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Between a Rock and a Hard Place: Critical Minerals and National Security
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Meghan L. O'Sullivan, Director, Belfer Center for Science and International Affairs, Harvard Kennedy School
Mike Pompeo, Distinguished Fellow, Hudson Institute, and 70th U.S. Secretary of State
***Moderator*: Misha Glenny, Journalist and Rector, Institute for Human Sciences, Vienna**

Misha Glenny
Thank you very much Niamh and welcome to what is going to be an extremely interesting session. We got a lot to pack in in 35 minutes there will be an opportunity for q&a A little later on. But I want to give a brief introduction in case you're not acquainted with this subject and the immense challenge that faces us. So there are 50 critical raw minerals on the list thrown up by the US Geological Survey, including relatively well known ones like lithium, copper, and nickel. They include the 17 rare earth minerals, which oddly are not rare, but they often require the mining of tons of aggregate in order to extract just a few pounds. And there's one French researcher working on this subject who has claimed that to meet the Paris climate change goals We are going to have to dig up more Earth by 2050 than we have done over the past 70,000 years. Put simply without easy access to all 50 critical minerals The world as we know it can't function. And we certainly can't deploy the technologies required to combat climate change. The US and the West however, there is one major problem in securing the necessary supply chains. over 30 years ago, the US began outsourcing the extraction and processing of a range of critical minerals to China. And in the intervening period, China has established a near monopoly on the processing of almost all rare earth minerals, and many others on the list as well. We all now know the consequences of European dependency on Russian hydrocarbons. But just recently, China banned the export of two rare earths gallium and germanium the former critical for some space technologies. To be clear, there are three parts to this story extraction, processing, and finally product product manufacture. There is lively competition between states and extraction. China dominates processing and every year China is expanding its market share in the manufacture of final products like solar panels, wind turbines or lithium ion batteries. In the past 10 years, the US and the EU have woken up to the implications of China controlling so much of these markets. One of today's panelists, Meghan O'Sullivan, was commissioned recently by the Aspen Institute, to chair to co chair work on a document critical minerals policy for the US. And I'd like to recommend this document to everyone here. It's a very clear it's an excellent introduction, and in fact, deep dive into this subject. So Meghan going to start with you and ask you why the US needs critical minerals policy, and how is it going to get there.

Meghan L. O'Sullivan
Great. Thank you, Misha, and thanks for that plug for the task force report which I co chaired with my friend and colleague, Jason ward off from Colombia. We have a fantastic group of experts, including Senator Heitkamp a critical and bringing it all together. So it's not just a document. It's actually a

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document that we had a very wide range of experts a bipartisan group, sign on to specific action items to help the United States to wiser cultural policy. But let me just start in the green because I know our time is limited, but I think you almost answered the question why do we need a critical minerals strategy? Obviously critical minerals are not new. But why are you all in this room to hear about that now? And the answer is really twofold. First, massive demand projections and the anticipated gap between demand and supply due to the energy transition. Misha mentioned some of the numbers there's lots of ways to present the potential gap between supply and demand. But it is staggering, even when you think about the conservative estimates out there. So there's a lot of uncertainty, but the one thing that is certain is that demand is going to rise exponentially. If the world gets on track, or even comes close to getting on track to meeting its climate goals. And these critical minerals are absolutely essential for EVs for wind and solar but also for electricity transmission. We don't really focus on that. But the United States increase needs to increase its electricity transmission by 60% by 2030. It might have to triple it by 2050. You can think of all the copper and other materials that are going to be required to build out their electric grids in that way. So that's the first reason the second reason also mentioned by Misha has to do with simply the fact that these supply chains are very vulnerable, particularly in this geopolitical environment. He mentioned China's dominance in these critical middle supply chains in this creates real geopolitical uncertainty and points of significant vulnerability. I hope we'll talk about that in greater detail. Because one of the things that comes out from this work the task force did is Yes, China has geopolitical advantages, but they're often overstated. We often talk about them as an every single one of these 50 critical minerals is something that is going to create as a potential creating a 1973 or oil. Arab oil OPEC embargo type situation, the US economy, and that would be the wrong place to start policy. So it's time to infuse that conversation about China's dominance with more analysis, more facts, and that's what we've tried to do and I hope we'll do this in this session today.

