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Special Episode | A SmarterMarkets Remix: Ideas Worth Repeating

It's a holiday weekend in the United States, and we thought it would be a good time to revisit some of the big ideas that our guests shared with us over the past year.

Meeting the new commercial realities created by the globalization of the natural gas market, the energy transition to a lower carbon economy, and the rise of artificial intelligence requires new and smarter markets in which participants are empowered with new financial technology.

And building those smarter markets will require big ideas. We hope you enjoy revisiting these moments and ideas with us.

Our guests featured on this episode are:

-Robert Friedland, Founder & Executive Chairman, Ivanhoe Mines
-Brad Hitch, Director of LNG Trading, EQT Corporation
-Samantha Dart, Head of Natural Gas Research, Goldman Sachs
-Susan Sakmar, Visiting Professor, Univ. of Houston & Board Member, Flex LNG
-Mark Lewis, Head of Research, Andurand Capital
-Hannah Hauman, Global Head of Carbon Trading, Trafigura
-Andy Home, Senior Metals Columnist, Thomson Reuters
-Andrea Hotter, Special Correspondent, Fastmarkets
-Ben Hunt, Author of Epsilon Theory & Co-Founder/CIO, Second Foundation Partners
-Michelle Finneran Dennedy, Chief Data Strategy Officer, Abaxx Technologies
-Dr. David Bray, Distinguished Chair of the Accelerator & CEO/Principal, Stimson Center & LDA Ventures, Inc.
-Josh Crumb, Founder & CEO, Abaxx Technologies

Josh Crumb (00s):
I think building communities and building networks are foundational to markets for all the reasons we have been discussing. That's absolutely been one of the three pillars of Abaxx. Sometimes it gets questioned. Why is an exchange building a podcast? Why is an exchange launching a community? It's because you know that in my mind, particularly where information technology is headed, is gonna be an essential, if not the essential piece of market building.

Announcer (25s):
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?
This episode is brought to you in part by Abaxx Exchange, bringing better price discovery and risk management tools to navigate today's commodities markets through centrally cleared, physically deliverable futures contracts in energy, environmental, and battery metals markets. Smarter Markets are here.

David Greely (01m 14s):
Welcome back to SmarterMarkets. It's a holiday weekend here in the United States and we thought that would make it a good time to revisit some of the big ideas that our guests have shared with us over this past year. Meeting the new commercial realities created by the globalization of the natural gas market. The energy transition to a lower carbon economy and the rise of artificial intelligence requires new and smarter markets in which participants are empowered with the latest financial technology. And building those smarter markets will require big ideas. We hope you enjoy revisiting some of these moments and guests and ideas with us this morning. Our guest featured on this episode include Robert Friedland, Founder & Executive Chairman at Ivanhoe Mines, Brad Hitch, Director of LNG trading at EQT Corporation, Samantha Dart, Head of Natural Gas Research at Goldman Sachs, Susan Sakmar, Visiting Professor, The University of Houston and Board Member Flex LNG, Mark Lewis, Head of Research at Andurand Capital, Hannah Hauman, Global Head of Carbon Trading at Trafigura, Andy Home, Senior Metals Columnist at Thomson Reuters, Andrea Hotter, Special

Correspondent Fastmarkets, Ben Hunt, Author of Epsilon Theory & Co-founder & CIO at Second Foundation Partners, Michelle Dennedy, Chief Data Strategy Officer at Abaxx Technologies, Dr. David Bray, Distinguished Chair of the Accelerator and CEO/Principal at the Stimson Center & LDA Ventures Incorporated, and Josh Crumb, Founder & CEO of Abaxx Technologies. You can find their full episodes on our website at smartermarkets.media or on all major podcast platforms. And now let's get started. And for that we will turn to Robert Friedland to set the stage.

Robert Friedland (03m 13s):
That's a very big and very important and fundamental question since we started this podcast and 200 have gone out into the universe now we have been subjected to an absolute blizzard of misinformation and disinformation about what constitutes an energy transition and what critical raw materials we need to get there from here. So we can separate out the existential question, what the two words energy transition means, then we can settle on the critical raw materials. We'll just note that the Mediterranean Sea was hotter last summer than ever recorded. There are over 600 water tornadoes and the Mediterranean Sea. We will take it as a given that the anecdotal experience of the hot weather the last few years globally supports the thesis that we have anthropomorphic global warming and that we need an energy transition. However, for a billion people and energy transition is for the woman of the household just to be able to cook with natural gas rather than wood.

Robert Friedland (04m 19s):
So let's set aside the words energy transition for a moment. We should probably come back to that and talk about critical raw materials. If you want to electrify the world economy, if that's what we're talking about in energy transition, clean electrical energy, electrical energy, that does not generate global warming gas and that does not exacerbate or trigger an even more critical cycle of the earth warming itself because as it gets to a certain temperature, we could melt the polar ice caps, we could release huge amounts of trapped methane that are frozen in Northern Russia, for example, into the atmosphere. And we could get into a reinforcing cycle where global warming gets even hotter because we trigger sort of a greenhouse effect. Setting all that aside there is essentially an ocean of disinformation and misinformation about the critical raw materials required. So let's go into that and let's peel that onion and get some people to understand a little bit about it.

David Greely (05m 25s):
So let's peel that onion and listen to our guests discuss the state of play in these key energy transition commodity markets. Let's start with Brad Hitch, Samantha Dart, and Susan Sakmar talking about LNG and the globalizing natural gas market.

