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P R O C E E D I N G S

MS. AARONSON: Good morning. I'm Stephanie Aaronson, vice president and director of the Economic Studies Program at Brookings. It's my pleasure to welcome you to this event entitled "Building Climate Cooperation: The Critical Role for International Carbon Price Floors."

We're gathering today to launch an important new IMF paper. This paper is the first of a series being produced by the IMF called Staff Climate Notes, which will be published at the IMF climate change page. And, since I have before me in the audience, that obviously cares about combatting climate change, I can't resist the opportunity to let you know that Brookings also has a new cross-program effort, the Brookings Initiative on Climate Research and Action. This initiative builds on Brookings's significant history of providing research and expertise to advance smart, actionable solutions to climate change at the local, national, and international level. We invite you to check out this new webpage to learn more.

Now, turning back to the matter before us, the IMF Staff Climate Note being launched today, proposes the idea of an agreement, struck by a few countries with large greenhouse gas emissions to adopt domestic policies that price carbon at an agreed-upon minimal level, also known as an international carbon price floor.

Here, to introduce to us this concept and the new paper is Kristalina Georgieva, the managing director of the International Monetary Fund. Before joining the IMF, Ms. Georgieva had a long and distinguished career in public service, including at the World Bank, where her first position was as an environmental economist and at the European Commission where she was vice president for Budget and Human Resources. She is originally from Bulgaria and is the great-granddaughter of a prominent Bulgarian revolutionary.

As to the order of the proceedings today, I will first turn the platform over to Ms. Georgieva, who will discuss the paper. Then we have a short video and a more detailed presentation by Ian Parry of the Fiscal Affairs Department at the IMF. Finally, Adele Morris, one of Brookings experts on the economics of climate change will moderate a discussion panel -- a panel discussion. Towards the end of our hour, the panel will address questions from viewers. So, if you have a question for our panelists, you can submit it via email to event@brookings.edu or via Twitter using #CarbonPrice. And now I'm pleased to welcome Ms. Georgieva.

MS. GEORGIEVA: Thank you very much, Stephanie. Fantastic to join you today. Of the qualifications I bring, perhaps the most significant is that I did my Ph.D. in environmental policy, and the subject matter was how to deal with sulfur, how to deal with bubbles and trade sulfur emissions within this bubble, clearly something that relates to our objective to deal with climate change using market mechanisms.

I want to start with the words of Sir David Attenborough. Talking about climate change, he said, "Real success can only come if there is a change in our society, and in our economics, and in our politics." At the IMF, we embrace our responsibility to press for change in what we know best, and it is, economics. Our work on climate has (inaudible), carbon pricing, carbon investment, disclosure standards and just tradition.

Today, I will talk about the first of these (inaudible), carbon pricing. And I want to express my gratitude to Adele Morris for being our moderator, because she has made a very significant contribution to the topic we will discuss. Why carbon pricing is so important. Our research shows that it provides the most effective incentive to make progress in decarbonization at the scale and with the speed needed to reach the goals of the Paris Agreement.

Gradually increasing price on carbon encourages innovation and transition to renewable energy, clean mobility, low carbon technology. If we are to lead global warming to 1.5 to 2^0C, that would mean reducing emissions by a quarter to a half by 2030, in 10 short years. And this is unlikely to happen without measures, if we're willing to adopt a global carbon price of around 75 dollars per ton by the end of the decade.

And we have a long way go. Yes, there has been progress with over 60 national and subnational carbon pricing schemes around the world, but four-fifths of global emissions still remain unpriced and the global average emissions price is only $3 per ton. So, what do we need? Stronger and more coordinated actions in the decade ahead.

And today, IMF staff is publishing a proposal still under in the discussion with the IMF board and membership that sets out how an international carbon price floor can help achieve the goal of accelerating the transition to low carbon growth over the course of this decade. Such a price floor would have three critical elements. First, it would focus on a small number of large emitters, such as the -- or all of the G20 countries. This would make negotiations easier and put fuel cover a big percentage of global emissions, thereby taking a major step towards the cuts in greenhouse gases we need.

