

[Transcript] The Ezra Klein Show / When Great Power Conflict and Climate Action Collide

From New York Times Opinion, this is the Ezra Klein Show.

Hey everyone, it's Roger here.

I'm the senior editor for the Ezra Klein Show, filling in for Ezra while he's on book leave.

Before I get into today's episode, I have some bittersweet news, which is that this will actually be the last episode I will be guest hosting.

At the end of August, I will be officially leaving the show to pursue my own writing and journalism career.

I'll say a bit more on all of that in the outro, but for now, I do want to get into today's episode.

So we've done a few shows now on the decarbonization effort here in the US, but decarbonization is necessarily a global phenomenon.

Nearly 90% of annual greenhouse gas emissions come from outside the United States.

So when we talk about decarbonization, what we're really talking about is totally transforming the entire world's energy system.

And energy is the foundation of the global economy, of military power, of the relationships between countries, of basically everything.

And so when you change the world's energy system, you're completely upending all of that too.

So I wanted to have a conversation that takes a global view of decarbonization and the kinds of transformations and collisions and tensions that come with it.

And the two individuals who I think have done some of the best work on this are Megan O'Sullivan and Jason Bordoff.

O'Sullivan is the newly appointed director of the Belfer Center for Science and International Affairs at the Harvard Kennedy School and previously served in multiple government roles, including as a deputy national security advisor in the George W. Bush administration.

And Bordoff is the founding director of the Center on Global Energy Policy at Columbia University and also spent time in both the Clinton and Obama administrations, including as the senior director for energy and climate change for Obama's National Security Council.

And in recent years, both Bordoff and O'Sullivan have together done some of the deepest analysis of the crucial nexus between the world's changing energy system and the realities of geopolitics.

So I wanted to bring them all on to talk about that intersection and what it means for the future of the world as we know it.

As always, if you have feedback or guest suggestions, the show email is Ezra Klein Show at [nytimes.com](mailto:ezra.klein@nytimes.com).

Let's get to it.

And Bordoff, Megan O'Sullivan, welcome to the Ezra Klein Show.

Thanks for having us on.

Good to be with you.

Great to be with you, Roche.

So your big picture argument is that decarbonization isn't some simple shift in what kind of cars we drive or how we power our homes.

That it represents a much more fundamental transformation of the global economy and geopolitics.

So talk me through that idea.

What is the energy transition, as it's sometimes called, and what does it mean for the world? Maybe I could start by just saying it is so easy to underestimate the scope, the scale, the complexity of this energy transition.

Maybe most people think of it simply as switching an energy source from one to another. They think about going from a gas-driven car to an electric vehicle.

But it is so much more complicated than that.

It is essentially changing not just what energy source we use, but changing how we produce, work, transport, and use energy.

And energy, of course, is at the foundation of virtually everything that humans do.

So we're talking about remaking the entire energy system of the world, and that is the backbone of a \$100 trillion global economy.

So this is a massive undertaking, and what makes it even more complicated is that unlike other energy transitions in the past, we're talking about doing it in a very compressed time frame due to the urgency of climate change.

Just think about the moment we're in today.

The summer of 2023 will be the warmest ever recorded on planet Earth.

Last month in July in China, there was a town that recorded a temperature of 126 degrees, the highest ever in the country.

And on that very same day, John Kerry, the U.S. climate envoy, showed up in Beijing to restart talks between the two world's largest emitters on climate change.

Because there's no solution to climate that doesn't include the U.S. and China.

And Kerry was largely rebuffed.

China didn't seem to have a lot of interest in talking with us, because we're in a moment of some of the worst tensions between two of the world's great powers.

The world is shifting to clean energy sources that depend on a lot of minerals we'll talk about that are very dominant, heavily concentrated in China.

Forces of fragmentation are growing at a time when we need more, not less cooperation and trade in clean energy.

They're growing forces of backlash from the developing world, lower income countries, toward how the rich countries are approaching this problem.

So there are a host of broad geopolitical trends, challenges that are complicating the effort to move as quickly as we need to to clean energy.

And the reverse is true too, that the transition to clean energy, if we're not careful and thoughtful about it, risks exacerbating some of those challenging geopolitical trends.

And it has been a lot of the focus of what Megan and I have been collaborating on how to think about.

Before we get to a lot of these different geopolitical dimensions, I also just want to level set where we are, just in terms of energy and the transition on an even more basic level, because it sometimes feels like we're in something of a contradictory place right now in the transition.

So on the one hand, over the last year, we've seen a flurry of really unprecedented clean energy investments, right, including the Inflation Reduction Act here in the US.

And those investments are working with the fact that the price of wind and solar and EVs have come down dramatically over the last decade, which means despite what's happening

this summer, we're on track for much better warming targets than just a few years ago. And on the other hand, total emissions continue to rise, oil and gas demand hit a new record last year and is expected to hit another this year.

The fossil fuel industry is projected to spend more than \$500 billion this year alone to bring new oil and gas supply online, which for context, the IRA was originally projected to spend \$370 billion over 10 years.

So where are we right now in the energy transition?

And how should we think about what feel like very contradictory indicators?

Well, I think it's a really insightful and astute question.

And I think for the reasons Megan talked about, the scale and magnitude of this challenge and how unprecedented it is, two things can both be true at the same time.

When you look at where we are in clean energy, there is a lot to be excited about.

20 million EVs on the road, that figure is going to grow 35% this year.

The cost of solar, of wind, of batteries has fallen 80, 90% in the last decade.

When you look at how much renewables we added in the last 20 years, we're going to do that again in just the next five.

So on almost every metric you look at, we are exceeding many of our wildest expectations. We're breaking record after record for the pace of clean energy deployment, for the pace of clean energy cost declines.

And as you said, other than a pandemic or a recession, oil use is going up every year, coal use is going up, gas use is going up, and emissions are going up.

That's what happens when you take a global economy as big as the one we are, when you have huge numbers of people around the world who use very little energy at all, when you grow populations, when you give people higher levels of prosperity.

As much as we talk about the phrase energy transition, the history of energy is not one of transition, it's one of addition.

And by that I mean, when we think of transitions, we think of going from wood to coal or coal to oil, these great historic transitions that take decades to play out in the industrial revolution.

That's true as a percentage of the total.

But what the planet cares about is not percentages of the total, the planet cares about how much fossil fuels we're using and how much CO2 we're emitting by burning them.

That number has never gone down.

We're using more wood today than we did in the 19th century.

That's because the denominator keeps getting bigger.

That's what happens when the amount of energy the world is using goes up because of rising levels of income and rising populations around the world.

So if we want to have a clean energy transition that solves the climate crisis, we need to do something we've never done before, which is not just have a transition where we add a lot of clean energy and the percent of the total that is fossil fuels goes down.

We need the total amount of hydrocarbons to start going down and the emissions associated with them to go down or otherwise be captured or stored.

So to just reinforce the excellent point that Jason just made, last year, 2022, the world used more coal than it ever has before.

And so even though we're making these huge additions in renewable energy, that's basically simply able to fuel the increase in energy demand that is happening globally.

And it is, again, only in a recession or a pandemic that that energy use has gone down.

So you both have made the case that one way of thinking about this moment is that we're leaving behind an age of energy security and entering an age of energy insecurity.

I want you to unpack that because in many ways it seems like a decarbonized world would be a much more energy secure world than one run on fossil fuels, right?

Like oil and gas are these zero sum resources concentrated in a handful of countries.

And that means when Vladimir Putin decides to invade Ukraine or OPEC feels like prices have gotten too low, you get all kinds of price fluctuations and shortages and so on.

But the sun and wind provide more than enough energy to power the world.

No country has a monopoly on them.

And so it at least seems like a greener energy system would also be a much more secure one.

So maybe we could start with you here, Megan.

