



THE BROOKINGS INSTITUTION

Climate Sense podcast

“US climate policy progress”

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Episode Summary:

This episode of “Climate Sense” is about U.S. policy—the challenges of implementing climate legislation in the U.S. and recently enacted laws. Climate change and other environmental issues are caught up in our country’s increasingly polarized politics. Nonetheless, new climate legislation will bring real benefits to people—with emphasis on financing existing technologies, innovation for new solutions, and promoting U.S. industry.

[news clips: Sen. James Inhofe; Rep. John Curtis; Sen. Ron Johnson; Rep. Nancy Castor; President Joseph Biden; music]

GROSS: Eight of the warmest years ever happened in the last decade, and July 2021 was the warmest month in recorded history. As the effects of a changing climate become more obvious to more people, political pressure to deal with the problem grows. After U.S. President Joe Biden campaigned on a promise to take action against climate change, in August 2022 Congress finally passed the most important climate legislation in U.S. history, the Inflation Reduction Act, which includes about \$370 billion in clean energy and climate investments over the next decade.

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I'm Samantha Gross, director of the Energy Security and Climate Initiative at the Brookings Institution. I started my career in engineering and have been in Washington for 20 years now, working on energy and environmental policy—practical solutions to some of today's most important problems. "Climate Sense" is intended to help people understand climate change—both its causes and the solutions we're working toward. You can find all the episodes in the series at Brookings dot edu slash Climate Sense Podcast. And, if you have a question you'd like answered on this podcast, I'd love to hear from you. Send it to Podcasts at Brookings dot edu, and I'll try to answer it in the final episode of this series.

This episode of "Climate Sense" is about U.S. policy—the challenges of implementing climate policy in the US and where we are today. Climate change has unfortunately gotten wrapped up in the partisan divide and the culture wars here in the U.S. The climate legislation that was passed in August 2022 did not receive a single Republican vote, in the House or the Senate.

But it hasn't always been this way. Way back in 2003, the late Republican Senator John McCain co-sponsored a bill to limit U.S. greenhouse gas emissions. The bill didn't pass, but five other Republican senators voted for it, and 10 Democrats voted against. And remember that the EPA was founded in 1970 under President Richard Nixon. Not that long ago, climate change and other environmental issues were much less partisan. But our whole country has become much more polarized and partisan since then, and climate change policy is along for the ride.

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But throughout this series, I've emphasized that climate change affects everyone. Concern about the climate isn't just for people who are "woke" or who enjoy hugging trees. It's not about saving Mother Earth for its own sake; it's about making the world safe for all of us and maintaining the environment that we recognize as "normal."

We heard from Kumi Naidoo, a South African human rights activist and the former executive director of Greenpeace, in episode six about climate justice. He explains how climate change is important to everyone, perfectly.

NAIDOO: Because what's at stake here is not the planet, and that's the most important thing we have to be saying to people. That the planet does not need saving. To be fair, in many speeches, I

probably said at some point save the planet, save the environment, save the climate. But just to be real, if we think about it, if we continue on this suicidal trajectory that we are on, we continue to burn fossil fuels, and engage in other polluting activities, the end result is we warm up the planet to a point where we destroy our water resources, we destroy our soil, we warm up the place so much that even agriculture cannot be sustained.

And you know, it's not rocket science to say that the end result is we will be gone. The planet actually will still be here. And the good news for everybody who's concerned about saving the planet, once we become extinct as a species, the oceans will recover, the forests will grow back, and so on. So, we need to understand, the struggle to avert catastrophic climate change is nothing more and nothing less than protecting our children and their children's future.

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And we need to break the idea that this is an environmental issue because even me, growing up in apartheid South Africa, I mean, I grew up with the understanding as a young teenage activist that environmentalism was what rich people and white people did. Right? And so, it's critically important for us to wage the climate struggle in a very human-centric way, something that has been lacking for far too long.