Second, the agreement would be anchored on a minimum carbon price, a single efficient parameter that would allow simultaneous action across different countries. And it would help large emitters scale up their ambitions by providing reassuranty (phonetic) that others are acting in coordination.

And finally a carbon price for agreement would be flexible, pragmatic, equitable, and it would account for different responsibilities across countries with different pricing based on different development levels and historical emissions. As an illustrative example, take an agreement among just six participants, Canada, China, EU, India, UK, and U.S. to implement a $75 carbon price by 2030 for advanced countries, $50 for high income emerging economies, $25 for low income emerging countries. This scheme could help achieve a 23 percent reduction in global emissions below baseline by 2030, enough to bring emissions in 2030 in line with global warming below 2°C. Of course, it would be great to help (inaudible) the higher emissions, so we aim for 1.5°.

And let me be clear. A carbon price floor arrangement does not mean carbon taxing per se. Yes, taxes are an additional mechanism. We favor taxation. But the price floor can work through other policy measures, such as emission trading or regulations that achieves equivalent outcome. As well as reducing emissions, an international carbon price floor can build domestic and international support for action on climate change.

On the domestic front, carbon readiness can help secure a just transition, compensating household for price increases, helping businesses and workers move from high to low carbon activity. And, internationally, it would be less divisive, far more effective than unilaterally involving (inaudible) carbon adjustment taxes on the carbon content of imports (phonetic) which may otherwise emerge as some jurisdictions move ahead, efficiency with carbon pricing and others fall behind, to protect the competitive strength of industry, the logical drive for the adjustments. And that is going to be a complication on top of complications we already have in trade.

Let me conclude that in the last 15 months, we have seen the importance of coordinated action. To save the global economy, government injected around 60 trillion dollars in support. To save life. Scientists came together to develop vaccines in record time to help repair the (inaudible) finances. G7 ministers agreed to end the race to the bottom in carbon, taxation as well as endorse steps of action on climate change by the IMF. To help save the planet, we must work together to prevent a climate crisis (inaudible) half as strong (phonetic). A robust price on carbon can play a hugely important role and even more so, when it is a product of an international agreement. At the IMF, we see an international carbon price floor as a viable option to reach such an agreement. And we will continue our work on it with all of you. Thank you.

VIDEO: Our planet's in trouble. To save it, to stabilize the climate, we all need to meet two deadlines. By 2030, we have cut a third of all greenhouse gas emissions. And then, by 2050, bring them down to net zero. So, how do we make that happen?

Most experts believe carbon pricing has a central role to play. It's a policy designed to boost clean technologies and ease us off fossil fuels. Here's how it works. For every ton of carbon dioxide put into the atmosphere, there's a price tag. The more you emit, the more you pay. A carbon price makes carbon intensive energy more expensive and so incentivizes private investment to move to low carbon technologies and to boost energy efficiency.

The idea has been around for a while. But, of course, no country wants to make their industries more expensive and therefore less competitive. So what if, instead, countries agreed to put a minimum price on their emissions, a floor price? This would make it easy for individual governments to raise carbon prices and move us to clean energy faster. Floor prices could be adjusted for richer and poorer economies.

A carbon floor agreement among the biggest emitters, Canada, China, Europe, India, the UK and the U.S., could impact two-thirds of global emissions. And with the biggest economies on board, we could have a good shot at keeping the planet livable. (End video)

MR. PARRY: Thank you, it's a pleasure to be here. So, the last window of opportunity to keep alive the possibility of containing global warming to 1.5-2°C, it is about to close. Unless global greenhouse gas emissions are cut by 25 to 50 percent by 2030, relative to 2019 level. And achieving this is going to require, in addition to current policies, phasing in measures that are equivalent to a global carbon price at around $75 a ton. Whereas the current global average carbon price is only $3 per ton.

So, there's an awful lot that we need to do over the next decade. The Paris Agreement is working to capitalize that global ambition. Sixty countries, covering about half of global emissions, have committed to zero emissions by the mid-century. But the Paris Agreement needs reinforcing to achieve the required emissions reductions over the next decade. In particular, even if our current pledges for 2030 were fully achieved, this would only be cutting global emissions by about two-thirds of the emissions reductions that are consistent, even with a 2°C target. Moreover, there's no mechanism to ensure that even these pledges are going to be fully achieved.