What does that view get right and what does it miss?

Well, I think that view is very accurate when we talk about the geopolitics or the security of energy in a net zero world.

So a world where we do have an energy sustainable global economy.

And often people assign the day 2050 to that.

Those are sort of the global ambitions is to get to net zero.

And I think it's true.

And Jason, I have written about this.

It is likely that that sort of world is more energy secure and there are fewer uncertainties and potentially even less volatility.

What that portrayal misses, and this is something that Jason and I really are focused on, is that the transition from, let's just say 2050 from today to 2050 is anything but smooth, it's anything but incremental, that actually there are all kinds of uncertainties and fluctuations and volatility in the system making that transition.

Because again, we're thinking about not a transition that is only driven by the market, which would be in itself uncertain in some respects.

We're talking about a transition that has a huge element of geopolitics as countries think about the energy transition as actually having competitive advantage.

We think about countries that look at the transition as something that's a threat to their economies.

And so you may have countries that want to thwart the transition.

And then you have others that are seeking to expedite it.

So there's a huge element of policy.

There's a huge element of geopolitics.

And there's a huge element of technology.

All of these things come together to make the energy transition very uncertain in ways that we can discuss, especially when we think about oil producers today.

How are they looking at the system?

And what does that mean for their relative power base in a net zero world?

They're likely to have less geopolitical influence than maybe they do today.

But that doesn't mean between now and then that it's a straight decline. Instead, you know, we've actually argued and we're seeing it now that these countries have enhanced geopolitical influence and economic influence because of the nonlinear nature of this transition.

What you described, Roger, I think is absolutely the promise.

We are being reminded, if we needed any reminder by the crisis that was prompted by Russia's invasion of Ukraine, that if we shifted toward a clean energy system that was much more dependent on electricity, more dependent on renewable energy, although not entirely, you'd have less dependence on globally traded hydrocarbons that are inevitably exposed to geopolitical risk.

So the urgency of climate is now matched with a growing recognition of the urgency of energy security, which I think a lot of people forgot was a risk for many years. And the promise now is really to harness those two forces together to accelerate the move faster to clean energy.

Well, Megan and I have been writing about are some of the risks that come with that transition that she just described.

And I think, as she said, they sort of fall into three buckets.

The first is the end state when we get to a net zero economy.

And we are not on track for that at all, but hopefully we get there.

And that new clean energy system has its own potential risks.

Heavy dependence on critical minerals will come to that, I'm sure.

Most of that done in China today, a system that has much more solar and wind, which tends to be more variable, places much greater strains on the grid in the need for flexibility to manage that.

So you've got to manage these things carefully.

As Megan said, that's many decades in the future and the process of getting from here to there, if we're not careful and thoughtful, can be messy and volatile and disorderly.

And that presents its own risks to kind of the legacy hydrocarbon system, not to mention the emerging clean energy system.

And the third thing I would just mention is that climate change itself is going to be a major threat to energy security in the coming decades.

Warmer water, severe droughts make it harder to cool power plants or nuclear plants can affect hydropower output, even affect wind speeds.

So the impacts of climate change themselves can create risks to energy security.

The last thing I'll say is none of this is to suggest we should slow down the pace at which we're moving to clean energy.

We need to move a lot faster as world events are reminding us this summer.

But it is important for us to be clear eyed about what the risks are, because if we don't navigate them, if we don't anticipate them, if we don't derisk the transition, if people see challenges with affordability or reliability to energy and the process of transition, there could be a backlash.

I mean, you could lose support for the faster climate action we need.

So one area of the bumpiness that you both talked about on the path

from here to a net zero world is one that you alluded to, which is that the move to clean energy isn't going to completely get rid of resource constraints. It's just that the key resource constraint is going to shift to what you just referred to, Jason, as critical minerals. And you both just wrote this big report on critical minerals. So tell me first what critical minerals are and how they are important to the energy transition, but then more specifically, the most obvious analogy here is to say critical minerals are the new oil. So what does that analogy get right and what does it miss? So the transition to clean energy depends heavily on these so-called critical minerals like lithium and nickel and a range of things that are needed for clean energy, such as batteries and solar. They're used for a lot of other things, too, including the iPhones in our pockets and sensitive defense requirements and other things. But the kind of goals we're talking about to get to net zero emissions by 2050 projections or that demand for critical minerals go up something like sixfold. We're not on track for our climate goals and copper demand is projected right now to double by 2030. These are huge increases. And I think it is hard for people to fully appreciate the scale and magnitude of how difficult it is to grow those supplies. Today, it takes an average of 16 years to bring a new mining project to development. And, you know, it's not easy to build mines all over the place. And those have impacts, they have impacts on indigenous communities if we're not careful on the environment, if we're not careful. And today, there is a lot of concentration of where those minerals come from. If you look at oil, for example, the largest producers of oil, the US, Saudi Arabia and Russia, each produce around 10 percent of world supply. If you look at the largest producer of cobalt of rare earth elements, the largest producer each of those is more than 50 percent of world supply. And most of 60, 70, 80 percent of the refining and processing is done in China. So there's a very heavy dependence on China right now in global supply chains that creates a lot of concern about what happens if the whole clean energy system becomes dependent on these minerals moving forward. Let me pick up where Jason just stopped to answer the specific part of the question, Roger, about, you know, to what extent is this a parallel to oil? And obviously, oil is the easiest thing for people to get in their heads because this is a physical commodity. And so it is involved in geopolitics in a similar way. And I'd say there are certain parallels, obviously, but the parallels break down in a couple of ways. I'd say the first thing is the most important thing is that the critical mineral is an input into something else rather than the commodity itself that powers the economy directly.

So certainly if the supply of these inputs are disrupted for political reasons, for natural disaster reasons, supply chain, whatever the reason, it is going to have an effect on the economy.

And these critical minerals, the US in 2022 identified 50 of them. These critical minerals are identified by definition. They have importance to America's economic and national security interests. So a disruption of supply would have an impact on our economy. But it wouldn't necessarily be as pervasive as an oil embargo. You know, it wouldn't mean that our economy ceases up in short order. It might be a little bit more like what we've experienced last year with chip shortages and how that affects supply chains and increases the cost of anyone who rented a car or tried to buy a car or at least these types of things.

So it would have disruptions and some of those could be very concentrated in industries, maybe the automotive industry, certainly in the world of defense where a lot of critical minerals are used. So that's the first thing is that they're different. It's an input rather than the commodity that actually powers everything. One difference as well is that actually in today's world, the production of these critical minerals is much more concentrated than oil and gas. And the US, again, by definition, a critical mineral is one that we have heavy import dependence on. So for 15 of the 50 minerals, the US is reliant on imports for 100 percent of our consumption. And for the other 35, it's more than half or about half. And so this import dependency is problematic when you have a very concentrated number of producers. Because when we think about how do we protect ourselves against anything that may be disruptive? Well, we have a diversity of suppliers. That's what we tried to do when we were importing a lot of oils to have a diversity of suppliers. But it's hard to do if the concentration of production is. So focused on just a number of countries. So that's one of the reasons why some of the vulnerability is even more acute than it might be when it comes to oil. This brings us to the country that you all have mentioned a few times, which controls a lot of these minerals right now, and that's China. And here I want to pick up on one of the points you got out in the report, which is that it doesn't really make sense to think of control of clean energy technologies, control of these minerals, and then what they create as one thing. It's really sort of three separate components, right? One is where the raw minerals are located, which, as you said, is highly concentrated. But then two is sort of who has the capacity to process them into a form

