Watts Up: Energy Security in an Era of Shifting Geopolitics
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Speakers

- **Dan Brouillette**, Co-Chairman, Torridon Group LLC; 15th U.S. Secretary of Energy, U.S. Department of Energy
- **Joel Sampaio**, Speaker, Brazilian Foreign Ministry
- **Jason Bordoff,** Founding Director, Center on Global Energy Policy, Columbia University
- **Meghan O'Sullivan,** Director, Belfer Center for Science and International Affairs, Harvard University
- **Moderator:** Zanny Minton Beddoes, The Economist

Zanny Minton Beddoes
I'm not going to grill you, just want them to do the same treatment that I gave you yesterday. Thank you. Thank you, Nick. Thank you. Welcome everyone to this conversation about energy security in a changing geopolitical world. I think it's worth reflecting that if we had had this conversation, what, 5, 10, years ago, and certainly if we'd had it in Europe, but I think probably here too, we would have expected to be talking about, how do we transition affordably and sustainably away from fossil fuels and in a decarbonizing world? That would have been the focus of our conversation today. That may be part of it, but it is certainly not the only focus of our conversation, because the world is so different. As Nick said, and as Anja has been telling us, the geopolitically, it's transformed. Economically, it's transformed. Gone is the world where we want to, want to integrate everything in a globalized world, we're now much more focused on industrial policy and resilience, and we are in the midst of this enormous shock revolution that is artificial intelligence, which has also transformed the energy landscape. And so I think energy security means something very different today than it did 10 years ago. And what I want us to do in this conversation is kind of explore that. And I think now, if you think about a country's energy security, you are thinking about, literally the security of your energy supplies. But you're also thinking about affordability. You're also thinking about, do you have enough energy supply to cope with the AI revolution? You're thinking about reliability, you're thinking about supply chains. You're thinking about a whole manner of things. And just to give you a sense of the scale of the change, we are suddenly in a world where energy demand looks very different than it did a decade ago, and electricity is what is going to drive the AI revolution. And just a couple of stats in the developed world. In the rich world, energy consumption was essentially flat for the last couple of decades in the US alone. The projection, the latest projection that we wrote about a couple of weeks ago, is from a consultancy. These figures for a 25% increase in demand for power by 2030 and a 78% increase by 2050, and that's just the United States. So to drive this AI revolution, we are going to need a huge amount more power. Secondly, the geopolitical landscape gives an enormous number of new strengths and vulnerabilities. Those of us who come from Europe are acutely aware of what over reliance on one provider of a key energy source means, if we didn't know it before February 2022 we certainly know it now. But it's not

just Europe, although Europe's particularly poorly positioned if you look at the United States, it's the biggest exporter of oil and gas, but China dominates supply chains for clean energy. There are vulnerabilities there, I think, for the US. And then the third area is the area of political economy, which I think has changed very dramatically. We are learning that there is a limit to the price that voters are prepared to pay for decarbonisation. We are learning that it is not simply possible to do to optimize only for the climate. We're also learning that the biggest economy in the world has what one might call a an erratic approach to energy policy. If you look at the thrust of the IRA and you look at the thrust of the BBB, they are very different in terms of the attitude to energy so I think there's a kind of policy what shall we call it inconsistency, or policy shock there? So this is the world that we all inhabit now. So how do you think about what it means to be energy secure, and if you're a policy maker, how do you kind of put these different things in different priorities? So that's why I wanted to start and Dan, since you have been Energy Secretary, I'm going to start by asking you to imagine you are back in your old job, and indeed, you've also Deputy Energy Secretary. And first of all, do correct me if I've mischaracterized the things that I assume you were thinking about. Dan, but how do you put some sense of priority on this? How do you think about what energy security means and what should be the priorities?