GROSS: I like Kumi's introduction, because I feel like he's describing a way forward for U.S. politics. When talking about the climate, you want to meet people where they are and address the concerns that they have. Many people right now are worried about inflation and the economy, keeping a roof over their heads, and having enough food for their families. But we have to understand that those are exactly the people who could be most affected by climate change—this is their issue too.

Concerns about increasing energy costs for Americans or loss of jobs have been central to the failure of past climate legislation in the U.S. It's no accident that climate action passed in a bill called the Inflation Reduction Act. That name addresses what people care about: high energy costs, along with prescription drug costs, the other big topic of the bill.

The Inflation Reduction Act, or IRA, may be the largest piece of climate legislation the U.S. has ever seen. But two other recent bills also have significant climate benefits. The infrastructure package that passed in November of 2021 contained significant climate benefits, especially for renewing the electricity grid and building charging for electric vehicles. The CHIPS and Science Act, passed in August of 2022, focuses on research and development and on revitalizing U.S. high tech manufacturing and supply chains.

To learn about how new legislation in the U.S. is encouraging climate-related innovation, I got in touch with Lachlan Carey.

CAREY: I'm Lachlan Carey, I'm at RMI, formerly known as the Rocky Mountain Institute in the U.S. program there. And I'm helping lead an initiative at the intersection of regional economic development and the clean energy transition. And so, it's obviously a very exciting time for us thinking about all the different ways that CHIPS, the infrastructure bill, and IRA both

accelerate the clean energy transition, but do it in a way that we think really encourages development around the country and creates economic opportunity for people.

I think these three pieces of legislation that I collectively think of as being a kind of a coherent green industrial policy, they break up this challenge in into three sort of phases. So, I think of the CHIPS and Science Bill as being the brains of the operation. Right? So, it's dedicating billions towards research and development, demonstration projects, innovation ecosystems, technology transfer programs. So, really thinking about what are the technologies we need and how do we accelerate them from a kind of technology push perspective.

But then there's the infrastructure bill, which is kind of the backbone here, you know. It provides about \$100 billion in climate related investments into the physical infrastructure that these technologies are going to need to go from, you know, niche, little interesting green solutions to the type of large scale commercial operations that we're going to need to, as I say, like decarbonize at scale.

And then finally, the Inflation Reduction Act is is the heart of this strategy. It's pumping blood into the clean energy economy. And when I say pumping blood, I mean \$369 billion worth of it. Right? In tax credits, in loans, in loan guarantees. And, you know, that 369 billion could well be a lowball estimate. Because a lot of these tax credits are uncapped, these estimates could well be half of what the federal government ends up spending on climate and clean energy initiatives.

And so, if you pull all that together, we're looking at over half a trillion dollars' worth of climate spending, which is about 15 times on an annual basis what the federal government has typically spent on climate, and that's probably a lowball estimate. So, you know, I think this this is just going to be a dramatic shot in the arm of the clean energy transition generally and specifically when we think about innovation.

GROSS: Lachlan's description of the heart, brains, and spine of U.S. climate policy reminds me of the Wizard of Oz, but this is serious business. In the last year the U.S. has created a whole structure to accelerate the clean energy transition. And we're going to need these technologies to achieve net-zero greenhouse gas emissions by 2050, a concept we talked about in episode two with Dan Yergin.

CAREY: I think you're definitely right to say we need to innovate faster and at a grander scale than ever. I mean, 2050 is just really soon and we need to have completely transformed our economies and the technologies we use to power them.

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I think these these bills come at a really important time, and there's no guarantee that they're going to do enough, fast enough to really reach our decarbonization goals. But they certainly go a long way.

GROSS: We clearly need innovation to achieve our climate goals. But can the government create innovation? We don't always think of government as a font of innovation, but government programs can help new technology make the leap from the laboratory to the marketplace.

CAREY: So, to me, one of the most encouraging things about this legislation is how thoughtful and strategic it feels. So, you know, if you look at the technology innovation literature, they typically talk about innovation occurring along these five phases: from research and development, applied innovation, early stage adoption, system integration, and market maturity. And between each of those phases, they describe what are called these valleys of death.