that's usable. And then three, it's who has the manufacturing capabilities to take those processed minerals and turn them into EV batteries or solar panels or whatever, which, as you alluded to, is like one of the differences, I think, between these critical minerals and oil. But China really dominates all three of these right now. So just to put some numbers on it, different minerals are located in different places. But China currently supplies around 70 percent of the world's rare Earths, which are really crucial for a bunch of clean energy technologies. And then where China really dominates is processing and manufacturing. For instance, China currently processes the bulk of the world's lithium, cobalt and graphite and Chinese companies currently control more than 75 percent of the world's EV battery and solar PV manufacturing supply chains. And so what you'll hear from lots of folks in the Biden administration, Jake Sullivan has said things like this, John Podesta, is that they're worried that China could weaponize its control over clean energy supply chains in the same way that Russia did with oil and gas. To your point, Jason, you know, it's only going to have more leverage. It could possibly be even more painful because of how much of the market that China controls. And already just last month, China announced export controls on two metals, gallium and germanium, that are key inputs to solar cells, among other things. And so the big question I have, and I'd love to start here with you, Megan, is how worried should we be about China weaponizing these supply chains? And how could it affect the energy transition if they do? Let me make three points. First, I think the world, the Biden administration, people in general, analysts, others are right to be concerned. As you described very accurately, China has enormous dominance of these clean energy supply chains right now. And so then the question is, do they have the intention to use these for geopolitical or other economic purposes? And I think, obviously, there's some costs that would be borne by China if it did this, but we have a couple of examples. Certainly, China's stoppage of the export of rare earth elements to Japan in 2010 when there was a dispute over some islands in the East China Sea. And then, as you mentioned, just a few weeks ago, we had two critical minerals and export controls that China put in place. So clearly they are inclined potentially to use this as they see it in their interest. But they may not only use export controls or bans, they could also do something that we found a lot of potential investors and manufacturers are worried about. They could dump a lot of these critical minerals onto the global market at a critical moment. And that could really, you know, viscerate some of the investments that people are making in increasing the production and processing of these

minerals in other parts of the world.

So they have the ability to create a lot of uncertainty in these markets in a way that undermines investments and allows them to maintain their dominance.

So it's a legitimate concern.

My second point would be that we really need to look at this on a mineral by mineral basis.

The numbers that you suggested are very important and indicative of the leverage that China could have, but we have to go a deeper level because take, for instance, copper and nickel, where China processes 40 and 35 percent of global supply.

That's true.

You think that gives them enormous leverage.

However, they use a huge amount of those minerals themselves.

So we have to look at are they actually exporters?

So they may be doing a lot of the global processing, but they may be consuming them themselves.

So they may not be exporting the minerals.

So we need to really separate out on a mineral by mineral basis where they have leverage.

And it's not across all 50 of these minerals.

It's more targeted.

And then we need to focus our action on those minerals that they have the processing capability.

And they also are very influential in the global trade of those minerals.

So rare earth elements is the most vulnerable spot.

And you gave us some good statistics on that.

And there you have China that does the production, the processing and dominates the global export market.

Lastly, the third point I'd make is, so what does this mean?

What are we going to do?

A lot of people have responded to these realities by saying, we've got to produce all this stuff at home in the United States.

And I think there's no question in the task force that you reference that Jason and I co-chaired and just the report was just released in June.

The task force says, yes, we have to do a lot more to increase production in the United States because we do geologically have a lot of these minerals.

But it also says we can't fool ourselves to think that the United States is going to be able to meet all of its own needs.

Even if the geology suggested we could, mining in the United States, there's a long history.

We could go into it in great depth, but there's a lot of social and political and environmental factors that will make it hard for us to really mine everything that we could potentially mine in this country.

And so we have to think about how to work with others in order to get enough global production that is not constrained in China.

And we also have to recognize that there is going to be a relationship with China that is around these critical minerals and that we have to think about how to manage that in a way because it is not going to be something that we're going to be able to replace, particularly in the timeframe in which it's going to become really urgent.

Let me just add two quick points.

One on how worried we should be.
And she talked about the possibility of mining.
We should remember, at least from the standpoint of China, China's dominance for the most part is about the refining and processing.
That's about manufacturing.
It's not about geologic abundance.
There's a lot of cheap oil in Saudi Arabia.
There's not a lot of cheap oil in many other places.
You can build facilities to do refining and processing of critical minerals in almost anywhere. It takes time.
It takes investment.
That doesn't happen overnight.
So it is a different kind of challenge than the geologic good fortune of nature about where oil or gas supply is.
There's a question about how to think about the concern with critical minerals.
They're important for not just clean energy, as we talked about before iPhones.
We depend on China for a lot of pieces of the global supply chain.
And when you listen to administration officials, Jake Sullivan, for example, in an important speech at Brookings recently talking about a small yard and a high fence.
And by that, they meant we want a lot.
The administration is saying we want a lot of trade with China, but there's a small number of things that are very sensitive, have national security or defense implications.
And in that area, we're going to try to distance ourselves and try to reduce our dependence on China. So the question is when you're talking about batteries or solar panels, where do they fall on that spectrum?
How should we think about them?
Are they a commodity like everything else you need for your iPhone or is there something particularly sensitive that would make us want to think differently about that?
And I think the answer is wherever you put it on that spectrum, with energy security generally, ever since Winston Churchill famously said security in oil lies in variety and variety alone, a big part of the answer is diversification.
It's part of the reason you're seeing Apple move iPhone production toward India and some other places to reduce dependence on China.
Now, as Megan said, diversification can't mean we do everything domestically.
It's simply not going to be possible.
And we can go into why we think that is.
So diversification means you need to be working with a lot of other partners around the world.
We need more free trade agreements, more trade partnerships at a time when protectionism is in vogue. And there's been a retreat on both sides of the aisle from support for some free trade principles.
So we need to engage more with a very broad array of partners around the world.
We might want to think about other tools with oil, for example, we have strategic stockpiles.
And I don't want to forget the fact that we should think about reducing demand.
You can recycle, you can use minerals more efficiently, and there's a range of electrochemistry

technologies in the works that might allow us to build a lot of these clean energy components with far fewer inputs.

And that would be a huge win as well.

So for all the reasons you both just talked about, you know, policymakers are really trying to quote unquote, you know, de-risk their clean energy supply chains from China.

And the way they've mostly gone about doing that is by building up domestic capacity, right?

So like the Inflation Production Act has all these provisions designed to help onshore production of clean energy technologies to domestically source inputs like critical minerals.

Europe's Green Industrial Plan has a similar intent.

And as you're saying, you know, you both have been very sort of critical of this strategy.

But I think the response you'd get from folks in the Biden administration would go something like this.

First, you know, integration is great in theory.

In an ideal world, we'd be able to rely on trade and cooperation.

But that's just not the world we're living in.

On one level, there are some countries willing to weaponize their resources.

But even beyond that, something we've seen over the past few years is that at the end of the day, when there are massive shocks to global supply chains, countries tend to look out for themselves and their people first.

And so if for some reason there's a shock that creates critical mineral shortages or disrupts the battery supply chain, which is very possible,

if that happens and we're dependent on other countries for those things, then we're vulnerable, you know, we're exposed.

And so the only way to guarantee security for ourselves is to build thriving industries right here at home.

And then there's also the political reality, right?

There's a reason Joe Biden's favorite line is what I think climate, I think jobs.

The voters, Democrats need to win, tend to see jobs in the economy as much higher priorities than addressing climate change.

And so to be able to attach climate policy to jobs here at home is what allows these policies to pass in the first place.

And it's also what helps protect them from backlash.

Like if you want to prevent a future Republican trifecta from repealing the IRA,

you need to create enough jobs in red and purple states such that it becomes politically disastrous to do so.

And so, yeah, integration sounds great in theory, but the political realities, both globally and domestically, are working against it.

And so I guess my question for you would be, A, sort of what your response to some of those arguments would be,

but then B, what this more integrationist approach, this more cooperative approach, would actually look like?

It's a really insightful question, and you're describing the tension the Biden administration is dealing with.