Dan Brouillette
Wow, I hate getting the first question. It's always it seems like the hardest one, and it should go to somebody like Jason or, you know, someone else who's really, really talented at this. Look, thank you for the opportunity to be with all of you here today. It's an honor for me to join you at the Aspen Security Forum, it’s my first time here, and I've enjoyed the few hours that I've been on the ground. So thank you for the opportunity to be with you. Look, if I were in the role today, it is obviously a much different world than it was just five years ago when I was in office. It seems like five lifetimes ago, but the world's changed quite a bit in five years. But if I were thinking about it today, I would approach it in much the same way that you just articulated. I think over the course of the last decade, perhaps two decades, we tended to view energy policy almost exclusively through the lens of climate and its impact on climate, which is important, I'm not suggesting that's unimportant. It is important, but it gets a bit risky when that is your primary lens by which you approach these things. The world has changed quite a bit. The, you know, the points that you made about the whiplash effect–those are my words, not yours, obviously–but I mean the changes in policy direction I think are most acute at the at the congressional level, and perhaps at the senior most levels of the of the elected politicians in the US, meaning the President and the Congress. I will tell you that in my experience at the Department of Energy, my experience in energy policy differently is that that looks a lot different when you talk to the technical experts, or you talk to the industry, you talk to the people who actually live in this world. And Jason and I have had this conversation many, many times. The things I did as energy secretary to advance things like LNG exports, natural gas production, we're simply building on what Ernie Moniz did as Secretary, what Jason bordoff did when he was a leader in the department as well. So there's a continuity there too that we often don't recognize. And I just want to make that point that it's not all back and forth all the time, but as I think–one one fan over here. And that's why I think these kinds of conversations are very important, so thank you again for the opportunity to be here, but thank you for the good work that you do. And I'll just make a couple other points real quick to set the table. If I were backin the office today, I would

be looking very closely at the regulations that need to come out of FERC, the Federal Energy Regulatory Commission. Not many people know this, but the FERC has this dotted line report to the US Secretary of Energy, and some of the legal authorities that are currently granted to that, quote, independent agency, are actually derivative authorities that were granted to the US Secretary of Energy. So if I were back there today, I would be looking at some of these and finding out which ones can I bring back to the department so that we can look at this regulatory structure in the United States a little bit more holistically than what is perhaps being done. And the reason for that is because what we just talked about, the increased demand for electricity as a result of AI, as a result of trade policy, increased manufacturing, whatnot. All of those things are true, and my fear is that we won't build the generation that is necessary to meet that demand under the current regulatory regime. And that's not the fault of utilities. They're just hamstrung by the current regulatory regime. So I would be looking very closely at that, and we can talk about what the details of that might look like.

Zanny Minton Beddoes
That's a really good point. So it's greater cooperation, greater regula–so you'd start with the regulatory area as being one where there is a low hanging fruit. Jason, I assume that you would agree with that and I'm going to make and come back to the international stuff in just a second. But since Dan mentioned Jason, let's assume you were energy secretary, and which perhaps in another world you might have been. But tell us what you would do if you were in that job now and what would be your way of thinking through the priorities.

Jason Bordoff
You know, thanks again to Anja and the whole team and Aspen Security Forum for having me back, and thanks to Secretary Brouillette for being here and for those kind words. He was really a fantastic energy secretary, and he was focused on– the energy policy goals don't really change, the mechanisms to get there, the approaches may change, but, you know, energy policy wasn't really a phrase people used until the 1970s energy was about energy security. That's the history of energy policy in World War I and World War II, how do we make sure we have enough energy supply? So energy security, energy affordability for economic growth and economic competitiveness, and sustainability and environmental protection. That's sort of the lens with which you should think about energy policy. And to your points in your introduction, Zanny, Meghan and I wrote in The New York Times around four years ago. I think we concluded an op ed with a line like, if climate ambition comes into tension with security of supply, affordability or reliability, climate ambition will lose and I think that's kind of where we are today. Because I do think it's correct. I think climate is an urgent problem. and we need to focus a lot more attention on it, but we are recognizing that we need to do multiple things at the same time and think about energy security, think about affordability and think about sustainability and decarbonization all at the same time, the world is very different, though, we're in a world now, that is becoming more competitive, more fragmented. If you think, when Meghan wrote the book that was mentioned in the introduction, the US was undergoing the largest increase in oil production of any country in history. We were in the middle of this enormous shale revolution to bring more supply to market. Electricity demand was flat. Renewables and batteries were falling 70,80, 90% in cost, largely because China was making them cheaper. And now that's a bug, not

a feature. And so the whole way we need to go about thinking about this is quite different. So we need to think differently about domestic sources of energy. And as you said in your introduction, for all the rhetoric around drill, baby, drill that means build, baby, build more than anything else, and it means power. It means meeting rising electricity needs. That's going to mean natural gas. It's going to mean nuclear, it absolutely means new and should mean renewables as well. We're going to need permitting reform to make it easier to build in this country. Again, we should be thinking about efficiency and reducing demand that also helps make you more energy resilient, we will learn that a few about a month ago, despite the fact we are a net exporter of oil now. importing 60% of our oil in 2008 or 2009, we were still really worried. Our president was really worried if something happened in the Strait of Hormuz, because prices are set in the global market. We'd be more resilient if we used less, not only if we produced more. And we need to be moving much faster as well to think about what's happening in the rest of the world. So we can come to that in a moment. But I think that is kind of at a high level, the approach that is consistent with what Dan said.

