

SM102 | 12.31.2022**Holiday Special | Part 2****Robert Friedland, Founder & Executive Chairman, Ivanhoe Mines and
Josh Crumb, Founder & CEO, Abaxx Technologies**

We close out the year with Part 2 of our Holiday Special with Robert Friedland, Founder & Executive Chairman of Ivanhoe Mines, and Josh Crumb, Founder & CEO of Abaxx Technologies. SmarterMarkets™ host David Greely sits down with Robert and Josh to continue looking back at how the SmarterMarkets™ vision has developed over the past two years and discuss where it's going next.

Robert Friedland (00s):

May we all focus on what the problem is and how to get there from here. May we pray for clever, younger members of the human race to reorganize the way electrons are generated and move to useful human work to feed a human population, to preserve water supplies, to save the oceans, to limit runaway global warming gas and to stop fighting wars over hydrocarbon. We've been fighting wars over hydrocarbon for about a hundred years. So for the New Year, let's pray for peace. Let's hope for the best. Let's gather our energies to continue the work in 2023 and beyond.

Announcer (36s):

Welcome to SmarterMarkets, 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?

David Greely (01m 10s):

Welcome back to Part 2 of our special holiday episode of SmarterMarkets. I'm Dave Greely, Chief Economist at Abaxx Technologies. We're continuing our conversation with two very special guests here with us for the holidays. Robert Friedland, the Founder and Executive Co-Chairman of Ivanhoe Mines, and Josh Crumb, the Founder and CEO of Abaxx. We'll continue looking back over how the SmarterMarkets' vision has developed over the past two years and where it's going next. Robert and Josh, I'd like to shift gears in our conversation and discuss how the nature of interaction between governments and markets has been evolving. The SmarterMarkets vision has always sought to harness the power of market-based approaches to solve some of the biggest challenges we face, like climate change and the energy transition and when it comes to climate change and the energy transition, we've seen government policy-based approaches and approaches playing outside by side. Robert, how do you think our governments and our markets are doing. In your experience what countries have leadership that you know gets it and which don't, and why does it matter?

Robert Friedland (02m 16s):

Wow. What a question. Of course markets are much smarter than governments. That's a no-brainer, but there have been progress in governmental thinking. I think I want to go back to the kingdom of Saudi Arabia. This is a country that understands that their wealth came out of the earth, the tribal society united under King Abdulaziz, young American geologists came out there and drilling their seventh well, prosperity number seven discovered crude oil transformed the kingdom, and that energy literally built New York City, literally built London in Europe. We lived on Saudi crude oil for generations and that society is now very much focused on looking at a greener way of doing things. It could be absolutely the world leader in the hydrogen economy, for example, and their interaction with integrated oil companies. Their concerned with LNG and producing LNG from unconventional shale can play a very positive role in transition fuels towards getting to a completely green economy.

Robert Friedland (03m 24s):

So I think the telegraph, how amazing the Telegraph was and how that changed financial markets. Let's go back to Thomas Alva Edison. Thomas Alva Edison started out burning coal in a steam generator to turn a steam engine, which drove a generator to make direct current and that direct current turned on the first light bulb in his garage. Oh my God. He, actually went to Sudbury, Ontario to mine nickel to make the filament because he was originally gonna make the first filament in the first light bulb out of Tungsten, but he couldn't get it. So he made a, a nickel filament. That first light bulb turned on, and he had about a foot tall light bulb, and he thought,

well, where am I gonna sell these light bulbs, there's no place to screw them in. So he went to New York City to Fifth Avenue and he created the New York Electric Light Illumination Company and he strung those light bulbs up Fifth Avenue direct current.

Robert Friedland (04m 22s):

Remember when you grew up and you had a Christmas tree and one of the lights went off on one of the Christmas tree lights, they all went out. This was direct current and he, he sold light to New York City. But here, therefore, we had been killing sperm whales to get sperm whale oil to light the lamps in New York City. So there's some disruption. We went from killing whale to light the streets, to burning coal, to making direct current, to selling light bulbs, to sell illumination in New York and of course, the New York Electric Light Illumination Company became General Electric, then came George Westinghouse and Nicola Tesla and they said you can't pump electrons down a copper wire a long distance unless you alternate the current and there was a huge fight in, you know, the war of the currents because Thomas Alva Edison had built a big direct current power plant at Niagara Falls Finance, I believe, by Andrew Carnegie and Tesla.

Robert Friedland (05m 18s):

And George Rustier said, the world can't work that way. You need to alternate current. Today about 97% of electricity used in the world is alternating current, but we only have these two ways of using electrical energy and we can generate it with solar or wind or nuclear burning coal, but we still have to generate electrons, ladies and gentlemen, moving down wires and we now have released from the dark side, from the military side pulse power, where you concentrate very small amounts of energy into very powerful bursts of power. This is originally kept only for weaponry, and now IPOs is bringing this out to transform the world economy a fundamentally better way or more disruptive way to use electrical energy and it's a physical analog to the revolution we've had in software and electronics and I'm so happy that Breakthrough Energy Ventures has invested together with the largest mining company in the world BHB in one of the applications of pulse power.

