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TRANSCRIPT

Energy 360°

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FEATURING

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Kevin Book: Why is it we have such big cars? Well, we're driven by policy. Those policies were accommodative of big cars. You got your fuel economy standards were in proportion to the vehicle footprint. And why is that? Because nobody gets reelected in America putting large people into small cars.

Lisa Hyland: Hello and welcome to Energy 360, the Energy Security and Climate Change Program podcast at CSIS. I'm your host, Lisa Hyland.

Today we welcome back to the show two returning guests: Kevin Book with Clear View Energy Partners and Liam Denning with Bloomberg Opinion. In mid-December, they sat down with Joseph Majkut to look back at the energy issues of 2023 that have had the most impact or staying power including the decline in clean tech markets, how oil and gas companies are investing in clean energy, the growth in the electric vehicle market, the impact of climate policy on trade, and politicization of energy issues, just to name a few. I will turn it over to Joseph for their review of 2023.

Joseph Majkut: Hello and welcome. What do we make about the developments in energy and climate that we've seen over the last year every year? The program here at CSIS does an end of year wrap up podcast to try and take some of the stories, some of the themes that we've signed, develop over the past 12 months and see if we can come to some conclusions about what we should learn and talk a little bit about what we're going to see next year. I'm joined today by two fantastic repeat offenders in this exercise. Kevin Book is a senior advisor here at CSIS. He's also a principal at Clearview Energy Partners and Liam Denning is an opinion columnist with Bloomberg Opinion. Both of the two of them are leading scholars and thinkers in the world of energy, energy markets and energy politics. And I'm really happy you're both joining us here today.

Kevin Book: It's good to be here.

Liam Denning: Good to be here.

Joseph Majkut: Now the challenge with doing a year-end podcast is you have to record it a little bit before the end of the year. So contingent on there not being something really, really explosive, pardon the use of the phrase, in energy markets over the next couple of weeks, I hope we can kind of have a fulsome discussion over all that's happened because it feels like it's been quite a bit and yet coming off of 2022 where energy markets were in total disarray, 2023 maybe signaled some return to calm as well. So I'd like to start the conversation maybe with Liam and what you thought moved markets or didn't move markets in the past year in a way that might've surprised you.

Liam Denning: I think one area I would focus on is there was not so much calm in that area of the market called broadly clean tech. Just to throw out one number, the Wilder Hill Clean Energy Index, which peaked roundabout the time President Joe Biden took office, is down four-fifths since then, give or take. And it fell again this year. And what's interesting for me about that is a lot of that seems related to, well one reversion to the mean in some respects because it ran up so strongly. But two, the rising cost of financing the rising treasury yields especially, which I think has not only obviously made it difficult to finance certain projects with I think U.S. offshore wind power being the poster child for that, but also in a sector that is a skewed quite heavily to upfront CapEx, which is still reliant on government policy a large degree. It's a lot easier to do that stuff when rates are at zero 1% rather than four to 5%. And we're still living with that today in terms of valuations and in terms of project developers having to go back to the drawing board and say, can I pencil this out? I probably had wiggle room of maybe a hundred basis points, not 3 or 400 basis points.

Joseph Majkut: What do you think is the long-term implication of that dynamic? I mean, I completely agree. You see projects being canceled, drawn back, scaled down. Is this going to lead to a sort of renaissance in cost discipline and five years from now we'll have a much more competitive energy clean energy sector? Or is it sort of saying if you don't have cheap money, the energy transition's going to be really, really hard?

Liam Denning: I think you would just to follow on, I think you would hope so. In one sense, the cleantech sector is going through what the shale sector went through to some degree. There's, there was a lot of free money in the sense of zero interest rates and then on top of that fiscal stimulus in terms of IRA subsidies and that sort of thing. And we know from the history of the shale industry, what that tends to do is you get a lot of projects financed and a lot of companies starting up, which as soon as conditions worsen even a little bit, tend to fall away. So I think we are going to see consolidation. I do see it at this stage as more of a bump in the road than a wall. I would put it that way.

Joseph Majkut: Kevin, what are your thoughts?