Brad Hitch (05m 42s):
You know, it's an incredibly vibrant time for the market. The US is over a hundred cargoes a month. At this point in time. It's pretty remarkable that it's done that within the space of 10 years, really less than 10 years actually when you go back to when the first projects got off the ground, you are continuing to see more and more new entrants, players of all shapes and sizes taking cargoes out on an FOB basis sometimes, you know, US volumes going all over the world. So it's an incredibly exciting moment we've reached and it's not peaking yet, you know, there's plenty more to come so it's great

David Greely (06m 16s):
And I was hoping you could put some of that size and the development of the market into some context for us. We often talk about the globalization of natural gas markets through LNG. How does what's happening in the US Gulf of Mexico today compared to what was happening say in the North Sea during the formation of the Brent crude oil market in the 1980s?

Brad Hitch (06m 40s):
That is a very good comparison in my opinion because you know, as the, as the Brent contract was kind of gaining momentum obviously within the North Sea, you had a, what was deemed to be and what was in fact a really good basis for starting that contract in the sense that you had 60, 70 cargoes a month, something like that at the peak and you had a lot of different players. So you had majors, you had traders, there was a good sort of distribution of companies that were in the North Sea at the time. If you compare that though to where we are in the golf today, well you know, now you're at over a hundred cargoes and growing in the golf at the moment. You've got dozens. I think I stopped counting when the number hit 25 or something a few years ago in terms of players that have either primary capacity in the original terminals where they are either tolling or taking long-term contracts or whether, you know, there, there also have been some companies that have come in and bought, kind of bought primary capacity from some of the original holders and doing that kind of further fragmenting the supply side.

Brad Hitch (07m 37s):
But what's also really important about the growth of the US market is that it's predominantly an FOB trade, which means that the volumes can go anywhere. It's coming from a wholesale market which is radically different from the only other real example of LNG being pulled from a wholesale market is LNG coming out Eastern Australia specifically. You know, it has the ability to kind of be the volume that the market swings on. If you look through time, you have had big producing volumes or you have had big concentration of volumes in single locations in the past at LNG, but you have never had that concentration of volume coupled with a completely fragmented supply side and coupled with the ability for players to take that, those cargoes where they are needed most at whatever time. So you know, winter they go to Asia, summer, they go to Europe, vice versa, south America during dryer periods, middle East when it's hot, they really can be the balancing volume for the market and that's I think helping the LNG market, helping the LNG become a much more global and kind of more dependable commodity for a lot of new, new entrants.

David Greely (08m 40s):
Samantha Dart, Head of Natural Gas Research at Goldman Sachs.

Samantha Dart (08m 44s):
If you think about the size of the market today, we are talking about upcoming capacity additions equivalent to about 50% of the size of the current market. But I think the most important stat is not even that one. It's the fact that you are adding, let's say between 2025 and 2029, you are adding about 200 million tons of LNG when your average demand growth out of Asia four LNG imports is less than 20. So it just doesn't add up, right and it gives you a pretty good sense of what's to come. We are likely to be not just oversupply but extremely oversupplied and then we think that the way to balance the market is exactly with prices falling, looking for a home, looking for new demand, new ways to absorb all of that LNG. So it's difficult to avoid that type of scenario when the scale of supply growth is that large.

David Greely (09m 46s):
And what do you think has been driving all the investment in LNG export capacity?

Samantha Dart (09m 51s):
Part of that investment happened after the crisis or during the crisis I should say. And to remind natural gas crisis really took off before even the Ukraine war started. If you go back to really the spring of 2021, that's when we had a big weather event in Europe that triggered the process of gas becoming more expensive than coal. That happened to be a tight summer and it was really the fall of 2021 when Russia started to cut spots sales to Europe. That was the straw that broke the camel's back and then the spiking prices took really a different scale. Some projects did reach FID after that happened. But a lot of other projects that are coming online over the next few years, they have been under construction for quite a few years. Some of them were FID back in 18, a lot of them in 2019.

Samantha Dart (10m 47s):
So it's cyclical nature of the investment, right and what we expect going forward is exactly because we have this wall of LNG just about to hit us in the face, you are going to have this pressure prices lower and somewhat reduce the incentive for new investment to happen for a few years, right? So it's a wall now, it will lead to a bare cycle in the market over the next several years, but the outcome of that should be absorbing all that glut of LNG because you're gonna dry up new projects and lower prices are going to create more demand. So we live in this cyclical industry, don't we?

David Greely (11m 30s):
Susan Sakmar, Visiting Professor, the University of Houston and Board Member, Flex LNG. I wanted to turn to you Susan and ask as we have got this booming US LNG export industry that's continuing to grow, how central is Europe to the plans, the business plans of US oil and gas producers of LNG exporters and how important are European environmental policies to their business plans Now, are they focused particularly on the European market or was it really just kind of the broader global export markets?

Susan Sakmar (12m 06s):
I think Europe is very important. I think all of the US projects, well they, with the exception of Freeport maybe, which is all Japanese off-takers, you know, the US projects do have a lot of European off-takers. And one thing that's really important is your off taker for the US model needs to be credit worthy and so the European off-takers are credit worthy. A lot of emerging Asia off-takers are not credit worthy. And so the US LNG model really relies on the credit worthiness of the buyer. So I think Europe is very important in that regard. So I think Europe is important and I think when you look at for example, Cheniere and you mentioned methane and the European

regulations, I think Cheniere is a company that stands out to me as saying Europe is important and we will do what needs to be done to ensure our US LNG will have a home in Europe and comply with European regulations.