In fact, under the Paris approach, there are two key obstacles to scaling up global mitigation policy action. First of all, it's just very difficult to negotiate more stringent ambition because there are just too many parties, 195, negotiating over too many parameters, at one per party. And secondly, when countries are acting unilaterally, it's just very difficult to implement forces that are needed to meet very aggressive emissions approaches due to concerns about competitiveness impact and uncertainty about what are the actions that other countries are taking.

So, we think that it's a fairly good chance of delivering the emissions reductions that are needed over the next decade. It's essential that the Paris Agreement is complemented and reinforced by an additional international mechanism. And this mechanism must facilitate negotiation. So, it must be focused on a small number of countries and a small number of transparent parameters, and it must be effective. That is, it must contain a concrete plan which, if implemented, would deliver the emissions reductions that are needed.

So, IMF Staff, including James Roaf and Simon Black, propose an international carbon price floor arrangement which had two key elements. First, is a focus on a small number of large emitters to facilitate negotiations. So, for example, China, India, United States, and the EU, if they were in the agreement that would cover two-thirds of global emissions in the future. If all of the G20 countries were in the agreement, that would cover 85 percent of emissions.

The second key element is a focus on a minimum carbon price, because that's an efficient and easily understood parameter. Joint action to scale up carbon pricing amongst the major emitters would be the most effective way to address concerns about our competitiveness and uncertainty about policy actions in other countries. And under this agreement, countries would have the flexibility to set a higher price than the floor price, if that were to help them achieve their mitigation pledges.

But we think pragmatic design of this agreement is essential in two regards. Firstly, to accommodate international equity or differentiated responsibility. True, for example, having differentiated price floors, stricter price floors for advanced countries and/or a simple transfer mechanism to provide financial, technological assistance to our low income participants.

And the second key pragmatic element is the flexibility to accommodate countries for whom carbon pricing is just very difficult politically, so long as they achieve true other policies, equivalent emissions reductions to those that would have been achieved had they implemented the price floor.

There are a number of other issues that would need to be fleshed out in this arrangement, such as which sources of emissions to cover, to monitor carbon pricing; for example, if prices are changing pre-existing fuel taxes. But we think these issues are manageable and they are discussed in the paper.

But it's just striking how effective this price floor could be. Illustration -- if advanced economies were subject to a price floor of $75 per ton in 2030, high income emerging market economies, $50 per ton, and low income emerging market economies, $25 per ton, then that would be sufficient to get global emissions down below levels that are needed to keep consistent with our warming below 2°C , even if this agreement only applied to six countries, six emitters, the EU, China, India, United Sates, Canada, and the UK.

So, what about other G20 countries still met their mitigation pledges and so long as the participants in the agreement either met the price floor or their mitigation pledges, whichever is the more stringent of those two. But, actually, under this differentiated floor, the emissions reductions seemed fairly equitably distributed. For example, India would be cutting emissions 10 percent below baseline level, so about 13 percent below baseline level which is actually smaller than the emissions reductions in the other participants. But, in fact, India's absolute emissions would be higher in 2030 than current emissions under this agreement.

And just, finally, we think that the pragmatic price floor is the most promising of other international mechanisms that have been proposed. One of the possibilities is a pure carbon price of all participants. But, under this scheme, it's less scope to address international equity, because it rules out the possibility of lower price floors for developing countries. Also, it precludes countries for whom carbon pricing is just very difficult politically.

Another international mechanism might be annual country level emissions target. But this creates a much larger number of parameters which complicates negotiations. But it's a really a zero-sum game if one country argues for a weaker target, other countries then have to strengthen their target. And, very importantly, it leaves uncertainty about what exact policy action other countries I will be taking.

And, finally, if an international carbon price floor is not implemented, it's highly likely that a system of unilaterally imposed order carbon adjustments is likely to emerge as some countries move ahead aggressively with carbon pricing while others do not. But a unilateral system of border adjustment is far less effective than the price floor at reducing global emissions because it only covers carbon that's embodied in traded product which is typically well below 10 percent of countries are (inaudible). Thank you. So, I'll stop there.