Meghan L. O'Sullivan
Thanks very much. Let me turn now to former Secretary of State Mike Pompeo. Mr. Secretary, you're on the board of USA rare earth company which aims to be the forefront on ensuring strategy extraction and processing of rare earth minerals. Now the moment China is able to process rare earth 30% cheaper than anyone else. So how do we compete?

Mike Pompeo
Well, first of all, thank you thanks for having me here. Thank you both for joining me boy girl boy girl in fifth grade. Trying to keep the conversation a little bit about that. So yeah, I come at this both as a capitalist now trying to help USA rare earth succeed in this space, but I spent a couple years as Secretary of State observing the risks the national security risks Megan spoke to the the environmental issues that matters. if EVs are the path of the future we will need lots of stuff to go into them into their batteries. The United States has always had the resource issues, but we've always figured out how to be the value added part of that supply chain and to secure those supply chains in a way that was relevant. The first time we really lost the bubble was on semiconductors, where we lost the value added component of this where we were getting with providers Machining Technology, but the bulk of this work was done in

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someplace that wasn't inside the United States and we lost that we can't lose that. Here. You're talking about a near monopoly. And then you talked about processing. And when they think of it under deeply related, like yes, the Chinese Communist Party subsidizes but if you think back to the dumping debates from the 70s and 80s for steel, it was really the capacity to manipulate margin to to make it unprofitable when the timing was right when a Western capital was being deployed to make it prohibitive for Western capitalism deploy so as a policy matter you're right USA rare earth is this opportunity now with gallium with the Chinese have made this decision USA where as a mine where there is gallium, but it's gonna require enormous amounts of capital to go get it and then get it processed in a way that they can deliver the actual end item that makes a difference. And you can be sure that the Chinese will use about the moment the capitals to arrive the Chinese will then find a way to dump change the margin and change the economics and so we ought to look at this as a national security and Western capital provision policy challenge as much as we look at it from any of the other various prisms that are also relevant to the discussion.

Misha Glenny
So Heidi Heitkamp we've seen that the inflation reduction act commits the US to meet the target of 50% of vehicles to be battery powered by 2030. this means that the US alone will require by then annually between 500,000 and 1 million tons of lithium carbonate. currently that's the global consumption of the metal currently. so we have similar targets not just in the us but in the US but in the EU and in china and in other markets as well. So how on earth are we going to ramp up production and how are the countries where lithium for example is found how are they going to respond to our rising demand?

Heidi Heitkamp
How on earth indeed the first thing we should do is look at the history of mining in this country. we have long had federal policy that basically says mining is a huge security national economic interest that's why federal minerals, hard minerals are not subject to royalty. That was something that was passed in the late 1800s. A lot of discussion about whether that policy should continue. We amped up production and we're the leading developers of these minerals during World War Two as we supplied the Allied effort. And so, what's different today in terms of our sense of urgency about climate, our sense of needing to do everything that we can today to develop these minerals at home to secure our national security and our economic security? The difference is that we now have environmental regulations. We now have cultural regulations. We have religious regulations. And an issue that doesn't get talked enough about is that as you saw that build out historically, you also saw abandoned mines not taking care of us thought mines basically being Superfund. sites because these minerals do not occur alone. There's a lot of heavy minerals, what we would consider toxic minerals that have been left behind and not treated. There is a lot of implications and a loss of trust with communities. We talked about the geopolitical reality of of working within kind of the the Chinese dominance that we have, and they they have dominance not only in supply, where they have been strategically buying up supply for 20 years, they have dominance in processing and not just the facilities to process but the technology, the process. And Mike's absolutely right. Historically, what's happened when we build our capacity, we see dumping, we said these are commodities, they're sold as commodity values, and there was a huge implication to reduce our attempt to dump enough product to reduce price and make an uneconomic against a

