

Erik: Joining me now is Craig Tindale. Craig is a private investor, longtime Macrovoices listener, and has recently penned an article called [Critical Materials, a Strategic Analysis](#), which has gone absolutely viral. The Financial Times reported that it has gained the very direct attention of the White House and the Pentagon.

So this is really just incredibly great work that you've done. Craig, as a long time listener, this is not. The first time that our listeners have heard concerns about how China's dominance, in terms of the supply chain has considerable strategic implications. But I think you've done a far better job than anyone else of just concisely writing about exactly what the issue is. So congratulations on that. Why don't we dive right in strategic diagnosis of what you call the end of infinite materiality. What is this article about? Why is it important?

Craig: I guess it's the ultimate genesis of state capitalism versus stateless capitalism.

You've got on one side a state that is intent on dominating all areas of commerce internationally. And on the other side, you've got a free market. Philosophy that is gained by, price. And so the Chinese are basically the system by lower the cost of refining and smelting so that they gain control. If you look at 50 to 98% of the critical metals needed by the west to, to go forward with all their electrification, their data centers, their the EVs, just about everything, you can think of the, even the nuclear build out, it requires critical metals.

Without those critical metals, you can't go forward. And what the Chinese supply chain has done is grabbed it in the middle and directed it towards itself. And it's done that at multiple layers. The one layer is the smelting refining, which I just mentioned, the other is the Offtake agreements and the mine ownership which directs towards those smelters.

Another area is, the ownership of the actual mines. If you look at Xin Jing and, and some of the, the Chinese state owned mining conglomerates, they've gradually bought everything in the west, in particular gold, silver and copper and many of the others and then directing those outputs.

Until the last few years, those outputs haven't been used by the west. They've been used by China. They now control everything that we need to control to reshore, everything. And it's Alexander Hamilton, I think pointed out in 1791 article of manufacturers that went Congress. That liberty and freedom exists, not by itself.

It's a contingent on having a manufacturing and a supply channel that allows it. That at that stage, Hamilton was looking at the dependence on the English. And I I guess I put it today that we're looking not at the English, but at the Chinese and that all his assumptions about the importance of that existing and the manufacturing existing is actually, you know, conditions precedent

For the West to be successful. And without that, we'd be, we'd become enslaved. We're almost serfs in the whole global supply chain. I guess I, I frame it like this, that we have a, financial balance sheet, and we're good at that.

Putting claims upon claims. But we've disconnected from the physical or the balance sheet that matter. And so these two things are separating as we speak and as they separate the ability for us to control our destiny becomes less and less.

Erik: You write about the feedstock paradox.

I love that terminology. You're describing this phenomenon where it seems like there's something about human nature, that people think about the raw material as the strategic asset. President Trump has clearly become aware of the importance of rare earth elements, but. He's talking about where we can mine them and the reality of the situation is China's got you've done some fantastic statistics, so I shouldn't speak for you.

Give us a perspective how much of the refining and Processing that's necessary in order to get any benefit from these raw materials. How much of that does China control today? And what would it take if the United States were cut off from that Chinese supply? What would it take for the United States and the rest of the West to recover if that event were to happen?

Craig: They've got 50% to 98% control depending on the category of the metal. 90% is, things like scandium, I'll start at scandium. Scandium is used in an aluminum alloy, and that aluminum alloy is I guess relevant to the new combat drones. And F 35 was built on the physics of G force 9 because that's all human beings can connect with

A combat drone can do 20 to 30 G because there's nobody sitting in it and the alloys required of that are a new industrial material. The whole west produces 15 tons of scandium per year at the moment, and they need hundreds, if not thousands of tons of scandium to build these combat drones.

The only source of that scandium at the moment is virtually China. And so if we wanna build our combat drones and defend ourselves and not create incentives for war, that is, there's two sides of this. One side is we have to defend ourselves. I think what people miss is if we can't defend ourself, we create a, an incentive for the more powerful nation, the foreign nation, to take advantage of that and having a good defense is, is important to creating a world piece as anything else, but copper's the same. Copper goes into almost everything, , in some of these ultra high voltage Cables per kilometer. There's about 60 tons of copper.