Zanny Minton Beddoes
It is consistent, this is wonderfully, you know, bipartisan committee. This is exactly what we want here, a very sensible list on both of you, Meghan, can we now open the aperture to a more international perspective? And as Jason said, the world is very different than when you wrote your book. But can you tell us at a big picture level, how does–who sort of wins and loses in terms of energy security in the current framework? Like, how do you think about energy security globally, given where we are now in terms of demand and geopolitics?

Meghan O'Sullivan
Sure. And thank you for hosting this panel, and I'm disappointed I don't get to be Energy Secretary.

Zanny Minton Beddoes
I have much greater ambitions for you. I'm thinking Secretary of State. We're going much bigger.

Meghan O'Sullivan
On that note, let me say that I think this shift to focusing on energy security is really a global one. It's not just the US doing it and that it's really important to understand why this is happening, why the world is shifting to focus on energy security, because that's the only way we're going to be able to address energy security accurately. So let me make two points on that. In terms of why it's happening, there's a lot of reasons you mentioned, AI, even climate change is contributing to energy and security, but I'd say the biggest ones are the changes in the geopolitical environment. So Jason referenced like and so did Secretary Brouillette, you know the last couple of decades really being, in retrospect, a kind of global energy age where we had abundant energy, the shale revolution, decrease in price and renewables, and we had a copacetic international environment. We had international cooperation, and we had increasing globalization. You put that all together, countries felt pretty comfortable, from the US to China to rely on the market for meeting their energy security needs. And now we're in a different world, where you're in a geopolitically competitive great power rivalry situation, and where

protectionism, not globalization, is the norm. And in that world, countries do not have comfort in thinking that the market is going to provide for their energy security. So energy security is back up at the top of the agenda. But as Jason sort of intimated, there may be kind of a false policy confidence. Oh, we know how to deal with energy security, we dealt with it in the 70s, and we've dealt with it through a lot of the last 50 years. And the point is, we dealt with that in large part by further integrating into global markets. That was the way we perceived to increase energy security. And when I say we, I don't just mean the United States. Certainly Europe was doing this as well, and doing that in today's geopolitically competitive environment is a recipe for crisis. So if you go back to 2021 what Europe was doing. It was saying, we're in this global age of energy abundance. The natural gas boom is further integrating regional natural gas markets. We're going to move away from long term contracts. We're going to go to spot markets and so we're going to no longer sign these long term contracts with Russia. So before the invasion of Ukraine, Russia started saying, well, we're only going to meet the things that are actually contracted for. We're not going to supply the rest of that natural gas. So again, global competitiveness, great power rivalry, amidst an attitude of, oh, let's just integrate into a global market created the grounds for this major energy crisis. So understanding that today is going to be key to devising the toolkit that actually will allow countries to meet energy security needs in this political, geopolitical moment.

Zanny Minton Beddoes
Can I? Can I just push you a little bit on that? Because it sounds as though you think it's, given the geopolitics, a bad idea for countries to think that it is okay to rely on the market for their energy security, whereas another way of looking at Europe's predicament is that Europe was incredibly naive to rely on essentially a sole supplier for cheap energy, and that had it actually had a much more diversified set of suppliers through the market, it would have been in a much better shape. So I'm just, I guess I'm slightly surprised that you think the lesson is the market is a bad idea.

Meghan O'Sullivan
I wouldn't say that I come at it from a perspective that the market is a bad idea. The market is a great idea in certain geopolitical circumstances, in a geopolitical world where China is willing and very able to weaponize its energy supply chains for a geopolitical reason, then expecting that you're going to be able to react to that simply because–the price of rare earths will go up, and then companies will invest in new production, because the price goes up, and that will allow us to meet our needs, that would be relying on the market. And that would work if you didn't have a time frame problem, right? You have a time frame problem, because left to the market, that may take 16 years, so you may be in a crisis for 16 years, or something like that. So again, we can't just, you know, blithely rely on the market when we've got a different geopolitical environment that will require a little bit more of government intervention.