MS. MORRIS: Well, thank you so much, Ian. I really appreciate that presentation. And I'm a big fan of this idea. In fact, I've been writing it by myself for quite some time. I'm going to start the panel session now by first introducing Ian. Ian is a principal environmental fiscal policy expert. I love that, environmental fiscal policy expert, we clearly need more of those, at IMF's Fiscal Affairs Department. And he's been at IMF for quite a while now. Before that, he was at Resources for the Future as are many budding principal environmental fiscal policy experts.

Now Ian hasn't really tooted his own horn yet, but if you look on the IMF website, you will see lots of work by Ian and his colleagues on getting energy prices right. And that's both in terms of climate change damages, but also many other external costs that can come from energy consumption and production. So, I recommend the body of the Fiscal Affairs Department work to you. And this is just the next installment of really good ideas that come from the IMF and from Ian.

Now, our next speaker is going to be Joe Aldy, there's Joe. Your video's live, excellent. Joe is professor of the Practice of Public Policy at the John F. Kennedy School of Government at

Harvard. And before that, he was at Resources for the Future. He still has an affiliation there, as he does with the NBER and Center for Strategic International Studies. And he was, indeed, practicing his public policy with the Obama White House and before that at the Council of Economic Advisors where we worked together in 1997 at time we were negotiating the Kyoto Protocol. So, I've known Joe forever.

And I want to recommend several things to those of you watching today that Joe has worked on. He and his colleagues have put together some great volumes called Architectures for Agreement. And these volumes have all kinds of good ideas about how build cooperation on climate change. And these are just terrific sets of ideas, and, Ian, your Climate Staff Note would fit in there just perfectly.

Okay, Joe, I'm going to turn it over to you for some remarks and then I'll give some of my thoughts about the report and the concepts therein, and then we'll kind of have a discussion amongst the three of us. And then I will start incorporating some of these terrific questions we've gotten from the audience. And so, please feel free to bring more of those in. It's events@brookings.edu, thank you for your questions. Joe, I'm going to turn it to you.

MR. ALDY: Great. Thank you, Adele. Thanks, Adele, for organizing and hosting this event and to your colleagues at the Brookings Institution for making this happen. It's great to be back here with you, since, as you noted, we worked together back in the Kyoto days and in the year with Yin, who I worked with in our youth, when we were at Resources for the Future, including on ideas like how to design a carbon tax.

I also really want to thank the IMF for its seriousness in addressing climate change. And from the senior leadership to the talented and growing Staff, the IMF is highlighting both the critical challenges that climate change poses to economic growth and developing effective policy proposals to mitigate the emissions that greenhouse gases that contribute to climate change.

The IMF recognizes that climate policy is economic policy. And this work on the international carbon price floor is an excellent example of that. So, I only have a few comments about how this idea, I think, can advance global efforts to combat climate change and then pose a few questions about its implementation.

First, I think the price floor complements quite effectively the framework in the Paris Agreement. In Paris, we have virtually every country in the world participating in a system of pledge and review. Now we've done pledging in one form or another for decades. We could say that the voluntary aims on developed countries in the original framework commission in 1992 was a form of pledging, but the -- negotiated in Kyoto in 1997 was a form of pledging the quantitative mission targets for the so-called Annex D (phonetic) countries. We did this again in Copenhagen and Cancun and then, of course, in Paris.

The challenge, though, is at the UNF Triple T (phonetic) contracts, we don't have as much good experience, that to the experience with transparency. And I think this approach, of an international carbon price floor, does a lot to enhance the transparency of what we're trying to achieve in Paris and enhances the credibility of pledges and it builds trust in partners' pledges and actions. So that the price floor project I think is really important because, by establishing this kind of benchmark for comparing actions, are you mitigating emissions with a price instrument or with a (inaudible) policy that had the effect of a price instrument that's at least on par with this minimum price, is quite important for major economic partners, your competitors to know that they're all moving forward in tandem.