Susan Sakmar (13m 06s):
So I feel like some of the companies, especially Cheniere, which is the largest US LNG exporter, has taken the lead on looking at methane emissions from the source of the natural gas from the gas that's being sourced and Cheniere just released a new lifecycle emission study that they think will comply and meet European regulations. And these are the regulations that are going to impact the imports of US LNG in a couple of years. I've been saying sort of on social media that I do think there needs to be, I'm calling it harmonization, but that's sort of a term of art. I think there probably needs to be some more coordination between the US government and European governments in terms of how the European regulations are going to roll out so that US LNG isn't excluded and I just the other day saw something come across social media that the US and Europe are looking at that.

Susan Sakmar (14m 09s):
So I think under Trump we are going to see a lot more and hear a lot more about how European regulations will impact us. LNG, I think that is still coming because in my view it's a bit unclear how the European regulations, how they're gonna be implemented and I think from what I have heard from some lawyers, it's a bit unclear on European buyers, you know, can they sign new US LNG deals and will those deals be valid in 20 years if European regulations are now requiring European buyers to look at the emissions of the full value chain, which is pretty hard to do, do, right. A European buyer, you know, has to look at the emissions of the full value chain of US gas. I mean it's hard for us producers to come up with that number and now we are sort of putting that on European buyers to make sure that it's going to meet the European regulations. So I think under President Trump, we are going to hear a lot more about that and how that's going to roll out.

David Greely (15m 16s):
Let's follow this discussion of the role of European policy on these markets into the carbon markets and for that, we will turn to Mark Lewis and Hannah Hauman.

Mark Lewis (15m 26s):
The EU ETS is still very much the global benchmark compliance market, still the largest market, the most liquid daily auctions. So pricing in real time with very decent liquidity, 35,000 to 40,000 lots traded every day on the EU ETS across the strips, still mostly in the front year contract, but you know, that's 35 to 40 million tons a day being traded notional in the carbon futures market. So it's a very sophisticated deep liquid market with a very wide range of players, the compliance players, obviously the power companies and the industrial companies that have compliance obligations under the scheme and then different kinds of financial players, banks who are in there on behalf of industrial companies very often then hedge funds and speculative funds such as ourselves who are looking to trade the pricing arbitrage opportunities and look for opportunities whether across the curve or between EUAs and the other carbon markets.

Mark Lewis (16m 28s):
And we will certainly get into that later in the conversation because at the moment, well right now I think probably the most interesting opportunity in compliance markets is, is in the UK and narrowing the discount to EUAs and we will come back on that, but that's kind of the state of the nation in terms of why the EU ETS is still very much the benchmark market for compliance schemes globally, the one that people look at and one other feature of it, of course, that I should have mentioned in that summary is it's the longest in existence. It's been going since 2005 and crucially Dave and I think this is a point that is often easy to forget in the day to day excitement of trading this market. We are now halfway through the lifetime of this market. It started in 2005, the cap is falling to zero by 2040.

Mark Lewis (17m 23s):
So this is a market that's been up and running for 20 years and basically it's only got another 15 years to go, at least as the legislation is currently written, we will see what happens as these geopolitical pressures from Donald Trump kick in and tariffs potentially kick in. But right now we're over the halfway mark in the lifetime of this market and the rubber is about to hit the road in a big way because coming back to your question, just trying to set the scene again where we are in terms of the development of the market, a very very key development next year we have the CBAM, so-called CBAM carbon border adjustment mechanism, which is effectively a carbon tariff that the European Union will place on imports of goods covered by the scheme to ensure that European producers are not at a disadvantage in their own market from foreign producers of steel and cement and so on.

Mark Lewis (18m 21s):
And this is going to change we think market behavior. And perhaps just to step back a little and explain to our audience the significance of this, I mean this is a market that from day one, so from the 1st January, 2005, where price formation has been driven by the power sector, the power generation sector, right? They have always had this obligation, certainly from 2008 they have been under an obligation to buy all of their allowances at auction. Whereas the industrial sector receives still a very significant share of their overall allocation for free precisely because of this problem of competitiveness with countries outside the EU who produce the same goods and what that means is it's been the power sector that has driven price formation. They're the ones we have had to hedge forward and take carbon pricing into account when they're selling their power forward. It's essentially just another commodity like coal or gas that they are using for their power generation.

Mark Lewis (19m 23s):
They buy coal and they buy carbon, they buy gas and they buy carbon. And because they hedge forward, typically they sell their power on a rolling three year forward basis. That's why they have always been the main driver of prices. Now of course, Europe is decarbonizing in the power sector very quickly. We have renewable energy capacity coming onto the system every year and it is displacing the older fossil fuel generation capacity and what this means structurally, the European power industry is reducing its ions from year to year simply by virtue of the fact that more and more renewable capacity is coming onto the system and what that means in turn is we need the industrial sector to step up and start hedging their forward liabilities in the same way that the power sector in the past did, but in the future will not be doing because they have less and less of a, a requirement to do that because more and more of their generation collectively is, is coming from renewable sources.

Mark Lewis (20m 23s):
So I think this is an absolutely crucial moment in the development of the EU ETS, which will be watched very closely by other jurisdictions that have compliance markets because the EU ETS, as we have known and loved it since its inception, is going to go through a big identity change as industrials step up to take over from utilities as the main driver of prices. I liken it Dave, to a relay race where the power generation sector has been running the first lap or the first few laps around the stadium and we are now getting into the box where they hand over the baton to the industrial sector and they have to step up and take responsibility for driving prices. So that's a long answer to your question, but just to give a flavor of, you know, where we are in the market, the day-to-day liquidity, the main participants and how we are thinking about these significant structural changes that are coming and the pricing opportunities that inevitably will arise from that.

