

SM52 | 1.15.2022**What Are Smarter Markets? | Episode 1**

Jeff Currie, Goldman Sachs Global Head of Commodities Research

For the opening episode of our new series, legendary podcast host Grant Williams welcomes back Jeff Currie, Global Head of Commodities Research at Goldman Sachs, to examine the question “What are Smarter Markets?”

SmarterMarkets is our vision for using technology to redesign and improve markets to meet society’s biggest challenges, including climate change and the energy transition. SmarterMarkets is also our weekly podcast, bringing you the entrepreneurs, icons and executives of commodities, capital markets and technology to rant on the inadequacies of our systems and riff on ideas for how to improve them.

Jeff Currie (00s):

You know, you get cold during the winter and we get to a point where, you know, this could become a humanitarian crisis. Luckily enough, here in Europe, the weather has been cooperative. But if it were to turn very cold, you know, to a point, you know, that becomes a humanitarian crisis if you don't have adequate supplies of energy and then those are the types of events that will quickly change popular opinion about how, how to deal with this and you look at the pictures of what's going on in causing stone. You know, and here's the thing about causing stone. So it's one of the world's largest oil producers and you stop production in king gees. It starts to have knock on effects all over the world. So, you know, you, you laughed what I'd scoffed, what I said, you know, the populace will drive this we're at that cusp where the populace really starts to look at this seriously and go, Hey, are we doing the right thing and I think we're at that cusp particularly here in Europe and I, yeah, we'll see what happens, but so far the winter has been cooperative, but it just takes a cold winter to really start to change this.

Announcer (53s):

Welcome to Smarter Markets, a weekly podcast, featuring the icons and entrepreneurs of technology, commodities and finance ranting on the inadequacies of our systems and riffing on ideas for how to solve them. Together, we examine the questions are we facing a crisis of information or a crisis of trust and will building smarter markets be the antidote?

Grant Williams (01m 20s):

Hi everybody. My name's Grant Williams and I am the guest host on the special Smarter Markets podcast to talk with one of the smarter markets guests one year on, and that's Jeff Currie of Goldman Sachs. Smarter Markets was created to bring you the entrepreneurs, the icons, and the executives of the commodities, capital markets and technology, to talk about the inadequacies of our systems and explore ideas for how to improve them with weekly episodes, exploring how technology can be leveraged to redesign and improve markets to meet society's biggest challenges, including climate change and the energy transition. In that spirit we kick off the New Year with this series. What are Smarter Markets featuring Jeff Currie, the Head of Commodities research at Goldman Sachs followed by Abaxx, Founder and CEO, my friend, Josh Crumb and finally bringing back the first host of Smarter Markets, Erik Townsend, talk about his views on Smarter Markets a year after he first launched the series and to see what's changed. So let's get started today with a true icon of the commodities markets as Jeff Currie, the Head of Commodities Research at Goldman Sachs. Well, Jeff, welcome back to Smart Markets. It's a great pleasure for me to finally get a chance to talk to you. I've registered for years and been a huge fan of what you've written. So it's a, it's a really good chance to meet and get a chance to chat.

Jeff Currie (02:32):

Great, well, I'm glad to be back here. It was a fun time last year and you know, we talked about a lot of interesting ideas, particularly with ESG and you know, the potential for carbon markets. Yeah,

Grant Williams (02m 44s):

Yeah. You did. I mean, it's, it's a shame, not much has happened in the interview years, so pressed to talk about, right.

Jeff Currie (02m 50s):

No, and probably not. It's gonna, no, lot's probably gonna happen between now and next year either.

Grant Williams (02m 55s):

No, exactly right, exactly.

Jeff Currie (02m 56s):

But we can have fun talking about it.

Grant Williams (02m 58s):

We'll, we'll kick off just talking about a couple of things that you actually spoke about in that first appearance about a year ago, you know, a lot of what you said, actually, if anyone had, didn't hear that first conversation, I should go back and listen to it and you'll, and you'll find an awful lot of things that Jeff said in there that have actually played out exactly as he said them pretty much. Now at the time you said that the pandemic and bearing in mind, we were in the middle of it and didn't really have any kind of sight line as to what it was gonna look like, but you said that that would be a catalyst for a bull market in commodities is because it would bring together the structural decline in supply due to this lack of investment we've seen for some time now I think you, you refer, we refer to it as the revenge of the old economy and the policy driven demand that was gonna lift prices and create kind of a broader price inflation. Now, obviously both of those things have happened. How do you now see this, this structural market and commodities, how far into it are we and how far does it have to run? Do you think?

Jeff Currie (03m 51s):

I still think we are in the first innings you know, is it a multi-year or potentially even multi decade, because you think about what's ultimately driving, this are two big issues that need to be resolved, income inequality and climate change and solving climate change is not a 10 year process you know, it's a bare minimum, a 20 year process. If we're lucky you know, I tend to think we're gonna take different approaches to it over the next couple of decades and probably take two or three chances to get to it. You know, and if history shows you anything, we don't actually come to the real solution until it's knocking on our back door. COVID, you know, case in point, but before we get into the details, I just want to fine tune some of the thinking that we talked about a year ago.

