



The Electrotech Stack at Risk: China, AI, and America's Energy Supply Chains

May 28, 2026

Featuring Phoebe Benich, RADM (Ret.) Mark Montgomery, Jackie Siebens, and Dr. Emma Stewart

Moderated by Harry Krejsa

Introductory remarks by Clifford D. May

MAY: Well, welcome, and thank you for joining us for today's event hosted by the Foundation for Defense of Democracies. I'm Cliff May, I'm the founder and president of FDD. It's Thursday, May 28th. We're pleased to have you here for this conversation, some in-person, some tuning in live, some listening to our podcast afterwards.

Today, FDD is joined by our colleagues at CMIST, the Carnegie Mellon Institute for Strategy and Technology, to discuss *Electrotech Moneyball: An Industrial Strategy for Ranking Risk and Opportunity in Energy and AI Supply Chains*, and it's a new FDD/CMIST paper available both outside and online. Hope you take a look at it.

The United States is in the early stage of a generational energy buildout. Hundreds of billions of dollars are flowing into batteries, into power electronics, and the software that forms the digital nervous system of America's electrical infrastructure. Yet even as that investment accelerates, the United States remains deeply dependent on China, which means the Chinese Communist Party, for the tools to build it. Beijing dominates much of what the paper calls the "electrotech stack," and that dependence is doing more than creating supply vulnerabilities: it is actively threatening to undermine the very security advantages an upgraded grid is meant to deliver. Compounding the problem is policy paralysis here at home. Overcorrection stalls promising technologies. Indecision continues to cede strategic ground to Beijing. The window to act is open, but it will not stay that way.

Electrotech Moneyball responds directly to this moment. The paper offers a clear, actionable framework for prioritizing investments and interventions to achieve the greatest strategic return on America's electrical buildout. To break down these challenges and the paper's recommendations, we are proudly – proud to say we are joined today by the paper's co-authors: Harry Krejsa, Phoebe Benich, and Dr. Emma Stewart, along with leader – leading experts retired Admiral Mark Montgomery of FDD and Jackie Siebens.

Phoebe Benich is a non-resident fellow at CMIST focusing on U.S.-China technology competition, energy security, and government engagement. She was previously director for strategic risk at the White House's Office of the National Cyber Director and served on the staff of the U.S. Cyberspace Solarium Commission and Defense Innovation Board.

Our own Admiral Mark Montgomery serves as senior director of FDD's CCTI – that's the Center on Cyber and Technology Innovation – and he directs CSC 2.0, which is an initiative working to implement the recommendations of the Cyber [Solarium] Commission, which was congressionally mandated, as you know. He serves as executive director of that.

Emma Stewart is a resident – non-resident fellow with CMIST, leads the Idaho National Lab's Center for Securing Digital Energy Technology, and is a nationally-recognized expert in batteries and grid, cyber, and supply chain security.

Jackie Siebens is the vice president of Public Affairs at Helion Energy, where she directs policy strategy, government relations, and stakeholder engagement regarding commercial fusion energy. She's also a senior fellow with the Atlantic Council's Global Energy Center and on the board of the Fusion Industry Association.

Finally, moderating today's panel is Harry Krejsa, director of Studies at CMIST. Harry joined Carnegie Mellon from the White House Office of the National Cyber Director, where he led development of the 2023 National Cybersecurity Strategy.

Before we dive in, just a few words about FDD. For almost 25 years now, FDD has operated as a fiercely independent, non-partisan research institute exclusively focused on national security and foreign policy. And as a point of pride and principle, we do not accept any government – any – any funding from any government. Never have, never will.

For more on FDD's work on China, AI, and technology supply chains, please visit FDD.org, follow FDD on X and Instagram, and subscribe to FDD's YouTube channel. We're everywhere.

Harry, the floor is yours.



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KREJSA: Thank you, Cliff, and thank you for that very kind introduction, and to FDD for hosting us in this beautiful space today and for partnering with us on this important report.

As Cliff mentioned, I came to this by way of, as in so many things, China, right? And before I was at the White House, I was at the first Trump Pentagon, where Volt Typhoon and similar designs on our infrastructure animated a lot of our work on counter-China cyber operations and strategy.

And the kind of big effort, the big problems we saw over and over again, were the seams between old and new technologies. Our grid was built on a foundation, like many critical infrastructure sectors, that was never intended for the level of connectivity and flexibility and dynamism that's now being foisted upon it. And like so many sectors, was in desperate need of attention and political and financial capital to bring it into a – a more secure and resilient state for both the threats it faces, but the affirmative future we needed to be capable of.

And wouldn't you know it; such stars aligned in the form of both demand and supply shocks. On the demand side, you may have heard a little thing, you know, in the news recently about AI and data centers, but also broader electrification of industry have kicked our – our growth in demand for electricity from decades of one-ish percent to like quadruple that, to a level that we've not seen in generation.

And simultaneously on the supply side, all that new – new investment is also new tech. We are seeing much more software orchestration of – of our grid to accommodate all the new different kinds of load it's having to deliver. 80 percent of all new capacity over the last couple years has been via battery and solar facilities, which are much more digitally enabled, much more flexible, and software-defined.

And between all of that, we are seeing electricity transform in real time from a physical flow managed by switches and fuses into something that is much more akin to software, something that can be controlled and manipulated much more precisely via software. That's what a microchip is, right, is the precise control of electricity. And now that dynamic is proliferating everywhere.

And this is a – it is more profound than it at first sounds. That's why some of our friends at the U.K. think tank Ember coined this term "electrotech." Andreessen Horowitz likes to refer to it as the "electro-industrial stack," that suddenly there is just a bunch of very similar technologies changing the way our modern society works.

You know, a smartphone is a solar panel is an EV is a drone is a fusion reactor, but for changing around a few ingredients here and there. It is a shared common industrial heritage that is suddenly linking a lot of sectors together all at once.

And as Cliff mentioned, the downside there is China is ahead in a lot of those sectors. It got a head start in making a lot of that tech because they, in fact, had a head start in making consumer electronics, laptops, and smartphones. The skills you develop to make those things are a lot of the skills you need to make everything else downstream of that.

The good news there is if you get a toehold in one of those spaces, you have the potential of spillover benefits into the others. But of course, how do we manage that – that nuance thereof, like, we're going to have to buy some stuff from China in order to catch up to China and reduce our dependence on China.

We can't go from zero to a hundred in a lot of these spaces. And we keep getting paralyzed by the – the challenge of doing so, where the threat really is – a threat that I know everyone on this stage agrees is grievous and urgent, but also can't be totally paralyzing or else we'll never make any progress on it.

So, Phoebe, how do we start making progress on that?

BENICH: Yes.

KREJSA: What is the framework that you and your illustrious co-authors propose to – to start taking on that challenge?

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BENICH: Yeah, so first, thanks to FDD for hosting us today and for their partnership on the paper. Before we get into the framework, I want to back up and talk a little more about the argument of the paper.

So, as we've talked about, the AI buildout is driving a digitization of our grid. The batteries, the virtual power plants, the electrotech stack that Harry outlined – that's really handing our energy infrastructure a two-sided future where the same digital transformation that's making our grid more defensible is also making us dependent on China to build it.