Mark Lewis (21m 22s):
Because what we are looking at now between now and the end of this decade, and in fact all the way down to 2040 now is annual deficits where demand is outstripping supply. So we should start to see prices move structurally higher over the next five years, between now and 2030 as we find that abatement price point for industry. What's the price at which industry can reduce emissions? That's logically that's where the price has to go. Now is it a hundred, 150, 200? That's what the market will have to figure out over the next two to three years.

David Greely (22m 02s):
Hannah Hauman, Global Head of Carbon Trading at Trafigura.

Hannah Hauman (22m 06s):
So as you said, we'll talk a lot about Europe today, but in reality this is a trend that we are seeing playing out globally, specifically that governments are increasing their pace on legislation quite ironically as corporates are starting to slow the pace on their side. So what we are now seeing is really the inflection point as that government policy is now actually conforming into policy, legislation and ultimately law and these really take different kind of forms and shapes. And you mentioned a few of those, but the way to think about the overarching framework and how they work together is we have elements like CSRD, which is really talking about carbon accounting. We have the CRCF, which is talking about carbon removals or the quality of what a net and net zero looks like. And then finally the EU green claims, which is exactly what it sounds like, talking about how companies actually account for their missions reporting, how they communicate this to investors and consumers alike.

David Greely (23m 08s):
I want to take it now to the last piece of regulation, the EU green claims directive, which regulates how companies may talk about what they are doing on the climate side and when you look at that, how does that regulation of the claims that can be made, what is that requiring and why is that important to putting together these three legs of the stool? I guess

Hannah Hauman (23m 30s):
I'm gonna use some words that you may have heard previously. Words like standardization, objectivity, robustness, no different to let's say that demand side of the equation, which is that emissions accounting, we need to define the quality, but then we also need to define how that is actually being used in the market and on what basis. So today we see a lot of descriptions in retail goods in corporate advertising, whether that be carbon neutral or low carbon. There is not really clarity on what that means as we look product to product and firm to firm. So what's really interesting about the EU green claims directive is we are now getting in effect a gap accounting version of what is the appropriate way to claim offsets, talk about decarbonization process and really actually define what makes a product carbon neutral or low carbon and what were the scientific objective measures that companies used to get there. So what we're really looking at going forward is kind of this concept of calorific content that we think about when we think about food, but again, moving more towards what is that objectively low carbon number, not just descriptive, categorical.

David Greely (24m 42s):
And so now we, we put these three pieces together, we have a regulatory definition of what constitutes a ton of a carbon emissions reduced or removed rules on how a green claim, including a net zero claim may be made and those claims now carrying the legal weight of financial reporting. So how do you see this regulatory approach reshaping the way we need to be thinking about the potential path forward in the carbon markets?

Hannah Hauman (25m 08s):
What's interesting about this is, as you mentioned, this is the three-legged stool. They look from the surface as though they are three very independent regulatory tracks, but in reality they are all moving at the same pace and really seeking to deliver at the same time for good reason and that's really because we're moving out of what I would say is a pure voluntary kind of guise of what corporate action looks like as we are now not only regulating the claims, but we are also regulating the underlying accounting and progression of those targets. So as we move forward, I think we're thinking less about these as completely two separate types of markets in terms of voluntary and regulatory. And we are really thinking about regulated markets, which in their own right are already increasing in terms of sectors, geographies, products that they extend to but now also a regulated corporate commitments market, which is now really again moving away from that sustainability report that's primarily focused on graphics and much more focused on what are the objective measures that companies are taking towards climate action. And again, how do they compete on the basis of decarbonization and progression towards targets.

David Greely (26m 18s):
And the carbon markets aren't the only market in which the energy transition hasn't gone the way people thought it would go. As Andy Home and Andrea Hotter explained in the battery metals markets.
You said that the energy transition hasn't stopped, but it just hasn't gone the way people thought it would go. And in this podcast series where we are discussing the state of play in the battery metals markets, I thought that would be the perfect place for us, for us to pick up the conversation. And I saw that you wrote recently in one of your articles that 2024 was in your words, a brutal year to be in the battery metals business.

Andy Home (26m 55s):
Let's take a little step back. I mean let's look at it being a, what's been going on in these markets for the last four or five years? So 2021, 2022, it was a rip roaring bull market. Do you remember cobalt, nickel, lithium, they were all going absolute gangbusters. Everyone was super excited about the EV revolution and you know, the exponential demand growth forecast that we were all looking at, okay, each one of them crashed in 2022, 2023, nickel started it, cobalt followed, lithium was last, right? We are back to sort of like where we were, but here's what happened in 2024 nothing. They just kept on grinding steadily lower and you are getting you to absolute producer pain levels, right? So we have got an industry that just, what, three or four years ago it was kind of like me trying to expand capacity, like there was no tomorrow we were told that the world was gonna run out of this stuff.

Andy Home (27m 53s):
This last year you had just seen a string of casualties, right? Plants have been closed, new mines have been closed, every once in all right can be pushed back. I mean any sort of investment plans, right? So this is a very, very difficult market for anyone trying to sort, right, get into the battery metals business. It's a difficult market for those already in the battery metals business, right? Demand has turned out to be the really unpredictable part of our market equation, right. In terms of moving units, absolutely. It seems subsidies work for consumers whether they are living in Beijing, London or San Francisco, right? But here is the thing, not all the electric vehicles are made alike. And one of the big surprises I think for me personally, but I think for the market as a whole is when we talk about electric vehicles and battery metals, I think most of us are thinking of a Tesla style vehicle.