Jason Bordoff
I just wanted to add one thing, because I think it's a really interesting question to think about, how what delivers energy security, and part of the answer, I think, is also it's different for different parts of the energy sector, and we don't tend to like differentiate enough. So what was

the lesson we learned a month ago? Iran did not go into the Strait of Hormuz. It did not strike Abqaiq. We did not–Israel did not strike Kharg Island. There was some measure of security that came from the fact that we're in a global oil market, and we're all in this together. And if Iran had tried to do that, it would have imposed pain on itself. It would have imposed pain on China. It would have imposed pain on Gulf countries it was trying to keep on its side. Same reason that the West didn't sanction Russian natural gas, or, sorry, Russian oil, because that would have impacted global markets. Europe is more secure when Russian gas is cut off, and it can go into a global LNG market, but also subject now to more, much more price volatility than it was before. It's very different, when you're talking about heavy rare earths, for which there's 90% dominance in China, which is why we just saw the US government make an equity investment in–so there aren't deep, liquid markets. So the question is

Zanny Minton Beddoes
Very good point. We're gonna get on to rare earths in a second but first I want to bring Joel in and because you come from a country that is a major player in global energy, oil exports are your biggest exports, how do you–listening to this conversation, do you think, first of all, how do you think and how does Brazil think about energy security? And secondly, do you think that being a big player in global markets is a route to energy security for Brazil or not?

Joel Sampaio
Well, first of all, thank you for having me here. I'll start with a figure, and then I'll go on from there. From Brazil's energy matrix. For the whole matrix, 50% come from renewable sources. So that's a good starting point for just about anybody, if you consider that the international average is 15. How did we get there while becoming, over the last 20 years, one of the top 10 oil producers in the world? We did that through certain programs. The biofuels program is probably one of the most well known which has been running for about 50 years, developing the hydraulic source was also very relevant and still is, cooperating with our neighbors in terms of energy since the Cold War era, where there were certain rivalries with Argentina, for instance, related to the peaceful use of nuclear energy, and there were certain rivalries related to territorial disputes which were solved through, for instance, the Itaipu power plant with Paraguay back in the 70s. So we have developed a mix that both addresses the need to security and also addresses the need to environmental care. And in that regard, I think Brazil has a few good stories to tell. It has a few good experiences to share. Give you an example. Biofuels amount to about 20% of the whole matrix, and that means, for instance, you can–ethanol is an option to just about everyone in every car, and we have specific technologies known as the flex fuel cars, which you can fill your tank up either with ethanol or gasoline. So there are lots of features in Brazil's mix that should be looked at

Zanny Minton Beddoes
But both for oil and more broadly, being part of global markets has been an important part of Brazil's ability to achieve that mix, right?

Joel Sampaio
Yeah, that’s true.

Zanny Minton Beddoes
So with that, let's move on to rare earths, particularly, and it's maybe slightly tangential, but it's important for energy policy, broadly, because I think you raised something really interesting, Meghan, which is given the overwhelming reliance on China and given China's clearly manifest willingness to use this power that it has in the last few months. Dan, back to you, what should the US do?

Dan Brouillette
What should we do? Start mining here in the United States and start developing some of the processing capabilities that we lost over the last two decades. In order to do that, again, to that point of electricity generation, these are energy intense processes, so we have to develop more generation here in the US. Look, I think, you know, I want to go back to what you were saying, Meghan, because I was really struck by your comments as well. I agree that global markets have increased our collaboration with other suppliers, other buyers, other sellers, producers, if you will, of both crude and natural gas. But I wonder if there's been, in the course of the last three to four to five years, a great power rivalry around renewable energy. I mean, we saw the United States pass the IRA, which, you know, many argued, I don't know if I agree with everything that was said, but some argue that these were just great subsidies for renewable power. And then we saw Europe's reaction to it with their Green Deal. I mean, I remember distinctly some of the news stories where they were quite upset that the US was starting this race, if you will, to develop more and more renewable power. So in that sense, perhaps there was some geopolitical tension is too strong of a word, but rivalry to develop these technologies. And when I look at what China is doing today, I think they read those cards pretty effectively. They said, wait a minute, if these two powers are going to subsidize these and we're going to develop these technologies, they clearly do not have the storage capacity available to meet this 24/7 demand that everybody thinks is going to come on. We'll start to invest in the areas that we know they're going to be dependent upon in the future. It's not unlike what OPEC and OPEC+ do from time to time, where they increase production, store more fuel and make it available to the market when the market appears to be short. So I just, I'm curious about reactions on that, whether or not that is even remotely accurate, or do people agree with it.