Industrial strategy is back in vogue, and there is a lot to celebrate about that.

There's a lot of opportunity there for how we think about the economy, how we think about the American middle class, and how we think about the manufacturing base here.

And as Jake Sullivan said in that speech at Brookings, part of it is just that the assumptions we had about how a globally integrated economy would work 20 or 25 years ago, China is not playing by those rules, and so we need to adjust our strategy accordingly.

I think one important area of a reality check on that is, and you've talked a lot about this, UNS run this podcast, how difficult it is to build at scale in this country.

And if we want to have a clean energy transition at the speed and scale we need, we should do a lot more domestically,

but it is going to be very hard for things like critical minerals, for example, to do all of that here at home.

So if you veer too far in the direction of protectionism, that can undermine our ability to move as quickly as we need to toward clean energy,

because it raises costs. We need much more trade in certain clean energy technologies.

The IEA shows trade in critical minerals increases threefold in a scenario where we meet our climate goals.

There's a range of studies showing that a big part of the decline we've seen in the cost of solar photovoltaic modules has been because we've had global trade.

So we can't do everything at home. We don't have the resources. It takes a really long time to build.

We're going to need a lot of trade and there's a risk to cost inflation.

There's a risk to the energy transition. If we're not working and engaged in global partnerships, then we need to think about how to do that in ways that are secure and resilient.

Those are important goals, but if security and resilience veer too far in the direction of protectionism or everything has to be by America,

that can be a risk, not just economically, but also can be a risk to the pace of the clean energy transition because of what it means for some of the costs of getting there.

So I would say, you know, when we talk about integration, and maybe I'm splitting hairs here, but we're not saying let's leave this all to globalization.

You know, this isn't a return to a world of no great power competition that we enjoyed for many decades.

We're globalization, you know, really took care of a lot of these things.

We're talking about greater integration with, you know, potentially a smaller set of countries, but still a large set,

but, you know, more of a regional approach or an approach of countries that have that are willing to sign up to, you know, certain standards that are negotiated.

So that essentially, let's take critical minerals because we've been talking about that as an example, that, sure, it makes sense to do what we can to try to increase production in the United States.

But we can't do that with the expectation that we're going to meet all our needs.

So it has to be complemented by an international approach that recognizes that a lot of the mining and the processing and maybe even some of the manufacturing will happen in other countries.

And how can we make sure that that growth is done in a way that is beneficial to all parties?

And that will require pushing back on this protectionist impulse that we've had, because if we want countries, you know, in South America or in Africa or in other parts of the world,

to increase their production and we want them to do them according to certain standards that are consistent with American values,

we need to find a way to get finance there and likely we need to look at our trade relationships to ensure that there are markets for these things.

So all of this is a web and in some ways it's good because we're in a world where there can be things we agree on that push us in the direction of doing things that we might not otherwise do.

So the fact that it's a bipartisan issue to compete with China, maybe that will be the basis for us to do certain things that we wouldn't normally do not only in the domestic world in terms of changing permitting and all that,

but maybe in the international realm in terms of getting agreements and maybe even negotiating or introducing the idea of market access back into our economic tools in foreign policy.

Yeah.

Let's then talk about what this more integrationist approach could look like in practice.

could look like in practice. Jason, you wrote this piece about a year ago, when the IRA first passed, arguing that its success would hinge on the foreign policy that went with it. So, walk me through the case you made there, but then also, you know, it's been about a year now.

What has the Biden administration done well, and what isn't it doing that it should be doing?

The piece, I appreciate you're calling it out. I thought it was important to point out this is an extraordinary domestic achievement, and that's the starting point, right? We don't know if it's half a trillion or a trillion, but it is by far the largest investment in clean energy in our nation's history, maybe any country's history at a time when the planet is reminding us every day about the urgency of the climate crisis. So, the Biden administration has taken a much more significant step on climate than any US administration ever, and that's an extraordinary achievement.

It is difficult to implement. And again, on this podcast, you've explored a bunch of the reasons why it's hard to build transmission lines and the land use that's needed, the permitting reform, how long it takes to do things. The point of the piece I wrote at the time was two points. First, successful implementation requires not only domestic action, like permitting reform, how we think about NEPA and environmental rules. It requires successful foreign policy to avoid trade conflict with Europe, so we can build partnerships for things like critical mineral security, maybe so we could work collaboratively. Now that we've taken this extraordinary climate action, Europe is putting in place border tariffs for carbon. They're thinking about things like climate clubs where some countries are in the club, some are not, and you might face a tariff on your products if you're not. We can now cooperate, hopefully, and find ways to work together, because we're taking this extraordinary climate action. We need, again, more trade agreements for all the minerals we're going to need, so we need to diversify suppliers. So, successful trade international economic policy is a vital part of the successful implementation of our domestic achievement, which is the IRA. But that domestic achievement is also about 12% of global emissions. 88% of global emissions are outside the United States. And so, what does it mean to take climate seriously for this administration or any administration? It is not just about domestic policy, it has to be about your international and foreign policy as well. And I think there, when we think about climate diplomacy, it's extraordinary. Someone like a former Secretary of State, John Kerry, is in charge of that. But it's not just these annual UN meetings and can we reach agreements and promises to do things, which, by the way, most countries are not following

through

on. One of the major challenges now, in my view, is how do we accelerate clean energy deployment in emerging and developing economies? That's where the big growth is coming from in the next 20 years

with emissions. How do we lower the barriers to private investment? How do we make more public investment available and use all the tools of international economic policy, development finance corporation, export credit or a range of tools the US government has to try to lower the barriers to investment and accelerate how quickly we can put public and private capital into getting clean energy

built and in the ground in parts of the world where it can be harder, the barriers are higher, the cost of capital is higher. And I think there, the administration has done a lot, but frankly, we all need to be doing a lot more, including the administration.

Let me broaden the aperture so we're not just talking about climate action, we're talking about energy and climate action. And on the energy side, not that long ago, I think the Biden administration did a few things that were extraordinary and were well done. And I'll just name a couple of them, but they're in relationship to shockingly something we haven't really mentioned

yet, which is the Russian invasion of Ukraine and the energy crisis that that triggered in Europe, but that cascaded to much of the world. So in terms of responses that the Biden administration did well, is it helped facilitate a lot of LNG flowing to Europe? A lot of it was US LNG. And of course, that was done by markets, but there was some diplomacy involved to get LNG to flow from other parts of the world into Europe. And that was really important for Europe to be able to position itself much better and to actually get off Russian gas more quickly than I think most people expected. Secondly, there was the price cap that we're all familiar with, and Jason and I were kind of skeptical about how well it was going to work. But I will certainly admit that it worked much better than I expected, that essentially, there was a mechanism put in place, which seemed kind of confusing at the time, but it essentially allowed for Russian oil to keep flowing to the global economy, but to focus on trying to decrease the amount of revenues that Russia would get from

those sales. And so that has been not seamless, but more successful than I think many could have anticipated. And then lastly, when we're thinking about this whole issue of energy security and climate action, the US relationship with Saudi Arabia is really critical to managing the global economy because of the impact of Saudi Arabia and OPEC, of course, on energy prices. And that has been a very rocky relationship over the last year. And I think my sense is that both Riyadh and Washington are finding better ways of working together and both accepting some new realities that hopefully can have a good impact on diminishing some of the volatility that can be so pernicious to the global economy and to energy access for the developing world as well.

I want to get to the developing world in a minute because I think that is one of the key questions of the transition is that question of financing that you mentioned, Jason.