Jeff Currie (04m 38s):

And I, you know, I really figured one thing I really came to the conclusion is that commodity bull markets and periods of inflation are invariably tied to populous policies, lower income groups and you know, a question I got right after the podcast we did a year ago is, is it inflation in higher commodity prices bad for lower income groups, pause and started thinking about it. I don't know, they're the ones who actually create inflation in commodity bull markets and really to get at that and understand why, you know, that this is, you know, gonna be a feature. This is let's think about physical markets and commodities there's spot assets that clear today's you know, supply and demand and if you think about how do you to be want to be bullish copper, bullish oil, you just look at the volume of demand versus the volume of supply, no growth rates, no discount factors, just simple volume.

Jeff Currie (05m 33s):

And then you think about when you're ready to get bullish in financial market it's amount of dollars that flow into that sector and they're driven by growth rates, discount factors and all the things we're used to looking at. So you can think and summarize commodity markets, volume markets, and all physical markets, volume markets, even labor is a volume market and then financial markets, GDP growth, or dollar markets. Now let me ask you the following can high income people create financial inflation absolutely yes. Why because what do they control dollars, can they create GDP growth absolutely yes because they control dollars. Can they create physical inflation and commodity bull markets, it's numerically impossible. They simply do not have the volume. Only the world's low income groups can create physical inflation and commodity bull markets and that's kind of the really big insight that I came to this last time we talked is that every episode of inflation, every commodity bull market in, you know, the history of, you know, modern economics were driven by low income groups.

Grant Williams (06m 37s):

You know, it's, it's such a fascinating way to look at it and it's something I hadn't considered. So I'm gonna, I'll have to go way off this and think about that, but let's stick on that inflation thing for a moment because you know, a year ago inflation was "transitory" and you know, today we've given up on that it seems and you know, the number of mentions in the fed minutes was steadily declining. Now they've kind of overtly said, it's not transit anymore. How has that changed in inflation and the change in the recognition of it as a problem that's gonna have to be dealt with how's that changed your, your kind of roadmap for commodities?

Jeff Currie (07m 11s):

Absolutely not, it goes back to this whole point and I think part of the reason why they've missed this is that, you know, when we talked about, you know, what was the core premise a year ago when we rolled out this thesis, it's low income groups are gonna create the volume metric demand growth that's required to create a commodity bull market and create inflationary pressures and so I really want to get at that point is that you think about high income people, we stimulate, maybe they represent 10% of the population. If you want to get a demand growth that you know is big enough to create inflationary pressures, you need all a hundred percent of the population consuming this at the same time. The only way you get that is through stimulus, getting those lower income groups, which is why it's consistently. So the composition of growth really matters here.

Jeff Currie (08m 00s):

And what changed is you can think about, you know, going up to 0809, we cut off credit to lower income groups, you know, 303 because if the red lining issues, QE benefited high income groups relative low. So we just pulled the carpet out from underneath them. All of a sudden, March 2020 we switched on a dime and next thing we know we're now stimulating these lower income groups. So that composition of growth has changed. It's we think about everybody goes, well, it's going to end with, you know, the end of the employment benefits, the unemployment benefits it's gonna end with the end of the furlough programs. No, because you think about green CapEx, you know, just as Biden pointed out himself. It provides jobs in the, in the green economy are gonna go to the lower income groups.

Jeff Currie (08m 46s):

What happens with, you know, the whole idea deglobalization AmSure who gets those jobs, lower income groups and so as we have all these policies moving that direction, they're gonna continue to support those lower income groups and those are the ones because you look at the core of their consumption, it's food, fuel and capital goods. These are the consumers that drive the commodity bull markets in these inflationary pressures. I like to point out the super cycle in the 70s. What was it generated by the war on poverty that Johnson initiated in the late 60 and you think about China, it was a gigantic wealth transfer between rich Europeans and Americans to low income, rural Chinese, 400 million low income rural Chinese and that's what creates commodity super cycles and that's not changing.,

Grant Williams (09m 31s):

But it's interesting because we've, you know, we've finally seen a wage hike cycle start here and that's obviously a very sticky kind of inflation and to your point, I think it's finally going to where it needed to go and a lot of it may have been accidental because of the pandemic, but how does the fact that we are seeing meaningful rises in minimum wages and a lot of big corporations giving out wage hikes, really just to seem like good corporate citizens. Does that just turbocharge the dynamic that you've already set out?

Jeff Currie (10m 04s):

Absolutely, but I almost think it's almost the same story in the sense that if you take the old economy who it employs the vast majority of low income groups, and then you have the new economy, which is the higher income groups and the problem is a lot of people went off, went to college. Everybody wanted to go work for Google in the new economy and we didn't have enough people to drive trucks and do all the old economy jobs and as a result, when we saw that rebound in the old economy, we were caught short people, CapEx, everything it needed, which has created those inflationary, pre pressures and goods in the rest of the old economy and so I almost really believe it's one story over this whole time period is that following 0809 we pulled the carpet out from underneath the low income groups with QE and everything.