So, it's one thing to come up with an idea in a research lab. Right? But the skills required to do that aren't necessarily the skills that it takes to, you know, engage in a financing round, to set up a startup and hire new people. And so, that valley of death between phase one and phase two is where a lot of ideas get stuck.

So, it's one thing to have an idea, to have a prototype, but you need to prove to investors that it works and that it works at commercial scale.

GROSS: The new legislation directs grant money through the Office of Clean Energy Demonstrations in the Department of Energy and the National Science Foundation to build promising research in things like hydrogen production and use, carbon capture, advanced nuclear, and industrial decarbonization.

It also provides for loan guarantees from the Department of Energy's Loan Program Office to help new technologies reach commercialization. These programs have taken some public heat in the past when companies failed—remember Solyndra? It became a political punching bag when it failed after receiving a loan guarantee from the Department of Energy. But other companies in that program went on to great success and the program as a whole during that time made money. These kinds of investments will always be risky. If they weren't, the entrepreneurs could just go to a bank.

CAREY: The whole point of these programs is to embrace risk, to embrace failure, to do the things that the private sector is otherwise unwilling to do. And the point is to have a portfolio approach where some fail. And if they didn't fail, it means that you're not taking on enough risk.

And if you look at the LPO as a portfolio, it has delivered positive returns to the U.S. taxpayer as a whole. You know, it helped finance the first five utility-scale solar projects in the country. It helped finance Tesla when it was, you know, on its knees—it's now the world's most valuable car company. So, who knows what it's going to do to next in that vein.

And I think it's a really difficult political challenge to embrace risk and to say it's okay, failure is what we expected, because everyone has this this view that, you know, oh, we shouldn't waste taxpayer dollars. And that's understandable, but it's important to get out ahead of it. And I think the Office of Clean Energy Demonstrations is going to have exactly the same challenge.

But hopefully, you know, my hope is that at the time of Solyndra, there was a handful of these type of projects happening. Right? So, when one fails, that makes waves and it looks like a pretty high share of the total clean energy investments.

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Whereas today I literally cannot keep track of all the new announcements. I started making a spreadsheet to try and have, you know, all the new battery manufacturing plants so that I could rattle them off when I have conversations like this and I couldn't keep up.

And so, when some fail, you know, that the LPO finances or a clean energy demonstration project doesn't work, that's just one in a slew of new projects that, you know, is a firehose people are trying to drink. And so, I think it's a very different environment politically for the Biden administration.

GROSS: This is good news indeed. Innovation and entrepreneurship are two things the U.S. is really good at. I'm excited to see legislation meant to nudge our innovative culture in a green direction.

The new climate legislation has a strong emphasis on innovation, but as we talked about in earlier episodes, there are many aspects of greenhouse gas emissions that we already know how to solve—decarbonizing the electricity system and electric light vehicles. Well, the new law is designed encourage the adoption of existing technologies as well as the development of new ones. To learn more about how the new law will affect renewable energy and the rest of the energy sector, I called my friend Xizhou, who I worked with for years at a previous job.

ZHOU: My name is Xizhou Zhou. I lead the Power Renewables Practice at S&P Global. And my main expertise is really tracking what policies and markets are doing to change the power-renewable landscape.

GROSS: The new law uses a lot of tax credits to encourage investment in low-carbon electricity. These tax credits have been around for years, but with some important problems.

ZHOU: It's the first multidecade legislation that tackles greenhouse gas emissions. In the past, it was always, we'll do it for one year, we'll do it for two years that created this boom-bust cycle, right, throughout the 2010s.

These are financial instruments that have actually helped the wind and solar grow in this country. There are two types of tax credits. One is called the investment tax credit, which is a tax credit that basically gives you a rebate as soon as you invest in a particular project. So, that's usually helpful for anything that's capital intensive.

The second type is called a production tax credit. And that tax credit is awarded to you on a per megawatt hour basis of any electricity you produce.