Kevin Book: Well, one of the aftereffects of the bubble and the mania is a series of happy second donors. So, this is not, I think the diversification or the transition for which environmentalists have been asking, but oil and gas companies have money and they buy things. They buy things when they're cheap and they make sense for the portfolios they have. And so, with that acquisition and diversification does become, you get a change

in the entity. So, an example I'll give ethanol plants, built probably too expensively and too hastily in the boom times of the RFS, went bankrupt and were bought for dimes on the dollar by refiners who then became interested in the policy outcomes that obtained to ethanol and had interests that aligned with a product, an industry that they previously considered either competitive or even arrival. So, you do get changes through these sort of boom bust cycles when you get diversification acquisitions, although that's not really what we've been seeing lately.

We've seen sort of the opposite of that. And I would say that maybe to Liam's point, one of the tailwinds behind clean tech was this notion of a very prescriptive that we were all going to be greening with clean tech. That was going to be the answer. And we had the president here in the United States, we had the European Union leadership taking Green Deal forward, and now what we're seeing is that the policies that we're driving this aren't able to overcome. Yes, the end of negative real interest rates and the arrival of inflation and perhaps the more pragmatic transition policies that are being embraced far and wide.

Joseph Majkut: Well, that's an interesting point because one of the critiques of oil and of the oil and gas industry is it's not investing enough in energy transition technologies. If you look at the IEA report published a couple of weeks ago or the massive consolidations within the industry itself, where can that we honestly expect that cash to go into energy in the way that BP or Shell might've wanted to do five or 10 years ago, or did we learn in 2023 that sort of diversification transition doesn't seem to be working out well.

Kevin Book: I think it was never realistic to expect oil caterpillars to turn into solar butterflies, no, but acquisition of BTUs at the right price is what these companies have always done and will continue to do.

Joseph Majkut: Liam, what do you think about that? I mean, do you expect to see that sort of a return to green energy investment?

Liam Denning: I think it will continue. There have been setbacks, but I don't think it's ended entirely. I still get press releases from an oil major every three or four weeks saying we've invested in this project, or we've just done this buyout. I think there is a realization that to Kevin's point, these are oil majors. They have a certain DNA which is written into their return’s targets and it's very hard for them to change that. I mean, if you are looking at a portfolio of potential projects to invest in and one has a 20% return versus a 5% return, that's maybe dependent on policy, you're going to choose the 20% one. I do think there will be some reshuffling of priorities in terms of cleantech investment. It's quite clear

that investing in say utility scale solar, which has attracted an enormous amount of capital, it's very unclear to me what the edge is that oil companies are going to have in terms of extracting better returns from that sort of business.

Whereas potentially carbon capture is more their kind of end of things and also as a side benefit can potentially extend the life of their core business, extract more value from that. Even for example, lithium mining where there is some or rather direct lithium extraction to use the proper term. There is some overlap there at least in terms of leasing, permitting, drilling, that sort of thing. So, I think we'll see more activity on that front, but yeah, I don't think we're going to see particularly the U.S. majors making a big push into offshore wind or something like that.

Joseph Majkut: Well, I want to return to the original theme, Kevin, you in our prep, you sent something along which I thought was really interesting, that the world is now dealing with two, maybe three fairly significant conflicts and yet markets are kind of quiet. What should we make of that? What do you draw out of there being still an ongoing war in Ukraine, conflict in Gaza, potentially a resource conflict in Venezuela and Guyana? Why don't markets, why aren't they jittery?

Kevin Book: We're sleeping through supply risk and actually sleeping through supply modification as OPEC repeatedly cuts to apparently no avail. There is a demand side to the equation and it's real. And so to the extent that investors look out at China and see something that scares them on the demand side, that has quite an effect. When you have such a major consumer and major importer, it's impossible not to notice. But there are also I think ritual underpricing that could be happening relative to the risks that we're facing. We have essentially two energy wars and you named a potential third one, right? The biggest energy supplier in Europe, basically at war with a country adjacent to the biggest energy market in the world. And you have with the Middle East, all the major producers and their routes, their seaborne routes increasingly looking fraught actually with the Houthis right now projecting force against Israel bound ships. And yet this doesn't seem to be pricing in at all. And I think part of it is that we have, it took a lot to move the needle last year and what did we see that fool me once, shame on you. The market is waiting to see the supply interruption. That hasn't happened yet.