Jeff Currie (10m 48s):

So you killed off the demand for commodities in old economy goods because they're the ones who consume most of this and at weak demand led to weak returns. We underinvested didn't hire people, jobs disappeared, offshoring all of this starved, the old economy of the investment it needed to grow and then all of a sudden, March 2020 the world turns upside down demand for old economy, good starts to boom again where short people, wages going up and you create that cycle and so it's almost like it's a self-fulfilling dynamic in which as the old economy strengthen is gonna hire more people, create wage increases and reinforce this dynamic

Grant Williams (11m 24s):

Yeah. It's interesting because you mentioned in that last conversation, the big difference this time around are the low bond yields we have and you said at the time that that combination of low bond yields and high inflation would, would essentially force asset managers to have to move into commodities as an inflation edge, because it's just a much better hedge for inflation than the

instruments they're already holding. Now we've seen one half of that happen. We've seen inflation pick up meaningfully and it feels sticky are you seeing the other side of that are investors looking to switch into commodities in the kind of way you forecast last year?

Jeff Currie (11m 59s):

Oh no. Unfortunately in fact I would say that was the most disappointing thing of our view last sitting here. I know I go back to like July, oil's gonna be at \$85 about we're gonna see inflation prints you know, we are going to see tidal wave of money coming into the commodities. The opposite happened. They're done. They left what little money that was there left and I think, you know, there is several factors. One, there was a belief that was transitory and then once they, the fed acknowledged it, they believed that it's gonna be completely under control and that there's no need to have the head just, but I think there's a couple other deeper issues at play here. One is that you look at the returns in the sector, they were abysmal. In fact, you know, I'd say the word, the losses were, you know, you know, just short of being epic.

Jeff Currie (12m 46s):

We were at negative oil prices 20 months ago and I think you take a CIO of an asset manager and he's going I'm not going near that space again with the 10 foot poles too dangerous and they reminded that black Friday oil was down 12%, which then further discourages the event. So I think that's one factor that's made investment really slowed that to come back from the sector and then we can throw ESG on top of that, which makes it more restricted because you look at last year, you know, roughly 300 billion went into commodity type investments, one and a half went into traditional commodities like our space, the other 299 basically went into ESG type products. So it really goes to show that, you know, it's difficult to get money into this space even if you have a rarely relatively strong story, you know, is that gonna change.

Jeff Currie (13m 34s):

Ultimately you need to track capital to this space and we think it will happen. The question is what is the hurdle rate and how high do the commodity prices have to go before you do it If we use the 200s as an example, that's super cycle, commodity prices really started to move in 03, it wasn't until 05 and 06 that you saw capital really move, which ironically is about two years because you ask most asset managers want see a two year track record two to three years before they go, hey, this is a safe entry point and you know, it went on from call 06 all the way to 2011, 2012. In fact, I would say that super cycle is January 2002 to October of 2012. So they may have not been early, but they didn't miss it by waiting that extra two to three years.

Grant Williams (14:19):

Yeah. There are two markets, particularly in the energy side that have seen some real fireworks. You know, oil's done very well, but if we look at uranium, we look at natural gas, we're seeing two prices move dramatically. Now there are reasons for those and then they're not pure market forces. Talk a little bit first, if you can, about the Uranium market, what you're seeing how that's changed in the last year and why the, these prices that we're seeing might finally actually be sticky.

Jeff Currie (14m 48s):

I think people are becoming to the stark reality is that you're not going to create a green economy without a reliable supply base for electricity because what was at the center of the European gas and power crisis was the wind quit blowing, yeah, it was a 15% shock to supply. You didn't have adequate gas supplies to be able to meet that drop in wind production, which then created those shortages and knock on effects. You know, I listened to clients that jokingly make the point European GDPs tied to whether or not the wind blows or not. That's not a place you want to be in and I think you have many of these European governments getting close to classified nuclear as being a ESG friendly green type of energy investment. Once that happens, you end up opening up the floodgates to the sector. And so it's a market that's incredibly small underinvested and we have this potential for, you know, a big surge demand throw on top what's happening in Kazakhstan, which is I think a, a bigger issue that we need to talk about in terms of what this does to the political backlash against, you know, being green because it was, it started with, you know, opposition against higher energy prices.

Jeff Currie (16m 02s):

But I think you put that all together. It created it, you know, the perfect storm for uranium and it all stems from the same story. A lot of people like to say everything we witnessed this last year, all stems from China, China cut coal production, you created coal shortages that then created shortages in power that created aluminum shortage, which then knock onto to copper and then they brought in LNG to overcome the shortages in coal, which then created a crisis in Europe, which then created a fertilizer crisis, uranium crisis. And so on down the line, I'm not gonna go that far, but you can see that the chain reaction here to being green in both China, as well as in Europe you know, I like to point out there is a global power and gas crisis everywhere in the world, but US East Iraqis, why is US East Iraqis

immune to this shear revolution you know, that, you know, you look at gas prices in east Easter Iraqi's and US they're okay. California is not, it's part of Europe and the rest of the world, but these stories, whether it's uranium gas, reso, they're all very much tied to, you know, these are some of the consequences of being decarbonization. I like to point out Europe is the poster child of the problem associated with decarbonization. US is the poster child of the problems associated with deglobalization, you know, the trucking problem, things like that.