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Those are probably better for projects that have already lowered their front capital costs, but then have an ongoing variable cost that you want to address.

So, those are the two types of tax credits. And as I said, it's been renewed every year or every other year, and the industry just didn't have that kind of certainty. And this time they essentially extended this tax credit for a long time until the power sector could reduce its emissions by 75%.

The other part is really that now includes a much broader range of technologies into what incentives would encourage. In the past, it's mostly been wind and solar, and now they're recognizing that there are a lot more carbon neutral technologies or clean energy technologies, including some conventional ones, like nuclear, that should also receive the government support because they ultimately help us get to the lower carbon emissions future.

For everyday consumers, I think it's very important, too, is we will also get tax credit for anything that's related to residential energy efficiency: for heat pumps, for heat pump water heaters. So, all of these will also get tax credits. So, it's not just for your big utilities and big developers. For everyday consumers and residential households. There are incentives here for us directly, too.

So, that's a big win for the clean energy industry. It addresses a much broader portfolio of technology, kind of going back to the Obama days. You know, I think Obama used to say, "what's our energy strategy?" And then he used to say, "all of the above." This is sort of all of the above carbon neutral technologies.

GROSS: This is a great development. Instead of taking small bites at the apple by offering short term benefits, the new law is finally taking a long-term approach that allows businesses to make long-term investment decisions, knowing that policy support will be there. This is clearly a win in terms of moving our electricity system toward zero carbon sources. But how much of a difference will the new incentives make?

ZHOU: The immediate impact is going to be on the cost of electricity for wind and solar. The levelized cost of electricity, which is a simple but important metric to measure the cost of electricity production, that would lower wind and solar after 2025 by \$10 to \$15 per megawatt hour. That's our current estimate, which would essentially put them below what coal- and gas-fired power would be. And they're already very close to coal- and gas-fired power, but this really just makes it very, very certain that they will start to squeeze out coal and later natural gas in the power mix.

So, that's a big immediate impact. And that means we are probably going to see before 2030, you know, 30 gigawatts of new wind and solar capacity, which would be about 10% above our current outlook, which is a big win for the wind and solar industry. And that could also mean that existing nuclear units, you know, the ones that are old and ready to retire, they would get production tax credit of \$15 per megawatt hour, which would be roughly 50% of their current cost. So, they're basically getting a 50% reduction in the cost of nuclear power production, which is good for a lot of these existing nuclear plants too.

GROSS: So, the Inflation Reduction Act is likely to lower electricity prices, along with greenhouse gas emissions. Nice!

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Other calculations out there show that the act will help the U.S. achieve greenhouse gas emissions about 40% below the 2005 baseline by 2030. The new law doesn't generate all of this reduction—we've been on a downward emissions trajectory for years, but it's a big move to reduce emissions faster. And it's getting closer to the promise that President Biden made of a 50% reduction by 2030, a reduction necessary to stay on track for net-zero emissions by mid-century. This new climate law certainly isn't the last word on U.S. greenhouse gas reductions, but it's a strong move in the right direction.

ZHOU: The U.S. has been on a pretty good trajectory the past ten years because of the switch from coal to gas. We reduced a lot of our emissions, but we're hitting a point where we really have to start using zero-carbon resources to meet the next steps of the challenge—like what Biden said, by 2030, we want to reduce power sector emissions by 50%; and by 2035, we want to reach net-zero electricity. So, we really need all of the zero-carbon resources to come in to make sure that we can get to those targets.

GROSS: The new law doesn't just provide credits for installing zero-carbon electricity, it's also focused on growing mining and manufacturing in the U.S. for the minerals and equipment that will be needed for renewable electricity and electric vehicles. I've often heard the complaint that switching to renewables just gives more power to China, where the majority of critical minerals and solar panels are from today. But the world needs more capacity across the board for these products, and the new law is designed to help.