I read an article yesterday there's 2177 tons of copper in Microsoft's new AI data center in Texas. The US planned to build 13 to 15 of these. That's a lot of copper. Everything we look at the physical intensity of copper is apparent in it. The, and it go, and not just the copper, it goes into everything.

Siemens at the moment have 138 b euro back order on equipment, things like the major transformers the major transformers are taking four to five years to be delivered. So we can build as many nuclear power stations as we want, but if you can't put the transformers in place to actually move the electricity, and if you can't put the UHV in place that is the ability to transmit over power lines. They're stranded assets, these nuclear power stations. That's why a lot of these new these new AI data centers are being set next to nuclear power stations because they already have equipment in place and they don't have to wait.

So you end up in a situation where they control our destiny they've already licensing a double licensing program and, it was a few days ago, they decided that they work gonna supply rare earth to Japan for the defense industry. You know on, the other side of it, Siemens with their 138B Euro back order

Relies almost a hundred percent on rare, heavy, rare earth from China. The order book from China is about 15%. You can really imagine China going well, if you want your rare earth, we want our transformers first. So they, they layer upon layer the ability to dominate the supply chain just by the, their initial influence.

And, this happened in history if We look, go back to 1914. There was a thing called the zinc crisis. A company called Metallgesellschaft German company was established as the major refiner of zinc and copper and a whole bunch of the other industrial metals. They had subsidiaries in North America and they had subsidiaries in Australia.

Ironically called Australian Metals and American Metals, and they basically took the off takes from those mines and sent 'em to Germany. And the Battle of Algiers in 1914, the French were overrun because they ran outta shells. A lot of people don't understand why the French got overrun so easily.

A lot of people say, they lost to the old generals were relying on horse cavalry and things like that. The reality is they ran outta shells. And Lloyd George the Future British Prime Minister was made minister for, munitions in those days because the fear was that they wouldn't be able to supply themselves.

So this has happened before many times. It's not actually a unique thing in history. It happened, you go back in the 16th century Spain, the Spanish had, all the gold from the Americas and silver as well. But they couldn't, eventually they couldn't buy, anything because the Dutch were making everything and Europe was making everything and no take their gold because they couldn't manufacture anything themselves.

And eventually the Spanish Empire fell, even though they had, a mountain of gold. So you, we've got rhyming right through history of this kind of thing happen. We just haven't had that happen at this scale. Now how can we fix it? That's a complicated subject. It obviously depends on will.

Whether we can optimize the political skills to do that. I think President Trump obviously sees it and I think he's probably seen it intuitively. He's almost hamiltonian in his regard of manufacturing and Reshoring the future materials and manufacturing capacity of the USA, he almost follows a complete Alexander Hamilton playbook. And Hamilton came up through, intense conflict and so he knew the importance. Eisenhower was similar. Everybody reads their Eisenhower speech and says, watch out for the military industrial complex. Eisenhower was even more interesting if you read the rest of the speech.

He was worried about the manufacturing complex and the ability to be self-sustaining, and that's what he warned about. We take one message it's similar to this freedom and liberty. It's an ideal, but we forgot what the foundation of that ideal was, and that's interdependence.

If we're beholden to foreign powers. We risk that liberty and freedom right across the west because we become beholden to the supplier of our goods. And they can withdraw them. They can stop our reassuring, they can do all the things that they need to do.

Erik: Craig, I think that your focus on the midstream, in other words, it's not where the rare earth elements get mined from, it's who's got the ability to actually separate those rare earth elements and produce the final product that we need for all of these applications.

Some numbers taken directly out of your article, and by the way, I should have mentioned at the beginning, folks. Craig's article is linked in your research roundup email. It's free on his substack, and I very strongly recommend that everyone read it, start to finish. It is cover to cover, just an outstanding piece of writing.

But if you look at something like Gallium, which is essential for certain kinds of military radar and 5G networks and semiconductors and so forth. China controls 98% of gallium production, not where it's mined, but where it gets refined and produced. Magnesium smelting, 90 to 95% rear earth separation, 90%.