Grant Williams (17m 19s):

So, so let's stay on uranium for a moment because we've had this this new spot closed end fund come in, which is, which has really kind of put the cat amongst the pigeons. When, when you analyze the uranium market, obviously this is kind of not necessarily a black swan, but it's certainly something that doesn't factor into the normal analysis of that market. What do you make of this fund, how meaningful has its impact been and, and how many is it likely to continue to be, do you think?

Jeff Currie (17m 43s):

Yeah. You know, we, we serve those stories, you know, back in copper and back in the, in the two 2000 because copper was the one. Yeah. It is really difficult, very to corner one of these markets with the cost to carry, there's a lot better ways to put these trades on than it is to you know, stockpile the uranium itself, because in terms of looking at the cost to carry uranium is a very difficult commodity to actually hold. You're gonna hear stories about it. We heard about it all the time. You know, we used to get accused of it back in the 2000s. We had 550 million barrels of oil and storage, are you crazy, think about the cost of storing 550 million barrels of oil. Yeah. You're gonna keep it on paper. So yeah, we're gonna hear stories about that across all the commodity markets. You know, my favorite way to do this is own the technologies of those micro reactors and wait until one of these European governments classifies, you know, nuclear power as being ESG friendly. This thing's gonna rip to the upside. That's probably a better way to actually do this.

Grant Williams (18m 45s):

Yeah. This kind of brings us onto politics, which I definitely want talk to you about because you mentioned in that last conversation again, that there's, you know, you, you put great emphasis on the fact this is all politics and I think, unfortunately it does come back to that, whether it be the ESG space and particularly the uranium space, you know, we've seen political decisions get made in the wake of Fukushima, which were trying to assuage public concern. The Germans have gone ahead and basically shut down their entire nuclear power grid and you know, we are seeing those dramatically elevated gas prices coming to them with the nor stream problems they're facing. How do politicians get out of their own way and try to message when we're talking about green energy, uranium obviously is one of the cleanest energy sources there is. How do they get out their own way and start to get political around messaging that, you know, we need nuclear, as you said, if we're gonna have a reliable electricity grid, we need nuclear power?

Jeff Currie (19m 36m):

It has to come from the populace. As politicians just reflect what the populace wants in terms of trying to get reelected and if you continue with prices going as high as they are right now, you're gonna continue to see, you know, the backlash start to start thinking, okay, there's got to be a better solution. It's got to be logical. Here's an interesting argument. When you think about nuclear versus let's say solar and wind is that when we look at the progression of energies, you know, we go from wood to coal, to oil. What happens is the density of the energy gets, it gets more dense and more dense over time and nuclear if you follow that logic path, nuclear is the most dense of all the energy sources and also the waste is very dense. So when you take, you know, we've never had a problem with nuclear waste anywhere in the world.

Jeff Currie (20m 25s):

It's very small, compact, and easy to dispose of. When we start to think about renewables, you're going the other direction. Think about how much the wind farms, the, the solar panel farms you know, the density is so low. It's just, you're taking up so much land and so forth and then the waste on these things also they're, they're, you're going the opposite direction and I think that when people start to look at the impact on the environment of renewables, in that perspective, they're gonna look at this relative nuclear, which is going in the right direction. That density really begins to matter as you go forward and I read a, you know, op-ed recently by an environmentalist who started out very much in the camp. We got to have solar and wind was making this point that the waste associated this, whether it would suggest you we're going the wrong direction. I think these issues are gonna start to come. Whether if it is in, in situation, like what's going on in Kazakhstan, you know, I think that we haven't seen the end of the yellow jackets or the gelatin in France yet and we're moving that direction. Then we're gonna start to take nuclear much more serious and I think it has to be part of the solution if we're gonna adequately decarbonize.

Grant Williams (21m 29s):

Well, it's absolutely part of the solution in Asia and the Middle East, you know, the number of projects planned and, and permissioned are, are enormous actually.

Dave Greely (21m 37s):

We hope you are enjoying what our smarter markets with Grant Williams. Please join us in February for our next series demystifying, the carbon markets hosted by myself, Dave Greely, Chief Economist at Abaxx Technologies. Corporate climate pledges went mainstream in 2021 as CEOs and boards of directors responded to increasing pressure from ESG minded, investors, banks, employees, and stakeholders. Moving into 2022 these companies are increasingly focused on developing and implementing plans to turn their climate pledges into climate action and understanding how carbon markets can help them turn their good intentions into meaningful change. For many, however, carbon markets remain unfamiliar, creating apprehension over the potential risks. They have many questions. What are carbon markets and how do they work? What is a carbon offset and what types of projects produce carbon offsets? How do I judge the quality of these projects? Will the carbon markets be large enough to be liquid and meaningful to all of these net zero goals in this series, we'll talk with the architects and experienced practitioners of the carbon markets, seeking answers to all these questions and more from the people who know these markets best. You can join the conversation on Twitter at smarter_markets. And now back to Grant.