ZHOU: There's a big chunk of money going into domestic manufacturing and the industry is already building that out prior to passing of this bill. This will give them another boost. China has been today because of the global shortage, a lot of this has actually been shipped in most of their modules to rest of Asia, to Europe. There's plenty of market for that, all of that materials, all of that equipment.

So, the U.S. being able to address more of its own needs are actually good for the global market because what we don't want to see is becoming like natural gas today, where is all the high income countries can pay through the ceiling on how much gas they can get. And then the poorer countries actually don't have access to this natural gas because they're too expensive. So, we don't want to end up in the same situation where solar panels or wind turbines become too expensive and developing countries can't afford them. So, everybody building out new manufacturing base is actually good for the global climate agenda, too, for people to build out this clean energy everywhere.

Even today, we already have some supply chain challenges with wind turbines and solar panels. And can we actually scale up the supply chain and the engineering construction side of things to meet this new surge in demand? And that's a big question. In fact, this year, you know, this past

year was the first year ever that solar and wind capital costs have gone up because of supply chain constraints, even though technology continues to improve.

So, we have to watch a little bit over the next five years what happens to the renewable and the clean energy supply chain. Do we have the polysilicon? Do we have all of the lithium for the battery storage and to make sure that this can be met?

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And this bill contains some of that for U.S. domestic manufacturing. But again, that's not something that you can scale up in a short amount of time.

GROSS: A final big question that will determine the success of the new law is our ability to get all of that new zero-carbon electricity connected to the power grid. This sounds like it should be easy, right? But it often isn't. Building transmission isn't nearly as sexy as building wind and solar projects, but it's super important to get renewable power out to customers. Transmission projects often cross jurisdictions and generate opposition, making them particularly difficult to permit and build.

ZHOU: We discussed some manufacturing domestically in the U.S., but what happens in the next five years? In the U.S., it's really about the transmission interconnection process. There are so many projects stuck in the interconnection queues in all of the regional grids. That's not something that you can address just by throwing money at it. So, there needs to be a lot more regulatory reforms both at the federal and state levels. Otherwise, it just makes the bottleneck even worse in the coming years.

It's really a function of DOE and the FERC and all of the state regulators. And it's just this patchwork of permitting, of cost allocation that has to be resolved. And it's a process that's accelerating now. We're seeing a lot more coordination. I sat through an eight-hour FERC meeting, was it a month ago? And halfway through I had a dental appointment. I went to a dentist and I can't tell which one was more painful. But this is the kind of stuff that gets really into the nitty gritty of what regulatory reforms on transmission is. It's super technical. A lot of people would listen for like an hour, they fall asleep on it. But it's very important.

GROSS: The issue of permitting is a very important one that is still unresolved. Remember, we need a zero-emissions electricity system that is larger than the one we have today to power all those new uses of electricity, like vehicles. This will require building things, especially transmission lines to move that electricity from where it is generated to where it is used. Government and communities need to work together in the planning and implementation of the projects we'll need to move forward. Lachlan makes good points here.

CAREY: There's the outcome side, but process is super important here as well. Right? We need to include people in the process. We need to reach out proactively and sort of whether it's handhold and really actively listen to what communities want and what they're afraid

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of in that process, while somehow managing for that process not to drag out for a decade. And that's a really difficult issue. And there are some very smart people doing some great thinking on what that looks like. But I really think that it's just going to get easier as people start to see and witness and feel these benefits.

GROSS: This brings us full circle. The energy transition doesn't need to be scary and it brings real benefits to people—all of us. Despite the challenges of polarized U.S. politics, I hope the advantages of all the new programs to advance the energy transition become more obvious to people over time. Maybe I can even hope for less polarized politics around climate in the U.S. A girl can hope ... right?

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Many thanks to the experts I talked to in this episode. Fred Dews is the producer; Gastón Reboredo the audio engineer; and Matt Murphy the audio intern. My thanks also to Louison Sall and the communications teams in Brookings Foreign Policy and the Office of Communications. Show art was designed by Shavanthi Mendis.

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I'm Samantha Gross, and this is “Climate Sense.”