

Peterson Institute for International Economics

Climate change, security, and the race for critical minerals

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[00:00:25.01] - Anjali V. Bhatt

Hi, and welcome to PIIE Insider Live. I'm Anjali Bhatt, Communications Manager and Research Fellow here at the Peterson Institute for International Economics. I often say that one of the best parts of my job is that I can just walk into the office of some of the world's top economics experts and just ask them anything, and then they answer. So with PIIE Insider Live, you're coming with me to ask those questions and get those answers. Today we're speaking with Cullen Hendrix, Senior Fellow here at PIIE. Before we start, if you're watching on Zoom, feel free to put your questions in the Q&A box. So hi, Cullen. Thanks for joining us.

[00:00:58.26] - Cullen S. Hendrix

Anjali, it's an absolute pleasure to be here. This is going to be fun. Thank you for having me.

[00:01:03.13] - Anjali V. Bhatt

All right. So first of all, climate change is real. Yes. And it's happening right now. Indeed. Climate change is not coming. It's here.

[00:01:11.20] - Cullen S. Hendrix

Yes.

[00:01:12.00] - Anjali V. Bhatt

Yeah. So climate change touches everything from human health to geopolitics. When you sit down to study this as a political economist, as a security analyst, where do you start? Like, what, what kind of lenses do you use to make such a large topic more manageable?

[00:01:30.20] - Cullen S. Hendrix

Well, I mean, Anjali, thank you for that question. And you're right, I mean, talking about climate change, and when I tell people I'm an expert in climate change, it's kind of like saying you're an expert on society or an expert on air, right? Like, I mean, it's so all-encompassing and, and total in terms of its impacts on human systems, on ecological systems, on our atmosphere, on our oceans, on our terrestrial environments, that it's really impossible to kind of be expert on all of this at the same time. That's why there are over like 700 authors contributing to the Intergovernmental Panel on Climate Change, uh, reports, uh, and— or not annually, but every time they come out every 7 years or so. My little corner of that space is the security and economic implications of climate change, in particular kind of in two baskets. So when I try to bin things to make sense of the world, I've been them into kind of what I think of as first-order effects and second-order effects. So the first-order effects are going to be the things that the climate is doing to us in a very kind of direct sense.

[00:02:28.12]

So that could be anything from increasing incidence of heat stroke during military training exercises at Fort Benning in Georgia here in the United States. It could be the increasing frequency of wildfires that we experience in my home state of Colorado with very significant economic and human security impacts at the domestic level. But it also relates to topics like sea level rise, right? The Navy has most of their assets within a meter or two of sea level. They can't afford to be anything but clear-eyed about the challenges of climate change. Uh, and then there's also a strand of my research which talks about sort of the impact of climate fluctuations, so changing conditions, maybe from a drought period to a period of intense rainfall, and the way in which that affects patterns of conflict and cooperation over things like rivers or fisheries in, in the Pacific Ocean. So that's the kind of the first bin. The second bin is what what we are doing to ourselves in, in a certain sense, in order to try to mitigate— that is, kind of decrease climate change by reducing our carbon and fossil fuel and greenhouse gas emissions— but then also by adapting to climate change.

[00:03:35.07]

So in that bin, you have things like the, the current scramble that we're seeing for critical minerals, which I know we're going to come back to that, so I'll bin that for a moment. Um, we could also think about the way in which these energy transitions are going to pose political and economic challenges for countries that have gotten rich and built essentially their systems, their societal systems around fossil fuels. And then probably the hottest possible button issue right now, especially in the United States, would be the impact of climate change and kind of declining rural livelihoods on migration. Not just pushing people from rural areas in the developing world into their major urban areas, but also, right, sending them abroad looking for

better economic prospects and fleeing the effects of climate change. So those are kind of the two broad bins that I— and perspectives that I bring to the table. Table.

[00:04:22.15] - Anjali V. Bhatt

Okay, so first order is what a changing climate does to us, and then the second order effects are what we are doing about that.