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backdrop of continuing to build trust with communities and protect other resources. Nevermind water and I could spend as a Westerner I could spend a lot of time talking about how this is integrated in the water wars in the West. So let me let me kind of calibrate this. If you look at the farm bill, which Mike and I are both that being from Kansas and need from North Dakota well familiar with, we decided that a food policy was critical and being able to grow our food was critical to our national security. So we've given assurances to foreigners who live in a commodity up and down world that you will be able to recover in essence, your cost of production. If in fact commodity prices drugs, will will help secure that we need policies like that in this country, given the trajectory and the horizon. But the real challenge in all of this is that we don't look community, that community. You know, we sit here and we look down at the United States and say, look at all of what we have the abundance of minerals, the abundance of opportunity here, especially in lithium and copper, we can we can in both of those areas. We didn't produce enough for America's needs. The question is, how do we do that in the context of communities that are literally at war with each other about whether we should reopen these mines whether we should re energize the mining industry in this country. And the result has been a lot of capital on like what my stipend well has fled our country and gone to other places. But what is the ethic in this country of saying we're not going to produce these these minerals here, but we're okay if children are digging it out of the rocks in the Americans are in the DRC. And we're seeing some global pushback on America's consumption on the back of impacts across the globe. And so these are tough challenges and I am proud of the report that we released because we didn't dodge tough challenges. We basically that head on, and guess what else we said that Megan hadn't had a chance to say? We can't just turn our back on China. We can't just say we are going to do this alone, because we don't have the capacity to meet the the climate goals. Yet today with what we can do and amping up our supply.

Misha Glenny
Heidi I'm going to cone to you on that Megan? Because of course, externally many countries Chile Zimbabwe, Indonesia. They're starting to nationalize their resources. And the more savvy in terms of how they're going to leverage these resources with people who want to buy them. Now we've had the inflation Reduction Act. The Europeans were pretty upset with what they consider the protectionist measures in the IRA and they're responding albeit rather slowly, but their own sort of version, but surely on this issue, the supply of critical minerals, the Allies, Europe, the US, Australia and so on. We really need to be working together on this.

Meghan L. O'Sullivan
You highlight one of the realities that came out in the report and I think, infuses this entire topic. Is that part of the answer to this problem? If there is an answer, the management of this problem is domestic and is increasing US domestic production of these minerals and that's what we've been talking about for the last few minutes. And as it suggested, there's a number of things that can and should be done, from permitting to how we consult with indigenous communities, those types of things, which can help increase our production. But no one should be under the illusion that the United States will be able to meet its own demand. So we're very enamored with the idea of energy independence, and now we have critical mineral independence. And it's a very attractive idea. And I'm all for increasing our production.

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But that shouldn't come at the cost of recognizing there has to be a whole international component to this strategy. So the by American sentiment that really animated the inflation Reduction Act, you know, can go a little bit too far because if it leads people to believe this is a problem we can solve on our own. We are destined to have a major supply shortage that will have implications for our economy and for our ability to reach climate. goals, and potentially implications for defense applications and other things as well. So on the international side, there's a number of things that we need to do. Part of it has to do with working with not just I think that's far Washington has a lot to say, will work with other democracies and will work with free trade partners. That's what the IRA legislation says, that's not going to be enough. We can't assume that just by working with that subset of countries. We're going to be able to meet global needs or even domestic and US needs. We need to widen the net, and establish a set of criteria that have to do with environmental and social and governance standards. And anyone who's willing to sign up to those standards, should, you know there should be some benefit to it in the sense of more capital flowing from investors. But also this is something very unpopular Washington right now. But those, those producers or those processors want to know that they're going to have access to the US market. So we get into the whole question of can part of this package being the development of standard, the provision of capital and finance and also in some cases in negotiation of market access to the US market. So I think all of this is a package that should complement domestic efforts here at home to increase our own production. And these two things in tandem, I think stand the best chance of allowing us to, you know, continue on an energy transition path that will be fruitful and that will have benefits for our economy and our national security.