Robert Friedland (06m 23s):

So the way we generate electrical energy and the way we use electrical energy can transform the world and we're gonna need copper no matter what, because it conducts electrical energy better than any other metal, except gold and silver, which are too expensive for the purpose, but we can electrify the world economy, we can actually generate an energy transition just like we could put a man on the moon and when John F. Kennedy drove that in the 1960s, the computer power on that first moon rocket was less than the computer power you're carrying in your iPhone. That's amazing. You know, is the glass half full or is the glass half empty, definitely the glass is half full. On the one hand we have a 1930s style direct attack on a civilian population for nothing other than territorial imperative. We thought traditional war and bombing of innocent civilians was, we're done with that, but we're not.

Robert Friedland (07m 23s):

And that's broadcast on, on the World Electronic system. That information is available to everybody instantaneously on Twitter. You can get that information on Twitter every moment. On the other hand, we have the ability to completely change the way we organize, the way we generate electrons and the way we do useful work and the frustrating thing is we need to talk to each other and come to a common plan about how we're gonna get there from eventually. We're gonna have to wrestle down these stupid governments and teach politicians what really is important and I think we're starting, we're just beginning to see glimmers of hope in governments that the way we're gonna organize the global supply chain, the way we're gonna generate food and water and electrons is gonna have to change.

David Greely (08m 12s):

And I was curious, Robert, you know, that the European energy crisis, you know, has been a bit of a real-time case study and how not to manage an energy transition. I'm curious with the people you talked to, what lessons have been learned by the EU through this period and perhaps which should have been learned by now?

Robert Friedland (08m 32s):

Well, you know, Angela Merkel shut down all of Germany's nuclear power plants while Harris Schroeder kept Germany addicted to Nord Stream one and Nord Stream 2 and today Germany is burning some of the dirtiest low-grade coal in the world to get through the winter. It's league night, the most polluting of all coals. That did not work out too well and then sometimes in the winter in we've seen in Europe where the wind didn't blow, you get these very cold waves and the cold waves are accompanied with no wind, and then all of a sudden all those offshore windmills are not working. We realize that it's totally pointless to build out solar and wind at scale unless

you have a way to store energy because the wind doesn't blow all the time and the sun doesn't shine all the time. So we're getting a real world case in what it takes not to freeze in the dark.

Robert Friedland (09m 28s):

So this week, Germany inaugurated their first rushed LNG terminal, thank God LNG exists to try to get Germany and the rest of Europe through the winter. But you can see the clash of pure idealism not having your feet on the ground and thinking you can jump over that broad river in one leap. It's just the whole world can see that the Europeans are getting a lesson it and that it's not that easy and, you know, you start to wonder why did the Germans get themselves completely hooked on Russian hydrocarbon. Germany was saying, well, we're not gonna have nuclear power plants, we're not gonna burn coal. But they were actually dependent on French nuclear power. They were buying French electrons from their nuclear power industry, and the French had to close a large fraction of their nuclear power plants due to corrosion in their fleet.

Robert Friedland (10m 20s):

The fleet was just getting too old. So here we see a test case of Europe, very idealistic desirous of having a new way to do things. God bless them, and realizing how important it is to find a new way of doing things both in the energy markets, in the software side of the system and in the hardware revolution that's required and you're gonna see more and more of this as we sort of balkanize the world economy. I think at least two thirds of the inflation we're experiencing globally is from the supply side. We have supply side or supply chain issues. Only a third of it is demand. So the world central banks can drive up interest rates and they can certainly engender volatility or a recession. They could, if they wanted to create a depression. But certainly a vulgar style recession can be engendered but that does nothing to generate the energy transmission.

Robert Friedland (11m 13s):

If you want to change the way we make electrons, we need a healthy world economy. We need a lot more economic development and investment in the supply chain in a renewed and differential supply chain and so I think the, the recession that we're engendering for 2023, perhaps into 2024, is just a temporary blip. Just look at how much the world has changed in two years since we started SmarterMarkets. We weren't talking about war. Mr. Putin not yet invaded Ukraine. The Germans didn't have to worry about freezing in the dark. The central banks of the world were thinking that inflation was conquered forever and we didn't see the water shortages or the melting of the earth glaciers the way we do today and so how wonderful that this community of podcasts started, how important this really is that we continue this dialogue and how valuable I find it has become and how pleased I am that SmarterMarkets will come to Saudi Arabia, for example, and that the energy ministers there also listen to this very important discussion.

David Greely (12m 23s):

That's really, really fantastic and Josh, I wanted to turn to you and maybe we put this under the category of better lucky than smart. It certainly feels like, you know, we all collectively dodged a bullet with FTX collapsing before it could obtain a regulatory approval to move into the commodity markets. I mean, just imagine the damage that FTX could have inflicted on our energy supplies and economy if they had gotten a government approval to trade energy, agricultural products, metals, all the materials that keep the economy moving, that could have been quite the supply chain disruption. I was curious, you know, how big a deal do you think this was, Josh, and how do we avoid this in the future?