And so, how we navigate that challenge, whether we build strategically towards an optimistic future or whether we paralyze ourselves towards a pessimistic future, is being decided right now, often through procurement decisions and regulatory gaps, and often without us even really knowing it.

So, what do these two futures look like in a little more detail? The optimistic future is real, and it's achievable. Software-defined – a software-defined, digitally native grid is inherently more defensible than its analog predecessor. That legacy grid infrastructure, which was really characterized by hard-wired systems bolted onto network connectivity that they were never designed for, that really – that's where our adversaries have been gaining a foothold, exploiting those seams between modern and legacy systems.

But electrotech components are built differently. They are networked by design, which means they can help monitor and patch our systems, and when something goes wrong, generate a forensics report that we need to respond. So, when done right, this not only modernizes our grid but actually actively contains the vulnerabilities our – our adversaries are trying to exploit.

The pessimistic future is also possible. If digitally active controllers are sourced without scrutiny and governed without standards, then the in – technology components that we're adding to the grid can actually become vulnerabilities and increase the attack surface.

But, in our paper, we wanted to be incredibly precise about exactly what we mean by the threat that we're focused on, because a cyber threat is extremely and categorically different from a supply chain dependency.

That economic dependency, with China dominating massive swaths of our electrotech stack, unfolds slowly. A supply chain cutoff, that, you know – it really will impair our future deployment but is rather – is a crisis of – over months and years.

A cyber threat, on the other hand, that doesn't wait for a procurement cycle. That happens on day – you know, sort of compromised grid management system, grid firmware. That compromises our balancing systems on day one of a contingency.

So, and moreover, the economic supply chain that we're building, you know, if we have a cutoff, that can be reshored over months, whereas the software architectural decisions that we're making now are very difficult to undo. And so, the decisions that we're making are really locking in the advantages or vulnerabilities for our system for decades, which is why the policymaking we're doing right now is so important.

And in our paper, we highlight that the most strategically underweighted danger to our electrotech build-out doesn't come from Beijing, but from our own self-inflicted paralysis. You know, blanket restrictions on all Chinese-made components that we deem – that are equally dangerous not only throttles our build-out but also prevents us from actively securing the layers that matter.

And moreover, I would say – actually, hands our adversaries a ready-made narrative that the legitimate security concerns we may have are just thinly veiled protectionism. The good news is that disambiguating that risk is what will unlock the upside, and that's what our framework, that we'll get into a bit more, really operationalizes.

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KREJSA: That's – that's great, Phoebe, and indeed, I think a lot about how the F-35 fighter jet does not have zero Chinese-made components. The defense industrial base just makes a decision about where in that bill of materials the cut line is for what they can care about and what they don't.

I – you know, those of us who have been in government have been in SCIFs fully populated by electronics and equipment made soup to nuts in China. And so, it's worth being indeed precise about what it is we're – we're afraid of.

And one of my favorite sources to find out what I should be afraid of is Dr. Emma Stewart. Emma, you've been in the trenches on identifying where this risk concentrates, cordoning it off, hedging it. Give us some insight into what that actually looks like.

STEWART: Well, hi, and also thank you for having us today. To – to echo a little bit of what you started off with, we're in this period. I'm a power grid engineer. I have been for my whole career, 23 years plus at this point.

When I started out my career, we were really – the way we designed the power grid has changed entirely at this point. So, we went from – and it's the first time in my generation I've actually seen this kind of level of enthusiasm for power grid engineering, along with actually building out the system to this sort of capacity that we're looking at, and we need to grow for.

So, when you look at power grid engineering, you talk sort of about the lines, the wires, how we build this. We built this with a kind of just-in-time type mentality, or just enough mentality. And now it's completely switched to this abundance growth, everything must grow. And a lot of that is dependent on large, concentrated loads and large, concentrated sets of batteries, natural gas, fusion reactors, and other things coming into play. It's a really exciting time to be this kind of engineer, but it's also the sort of time where you're seeing this concentrated risk come into play.

When we talked about battery risk a few years ago, it was actually we were seeing this growth start, but it was not the same as we're at now. We're seeing this coming. We're like, "OK, does everyone know where all of our batteries actually come from?" At the time when we're in the cyber side, most people were like, "What? They're from – they're from where?" We're like, "Yes, that's exactly where it's been coming from."

So, we've reached this point of trying to explain the difference between cyber risk for a battery, for a battery electrolyte goo, for the material that's coming in, versus the risk of the electronics that are attached to it. And it's not just batteries; lots of other things: the electronics that are attached to it that have the communication system. You can't really talk to a piece of electrolyte in particular. Like, if you've got a bit of lithium ion sitting out there, you're not really going to go out there and talk to it with a computer in any way.

You want to look at the actual controls that are attached to it, things like the inverters, power conversion, battery management systems. Those are the things that both talk to the electrolyte and make it do things, and also, they are the things that talk out to the bigger system.

And that's where the risk comes from. If you're going to attack from a cyber perspective, you need to be able to actually talk to it. And so, that's – that's where the inverters and things are coming into play and how we're talking or framing this approach of, here's the things that we need to grow both capacity and manufacture for, while also focusing on how to mitigate the risk of the things that are there already. Because we need to both build and grow that capacity all at the same time, which is where it's really exciting as well in this kind of field. So, that was really the focus of that, so.

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KREJSA: Small challenges, indeed. It's akin to your F-35 example again. Your avionic software and navigation and targeting computers are, like, something you would worry about. But, like, are the – if you find out your, you know, wing-attaching screws are sourced from somewhere that, you know, isn't made in America, do you shut down the whole production line until you can find someone else to make those screws? You might, but it's over different timelines, and we're talking about that computer. The electrolyte goo can't hurt you, right?

Jackie, we've been – we have been illustrating a – a – a vision here that I think many people in government and across policy feel about China, a – you know, "you can't live with them, can't live without them" kind of conundrum.

How – how are you, in kind of the advanced manufacturing, thinking about that? Because I know industry has to actually make P&L decisions and sourcing conversations and IP protection sorts of moves on a day-to-day basis with that challenge.

SIEBENS: No, that's exactly right. And I know we haven't really dived into the three tiers that are the framework in the paper, but it – that's what really struck me at first in reading this, because I'm – what I'm going to try to do right now is take us from sort of this macro space to the micro, of, like, how one company, Helion Energy, sort of looks at our own individual supply chain challenges in a similar framework. I just never really thought of it the way that you guys laid it out before.

But just really quickly – so I'm – I'm with Helion Energy. We're a fusion energy company based out in Washington state. We have the world's first power purchase agreement with Microsoft to deliver full construction of the first fusion plant by the end of '28 and then bring it up to power by the end of the decade.

The advanced electrotech stack that we're talking about is the very reason why the company was founded in 2013, because that is what – these advanced electro- electrotech components are what makes it possible to actually build out this concept and make it work of what we're doing. That conversation on the wonky side of the tech is for another panel.

Now, the tiered framework that I want to dive into on the micro scale for – for Helion...

KREJSA: Now, Jackie, do you want Phoebe to give a quick rundown of the – of that there?