[00:04:32.08] - Cullen S. Hendrix

Exactly right. So, so, you know, I mean, this is— climate change is often characterized as a wicked problem. And one of the ways, you know, that you're dealing with like a wicked problem is that the solutions that you come up to all have problems associated with them as well. That is that there's no obvious kind of solution to these things that doesn't trade off against other things that we value. I mean, just a preview, right? If you think about the increasing demand that we have for metals and minerals that are going to fuel these energy transitions, well, those have to come from somewhere, which means you need a lot more mining, which means that you're going to have to think about how to deal with the social and environmental impacts of that mining in order, right, to wean us off of the detrimental effects of our addiction to fossil fuels.

[00:05:15.11] - Anjali V. Bhatt

Okay, well, there are a lot of steps there, so let's start with the first order effect. So The climate is changing. Are there examples of, you know, changing climate, extreme weather events that have led to conflict? I mean, as we well know, correlation does not equal causation. But what does that look like in real life?

[00:05:35.22] - Cullen S. Hendrix

Sure. Yeah. So this is something I spend a lot of time trying to communicate to policymakers because, you know, if you're looking around in the world, you're probably saying to yourself, well, I don't see a lot of, you know, armed movements that are raging against climate change or where their primary motivations relate to a drought or a decline in agricultural productivity. I don't know that I've ever seen a manifesto that directly mentioned decline in agricultural productivity. What it is, I think that the better metaphor is not that there's a smoking gun, like a direct A to B, A causes B relationship. In a probabilistic sense, it's making a lot of these bad outcomes that we're concerned about from a security perspective more likely. So don't think about smoking guns. Think about climate change as loading the dice and making certain bad outcomes more likely to occur. Now, if you're asking me for an example, and this is— right, yeah, sure. I mean, the most prominent example that we can point to is probably the Syrian Civil War. Now, it's

contested, but I think that the basic contours of the story are pretty straightforward. Um, so between 2006 and 2011, uh, so continuing into the Arab Spring period, we had the worst drought in instrumental record in the Fertile Crescent.

[00:06:50.05]

And we know because of posterior studies that we can attribute this kind of once in a 500-year kind of drought to climate change. Now that drought caused anywhere, estimates vary from 300,000 to 1.5 million Syrians to leave rural areas because their harvests were failing, right? And so under these circumstances, many of these people, particularly young men, went into the urban areas in Syria in search of jobs and access to social services. And when they got there, they didn't necessarily find them. This led to a protest movement. Keep in mind this is occurring during the— in the context of the broader Arab Spring protests. And so it was sort of the primary factor that was pushing people into urban areas. But at that point, policy choices matter. And the Assad regime's decision to respond to these protests with overwhelming and brutal force catalyzed a mobilization, right, sent that movement somewhat underground, and it reemerged in the form of these many armed groups and a civil conflict that, you know, as of now, probably claimed somewhere in the vicinity of half a million to 600,000 lives and displaced anywhere from 12 to 15 million people. And so that's an example where you have, right, you have the forcing event is the drought causes hardship in a rural area.

[00:08:08.28]

It pushes people into urban areas seeking alternative livelihood strategies, right? They're not gonna lie down in their fields and die. They're gonna try to find a way to make this work. And they move into urban areas, and that creates strains on a variety of social systems. But it still is important to keep in mind that policy policy interventions matter, right? The way you respond to mobilization around climate-related issues matters a lot. It also matters that the Assad regime was a situation which you have a tiny kind of religious minority ruling over a religiously fragmented society where a lot of people depend on kind of agriculture, and in particular rain-fed agriculture, for their livelihoods. And in that context, if you have a situation where you don't have safe social safety nets, and in the case of Syria in particular, you reduce subsidies, uh, for fertilizer and water during a growing season, right, these policy choices contributed to it. But if you follow the causal link, right, there was a spark that was the drought that caused mass migration that led to stress on social systems, which ultimately led to conflict. So you can't just say a drought happens and a war is going to start.