Josh Crumb (13m 06s):

Yeah, so, you know, I think there's a lot of talk about governments versus markets or just sort of two parties in this conflict. But I actually think about it a little bit different. I actually think there's, there's a couple problems that are more related to centralization versus decentralization. I actually would also put a lot of the direction of our financial markets, really the last decade after the financial crisis. We've actually consolidated, you know, we have less systematically important exchanges, less banks, less clearing houses. We're kind of hyper, you know, centralized a lot of things. So that really has nothing to do with governments, you know, directly. Yes, there's probably policies and, and central banking policies that led generally in that direction but, you know, ultimately we're, actually comes to commodities and I'll kind of explain this in a second, is I think we've increased the, both the, the centralization and the financialization of commodity markets, which I think is, is ultimately a bad thing.

Josh Crumb (14m 06s):

We're allowing less information from commodity markets to really discover true prices and allow, allow for the efficient capital to flow. So as it relates to FTX, you know, just a little bit more background, they were actually lobbying the CFTC to allow their highly centralized version of markets to take place in in US markets and on, although they said that they didn't wanna ultimately get into

commodities, you know, you can hear them in podcasts and on blogs talking about how they're gonna bring all of their crypto markets to commodities. So that was definitely, that, that highly centralized, highly financialized model was sort of the path that they were heading down and we've actually seen some other exchange groups quietly in the background were supporting this idea of further centralizing markets and getting away from clearing members and FCMS and brokers that help, you know, create that decentralization.

Josh Crumb (14m 57s):

So again, you know, at Abaxx we're focused on a couple things here. How do you actually increase more information coming from the markets you know, less centralization, less conflict of interest and ultimately we also are very much focused on returning, you know, the commodity markets to their physical origins. Again, we think it's been over financialized. So getting back to your question that you asked Robert about the European Union, there's actually been two problems in my mind with the way that EU has looked at, you know, even LNG, you know, the, obviously the markets that we, we focus on, you know, there's been two problems there. One of course was, you know, a lot of the government policies that led to the need for emergency LNG cargos but the second one, you know, when they had all of this price volatility earlier in the year, they very much wanted to be involved in creating a financial index, a financial benchmark for that LNG to be priced at, you know, to come to Europe.

Josh Crumb (15m 52s):

But they wanted one that the European Union and the European Commission could sort of be involved in setting the price or capping the price, which has led to the ICE group, which is a big part of the energy markets in Europe was even threatening to pull out of Europe if the European Commission was gonna try to tap the price, you know, not just in the market in physical settlement, but actually on exchange to maybe change the software to put a limit in or something. So we, we've had this problem of centralization and financialization and of course what Abaxx has been trying to do, you know, our part of the SmarterMarkets vision is what we call, you know, going back to the futures where we're actually futures prices settle physically very much like, like WTI or Henry Hob or some of the great energy markets.

Josh Crumb (16m 35s):

And in commodity markets, the London Metals Exchange, the Comex, you know, a lot of the great contracts are physical settlement contracts where you go long and at expiration, you can actually take physical delivery that is very key, not only for true price discovery, because you have that real convergence between what the physical market and, you know, financing the supply chains does. But it's also very important in, in times of shortage where at, at the end of the day, a lot of times the price doesn't matter if you have no quantity, if there's not nothing available, the price can be whatever you want it to be because you can't get the supply and so we believe that over the last, you know, 10 to 15 years, that physical, you know, buyer and seller of last resort is what we call it, that buyer and seller of last resort has not been needed that much because supplies were abundant and commodities could be financialized in that environment.

Josh Crumb (17m 24s):

But in an environment where you're increasingly don't know where that next car goes coming from, particularly if you look at next, you know, storage season and in Europe where they're gonna have to refill these gas inventories, it's gonna be much more of a bidding war with China. Because remember, China with their COVID zero policies really wasn't in the market this last year and so while we maybe diverted a lot of cargos from places like Pakistan and India, we have not yet had that real bidding war between Europe and Asia and when that happens, the European Union, you know, they can try to centrally plan or, or try to put, you know, caps on prices, however they think. But at the end of the day, people actually need to get that cargo and so we're gonna need these physical buyer and seller glass resorts that converges with the physical economy, which is what Abaxx has been very much planning for in this next commodity cycle.

David Greely (18m 12s):

So speaking of, you know, the European LNG market, of course we've just seen the EU officials come out and put some sort of a price cap on gas supplies into Europe. What do you think some of the implications of that are gonna be? What are your thoughts, Robert?

Robert Friedland (18m 29s):

I'm concerned about the inherent fragility of the supply chain completely and I think that it's very naive to try to cap the price of anything. The Nord Stream 1 and 2 pipelines have mysteriously been blown up. There are a couple of critical natural gas pipelines from Norway to Europe and also from Algeria to Spain and Italy. If somebody were to come along in a submarine on thousands of kilometers of ocean bottom natural gas pipeline and blow them up, Europe would freeze in the dark and it doesn't matter what artificial price you

think you're capping, you would need a telescope to see the price of heat. Same thing applies to ocean bottom internet cables. They're completely vulnerable and so the telecommunication system that makes markets internationally is also vulnerable unless we have space-based systems and then even space satellites are vulnerable to electromagnetic disruption.