Zanny Minton Beddoes
I think, Meghan, to you, I think, just as the resident European here, I think what we were really cross about with the IRA was the protectionism in it that didn't give us access to.

Dan Brouillette
Well, that too.

Zanny Minton Beddoes
But Meghan, why don't you answer that? But also perhaps give the example, or tell us how you think the Gulf is playing this game, because that is a region that is shifting from great strategic

power in one energy market now with huge investment in data centers and so forth in the new world. So put that in context too.

Meghan O'Sullivan
Sure. Dan, I agree with a lot of what you're saying, that there was, and I would say there still is, although maybe the US isn't playing the game, but there was kind of a geopolitical competition around renewables, and many of us thought, oh, we have to switch gears. We always thought we're going to address global climate challenges through international cooperation, through the COP, through all of these global agreements, and maybe we're actually going to get the advances we need by competing with China, compete to get the best experiences and the best technologies. And so I think the IRA would have never happened if China were not so out in front in terms of being competitive on clean energy. So it was part of the impetus and part of the reason that the votes were there for it. On the point about China and its investment in clean energy supply chains, I think it goes back much further. You know, I agree with the general supposition this is going to be geopolitically advantageous for them. But this started, you know, in the 90s, when you had one Chinese leader say, Saudi Arabia has oil, but China has rare earths. And so there was a long foresight that China could actually be dominant in these global supply chains and the rest of the world, because we were operating in an internationally cooperative world where we felt like we could rely on markets. We said, China wants to do this. They can do it more cheaply. They can do it and bear the environmental costs. We're great with that, and it's only recently, in the last five years that we're not so great with that, for the obvious reasons. In terms of the Gulf. I mean the Gulf, particularly, I would say Saudi Arabia and the UAE, are really playing into this in a very, very significant way that I think will really accrue to their geopolitical and economic advantages. You know, they're in the midst of managing an uncertain, but somewhat inevitable energy transition, and they're thinking about, what are the other sources of strength in their economy? And so, you know, Saudi Arabia is leading into building some of the largest renewable energy spaces in the world, and they're doing that partially as a way of preparing for a world where oil is less significant, but also taking advantage of the fact that they can just sell more oil until the time when that commodity is not worth as much as it is today. But they're also doing this to really drive home to places, particularly the United States, that they have the advantage when it comes to energy and the energy needs for AI, you mentioned this in your opening comments. It's a huge part of the equation. It's one of the reasons that I answered you so wrongly when we spoke in January about expectations about what the Trump administration would do related to renewable energy, I thought that the need for electricity for AI was going to be a much stronger driver in this administration to allow all energy sources to contribute to the national power structure. But in terms of the Gulf, what they're doing is they are quite smartly, bringing renewable energy online and using their wide spectrum of abilities to contribute energy as a competitive advantage for offering hyper scalers, these guaranteed low price energy out as far as the eye can see. And this is part of the reason why President Trump, when he went to visit the Gulf in May, was able to get agreement on some deals that would actually place the heart of American AI advantage in the Gulf, which is a huge strategic win for the Gulf.

Zanny Minton Beddoes

Thank you. I want to make time for a few questions, just to give you a little bit of warning. But first before that, couple more questions for you guys. Jason, Meghan just mentioned that we she and I were on a panel earlier with you, actually, earlier this year, and she had a very different expectation of what would happen in terms of the whether or not the tax credits for renewables would be so dramatically curtailed, and she's just laid out the logic for why she didn't think it would be the case. But that begs the question that I think we have to ask ourselves, which is from the outside, the whiplash in US energy policy doesn't seem to me to be the hallmark of a particularly sort of thoughtful strategic plan for the country. And I wondered if you could tell me what the strategic logic was behind it, and if there wasn't one how much damage that will do.