The high tech magnet production, which is the heart of electric vehicle motors wind turbines for for wind powered energy and so forth, and the actuators in defense mechanisms. More than 90% controlled by China graphite. Anode production for lithium ion batteries, more than 90% controlled by China.

Tungsten production, more than 83% controlled by China. And there's a long list that continues after that. Craig, what would it take? If president Trump were to get together with other Western leaders and say, boy, this leaves us exposed to where if China cut us off from all this stuff, we would be completely helpless.

We can't have that vulnerability. Let's reshore and rebuild all of that capacity so that we're not dependent on China for any of this stuff. How many years and how many dollars would it take to eliminate this dependency?

Craig: Short answer is trillions. I think it's variable because there's a lot of stuff on foot at the moment.

They can already see this, the White House and Congress and the Department of War as they call it now. I track a lot of companies who are receiving funds. You know as far back as two or three years ago to develop our capacity to refine rare earths and all these metals.

If you look at a company like UCU UNICOR I think they've received something like a hundred million dollars already to produce a rare earths capacity in Louisiana

Which has gone into initial production, I think this month or the or next month. You've got companies, an Australian company like IPX, Hyperion X. Now they're producing titanium. Outta Virginia. And they've got a new process that they took from the University of Utah from a, a scientist called Zach Fang which I is a delightful name.

He works in the University of Utah. He's like the Steve Jobs of. Of materials science, he's come up with a way of making titanium powders, at 80% less cost than the current method. There's another company that comes from Metal is also Australian lead.

It takes the, technology and the IP from James Tour outta Rice University. And they use a thing called flash dual heating, which heats everything up to 3000 joules, injects some chlorine into it. You get a methyl ox oxide out it that then can be separated into its different streams.

You know, not many people realize it but, the department of energy tend put out just before Christmas for three \$25 million worth of funding to take rare earth to titanium gold and silver out of fly ash out from from coal fired power plants, for every coal fired power plant is billions and tons of fly Ashes sitting around it that were, the output of the burning so much coal. , they all have a a significant amount of minerals still in them. They just have to be extracted. There's a number of innovations that we're doing, and it's like fits the old American, Yankee knowhow innovation cycle, that a lot of this stuff is coming to the floor But what it take is lowering the cost of capital for these projects. These projects haven't, flown in the past because, we've been funding things that give quarterly results. Like social media, like a lot of the software's gonna eat the world type stuff. You learn the code type of stuff where the cost of capitali not Not high at the start, and once you've built the software, you just have to incrementally add to it.

It's not a 10 year return and it, the return is fairly significant. So we haven't, we measure bread and milk as far as inflation, but we don't measure the asset market as inflation.

So we measure bread and mild but we don't measure the price of shelter. And so when bread and milk have gone up, we've raised the cost of capital and not notice that a lot of the industrial projects have been killed off. It be, as soon as, we go to four and 5%, the industrial projects, die on the vine. And we go back to the kind of hollowed out economy that the Fed policy.

Creates for us. And it's the Fed policy that's, at the core of the problem, the core of the problem is that industrial projects just don't get the funding that they need. Now the other one is weaponized pricing. We've gotta deal with that. Weaponized pricing is, every time, at the moment there's great example is copper melting in China is being done at negative cost. So if Peru and Chile ship their copper to china they're getting paid \$50 a ton to, to process it. Now you imagine what that does to the copper refiners in the west. They can't compete. It's their method of, gaining complete control. They send us broke in the key areas that we need to evaluate.

I think one example is the chairman of Palantir has put together another startup called Epirus, and Epirus basically shoots a gallium gun, microsecond at drones drone and they just fall out of the sky. It fries their internal electronics. You put these gallium guns in low earth orbit and you can fry the electronics of an ICBM inside the silo.

So they have very consequential, you, if you take it away from us because it changes the, the pathway of our defense. You know we talked about copper, if you cannot put the copper in place. The end product it you can't build anything that we're talking about. So we need to do what we did in 1914 and what we did in different other scenarios and bring that onshore now. I think there is a pathway to do that. I've got another paper coming out on how to change the fed to do that and separate the Fed's ability to price control consumer prices, but separate out the infrastructure and industrial items so that they can survive.