But before we move on, I want to come back to China. Let's say the Biden administration perfectly implements this integrationist, French shoring approach, right? We sign critical minerals agreements, we create climate clubs, we also clean up our act on permitting and successfully

build out a lot of battery factors and lithium mines, the stuff of dreams, I know. Even in that

best case scenario world, how realistic is it to think we can fully disentangle or de-risk from China when it comes to clean energy supply chains while also meeting our decarbonization goals? I think China is going to remain a very significant part of supply chains for clean energy for a long time to come. That's why it is important to think about de-risking and not decoupling, to use the kind of language of the day. It's not going to be possible to disentangle, to completely separate yourself. But there are a number of steps that policymakers can take and individuals' companies can take to think about how they reduce the risks of potential shocks, and those could be conflict, those could be geopolitically motivated, they could be a severe weather event. I mean, any concentration and excessive risk in one location is a concern, as we've been reminded, following the pandemic. So diversifying those supply chains, the possibility of strategic stockpiles, that's harder for minerals because there's so many of them, and say it is for oil, but we can think about ones where it might make sense.

And I think there are a number of other lessons that can be learned from energy security, from oil and the Arab oil embargo, the oil shock of the 1970s, the steps we took after that. Another one is governance, cooperation. After the 1970s oil crisis, we built the International Energy Agency to provide more transparency, more trusted data so markets could work more efficiently. So if there is a disruption in supply, you can import from other sources, markets can respond and adjust. We had new mechanisms for cooperation between producers and consumers. Those are a number of the lessons that can be learned from past energy shocks to try to reduce the inevitable concentration that will continue to exist while we try to lower it for China in these supply chains. I'd just like to emphasize, as we have another context on this podcast, that two things can be true. One, it is unrealistic to think that we will, in your words, Rochette, fully disentangle ourselves from China when it comes to clean energy supply. So I think that is truly unrealistic. But at the same time, it is also true that it is an urgent need for us to try to move in the direction of becoming more sufficient with the help of friends and partners and allies around the world, and that we should aggressively and creatively seek to minimize our dependence on China. So those two things, I think, are true simultaneously.

And I also think it's useful for us to just acknowledge there is a real tension here, there is a real trade-off here. And this is what policymakers grapple with all the time, that you could either decide, okay, we're going to continue to have this very outsized vulnerability to China. But if everything goes well, it is probably the fastest path to an energy transition, although that everything goes well is a pretty big caveat. Or we can say, in our efforts to try to diminish that vulnerability to some extent, it may be more costly, and it may take a little bit of a longer time. And I think that is what policymakers are grappling with, and finding the right place to be in that spectrum where you recognize there's going to be some element of vulnerability, but you're also willing to pay potentially a little bit of a higher price, or maybe slow down things, hopefully not appreciably, but somewhat in order to allay that vulnerability. It's a spectrum there. And you see, it's not just the United States that's grappling with that. You look at India, and India is thinking, we do not want to be completely reliant on China for solar power and energy. And so we're going to develop a lot of this here in India. It's going to be more expensive. It's going to take us more time, but we're not going to have that vulnerability. And there's also benefits on that side that we already talked about. If this helps with domestic manufacturing and domestic production and domestic economic things, that's not only good for the economy, but it also helps build support in a constituency for clean energy

action. That is consequential as well. So I worry about where this leaves us, though, because to your point, Megan, I think there are going to be numerous points throughout this transition where we have to choose between de-risking from China, disentangling from China, and decarbonizing.

And I would love if we could all just be level-headed and find the right balance between those two. But my worry right now is that the political headwinds are really stacked against decarbonization, especially here in the US. And when it comes to the politics here, Republicans are mostly united on wanting to be tough on China and on not really caring that much about climate right now. There wasn't a single Republican who voted for the IRA, but Democrats are divided. They really care about the climate, but they also don't want to be seen as catering to China or promoting jobs in other countries. And so you get things like earlier this year, an example that always comes to my mind, is that a bipartisan group of legislators in Congress passed a bill that would have placed tariffs on solar panels imported from Chinese manufacturers in Southeast Asia. And the idea there was that this would support the American solar industry and the jobs it could create here at home. But the flip side is that the US imports a lot of its solar supplies from these Chinese companies, like a lot, which means these tariffs would have really raised prices and slowed the decarbonization effort. And so it was one of these moments when we had to make a choice. And in the end, you know, Congress chose to pass the tariffs, but the Biden administration ended up vetoing them for those reasons, which I think was the right choice, in part because, you know, if we really care about decarbonization, the speed is really important and keeping prices low was really important. But as the anti-China momentum continues to build on both sides of the aisle in the US, I worry that those kind of decisions, the kind of decisions where we choose to prioritize decarbonization, that those are going to get harder and harder to make, and that the politics of this issue are going to become more and more tilted against decarbonization, and that this would be really harmful to our ability to meet our climate goals. And I'm just wondering how you all think about that concern. Like ideally, we'd be able to find some sort of balance, but I worry that at least domestically here in the US, the politics are going to make that harder and harder. As long as we think about the way to make progress on climate as demanding cooperation, particularly between the US and China, as long as we think that, I think we are in a mindset that is not going to bear the fruit we're looking for, that we have moved away from a global environment where the dominant dynamic is cooperation,

which was actually the dominant dynamic for much of the post-Cold War era up until, I don't know, the last five or 10 years. And so it made sense that we tried to approach climate in a cooperative manner. It's a transnational problem, and so it makes sense that cooperation would be the way in which we try to approach that, and that has to do with the US-China climate agreement, that has to do with Paris, that has to do with the COP, all of those things made sense. We're now in just an utterly different global dynamic. We're in a different geopolitical moment where great power competition is the dominant dynamic. And if we continue to think that climate is going to be some exception to that, and that we're going to have to find a way to cooperate in order to get to where we want to go on climate action, I think we're doomed to fail, that it's kind of irresponsible for us to think we need cooperation to get to where we want to go and we don't have cooperation and we don't have good relations, then we're not going to be able to get to where we want to go in climate. And we need to think more about how do we harness the competitive element of this,

not just bilateral relationship, but really a global dynamic in order to leverage it, to advance where we want to be on climate. And I think what this means a little bit more practically, I mean, the IRA is a perfect example of that. So, Rosha, you pointed out the agreement around being more competitive with China between Democrats and Republicans. And even though you didn't have Republicans vote for the IRA, there are going to be a lot of Republican constituencies in the United States that benefit from the IRA. And I think you could see some changes in support for such action. But again, I think the idea of competing with China and one of the ways that we're going to compete with China is on climate. It's not only going to be about Secretary Kerry trying to get cooperative mechanisms, we're going to compete with China because climate is one of those dimensions where competition is going to be important. And then it could lead us to think about we need to compete with China in terms of building partnerships in the developing world. For clean energy action, because that is going to be an area of geopolitical advantage as well as economic advantage. And if we can gain support for that, which otherwise I think wouldn't have a lot of support in Congress for financing clean energy development in the developing world. But if it can be seen in the lens of competing with China, then we might be able to get somewhere. I completely agree with Megan. I think it's a really important point. And just to be clear about what we were saying, I don't think we're being polyannish or saying policymakers should approach the international global economy the same way we did in the early 1990s or when China was welcomed into the WTO and everything has to work that way far from it. I think the point we were making was China is still going to be part of these supply chains. That's a reality. You want to reduce that. You want to de-risk it. And there's a bunch of stuff you can do there. But to your point, you asked about what does it mean for the priority of decarbonization and how quickly that has to happen. Of course, decarbonization is an urgent priority. And we have other policy priorities too, like human rights enforced labor, intellectual property, cybersecurity, and it is legitimate to think about all of these things while you're trying to navigate your policy with China. But I think what Megan said is very important. We definitely need cooperation where it is possible. It seems quite hard now, and we shouldn't assume that it is necessary to make progress. But if you think about the things that have been most consequential for the clean energy transition in the last 10, 20 years, we talked about how quickly the cost of solar has come down, of EVs, and batteries has come down. That was a lot because China then made an industrial strategy decision to dominate those industries and drive the cost down. They did that for reasons of competition. If you read Joe Manchin's statement of support for the Inflation Reduction Act, it was not about climate change. It was about US competitiveness and the health of our domestic economy and our energy security. And that competition to own some of these areas, to be stronger in some of these emerging clean energy technologies, was a powerful motivator for the most significant piece of climate legislation that we have passed. And when you think about the things we have to do in the developing world to make more capital available for how those countries will evolve, you look at the Belt and Road Initiative China has put forth. As Megan said, you can build, hopefully, build bipartisan cooperation, because this is not just about climate change. This is about America's place in the world, about China's place in the world. And those forces of competition, if we're smart, can be harnessed to drive a faster transition at the same time that we're trying to put in place a