(CROSS-TALK)

SIEBENS: Sure.

BENICH: ...yeah, yeah, just – just – not to interrupt-

KREJSA: -to interrupt your praise of our work...

SIEBENS: No.

(LAUGHTER)

BENICH: Maybe as context then. So right, we –we'd been talking about how with – across the electrotech stack, not every component carries the same risk. We've been using this sort of smart-to-dumb spectrum as the indicator of where risk is greatest. You know, towards the smart end, greater risk; towards the dumb end, less risk.

But we developed a three, sort of, question assessment, of which threat is only one of them. So, the first question that we use is: how urgent is the deployment of this component, and how close are we to the cost curve lock-in? Is it disproportionately expensive for us to try to re-shore a technology? And then second question being, you know, where is the threat concentrated? This is the question we've, I think, been agonizing over most. But then the third question is: does this, does domestic or allied leadership in this component confer geopolitical, industrial advantage?

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And so, from that assessment, we then break – we've broken out three different tiers, and the first tier is where we want tight domestic control for those critical control layers. The second tier is where we think we could do trusted allied sourcing – Five Eyes, Japan, Korea, EU, et cetera – where we can accept a little more sourcing from abroad. And then the third is where we feel pretty comfortable sourcing across the globe because we know that there is less – less technical risk but also most urgency to get to that component deployed. Like, it's OK to be buying this from China because we just need it now.

KREJSA: Great.

SIEBENS: Yeah.

BENICH: So, with that framing...

SIEBENS: No, that's – yeah. So, I – whenever I talk, I actually spend most of my time in the policy space talking about supply chain. That is really – aside from permitting hell, which is basically what all of us in the deployment space are dealing with and really hoping to see some movement on – it's really supply chain. And so, we talk about it at Helion as buckets, not tiers, but I just want to kind of very quickly walk through how we – how we think about this.

So, the first one is bucket one, and these are essentially solutions that we look at, and that's where do we actually need to look at vertically integrating in a serious way? That's, like, where a single component is so important to our generators that we actually need to – and if we find that we cannot actually acquire it either domestically or even necessarily internationally at the rate we need and at the cost we need, how do we actually look at vertically integrating that?

And so far, we've made that call on exactly one thing, and that is our high voltage electrical capacitors. That is truly the heart of our – of our system. We need thousands of them for one of our generators. And so, we have – we're – we're right now, currently, scaling up that production capacity in-house.

And second is bucket two. Where do we actually look at on-shoring versus ally-shoring, which gets at something that you just talked about, Phoebe, which is where does it make sense to actually pursue policies here in the U.S. to incentivize, you know, growing manufacturing bases here versus overseas with our allies?

And really, what we ground that in is a test of whether the soil is really fertile enough here that the investment will actually compound here if we – if we sort of pursue growing those manufacturing bases, versus is it better suited for overseas? And so, we're making a lot of decisions right now on our own sort of procurement that kind of resides in that space.

And then finally, bucket three, which you also get at in your framework, is being strategically realistic about acquisition from competitors. When China already owns 80 percent of the market space for something that we really need, it is almost impossible for us, at least currently, to find a path forward where we're going to have a cost-competitive rate either here at home or abroad.

And so, one of the things we talk a lot about is where do we need to be smart about making sure that we're not essentially putting up those barriers for us building? We cannot have, you know, 100-plus percent tariffs on – on components that are absolutely critical for us to move the technology forward, not just for fusion but others as well. So, I'll – I'll stop there, but that's how we really think about it in our – in our own company.

KREJSA: That's great. Thank you.

Mark, the president has said on various occasions that he would like to see more Chinese manufacturing come to the United States, specifically, you know, cars, batteries, et cetera. And we recently kicked off a – what sounds like it's going to be the first of several rounds of Trump-Xi bilateral summits. You know, there's no – there's no such announcements or deals in that respect out of this one, but there's been tons of smoke around that.

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Do you see a – a – a path to that level of nuance in the energy dominance agenda and the competition with China agenda from what you've seen on the front lines of national security policy? And I should note all of the time you've been spending in Kyiv and learning about drones and the military applications of electrotech.

MONTGOMERY: So, first, I'm really proud to be on here with – with Emma and Jackie, but really, with two of my Cyber Solarium shipmates, Harry, and Phoebe. You've done great work here, and I'm very proud that we're aligned with the Carnegie Mellon's Institute on Strategy and Technology.

And now I'm going to rip into China.

(LAUGHTER)

So, look, we can't do nothing. "Nothing" was an option for 30 years in this, and we took that option pretty well, made a lot of money doing nothing. But we also can't go cold turkey on China. And just to put this in perspective, we do – I testified last year in front of the China Select [Committee]– or maybe a year and a half ago – about illuminations. Illuminations is what we do – is when we illuminate a weapon system. And we had a group that looked at 180 weapons systems, U.S. weapons systems, and we didn't find one that didn't have Chinese parts by the second or third level of the supply chain; some of them were intentional.

You could tell the company knew they were going to China. You know, they put up a – had a P.O. box in Vietnam that they were pretty sure was just a P.O. box, and parts are coming. And this is one level down in the supply chain. Now look – so if you look at a Patriot missile, a THAAD missile, standard missile, all the kind of stuff you hear about in our air defense system, they all have Chinese parts in them.

Now the question is, do they have smart Chinese parts or dumb Chinese parts? And they're almost all microelectronics, but do they – are they hardware or are they software running on hardware? And these are differences. And Department of Defense has taken a hard look at that. So, this is not a unique problem to the grid. It – it exists everywhere. You have to manage risk. We have to buy smarter.

And as I said, we can't go cold turkey. What this reminds me of also is that we have to prioritize. You talk about it in your paper. Prioritization is key here. What – what is the "must do" and what is the "should do?" And you got to start with the must dos and get those done. And I think it generally has to do with things that think and things that talk.

You know, we just finished a paper, myself and – and Craig Singleton [senior director of FDD's China Program], Jack Burnham, Johanna Yang on cellular modems, where we looked at this same – excuse me, cellular modules – where we looked at the same issue where, you know, there are cellular modules in pretty much everything. You know, cranes, trains, planes. They don't have to rhyme.

(LAUGHTER)

But, you know, pretty much every system we have out there that has to have some kind of connectivity has these cellular modules in them. And they – many of them speak home to wherever they were built. And 45 percent of the worlds are built in China. Quectel is one company that we allow to permeate our system.

And you know, we're going to have to take a hard turn on that. I think it's the same here. We have to prioritize that. And you know, the one thing that's going to be a problem with this is Congress is going to ask, when's this – when's this stuff stop? You know, when is this – when is this over?

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And the answer is, well, as soon as we, you know, stop allowing China, whenever an emerging tech- technology comes out, to beat us to the punch, create a state-owned enterprise that, you know, through – doesn't have to – it's either state-owned enterprise or state-supported enterprise that's illegally funded to create a non-level playing field, grab market share, and slowly drive U.S. and European and friendly Asian countries out of it.