Robert Friedland (19m 33s):

So once you start thinking about war, once you start thinking about what could happen given humanity's propensity to do absurdly evil things, occasionally you realize the fragility of these systems and you again exacerbate each nation's state's sort of primal desire to secure its own supply chain top to bottom. So it, it's a very nice thought that you can cap a market and just arbitrarily define, you know, a maximum price for something. But that's more of the naive where we now actually have an overlay of national security and war related to these critical raw materials and markets and so this almost mystical interplay between the financial markets becoming more sophisticated and the requirement to change supply chains, it's too bad that five years ago if you went to Wal-Mart, everything you saw there said, made in China and then the Donald came along and he said, I don't want anything sold in Wal-Mart to say made in China anymore.

Robert Friedland (20m 42s):

But you can't get anybody to flip hamburgers in the United States for less than \$30 an hour because Mexican labor is not allowed into the United States anymore. Highly qualified people aren't allowed in the United States, and you have a shortage of labor. And if labor demands a higher price, then you can't get rid of inflation. There's no end to the inflation cycle until you can mitigate wage demands and so we're facing a monumental series of challenges and yet at the same time, people like Bill Gates are funding the early stages of moonshot technologies that are required to get there from here, now that I've reached the privilege of being 36 years old the second time. I think that disruptive technology is the only potential way for humanity to get there from here. I think this project of a, of the way we make electrons, useful electrons and the way we generate them and the way we utilize them, sort of a recycled greener world economy to make that transition without engendering war, fighting over the old economy is gonna be a considerable challenge.

Robert Friedland (21m 55s):

I think that electronic networks like the type you've created in SmarterMarkets are critically important and I think thinking about what markets the future going to look like are critically important and it's just bizarre that, that the European Economic Union said they're gonna cap the price of gas that's like shouting at the sun and not to rise or the sun to set. You know, this is sort of human arrogance that you can cap the price of anything when the real world may come along and intervene. I would pray for the safety and sanctity of that Norwegian natural gas pipeline to Europe. I would pray for the safety and sanctity of those Algerian natural gas pipelines going to Spain and Italy, because without them, we're really gonna get a less lessen in what energy disruption means. And there won't be a price high enough when people worry about freezing in the dark.

Robert Friedland (22m 49s):

And so when you come back to the poor miners, you know, the oil and gas industry spills more money than the mining industry makes. The mining industry is tiny, tiny, tiny, tiny and yet we have to find these critical metals to an enable an energy transition and so a continued schooling of our, you know, we gotta go back to the kids and say everything you touch, we either mind it or we grew it agriculturally and we need to determine what metals we need and how we're going to mine them in a more conscious way. It's a really, really difficult thing to, to build a tier one mind, to find one, to engineer it, design it, construct it, and build it and we're gonna run out of these metals, we we're seeing extremely low physical inventories. They're mispriced the capital is mispriced, and in the end I think governments are going to have to come forth with free capital to mine these metals.

Robert Friedland (23m 46s):

Now you're starting to see this in the United States. You're seeing the United States department of defense giving the first loans to mine antimony, for example. Cause every time a bomb goes off, every time Michelle goes off in Ukraine, that's brass, which is copper and antimony in the explosive, that's not recycled and so military demand really sort of crowds its way to the forefront in the demand in the supply chain and now we have this huge, huge, huge challenge to change the way we generate electrical energy in the world, and at the same time maintain human peace and feed 8 or 9 billion people on the planet. And for that, we definitely need a market mechanism. We need smarter markets and we, and I do think that, that there is gonna have to be regulation in those markets. We, we can't have the chaos of a long-haired freak in The Bahamas, you know, just sort of doing whatever he wants. It's just, that's not gonna work. So there is a role for government and regulation in smarter markets

David Greely (24m 55s):

And it certainly feels like, you know, the political talk is running up against the walls of reality and certainly the European gas price cap seems like the definition of arguing from a position of weakness or negotiating from a position of weakness. You know, a lot of what we've tried to do with SmarterMarkets is to turn talk into meaningful action. And I know both of you with the companies you're building have been very active this year. You know, Robert, you've had a massive year with Ivanhoe Electric owning Public and with Bill Gates and BHB, as you said, investing in the IROs Ventures with the IPulse Technology and you've done this in what would charitably be described as a difficult year in markets. I was curious, what did you learn, you know, from launching each of these ventures under these circumstances?

Robert Friedland (25m 45s):

Firstly, you learned as no is nothing is easy. Ivanhoe Electric went public on the New York Stock Exchange in an anaerobic environment. It was truly a falling knife stock market. Last June recently, I was talking to a friend in Fidelity, said he thought we had the only IPO you could think of that's trading above the issue price. So hats off to Jeffries and JP Morgan and Bemo who actually led that issue. That issue is predicated on mining consciously copper and other critical raw materials in the United States. It's the third Ivanhoe Mines incarnation. The first one was in Mongolia, the second one in the Congo. This one in the United States to try to consciously mine these metals that are desperately required for the energy transition. So we're going to mine copper in Arizona with solar power we're going to generate zero global warming gas, or as close to zero as humanly possible in mining that copper.

Robert Friedland (26m 48s):

And we wanna power that with the grid scale storage and solar powers, solar power and big batteries. Now none of these things are easy and nothing is easy in the financial markets, but we want to create an example worthy of government support that it's possible to consciously mine in the United States. The best mines for copper are in other countries Latin America's become quite unstable. Panama is negotiating hardball with first quantum threatening to take their tier one copper mine away from them. Lots of instability in Latin America as it swings to the left. Peru, for example, the second largest copper producer has had a huge amount of political instability in recent weeks. And one of the problems is that as these critical metals go up in price, governments become more unpredictable. So the physical ability to create metals in the scale we need for any obviously available energy transition technology is going to require a period of much, much higher real prices.