It's really (inaudible) around ensuring at the sub-minimum level of reciprocal action. And I think it will require greater transparency by national governments and disclosure about what they're doing in practice that makes those pledges under Paris, the so-called naturally (phonetic) determined contributions all the more rigorous and credible, which is going to be critical if we're going to come together and try to enhance the ambition over time.

I think the discussion about the need and importance of monitoring and transparency build on this really effective track record in economic policy. In fact, what I would describe as the gold standard in policy surveillance and transparency represented by IMF and how it has evaluated economic policy throughout the world through the Article IV Consultations. In fact, some what they have been doing through Article IV Consultations validated (phonetic) some of the work we did back in 2009 when I was in the Obama administration, in trying to enhance and improve the quality of review and reporting, peer review and expert review, are all part of what was in Copenhagen and Cancun because of the effectiveness of Article IV Consultations.

I think this approach to using a small number of countries, a club approach, has a number of really appealing characters (phonetic). First, we have experience seeing how starting with a small number of countries on a small number of issues has served as the basis for broader policy progress over time.

Whether it's going all the way back to the 1950s and looking at the origins of the European common market and how it's evolved in the EU today to something more recent, like when China and the United States reached a bilateral agreement in 2014 that I think helped spur progress toward the deal that we reached in Paris in 2015. Once we have a small number of countries, a small number of policy dimensions, especially when they share objectives, I think it's likely to lead to an agreement and serves as a signal to the rest of the world about what could work effectively and try to attract then more countries over time that (inaudible).

The challenge, of course, is how we identify who participates and who has those shared objectives and how we might need to expand the policies base to get more countries to join. That's why I think starting with a small number of countries, less than even the G20, is probably a really smart first step to demonstrate how this can work in practice. And that makes it then, I think, more appealing for others to join.

There's three questions or, if you will, sort of challenges as to how we might think about implementing this approach. First, I want to talk about how we might define a carbon price, how we might think about equity, and then, finally, how we can divide (phonetic) competitiveness.

So, one challenge, of course, is what is carbon price in a country? There's a lot of energy (inaudible) carbon prices within a country. Some members like a variation over time that the country's using, say, a cap and trade program like the emissions trading scheme in the EU. Some of them could reflect variation of policy coverage, where some emissions in a given country are covered by a carbon pricing policy attack (phonetic) (inaudible) and others are not.

I think there are some challenges to how we effectively measure carbon prices, and it may be politically difficult to get agreement on that. I think back to my time in government in the Obama administration where we worked on an idea that was first espoused by the IMF -- we should get rid of fossil fuel subsidies around the world. We were able to reach an agreement on that as a goal for the

G20. But defining fossil fuel subsidies and what constitutes the elimination of fossil fuel subsidies was a really tricky question. I mean, there's also an issue about how we think about the coverage of the carbon price.

I have some reservations about excluding transports, $C0_2$ emissions from the initial coverage. In part, because I think however we first established the rules of what's covered, creates incentives for various stakeholders to try to keep those in place if it's to their benefit. I think it may also weaken some of the incentives that I think we need long-term, if we're going to decarbonize our economies, where we are going to like to find transport, where we could find a potential role for hydrogen fuels in transport. We don't want to have a different set of rules that may affect say the power sector in transportation. Because I think the walls between those sectors are falling down because of technological achievement.

Let me give a couple quick comments on equity. I think this is really hard. The paper which I really recommend, it's a really well-written report, goes (phonetic) about how we could do some simple transfers to address equity, and I will simple transfers in practice are not very simple politically. It's difficult find, I think, also middle ground between a common core and full country specific differentiation. And while there has been this effort in the proposal I think about a couple different levels of a price floor, I think, as soon as we get into that discussion of some countries have different standards than others, everyone's going to want something that better caters to (inaudible).

I think it's also a challenge when we think about this is, to the extent we do have greater differentiation of price floors, we may still have some residual competitiveness impact that could affect some countries in some industries.

Now, let me close with a comment on competitiveness. Here, I think the price war might actually serve as a trigger for a domestic country to use a border carbon adjustment. That is to say, if you are a party to this club, and you adopt this floor, we will exempt you from the border carbon adjustment. But it may be that if you're not part of this club, we would use the border carbon adjustment against you. Now that may create incentives for more countries to join and that would be good. But it may be something that, as you start to see multi-lateral agreements on something like this, that may make it easier for a country under the WTR H20 (phonetic) border carbon adjustment among those who are not complying with or participating in the price floor.