Grant Williams (22m 55s):

Going back to that idea of this change and desire, having to come from the populace, you know, the nuclear example highlights just how dangerous that is because it's gonna take an awful lot for the public to want to go back to nuclear because they've been terrified by it. Needlessly I could argue if you really break down the data, whereas everybody wants to push for renewables. They want to push for wind farms. They want to push for solar. So is there a way that this cycle can be broken and the smart decisions can get made as opposed to the most popular ones?

Jeff Currie (23m 28s):

Well, you keep going \$45 an MMBTU gas. For those of you who don't follow, it's \$3 in the United States, you know, as you continue with that pressure, we're creating disruptions in industrial output. You know, you get cold during the winter and we get to a point where, you know, this could become a humanitarian crisis. Luckily enough, here in Europe, the weather has being cooperative, but if they were to turn very cold, you know, to a point, you know, that becomes a humanitarian crisis. If you don't have adequate supplies of energy and then those are the types of events that will quickly change popular opinion about how, how to deal with this and you look at the pictures of what's going on in Kazakhstan. You know, and here's the thing about Kazakhstan, it's one of the world's largest oil producers and you stop production in Kangee it starts to have knock on effects all over the world. So, you know, you laughed when I'd scoffed what I said, you know, the populace will drive this we're at that cusp where the populace really starts to look at this seriously and go, Hey, are we doing the right thing and I think we're at that cusp particularly here in Europe and I, you we'll see what happens, but so far the winter has been cooperative, but it just takes a cold winter to really start to change this.

Grant Williams (24m 34s):

Yeah for sure, let's move on to ESG, which is something that you spoke again great length about in the last conversation and a big part of that was this idea that it was so important to get the three big emitters, the US, China and Europe on the same page and that's really, I think the point you're making was that that's really what you need. If you can do that, you can make some material progress to solving this problem is that feasible to get those three guys on the same page, given where China is in their cycle versus where the US and Europe are now obviously much more mature markets. They've built their societies on fossil fuels and they're now asking the Chinese to kind of step away from that. Is it possible to get there, do you think, or is, is that another kind of hope rather than likely outcome?

Jeff Currie (25m 23s):

I put a higher probability on the Chinese going aligning with the Europeans than the Americans. Let's assume that the Europeans with their conservation effort have it right, by the way, there's different ways of solve this. You could do it through conservation, which is what the current solution is through let's say EVs and then moving away from fossil fuels or you could do it through capture or removal of carbon and continuing to move these and the technology's not there. I'll talk about that a, a little bit later, you know, so there's different options here, but let's assume that the Europeans are right and we go that way. So when we think about the Chinese, they're asking for, you know, a two degree limit as opposed to one and a half degree, like we know that they owe with any accuracy that those are gonna be the parameters, but when the Chinese commit to something, historically, they typically hit their targets.

Jeff Currie (26m 14s):

So I tend to think you can get to an agreement with the Chinese over the two degrees and also with the Chinese, is that the Chinese may be very far behind Europe in the US in terms of overall emissions. I think the Chinese are a lot further along in their ability to actually deal with this problem. They've secured copper supplies. They own the technologies to create renewables, hydrogen and so forth and so their ability to execute on a plan to reduce emissions is more developed than where the Europeans and the Americans are. Now, let's talk about the Americans a little bit there. This thing is a really difficult problem. The issue there is you can't get a carbon price nor can you get a carbon tax pass through and this goes back to, you know, the Boston tea party Americans, don't like taxation with the route representation.

Jeff Currie (27m 00s):

And to think that the tax revenues are gonna go to fix a global problem in places like Brazil with the rainforest. So, you know, the opposition to it is naturally very, very high, which makes it very difficult for the Americans to overcome many of these issues, which again goes back to the point, is climate change gonna have to be knocking on everybody's back door before they come up with a solution, like COVID was, we were told COVID was really bad, a long time before it actually was knocking on our back door, right, which means they probably have to get to that point, but I think, you know, to get the Americans on, it's gonna be mu much more difficult and here's the irony of it all is when we think about ESG, ESG is imposing a tax on us. You know, it leads to underinvestment in hydrocarbons, which raises the price of coal raises the price of oil, raises the price of gas all over the world and that's your effective carbon tax and here is the key point. It's a tax, not only without representation, it's a tax where the revenues go to places like Saudi Arabia and Russia, and they're not kept at home to go to redistribution to help lower income groups or, you know, other groups that actually need to benefit this, or even go into investments into green CapEx. So it's a suboptimal solution here because the Americans can't seem to get around passing a carbon tax.