Robert Friedland (28m 00s):

Jeff Currie talks about the revenge of the old economy. There's absolutely no doubt that wars were always fought over the old economy wars were fought over crude oil and there may be a little bit of an element of that, yet again, perhaps the Germans thought that you can turn off your nuclear power plants and not worry about where your electrons are coming from and so Europe is presenting a fascinating open experiment in why the old economy really counts. I've remain optimistic even though we're seeing sort of an acceleration of human affairs, that with a combination of smarter markets and a more intelligent application of capital that the technological means will get us there. But I think it's gonna be touch and go. It's sort of like Star Wars. You've got the dark side of the forest, which looks like it's certain to win, and then there's the good guys that hang on by their fingernails and save the world to save this planet. We're going to have to canonize a lot of the, the miners. We're going to have to find huge quantities of certain critical raw materials to grow the world's food and to save the world's water and that work is in an embryonic stage. But I do think that the next two years we'll see the application of a lot more capital of these technologies and hats off to people like Bill Gates that have been funding these, these sort of moonshot new technologies that are required to get us there from here.

David Greely (29m 33s):

And Josh, you've also been pretty busy. You and your team took base carbon public and put the capital to work and carbon reduction projects in Rwanda and Vietnam. You're also moving Abaxx Exchange to launch next year in Singapore, and you're building out a suite of technology products around ID ++ and heading that towards release. In what ways has the landscape of the past couple years of Olive Des you would hope had hoped and, you know, what events were tailwinds and you know, which were headwinds?

Josh Crumb (30m 05s):

Yeah, I would echo, you know, some of Robert's thoughts around the IPO timing of, of Ivanhoe Electric. You know, I remember Jim Kramer you know, out there sort of bashing Ivanhoe Electric, but here we are end of the year and like Robert said it's one of the few IPOs, maybe the only that are, that are up this year, but that market's been very difficult. So, you know, similarly, if we look at base carbon, this is a company that raised about 70 million last year on our kind of our initial pilot projects and investments in in

decarbonization. We've subsequently deployed about 30 million in US into our first projects. And, you know, if you look at some of the, you know, third party reports we're looking at, the stock itself in this market is trading at like a \$15 million enterprise value.

Josh Crumb (30m 51s):

So, you know, it's, it's trading at a less than the value of the capital we've deployed. And it's, you know, only a fraction of the net asset value as calculated by the investment bank reports. So I think, you know, the industry I think has rallied around a lot of these ideas, but I, still believe we're very, very early in the capital markets, you know, sort of pricing these, I think Roberts done a great job with his companies and getting some of the value for the company, but, I still see a much, much different macro environment and pricing of these equities. As far as Abaxx Technologies, I would say we're still very early or probably earlier stage than, than some of Robert's companies but I think the recognition of, of what we've done in, in, in particular in LNG markets, the European markets in particular, but I would say Asia as well next, next year when China's back online and buying liquefied natural gas, you know, it's gonna be really a bidding war that needs that buyer and seller over last resort physical market.

Josh Crumb (31m 47s):

And we are the only exchange in the world that's been working on a suite of physical LNG price signals and futures contracts that can actually go into going into delivery. So I believe that, you know, our, our products are, are very well timed. If I look one to two years out, not only are we gonna have to have that fire and sell of last resort commodity market, but more and more we need to price those externalities like carbon and we built an entire workflow away, you know, what we call EFP plus, you know, where we can actually attach and bundle a carbon offset credit to that commodity import, you know, say an LNG car ago going into Europe, that, you know, through the exchange, you can actually make that carbon neutral as the physical delivery goes into, goes into Europe.

Josh Crumb (32m 31s):

So we've put a lot of, you know, a lot of effort in the, in the market mechanisms in putting together the market participants and all of the pieces of that financial infrastructure that's needed in a modern wholesale exchange but again, I think the market's still very probably early in recognizing what we've been building and then I think, you know, if we talk about our ID ++ and some of the Blockchain technology that we're using for supply chains, I think this is still very, very early. No, we see this as a, you know, a five to 10 year investment cycle and I always like to say that maybe we were, you know, two or three years early to investing in some of this, but Robert's always, you know, 10 years ahead of the curve. So I'm, really just seven years behind Robert rather than three years ahead of the market. But I do think we're on the right track.

David Greely (33m 16s):

And, you know, this part of our conversation will be releasing on New Year's Eve, which makes it a natural time to look back and look ahead to the coming year and you've kind of led us a little bit into this, Josh, but I'd like to ask each of you, what surprised you along the way this past year, and how have those surprises changed or strengthened your vision for SmarterMarkets. Maybe we can start with you, Robert.

Robert Friedland (33m 42s):

Wow. How far back do you want to go to calculate today's surprise do you wanna go back two years?

David Greely (33m 48s):

However long you'd like?