I think the price floor could also reduce some of the barriers for communicating design and threats about border carbon adjustment. The training should be good. If the end result of border carbon adjustment is to not actually use it but to encourage more ambitious action among other countries. I also think there are going to be some challenges to how we account for non-price policies with similar emission outcomes for the price floor. They may have different competitiveness outcomes than a carbon tax floor cap and trade program.

So, I think there are going to be so many sort of details that I think need to be worked out in order to address what I think at the end of the day will be the key political either motivations to join such a club or potential barriers that may make some countries reluctant to do so.

But the bottom line, I think this is a fantastic idea for promoting greater ambition among the largest economies. I think it does what we need of delivering greater environmental benefits while mitigating some of the adverse domestic political challenge to such ambition. Now there will be challenges in designing the details, but I think the promise of this approach should compel both government and key stakeholders to work on this idea as a complement to and an amplifier of the Paris Agreement. Thanks again for the opportunity to be here.

MS. MORRIS: Great, Joe. Thank you so much for those insightful remarks. And I saw Ian taking careful notes of what you said, so that's wonderful. So a few of my own thoughts, and then I'm going to also do like Joe did, kind of end and talk about some challenges.

First, I really want to emphasize Ian's pointing out that the underlying challenge is the need to ratchet up near term ambition. So, he was showing targets or price floors out at 2030. We're at a critical juncture and there's no time to wait. And what I'd like -- one thing I liked about this kind of proposal is it makes that ambition much more transparent. And Joe talked about this.

And I'll give you an example. You know, when you go to those big conferences of the parties and it's a lot of whoop dee do. And then you've got your nationally determined contributions. Well, some of that is just totally opaque. You say we're going to have a target, but how you are you going to achieve it? What's the there there? (phonetic) And this really -- what's that conversation? In my opinion, from public relations, the hard core economic negotiations. And I do want to focus on that economic negotiation part of that.

One of the things I think is critical about how these negotiations could work is the engagement of the economic industry, the finance minister, maybe the trade ministers. And it's usually the environment ministers that go to these big meetings under the framework (inaudible). And God love the environment ministers. They are working hard. However, in most instances, they are not the most powerful ministers within their government. That tends to be finance ministers. And we need to get them on board and central to these economic agreements and the policies that are going to be used to implement these targets. So, I don't think that can be over-emphasized.

I do like the idea of starting with a few number of willing participants and get some agreements going and then build momentum. And, honestly, if the cool kids are at the table, the other kids want to show up. So, let's start with the core group and get that ambition on the table.

Now I do think there are some challenges, and Joe listed a lot of them, and I won't go through them all. But I do think there are a few things that would have to be nailed down. And I'll try to pick from ones that Joe didn't talk about. One is determining this price level. In my opinion, I think we should be thinking in terms of price trajectories. We know, you know, it's not just the price, the statutory pricing, but price expectation, right? You want to turn that capital stock over in the most efficient way. And it's good to know, okay, the price in real terms is going to be going up. So, better invest now in the technologies and the deployment of long I (phonetic) capital. And so, an agreed price but also an agreed escalation I think is really important.

Now, part of the reason I like to say yes (phonetic) because I've been writing about the same idea since 2009. You can find a working paper on my website. You've got the paper also on your website at the Golfer Center, Joe. And one place -- the most recent version came out in 2014 with our proposal to integrate price mechanisms into international climate negotiations.

Now once nuance that we added that the IMF does not talk about but could be on the table is the idea of price ceilings. You've got a collar, you got price floor. Now what would be the point of a price ceiling? The idea of a price ceiling would be that, in principle, countries could agree that if you price carbon at a particular level that's high, and you exceed your emission target, that's going to be considered okay because you've shown a level of effort that is economically transparent and significant. And that lets country take on ambition that they may not otherwise do in terms of the emissions target.