Grant Williams (28m 17s):

Is there a way that you think that can happen, because I agree with you it's gonna be a very, very tough thing to do, but I think your point is absolutely spot on, you know, if they can find a way to get that passed, it goes a much longer way than any other solution they've come up with solving this problem.

Jeff Currie (28m 32s):

Absolutely, but let's look at, could you imagine five years ago with the American recovery act and all of these things no, it requires, you know, you go to hit that wall to ship populace opinions and you know, here here's a potential scenario. We could be, you know, spending the next decade, doing these conservation policies and they don't work that well, climate change set in, then we go to resiliency policies, which means building dikes around Miami. I think when you get to that point that's knocking on your back door to the point where hey, you know, we better be thinking about solving this because actually I just want to take a step back and talk about the war on acid rain. It was a spectacularly successful environmental policy that was cross border and international and by the way, the two superpowers at the time this goes back to the 60 and 70s were Russia and or Soviet Union and then the United States.

Jeff Currie (29m 35s):

They ignored this problem, just like the Americans and Chinese did why it was somebody else's problem, but once their forests started melting and you could see it in their backyards and lake Michigan and everybody had problems, then the Americans got serious about same thing with the Soviets and by the way, the Europeans were proposing the same solution back then, as they, as they are now quit consuming fossil fuels why because the Europeans don't have any, the Soviets and the Americans were the two largest oil producers in the world back then, of course they're not going to say quit consuming fossil fuels and what do they propose, desulfurization get the sulfur out of the fuel, but I think there was a key lesson, two key lessons to take away from the, the war on acid rain. One is that by the problem, knocking on your back door, the politics change where you could get a solution.

Jeff Currie (30m 18s):

Second of all, once you had the two largest superpowers agree, they were to able to wrap up a solution to climate change in a nuclear treaty, which then was enforceable on NATO and Warsaw pact countries and you know, so you needed a cooperation to the two largest entities and you needed pain in their backyards, both of which were achievable in 1979, which is when that treaty was actually signed. By the way, here's something to keep in mind, sulfur cools the planet, carbon heats it and you think about why do we want to get rid of all the sulfur because of smog and the smog reflected the sunlight. We didn't like it because places like LA were foggy, but you know, by removing a lot of that sulfur, we actually sped up the warming of the planet. You know, so I think, you know, hopefully we can come up to a similar type of solution here, by the way, you know, I don't know how, how you solve this problem.

Jeff Currie (31m 09s):

We can think about, you know, if we solve this with conservation, the biggest issue with conservation is getting electricity to work. You got to figure out how to solve electricity. If we were to solve this problem through capture or removal, meaning getting the carbon out of the atmosphere, we can capture this stuff. We can capture the CO₂, you can't store it. You go to inject the gas under the ground, which you run out of space rather it goes back to that whole density issue. It's not very dense. So you got to be able to separate the carbon from the oxygen, turn it into a solid and bury it under the ground like we do with nuclear waste. Now the, the problem with doing that, that's a really technically challenging problem. So the way you can think about it, you do this through conservation. You got to figure out how to store electricity. You do this through capture or removal. You got to figure out how to store carbon, both are difficult problems, but we haven't spent any time or money trying to figure out how to store carbon.

Grant Williams (32m 01s):

While we're on the subject of carbon, again, you said that that arguably the most important thing that had to be solved was establishing a price for carbon. It couldn't be taxed. So it was really, it was trying to find a way to price it. So in the last year, what, what progress, if any, has been made along those lines?

Jeff Currie (32m 18s):

If you look at, you know, places, you know, different states in, in the United States because they could do it at a state level as opposed to a federal level, you look at places like India we're making progress, but the problem is that as a individual state tries to go on their own without carbon border tax, all it does is make you uncompetitive. The only way this work is it needs to be a, you know, a global policy or you need to have carbon border taxes put in place and I think the next stage of this is if you can't get everybody to agree to it, you start to levy carbon border taxes, which then kind of forces a carbon price on the rest of the world if you start putting, you know, these carbon border taxes in the place and by the way on that note, you know, there's a lot of talk about, you know, signing of, you know, the crude oil export ban in the US.

Jeff Currie (33m 05s):

You probably heard about that or China's just quitting, exporting aluminum and steel. One of the reasons why, if you get a carbon budget, you're gonna go into these carbon border tax negotiations in a trade war type of environment. You want to make sure that all of your carbon exports are in the highest valued production, not in raw materials like steel alloy and crude which, goes to the point, why are some of these senators in the us advocating a policy that would seem insane on face value, by the way, if the US did impose the crude oil export ban, it would be like the Arab oil embargo in the 73. You know, so it's not gonna happen here because the US exports an enormous amount of oil, but the motivation and the thought process behind that is reduce your carbon exports, because if you have a carbon budget, you want to get, make good use of it, move it to the higher value goods.