Robert Friedland (33m 49s):

You know no one can predict the future. Nobody, we all try, we have a perfect view of the past, and we, we take our perception of the past and try to look at, you know, going forwards. I think 2023 is gonna be a very challenging year. We don't see an immediate end to the conflict in Ukraine. It's sort of depending on the vagaries of one man. Russia is an incredible country and the Russian people are amazing. They have a long history culture, literature, music, arts, dance, ballet, and chess, but we have to wonder about the physical and mental health about one person running the Russian state and the fate of Ukraine and how that affects it mentality of the Europeans. That's going to remain an enormously important theme and then of course, we have the alliance between Russia and China. China has been largely silent about their recently announced alliance with Russia and it's rational for China to worry about its supply chain.

Robert Friedland (34m 55s):

China has 1.3 billion people to feed, and Russia becomes a cheap source of hydrocarbon, a cheap source of energy, potentially a cheap source of food for China. But that's a newly reorganized organization of the world economy. In the 1950s, Russia and China nearly went to war. They were arguing about who was the real communist between the Stalin era and Marxism. So the very strong alliance between Russia and China and perhaps to a lesser degree Iran, very, very important. Imagine that drones are being built in Iran and then supplied by Russia to bomb Ukraine and as the Iranians build drones to scale, imagine the concerns if those drones were turned on Saudi oil and gas infrastructure and what that would do to the price of energy. So I think we're beginning to realize that the, the world energy system as it currently exists is incredibly fragile.

Robert Friedland (35m 56s):

And I keep on repeating how important it is that the energy incumbents continue to produce conventional energy and Josh was just talking about the way energy is priced. There's no present value after seven or eight or nine years. That's crazy. What's much more likely to surprise us is a massive increase in the price of energy if we have conventional conflict in the Middle East. You, you look at the way the Iranian state is treating women, for example, the youth in Iran are rebellion against the Iranian system. That could go a lot further in the next one or two, or three or four years. The potentials for disruption, it wouldn't, it wouldn't surprise me at all to see \$200 or \$300 crude oil. Heaven forbid that happens. The, the human suffering that would cause would be incredible. So we need to add a lot of respect to his Royal Highness Prince Abdulaziz, the Energy Mister in Saudi Arabia for maintaining energy stability.

Robert Friedland (36m 55s):

The requirement to maintain crude oil, say in a range of \$60, \$70, \$80, \$90 a barrel, \$80 a barrel than what it used to be with a depreciation of the dollar. We need stable energy to feed people on this planet. My bigger concern is the increase in the price of food, the increase in the price of water, the increase in the price of basic human necessities creates geopolitical stress that have to be a cause of concern and so markets are going to have to supply in a very intelligent way, more capital to those points where these supply constraints are going to occur and I think one of the first people I really, I spoke to his Josh in the early days of Abaxx Technology, you know, he was saying the only rational transitional fuel for an any, any kind of rationally defined energy transition is LNG.

Robert Friedland (37m 50s):

We can argue about the end point of how we get there from here, but we need that LNG is that transition fuel. I think in the end we'll have new forms of nuclear power and we'll have geothermal energy, hopefully, we'll, we'll harness the thorium cycle. So we have safe nuclear power, and Mother Earth is a nuclear reactor. We're working on a much better way to develop geothermal energy, and we're going to have to pray that the monsoon does not fail in India. Have to pray that the snow pack is maintained in ml or a billion people on the deck plateau in India, would've no water to grow their crops. This issue about anthropomorphic global warming is not going away. Understanding that we're all in this together is perhaps the glue that can keep China talking to the United States. Whenever I speak in the United States about China, I ask people to raise their hand and see who can most quickly tell me the Chinese name for America, the Chinese name for America is Meigu, which means the beautiful country.

Robert Friedland (38m 57s):

And always ask people, do we really want to go to war with China, with people that refer to America as the beautiful country. We need to understand each other. You know, we saw a tremendous deterioration in American Chinese political and economic relations. If 10 was as bad as it could get, it probably got to an eight. Recently, Mr. Biden met with President Xi, and perhaps we've temporarily cooled it and humanity has to step back from the brink and see that we're really all in this together on a very fragile planet and I don't like the outbreak of conventional war. I really hate this idea that you can bomb a civilian population consciously to freeze in the dark. Now, we've had terrible human conflict in the Sudan, in the Horn of Africa. We've had Hutu and Tutsi, for example but as this comes to Europe, and you see this right on the doorstep of Germany and Poland, it is a terrifying phenomenon.

Robert Friedland (39m 57s):

And let's pray for peace and some kind of sanity to prevail, because I can't recall a time that a politician in Russia would openly threaten use of nuclear weapons. We've forgotten about the enormous destructive potential of nuclear weaponry. But more importantly, we've forgotten about how fragile the world economic system is. These pipelines that transmit natural gas, these fiber optic cables on the bottom of the sea, this could be disrupted in a nanosecond and then we wouldn't be able to have this podcast, would we. Or the internet, let's say money was just Bitcoin, what happens to those Bitcoin if the servers are down, you can't access your Bitcoin. Can you. Maybe you're better off to bury a gold brick in the backyard. Maybe the gold price is bottomed, or maybe the

Chinese are going to have digital money backed with gold in other commodities. We're facing a, a world of unprecedented rapid change.

