DOLLAR & SENSE: THE BROOKINGS TRADE PODCAST

"Fixing the climate crisis will require local experimentation and solutions"

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Episode Summary:

David Victor, a professor of innovation and public policy at the School of Global Policy and Strategy at UC San Diego and nonresident senior fellow at Brookings, joins David Dollar to discuss "Fixing the Climate: Strategies for an Uncertain World," a new book he coauthored with Charles Sabel. Victor explains why global climate diplomacy and treaties that prescribe top-down solutions to climate change are not working. He argues solving the climate crisis will require local experimentation and cooperation between governments and the private sector to push the technological frontier and identify innovative solutions.

DOLLAR: Hi, I'm David Dollar, host of the Brookings Trade podcast, Dollar and Sense. Today, my guest is David Victor, a professor at the School of Global Policy and Strategy at UC-San Diego and also a nonresident senior fellow in Brookings Energy Security and Climate Initiative. He's got a new book on fixing the climate out from Princeton University Press and that's what we're going to talk about. So welcome to the show, David.

VICTOR: David, it's always great to be with you.

DOLLAR: So let's start with the big picture. How is the world doing with fixing the climate, specifically with carbon reduction and addressing climate change?

VICTOR: Well, I think it depends a lot on how you measure progress. If you measure progress against these aspirational goals that were set up a few years ago to stop warming at 2 degrees—or now a lot of people are talking about 1.5 degrees above pre-industrial levels—we are not doing very well. We're going to blow through 1.5 degrees. We're going to probably blow through 2 degrees. I think for a long time we just waited too long to work seriously on the problem.

If you measure this against what would have happened otherwise absent climate policy efforts and all the kind of political momentum and now real capital, new technologies, moving into things, you measure that way, things look actually quite a lot better. 10-15 years ago, the world was on track for maybe 4 or 5 degrees of warming over the coming century, which is just so much climate change that we didn't even really know how to estimate the damages from that. Now we're probably on track for 2.5, 2.8 degrees. So it's still a whole lot of climate change; we are in for a whole lot of climate change. But it's a whole lot better than four or five. I think that's the overall picture right now. We're making progress by bending down the curve, but if you measure it against, frankly, goals that were never really achievable, then it looks like we're doing worse than we actually are.

DOLLAR: I just want to clarify those are centigrade numbers David's talking about. So these are pretty significant increases in temperature. Now, David, as I see it a main argument in the book is that top-down solutions are not really the key to solving this. We need more bottom-up experimentation involving governments and business. So can you explain what experimentation is about?

VICTOR: Sure, absolutely. And I think the premise the question is exactly right, which is if you imagine governments coming together and trying to figure out some centralized set of targets and timetables—we are going to do the following things over the next ten or 20 years—that kind of approach is bound to fail because you just don't know enough now about what's politically feasible and what's technologically feasible in the future. In fact, we ran that experiment with the Kyoto Protocol, this treaty set up in the late 1990s. It had almost no impact on behavior. It had centralized targets and timetables—top-down. So that really was a complete failure.

One of the reasons we're not doing better on climate is we spent 10 or 15 years messing around with ideas like the Kyoto Protocol and not spending enough time on what Chuck Sabel and I call in this new book, "Fixing the Climate," what we call "experimentalism." The idea is that you just don't know what's technologically feasible. You also don't know how different technologies are going to work in practice, so you have to run experiments.

So what you have are these governments—not all governments, but many governments, a growing number of governments—growing a huge number of firms that are highly motivated to do something about the problem but don't really know what to do. The way society solves problems like that is these firms and governments, often in collaboration because it's too risky to act alone, they go off and test lots of ideas in a decentralized way and then they peer review each other to figure out what works and what doesn't work. So it's really not bottom-up-ism as much as

decentralized experimentalism and then a centralized review to figure out what works. How do you adjust the central targets and so on.

One of the things we do in the book is not only apply that logic to climate change, but actually most of the book is laying out this idea and explaining how it works and then also going back in history and looking at a series of iconic success stories and showing that, in fact, that's how we solved a large number of the world's most pressing environmental problems.