Joseph Majkut: Liam?

Liam Denning: I would agree with all of that. We've seen a buildup in spare capacity. I know there is this long running narrative of the oil industry not

investing enough, but as we see OPEC plus cutting back, particularly Saudi Arabia cutting back production, the flip side of that is, okay, there's more spare capacity in the system. We've seen the shale industry in the U.S. emerge from a period of massive overinvestment and bankruptcies and financial distress to an industry that now looks by the day I saw another deal announced this morning, more consolidated, better able to ride out the storms. Production is rising at a hefty but not crazy pace. And I think all of that tends to make people think, well, yes, I see these potential hotspots emerging, but the hottest of them in energy terms was clearly the Russia, Ukraine war and seemingly the market seemed to have a hiccup and then digest it and here we are.

Joseph Majkut: Fairly large hiccup.

Liam Denning: Right? But you go back to news reports at the beginning of the war, and we were looking at $200 oil and that sort of thing.

Joseph Majkut: And remarkably, I was looking at the data this morning, gas prices are back down to pre- conflict levels even in Europe where that's not necessarily all a positive story. There's been a lot of de-industrialization and loss of productivity, but the price signal isn't showing you that you're in this sort of new regime of scarcity there.

Liam Denning: I think just to add, I think there's an element here, and I don't really know the answer to this, but there's an element of confusion, which is that looking back is maybe not as good a guide as it used to be, and I'm thinking particularly of we tend to hear constantly about the level of oil inventories and I think the way we thought about oil inventories on land maybe 10 or 15 years ago, it's a different world now. The U.S. is a net energy exporter. It's accepted that we have vastly more reserves in place than we did, than we were thought to have back then. China has become a much bigger and rather opaque factor in terms of its level of strategic stocks and the role of its refining industry. So that just I think makes it harder for people to judge where we are at any given moment compared to how things used to run.

Kevin Book: The mergers you mentioned, although I mean 10 barrels walk into a merger, an eight walk out, there's a rationalization that tends to happen with a high grading and optimization. There are other tightening factors at work and demand is relentlessly charging ahead. So the calm that we see now is vulnerable. The spare capacity that's the buffer to this potentially turbulent world is actually resident in the same area that could be exposed to geostrategic risks. So where do those barrels go when they have to come out to the world? Well, through the strait of Hormuz, through the Suez Canal, through the Gulf of Aden. These are

going to be problems if we actually run into them that I think, again, we may be underpricing because of past experience. It's very easy to have a recency bias. Anyone who doesn't is lying.

Joseph Majkut: But what does change, right? So, we find ourselves at a place where the demand sort of demand uncertainty take oil. Natural gas is the demand. Uncertainty for the future is enormous for oil, it's smaller on percentage terms, but it's still, if you take a credible and a credible low end for the next decade, you get 10 million barrels spread or something like that. At what, let me see if I can find a better way to phrase this. Liam says that the past may not be the best guide toward evaluating risks in the future. And I wonder, Kevin, what you think about that same question when we are at a time where it's not super clear how quickly the energy transition will proceed, how quickly EVs will take a bite out of oil demand, how there's potentially a decoupling between economic growth and demand, at least in the fossil side of the system that could really upset our intuitions about security going forward.

Kevin Book: Well, we've had a long trend of energy intensity, of GDP falling continues to fall oil intensity of GDP falling and EVs very clearly take a bite. Every million EVs on the road in the U.S., 30,000 barrels per day disappear. In theory, if they're used the way the LDVs they replace were being used. But then you also really do have to consider how much of those trends are continuous. There was a great headline this year, it may have been the Economist or something. It was like from the uber rich to the Uber driver was the point of the headline and the idea was that the every man, the regular Uber driver is driving EVs, but actually there's nothing regular about an Uber driver. Someone with that much VMT, someone who drives that much is very unusual, right? That's someone for whom the fixed cost premium is worth it because you have the variable cost delta you can exploit to benefit.