Robert Friedland (40m 59s):

It is inevitable that the financial markets will be rebuilt and, I meet a lot of smart guys. Josh is quite unusual. He was a gold analyst at Goldman Sachs, but he had a much broader vision than just gold. I met him early. I was fortunate to meet him. One of our other early investors Lucas Ladina unfortunately passed away too early but I clearly see that Abaxx is going to succeed in changing commodity markets for the better and it's gonna happen because it's necessary. We already see today that if you have green aluminum, if you can make aluminum with hydroelectric power or with geothermal power in Iceland, that aluminum is already trading at a premium. So a driven automaker wants to make a clean car. I've got to know Ola recently. He's the CEO at Mercedes-Benz. We've had some very interesting dialogues about Mercedes and how they're concerned about the supply chain and critical raw materials.

Robert Friedland (41m 59s):

I've been involved in the, the battery business, learning about what we're trying to do with batteries for the electrification of the car and the raw materials required there and new ways to build a battery. We've funded a startup called Pure Lithium out of Boston that has developed a better way to make lithium metal for high energy electric car batteries. We see a lot of positive trends and we should be arguing for a lot more venture capital directed at the intersection between disruptive technology required for the greening of the world economy and the raw, raw material supply chain, which is directly linked to making Smarter Markets for those materials. So we're sitting at the nexus of three incredibly important trends that will not change for the remainder of our lifetime. Different raw materials are gonna be required for a better world. The pricing for those raw materials are going to be revolutionized.

Robert Friedland (42m 55s):

And the way we organize water and food for everybody on this planet is going to have to change to make it more sustainable and along the way, we have to understand different societies, different cultures, so we don't blow each other up on this little spaceship. We share. You know, I've been starting on my speeches lately by telling people as we sit on this planet, we're evolving at about 1,100 miles an hour as the earth spins on its axis and as we went hurdling around the sun in the last year, we've been going at about 66,000 kilometers an hour, our little spaceship going around the sun and our solar system is orbiting the Milky Way at about 450,000 miles an hour amazing. Our entire solar system is orbiting our galaxy and our galaxy seems to be on an orbit of a couple billion years.

Robert Friedland (43m 52s):

So just one galactic years measured in hundreds of millions of years and yet, financial markets are what Josh, since Babylonia, 5,000 years old, since things were, were engraved on clay tablets and the London Metals Exchange is still a bunch of white guys yelling at each other in a trading floor. How bizarre is that. That's gonna go the way the Dodo bird, we're going to have to have smarter, resilient markets custom fit for a new world. We're doing this for our kids, we're doing this for our grandkids and at the same time, we're going to have to I'm gonna be spending the New Year praying for a more peaceful world.

Robert Friedland (44m 48s):

I find that Russia is the new ESG. I think that it's completely obscene that, you see the daily bombardment of civilians so they freeze in the dark. That just, it doesn't fit with all the technological progress that humanity's made. How do you negotiate with somebody that's perpetuating such an evil scheme as to get people to submit by making them freeze and starve in the dark. I'm talking about children, innocent civilians and so, it's a bittersweet holiday season. Christmas, remembers Christ and the teachings of Christ. It's also a new world for Jewish people, and I'm hardened by a Middle East that is starting to look different. You've had the Abraham Accords between the United Arab Emirates and Israel. You've had some realignment of politics in the Middle East, and you have young and I and quite enlightened leadership in Saudi Arabia, the United Arab Emirates, and in Qatar. I'm amazed at the positive changes I've seen there in the last two years. In fact, I'm astonished at the positive changes I've seen there. So I'm going into this holiday season hoping that the glass is half full, not half empty, and praying for world peace,

David Greely (46m 10s):

As are we all give special meaning to that Christmas wish for peace on earth and goodwill towards men. Josh, I know you are also a big fan of science fiction and as Robert said, none of us can predict the future, but science fiction also sometimes gives us a lens into it. So I'm curious, you know, what are your thoughts for the future and where this is all going and in particular, what do you think might be surprising the rest of us in the coming year or years?

Josh Crumb (46m 42s):

Yeah, look, it's very hard to follow, Robert's vision and really deep vision of, of where we're at and where we're headed. You know, I would echo, you know, some of my worries on the short-term horizon that we're not recognizing the volatility, particularly in commodity markets. You know, we have a lot of capital allocators maybe have moved away for this sector for as much as half a decade or maybe even a decade in some cases, that don't understand in, in, in my view that the fundamental demand rationing mechanism is not just price, but it's volatility. I think we're heading into a higher volatility environment, and there's a lot of capital allocators that don't know how to invest into that volatility. There's a lot of people looking at these swings and energy prices and metal prices for the last year that, you know, look, I think the, the capital markets generally woke up to a new commodity investment cycle over the last, you know, 12 to 24 months.

Josh Crumb (47m 35s):

Yet it's had a lot of false starts because we've had a lot of, you know, federal reserve and the dollar policies, you sort of overwhelming that and a lot of people sort of lost to, you know, to what, you know, not knowing where the oil price is going or where commodities are going. So they've kinda pulled back, in my view, from investing in these sectors. Like they probably were, you know, maybe at the beginning of 2022. So I think 2023, I think people need to recognize the volatility, but they need to stay invested because we, you know, we need the capital coming to these sectors. And of course, you know, what we're building at Abaxx is mechanisms, you know, for better risk management and hedging and utilizing the information of the market better. We're very much focused on that trend. But, you know, maybe to answer your question on the, on the longer term vision, again, I do share Robert's optimism.