DOLLAR: it sounds great in theory, and it would be nice to have some historical examples. In the book you cite the Montreal Protocol on the ozone layer. So how did local experimentation help with our implementation of that?

VICTOR: Well, the Montreal Protocol is one of these great episodes in history where the standard view of what happened from today's perspective, where we often rewrite history and make history seem much, much more linear than it really is. The perspective from today is that, gee whiz, governments got together. They were worried about the ozone layer. They set strict targets and timetables. Firms that previously had been dithering just got into action and they went out and saw the problem, and boom, we had success.

One of things we do in the book is we go back and look carefully at the history. What's really interesting about the history is, yes, governments got together in 1987 in Montreal and set strict targets and timetables, but those targets were encourageable against evidence of what actually worked. Most of the firms didn't really know what was going to work. So we go through in the book and look at the different chemicals and the kinds of experiments and tests the different firms did to try and figure out what worked. By luck, to some degree, it proved to be easier to address the ozone layer problem. So then the targets got ratcheted up. But sometimes some of the uses of these chemicals were actually harder to get rid of and the targets got loosened. It's this ratcheting tighter and looser and connecting the central goals, the central legal goals, with practical experience that really explains a lot of the success of the Montreal Protocol.

DOLLAR: So in the climate arena, you also cite the rapid expansion of electric vehicles as an example. How can you explain that as a result of this bottom-up experimentation?

VICTOR: So electric vehicles are one of many technologies that we know are probably going to be crucial to making big reductions in emissions. And so far, the world is doing shallow decarbonization. 10, 15, 20 percent reductions in emissions. To stop climate change, you need deep decarbonization. You need 80 percent, 100 percent reductions in emissions, which means that in a sector like the transportation sector you have to completely rethink the way the automobile operates. Either you have to put a new liquid fuel in that doesn't cause any emissions, and that might prove to be a viable option, or you switch the drive train completely to electric vehicles. And it now looks like electric vehicles are going to be the leading solution.

What's interesting is the frontier of the electric vehicle industry is one that was charted by some companies that didn't exist previously and saw an opportunity—think Tesla—and also by companies that knew they needed to do something about the problem, didn't really know what to do, and so they went off and tested some ideas. Think General Motors with the EV1 and now a series of other electric vehicles. And I think what's really interesting is nobody really knew when these technologies would roll out. The original idea was in the 1990s they would roll out. The batteries were not ready for that. So the targets got adjusted, timetables pushed out in the future, batteries improved, and now we're in a situation where we're rolling out electric vehicles very, very rapidly.

Then as you solve each problem some new problem emerges. So the next frontier of thinking about electric vehicles is going to be around the charging network and in particular around human

behavior. If people switch to electric vehicles and then they just plug them in any time of the day, then that might not actually do very much—do a little bit, but not very much—to control emissions. So you need to find a way to get people to charge their vehicles at the same time that the electric grid has a lot of extra electrons available, potentially available, that are zero-emission electrons.

In California where I live, that means, for example, getting people to move their charging from the nighttime, which is when a lot of charging happens right now, to the middle of the day because the California grid is so dominated by solar electricity. That's another one of these experimental tasks. You have to run experiments—and a lot of companies are doing this right now—and that's the way we are going to solve this problem. It's not kind of some global committee that's going to set a central set of goals, but in every sector with teams of firms and committed governments going off and running these kinds of experiments we're doing right now with electric vehicles.

DOLLAR: Listening to you, David, I'm reminded that in the early history of the gas-powered car back around 1900 there were a lot of different companies and there was no standardization. They couldn't agree on where the steering wheel goes, where the brake goes, all kinds of practical issues. Engine in front, engine in back. Then through experimentation certain positions won out and then we get more standardization. So, listening to you, it seems like we are going through something similar with electric vehicles.

VICTOR: I think that's true. And indeed, rewind the tape of history 120 years ago and it was not obvious just about then the internal combustion engine was winning out. But there were three rival technologies. There were steam-powered cars which were actually faster. Middle-aged mainly white guys with lots of extra money were buying steam-powered cars because they were really fast. They happened to blow up and kill everybody on board, so that was not good. Electric vehicles looked attractive and the internal combustion engine looked attractive. So you had these different drive trains, all kinds of different designs.