That is not the mass market moment. We haven't hit the mass market moment in a lot of places for this big transition technology. So, I would also say that a lot of the questions about what we're doing on climate are starting to go from panic and crisis vocabulary to, well now we're going to need a band aid. I don't want to use the geoengineering word this early in the conversation, but this year if there was something that happened this year that struck me, it would be that the idea got normalized as recently as James Hansen writing a paper that said, yeah, we're going to have to do this for a little while to correct the fact we're overshooting. This is the original Mr. Climate Crisis himself. And so this is I think a moment that takes us closer to a more pragmatic look at transition. I don't whether you call it a moral hazard or a reconsideration of the factors available at transition once you start interventions at that level, whether they be five or 10 years out, I think

the pace of things might change and as we start talking about the life of hydrocarbons as we know it, we may be talking about a very different future.

Joseph Majkut: Yeah, I mean that definitely moves us away from the prescriptive transition that you were talking about, right? If you can break the relationship between total cumulative greenhouse gas emissions and global warming, the state space in which you can operate gets a lot larger and still you can still kind of maintain climate safety. I completely agree with you that there's been a sort of growing shift in public and elite opinion about geoengineering. There was the White House report from earlier this year and eventually the idea that 1.5 degrees centigrade is a tenable global warming target is, I mean it'll be a quarter of a degree in the rear-view mirror before anybody's ready to admit it, but it's coming and probably isn't as far off as a lot of people think.

Kevin Book: The relationships that we've always treasured, right? They're all changing. So, OPEC itself has decided now it's going to cut preemptively, right? This is a recognition that the world is not as we knew it, the old order has changed the ideas whether they'd be energy intensity of GDP or what the marginal barrel costs and how you price it. These are all built on the way things were when there's a lot of turbulence in flux. We've assumed that the commercialization cycle for new technology is as it was, but what does generative AI do to that? We don't know the answer to that, but it's a very deliberate goal to try to use AI to accelerate the diffusion of new competitive technologies. So I think a lot of humility is in order and also the recognition that what we've been talking about for three decades at the conferences of parties doesn't seem to be working the way it was supposed to and there's going to have to be something else and these are all things that happened this year, so it may have seemed like a slow and boring year if all you were doing was looking for $200 a barrel, but many things came up.

Joseph Majkut: Liam, I'm sure you've got a response to that.

Liam Denning: Well, I agree that this certainly was a much more turbulent year than perhaps it seemed just looking at the line of the oil price Moving along with regards to geoengineering, I guess it's not an area that I'm very familiar with, but the question that occurs to me is it seems like that's an area that we really don't have our arms around in terms of what's potentially required in terms of cost. And I guess what remains mystery for me is we're in a world right now where we're still arguing over how the energy transition gets financed and whether that's a mix of subsidies or carbon taxes and then there's trade elements around that that come into play as well. And now we're talking about, okay, well if

we're going to miss that, maybe what we need is some geoengineering. And that seems to my mind even less well understood than developing alternative forms of energy. And so, I question when we really start to grapple with what's involved in that, what are the numbers going to be and again, how are we going to apportion the cost of that? Because again, we're talking about planetary things that intersect with national economies and national priorities, which is obviously one of the big themes that's disrupting COP at the moment.

Joseph Majkut: Having spent a little bit of time looking at it, I can help. I mean if you think about the physical process of lifting some sort of small particle, maybe sulfur, maybe diamond dust, calcium carbonate, there's a few different candidates. You're talking about a cost which pales in comparison to the cost of imposed by energy transition, tens of billions of dollars a year say the problem is that's just the physical lifting part and not everything else. When it's a sin of commission instead of a mission, people definitely want more compensation. So, say this actually makes the Sahel dryer or you make winters in Russia worse through an active program, there's a lot more incentive and knowledge about how to censure the active agent there than there is when it's sort of this cumulative problem that humanity's been building up. It's been building up over a couple hundred years. That's the place where I think geoengineering is completely underexplored. Kevin talks about the prescriptive transition. It's like I'm, one of the things of the concepts I developed in 2023 for myself was we have a little too much model brain when it comes to imagining the energy future and we need to kind of think a little bit more about different scenarios or different ways of thinking about uncertainty because you can throw a computer model at the energy system, it gives you an answer, but it's not clear. It's as informative as you want it to be.