Finally, I'll say that I do believe in – in friend-shoring. Not even ally-shoring and certainly not U.S.-shoring. There are times when there are a handful of things I would U.S.-shore. The vast majority of what we're talking about here are block and tackle, you know, hardware and software, microelectronic products. We can buy them from Taiwan, we can buy them from Philippines, we can buy them from Mexico, we can buy them from Indonesia. We don't have to buy them from China, and we certainly don't have to buy them in the United States, right?

That's why we have friends and allies, and then we have – we make sure they adhere to a standard and we work with them. You know, the doing nothing with the grid is not an option, right? We know what China's doing. Volt Typhoon is an operational preparation of the battlefield against our critical infrastructure. It targeted our transportation sectors, our power sectors, our financial sectors. It – Volt Typhoon is the, is the Salt Typhoon of electronics. Salt Typhoon was communications. Volt Typhoon gets at our infrastructures including energy. China knows this is a risk for us.

We need to treat it like a risk, and we need to manage it properly. So, prioritize, friend-shore, and make sure you get the must dos with a friend, ally, or U.S. manufacturer.

SIEBENS: And I would just add, Mark – great points – that it's important to not only be prioritizing across products, but within products, right? We've been talking a lot about batteries, but it's important to look at the different subcomponents of a battery that contain more risk, or that – verses we could friend-shore or ally-shore more easily. Oftentimes policy does look more holistically at product-level restrictions, and that can also throttle the build-out that we need.

(CROSS-TALK)

SIEBENS: I'm sorry, go ahead.

STEWART: I could add to that as well. So, when you look at the battery system as well, there – you might look at what the name is on the container. So, the big container that's pushed out. A lot of the work I did in the last few years was somewhat launched after a military base removed a battery saying, "Oh my goodness, we just discovered where it's from," even though they'd taken a picture with the name behind their head. But at that point it's still a – address.

MONTGOMERY: That was a report by Craig Singleton from FDD.

STEWART: I know, I'm aware.

(LAUGHTER)

But there was a picture with the name. And you're like, "yes, that's there." If you look inside that tin, yes, a lot of those electronics will still also be from China. But you could also buy another container that has a name on it that's a more familiar American name that you're like, "Yep, I finally bought my American supply." But then you have the one tier below where you're like, yeah, but it had the same inside, so, like, the exact same insides will be there.

Again, securing those items is the goal there because you might be able, in that case, to replace things like firmware and software where your hardware can sit there and, you know, just be there as the supply. But again, the name on the tin is also relatively important at that point because who controls that firmware, software, comms is generally that name.

So, that's one of the risks that comes up in some of our legislation as well, is they'll say you need to look at who's in your supply chain. And it's the first tier of risk, not necessarily the third tier of supplier that gave that power electronic device to the first supplier as well. So, that's where some of that comes from.

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KREJSA: Wait until they find out who manufactured their TS computer systems, right? But you know, I say that, you know, glibly, but the counter argument is that Apple, while like their – their phones are made soup to nuts in Shenzhen, has unusual top-to-bottom visibility and control over how it is assembled, the firmware and software integration, every piece of it along the way. And that's like another kind of angle into how you can have confidence in those control layers that you're putting onto it. Now, like, Apple is an n of 1. Literally no one else in the world can have that level of supply chain, vertical integration, and attention. But it's like that level of effect of confidence that we would need to try and get to.

Jackie, you were going to say something?

SIEBENS: Yeah. So just this whole sort of thread brings me to one of the things we've identified. So, I mentioned that we vertically integrated our high voltage electrical capacitors. Well, now we're onto that second tier of a supply chain and have identified that the dielectric film, which we need miles of for a capacitor, A, isn't made here at all. Predominantly made in Asia, and then the largest percentage of that is in China.

Now the film that we're talking about is not something that you only need for capacitors or for just a Helion capacitor. It's used across the defense complex. It's used across all sorts of electrical components that go into the grid. And so, we are now looking at, you know, going back to those buckets I described earlier, is this something – some people in our company are saying we should vertically integrate this too. Others are saying, "Let's find somebody to partner with here in the U.S. that's better positioned to scale this up here."

But at the end of the day, I mean, I think we're just in a position where – and you mentioned Shenzhen, and I'm so glad that that's part of this report that you brought up – I think that we have to decide here in America what are we actually going to solve for and what are we going to define success as? Because if you look at Shenzhen, I mean, this was something – this was a decades-long effort, right? It was in the '70s that the – that the Chinese government first decided that was going to be their first economic development zone.

And then you've seen different industries over many decades be developed there and grown there, right? It's not – it wasn't started with, you know, obviously, with AI or even batteries. It was consumer electronics. And then you've seen these other industries be built on top of those layers that came before in the '80s and the '90s. And so, you know, what do we want to do here in the United States? The thing that we're missing, and we feel this every day at Helion, is that large supplier base within a very small geographic area, right?

It takes – we just move slower because we don't have access to the components and to the prototypes that you can get in Shenzhen within a day or two, or even within hours. If you have a new idea, you can – you can send it, you know, a mile or two away and say, "Hey, can you mock this up for me?" It's on your desk that afternoon, and then you have a whole new, you know, working prototype that you're going to put into production a week from then. And we just simply don't have that replicated here.

Is the answer here in America to try to replicate that really true sort of supply-based cluster? I think maybe on specific things, that Mark got at. Not on everything, right? But how can we sort of move from a solution approach of what I call "node policy," where we're sort of celebrating these sort of policy achievements of, you know, build, you know, build a new factory here or there, you know, but we're not actually pursuing the network that we need to be successful.

And I'm hopeful that, you know, moving forward we can pursue that durable policy that's going to build out those networks. And it's not just here in the U.S. Those networks include our allies and our friends. They have to. There's no other way to go about it.

KREJSA: I think that there's so many really great points, and it reminds me of how – I'm going to ask everyone in the room and on the livestream to keep this under your hats.

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(LAUGHTER)

But it looks like, you know, whispers are – we may be in the – one of the most optimistic implementation timelines of the CHIPS Act, that fabs are coming together and producing yields as good or better than in – in Taiwan. The supporting ecosystem around – around those fabs in Arizona in particular are starting to reach a flywheel effect where they're self-sustaining without those huge checks from government.

And it looks like we're well on our way to having a – a fundamental capacity for high-end chip manufacturing in the United States outside of Taiwan. And again, don't tell anyone, but it looks like – what are the early lessons we can try and take from that? And it seems to me that those are like dark and – dark – deep and sharp priorities, right? Super narrow goals, right? We need – we said that high-end chip manufacturing was the lion's share of this scoped objectives.

We're not trying to bring everything back to the United States, but a fundamental fraction of it, so that, you know, heaven forbid, World War III breaks out tomorrow, the electronic dark ages that follow are not 20 years, but more like three years. And a – like putting all our chips on the board – chips need more analogies here – (inaudible) specific technologies, being willing to write checks to companies, to major vendors and our allies, right?

Like, Intel didn't just get big checks from the CHIPS Act, but so did Samsung, and of course TSMC. And so, as I'm looking at that, I'm asking how would you start applying that to an electrotech kind of framework, right? Where would you start to look at that?

Phoebe, how do you think about that?

BENICH: Well, first, Mark, do you want to comment on the grand success of the CHIPS Act?