[00:09:16.26]

I mean, that would massively overpredict the amount of conflict we see both within states and between states. So one of the things that we do in our community is we try to identify what are these kind of structural factors, like what is the what is the profile of a country that is at extreme risk for climate change-related conflict or violence? And that's what it looks like. It looks like minority and exclusionary rule. It looks like a high dependence on, in particular, rain-fed agriculture. And it typically occurs in societies where you have a high degree of what scholars call groupness, which is the degree to which if you and I are from a different ethnic group, or a different religious group, you have your team and I have my team. And that, that seems to matter because it makes it a lot easier to mobilize people and get them on board, uh, when the fighting starts.

[00:10:06.05] - Anjali V. Bhatt

So this is, you know, the, the chain from the drought to a war starting is quite long.

[00:10:13.22] - Cullen S. Hendrix

Yes.

[00:10:14.01] - Anjali V. Bhatt

Um, and, and like you said, if you're profiling a country, you have to worry about everything from the religious makeup to their agriculture to you know, other sectors in their economy, governance and policy reactions. This is, you know, very interdisciplinary. How does one go about studying something so broad?

[00:10:36.10] - Cullen S. Hendrix

I mean, the simple answer is with a whole lot of help from people who know a lot more about different corners of this vast kind of climate landscape than I do. So my training is actually as a political scientist, but much like the economists that I work with at the Peterson Institute, Political scientists tend to collaborate with other political scientists. Economists tend to collaborate with other economists. If I want to do work on the oceans, I can't do that on my own because, you know, I don't know enough about the oceans to do that on my own. And so in my, in my career, I've had the opportunity to work not just with oceanographers who can explain to me how the ocean works and, you know, what, how changes in ocean sea surface temperatures are driving changes in fish abundance and where they are in the ocean and how that's creating frictions in places like the East and South China Sea. I've also done work in lacustrine systems, which is to say around lakes. Sorry, I know I dipped into the—

[00:11:31.15] - Anjali V. Bhatt

Lacustrine?

[00:11:33.05] - Cullen S. Hendrix

Lacustrine system.

[00:11:34.16] - Anjali V. Bhatt

I learned a new word today.

[00:11:35.13] - Cullen S. Hendrix

Sure. So this is like Lake Victoria in Sub-Saharan Africa. So I'm working with natural resource managers and ecologists and physicists and climate modelers, et cetera. And that's simply because the old stereotypical kind of great man model of science where I sit in my office and I think great things and, you know, there's a Bunsen burner going in the background and there's some smoke coming out of like a little bottle, right? Like, that's not what this is. This really does require a team effort. And so I'm very indebted to all of these wonderful people that I've had a chance to work with, including my wife, who's an oceanographer, who I get to work with from time to time, for helping to kind of educate me about these things so that I can bring what it is I know about conflict and cooperation in human and social systems to the table to try and round out their understanding as well. So yeah, that's the, that's the challenge. It usually takes big, big teams and a lot of coordination. It's challenging, but it's definitely worth it.

[00:12:33.22] - Anjali V. Bhatt

So with these teams, with the oceanographers, you know, with natural resource managers, all the big team that you've mentioned, yeah, what is the relationship between the big team, climate scientists broadly, the relationship between, you know, the people doing that kind of work and the military/national security apparatus. What does that look like?

[00:12:58.26] - Cullen S. Hendrix

Well, you know, about a year ago, I would have told you that it looks like kind of a slow but steady progression towards a greater understanding of the way that climate shapes our risk assessments. And the threats that face the United States. But this is not an issue that is unique to the United States, obviously. It's a global phenomenon. There are climate security risks facing China, facing Zimbabwe, facing every country under the sun. In the United States, this march started in the earliest parts of the 21st century, was when this really got started getting

ramped up, especially within the Navy and the Air Force. And that's because they, right, as a function of their work, are operating in environments where the, the conditions of the atmosphere are really important if you're going to be flying an SR-71 Blackbird up there, like 75,000 feet or something like that. Similarly, you're going to want to know something about the ocean and say the prevalence of sea ice in the Arctic, and if you want to make sure that your ships and your people don't, don't sink, right? They had to be early adopters of this. And so by 2010, climate change gets mentioned as a threat multiplier in the Quadrennial Defense Review.