Jason Bordoff
Well, it's hard to identify what the strategic logic was when we Dan was a part of this on Capitol Hill. You know, a long time ago, there is supposed to be a process by which committees with jurisdiction and expertise get–sit down and think about how to solve large problems. Now we're just taking this one shot at reconciliation every year and pushing the biggest health care bill and energy bill and everything. So it's hard to sort of say there is a clear, defined logic to it. I think if you step back, I don't know if Dan agrees with this what you see coming out. I mean, one was we needed to find a lot of money to pay for other things like tax cuts, and it still is an enormous increase in the deficit. But the approach that was taken to what remained in of the IRA, or in the one big, beautiful bill, support for nuclear and making it easier to build infrastructure and permitting reform, even geothermal, and the things that were pulled out, and some of the process by which we got there, there was a point when the Senate was going to put was actually going to impose a tax on solar and wind if more than a certain percentage of the components came from China. I think one way to think about this is intermittent forms of energy are bad, not good, because they create reliability and security problems. I don't think that's correct and I think those can be managed, and China's bad. And so you saw a lot of support for domestic energy. That's 24/7 that's firm power, and support pulled back for things where there's a very heavy element of Chinese dominance in these supply chains like electric vehicles and solar and wind, and that sort of comes back to, you know, some of the comments you asked about Zanny with critical minerals. Because if you're thinking about energy security, if you're in the US, or if you're in Europe in particular, where you're exposed to volatile global oil and gas markets, exposed to geopolitical risks, and you want to increase your energy security, what would you do? You'd want to electrify a lot of things that aren't electrified today. If you want to move in a lower carbon direction, you want to electrify a lot of things that aren't electrified today. That means an enormous amount of copper and other critical minerals. And we know that China either mines or refines and processes 70, 80, 90% of these. So as Dan said, to address that, you would want to do more of that at home. The problem is it takes a very long time to do that. You want to diversify those supply chains, and diversification and reducing China's dominant role in these supply chains needs to mean like everyone else except North Korea or something, is your friend, and we're working with allies, and we're building partnerships and trade arrangements, not throwing sand in the gears of those. I think that's a really important lesson from it as well. And a lot of those things really didn't play into how the one build back better thing emerged. I think Dan is right, that when you look at the reason China is where it is, and Meghan

said this too, its energy security as much as anything else, China is a very import dependent country for oil and gas. They've deployed a lot of intervention of the state, more than half the cars sold there are electric, not only for local environmental problems, but it reduces their need for imported oil. They use a lot of solar, and they use a lot of coal, and that's domestic resources and supply. And so I think we need to approach diversification of our energy system similarly, but we need to be honest with ourselves about the fact that even if you do all the things we should be doing, China's gonna have a really dominant position in these supply chains for a very long time. And we need to be thinking about other tools of resilience to manage that dependence the same way we did in the 1970s by building strategic stockpiles of oil, for example, reducing the potential leverage they have, because they're going to be in this position for a long time to come.

Zanny Minton Beddoes
I'm going to just bring in Joel here, because there's one question I want to make sure we have time for. Then we are going to get to a couple from you, which is, we started this conversation by saying that, or I started it by saying that, 10 years ago, we would have talked overwhelmingly about climate change. This time, we've hardly talked about it at all. Your country is trying hard to maintain progress there and push it on the international agenda. When you hear this conversation about energy and energy security coming from the United States, do you think that it is going to be possible to continue to make progress on the climate agenda?

Joel Sampaio
It's clearly a tough sell, but we're stubborn, and we have good allies, and I think there's an understanding that the environmental aspects of it should be taken care of. As far as energy security, I think with the current exception of the dispute between Venezuela and Guyana over the rights of drilling in a territorial disputed area, cooperation has worked very well for South America as a whole, and it's still true today. For instance, the shale gas projects in Argentina are clearly another source that we will cooperate on. So I think cooperation and attention to the environmental aspects are very important, and also as to American interests as a whole, I would say engagement is key. Not engaging is giving room to other actors, and not only this one you have been mentioning quite often, and those actors have taken full–they have identified and they have used the opportunities that are available in the Brazilian market, which is–has transitioned in energy from state run to market driven. So there are lots of opportunities to be addressed there, and engagement is key.

Zanny Minton Beddoes
That's very important. Questions? Yes, four or five rows back there, gentleman there in the light jacket. Keep it very brief, and we're going to get a couple of questions and then come back to you.

Audience Question
Thank you. The panel was great. I think we discussed a lot of the issues at hand, but not enough of the solutions. Micronuclear seems to be the solution to everything we discuss as the problem. So it's scalable, brings jobs to the US, the public markets love it. Look at Oklo, a new

scale, Oklo's up 180%, the Department of Energy head was a board member, reduces our dependence on Gulf states and any bad actors. And I think it's an inflation reducer, right? So it helps the middle class keep as much as

Zanny Minton Beddoes
Keep it short because I want to get a couple of questions in.