MONTGOMERY: Yeah, I – look, first I want to be clear, like, just because you brought up Taiwan – you know, sometimes, like, it's funny because I hear the president talk about Taiwan. You know, we have a \$150 billion trade deficit, and I would say yes, we have a big, beautiful trade deficit.

(LAUGHTER)

KREJSA: That's right.

MONTGOMERY: Because that \$150 billion from Taiwan, those chips that might go to us drives, you know, three, four, \$5 trillion with the U.S. GDP, whether it's – and some of it's in the grid here, in the data centers. A lot of it's in F-150 trucks, it's in F-35s, it's in our phones, it's in our Frigidaire, you know, refrigerators. It's in everything.

KREJSA: Yes.

MONTGOMERY: What's happened in that transfer, I think, is about four to six percent. You know, when it's fully realized, and the centers are up and running, in logic chips at least, I think it's going to be four to six percent.

Yeah, I don't think we have 25 more CHIPS Acts in us...

KREJSA: No.

MONTGOMERY: ...100 percent. But I do think it's indicative of what can be done when we decide to make some industrial policy decisions. So, if – if your sector's one that an industrial policy decision is made for, you can be in good shape.

We're seeing that right now in certain parts of the defense industrial base, both munitions, missiles, and some systems. And so, you're seeing where we're actually putting U.S. money, you know, government money in the – in the kitty, to use your analogy, along with the company, the primes or subprimes money, and – and building on our capacity.

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I see that analogy playing out in other sectors where necessary. And I would say just, if you judge by congressional hearings, you know, op-eds, government executive orders, data centers and energy and the reliance, reliability of the grid – that they rely on, that they use – is starting to get high enough in attention that there's some likelihood that there's going to be, I wouldn't call it government intervention, but I call it – there's some likelihood of industrial policy being applied.

That does not always mean money.

KREJSA: No, right.

MONTGOMERY: But it could. And I – and I think that this president is more, because he's not limited by precedent in any way, shape, or form, could easily see that as a solution to this problem, which isn't a bad thing necessarily. But we need things we need to be ready for, and you need papers like this to kind of lay out some of the opportunities. And then you need companies and national labs that kind of put some left and right limits on what can be done.

KREJSA: To follow up real quick, do you think that – you know, you've been to Kyiv a bunch, you think about Taiwan contingency a bunch. What is your take on what we're learning about, in particular the war in Ukraine, around drones and their likely centrality to future conflicts? As I think about those, they're essentially batteries with rotors on them, right?

MONTGOMERY: Yeah. So, first, it's really interesting to watch, over the couple of years I've been going there, the – their early reliance on Chinese drones has really dissipated. I know there's a perception that, you know, they're using DJI drones. They were when I first got there. Their one-way attack drones were 90 percent DJI, pulled out of the box, minor, minor modifications, weapon attached, and off to the races.

I would say I thought it was down around 40 percent middle of last year. I think it's 30 percent now. I think it is – you know, this is an interesting asset, by the way. We all understand that China supports China, North Korea, and Iran, support Russia. Ukraine is fighting all four countries. But China takes a – and China begins elect – you know, I don't want to get into all of it, but they do a lot of microelectronics for the – you know, if you illuminated Russian weapons systems, it'd be a lot of Chinese shit in there.

But also, they economically backstab the economy. But the second thing they do is bleed Russia dry by providing DJI drones to third parties to Ukraine. And Ukraine uses those. You probably heard the numbers. And I can validate that it looks this way when I'm watching combat, that 80 to 85 percent of Russian casualties come from drones, either ground drones, which are kind of like mines, or small one-way attack drones.

But there, you can see them driving themselves off. They're not there yet. That's why, you know, Zelenskyy won't say a bad word about China because he doesn't want that cut off.

In the other kind of drones – ISR drones, long-range, mid-range, strike, and bomber drones – they got themselves down very rapidly to just three or four Chinese parts. And kind of like we're talking about here in the grid, they prioritize, and they're attacking them one by one. They were cameras, some of the parts of the motor controller for the operator, the wound cables. There's a few things like that. They've identified them, and they working it.

The problem's cost. I mean, there's a reason – I loved your little Apple analogy earlier. They're unique; they've been able to do this. Well, that's why my Apple phone cost \$1,200 and my daughter's, you know, phone cost \$150, and they pretty do the same thing.

You know, you pay for that kind of security. And Ukraine at the time could not pay, so they bought Chinese. But now that they're in a different position, they're running a defense tech industry, you're seeing them start to come off of it. And they're not red free yet – “red free” being “China free” – but they're getting there. And if you talk to Taiwan, Taiwan is all about a red-free supply chain on the equipment that they're going to start building. And that – it's anchored in drones, both undersea, air, and – and on the surface – USW drones – but, you know, you can see that happening.

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So, you can see the same sort of issue playing out in the defense industrial base. And that's why I think this is usually, if you go up and say, "I'm going to talk about an energy issue," you can watch half of Congress fall asleep, right?

I think that's changing. I think it's changing because people understand Volt Typhoon's happened, so you understand the linkage to China. This defense industrial base issues happened, so you understand the national security implications of reliance on China. And you understand it was cost. You know, when you talk to the prime or you talk to the Ukrainians, it was cost.

So, we have to have an honest discussion. Is the government going to assist in getting us out of this? Is it going to be industrial policy to do it? Are we going to require our patrons, our customers, to pay more for power to get off of Chinese?

I mean, I got to tell you, if you went to my neighbors and said, "I'd like to increase your power – your energy bill so you can get off the Chinese supply chain," they're going to be like, "Stay on that supply chain."

(LAUGHTER)

So, you really have to explain this is a – this is an issue that requires a comprehensive discussion of – again, why I like your papers. It begins to deal with some of the issues of prioritization, and the idea that eventually – I don't think you say it quite as bluntly as this, but there better be some damn industrial policy to deal with this over the next two to three years.

And we're already way behind. I mean, you can see the legal fights going on in Texas over data centers. Just, you know, 50, 25 miles from here in Loudoun County over data centers that, you know, we are already deeply involved in this issue and in the construction of it. And we better get some industrial policy. I know that's a long answer. Sorry about that.

KREJSA: Phoebe.

BENICH: Yeah.

KREJSA: That damn industrial policy.

BENICH: No, this was an incredible setup. And I'll turn to Emma next to – to talk a little more about the technical side of the two case studies that we walked through, and potential other examples that we would look at next.

But, you know, to Mark's point, an analogy that we often use that you did not include in your intro remarks is that everything is electrotech. Everything is electrotech Taco Bell, right? It is the same couple of ingredients that you are just moving around from tortilla to taco. And of those ingredients, some of them are incredibly...

MONTGOMERY: There's going to be a lot of lawsuits out of this.

(LAUGHTER)

MONTGOMERY: Now we're going after Taco Bell.

BENICH: It's incredibly important. I think we're elevating Taco Bell.

KREJSA: Taco Bell, this is complimentary.

BENICH: Yeah, right.

KREJSA: Complimentary.

MONTGOMERY: So, it's out of that way. Go ahead.