Andy Home (28m 54s):
Pure battery driven, right, actually the vehicles that sell much better than pure battery are hybrids. The world's car buyers really like hybrids, plug-in hybrids, full hybrids, extended range hybrids and that applies to the Chinese as well where hybrids are the rage, right? But here is the problem, battery in a hybrid about a third of the size and a third of the power in one, in a pure battery electric vehicle, right? Which means what? Yeah, a third less of all the materials are going in to make that battery. A lot of the batteries being used now changed to chemistry. Just lithium iron phosphate, no nickel, no cobalt, no manganese. So demand in terms of vehicles going up to 25% growth in global electric vehicles last year, right? But that's not the same as saying that's the equivalent demand for the metals because solar cars, which are really moving fast at the hybrid models using less metals, right? This is kind of a really, this is the market,

David Greely (29m 53s):
Andrea Hotter, Special Correspondent, Fastmarkets.
I would think that you have had a lot of the producers in particular outside of China in these metals sectors struggling. And one of the benefits that China has is there's been such an alignment through the government, through the supply chain of the direction they are moving in and it sounds now like Western producers are kind of having to take a step back because you don't want to commit a lot of capital if there's just too much uncertainty about the future. So I am curious, it seems like this could kind of tilt the odds against Western producers a little bit more. I mean there's always a chance that the easier permitting, potentially some subsidies, some other things that are done can help give them a boost competitively. But it would seem like just the ambiguity has got to be making them pause a lot of decision making and lead to less investment in the near term.

Andrea Hotter (30m 49s):
I think it's interesting. I think you need to differentiate between producers investing in the US and companies outside the US and I think, you know, it was quite evident from some of the comments, again, a lot of the producers are being quite cautious about what they say, but we have heard some of the Australian producers in their earnings this week, lithium companies say, well the energy transition hasn't stopped just because of this. This is carrying on with or without the US. We are still pushing ahead with our projects. So I think once you have invested that capital, once you have committed to it, I think it's really hard to pull back, particularly in all of these massive projects abroad where you have got jobs reliant on it, you've got investment that's already happened and you know you have your own targets to meet within those various countries. So to a certain extent it's really important for the US market and for investment in the us but you do have to look at the rest of the world as kind of, it's still really important to the energy transition and the US might pulled outta the Paris Climate Agreement, but all the other countries that are its signatories have not, and they still have their targets to meet.

Andrea Hotter (32m 03s):
So I think we really need to be aware of that. And I think the other thing to think of is this material will just flow somewhere else. We saw during the Ukraine and Russia war, when that started, that materials started to reroute and you could do business with some countries and you couldn't do it with others and we saw who would do hoop business with who, and that material is still there, it's just going to different places that it did before. So I think a similar kind of thing will start to happen in terms of trade flows, in terms of projects and capital investment amongst producers. Yeah, it would probably give pause if I didn't think that I was going to get tax credits and so on and it suddenly skyrocketed costs. But I think if you already made the investment and you are already committed, the money's in the ground and you are doing it, then pausing that project it, we'd be hard to find a reason to.

Andrea Hotter (32m 58s):
But again, you know, anything's possible, anything can happen. In theory the US still wants to push ahead with its drive to procure and produce critical minerals for its supply chain. So it wants many of those to be produced domestically, which suggests that if you are a producer and you want to invest in the US your money should be welcome. What form that takes, I don't know maybe the inflation

reduction act, like I said, maybe it gets renamed something else because maybe it comes the Trump Natural Resources Act. I don't know. But you know, I am being a little flippant here. All I am trying to say is I don't think that that push has gone away. I just think maybe it's become a little more politicized and once we get over that, I think that you might find that the goals and ambitions are probably the same.

David Greely (33m 48s):
Building these new markets to meet the new commercial realities of the energy transition also requires making them smarter. And new technologies, such as artificial intelligence have been redefining what is possible. Ben Hunt, Author of Epsilon Theory, joined us to talk about how the rise of artificial intelligence and large language models isn't just a technological revolution, it's a linguistic one, a transformation in how we perceive, construct and share. Meaning

Ben Hunt (34m 18s):
I will start with something close to home. I mean how we are actually using it in our work. I've been trying to think of best way to describe this. What we do in our day job is we're trying to find the semantic structures in unstructured data. That's a $10 phrase, semantic structures. The examples I like to give, if I'm talking to somebody from Hollywood, I say, well an example of semantic structure is the hero's journey, right? It's that old story, it's a story arc, it's a script, it's a narrative archetype. I mean there are thousands of different scripts and movies that use the hero's journey as their base, different characters, different settings, different words to describe it but what we mean by semantic structure is that it's one story, it's one coherent story and the kicker is that I really believe this is that, that we humans are hardwired to respond to that story.

Ben Hunt (35m 21s):
That our brains are wired not just for grammatical structures, but I think even more so for semantic structures, for story arcs and archetypes as I am describing now in Wall Street in investing, an example of semantic structure might be, well we are bullish on the new thing, right. Again, can take a thousand different forms, not dependent on what the new thing is. It's dependent on telling a story in a certain way that we humans are also hardwired to respond to. We start paying attention to that new thing, we start getting excited about the new thing. So that's what we try to do in our day job and our initial cracks at this and gosh, I have been working with language, we didn't call it large language models. We didn't call it natural language processing 30 years ago, 35 years ago now, my god, we are getting old.