So they're not measured as part of inflation. And, we may even have an interest free bond or something like that type solution where we offer. Not an interest free bond. A tax free bond where we offer pension funds, an alternative to investing where a pension fund would flow money into an industrial project and it wouldn't be paid by the treasury.

It would be paid by the industrial project and a tax free rate.

I guess the industrial project owners would be would part, would, partner with the state like the Chinese do to produce the industrial output that they need to do. There's no other way of doing it. State capitalism on the Chinese side I think is, 50 points ahead at half time.

And has got, we're not playing well enough to make a comeback.

Erik: Let's talk about how the AI trend plays into this, because a lot of military experts have opined that basically the AI race between the US and China for

leadership on AI is akin to the US Soviet arms race because AI has such profound implications in terms of its military applications and so forth. From reading your article, it sounds to me like we're headed, this is 1947. We're headed into an arms race, not with the Soviets this time, but with China, and it's about AI, and the strategy is gonna be that we'll buy our nuclear warheads from Moscow.

What? That doesn't make sense. How much of you know you gotta do two things to build an AI data center, you've gotta have all of the copper and all the materials that go into building that data center, and then you've got to power the data center. How much are we dependent on China? If China, th thought that the str, if we be ever did get into a kinetic conflict where we're actually at war with China and they decided to cut us off.

How much would that impair our ability to build AI data centers?

Craig: It could potentially totally impair, you'd end up with a situation where you've gotta do rationing on the western side to make sure that they get the materials they need, build the data centers. If we. If we start looking at AI not as a consumer device I guess Michael Burry sees it, and as a weapon system which you've just outlined then, it becomes a different equation because.

If you can't build these ai da data centers and they're weapon systems, the arms race takes a whole different feel, look, and feel, and all of a sudden, you return on investment and the various metrics that you would put on it as a con, as consumer item go out the window and it becomes a must do.

OpenAI to me is a weapon system manufacturer of the future to reconceptualization. But You know, it, it essentially is. And so a lot of this Michael Burry thing about, it's a bubble. It doesn't equate properly with where it, it actually sits. It's making it sound like it's a new Google.

Where in fact if they don't succeed. The West might not succeed either. Now, individually, they, they may or may not succeed. But I think the workloads that are potentially coming onto these, systems are so important that, we can't look at them as a consumer device Now. If you've got Transformers taking, four or five years to get to you from Siemens or Hitachi and the rare earths they're depended on, and then you're in quite a chokehold you need to find that stuff from somewhere else.

And, I think in the article I outlined. Potential areas that would probably unthinkable today, but they won't be unthinkable tomorrow. They, it's 20 grams

of silver in a solar panel. I propose that you tear all them up if you get into real desperate circumstances and use them for data centers and weapon systems.

The same goes for gallium and all the other things. Where we have to reframe the world to some extent. The world is not how we see it or how we've seen it. The world is a different place and we have to, reframe our conceptual building blocks to, to look at the world this way because a denial by China or Russia because trust Russia control some of these, these things as well, in particular titanium.

That framing changes how we look at capitalism. We have to adopt some type of state capitalism and everyone will think that's nationalization. It's not nationalization, it's just an admittance that stateless capitalism that followed price to the point of efficiency so far that letting our foreign power supply the things that are crucial to the ongoing perseverance as, as the west, it's that important. And the density of copper is significant. The density of silver is significant as well.

Erik: Now you wrote this article, Craig, from the perspective of geostrategy and basically trying to get policymakers attention to recognize how vulnerable we've made ourselves to being cut off by Chinese dominance of supply chains, but.

You actually got to this through your own research. Not trying to research geopolitics, but research investments. So let's talk about where the trades are and where some of the opportunities are. I hate to take such a grim topic and try to make a buck out of it, but, that's what we do here on Macrovoices sometimes.

Craig: That's what I do too.

Erik: Let. Let's talk about that. I wanna start with silver, which you mentioned a couple of times. Most analysis that I've read recently about silver says, okay, look, what's going on here is silver is basically gold on steroids. We've got central banks buying up a lot of gold because they're concerned about US policy that's just causing the bubble in silver that's about to blow off.