I think the biggest critique of the geoengineering idea at the moment is it's something that's entirely in model world. We don't really one have the engineering technology ready, though you can imagine a Manhattan project scale initiative that would ready it, but we haven't really thought about the implications political, geopolitical and economic of a small group of actors influencing so much control over the climate.

Kevin Book: The disruptive thing you mentioned was the orders of magnitude between double digit, billions of dollars per year and single digit trillions. If the green premium is what makes up those trillions, then eroding that green premium by taking away the urgency of the moment is a potential further catastrophe for your green tech index. But I think that your points were all well taken, and we shouldn't just count the cash cost of moving something when we're busy internalizing

externalities everywhere else, we shouldn't ignore them in this context. All I will say about this, since I don't have your scientific background and no ability to talk about actually how to do it, is to look at recent precedent, which is that very mysteriously robust White House report from June 30th, a four day weekend buried at night, which no better time to release, went at length into the discussion of what a governance structure should look like and the importance of having one in place.

And you could say, well, surely, we wouldn't do something like this without science and without governance, but how many shots have you got in your arm that happened without all the science and governance being done? We do things in emergencies and covid was an emergency when we're willing to waive some rules. And so, I think what we should ask is what will the world look like in that distant future? We're not talking about next year now, and so I'm ready to move back to that, but in that distant future when we decided it's an emergency, I think maybe some of the rules we think we need to have might not be as necessary as we think they are.

Joseph Majkut: From COP to Keith Richards. I think one, big shout out to OSTP for what I'm putting together, what I thought is a thoughtful report, even if you don't agree with all of its conclusions, also any wealthy philanthropists who are interested in this, feel free to contact me because I think most of the questions really are their political and geopolitical, right? I think there's a whole basket of engineering challenges, but understanding the other side of the equation for geoengineering is probably really where we want to put a lot of effort. How are people going to respond? I was looking up while you were speaking, Kevin, this graph that was going around X formerly Twitter last week showing the evolution of the carbon intensity of economic activity and it goes up and down, but it's basically been a straight line indicating that it's for all the efforts we've spent on energy transition, it's been very hard to curve that thing so that we get a faster one.

Liam, you've been writing some really interesting stuff on the EV transition and how we should think about how that progressed in 2023 because you get two storylines in China, it seems like EVs are just totally taking over the marketplace in Europe, you see a very high level of uptake as well here in the U.S. 2023, it looks like a record year for EV sales, and yet there's this sort of cloud hanging over the industry. What are the important things to take with us as we enter into 2024? What are the important storylines and what are you watching?

Liam Denning: So, I think that dichotomy is probably the biggest storyline for this year. On the one hand, you have EV sales growth this year estimated about 38%. And just to put it in more manageable terms, five years ago, I

think I've got this right, one in 44 new vehicles purchased worldwide was an electric vehicle, either battery or plugin hybrid, and this year it's more like one in seven. So that's clearly a lot of progress on that front. China, as you mentioned, is far and away the leader. I think it just hit the 1 million a month mark here. We're celebrating the fact that the U.S. has got to 1 million over the space of four quarters. And I think what's been interesting for me is that there have however been some setbacks, particularly here in the U.S. that led to a really kind of sour mood kind of developing around the industry just within the last few months and just to name a few of them. One is Tesla is obviously the leader here in terms of EVs and the biggest listed vehicle company worldwide and has very popular EV models, however, not popular enough. They were making more than they could sell. They were having to discount them, their margins while still pretty healthy by the industry standards have collapsed from what they were just a year or two ago.