Ben Hunt (36m 25s):
But that's what it was. You know, the math hasn't changed, the linguistic approach hasn't changed. But what has changed is just the raw firepower that's at our fingertips. The artificial intelligence of a large language model. I like to call it a non-human intelligence artificial that makes it seem fake. It's not a fake intelligence, it's a real intelligence, but it's also profoundly not human intelligence. We have all seen, I think the cartoon of the Shaghaf monster with the million eyes and kind of the jelly monster that this is what a large language model is and we put a pleasant face on it through our training and our reinforcement learning and stuff like that. But it's a very non-human kind of monstrous thing back there. We said, okay, let's use that as our engine. Let's build a backend and a front end large language model as I'm mixing all my metaphors here, but as our steam engine here, as our source of energy.

Ben Hunt (37m 30s):
And maybe we will catch more fish. I bet we catch some old shoes as well. Our expectation was, okay, we will be catching a lot more fish. We are building a much bigger net. We will get a lot more signal from incorporating large language models directly into our technology stack. We will get a lot more signal, but the signal probably won't be as high a quality as the signal we got from Ben and Rusty. Thinking really hard about a problem and in fact when we built our new net, put it into the pond, we called a lot of fish, a lot more fish, like 10 x more fish. The crazy thing though, Dave, was that we didn't get more false positives. We got a lot less. It wasn't just that the amount of signal increased dramatically, like by a factor like 10 x, but the quality of the signal improved as well.

David Greely (38m 28s):
But while this kind of intelligence lets us see more, it also raises hard questions about control, autonomy and how our digital environments shape us in return.

Ben Hunt (38m 39s):
You know, anything you say can and will be used against you in the court of social media. I hated reading him in grad school Fuko, because you know, he writes in a language that's intentionally obtuse and difficult to understand. But the concept, again, not original

to him, but to Jeremy Bentham, the Notion of the Panopticon, the most effective prison in the world is not the one with the most guards. It's the one where you think someone's always watching you. If you think that what you are doing is always being recorded and could be used against you, man, that constrains your behavior so much more than anything else that can happen. I really feel like we build our own mental panopticons and our prisons. No, I can't change my mind on this political candidate or this sports person or this, you know, this celebrity. No, I am on team this or team that because we have outsourced our consciousness, right and so it's so difficult to reclaim that for ourselves, that autonomy for ourselves. I think the only way we can do it is to find those small groups of friends, of friends and have conversations where we work things out and talk about stuff without worrying that it's going to be stuck in your ribs.

David Greely (39m 59s):
Such a novel invention the friend and I wanted to ask you, you know, like for doing this, we have been building our own coffee house and thinking about how the format of our digital communication alters the content, alters how people engage with it. I think the original character limit on tweets was a great example. Like remember when that first came out, it seemed like what you are going to say and so few characters, but it completely changes the way people communicated with each other. I am curious, you know, like how do you think about, do we need to change some of these formats? Because I don't know what the analogy to form follows. Function is in language, but is kind of the content of our communication, the content of our thinking, being shaped and constrained by the formats we're able to communicate in.

Ben Hunt (40m 46s):
Do you read books anymore, Dave?

David Greely (40m 49s):
Seldom, unfortunately.

Ben Hunt (41m 01s):
Me too.

David Greely (41m 04s):
It's gotten much shorter form.

Ben Hunt (41:06):
Me too I want to be a book reader. I used to be a book reader and we can be honest here. I don't read books anymore. I buy a lot of books because I want to be a book reader. The book has become really a totem to me. It's less of a source of information entertainment, honestly. Books have become just like a, a totem, you know, an object that make me feel better to have around me, but that I don't use instrumentally the way I used to. I can force myself, I guess, maybe to become a book reader again. I don't think that's a winning formula. I think that we have to recognize how we have been changed by the pervasive sociopathy of the system, by the technology that is both this enormous and incredible energy source as we started off this conversation and not, but, but, and is an energy source that can be used against us.

Ben Hunt (42m 03s):
I think what we have to do, Dave, is it's not try to force ourselves into the old ways. By God, we're all going to become book readers again and we are going to like it. I think I could just got to admit to myself that I like having books because they make me feel good to have around, but I ain't going to read them. That's the way I used to. I think that by using what we have got, which is this enormous form of energy and invention in the form of large language models and that non-human intelligence really to create extensions of ourselves, not to outsource our consciousness, but to leverage our consciousness. Man, that gets me kind of excited and I know that that's a big part and I think that's a big part of what you guys are working here. That it's a place to have trusted circles of conversation and it's, I will say native to digital agents and using large language models to extend our consciousness, not to outsource it.

David Greely (43m 10s):
As Ben Hunt explained, large language models internalize the stories we feed them. And in an age where data is the raw material of intelligence, the systems we use to collect, store and monetize that data matter more than ever. But what happens when data becomes a commodity traded hoarded and reused across invisible supply chains? And what does that mean for our privacy identity and agency in the age of artificial intelligence? Let's discuss this with Michelle Dennedy and Dr. David Bray.

Michelle Dennedy (43m 41s):
The quantity and the quality of the damage in this kind of situation is over time. So right now I think the immediate damage is more spectral than actual. But I think there is sort of two mind thoughts here. One, why aren't we talking about this more? Why aren't we hearing all the commentators being afraid, wring their hands, etc., and I think it's partially because we have become numb. We keep hearing about breach after breach. We are spending trillions of dollars on security measures and security leaders and fancy C-Suite designations for people and yet we continue to have these massive bunches. So the other side of this is, it's a massive bunch. I mean, we are talking about billions of records on. Unfortunately, I think this is the beginning of an era now that we understand that data and training data and data supply is a market, a new market that is allowing for this boom town of ML and AI. This is the beginning.