BENICH: Importantly, Taco Bell. And, you know, so whether you're looking at energy systems exclusively or defense industrial-based systems, everything is electrifying. And so, we took two case studies, one – there are two that we felt were most apparent that really draw out the differences in approach.

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The first being batteries and looking at that as a tier one commodity. And so, where should we be investing our – investing money to help build out the battery management systems that we need to run the batteries that are going to be stabilizing our grid, running our drones, hospitals, transportation, et cetera? That is, to answer the first question of the three that we pose, an incredibly urgent need.

And then on the other hand – and then I guess to the third question, I think, which is always neglected, but is arguably my favorite, which is which confers the greatest industrial advantage geopolitically. And truly, as we've talked about, this is only going to be an increasing market. So, if the U.S. can get ahead of that by investing in these types of capabilities now, that will give us advantage for decades to come. And then the other being solar panels, which we thought were of the more obvious tier three technologies.

Now we talk a little – and Emma can walk through this maybe in more detail – how, when the inverters are connected, they can maybe become elevated to a tier two type of component where you would maybe want to have slightly more trusted sourcing. But generally speaking, solar panels are on the dumber side of the threat spectrum, but also quite urgent for deployment, so probably OK to be sourcing from China.

But Emma, how can you add some more technical detail to those technologies that I walked through?

STEWART: I like the word dumb. That's it. Like, just saying they're dumb. It's OK.

KREJSA: That's right.

STEWART: No, I will add on a previous comment as well about the chips and the sort of innovation there. That's another thing that we've somewhat got behind in from the other side of that, from the energy side.

If you design an inverter in this country, it's going to look the same as the one that we import from China. At the moment, the standards for design haven't really been super innovative over the last few years. And I think there's now a – sorry to anyone who's been designing them – but we've kind of gone the same direction on it over and over again. And there's now a sort of need or opportunity for us to redesign those systems in a more sort of secure, better, innovative way.

And the same way in chips. There's been massive amounts of innovation going to growth of the chip market. We've kind of not done the same on sort of energy delivery there, particularly in that type of system as well. The power electronics are doing what they're meant to do, but not yet quite as well as they should.

But on the cases that we looked at, yes, solar panels, when you look at them, they can be smart. There are versions of them that attach other electronics to them. But they really are just wafers, essentially. They're sitting there. They're the same as the DC electrolyte that we talked about earlier, or the goo. They're just a source, essentially, that converts the sun into DC electricity. That's it.

Same with sort of electrolyte goo in batteries. But what's different on the battery side is they have these battery management systems to make them work properly. And that's the brain, and where we care about that as well.

I think we'd mentioned this earlier as well, but that's the thing that controls all of it. It's also where a lot of the safety systems lie at the moment as well. If you worry about what battery electrolyte can do from the electrochemistry side, one of the challenges we have in battery management systems or batteries is that they can go into sort of a thermal runaway type approach, which is essentially a big fire.

You've seen some of them on the television. It's not that bad, but they can go in fire. Solar panels, less so. They don't necessarily burn in the same way. If you've ever set a fire to them, it's awful fun.

(LAUGHTER)

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STEWART: But they don't necessarily burn the same way.

And so, there's sort of a different set of risk profiles there for how that management system works as well. So that's where we sort of spread that risk of, you know, we really should focus on things like the battery management system as that approach.

From the sort of strategic advantage, also batteries and things like that are actually – I am sorry on the solar side, but they are better for the grid because they can be managed in a certain way to do things like support fast ramping conditions that we're seeing.

They can be controlled, but that also makes them – they can be controlled. Whereas solar panels can't necessarily be controlled as much. Solar, OK, you can move them around on the direction of the sun. That's not necessarily creating an oscillation on the system that will make everything effectively shake out of control and turn off the lights.

So, there's a sort of change of how we want to look at it from the higher risk, but again, there's still ways to secure them. But looking at those higher-consequence systems, again, is really important there.

KREJSA: That's great. And speaking on – speaking of sticking to the smarter end of the spectrum, we are going to move to audience questions here in just a moment. But before we do that, I was going to observe that in the course of putting this together, you know, a lot of, like, data center energy technology is evolving in real time before our eyes.

And an illustration of one of Emma's points just now is we're hearing that a lot of data centers are moving to battery systems, not just as, like, backup, but as a fundamental part of their operations. That, like, you know, they're dealing with so – such high quantities of electricity doing such precise things of such great monetary value to them, that batteries' ability to give them pristine electricity at just the right, you know, hertz and, you know, volts and all the metrics that Dr. Stewart knows and I do not, is becoming critical to just doing their operations.

And so, a lot of them are building these behind-the-meter, you know, generation capabilities. It often is connecting to batteries before they connect to the grid. And it's just the importance of batteries in creating a software-defined electricity ecosystem for these much more advanced capabilities that we're moving toward, just cannot be understated, and is probably why it's our poster child for a lot of these arguments.

But so, to the audience, if you have a question, I understand that there's a mic in the back here, please let us know. Throw your tomatoes. What questions do you have?

ROGERS: Hi, Matt Rogers from CISA. I lead our CI Fortify work. I'm curious when you're talking about, you know, bringing stuff like firmware and DERMs and that kind of software in-house, who's writing the new management software?

Just to give a comparison from other sectors, right, like in the transportation sector, the government mandated everybody must do this protocol and everybody has to talk to each other. It's called positive train control.

And there's some fun policy ramifications where, you know, the Federal Railroad Administration can decertify all the radio equipment if there's a safety issue. That has never happened. Are there safety issues? Absolutely.

And so, A, like, how do you make it so this isn't just a, you know, new form of vendor lock-in just from different vendors that we like? And then, two, like, who's writing this software and what does that actually end up looking like?

KREJSA: I'm sure I could vibe code something with Claude here after this. But Emma, I saw you react most strongly.

STEWART: Well, to that, no, don't do that.

(LAUGHTER)

KREJSA: Yeah.

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STEWART: I will add it's an opportunity, though, when we talk about, like, where the growth can be. That's an opportunity for a business to grow in this country as well. Like, that's a supply chain component that could be built here that would help with this situation.

It's an opportunity for people to build, hopefully not just using Claude coding or vibe coding. Please don't do that. Again, I'm going to say it again. But we have seen out in the field, there is a number of entities actually trying to do that now.

A number of the more sort of advanced larger utilities have also said requirements of, hey, you must use this version of firmware that we have made as opposed to you have made. Still challenges with that with the vendors, because they don't always let you do that. And that's where the policy comes in of letting them do that on the testing for their assured systems.

But somebody will need to develop a sort of assured software for these capabilities. DOW does have a number of things going on there as well. I was at another event yesterday on energy storage for defense.

And essentially, they were talking about there are a couple of companies that are now providing that assured software to these systems as well, but that will take – it'll take a period of time, but it's something that I think could be developed quickly and urgently to help solve some of these challenges.

KREJSA: And – oh, sorry, go ahead.

BENICH: No, I was going to say, I don't know if Jackie has any perspective from the private sector too, but we talk in the paper a bit about how, like, waiting for some of these federal processes to unfold could take years. And that is exactly the opposite of the kind of pace that we're talking about with our needs for the AI build-out and other such approaches.