bunch of tools to increase energy security, increase our resilience, reduce the risks of the fact that, as we talked about, China will still be a major player in a lot of these supply chains for a long time. We've been talking a lot about the West and China. But as you both have mentioned a few times now,

whether or not we hit our climate goals really comes down to what happens in the developing world. I've seen estimates that by 2030, the developing world, even excluding China, will account for the majority of annual carbon emissions. So tell me, how is the energy transition going in the developing world? And what are the major obstacles or hurdles that we still need to overcome there? The energy transition in the emerging and developing economies is not going nearly fast enough. And it's hard to overstate how important these parts of the world are. First, we should say, what matters for climate change is the total emissions that have accumulated over time, historic emissions, not just the annual flow of emissions. Half of that comes from the US and Europe, around two or 3% from Africa. So you're talking about parts of the world that historically have not contributed to the problem that we're confronting today. At the same time, when you look at where we're headed going forward, there's around two dozen countries or so between

now over the next 20 years, that if they develop in the same carbon intensive way that China did over the last 20 years, you're talking about the same growth in emissions and the possibility of reaching goals like one and a half or two degrees Celsius is almost impossible. And I'm not talking about the lowest income countries, sub-Saharan Africa, where there's a very important story that we have to focus on for energy access to be able to use clean cooking fuels, people who use almost no energy at all. We're talking about emerging market countries, India, Indonesia, Pakistan, Bangladesh, that are growing incredibly rapidly. And there's no just ethical or pragmatic way to have an energy transition if we don't help people around the world who enjoy just a fraction of the standard of living that we do. You have a better standard of living, and that requires more energy use. But we have to figure out how to do that in a way that is lower carbon than has been the case in the past. This year, we'll invest around \$250 billion globally in clean energy and the emerging and developing economies. If we were on track for our climate goals, that number should be seven times higher, \$2 trillion. So you're talking about huge amounts of capital. Most of that will be private, but public capital has a role to play to help de-risk and catalyze that private capital that has to be put to work, expanding the deployment

of clean energy. And there are a lot of different and larger risks to doing that. We've done a lot of work at the Center on Global Energy Policy at Columbia, for example, on currency exchange risk, which is one of the barriers to putting capital to work there. How might we overcome that with some innovative mechanisms? The cost of capital is about seven times higher in these parts of the world than it is if you're looking at the developed world. So there's a lot of action that we need to be taking and government leaders need to be taking to reduce some of those barriers so we can put capital to work in parts of the world that are going to need to use a lot more energy. They're using almost very little energy today. So I think it's worth us trying to reflect a little bit of the anger that exists in the developing world and in emerging markets around this whole issue of the energy transition, because many leaders in speaking with us have emphasized, you know, you can't transition when you don't actually have energy. So before we are asked to transition to a different kind of energy, we need to have more energy. Obviously, the objective is

that they would have more energy, but it would be of a clean energy nature. But for the developing world or for much of the developing world in the emerging markets, it is a question of energy access, which seems to trump the issue of climate. And so this goes back to our initial point about how energy security and climate action need to go hand in hand, because you can't just talk to the developing world about climate and decreasing carbon emissions without talking about increasing energy access. And just to put a few numbers on what Jason was talking about. So if you're in Sub-Saharan Africa, you're probably, you know, you may be well aware that only 2% of the emissions in the world today come from Sub-Saharan Africa compared to a quarter from the United States, more than a quarter from Europe. And so there is a real feeling of injustice that part of the world that is not responsible for virtually any of the carbon emissions in the system today is bearing the brunt of climate change on the ground. So there's a frustration there. I've heard a lot of frustration over what is perceived as hypocrisy, that when energy security issues are dominant in the developed world, there is a rush to try to build more energy infrastructure that may rely on fossil fuels, whereas there's a continued message to the rest of the world don't build that kind of infrastructure. So I think when we get at this whole question, the developing world, there are some of the realities that Jason underscored really well, but there's a real anger which is being amplified not just by the energy transition, but by the multiple geopolitical crises that are affecting the developing world, whether it's the food crisis or the energy crisis or global inflation, or the many things that are coming out of the Russian invasion of Ukraine that are having a big impact much further afield than Europe.

I really appreciate the way you have all brought in how this all looks from the perspective of these developing countries, because as you pointed out, I think one of the core injustices of this transition is that the countries who have contributed the least to global emissions are often the ones bearing the greatest brunt of the damage of climate change.

And then we in the rich world who are responsible for creating the problem in the first place have the audacity to turn around and tell these countries that they aren't allowed to grow their economies the way we did, that we aren't going to fund their natural gas projects, that they need to go green, even as we are importing more coal and building more LNG infrastructure and trying to drill for more oil in the wake of the Russia's invasion. But at the same time, it is generally agreed that we have to find some way for these countries to continue to grow while also transitioning to clean energy. And it doesn't seem to me that that's impossible. Kingsmill Bond at the Rocky Mound Institute has estimated that in 90% of the world renewables are already the cheapest source of new electricity and they're only getting cheaper. I know that's probably a little bit of a bit of an optimistic estimate, but it's in the ballpark, I think. You know, a lot of these countries, sunlight is far more abundant than in other places. There are all kinds of health benefits.

And so I guess what I'm wondering is, is there a necessary trade-off here between these countries growing in the ways that they want to, in lifting people out of poverty on the one hand, and on the other hand, having a green energy transition? Or are there things that we can do either with financing or otherwise to make it so that both of these can happen at the same time? I would say it's not at all pie in the sky to think that these two things can be compatible.

I mean, not only is it that ambition, but it's almost the imperative because energy access and done so in a climate-friendly way is really the holy grail here. And again, this is possible, but there are some gaps that are really preventing it from happening at the speed and the scale and which it needs to happen both to meet the needs of people in the developing world and to address

climate. And some of that has to do with the risks surrounding investments. And we've mentioned finance a lot, but the finance piece is huge. And there are just risks associated with investing in clean energy projects in the developing world that don't exist in the developed world.