David Greely (45m 09s):
I want to talk about the value of that currency as you put it with you, because from our earlier conversations on the podcast, one of my big takeaways has been that we all need to understand that our data is a highly valued commodity with an entire industry around it that most of us are not even aware of. And much like people learned about physical supply chains over the course of the COVID-19 pandemic, people now need to learn about data supply chains. So how do we get started thinking about this data industry and the data supply chains that support it?

Michelle Dennedy (45m 45s):
It's really important to, I think, start with the foundations. Let's go back to the mortgage crisis of 2008. Why was anyone able to resell a mortgage that was given out to a person with very little credentialing, if any? We had people who had no employment or very low employment, able to take out a lot of money with absolutely no backing whatsoever. Well, we were able to do that because we were able to bundle these things into packages and then resell those packages. You never would've said, oh look, it's a 18-year-old kid with two months of bartending behind him. Of course we'll give him a home loan. You never would do that. So part of the reason with privacy to kind of like move into that analogy is the companies that are selling and reselling your information don't necessarily care about you, the individual. So for the longest time, particularly in ad tech where we are making money by displaying things, quote unquote for free, by sucking information about the use and the viewing of those ads, the use of those services, the companies were able to say, I don't care about Michelle Dennedy I am gonna call her Michelle X, we will call that anonymized. We will put her in a bundle with all the Michelle X like creatures, and we will start to auction off that attention to the highest bidder and over time, we have seen regulations sort of try to catch up with that but understanding that we as a group of people are very important to the world economy in the digital world, buying and reselling. But we are also really important to understanding how we are a part, a fundamental part of how the sausage is actually being made. We are not just viewing ads. So what we're doing to try to understand how we interact, particularly with software, but it all trickles all the way back. The software is running somewhere. In reality, our quote unquote cloud services are all attached to actual servers and computers and databases. So at software, it's hardware, it's HVAC, it's energy. How are we having all of this data flow and how is it equally flowing? It's easy in that complexity and that expense to forget each individual element. So we are all sort of the blood flow. And that's why I say data is not oil. Data is a currency because it's contextual.

David Greely (48m 26s):
Dr. David Bray, Distinguished Chair of the Accelerator, and CEO/Principal at the Stimson Center & LDA Ventures Incorporated.
I want to go back to something you brought up before, which is trust. Because that seems like that's one of the fundamental hard problems at play here as we change the whole nature of the means by which we interact with one another. I really appreciate your definition and I want to repeat it because I think it bears repeating where you said you define trust as the willingness to be vulnerable to actors whose actions you cannot control. And I think that's really worth spending some time thinking about. And when I think about trust and the loss of trust that we've experienced in our digital communications, it reminds me of an old quote in a slightly different context, which was, you know, it's say, the problem with losing the ability to know who to trust isn't that you believe nothing, it's that you're capable of believing anything. You know, it's not that you trust nothing. It's like you might trust who knows what. So my question is how do you think we go about rebuilding trust in our digital communications?

Dr. David Bray (49m 36s):
It's proven hard to figure out how do you put identities on the internet in a way that at the same time protects people from a surveillance state occurring? Because the very thing that authenticates that it's you or authenticate it's me, unfortunately, makes it really easy for surveillance to be done, either for government means or for corporate means. We lose the ability to have consent about when that's done or not. And then yes, there, there are efforts afoot. Maybe one day will figure it out. But I would say right now, if anything, there are countries, one that's 1.3, 1.4 billion people that have already rolled out their version of the internet in which everybody is surveilled. Everybody is known, not great, it's not consistent with what I consider to be a free society, but that's what they

have chosen. I am going to give a different path, which says, what matters in free societies is the ability to, that you can be pseudonymous, you can actually be anonymous if you want to as well.

Dr. David Bray (50m 20s):
Now maybe because you're anonymous, I am not going to, you are not going to get the fast lane on getting an airplane. You may not even get on an airplane at all if you don't give some identity. But if you give some identity, you can get an airplane. If you give even more information, you get into the TSA green line. But, but what's even more important is the provenance of data. And what do I mean? I mean by that, where did it come from and who or what did it come from? And in some respects a little bit into it, but it's focusing on the data versus who you are because that gets necessary because one, as we try to try and figure out what's more authentic versus an authentic, what do I want to believe versus what, what I don't want to believe. I mean, that's what the intelligence community does is they pull information from different sources, they have different degrees of confidence in those sources, and as a result, they try to complete the whole picture. And I think if we are going to find any solution that allows individuals to do the same thing, we have to start with how do you know that that's really coming from a source that in general has been more right than wrong over the last three to four years, or it's something that I am willing to say they actually did some vetting. And again, you may choose and say, look, I am also going to include sources that I know are politically biased, but they're part of my team and that's okay and that's fine. But if we can focus on the provenance of data that helps solve issues for corporations, trying to figure out what are we gonna do about this market or this supply chain that helps communities figure out, which is, is this a reliable source of news about what's impacting us at the local level or the national level? And finally it helps us deal with the fact that we're increasingly gonna have synthetic information and machine delivered information. And how do I know that what this machine was trained on is anything that's reliable, let alone if the machine itself, whatever it's giving me is reliable too.

David Greely (52m 04s):
And we will finish out the discussion with Josh Crumb taking us into the next chapter of SmarterMarkets where digital identity, verifiable titles and collateralized assets come together to build smarter markets for global trade.