Grant Williams (33m 56s):

I kicked myself. If I didn't take this opportunity while I'm talking to you to talk to you a little bit about gold because it's a subject close to my heart and you spoke about it last time and you, and you talked about it as a great hedge against deep basement rather than inflation, which I thought was a fantastic distinction to make but given what we've seen unfold in the last 12 months, what do you make of gold's kind of tepid response to, to conditions which one would expect ordinarily would be quite positive and constructive for it.

Jeff Currie (34m 22s):

Actually, if you take the debasement theory here and you extend it, gold, copper and oil did exactly the way they should be. Gold and copper are cyclically procyclical assets. Gold is not so gold should have peaked when you peaked out the surge in debasement. But as you had the cyclical strength takeover, and just look at a chart of gold versus oil and copper, it works exactly the way you would expect to be. You start off with the debasement of the dollar, through the printing of the money and you know, the decline in real interest rates and you look at when real interest rates trough, you know, that's essentially basically when, when gold, you know, kind of petered out. But then as you, that all of that printing of money started to create the cyclical strength in the economy and gold and or excuse me, copper and oil started to accelerate that's your hedge against him The actual physical inflation.

Jeff Currie (35m 19 s):

By the way you can debase the dollar against financial assets. You can debase it against physical assets. So that's why when I think about debasement, it doesn't that, you know, economists think the word debasement is inflation, but let's go back. Where did the word

debasement come from, it came from putting base metals and precious metals debasing precious metals with base metals back in the Roman era and so that's what the word means and so gold was always the perfect hedge in Roman times against the basement, because it was what you were trying to protect and if you think about, you know, how to go perform in 2020, it was the star commodity because you were printing money and it had not created that cyclical recovery pressure. Once you got the cyclical recovery pressure you know, you look at copper, oil and your other cyclical commodities, they're the ones that perform.

Jeff Currie (35m 56s):

So I look back over the last two years now, it seems relatively obvious and I wish I would've known that two years ago, but yeah, gold is truly a debasement hedge while copper and oil are cyclical hedges. By the way, the Cryptocurrencies are just turbocharges copper, they're procyclical assets and so, you know, they're gonna hedge you for inflation. They're gonna act like copper and oil. They don't act like gold. You know, gold is your true defensive asset. I'd like to point this out. Can you bury oil in your backyard, no. Can you bury Bitcoin in your backyard no, but can you bury gold in your backyard absolutely, yes. That's why it's a defensive asset. It doesn't need infrastructure to live in.

Grant Williams (36m 34s):

Yeah, we look, listen, we, we best not with the time we have left, we best not go down the crypto rabbit hall. I don't think we'll have time. Even a lot of people would be cursing me for not taking you down there. But I wanted, there's a couple more things I want to quickly finish up before we run out of time and the first one of those is this idea that you talked about the feedback loop between rising quantity prices and cash going into the sector. Are you starting to see that because it's been just staff investment for such a long time. Are we starting to see the beginnings of that feedback loop start to be generated again or are we not quite there yet?

Jeff Currie (37m 06s):

I don't think we're quite there yet. I thought we would've been when we did this, you know, podcast a year ago, but you know, again, I look back at, you know, the 2000s, you know, I had enough information a year ago to know if it didn't happen and you, in fact, you look at what happened and here's what I think happened in the 2000s is the commodity prices moved by the way, I remember we had \$8 crude in 90, 98, 99. People had a sour memory in that the super majors were created during that time period because the returns in the old economy were terrible and so investors abandoned the space. They went into .com, the tech, the new economy and forgot about the old economy. Well, finally you under invested in the old economy and we coined the term, the revenge of the old economy in February of 2002.

Jeff Currie (37m 52s):

At the beginning, you had oil rise, copper rise, all the commodity markets did relatively well, but the investors weren't interested, the investors started coming in around 05 and you know, good two, three years after the, the rally in prices. I mean what happened in that second leg up in 05 was once you gave all the companies money to spend, as they, you know, you started pumping money into the equities, they created cost inflation, which then drove you the second leg up and that created, you know, the rise in, you know, once you started the drill and mine the inflation. So the energy CapEx started to flow in 2006, the metals CapEx, however, didn't start flowing until 2008. Now my theory is why that took so long is oil prices came off in 06 and so that tells you what you take from that.

Jeff Currie (38m 42s):

And I listen to our bankers and they tell me this too, is that if you're a C-suite and you got rising input prices, rise is commodity prices you have no idea where that equilibrium is and once you start to get comfortable where that equilibrium is, where once you see prices come off or stabilize, then the CapEx flows and what happened with metals. They started coming off late oh seven and oh eight. And at that point, the minor companies felt comfortable where the equilibrium is and that's when the CapEx started to flow. But think about that. It took, you know, 02 to 06 for the energy, 02 to 08 for the medals. It took a long time for investors to feel comfortable.

Grant Williams (39m 17s):

There's one more thing I want to ask you about you, you wrote in a recent piece, a fascinating comment talking about how, you know, many investors wanted to be invested in ESG for social reasons, and obviously they believe they're gonna make money and that's what's happened recently, but then you talked about how climate change is gonna be this enormously expensive endeavor, the, the most expensive that humanity's ever undertaken and you asked the question, you know, would these investors still be committed to it and you, you happen to pick the idea that Tesla's valuations would normalize, just talk me through that because I think it's an important thing for people to understand and think through, because you know, a lot of the moves have happened. And once the checks start having to be written, as you say, there could be some significant rewritings of, of companies in the SG space?