[00:14:08.19]

This was like its kind of coming out party.

[00:14:10.18] - Anjali V. Bhatt

What's a threat multiplier?

[00:14:13.04] - Cullen S. Hendrix

Oh yeah, great. I'm glad you asked that. So watchers of a certain age are going to remember these old BASF ads. Say it with me if you remember it, right? At BASF, we don't make a lot of the products you buy. We make a lot of the products you buy better. That was a free pitch for BASF, by the way. Now, the analogy here is that the threat multiplier logic is that climate change isn't necessarily creating new threats. It's making existing threats— violent extremists— it's easier for al-Shabaab or Boko Haram in the Horn of Africa and Nigeria respectively to recruit if there's a large population of people who are impoverished because of drought or a decline in the Lake Chad fishery or something like that, right? Um, there's, there's that component to it. Um, I think in addition to that, right, that you have posterior to this 2010 QDR, which is just a big defense document, but that's— that was its coming out party to that community. Here it is, we're planting a flag, this is an issue. And it appeared in, you know, every global threat assessment, which is the intelligence community's statement to the people of the United States.

[00:15:22.06]

Here's what we're concerned about, here, this is what should guide our national security doctrine. It was in every report that the Biden administration issued. It was actually in every report that the first Trump administration issued. It has been zeroed out completely by the Department of the Defense, now the Department of War, in terms of its treatment domestically. Are there still policy shops and people like myself on the outside of the national security apparatus who are thinking about these things? Obviously, and we will continue to do so because climate change is not a threat that you can just ignore and hope will get better. But it is

to say that in the United States, that relationship that had built over several decades has become very tenuous very, very, very quickly. But abroad, it's been mainstreamed amongst many of our NATO allies. There's now a NATO Center for Climate Excellence, a NATO Center of Excellence for Climate Security in Montreal. And it's also really a matter of life and death. This is existential for many less developed countries. If you have 80% of your population living in rural areas dependent on rain-fed agriculture to keep what roofs they have over their heads and their children pay their children's school fees, they can't afford to be, um, you know, lackadaisical in terms of their approach to dealing with climate change.

[00:16:39.07]

So around the world, increasingly close relationship, the United States has become the outlier.

[00:16:45.17] - Anjali V. Bhatt

So you, like you said, is that climate change isn't necessarily presenting new threats, but it is making new threats work or making existing threats worse. Um, But for an organization like NATO or the US military or, you know, any government or national security apparatus around the world, you can't like pew pew climate change, right? Like there's no way for, you know, the way that militaries would address a traditional threat. You can't do that with climate change. How are they working with that?

[00:17:21.01] - Cullen S. Hendrix

No, this is a real challenge. And I think that, you know, especially under, you know, Secretary of Defense or Secretary of War or Hegseth, right, there's been a return to thinking about what is the core mission of the US military? And the core mission of the US military is to fight, right? Or to be so good at fighting that you deter other people from challenging you in the first place. And, you know, the United States, as a military-industrial complex, has gotten really, really, really good at the shooting part or the making things go boom part, right? The problem is, is that, you know, SEAL Team Six and the nuclear triad and our, dozen or so carrier groups are really not effective in addressing the underlying root causes of climate change. I mean, I haven't found the caliber of bullet yet, right, that will stop a hurricane.

[00:18:11.24] - Anjali V. Bhatt

And it would be wild. No, I mean, you know, scientists, get on it.

[00:18:15.17] - Cullen S. Hendrix

I was going to say, you know, that said military-industrial complex is probably working on it. But, but all I mean to say is that our traditional way of thinking about what it is we use our national security apparatus for. It's to deter and compel. Don't do something, or in the case of compellence, do something or else. You cannot deter or compel a meteorological event. It is not an actor. And so it is a fundamentally actorless threat in many ways. It may embolden actors who are, who are conventional threats that can be dealt with kinetically, uh, to use the terms, the euphemism that they like to use, like Boko Haram, right? But it's still going to cause problems problems like the wildfires that ravaged the Front Range in Colorado, or it's going to exacerbate the spread of malaria, make that harder to contain. There are all these different impacts that will make our world less secure and less safe that do not fit into the conventional national security kind of paradigm. And so, you know, under previous administrations, what was happening was you were seeing an increasingly interagency approach. So that if you're thinking about climate security, well, yeah, DOD is going to be in the room.