There's really nothing substantial behind it. I think you've got a very different perspective from reading the article. Tell us about silver's atrategic importance. How does it play into the rest of everything that we're talking about? And is this a bubble that's over in silver or is it just getting started?

Craig: It's, yeah, let's just do some numbers. We've been 5,000 ton of silver short for the last four years, I think the overall it's 24,000 tons. Since 2020. When we're in deficit, we have to drag it outta vaults or people's cutlery drawers in order to provide it, silver is actually central to the whole electrification. The AI, there's 20 to 40 grams of silver in a major missile. There's eight tons of silver in a data center. There's almost, in the robotics world, if Elon's gonna build these robotics armies there's a good percentage of silver.

In each robot. So it becomes a substantial input. Now, 70% of our silver comes as an off take from copper, zinc, and lead refining. That's 60% happening in China. Now we are already in deficit, let's take that into account, even with the Chinese output. Now just before Christmas they put some licensing in that basically said that all silver would be licensed to the end supplier. I think there's 43 different Chinese companies that can output silver.

Now, what if they decided to cut all that off from us, from the west? All of a sudden the 5000 ton a year deficit turns into maybe 10000 ton a year deficit or more now they all must have to come from the cutlery drawer so one analyst says there are 200000 ton in inside people's cutlery drawer. Like I doubt that because I actually don't think anyone knows how much is in the cutlery drawers and the jewelry drawers. But we would have to drag it out the vaults and that's gonna send silver. Obviously skyrocketing because the net cost of silver in some of these products is marginal anyway.

There's a lot of silver in an EV, but, if silver doubled it's only gonna add 1% or so to the cost of the EV. And then we've gotta prioritize what silver goes into what, we if we look at AI as weapon systems rather than consumer items, they would get priority over an EV.

I'll give you another thinking model. And this is triggered by what happened to BHP recently. BHP were told that they were gonna take offshore C&Y.

As payment for iron ore and BHP refused for a month. And then they decided that they would accept the offshore C&Y. They were the last holdout of all the iron ore producers. What if China said to us you can have these rare earth minerals but we're gonna require offshore C&Y to pay for them. That would introduce a really weird dynamic because all of a sudden you've gotta have industrial companies in the west trying to reshore the AI companies building the data centers, the defense companies trying to sell C&Y in order to pay for these things.

I noticed there's a number of gold producers being acquired by, if you look at the quantity of that, it's getting quite significant. What if they gave for golders money and they backed the C&Y with gold and they require all of the rare earths and critical metals to be purchased under offshore C&Y. They could still run their internal renminbi. As a currency that was fiat and then they run the outside currency as a as a reserve currency, so to speak.

All of a sudden you, the tables change. There's, doesn't mean that USD would crash or Euro would crash or anything like that because they're still required to service debt, but it would change the whole dynamics of the currency market. Still put them in a place because, you even go down to the machinery level.

Linus Metals put out a note. A few months ago, basically saying it's all well and good for us to start building these refining points in Texas. But we need the Chinese machinery to do that because we are not making in the west, the machinery to refine these metals. We're beholden to them for even the machinery.

So we've gotta learn how to do that. So that puts a lot of gap, that puts a lot of I guess risk in the west, climbing back into a situation where they enjoyed for the last four decades, and that is dominance over, Hegemony, the over the east.

Erik: As you look at this picture overall, where do you think the most opportune trading opportunities are?

We talked about silver briefly, but what else is going to get scarce? As much as the solution to this problem would be for governments to make big investments in reshoring, you've also said in the article that you don't think that reshoring will be. Profitable for a lot of American companies in the short term.

So it's not the actual reshoring that you want to invest in. You probably wanna invest in scarcity. First of all, would you agree with that? And if so, what other things besides silver that, silver's already seen a huge move. What hasn't moved yet? Where's the ripe trading opportunity?