So, we talk a bit about, you know, how can we leverage state-level leadership? You know, states like Virginia and Texas that are leaders in data center deployment, are there quicker processes through either like procurement decisions that can be leveraged as sort of examples for others to follow, as opposed to going through a sort of long, arduous requirements-based process? But Jackie, I don't know if you have anything...

SIEBENS: Yeah. So, you gave me a really good pivot to something I wanted to talk about, so I'm taking it. I want to talk about state-level sort of support strategy engagement here. Because I think that when we talk about that idea of network building versus node building, at the end of the day, it's really states and local communities who understand what their – what their strengths are.

I kind of think of it as – I use the metaphor earlier of, like, fertile ground. Like where in the U.S. do we actually have fertile ground where it makes sense for us to invest to build out these clusters? And nobody knows that better than the actual states and local communities.

And so, I think we have a good example right now at the Department of Commerce, which is these tech hubs, which a lot of folks love them, a lot of folks hate them. I'm kind of in the middle. But I think it's one of the only examples we have of network-building support at the federal level.

I think what we're missing is sort of having that broader scope support at the federal level where they're sort of – you're building the recipe book there. But it's really the states that need to be able to say, "Hey, we think we have a really great sort of fertile ground here in our state, or this community, where it makes sense for us. We have the talent, we have the engineering, we have some of the supply base. Let's grow that and then work with the federal government to get support." Not just money, right?

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We've talked about – certainly CHIPS has a lot of money and all these things. But at the end of the day, I think we also have really great expertise in the government that can help companies that maybe don't create the high quality products that you can find in Asia, right? Or don't have the modern processes in place to build their products. Let's help on sort of all those fronts to build it up.

But I think that – I mean, we're certainly interested and a lot of our work is actually at the state level. And that's including, of course, on partnering with vendors, of course, and trying to find new pathways for procurement, but also at the policy level.

It's – it's where can we really work with close partners at the state and city level on where we want to sort of build those long relationships, to have procurement pathways that are durable and secure. And I think that's something that we should talk a lot more about.

MONTGOMERY: I do think that I'm required at any FDD event when we start to talk about state and local and cyber to say that we fully support the PILLAR Act, or, you know, reauthorizing the state and local cybersecurity grant program, although not directly related to this. We stand firm on that.

I do want to say on state and local, sometimes they're the right solution in terms of driving change. I think in this case, I am a little worried about – and this isn't what anyone was referring to here – but we – they are not, I'm not excited about them maybe setting standards for what needs to be, you know, what should be or shouldn't be, you know, where you could do the cut line on prioritization for American parts or allied-shored parts.

Because we cannot – we need one – we're barely able to achieve one standard in America. What I'd like to do is set that standard at the right spot. Have a federal FERC, or someone – it may not be the FERC, but someone – establish the appropriate standard. Like, our first prioritization is these three components, or these six components will be source familiar, and then drive everyone and give some period of time to drive everyone to that. We don't need state and local.

I know there's sometimes when California likes to get ahead of everybody else. That will not be helpful in this case, because not everyone's created equal in terms of the funding they have and the resources, they have to meet that. And you don't want companies generally – while the energy company may be regionally located, the producers and manufacturers are not, right? You know, they produce broadly for everyone. So just something to worry about.

But, you know, sometimes when you say you have a problem, there's some states that immediately say, "Well, I'm going to regulate a solution to that." In this case, I would not go do that. There's lots of cases where I would. This would not be one of them.

KREJSA: That's – that's really fair. And, well, as a quick aside, Jackie, you mentioned the Tech Hubs program – love them or hate them. I'm now obligated to note my wife was chief of staff of the Tech Hubs program. And so, honey, if you're watching, we love them.

(LAUGHTER)

Phoebe, as Mark mentioned, there's these dangers here about proliferating standards, people not having the whole picture. What role might, hypothetically, certain tech giants, major buyers of electricity who might be trying to stave off pitchforks in various parts of American discourse right now, have a role in tackling that kind of challenge?

BENICH: Yeah, this is a bit of what I was referring to with the procurement decisions. An example that we talk about in the paper, I think, if not something we're always talking about in person, is how Google really volunteered itself to set standards for – not to use the word clean in an FDD event – but for clean energy usage in across its offices and across the business.

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And those kinds of voluntary decisions, as hyperscalers are taking some, perhaps, rather unpopular decisions in building these data centers across the country. Like, if there are ways that the hyperscalers can choose to be more efficient with their energy usage, develop more secure firmware that will accompany their own data centers, that is the kind of leadership that I think would be much more timely than having a government process set a standard to force industry to follow.

KREJSA: Done in a public-private sort of collaboration but not waiting for that capital S standard process that Emma mentioned as, you know, being a little too slow here. And that's also something that, you know, they overpaid for in the last decade, you know, a little bit in hyperscaler terms, but that, like, perhaps they might be willing to overpay for this time around, right?

Yes, Emma?

STEWART: I would just add one thing on the states' issue as well, is when we're putting things on the energy grid, interconnection is driven by the states. And so that's the process for actually connecting anything to our system.

The state will define what you do or what analysis you do or what rules you're going to follow.

I think one of the challenges we've had in supply chain is all of them want to follow a certain rule, but they can't necessarily point to any one rule that's going to help us with a particular situation just now, or any guidance or anything that's particular of do this with your supply chain.

And so that's created a sort of patchwork across the country of interconnection standards at the moment, which are challenging for anyone to meet and is a massive source of research at the moment. So yeah.

MONTGOMERY: So, we need one rule to govern them all.

KREJSA: Right.

BENICH: That should be easy.

KREJSA: Easy-peasy. We got a lot of mileage out of that question.

MONTGOMERY: (Inaudible)

KREJSA: So next question.

BREAUX: Hi there, Reece Breaux. I'm a fellow with the Select Committee on the CCP, where I work on defense and national security issues. Of course, all this stuff is very near and dear to the work we do on a daily basis.

Question: do you see any dependency risks that may be generated from this approach? We're already, of course, very entrenched in the Chinese tech stack, as this report makes clear. Do you not see this approach as perpetuating that in some ways? And how do we mitigate that approach to make sure that at the end of the road we insulate our economies and those of our allies from this dependency risk. Thanks.

MONTGOMERY: So, look, you have this. When we talked about weapons with the Select Committee and others, you have this challenge of, well, I'd like to fix all of this, you know, everything everywhere, all at once.

Look, this is a – we worked really hard for 40 years to dig ourselves into this hole, right? Taking the cheapest path on almost every – any procurement issue or any decision made by the manufacturing and then by the actual engineering – the actual electricity companies – was driven by a desire to keep prices low. If you're kind to them, you say, so that their customers pay less. If you're mean to them, you say, so their dividends are bigger. But in any case, you know, it was a 40-year hole.

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So, the answer to the problem is yes, this will continue. We will continue in the hole in this strategy. But the idea is to prioritize what you get out of the hole.

You know, the priority – and so, I think, you know, on almost all emerging tech issues where China's cleaned our clock, it's a question of how do I get out of this problem, and how do I prioritize getting the most important things out?