And we've seen Detroit's efforts to get into electrification, suffer some setbacks. I'm sort of reminded of the old joke about the restaurant with the food being terrible and even worse, the portion's quite small, and as they've struggled to make that transition from dependence on legacy vehicles, high margin legacy vehicles to these new vehicles which lose money hand over fist, we've seen them scale back their ambitions. And I think that has led to a lot of the negative feeling around the industry. Now I do want to point out it is kind of weird to see an industry growing 38% in a year, and actually in the U.S. sales are up 50% and for that industry to feel like it's failing or faltering in some way and certainly the growth rates are still ahead of, and I'm relying on my colleagues at Bloomberg, NEF here still ahead of what would be required for an ambitious transition scenario.

However, it does seem clear to me, and it was kind of epitomized by the launch of Tesla's recent vehicle, the cyber truck, which by my guess who knows I'm assuming is going to be a fairly acquired taste, but I think it does bring home to us that we're reaching the end of maybe a first phase of EVs here in the us. And what's needed is a mass market model. Detroit was really supposed to be bringing those out fairly quickly, but they pushed them back. Tesla has a mysterious new model that we're yet to see, but I think that is the key to unlocking the next stage of growth. So even though this can feel like, oh, it's just bad vibes, clearly, we're reaching a point where some new product or products have to enter the market.

Joseph Majkut: So I don't do a lot of analysis in this space, but I'm a car enjoyer as a red-blooded American. One thing that is bothering me, maybe you can help me understand it. When I see these product announcements like the Ford pickup or the cyber truck, they come in and they seem like, oh

man, feature-rich, very affordable. And then when it actually gets launched, it's 20,000, $40,000 more than originally announced. Is that feature drift? What is preventing this from sort of being a new product category? Where you hear about these by example, these Chinese firms are making little four-seater EVs that sell for the equivalent of like $10,000 and they can go 250 miles and it's like you would consider buying that for a whole different set of purposes than you do a primary vehicle in the U.S. What's going on?

Liam Denning: Well, first of all, I hope you're not suggesting that the auto industry sometimes over promises on what it's going to deliver because that would never have happened in history. I think part, so one thesis I have about what sets the U.S. apart in general is obviously the U.S. is very fond of its larger vehicles, it's SUVs, its trucks, and that's obviously partly consumer taste driven, but it's also I think the industry, the legacy industry figured out that this was a market that was largely X growth. And if it was going to squeeze more juice from that market, then it would have to sell higher-end and tricked-out models and those turned out to be hulking trucks with lots of gizmos on it, various add-ons. And we're kind of reaching the end of that. The U.S. market is now saturated with trucks and SUVs. And then the ironic thing is the obvious next growth area would be electrification.

However, really hard to do that when you've conditioned everyone to drive something with the aerodynamics of the house brick and where people want 300 miles of range even though they only really need that for a few days of the year. And I think that is going to be a real challenge for the industry because those trucks are very expensive and once you electrify them, you stick in a 100-kilowatt hour battery, they're super expensive. They don't have the towing range, which again, most people might not actually need, but certainly want to feel like they can have it if they need it. And in some ways, this is the most challenging thing in the US EV transition, which is you need a mindset shift, you need a shift around what's the form factor that I really need to drive. And obviously the question that everyone keeps coming back to is can you charge these things easily? Is public charging going to be ubiquitous and easy to use.

Joseph Majkut: And where's the minivan? There's no minivan.

Liam Denning: Well, we got the cyber truck instead. We were promised the minivan, but we've got a cyber truck.

Joseph Majkut: Kevin, this is one of the areas where U.S. politics has been intensely focused over the last year. The 30 D tax credit, which was part of the inflation reduction Act, allows for up to $7,500 to be rebated to the

consumer buying an electric vehicle if the minerals in the battery and in the gear come from certain places and definitely exclude China's Chinese firms. We just saw the treasury release a proposed rule for how companies can build cars to get that credit. There's sort of a tension about how that rule would be written, right? Would it be very permissive thereby allowing the EVs to get onto the road faster and at higher volume or would it be written strictly so that you could focus on the sort of security aspect of a diversified supply chain? How are you thinking about that ruling? Is the treasury making a choice one way or the other?

