debt situations, good businesses with good management. Of the bigger and safer players, Lundin remains the go to player. Glencore has much more debt, so it is also more volatile, alongside the coal and other exposure.

Lundin versus Glencore stock

First quantum as a pure copper player is a bit more volatile than Lundin. So, it doesn't really pay to risk much by going into leveraged plays as the market reacts similarly. First Quantum was up 200% while Lundin just 100% from 2016 to 2018, that is something, but I don't think the upside justifies the risk.

Lundin, First Quantum and copper prices

The key to see is how small changes in copper prices have big impacts on copper stocks. This is the reason why I am careful about long-term investing, at least for now where I don't see the beautiful effect of copper deficits just yet. Perhaps from 2025 onward and then I will do my best to buy in 2022.

The market is always thinking short term, when copper is low, they project low prices into eternity, when high like now, projections are for even higher prices.

So, the margin of safety strategy is simple, buy Lundin, Boliden and perhaps add a more leveraged but irrationally beaten down one to the mix when copper is closer to $2.5 than to $3.

If it doesn't happen anymore, well, doing a sector analysis like the one I just did, should lead to low risk high reward opportunities somewhere over time.