And you see that where there was Huawei, DJI, you know, Hesai, the LIDAR companies, cellular modules, or this, you have to prioritize, pull the most important crap out of the CC – Chinese clutches, and then, you know, reevaluate and figure out what's the next priority and pull it out. And the beauty is if you begin to build an industrial capacity in an ally or friend or in the United States, it will – the next element that you pull out – the next one you pull out would get easier and easier because you've set up the industrial policy to support it.

So yes, I concede you this policy does not solve the issue rapidly, but it solves it in what I think is a fiscally and policy-manageable way.

KREJSA: Yeah, and I – talk...

STEWART: Yeah. And one thing, building one will be great. But if you look at sort of the power electronics market or grid components, you can buy from 71 different vendors – that was the last count I had. Very exact, 71. 71-ish vendors from China, effectively, and three that were considered not China, effectively. Like, there's one from the U.S. and two from other countries as well that we are friends with.

So, you can't necessarily just concentrate this into we're going to have one vendor, and they're going to supply the entire system because that's another concentrated risk in itself as well. If we had everything made by the same person, if there's a single vulnerability in that system, we come up with the same problem.

So, we're somewhat in that kind of circle at the moment, but I do think there's still the opportunity to build that market. It just needs to be more than one – that is my...

MONTGOMERY: But I believe when you say we're going to preferentially not buy from China, you will instigate growth...

STEWART: Yes.

MONTGOMERY: ...in the non-China companies that are willing to do this.

KREJSA: And I think it – please, Jackie...

SIEBENS: Sorry, I just want to add too, like I think there's two – we're doing two things at once, or at least we should be doing two things at once. And I think chips is a really good example of trying to recover something that we've lost; that's part of the hole that we've dug ourselves into. I really like that analogy.

I – I think that for fusion in particular, but other emerging technologies as well, that's where I think we need to be proactive and try to learn our lessons from 40 years ago and say, what would we do differently if we could go back?

And that's where we need to apply those lessons to emerging tech like fusion, and that's where we cannot get in the hole in the first place, at least in a larger part than we got into it with other technologies.

MONTGOMERY: And that is something eventually – I mean, I'm not saying FDD is going to do this, but people outside of government need to help the government understand what is the next levels of emerging tech that are doing it, because our Congress is getting tired of it, but nothing's easy, right?

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Introductory remarks by Clifford D. May

DJI was a four – it took four swings at the pitch, right? They had four different years of legislation passing till we got the legislation that was right. I would say on LIDAR, we're in the – we're in the second – heading into the second year of correcting that. Huawei took five years or six years and another half a decade of funding. And we can say the same with cellular modules.

In other words, you have to keep coming back, coming back.

But the most important thing would be to say, here's the next generation of things that we need to start with a level play. Ensure that American companies and our allies and friends have a level playing field to compete on, and make sure China knows that we know what their intentions are in terms of those, and to create an unlevel playing field. And not dismiss it because it saves us money.

SIEBENS: Well, not dismiss it, and also importantly, if you look at – I think so often with emerging technologies, we define success as a country as getting to demonstration, or getting to first, and claiming the IP.

And then, the sort of cycle we've gotten into is "Great, we invented it, now let's go make sure that somebody's building it for us for cheap overseas." And that's what we want to avoid going forward. And I think that with fusion that's still a problem that we're doing. We're doing the same thing right now.

We're looking at the big R&D facilities, the state-run R&D facilities that you see pictures of over in China. And I'm not looking at the big R&D facility. I'm looking at the things on the periphery of that, where they're already better positioned to scale the technology that we actually are going to beat them at building here for the first of a kind.

They're already positioning themselves to run the same playbook they have with other technologies, to build it faster than we can, and better, and cheaper.

KREJSA: And the trying to get ahead of the curve there is also a family obligation of plugging the tech hubs program.

SIEBENS: Right.

KREJSA: Hope of like seeding, you know, placing bets of like this might be the next thing that we should worry about before we're in the darn hole.

SIEBENS: But I think the biggest – and I'd love to hear more from you, Mark, on this – but the thing that I cannot wrap my head around is how, in our government system, we actually find a path for the durable policy that we need to have in place. It's going to get us that decades-long effort.

It's going to build us these resilient clusters, these resilient networks. And I just, I see the – the sort of habit we have of these one-off fixes, and then somebody goes and dismantles part of it.

MONTGOMERY: Right.

SIEBENS: And so that's the real crux of this, I think, really through line of a lot of this conversation, is how do we get that durability in place with the policy?

KREJSA: Well, and I think the first step to that is being precise about what the mechanism of our fear is, right?

When we talk about dependence on China, like of what and what is the actual lever of harm that we think could unfold, right? Like, heaven forbid, as Phoebe was mentioning earlier, like, if we go to, you know, World War III breaks out tomorrow, right, there will be – and like, trade with China ceases, right? If it would be different, and talking about kind of electronics dependence, than if we were dependent on them for like food or oil, right?

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Food or oil, World War III tomorrow, like, we suddenly have a huge problem, right? Because that – those are consumables; they go away, and we have a crisis on all fronts. For electrotech, you know, battery – from a supply perspective, if all trade with China ceases tomorrow, and we're sinking each other's cargo ships, every battery and solar panel in the United States is going to keep generating electricity.

The concern there is, is there a pre-positioned cyber risk, right? Is there a day-one threat from a cyber risk, you know, turning off the lights via that electrotech?

But if we, as this stage is kind of – has illustrated together over the last bit of time – and I think we're, this has become the – the last question and our elegant closer. If we are able to figure out how to have confidence in the smart stuff, then we don't have to have that worry about the day-one crisis of dependence from the dumb stuff.

And that gives us the headroom and policy, you know, the policy attention headroom and the resource headroom to then figure out what our medium and long-term play should be for the dumb stuff, for the stuff in the middle, the thing that needs more pieces in between.

Is there anything that we've, you know, left on the table here that we need to hit before we declare victory and head out?

MONTGOMERY: Let me do 30 seconds. I'll just say, great job on this paper for all three of you. It – very proud to alumni there.

KREJSA: We learned from the best.

MONTGOMERY: But most importantly, we will take this, we'll write legislation. So, Reece will have something coming.

So, I don't know if we'll go to E&C or China Select – like – but this is something that there is in this a need for good. And I think what that does is it gets it a durable solution. You cannot have – I don't even – I've lost my faith in executive orders being durable solutions. I mean, unless you're building a shredder company, then four years later, you know, shred things.

(LAUGHTER)

But I believe in the law.

And I believe there's one of these. This is one of those areas where – I don't – we're behind the eight ball on this one, but, you know, starting to identify the new technologies.

I like the idea of fusion. And there are a few – one thing you're going to find that legislation's hard. Legislation's hard because almost everything we mentioned crosses at least one committee line. And once you do that, you're – you're up for, you know, you're in for a fight. So, we'll get working on that.

But you two did a good – you three did a great paper. And I appreciate the opportunity to be on the panel with you.

KREJSA: Thank you, Mark.

BENICH: Thanks, Mark.

KREJSA: Thank you, Dr. Emma Stewart, Jackie Siebens, Mark Montgomery, and Phoebe Benich. Thank you, FDD. And thank you all for being here today.

END