Kevin Book: Well, just first to Liam's last point, why is it we have such big cars? Well, we're driven by policy. Those policies were accommodative of big cars. You got your fuel economy standards were in proportion to the vehicle footprint. And why is that? Because nobody gets reelected in America putting large people into small cars. It's simply not popular and it's not going to be. So, EPA every year in their auto report talks about how horsepower has gone up. We want them big and fast. The rhino you used in your article about the cyber truck was a terrific example, but so now to this question, this question of decarbonization versus deglobalization. If you listen to President Biden, when he goes to factories over and over again talking to the manufacturing audience, he's talking about jobs and making things here, a value chain that starts and ends in America.

The problem of course is that most of what we want for transition doesn't start and in a lot of cases doesn't even end here and requires a still very globalized world centered around the concentration of minerals and processing in China. So, the 30D credit included a couple of features that frankly look like they were intended to stop anything but domestically made cars, right? Domestically made batteries constructed from domestically mined and processed critical minerals or those processed in places that we favored, places where we had free trade agreements, however spurious they might be, and without congressional approval, which Congress has started to take exception to in its own right, making things still harder and yet the real risks here when we talk about political polarity changes are probably not risks of rescission. That law looks like it'll probably stand in some form because it's popular with all the red states that are manufacturing batteries.

But reinterpretation and the interpretations that have been taken have been actually kind of permissive by deciding what is a mineral and what is a battery component. Deciding what are the subcomponents of the battery components and how they divide and where are the percentages, where do they wash out to? If you have a couple removes from China, is it a foreign entity of concern as conceived in the 30D sub

D sections that we were all wondering what it was going to say and the answer is actually no. No, it's not. Depending on where things were actually manufactured, yes, manufactured in China, you've got a problem, but what if it's Chinese technology somewhere else? Well quite lenient those interpretations might not stand in a differently minded future administration looking at the same regulation and deciding to think about it differently. But this is yet another example where the administration is leaning at least a little bit in our view, in favor of the decarbonization getting green stuff deployed quickly for transition purposes and also really, I think just try to put some numbers on the board to show that they've hit a success with the IRA and the agenda.

Joseph Majkut: Yeah, I think that my interpretation of the rule was that they were trying to have it a little bit both ways. If you sort of, as you say corporate structure yourself away from Chinese influence, then a globalized supply chain is completely fine and should be supported. And if you are sort of, how do you put this, the thing I'm still trying to figure out is how much friction this is going to actually develop for companies and potentially for consumers because they introduced this system by which do you really want to be in the business of tracking battery cells, right, which get pounded all together to make a big lithium battery in an EV truck. Does that mean there's going to be classes of vehicles that are credit where they can earn the credit and the same model might not be able to depending on which factory it came out of, or what battery it has, so that one needs to get leased and dealers are going to be confused, consumers would be confused. It seems like it would be quite messy to me.

Kevin Book: I think it's already quite messy. It's been messy from the start. A lot of models being ruled out or partial credits. Some of the phase outs we're seeing right now are happening not because of the foreign entity of concern provisions, but because the critical mineral and battery component requirements increase at 10 percentage points per annum and so the domestic content requirements are phasing them out already. So no, it's definitely messy, but it's also got leniencies built into it That wouldn't seem like leniencies if you saw them. What do you have to keep a ledger of batteries? You make it sound like a bad thing. Well, yeah, if you're not in the ledger of battery business, it seems like a hardship, but it also abstracts the specific materials away from the overall count of approved vehicles. So now what you're really being given credit for under the system that the DOE and the Treasury Department proposed was having something that you can allocate or abstract away and count as having hit the numbers. Now that's not the word in the law, mind you the word is any, and so we'll have to see how

that tests out if someone challenges it, but that is actually a flexibility mechanism as cumbersome and bureaucratic as it might seem.

Joseph Majkut: If they just let them trade those. You could have cap and trade for Chinese battery inputs.

Kevin Book: You could have a market anywhere you want to find one, but you better structure it well, right?

Joseph Majkut: There's always so much fun talking to you two. Obviously next year we have national elections in the U.S. we have elections in Europe, we have ongoing conflicts, but I'd love to hear from each of you one or two things that you're watching in the coming year. From my part, I think the continued interaction of climate policy, energy policy and trade is one of the places where I'm going to be spending a lot of my time this year. The EU-U.S. negotiations around what constitute clean steel and how they can work together there fell apart at the conference of the parties in Dubai. There's been a lot of debate around using trade mechanisms, but I think things like border adjustments are here to stay. I think climate clubs are coming and thinking through what those things will actually look like in practice is to me a very interesting thing to keep watching.