Misha Glenny
Thanks Megan, Mr. Secretary on the issue of processing Raytheon's the CEO warned in June, that Western manufacturers will be able to reduce their dependency on China, but will not be able to cut ties with the country altogether. He said think about the $500 billion worth of trade that goes from China to the US every year. This was to the FT he was speaking more than 95% of rare earth materials come from are processed in China. There is no alternative. And we heard Pat Gelseinger of the CEO of Intel making a similar point point here. So so my question is how do we stop the US and China descending into a tit for tat fight, which nobody emerges as winner from over the issue of chips and over the issue of critical minerals?

Mike Pompeo
You're probably asking the wrong guy. This is about risk. In the end, this is about risk and risk management. And you know, econ 101 tells you the core tool for risk management is diversification. So, it cannot simply be the case that we we put ourselves in a place in any of the critical spaces and I, I might disagree with Megan or Heidi on this. We have to be careful about how we define national security or it can become all consuming and you end up you end up in a place where you are protecting everything and this is not my model of what we ought to do and frankly how we should respond to the challenges that you see being presented to us. But we shouldn't talk about tit for tat this we didn't bring this. This was brought by Xi Jinping this this risk as a is is very much a function of his change in behavior. This isn't even the Chinese Communist Party other leaders in China didn't present the risk to the

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American people in the same way that shushing pink presents that risk and so when I hear the CEO say that I appreciate from whence they come. I am deeply aware that it was American policy for 50 years to encourage them to go there so I don't fault them. But it's time. It's time that we now make sure that at least for the things that our soldiers, sailors, airmen and marines need, that we test really get the diversification that we need to ensure that we've got supply chains that are sufficiently secure and you'll know that that's not American supply chain. Hap I was, I was I was the best salesman for Nokia in history. Right, I know it's true. I told him I should get a commission 1% I'd be Richard revere Japan. Now. We weren't protecting America. We were protecting the telecommunications infrastructure from Huawei. And from the Chinese Communist Party, that is the model that when it comes to rare earth and the other things that matter, that's the model. I'm happy if it comes from South Korea, equally happy with comes from Australia, from Europe or from the United Kingdom, but to be dependent on a single country that is as hostile and as adversarial to us as it is today. And I pray that that changes would be foolish,

Misha Glenny
Heidi. Did you want to come in on that?

Heidi Heitkamp
Yeah, I mean, I think that's all fine and good. If we're just sitting on a big pile of processed rare minerals today, and we can make the conversion. This is a tiny problem. And when you look on the horizon we are not prepared today to say we can be abandoned supply chains that currently exist. If we are going to be a dominant manufacturer. These are necessary inputs, not just in green energy imports, but across the board. These are critical minerals. Not just in the process of EBS by for many, many processes. And then you look and as I have I you know, I have a friend Ernie Schneider who is a reporter with Reuters. He's written a book called The War below. And I expected the book was going to be a diatribe about what kind of minerals we need and where they're going to be. I got an advance copy. You know what the book is? The book is a dialogue about communities and what's happening at Rio Tinto, what's happening up in the Boundary Waters in terms of the deal or in terms of the political risk? And in terms of the political dialogue within communities, we are a Federalist Society. Wouldn't it be nice if we were Chinese, Communist China, and I mean that not one bit. But wouldn't it be nice if you could just say, Okay, we're going to dig a hole here, and we're going to produce whatever we want to produce, and we're going to process and we're going to have tailings and we don't care if the dam breaks and kills 300 people, we're just going to do what we need to do to be dominant. That's not the values of America. And so the values of America would tell us that these minerals are going to be produced with standards that recognize indigenous rights. As a lot of a lot of these minerals are located in places where nobody wanted to live that we're all reservations. Now everybody wants to prospect there, because that's where they are. I would remind you all of the story, the Black Hills of South Dakota, and so we've got to proceed in a way that builds trust with these communities, but also develops the resources we need. But that can't happen in the timeframe that we need to achieve other goals, whether it's climate or national security.