As Jason mentioned, we need to increase by sevenfold and more in our years of the finance that is flowing to the developing world. And this is going to have to be done through creative partnerships where, again, as Jason said, mostly private capital, but likely there needs to be some de-risking of that capital with public money or philanthropic money. So it is basically closing that gap that makes it sensible for more investment to flow there. One point that I think is important when we think about this holy grail vision of growth and growth in clean energy circumstances is just the reality right now. Because renewables are intermittent, it is hard to build industry off of sources of energy that are intermittent. So when you talk about the sun shining and the wind blowing in all parts of the world, that's true. But we have to have either duplicity of energy sources. So there is more dependency or obviously much more storage capability. Because if you're going to develop an industry that can likely be the backbone of development for a country, it's not just being able to charge your cell phone when the sun is shining. It's something much more fundamental than just providing certain access to electricity to parts of the world that haven't had it yet. Totally agree with Megan. It is a false choice to say that we have to care about poor people around the world or care about climate change. And that's not what we're arguing, I hear that sometimes. If you care about the world's poorest, we just have to ignore climate and continue to use fossil fuels going forward as we have in the past. That is not the right solution. It is fair to say the pace of transition in a multi-decade transition may look different in different parts of the world. I mean, the US is still getting 20% of its electricity from coal. So you might think about the different issues of equity in different places and how they develop. But it is also important to be honest about the scale of the challenge and where we are today. So numbers like in 90% of the world, the cheapest source of energy is renewables. I think there are some optimistic assumptions. And when you look at what's actually happening in the world today, India is a good example. Give one more statistic that I think is illustrative. India has a goal to install 500 gigawatts of installed renewable energy by 2030. These are huge increases. Last year was a record year for wind and solar capacity additions in India. If you want to get to that goal, you need to take last year's record number and triple it and do that every single year between now and 2030. It would mean building the equivalent of India's largest solar park every four weeks from now until 2030. And if they do that, coal use in India in 2030 is the same as it is today. Because that is what it means to take the most populous country in the world and grow their economy and grow their population. So the challenges of meeting economic growth in these parts of the world and doing it purely with zero carbon energy are really hard. The numbers are really big. And that's why we need to be honest about it and not just say renewables are cheaper. So just go do it. We need to work a lot harder. We need a lot more international finance. We need the World Bank to be working harder. We need governments in a lot of parts in the world, including the US administration to be working harder. And we need private financial institutions to be working harder to overcome the barriers to investment in those parts of the world that Megan talked about. Can I just say one thing? Just based on what Jason said,

that really fantastic and sobering example of India underscores the point that this transition is not just about solar and wind and renewables. That the world is not going to get to the place it's trying to go simply with renewables. That there are requirements for many other sources of energy, some of which are more contentious, like nuclear energy. And there's going to need to be a role for carbon capture, for new energy sources like hydrogen, that essentially in order to close the gap that Jason described, it can't be all done with renewable energy. And that's part of the realization I think that people are coming around to. And that does mean that there are a lot of energy sources that we've hardly touched on today that are going to be so important. And if you think about the question of technologies, the IEA says that we have the technologies we need to get to our goals in this decade. But we still need to develop new technologies in their commercialization for the out decades of the energy transition. So a lot of that is still to come. It seems like what you are both circling in a lot of ways is that the key bottleneck to threading this needle between growth and greening in developing countries really comes down to financing. And part of my question is why this is so hard. Jason, I was listening to a podcast you did earlier this year with Larry Fink, who's the head of BlackRock, who's, if anyone's going to know what it takes to get sort of the financing right and the investment right, it's him. And you asked him how we're going to get the capital we need for the developing world that we need for the transition. And he said he had no idea. And that was really disconcerting for me. So I guess my question is like, why is this question of financing so hard? And if there are any ideas that seem promising, because I think the current theory is like, well, the best thing we could do for the developing world is to invest a lot in bringing down the price of clean energy technologies like wind and solar, like Megan, you were saying like we're investing a lot in hydrogen, we're investing in carbon capture. That's what the IRA is meant to do. And so by bringing the cost of these down, that will trickle out to the rest of the world. But it seems like there's a lot more financing that's going to be needed and that there's some real difficulties in getting that financing. And so I'm just wondering what those difficulties are, whether there are any ideas that seem promising on those fronts. I remember asking Larry Fink that question. And you mentioned one of the answers that the Biden administration has given and would give. And I think it's a fair one. It's not sufficient, but it's fair, which is one of the things the Inflation Reduction Act will do in the same way that the efforts that China took over the last 10, 15 years, again, for reasons of industrial policy and economic competitiveness, to drive down the cost of solar, of batteries to make it cheaper for all of us to use, what the IRA will do with a suite of technologies. As Megan said, half of the cumulative emission reductions between now and 2050, according to the International Energy Agency, come from technologies not yet commercially available. We need hydrogen and low carbon fuels. We need carbon capture. We need a range of technologies. If you lower the cost of those through early investments like the IRA, you make it lower costs for the rest of the world to pick up. True, but not sufficient. We're not even making good yet on the promises rich countries made a decade ago to provide \$100 billion in climate finance to low-income countries. So let's make good on our commitments. We need more, and we need to think about a creative range of tools. In the U.S. government, for example, it's not nearly sufficient, but there's something called the Development Finance Corporation, and they put government capital to work to incentivize private investment for a range of reasons, including some of the national security reasons we talked about before. So you

can look at certain tools we have in the U.S. government. We need more of those tools, and we need to allocate more capital. There's a lot of big discussion going on about World Bank reform now and how the World Bank can put more capital to work to de-risk and lower the barriers to private capital, because we have to remember most of those trillions of dollars. There's just not enough government money. Most of that is going to have to be private capital. And if you're looking at

a renewable project in Europe, or you're looking at a wind project in, I don't know, Vietnam or another South Asian country or in Africa, there's just different, and there's more barriers, currency exchange risk being one of them. There's political risk. There's a range of risks that make you more concerned. And I think you want to de-risk those and lower some of the barriers so that the huge amounts of money we need from private capital. There's a lot of private capital out there, multi-billion dollar funds that are looking to invest in the energy transition. We need a lot more of that going into lower income countries around the world. Part of the answer to that question, I think, returns to the concepts we've been talking about, about harnessing the competitive relationship between the US and China to spur action that is going to advance the energy transition. And the developing world is certainly one area where I can imagine that happening. What does the world look like where China has been the country that has financed a lot of the energy systems in the developing world and emerging markets? What kind of world is that? And what are the geopolitical implications of that world? And are they such that American policymakers and legislators want to make sure that doesn't develop? So I think it's getting a different frame around providing financing or de-risking financing to the developing world. As Jason has said a couple of times on the show, this is not going to be done with public money, but it can be done with the help of public money. And so getting people to look at this more as a critical national security interest rather than something that's altruistic or something that makes sense purely on climate grounds, I think is going to be essential to getting the kind of action that will be necessary to try to expedite some of the flows of finance to the developing world. And as Jason said, on another note, there are a lot of initiatives that are trying to look at this. Some of the initiatives that have come out of the cops of the last couple of years, the World Bank under new leadership, really trying to ask questions about how do we have to change our lending model, our overall, quote unquote, business model, so that we're meeting these needs in the developing world. And we're taking riskier bets in order to advance these kinds of interests in the developing world and emerging markets. So I want to end by looking forward. We've talked about a lot of the complications, the tensions, the problems that could accompany this energy transition. But let's say it's 10 years from now. It's 2033. What's the best case scenario for where we could be at that point? And what would have to happen for us to get there? So when I think about the best case scenario for we might be in 10 years, I don't think about like a particular metric or temperature point or something like that doesn't come to mind. I actually have in mind a completely different approach than the one that we've been taking thus far that really builds on the reality that we've been discussing, that the world is in a geopolitical moment of fragmentation, of competition, of protectionism. And the energy transition is both a cause and a consequence of that or casualty of that environment. And so to me, what a great position for the world to be in 10 years time would be where I'll just take the US because we're American here, but where American policymakers

and other policymakers would think about approaching the energy transition not only as like a goal, like this is something we want to get to a net zero world, but also to acknowledge that the energy transition and global politics are deeply intertwined and that what we do on the energy transition influences geopolitics and vice versa, which is really where we started this podcast, so that we would not only have a strategy that would help us get the necessary climate action, but it would be one that would also have an impact on geopolitics and would sort of assuage some of the worst elements of the geopolitical fragmentation that we see. So to think about the energy transition, not just as an end, but also as a means to try to address some of these issues. And the best example that we've talked about so far today has been that of trade.