And, David, I think you put your finger on one of the big challenges when you are in these early niche markets of a new technology, which is often people talk about the need for standardization. But standardization prematurely can lock in solutions that turn out to not be very good. A great example of that has been the American rules around ethanol, which doesn't really do much for the environment but does a lot for farmers in Iowa and voters in Iowa. So early on people thought that would be a good approach to reducing emissions from vehicles and so they locked in a set of standards and rules, and that, frankly, probably slowed down the entrance of alternative technologies and approaches.

DOLLAR: So if good things like the experimentation around electric vehicles are occurring, why aren't they happening enough?

VICTOR: Well, I think what we are seeing now is experimentation in all ten of the major industrial sectors that cause almost all emissions. So electric vehicles, heavy freight, shipping, aviation to some degree, electric power, on and on and on. Most of the progress has been made in electric power in part because the technology is just further along there so the opportunity is greater. I think the central reason is that we haven't had strong enough incentives.

The argument that Chuck and I make in the book is that what really motivates these efforts to push the technological frontier, to disrupt one's own industry and for new entrants to come into that, what really motivates those firms is almost an existential fear that if you don't disrupt yourself then you could go out of business. The place we see this right now most conspicuously is the oil and gas industry. All the European oil and gas companies are out investing in all kinds of new technologies in a pretty major way because they know they can't keep their license to operate unless they push that technological frontier. Whereas the American firms, frankly, have been somewhat slower,

although that's now changing pretty quickly. So I think the central problem here is a lack of really strong incentives more widely around the world.

Part of it, too, is I think frankly all of us in the analyst group have gotten in the way a little bit here because we've imagined that all you need, or most of what you need as an incentive to encourage action, is a price signal. A cap-and-trade system or a carbon tax or something like that. And that's been beautiful in theory, but then in practice what's happened is those price signals have been relatively low, because that's all it's politically feasible, and so you have all of these measures that are kind of pretend measures. They look like you're doing something about the climate problem but don't really send a strong signal to firms that they have got to move the technological frontier.

DOLLAR: So let's talk about the climate bill that's just been passed and signed in the United States. It's the bill that's opportunistically name the Inflation Reduction Act, and we can also call it the reconciliation bill, but it's primarily a climate bill. So is this going to make a difference? Is this going to support the kind of local experimentation that we need?

VICTOR: I think it's going to do some of that, and I think the bill overall is a big accomplishment. It also reflects American politics. You know, it's a razor thin voting margin on the Senate, of course, and almost as thin on the House side. A completely partisan bill. It's a reminder that if we really want to make sustained long-term progress in the country, we've got to find legislation and other kinds of policy instruments that occupy the center. The bipartisan infrastructure bill is a good example of that, which also has some provisions. Not as many provisions as the new Inflation Reduction Act. So I think overall it's a good measure.

My guess is that mostly what it's going to do is it's going to deploy technologies we already know about. When you look at the numbers, that seems to be the case. A whole lot of money is going to extend renewable power out to ten years—the tax credit system that promotes renewable power. There's going to be a bigger system of credits or incentives, tax incentives, for companies that invest in carbon capture and storage technology and electric vehicle charging. So these are all technologies that we more or less know about and they just haven't had a strong enough incentive.

I'm more skeptical that the Inflation Reduction Act is going to do very much to really push the technological frontier. For that, we probably need something that's closer to the CHIPS Act, for example, which is a different industry, computer chips, but included incentives to onshore and also big incentives to invest in innovation. I think that part of American climate policy continues to get short shrift, which is we really need to invest more in the technology pushing and frontier expanding kinds of ideas. And the Inflation Reduction Act will do a little bit on that front but not a huge amount.

DOLLAR: So even if there is a lot of progress in the U.S., there's still the free rider problem. Is this approach of relying on local experimentation, is that really going to make a difference in places like China and India? As I read it, China now accounts for, I think, 27 percent of global emissions. Their emissions are actually increasing it looks like this decade. So I worry about this free rider problem. And, you know, there are some potential solutions like a border tax, what's called a border adjustment tax. So if the U.S. and other advanced economies are making a lot of progress on carbon reduction, but China is not and some of the developing countries are also not, then you might very well have some kind of tariff scheme to create incentives there and to try to level the playing field. What's your view on all of that?