[00:19:21.11]

Uh, and then, you know, the, the intelligence community is going to be there too. But what about the Department of the Interior, the Department of Agriculture, right? You need a bigger table and more inclusive discussions in order to be ready for what's coming in terms of climate threats that makes it fundamentally somewhat different from the threats that are actor-based that the United States is preeminent in terms of addressing.

[00:19:43.21] - Anjali V. Bhatt

So there are— but there are things that we can address. And this is sort of that second-order effect that we talked about earlier. And so one of the things that the government can do is, you know, respond with the technologies that we need to adapt and mitigate climate change, right? And so that takes us to critical minerals. Oh yeah.

[00:20:03.03] - Cullen S. Hendrix

Okay, cool. I was hoping we'd get there.

[00:20:04.24] - Anjali V. Bhatt

Yeah, I think that was a nice little, you know—

[00:20:06.25] - Cullen S. Hendrix

Fantastic.

[00:20:08.10] - Anjali V. Bhatt

Okay, so let's just start with, you know, what are critical minerals and what are they critical for?

[00:20:14.20] - Cullen S. Hendrix

Okay, so critical minerals. Let's start with just some kind of examples and then we'll go back into kind of how this term came into our lexicon, right? So if you've heard about critical minerals, you've probably heard about them in kind of one of two contexts. So the one of the contexts is going to be the massive increase in demand for things like lithium and cobalt and nickel and graphite, all of which are critical minerals, and copper for that matter, which is a new one for the United States this year, that we need for energy transition. So as we wean ourselves off of fossil fuels and move towards renewable energy, and, you know, electric vehicle-based transport systems, we're going to need a lot more of this stuff. Sometimes, in some cases, you know, 50 to 60 times. We're going to have to mine more copper in like the next 2 decades than we have in human history in order to meet anticipated demand.

[00:21:04.25] - Anjali V. Bhatt

That's a lot.

[00:21:05.19] - Cullen S. Hendrix

No, it's a lot, right? But it also includes things that you've probably heard about in other contexts. So it includes antimony. We need antimony for artillery shells and other things that go boom. Right, so that it becomes— it's critical because it's critical for national security applications. And then a bunch of heavy rare earths that are used in advanced radar arrays and semiconductors, which is why this has been a central axis of US-China tech competition. The definition of it— what these things have in common is that the United States is largely dependent on exports to satisfy domestic demand, or there is a single point of failure in the domestic United States supply chain. And what that means is just, okay, if there was a power outage, a sustained power outage in Tempe, Arizona, and that's the one place we do X, the whole thing downstream from that facility grinds to a halt. And so because it's related to your import and export profile, what is critical in the United States is the stuff we don't have, which makes it very different from the things that would be critical for, say, another country that has rich endowments of those materials, but maybe lacks you know, iron or domestic steelmaking capacity or something like that.

[00:22:15.23]

They would bring a different kind of lens to thinking about it. But the bottom line here is that it's any mineral where kind of an export ban from a foreign exporting country or a natural disaster could cripple downstream industries and national security. And there are about 50 of these.

[00:22:30.28] - Anjali V. Bhatt

Okay. So, okay, that's a lot of minerals. Oh, yeah. But like you said, one of the most commonly talked about is lithium. Sure. Right. Which is used in batteries. Batteries, etc.

[00:22:41.12] - Cullen S. Hendrix

Yes.

[00:22:42.26] - Anjali V. Bhatt

And we don't have lithium. We don't have large lithium reserves in the US. What does that value chain look like? Where is the lithium? And then how does it get from the ground to a battery?