And so we lay out the concept of allowing countries to comply in two different ways. One is with their emissions target and the other is by hitting a carbon price level that everybody agrees, okay, you didn't want to go over that, that wasn't going to be politically sustainable, you know, that as long as you show you've hit that target for a reasonable period of time, a certain amount of excess emissions is okay. So, I just throw that out as an additional possiblity to supplement the U.N. nationally determined contribution.

Now, I'm going to turn it over to Ian to reply to Joe's comments and some of my comments. I'm going to end with one little challenge. Or let me phrase it positively. It's a hope. Like I really hope that this kind of cooperation really does foster reciprocity and mutual ambition. And kind of buried in that concept is the idea that I'm more likely to do more if you're doing more.

Now, I would just observe over the last few years in the United States, we went from the Obama administration, where they were doing everything under their power, literally, to reduce emissions and take on targets and pursue what policies they could with the authority they had and pursuing new legislation. Then Trump takes over and then we see a wholesale reversal of that initiative. And now President Biden is in office, we're seeing a wholesale reversal of the wholesale reversal. Now, everybody agrees that's not economically efficient and that's no way to steer a large economy to a clean energy future. But it also suggests that our policies are not a function of what other countries are doing. Not yet. Because the other countries were doing the same thing the whole time all those reversals were happening.

So, I'd like to think that we will get to the point where we are in a mode of fostering reciprocity and not political gyration. And so, I look forward to the day that this is a mode of our negotiations.

Okay. So, Ian, I'm going to turn it over to you. And then the first thing I'd like you to do is tell us where to get this report. Remind everybody how they can access your new work.

MR. PARRY: The report should be available now on the IMF website. If you just Google IMF and then a climate page, it should be available there. I think (audio garbled) two quick observations or comments. One is this issue of should the price floor arrangement be combined with a border carbon adjustment as a kind of enforcement mechanism. And we don't have strong views on this, or kind of pros and cons. I mean, yes, it does create this nice area of border free trade which can encourage participation. And it can more effectively address the risk of emissions leakage.

But maybe the incentives aren't that large for joining, given that only a very small portion of a country's carbon emissions are embodied in their trade. So, it's not as if a border adjustment appropriates a large portion of the potential carbon tax base in another country. So, maybe that incentive isn't quite as strong as we might think at first. And second, just it complicates the setting up of the price floor. Because not only do you have to sort out all the details from the price floor, but, in addition, you have a whole set of other issues related to, well, how do we embody carbon -- how do you measure embodied carbon.

So, it's not necessarily -- I mean, I think the strong incentive for countries to participate in this agreement, because it's a massive incentive for all countries to avoid warming going above 3 -- 2°C , know that the tipping point is going to escalate rapidly. So, we haven't got that incentive, but to try and prevent warming going above 2° would be enough. You have to think if (inaudible) interested in this.

And then a second point that the embodied carbon in a traded product is actually a lot larger in emerging market economies than in advanced economies. They tend to have more emissions intensive power generation make greater use of coal in industry and so on. So, if all country were implementing the same carbon price, that would actually hit emerging market economies more, in terms of our competitiveness. So, on this differentiated price floor offsets that tax to some extent.

MS. MORRIS: Great. Okay, thanks, Ian. Given how many excellent questions we got from the viewers, I'm going to start launching into these. And, again, thank you, viewers, for your excellent suggestions for question. I'm going to go back to you, Ian. Now, I've got a couple questions that are sort of the form of, what's the role of the IMF in all this? What are you guys doing? Are you going to fit this into your mandate where you're going to use conditionality or actee (phonetic) building, or surveillance to promote carbon pricing? What's the status of this as a policy matter for the IMF?

MR. PARRY: Well, it's more of an idea that we're trying to promote a dialogue on. So, in our Article IV Consultations with countries, where we do cover climate change, we bring this issue up.

So, we've discussed this in some recent Article IVs with the UK, Canada, Germany, for example. And in the Article IV, we've gone (phonetic) China later this year. And we'll also be discussing -- trying to have a dialogue with the authorities on this proposal and trying to get their feedback on it, what changes in design might entice China into this sort of agreement. So, it's more that we're trying to promote the idea whenever we have the opportunity in our bilateral surveillance and also opportunities that might arise in international forums.