Maybe we actually get a pullback from this embrace of protectionism

because we've crafted a climate strategy that demands we have some level of greater integration on trade because it is required. So where you have this kind of like beneficial cycle between climate action and geopolitical forces rather than where I think we are now or we have more of a downward spiral of the energy transition reinforcing fragmentation, reinforcing a slow down in the energy transition. So thinking about how we could create an upward spiral rather than the downward spiral we seem to be in right now.

Yeah, I think when I look out a decade from now, I do think a little bit about some of those metrics for being on track for our climate goals. By that point, hydrocarbon use would have peaked and people

would anticipate a long term decline somewhere close to the goals we've been talking about.

We're so far away from being on track for that today that the question is what would have to change in order to sort of get on track. And I think we're going to need a lot as we've been talking about the techno economic and policy stuff we need finance and we need the technology cost to

come down. We need the sense of urgency about this transition to go up. And I think when you look at

history of environmental movements or other social movements, they don't move in a linear fashion. And when we think about the kind of impacts of climate we're seeing around the world today, the potential for broad scale social mobilization to have its own tipping points

where people are sort of demanding solutions much more quickly, that would be there a decade from now. And I think that can take two forms. And one form is one where there's a collective sense to work together to put in place the kind of policies we need and move toward a world of clean energy. It can take a very disruptive form with the kind of severe climate impacts that you might see in low income parts of the world that are least able to deal with this. And then that backlash from the developing countries because of what they're dealing with and the insufficient funding, they have to deal with it. That gets worse. The potential for energy price volatility and we know from experience that when fuel prices go up, whether it's yellow vest protests in Paris or uprisings that topple the government in Sri Lanka, there can be a political backlash to that.

So these risks of a disorderly transition that Megan and I have written a lot about, that would be a concern. Either the world is just status quo and we're not doing anything about climate change and that has its own risks. But if we start to accelerate the energy transition, which I hope we do, the risk a decade from now would be that starts to take quite a disruptive and disorderly form that increases, not decreases, conflict between countries, conflict over resources, increases tensions between rich and poor countries around the world.

And I think that's why we've been spending so much time in our work thinking about how to anticipate what those risks are. Again, not to move slower on the transition, but to take steps today to reduce those risks so we don't run into those kind of challenges.

Well, I think that is a perfect place to end. The last question we always ask on the Ezra Klein Show is for book recommendations. We usually ask for three, but because there are two of you, I will ask for two each. So, Jason and Megan, what are some books you'd recommend to the audience?

Well, I've been lucky that one of my mentors has been Dan Jurgens and anyone who's spent their career in energy. Most well known for being a former guest of the Ezra Klein Show course. He is. I listened to the episode. Dan Jurgens's tour de force, the prize is a really classic work about the central role energy, particularly oil, has played in global power and geopolitics for more than a century. Lord Curzon famously said after World War I that the allies floated to victory upon a wave of oil. Winston Churchill shifted the British Navy from coal in nearby Newcastle to petroleum from faraway places like Persia because it was a superior fuel in his view. But that created a host of new national security and geopolitical and diplomatic challenges.

And I think as we mark the 50th anniversary of the Arab oil embargo, this obsession with energy security has shaped so much of energy policy. You really get a sense of that from the prize and the work that Megan and I do together is to think about how the future of energy geopolitics might unfold. What would the prize of the next 50 years look like? Not that we could aspire to write such an extraordinary Pulitzer Prize winning book. The second that we've talked a lot about today is about this gap between ambition and reality, the ambition being the urgency of the climate crisis, the reality being that the world's using more and more hydrocarbons

every day and how quickly or how that might change. Earlier this year, I had COVID. I was in isolation

for a week and I got a huge 800 page history of the modern American environmental movement by the American historian Douglas Brinkley called Silent Spring Revolution. It's a really fantastic book. But what really comes across in those pages is not just the importance of environmental protection. It is useful to go back and remember how bad the damage was to the air and the water quality in the United States, all the damage we did in the decades after World War II or even before. But also what struck me in reading the book was how quickly all of that came to a head. We talked about, there was a lot of work on this. There was the famous book Silent Spring. And then it kind of all in the late 60s, 1970 and the first Earth Day came to a head where one in 10 Americans came out into the streets in the first Earth Day in 1970 and said, we just can't live like this anymore. This has to stop. Ernest Hemingway once wrote of a character in one of his books who was asked how he went bankrupt. And the character replied in two ways, gradually and then all of a sudden. And I think Brinkley's book really shows how history tells us climate action might proceed along a similar course as we see temperature indexes, combinations of temperature and humidity indexes that are the summer broaching the limits of human survival. Thank you. And Megan?

I think it says more about the energy reading landscape than it says about Jason and my partnership. But I, of course, had the prize as one of the two books that I would recommend for all the reasons that he suggested. And I think anyone who works in geopolitics and energy, that would be the first one that they would recommend. But let me mention another book or two. So one of the books I wanted to mention was Kevin Rudd's book called The Avoidable War,

[Transcript] The Ezra Klein Show / When Great Power Conflict and Climate Action Collide

The Dangers of a Catastrophic Conflict Between the US and Xi Jinping's China. And it came out last year in some ways. You know, it's not a book about energy per se, but it is a book about this relationship that has been part of our entire discussion, the relationship between the US and China and written by someone. So Kevin Rudd is now Australia's ambassador to the United

States, but he is a sinologist. He has lived in China, speaks fluent Mandarin. He's somebody who knows China and knows the US very well, but is neither Chinese nor American. And it is just a very deep and I think realistic portrayal of the relationship and of the impulses of the leaders and the systems there and an assessment about how this relationship could become one of conflict, but also a practical book in the sense of saying, here are some steps that can be taken to mitigate those risks. And I think it really does have a lot to do with the climate issue and with energy, generally speaking, because that this US-China relationship, both the competitive nature and the prospect of a better relationship, I think I'm really bowed directly to the issues that we've been talking about today. In the other book since I won't count the prize, I think that many of your listeners might enjoy reading Bill Gates' How to Avoid a Climate Disaster. Unlike Kevin Rudd's book, which is a lot about policy and geopolitics, Gates' book is a lot about technology, but it's also practical in the way it's sort of empowering in the sense of describing here the ways in which everybody can contribute to a successful energy transition. So I find that to be, you know, for somebody who's embarking on this, maybe not from a point of expertise, but from a point of kind of potential activism, I think it's a great book to read.

Well, Megan, Jason, thank you so much for being here. I can't wait for your book to come out, because I feel like I learned so much in this conversation, and we'll continue to learn from you. Thank you so much for coming on the show. Thank you, Roger. And we feel really honored that we are your last guest on the show. Thank you for the invitation. Really, really enjoyed the conversation.

Thanks so much for listening, everyone. As I mentioned in the intro, this is my last episode of the show, and it truly is bittersweet. This truly has been the experience of a lifetime, so I couldn't be more grateful to Ezra for giving me the opportunity to play such a key role on the show and for his mentorship over the years. End of the truly amazing team I get to work with every day. You know, I came for the book recs, but the people are really what have made this experience so special. And on that note, I also just wanted to thank you all, the audience, because the reason we on the show get to do what we do every day is because of what a gracious, curious, open-minded audience you all are. In terms of my next steps, I will be starting as a staff writer at the Atlantic, covering economic policy, and I hope I can continue to interact with a lot of youth of the work I do there. And so I guess I'm just excited to be getting back to being a listener again.

This episode of the Ezra Klein Show was produced by yours truly, fact-checking by Michelle Harris with Mary Marge Locker and Kate Sinclair. Our senior engineer is Jeff Geld. Our senior editor, for now at least, is me, Roger Karma. The show's production team also includes Emma Faugawu, Roland

Hugh, Kristen Lin, and Annie Galvin, who is on leave right now. Original music by Isaac Jones. Audience strategy by Christina Samlowski and Shannon Busta. The executive producer of New York Times opinion audio is Annie Rowe Strasser. All right, I think that's it.