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Misha Glenny
Megan coming before we go to questions, Megan, I know you wanted to chip in on.

Meghan L. O'Sullivan
Just on the China point, since we're getting into this in a good way to put a number on Heidi's point about timing. It takes on average 16 years for a mine to be permitted, built and start producing so we can compress that time and I think that's what legislators are trying to do and have to do, but it's not going to be compressed such that again, to my earlier point, we're going to be able to meet our demands in a necessary timeframe. And so it makes the China question particularly awkward if we think about China, we think about the challenge of Taiwan 16 years seems like a pretty reasonable window to think things could come to a head so it is a point of vulnerability. And I just want to suggest a starting place because it's pretty amazing that this hasn't been done but where we really need to start is looking at these minerals mineral by mineral and assessing like what is our vulnerability to China's supply chain dominance there? Because in the rare earths we've been talking about those 17 There's a lot of vulnerability, no question about it. But in others China has is dominant in terms of global processing capacity, but they're also net importers of certain minerals. And in that case, they're not going to be able to use that dominance in the same kind of way either to affect the market or to create geopolitical leverage in a Taiwan's type situation. So I think really analyzing this so that we can target and not just protect everything but we can address exactly the minerals that that need such attention.

Misha Glenny
Thank you, Megan. And now I'm gonna throw open to the floor. Do we have questions? We got 10 minutes I saw one hand there straight away. And yeah. Can you hold your hand up for the for the microphone?

Audience question
Hello, my name is Ronie Kalen and I'm a Member of Parliament of Ukraine and then just like to bring the attention of audience to Ukraine an aspect in this raw material discussion, because one very short comment, I think I had experienced in raw material development they tell you actually before I was like So first, the reason why this raw material was not well developed in democratic countries Western countries in the United States in particular, was because the private equity, wasn't much more welcome in IG analysis years compared to traditional spheres, based on ecological standards as well. So it was reasonable. the Chinese, they made their own strategy and then finally achieved the goals. And the question is, do you think we talked a lot about China? But what about dependencies from Russia? In particular, if and we are talking about the tenure at the moment, this is a critical material. It's such a raw material like lead to or others, but it's critical for military industry for defense industry, not only United States, but also for all layers and level of dependence of your aerospace. Industry and Boeing, for example. I was not alone, even just to put a Russian a bigger producer of titanium to the sanctions. So what the West is going to do, and maybe Ukraine is the right place to look because we have not only titanium, but leaking Cooper and almost everything you mentioned

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Misha Glenny
Meghan, this is this is a very interesting question because Ukraine is potentially a mineral superpower. And it's an aspect of the war that Andrea is highlighting. That has not been mentioned much in the media, the fact that there are there is even more at stake than we thought possibly in the Russia Ukrainian war.

Meghan L. O'Sullivan
Well, I mean, thank you for those comments. And I think it's useful to highlight that Ukraine is believed to have many of these minerals I believe many of them are in places that are currently occupied by Russia. I imagine this will certainly become part of the reconstruction conversation. And it should be I mean, this is this is someplace that it could be both beneficial to Ukraine and to the west to develop more of those minerals. However, I think, you know, we're we have to think again, about timing that this, this is we have the defense applications, which have been existing for a long time, we have stockpiling that tries to address some of those potential vulnerabilities. But when we layer the energy transition on top of it, we're talking about real huge increases in needs for supply in the coming 10 years, right. So people look at 2040 and say we'll need six times the critical minerals that are currently produced today. That's if we're on track for net zero, which we're not. But in some when it comes to lithium, that's 40 times what we're producing today. So, you know, there's a question about when the world would be able to access those minerals in Ukraine, but I think it certainly should be part of the conversation and I expect that it will be.