VICTOR: I mean, I think fundamentally the climate doesn't care where the emissions come from. Anywhere on the planet the emissions cause warming of the whole planet, so there's ultimately a giant collective action problem. The argument that Chuck and I are making is that the world's going to solve the collective action problem not initially with global centralized targets and timetables and some grand U.N. committee, but it is going to solve it by changing the facts on the ground in key

industries. And by changing the facts on the ground—making electric vehicles less expensive, integrating them better on the grid, and so on— it makes it easier for lots of other jurisdictions to then do something similar. It doesn't make the politics trivial, but in effect the technological change and the experience then makes political changes. And it's those two together, technology and politics, that are really going to going to make deep decarbonization possible.

When I look at China and India, what I'm impressed by is that they're all doing it. To some degree, experimentation is a little bit like authors discovering they have been speaking prose their entire lifetime. This is how society solves these kinds of problems. You know better than I that in the Chinese case what you've seen is a huge amount of experimentation, both in terms of overall economic models but also in clean energy. More investment is happening in clean energy on an annual basis in China than any other country in the world by far. Similar in India; the numbers are not as big. India most notably has a huge amount of experimentation going on with electric vehicles and scooters and also with renewable energy. So that's what they're doing on the ground. What's auspicious to me is that the Paris Agreement and the way that we're doing international diplomacy these days is less about the centralized goals and more about, in effect, treating the Paris Agreement as like a big umbrella under which every country can go off and figure out what it's doing and what works and what doesn't work and come back and check progress. And there I think we are actually seeing quite a lot of good news.

Just one caveat, of course. The larger geopolitical context I think is going to be a big, big cloud over all this. In particular, I'm really worried about the U.S.-Chinese relationship. A lot of the most important clean energy technologies in the world are becoming better because they're global technologies, whether it's electric vehicles or earlier solar panels or now batteries. They benefit from globalization, and in a world where there's kind of a lot of fragmentation and deglobalization, friction, chaos and uncertainty, that's a world that's not good for a global technological frontier.

DOLLAR: I think you're right about that. And despite the trade tensions between China and the U.S., actual trade between the two is held up pretty well. There's some very specific product categories like semiconductors and telecommunication equipment where trade is down in both directions. But leaving aside these very specific categories, overall trade is actually booming. It's going to hit a new historical high this year in both directions. And that's interesting. If we lose that then you really are going to have much weaker market incentives to invent things and exploit them.

VICTOR: Yeah. I think that's exactly right, and I'm concerned. I think right now both sides have done an okay job of allowing their governments to have these geopolitical conflicts and then letting business continue to do business with the caveat that obviously the pandemic and the supply chain recovery and so on evoked a lot of chaos. I am concerned about the longer-term direction, because the longer-term direction—on-shoring, friend-shoring, various kind of flavors of shoring—all of that stuff and creating local content requirements, that's going to introduce friction into these markets and into the supply chains. And people are going to pretend that it's going to make the supply chain more secure. My guess is it's going to have the opposite effect. And they are going to pretend that this is good for the green energy revolution. It's probably going to have the opposite effect.

What you mentioned in passing a little bit ago, border measures, I don't see how we're going to get really serious about deep decarbonization without some kind of a border measure that levels the playing field at least to some degree. And the Europeans are experimenting—pretty far along right now on experimenting with that kind of an approach. My guess is the U.S. will follow along. Of course the danger in all of this is you get started with border measures for one reason, a good reason, legitimate reason, internalizing externalities of carbon pollution. Then the politics come out of the woodwork and then you end up with border measures that are being used for protectionist purposes. That's a big worry.

DOLLAR: So, David, I like to end on a positive note, if possible. So last question is what would a best-case scenario look like for carbon emissions and for fixing the climate?