[00:22:57.05] - Cullen S. Hendrix

Yeah. So, okay. So lithium is an interesting one. And the US has some resources, but it's going to take a while to develop them. So for present purposes, right. You kind of get lithium one of two ways, and you can get it in different areas. So the first way is kind of hard rock mining, which is exactly what you think of when you think of a mine. You think of a big open pit, you think of, you know, really large earth movers and things like that. And it's exactly what you think of when you think of mining. The other way is brine evaporation, and they're moving to something called direct lithium extraction as well. What that is, is it's taking lithium-rich water from underground aquifers. Some of them are shallow. Some of them, in the case of direct lithium extraction, are like really deep, which is why a lot of the oil majors are getting into this because they're really good at digging really deep holes. Right. You know, you get it from the evaporation. So they bring that lithium-rich water to the surface and then evaporates in a big pond. And then what's left is concentrated.

[00:23:53.29]

It's put on a truck, it's taken to a port. More than half of it is, is destined for China, where it is going to be refined into the downstream product that we actually use, which would be lithium carbonate or lithium hydroxide. And then it is the industrial input that goes into the cathodes and anodes, which make our batteries, which power all of our devices, etc. So there are kind of 3

real— on the mineral side, you can kind of think of it in sort of those, those sort of 3 stages, right? Is the, is the getting it out of the ground, processing and refining it, and then turning it into that intermediate good, which is then goes out and feeds into a bunch of different supply chains for different products.

[00:24:33.26] - Anjali V. Bhatt

Okay, so, man, we're like almost out of time.

[00:24:36.17] - Cullen S. Hendrix

Oh, really?

[00:24:37.06] - Anjali V. Bhatt

Yeah. Time flies.

[00:24:38.24] - Cullen S. Hendrix

Golly.

[00:24:39.21] - Anjali V. Bhatt

So we mentioned China, almost half of the lithium, raw lithium is refined in China.

[00:24:45.12] - Cullen S. Hendrix

Yes.

[00:24:45.27] - Anjali V. Bhatt

And we know that China is a big player in a lot of these markets, in a lot of these value chains. Yes. But governments around the world, not just the US, but many governments have been putting in different policies to deal with the high demand, right, and different parts of the value chain. And like you said, the list of critical minerals and where countries are is going to be different depending on their natural endowments and their refining capacity. So what are different governments doing?

[00:25:20.08] - Cullen S. Hendrix

Yeah, so in the interest of time, I'll keep it real simple. So the high-income economies are attempting to reshore some of this capacity using a variety of sticks and carrots. So the carrots would be, here are the tax incentives. This was what was a big part of the IRA, right, was to create tax incentives.

[00:25:35.17] - Anjali V. Bhatt

The IRA is the?

[00:25:36.14] - Cullen S. Hendrix

The Inflation Reduction Act. There we go. Yes. So a lot of the tax incentives for green energy purposes have been wound down, but the tax incentives for other types of critical minerals, which are national security specific and, you know, national defense semiconductor specific, those are still kind of in place. That's been the US approach. The US is also now kind of attempting to put up sort of a tariff wall to encourage jumping that wall to invest in mining and processing capacity here in the United States. The European Union, members of the European Union are doing something similar, but in a less coordinated fashion because their subsidy policies are still going to all be directed by their national governments, as opposed to being, you know, coming down from the European Commission. And then the actual mineral-rich countries themselves are trying to play a game which I like to call kind of get like Indonesia. Indonesia was kind of the early adopter of, all right, we're very nickel rich, we want to get more value added out of it, we have a big home market, we're going to put in place an export ban, and we're going to force the mostly Chinese companies that are refining this to move here.

[00:26:40.03] - Anjali V. Bhatt

So you can take it out of the ground and also refine it.

[00:26:42.23] - Cullen S. Hendrix

Exactly. They're moving from step 1 up to step 1 and 2 with an eventual goal to kind of get to that third, which is final battery assembly. Now, that works out really relatively well in a massive country like Indonesia, with a potentially large home market, and also access to a lot of energy. Now, it's dirty coal energy, but they still have it, and so their energy costs are low. So it's going to be more difficult for other countries to achieve the same kind of ends by trying to kind of take this sort of resource nationalist approach. But they are working on it. And the scramble for kind of the midstream in these value chains, I think, is going to be one of the defining features of kind of mineral commodity markets for for, you know, at least the next decade.