Mike Pompeo
one thought just open it as you brought it into titanium. I ran a machine shop in Wichita, Kansas, we machined titanium, it was Alcoa product from Russia, via Boeing. So I'm familiar with this. We should think about three things. One, we've been talking about timing. I get it I get the timing challenge. Two sub thoughts one timing can often be a dodge to do nothing. And we should be mindful of that people can say well, it's just gonna take a long time and so the answer is do nothing. We can't do that. Second, we should not forget China's not going to turn this stuff off. And to sell it somewhere. Any markets to and when a lot of cars in Germany, we make a lot of cars in the United States. And so we have many tools. Don't forget what's the most important energy resource for the next 40 years. It's none of these things can be natural gas. And for the next 40 years, you can write this down. We can go to every NGO and they'll tell people I'm nuts, but I predict this there will be more crudo concerned, consumed 30 years from now than there is today. And natural gas will continue to be the low cost most environmentally friendly energy source, even decades from now. So as we think about quote, transition, end of quote, we need to remember that are those historic materials as well. That are going to continue to be very important and China has almost none of them. So they have an enormous amount of leverage with respect to that. Last thought. And this really gets to where agreement you do have to look at these one by one. It is absolutely imperative that you not just talk about resources and national security at the top level, but actually drill down on risk associated with each one. Which one matters which one can you

transition the most quickly, and which ones require the least capital to achieve the actual effect that you're looking for.

Meghan L. O'Sullivan
Very tiny intervention on timing completely agree it's not it's about timing. We should do nothing. It's the opposite. It's actually if we wait for markets to work on their own, they will work. High prices will bring in more producers, but the timing will be a problem. So the timing argument is more about this is a place where there needs to be policy. There needs to be some government involvement, to supplement market forces to because markets are not going to maximize for many of the parameters that are part of the conversation we're having.

Heidi Heitkamp
I did, I was just gonna say we've talked a lot about timing as if it is possible to achieve all these goals and build electric vehicles at the rate that we think we can build them. The answer is we can't and I've said repeatedly What's plan B? Well, Plan B has to be a number of things. Yet looking at natural gas if we if we believe that carbon capture is possible, we can functionally big natural gas, electrical generation zero emission. And the Argonne labs just announced that they have a new process using fluoride. You saw this that basically says we can extend the life of the battery. We have a development in geothermal that's very exciting. And so we can't put all of our eggs into the basket we know today. We have to Yes, it will be realistic about this transition. But I think overall we also have to have a plan B a realistic plan B. That is a moonshot on other technologies that are not necessarily as dependent on the supply chain for these memos.

Misha Glenny
The front, this is the last question. Can we go to mic, thank you.

Audience question
You've focused a lot on processing, curious on extraction with International Seabed Authority about to change conventions on deep sea mining, particularly in the ccz. The ability of China and their preparation already to take advantage of that. Where do you come down on this?

Misha Glenny
And then let's not forget the moon either who wants to talk about?

Heidi Heitkamp
this is a look up question. But this is not new. deep seabed mining has been talked about since the 70s and an access to magnesium and nodules and and all that I I think the technology for mining has not exactly been as proven as what you could say. But we also have a problem. When we talk about the Law of the Sea. We talk about who owns those minerals. How do you extract them? What is the geopolitical analysis that goes into mining deep sea minerals, and so where I think that's something that has to be talked about, it's not something that that I think realistically is in the realm of the next 1015 years. It

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may be I know a lot of people disagree with me. I've gotten into this fight with other people. But kind of going forward. I take a wait and see approach and think that we need to look at the current supply sources that we know how we get and pose out realistically and make this work.

Misha Glenny
Do you want to join in the fight there? Mr. Secretary Oh, good. Okay. Well, I think we can have one more question. No, we can't have one more question. That's that I'm really sorry. However, I know it's been a short 35 minutes but boy, it's been packed with information and really good ideas. Please join me in thanking my panelists.