Jeff Currie (40m 03s):

Well, I, I find it, you know, about the same time we made that comment Elon Musk was selling enormous amounts of shares of Tesla. So he obviously agrees, but I, but I, but I think, you know, the key point here is, you know, there was a big buzz about being green. And I remember in oh seven, you know, when everybody wanted to be long China, because it's basically, it was the, the cool thing to do. Every taxi driver, everybody was talking about China, China, China, and I think ESG last year was kind of the same thing. And it was people were blindly buying ESG sectors without actually really thinking through what, you know, what the economics are and what the potential consequences are and the reality is a lot of these technologies, they are not the first best solution to many of these problems. That's why we chose oil for its density and everything like that in that these technologies still need to be subsidized.

Jeff Currie (40m 56s):

They're not profitable. They're in are very, you know, a Tesla is still for the higher income groups in the world. They're not for the lower income groups. Yeah. They're getting close to creating a lower income mass produced car and you know, maybe they're gonna get there, but it's still not to the point that it beats the internal combustion engine in terms of making about a car that fits all income groups. So, you know, when that reality begins to strike that, Hey, this stuff does not function on its own. It's not a purely profitable, by the way, I'm not gonna say there's there isn't investments that we can still make that, that are profitable. There, there are. but when we look at it in its entirety over, you know, trying to do a complete decarbonization of the world, you know, the vast majority of the still very expensive technologies, unproven technologies, and there's still a lot of risk. I think I like to point capture.

Jeff Currie (41m 41s):

If somebody come up with a captured technology that worked every one of these investments in EVs and conservation is done, and that's kind of risk that you're because basically it's a winner take all type of winning investment on. So this stuff is very risky. It is very early technologies and I don't think people, people think, oh, the EVs you can mass produce. You know, I, I have the numbers for, for 2019 and 2020, if we made like 5 million of these cars in 2019 versus 95 million internal combustion engine cars. And we look at the number on the road, it's probably somewhere around 10, 15 million EVs on the road versus 1.25 billion internal combustion engines on the, on the cars on the road. And so, you know, when we look at how far we've gone and how far we need to go, I mean, it's really difficult.

Jeff Currie (42m 29s):

Another way to think about this was we're running two parallel systems. We're running the old carbon economy that is now suboptimal and we're running the new green economy and these are two parallel systems, right? At the same time, both are suboptimal right now, which is why we have all the chaos and gas and coal and, you know, power prices around the world and, and when we think about that, you know, we need to kick up the investment in both of them at the same time, we can't just invest in the green one by itself, you going to do both. And I think finding that equilibrium between the two is gonna be critical. And right now it's very lopsided investment, which is very dangerous,

Grant Williams (43:05):

But you, you, you made a great point about the, the scale of investment that was gonna be required for decarbonization investment. I think you talked about an additional close to \$3 trillion a year, which I think bring brought the total up to twice that, and you pointed towards a lack of any kind of effective policy framework, which, which would make channeling that kind of money effectively really, really difficult. Just talk a little bit about that to finish if you can, because I thought that was another fascinating point you made.

Jeff Currie (43m 32s):

I like to say it's equivalent to about China. We estimate this decade, you're gonna need somewhere of additional CapEx around \$16 trillion and in the two thousands China's CapEx over that time period was 10 trillion. Put it in today's dollars. It's about 15 trillion. So it's about the same size. So it's one China, this decade two China's next decade and think about what China did to the global commodity markets. It was incredibly disruptive which is why copper is king to the story we have to say, copper is the new oil. Copper is the most strategically important commodity because there's no way you're gonna decarbonize and electrify the world without copper because it's the one that conducts electricity and it's the one that's going to be used in all these different applications. So, and then when I point about China as light years ahead of the Americans and Europeans, the Americans Europeans have no national champion minor, they don't have strategic reserves to copper. They don't have access to African copper. You know, so they haven't made all these investments in all of these inputs that go into to achieving this and the Chinese, Chinese have.

Jeff Currie (44m 452s):

I think the key point here is the investment. Just this decade alone is another China. And think about what China did to these markets. Then the next decade is to China. And by the way, that's assuming there's no cost inflation. What happens when we start to span, we run into the cost, inflation run out copper you know, that's why I point out, you know, it dawned on me when it was Boris Johnson, when he was opening up, you know, COP 26, he goes, you know, right here in Scotland 250 years ago James Watts invented the steam engine. The first doomsday device think about that. We're unwinding 250 years of investment in the way we produce things, the way we create our transportation and the way we heat and cool things. That's why this is gonna be even one of the most expensive, the most expensive endeavor human beings have ever embarked on. And it's gonna take a lot of time and a lot of money and a lot of resources

Announcer (45m 45s):

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