Craig: Isaac's, the ripe training opportunities are the ones where our own form of state capitalism starting to show their face. You know, I mentioned a few of them before where, the Department of War and the Department of Energy are starting to finance some of these companies, and I think they give us, the trails to follow about the companies that will flourish in this new era

You know, the, the new scandium plays, the new gallium plays. There's some winners being picked and being subsidized with state capital from the West, and that's happening right across Canada, and it's happening in the Australia as well. And they're the, I guess they're the sense to follow to, to good returns.

Some of these companies that I'm sitting on at the moment have already had, you know, four, five hundred up to a 1000 percent near term increases in price as far as stocks. MTM for instance, I think I bought at 8 cents and it's near a dollar at the moment. I wouldn't be surprised that goes to \$50 at some stage.

Now that's crazy. I know, but they're the kind of returns I think you'll get from this circular economy. IPX that I mentioned, basically uses some IP out of the Rice University. And what it does is it heats up fly ash and e-waste so all the circuit boards and that, is sitting in millions of tons in the US and it, he heats them up and injects some chlorine into it and makes a chloride, metal chloride mix outta it.

And then you can separate it at the chloride stage. I can envisage a company and then, I just don't mean this one. There's a there's a dozen of these types of companies where all of a sudden, we're processing the e-waste. They just made an agreement to take 2,500 tons of e-waste off glencorp. So they're fraternizing with the large industrials and they take that e-waste and, out a ton of e-waste is about 500 grams of gold. Out a ton of e-waste is about 300 grams of silver. I mentioned fly. The same thing is if you heat it up.

And in that add the chlorine mix, you get this chloride that all of a sudden makes it a circular economy. We can start processing these things. And this kind of fits the mode that we've used in the past in war situations under, under, under conflict where we've had to use our own resources and I think ultimately it serves us because it's gonna teach us to be innovative. There's another one Hyperion X that's gonna make titanium outta Virginia. 25% of an F 35 is titanium. I don't know. The, we're letting the, I guess the. The capabilities, even now downgrade.

But they've been given \$115 million outta Department of Defense to, upscale this titanium capability so that they can produce titanium oxides. Now, this is an innovation story. We've just had the two last two decades where we've worshiped at the altar of, Zuckerberg who I guess is, main claim to fame. This is hypnotizing our attention and distracting us where we've had, real scientists developing IP that hasn't been recognized yet because they can't get it off the ground because they can't get the capital. Now if you look at some of these

places they're moving from pilot to commercialization and you've obviously got that risk element there.

But if they can make it through the commercialization stage, and they've virtually done that, certainly in the IPX case. These are the industrial companies of the future. These are the materials company that have to emerge. If the West is gonna survive. There's no other way to do it.

If you think of all the paths of doing this it's gonna be innovation and it's gonna be reestablishment of this materials capability onshore. Whether it's, whether it's in Australia through the allies, or whether it's onshore in the US. It has to be developed.

There's no other way of doing it, and you're not gonna do it the same way. That's not the American way. They'll do it in a more innovative way, to stop the pollution. One of the reasons that we offshore everything is that we didn't want the pollution tax the, we didn't want the pollution in our country.

I think Ricky, Gervais, know, made it great analogy About you, slavery being relocated to Foxcon factories with nature around them that, just because we haven't got ships and we're not bringing people over we're still enslaving them in their own countries. Now we can divert past that with innovation.

We can, I, me, I mentioned UCU. I'll mention them via symbols because I'm an investor first. There in Louisiana they're developing an amazing closed loop system that doesn't have any heavy, rare earth pollution with it. But throughput is lower costs than the old metric.

Now obviously the, the limitations on this is, we have a limited skill base. We have a limited education base. We're teach, we're telling everyone to learn to code a few years ago, and now we should be teaching them, learn to go to chemistry or learn to go to engineering in order to create the, I guess the industrial age 2.0.

There's a number of these companies I mentioned Linus, they're building a, they've got the go ahead in Texas, they had ESG problems in Texas. You've got all these I guess folks who are worried about the development of some of these capabilities in US states slowing the whole process down with.

Agreements and bureaucracy, they're now starting to be taken out the way. So you know, Linus has been trying to get this thing off the ground in Texas as a

rare earth refining project for a few years. And now they're going forward and we have to get these things out of the way for them.