[00:27:22.21] - Anjali V. Bhatt

So quite recently, I saw, you know, somewhere on the internet that there's been new proposed legislation here in the US for a critical mineral alliance.

[00:27:34.02] - Cullen S. Hendrix

Right.

[00:27:35.08] - Anjali V. Bhatt

What does that look like?

[00:27:37.02] - Cullen S. Hendrix

Yeah, so the goal here is to kind of create or seed sort of ex-China, so not including China, supply chains for many of these critical minerals, and in particular, the ones that are kind of mission critical for national security and semiconductor applications where China has really dominant shares of the market, like above 90% for many of these. This is a US initiative. It's currently in the Senate being discussed as a bill that would remove kind of tariffs on critical minerals and downstream products like batteries and magnets within an alliance, right? So this would be a coalition of the willing, and that to be a member of that alliance and get tariff-free treatment for your goods coming into the United States. What you do is you similarly close your market off to Chinese imports, or maybe don't close it entirely, but put in a tariff regime that is similar to the 301 tariffs, similar to the tariffs that are on Chinese products in an attempt to create ex-China supply chains. Now, is that a good idea? Yeah, to get scale. So for some of these— I can't let myself get out of here without saying this. So imagine all the copper mined last year in the world is about the size of the Capital One Arena if it were 40 stories tall.

[00:28:49.09] - Anjali V. Bhatt

Okay.

[00:28:49.16] - Cullen S. Hendrix

It's a big chunk of copper.

[00:28:50.27] - Anjali V. Bhatt

Yeah.

[00:28:51.08] - Cullen S. Hendrix

Some of these other elements, think more the size of, say, a refrigerator or a hot tub. So scale is going to matter a lot. So it makes sense for the United States to want some of these other countries to get in on these supply chains to prorate kind of the cost of developing them for these tiny boutique products. Um, I guess my question would be, do these other countries want to anger China in that way? Because I think there would be pushback coming from there. And then also, frankly, I think US foreign policy stability isn't what it used to be. And I think even regime proponents would say that as well. And because of that, these potential allies may be concerned about trading dependence on China for dependence on another major power.

[00:29:31.10] - Anjali V. Bhatt

Okay, so we are almost at time. So really quickly, yes, tell me, besides this legislation that is moving through Congress, what else are you looking for in the next like 6 months?

[00:29:43.01] - Cullen S. Hendrix

Um, 6 months? Uh, I don't know, how scared do you want to be?

[00:29:46.20] - Anjali V. Bhatt

Medium scared.

[00:29:47.12] - Cullen S. Hendrix

Medium scared. So over the next 6 months, I'm actually going to be tracking, uh, the temperature of the Central Pacific, um, because that's where the El Niño and La Niña cycles originate. And we know, um, you know, thanks to research by a variety of people, but including yours truly, that the different El Niño phases have different implications for sort of climate security outcomes in different parts of the world. Um, so if we go back into an El Niño phase, for instance, we can expect an uptick in conflict over fisheries in the East and South China Seas. If we go into a cooling La Niña phase, things might calm down a little bit. Over the broader term, if you don't want to sleep tonight and you're out there, Google something called AMOC collapse. I think that's all we have time for.

[00:30:30.04] - Anjali V. Bhatt

Okay, we'll let people Google that on their own.

[00:30:32.17] - Cullen S. Hendrix

Yeah.

[00:30:33.03] - Anjali V. Bhatt

All right, wow, well, we covered a lot and we're at time, so thank you so much for giving us an overview of climate change and national security and the minerals that go into it. And thank you for joining us for this edition of PIIIE Insider Live. What did you think? What do you like? What do you want to see next? Feel free to email meetings@PIIE.com. And if you're not already, subscribe to PIIIE Insider, the newsletter, at PIIE.com/subscribe. Thanks for joining us, and we'll see you next time.