Liam Denning: I'll kick off with the thing that I began with, which is the interaction of the cost of finance and what it means for the clean energy transition. I mean, we've just had numbers out of the New York Fed this morning with very low inflation expectations, and I think it will be interesting to see if we see an inflection point on rates, what that might mean for the mood around Cleantech and valuations and project feasibility and even the financing of new vehicles. One thing we didn't really talk about is natural gas, but I've kind of got that on my radar. This may be a longer-term thing, but it's interesting to me to think about what's going to happen to the gas market in the U.S. in a world where you have, on the one hand, OPEC effectively juicing supply of U.S. natural gas associated with oil production on the other, a growing U.S. solar manufacturing business spurred on by IRA incentives and also solar deployment. We're going to see a gas market that is particularly on the power side, I think transitioning at different speeds in different parts of the country from base load to load following. We're seeing signs of that in places like Texas and California. And then as a follow on from that, what does that mean if the U.S. ends up having even more potential export capacity, I guess where does it go and how does it get used geopolitically.

Joseph Majkut: Well, and how does that relate to the ongoing process of industrializing? Right? We've got a ton of industrial policy in the U.S.

and a ton of foreign direct investment in factories in ai. How that affects energy planning over the next few years I think is also super interesting.

Kevin Book: Yeah well, I'm with you on the carbon border adjustments and the broader question of climate trade convergence. It's here, it's happening and it's a function of not just climate policy, but actually protectionism driven by among other things, fiscal stimulus of which the IRA is an example. It's very circular very fast, but I think continuing on that theme and also Liam's theme, we're getting into sort of a moment where we're looking at methane much more seriously, not just the rollout of the EPAs new source performance standards and admissions guidelines for states, which will be a three to five, five-year process before it's all said and done, but the European Union deciding that it's going to get choosy about which gas buys eventually, if not right away, they'll have delegated acts that fill in the details that we never quite got from their methane regulation that they've already finalized.

The world's starting to launch satellites to watch from space and the idea of super emitter detection. The idea of third parties getting actively involved is going to start to create some, I think, new and interesting dynamics we'll start to see next year moving back to earth. If I can just to close it out, I think it's safe to say that we are not yet united around a single concept of energy like we once were. The rocks that you had in your state would be something you could drill for oil 10 or 15 years ago. It has gotten very ideologically polarized. It makes very little sense relative to the underlying questions of what resource you have and what's economic or efficient, and yet people fight about it so well. The IEA and OPEC are fighting right now on a global scale in sort of a macrocosm of what's happening between Republicans and Democrats here in the us so the question I will be watching to see what happens, are we going to get more politicized on energy or less? Is there a movement back towards a realistic world where Republicans can talk about clean energy seriously and emissions reductions and actually do so in a way that doesn't immediately end their political careers? Can Democrats acknowledge that oil production is still something upon which we very much depend in need and maybe have a more rational discussion? I'm not holding my breath.

Joseph Majkut: Well, hopefully to the extent we can have that more rational discussion, it continues to happen here at CSIS and it continues to happen with you two. Gentlemen, I hope you guys have a great holiday season and happy New Year and I hope to see you back here a year from now, having learned another 12 months of well having gone through another 12 months and maybe being slightly wiser.

Kevin Book: Thanks very much. It's the best we can hope for.

Joseph Majkut: Thank you, gentlemen.

Colleagues, thank you so much. We've enjoyed all the opportunities to engage with you over the course of the year, and we look forward to 2024. Wish you a happy holiday season. This is Joseph Majkut at signing off.

Lisa Hyland: Thanks to Kevin and Liam for joining us again to close out the year. We look forward to keeping up with them in 2024.

You can find more episodes of energy 360 wherever you listen to podcasts and on our website, CSIS.org. Follow us on Twitter @CSISEnergy for more updates. As always, thanks for listening

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