Josh Crumb (52m 20s):
That is a problem and I think, I think our minds can't even get our head around some of the, some of the things that are gonna happen as a result of generative AI and the fact that the centralized data model, as much business trust architecture as you can put in place, it's going to disrupt things sort of incalculably at this at this point. So I think, you know, we always kind of had that vision that, you know, we, we needed to really go down to the first principles and, and really, really think about trust infrastructure, both from a business infrastructure and workflow as well as, you know, the actual IT systems that, that support that, that's always been a core of Abaxx is try to kind of build ahead of the storm. And I can say pretty unequivocally, we hit sort of a terminal threshold for some of the problems of trust on the internet over the past year.

Josh Crumb (53m 11s):
It's only gonna accelerate from here, but we have always been trying to get ahead of two problems at one. All I am trying to do is apply things that have worked and sort of decentralized and distributed systems of finance and try to bring that to the world of information. When we think about ID plus plus. Absolutely we are thinking about trying to track and trace the providence of the very beginning of, of a supply chain and say, you know, Robert Friedland's copper, but we are also thinking about can we take that same, those same systems of information supply chains and apply that to data, right? You know, right now we, we have no idea where the content authenticity, you know, starts, you know, where does that supply chain start and you know, as Michelle Identity has said on the podcast, we are swimming, swimming not in data lakes, but you know, data sewers in in many ways because the bad stuff is polluting the good stuff.

Josh Crumb (09m 00s):
We don't have the filters, we don't have the refining, right. I think that's another way to look at it. We have all this raw, raw information potential, think about it like a, you know, a crude oil deposit, but we need to extract that data. We need to refine it, we need to, you know, make it safe, you know, to be u used as jet fuel and, and the LLMs, that's the sort of the lowest entropy crack of the barrel, right? That's what we need to do with information. So again, all I am doing is applying what we have done in other systems to thinking about how we do this in information systems and I think that's where ID plus plus is, is so, so critical is being able to have those verifiable credentials for not only every individual, but how every individual interacts with every organization, how they act with every piece of data.

Josh Crumb (54m 36):
Again, this is a big task and that this is, you know, like Smarter Markets. This is a, a long term endeavor. Smarter markets is not that we know Smarter Markets, but we are at, we are just trying to ask the questions and build the systems so that we can always progress smarter markets. So where, where does identity come in, right? So identity is super important because this is where the trust anchor comes from that. It was a great point last week when you were talking about insurance and if a bar is stolen versus a bar was lost in accounting, how does insurance come to play? All of that comes down to what I call what would be like a signature skin in the game, right? Who signed that count? Who audited that? It's all that contract law that comes down to an individual signing it and an individual has some sort of authority or responsibility.

Josh Crumb (55m 31s):
They're putting their job on the line saying that like, yes, I counted this correctly. They said, yes, this forward contract, these performances, I'm signing my credibility to that right. So the foundation of trust is not just abstract concepts like regulatory and all these other institutions. It always comes down to the individual and that individual signing their identity into a contract. So in my view, digitizing that process in a more secure, trusted way than just passing things around on DocuSign became far more important to seeding trust in the financial system than trying to put something on a Blockchain. But the next step from there actually is again, what we have talked about is smart commodities. Having that digital title, there's things that we can do to be able to have more data than just the pure grade and location. You can have all sorts of other environmental impact or other data in that commodity. And again, that will all happen with a digital title that has much more metadata, much more persistence of data all the way through the supply chain embedded into the digital title. So again, there's multiple layers of getting this technology right, getting our messenger out to market, getting our signing tool out to market, and ultimately our identity and digital title as that pulls it all together.

David Greely (56m 43s):
The systems thinking, I think is what often gets missed at first blush because you know, even going back to the, the very, even before Smarter Markets when you were with Eric Townsend, the first host of Smarter Markets on his Macro Voices podcast, and you talked about the dimensions of Abaxx and the part that was markets, the part that was financial technology, the exchange and Clearing House ID plus plus. I think often people would scratch their heads and say, well, these don't seem to be related, but you know, whenever I talk with you, it's very clear how they are all related. It's the same systems thinking, and it's also related because all these things you are doing are about building networks and helping people use existing networks and systems to collaborate in new and more powerful ways. And so I wanted to ask you, getting those networks going is always a big challenge. Like what sets this type of business apart, both in terms of the opportunities once it's built and the challenges in getting it there.

Josh Crumb (57m 44s):
Yeah, well, I think it's the recognition of the interconnectedness, and again, one of the first themes that Robert Friedland, you know, mentioned on the podcast is, is our interconnectedness, but it's off string those networks and those communities of asking questions, right? That was the point of, of building the, the podcast. But I think you are gonna start to see in, in years ahead that we are going to take that from just a bringing guests of our ecosystem on to talk about their piece of the system or piece of the infrastructure and we are going to start moving this more into real time, being able to query different guests at that dinner table. And by the way, not do it sequentially, but do it, you know, everywhere all at once as the transformer model will allow us to do, particularly as we network it and bring it to scale. So yeah, I mean, I think building communities and building networks are foundational to markets for all the reasons we've been discussing. That's absolutely been one of the three pillars of Abaxx. Sometimes it gets questioned. Why is an exchange building a podcast? Why is an exchange launching a community? It's because you know that my mind, particularly where information technology is headed, is, is gonna be an essential, if not the essential piece of market building.

David Greely (58m 56s):
Thanks again to all of our guests. We hope you enjoyed this episode. We will be back next week returning to our podcast series Gold for the 21st Century. We hope you will join us.

Announcer (59m 01s):
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