VICTOR: I think we're starting to see many elements of a best case. I mean, maybe not the best of all possible worlds, but we're starting to see many elements of a best-case scenario. What you see is in each of the major emitting sectors you will see new firms emerging and existing firms experimenting with new ideas that really redefine the methods of production. We're seeing that in steel right now. Sweeden is one of the most interesting cases. Zero carbon steel has been delivered. Volvo has just sold the first truck, steel truck, made with zero carbon steel. We're seeing electric vehicles as we discussed. We see a lot of it in the power industry, mainly because of renewables, and then increasingly some role for carbon capture and storage. We are going to see it now in long distance shipping. Maersk and others are experimenting with methanol, ammonia, and to some degree hydrogen as technologies.

The European response to the Russian invasion of Ukraine has been very interesting because they are enormously dependent upon imported Russian natural gas, so the next few years are going to be pretty rough and that's very much in the news. But to me, what's interesting is the Europeans doubled down on their climate change goals. So they are now investing in technologies including hydrogen that will allow them more rapidly to move off conventional natural gas.

So you put all those pieces together and that's the business of experimentation. That's changing these facts on the ground initially in the niche markets where governments and firms are most highly motivated and then over time spreading out. There's a big Chinese role for this. Not as much driven by climate but driven by other factors, industrial policy, and so on. Electric vehicles, electric busses, are heavily Chinese stories. So I think that's actually pretty encouraging. And we need to make sure that these aspirational goals like stopping warming at 1.5 degrees centigrade above pre-industrial levels, which were never achievable, we need to make sure those then don't end up being the yardsticks because that's, I think, the wrong way to think about progress.

DOLLAR: David, your ideas really do fit the Chinese case quite well as I think about it more. As you say, there's tremendous innovation going on. More installed capacity of solar and wind than anyone else and plans to double it. What's happening with vehicles, et cetera. But meanwhile, they do have one of these carbon trading systems that's mostly for the power sector. That's the more kind of top-down approach that there's essentially certificates or whatever you want to call them that allow you to emit. And in that market, in the power sector, the price is about $6-8 a ton I believe. From what I read we need more like $100 per ton. So it's really not very binding, it's not very effective. Maybe it gets tightened over time, but what's happening dynamically on the ground is a lot more interesting than their carbon trading scheme.

VICTOR: Yeah. And I think their carbon trading scheme is like many carbon trading schemes, in fact almost all the carbon trading schemes in the world outside the European scheme, which is what Danny Cullenward and I called in a book we published a couple of years ago, a “Potemkin market.” It looks like a market that's doing something to control emissions. When you look behind the facade, nothing’s going on. So what's happening in the Chinese system, like frankly in the California trading system, is they are trading these rights to pollute, these certificates. But what's really doing the work, what's really affecting emissions, are all these other regulatory measures and industrial policy measures like renewable energy mandates, grid interconnection rules, and so on. So those are doing the real work. And what's happening is the trading system is trading the residual, what's left over. So the prices that come out of the trading system are going to be low prices, but they don't really reflect the level of effort.

I think this is one of the really important insights that comes from connecting the ideas of political economy with the ideas of administrative law and administrative procedure. We really have to focus on which of these instruments, which policy instruments, are doing most of the work. For a growing

number of governments, it's industrial policy. Even in the United States industrial policy is back. You know, long a bad word, but think of a lot of what's happened in the Inflation Reduction Act as, in effect, a kind of industrial policy around climate and to some degree around health care.

DOLLAR: Absolutely. Then especially when you add in what's in the CHIPS Act.

I'm David Dollar, and I've been talking to David Victor about the crucial issue of fixing the climate. He's got a new book from Princeton University Press with lots of interesting ideas and examples about how local experimentation between governments and businesses are generating essentially new technologies that are going to make a huge difference in terms of carbon reduction. So thank you very much for joining us, David.

VICTOR: David, thank you so much for inviting me. It's really great to be on your program.
DOLLAR: Thank you all for listening. We release new episodes of Dollar and Sense every other week. So, if you haven't already, follow us wherever you get your podcasts and stay tuned. It's made possible by support from producer Fred Dews, audio engineer Colin Cruickshank, and other Brookings colleagues. If you have questions about the show or episode suggestions, you can email us at podcasts at Brookings dot edu. Dollar and Sense is part of the Brookings Podcast Network. Find more Brookings podcasts on our website, Brookings dot edu slash Podcasts.

Until next time, I'm David Dollar and this has been Dollar and Sense.