Josh Crumb (48m 25s):

I do think that this commodity investment cycle is very different than the past ones. You know, we do have social media, we do have podcasts. We do have much more open sourcing of, brains to come up with better solutions. You know, we do have new venture capital mechanisms that probably weren't there, you know, definitely weren't there 15 years ago, probably not even, you know, seven, eight years ago, the end of the last commodity cycle either. So I do, you know, have a lot of optimism and, you know, even this podcast, you know, next year we're gonna spend more time, you know, talking about market information in better ways you know, as Robert said earlier, the conversation that if we had a super computer that can bring all of those good ideas, you know, to the forefront faster, that's exactly what we're trying to do.

Josh Crumb (49m 03s):

And I think that's the next, the next wave of the internet is again, what, what we say is the commoditization of trust. We've had this sort of lots of noise internet where lots of voices are being heard, but there's not a lot of trust on the internet right now. I think there's gonna be a whole new wave of building trust mechanisms on the internet. So it's not just a handful of companies with all of the world's data running their own internal but we want more and more of people's information sharing across platforms and bringing the best knowledge to the forefront. Not just the loudest noise, but the best signal. So we think there's a lot of technologies that are moving that vision forward. Now, I wish they were coming faster, you know, and I think, you know, even something like these, you know, what's going on with Twitter, with Elon Musk and the Twitter files and all of the, you know, questions about how a platform like, like Twitter can ha you know, enable better trust, better content moderation.

Josh Crumb (50m 00s):

I think the world is hyper-focused on these issues, which means that, that there's gonna be more, more innovation and more impact five to 10 years out. I want it to be faster. We're investing as much as we can for it to be faster but, you know, I, I think we are headed in the right direction there. So again, I do share Robert's optimism for the medium term, even though I think we all need to recognize the volatility and the risks and the very short term. That's kind of the, the outlook that I'm looking at over the next, you know, the next year and the next few years.

David Greely (50m 30s):

Thanks Josh and Robert, I'd like to give you the final word. Maybe you could close us out with a few thoughts on what gives you hope this holiday season for the future

Robert Friedland (50m 40s):

Well, humanity's had a long and checkered history of objectifying the other and creating war. We do use this time of year to think about the great teachings that have come from the world's prophets and the world's religions, all of which talk about the necessity for peace. We see an exceptionally ugly holiday season as people in Ukraine are being bombed. Let's pray that, um, that this never goes to a

nuclear conflict. I wanna thank President Xi Jinping of China for openly saying he thought that Russia's threatened use of nuclear weapons in Ukraine was a bad idea. It is a very bad idea to threaten the use of nuclear weapons. Now, the non-use of nuclear weapons is probably the most critical of all environmental issues. We have to remember that and then we have to think about how we're gonna feed and clothe 8 or 9 billion people on this planet in a way that doesn't generate enough global warming gas to destroy the oil and gas production in mother Russia.

Robert Friedland (51m 47s):

The world gets much warmer all that methane in Siberia will be released and all that permafrost will melt and those 50 years of oil and gas pipelines that cross Siberia will be twisted and destroyed, and Russia will be out of the oil and gas markets. Russia's the second largest producer, so my grounds for optimism come in having met young Saudis who are openly talking about developing a hydrogen economy, a solar economy, an electrical car economy, an understanding amongst hydrocarbon incumbents that it's possible in the generation to green the world economy and young entrepreneurs like, Josh put a group of team together to use this technology to try to aggregate people that realize we need a different market mechanism to direct capital, to actually have a transition. It's amazing that this podcast started out of nowhere and ghost over 180 countries. It's astonishing for me to go to the United Arab Emirates or Qatar or Saudi Arabian, and people walk up to me and say, wow, I was listening to SmarterMarkets.

Robert Friedland (52m 58s):

It's really important, you know, I could probably fill a dozen more episodes talking about specifically what we are trying to do about the big existential question. I want to thank you, David, for putting this together. It was a great idea for Josh to, to go back to the beginning to dial this back a 100 SmarterMarkets episodes. May there be thousands more, may we all focus on what the problem is and how to get there from here. May we pray for clever, younger members of the human race to reorganize the way electrons are generated and move to useful human work to feed a human population, to preserve water supplies, to save the oceans, to limit runaway global warming gas and to stop fighting wars over hydrocarbon. We've been fighting wars over hydrocarbon for about a hundred years, so for the New Year, let's pray for peace. Let's hope for the best. Let's gather our energies to continue the work in 2023 and beyond. Thank you.

David Greely (54m 09s):

We hope you enjoyed our special holiday conversation with Robert Friedland, the Founder and Executive Co-Chairman of Ivanhoe Mines, and Josh Crumb, the Founder and CEO of Abaxx. From all of us at SmarterMarkets, we wish you a Happy New Year and all the best to your friends and family. We'll be back next week to kick off a new year on SmarterMarkets. We hope you'll join us.

Announcer (54m 29s):

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