Audience Question
Okay, but micronuclear, we haven't discussed it. Can you give some thoughts on to that?

Zanny Minton Beddoes
Okay, we'll get to get a couple more questions, and then we'll get to micronuclear. There was a lady over there.

Audience Question 2
Yes, thank you. I have a quick comment and a question. Very quick. The comment is that the Department of Energy, Office of science laboratories are doing amazing, innovative research at TRL, two, three that can save that can very much have impact on energy security with cryo data centers with factors of three or 10 for AI data centers, and also particle colliders and particle accelerators can be used for fabrication. I want to thank my former boss

Zanny Minton Beddoes
Okay, thank you. Can you just give us your question? Because otherwise we're going to run out of time.

Audience Question
The question is my the mining of rare earths in the US is so strongly regular regulated today, I think the Department of Defense, just now, committed 400 million to MP materials in California. So what are the regulatory practices to make this better? Again, to my former boss, thank you.

Zanny Minton Beddoes
Okay, I think we're going to have to actually have to leave it at two to give you a chance to answer them. Micronuclear and the regulatory barriers to rare earths, I think they're both directed to you.

Dan Brouillette
I think you know, the answer is similar for both questions. I think in some respects, that's kind of what I was alluding to earlier. We have to allow small modular reactors behind the meter. If they're going to work, we have to put them behind the meter, because the regulatory structure in the United States, state regulators will not allow the cost of that first of a kind technology to be borne exclusively by rate payers in those geographic regions. So we have to come up with a new paradigm, a new regime to allow hyper scalers or others to pay for the generation, perhaps let the utility operate it, but it's got to be behind the meter, and we'll figure out the tariff schedules if they want to use the grid for backup power for that generation source, but that is what I was

alluding to earlier, and that really needs to happen. That's a tough challenge. I don't want to minimize how hard that is. It's very, very difficult. The same thing with reprocessing or processing of critical minerals here. We've developed an environmental regime here in the United States that says that's going to be very difficult to do if you want to do it here, which is why we've exported it to countries around the world, like China. If we want to build–bring that back, we have to one, look at the environmental regime that we've established here. But two, we also have to think about, how do you generate the electricity that's required to do that processing? And that gets back again to the small modular reactor, or other forms of generation that state regulators are not going to let the right rate payers in their geographic regions pay for exclusively. Industry wants to do it, the regulators are going to say, let industry pay for it.

Zanny Minton Beddoes
Okay, we have 30 seconds. So, Jason, I know, I'm not sure you've got to answer something in 20 seconds. But if, if we have this increase in demand that we've been discussing, and if we don't solve all of these regulatory challenges that the Secretary laid out, we are going to see a large increase in prices. Talk me through, what happens then?

Jason Bordoff
Yeah, it's starting to happen already. If you look at the utilities and the requests they made for rate increases this year, it was twice what it was compared to last year. So you're already seeing that impact. I think your caveat at the beginning was right, if we see this increase clearly, power demand is going to go up. There was an article in The New York Times a few weeks ago about two gigawatts to train the next generation of Anthropic models. Just to put that in perspective, two gigawatts, I think Dan, it took 11 years and $35 billion to bring Vogel online. Coming to the point about nuclear, that's two gigawatts.

Dan Brouillette
And to put it in scale, New York City is roughly six gigawatts on an average day.

Jason Bordoff
So for all the reasons Secretary Brouillette talked about first of a kind risk bringing those costs down, I am optimistic about what's happening with advanced nuclear technology and how much capital is really going into the space now, and there's a real geopolitical reason to do that too. 80% of the reactors under development in the world today are China and Russia. So there's a reason for us to have leadership there. It just there's like a caveat to keep in mind. There's a Forbes op ed I came across the other day from 1999 and the headline was, dig more coal. The PCs are coming, and it was about a study at the time that the Internet would consume half of US electricity. So people do tend to draw like straight line, exponential increases, and the technology does become more efficient. The same thing happened with cryptocurrency. I'm not saying power demand is not going to go up, it is, but there is a wide error band or uncertainty band around that, and probably a lot we can do to use energy more efficiently as we're doing that in doing that, we're still going to have to make it easier to build, and we're still going to need a lot more power generation in the US, for sure.

Zanny Minton Beddoes
Well, you've had some good ideas here, and if you have the bipartisan committee that we've seen on this panel, it might actually happen. Thank you all very much.