But I think it's just common sense. I would go down the rabbit hole of all of these critical mineral plays, and chemical plays too. We're gonna need the chemical. There's a lot of a chemical association with critical metals plays, and, if you go down there you'll find that, that's the future of investment.

The future of investment. This era is, pivoted to a critical metal survival. Industrialization 2.0 that provides the feedstock and supply chain into the things that we've talked most about in the greater financial environment, investment environment. We keep talking about an AI bubble.

In order to do an Ai, whether it's a bubble or not, and I don't think it is. I think it's a military capability. We need to, understand the conditions precedent to creating those massive AI data centers and those, and the, all the electrification that goes with it, the energy, the gas the nuclear needs, copper.

Like I said, the, that one, that Microsoft one, I just read a report on 2,177 tons in one AI data center and there's 20 of 'em around the world. That's a lot of copper. That's but I think we have to be, careful of where this is not an automatic commodity play either because China's gaming that system too.

I put a note out yesterday about iron ore the Simon the the Guinea iron ore play. For China and Rio Tinto, they've put \$20 billion into an iron all play. It's, I think, a large percentage of that goes into a railroad and, \$20 billion. And it's not something that we would've risked in the west because we'd have to have a return of 20%.

If you look at what China uses, they use about a billion ton of copper a year In all their industries for 20 billion, they get, I think, stage four and five. They get up to about 60,000 ton By the, when the mine's fully operational, they get to about a hundred thousand ton per annum. But that's at 65% mineral Concentration.

You if you look at something like fmg, they're at 56% mineral concentration. Now that nets out that you've gotta process 8500 tons more. In ore, in dirt to get the same amount of via ore out, sorry, I think I said copper. You've gotta get the same amount of via ore out.

So you've got this thing where if they finance it they might lower the cost of, iron ore They might lower the cost of iron ore by 10% Say \$10 a ton. And that

\$10 a ton will give them an overall saving across their their iron ore usage of 10 billion dollars.

And that \$10 billion gives them an ROI of 50% of their investment straight away in, inside, say, 12 to 24 months. You know that's a significant difference because if their return on investment. Also looks at the price. It means that the iron ore they, that they, them investing in iron ore production and making these mines and making an oversupply is pay pays them back.

Their ROI is differently configured to our ROI and so where we're saying the copper demand's going up. Significantly so the price will go up. That's old analysis. The new analysis says the copper demand's going up. They have complete control of the supply, so our copper costs might go up. But their copper cost, if they decide to, stop refining it for us and giving it to the, and start giving it to themselves exclusively, means that they've lowered the cost of copper from all their supplies.

And that changes everything because it changes the valuation of, a company like Escu fmg, it changes the valuation of bhp. It changes the valuation of Rio altogether because Rio, all of a sudden, even though they own 45% of the, similar, our mine, they're in a cost plus situation.

They're not in a, an iron all price situation.

Erik: And Craig, you've got an entire section in your article, which is about disruptive technologies and where some of the investment opportunities are. So again, I very strongly encourage all of our listeners to read the article. Craig, you told me off the air you're not really promoting anything as a private investor other than reading your articles.

Tell us where your substack is and if there's anything else you'd like to tell our listeners about what. You do

Craig: well, my [Substack](#) is just my name, Craig Tindale. You'll find it there. Same with my [@ctindale](#) for X. And then you can find me on [LinkedIn](#) as well because I'm publishing there as well.

Just my name again. All I'm asking from anybody. I've done pretty well at investing over the last decade and I don't really need to promote anything. What I'm really trying to promote is our own survival and awareness of what we need to do for our own survival. So it's pretty pure in that context.

I just ask you to read it thoroughly because it's important to every one of your investment portfolios out there and to forward it to other people because we need to get the word out. We need to change the way we're thinking about things in the west to so that we. We become resilient, that we survive as a culture, as a civilization.

And that if we don't do that we have a different future than I think we're all we've grown up with.

Erik: And again, folks, the name of the article is Critical Materials, A Strategic Analysis, and you'll find a link to that article in your research roundup email. Patrick Ceresna and I will be back as Macrovoices continues right here at Macrovoices.com.