MS. MORRIS: Great. Okay. So, again, a number of questions, and, Joe, I'm going to throw this one to you about how this idea fits or its relationship to some of these new carbon pricing bills we've seen. I give a shout-out to the Resources for the Future Carbon Pricing Bill Tracker that talks about these different pieces of legislation and they're very -- design features, and there's also a number of other excellent tools. We had a quick question about what the carbon price would do to different energy prices. And there's actually a really nice energy price calculator on the Resources for the Future website where you can put in a carbon price and get the implied effects on fossil fuel prices pop out of that.

And a couple shout-outs to new legislation in this, the 117th Congress. There's that Energy and Carbon Dividend Act, HR2307, people asked about. And there's also, now, as of two days ago, Sheldon Whitehouse and Brian Shatz's new bill called the Save Our Future Act. I don't think that one is up on the RFF just yet, but you can check out that bill on the Senator's website. Joe, how do you think about a carbon price floor agreement in the context of discussing carbon (inaudible) legislation?

MR. ALDY: So, I think there's two things to think about here. One is just the sort of mechanics, what does any carbon tax bill, what's the price. And I think to the point you raised earlier, Adele, what's the price trajectory and how does that compare with what we might see as part of something that could be negotiated, a price floor among major players. I tend to think that because of the sort of salience of that initial starting point number, and I think a failure for some people to really appreciate compounding over time.

You could start with a relatively low carbon price for your tax, say, in 2022. But if you have a high growth rate, some of these have put out proposals of adjusting for both inflation and then growing another, 3, 4, 5 percent on top that. That starts to add up quite significantly in a relatively short period of time. I think it signals to your point earlier, Adele, by we're expecting a really quite a meaningful carbon price in the not so distant future. So, when we think about the investment, the private sector, or household to make that a long-lived equipment, power plants, factories, cars, appliances, what have you, there's a clear signal about where we're going and what makes sense when you're making those investment decisions. Decisions today (phonetic) that I think is really important.

I think if we had something like a carbon price for this negotiated among major players, including, say, China. That as a met (phonetic) will help a lot when we think about the political economy for the U.S. of adopting any climate change policy. When we name a climate change policy in the U.S., there is this incredible fear about what kind of impact it will have on U.S. manufacturing for our output as well as our employment in those industries. I agree with Ian's point that border tax adjustment is covering a relatively small fraction of a country's emissions. But I would say that these are some of most politically important emissions, at least in the U.S. economy.

So, I think how one thinks about this. I've always thought that a border tax adjustment is clearly second best to just getting all your major trade partners moving forward at the same time. And I think that if this is a way to do that, that helps really improve, I think, your politics domestically of getting any kind of carbon fee or carbon tax or any climate change policy, for that matter, through Congress and signed into law.

I think definitely it does help make it that much more credible. That much more credible for the U.S. that they're going to be a partner to this. Because of the kind of yo-yo in U.S. climate policy over the last two decades, we're saying, we're going to negotiate this, and we're doing something in Congress that will change our tax code. Which we don't change our tax code that often on something like this. I mean, it's a huge deal to get it in, but once it gets in, it's going to, I think, establish more credibility than you had working with other partners on establishing some kind of agreement within this (inaudible)

So, I think there's a strong synergy going in both directions between the domestic politics and international politics. I think we had a carbon price floor negotiation coupled with discussion about what the Congressional action on the carpet (phonetic).

MS. MORRIS: Yeah, I'm really glad you addressed the politics because that was another set of questions we got. I think that's great. And I do think there's -- it does highlight though, to me, that in the legislation, each of these bills has a border carbon adjustment in it. But it does suggest to me that, if we're going to have international negotiations on carbon price floors and border carbon adjustments, it's important that the legislation gives some flexibility to the administration to suspend those adjustments or adjust the adjustments, or otherwise kind of make minor tweaks to our domestic policy as a result of the confidence building measures that we've managed to develop through these international negotiations.

How that's done exactly is not clear. But sometimes, bills give discretion to the Secretary of the Treasury to do certain things. And I think this whole discussion highlights, perhaps, the importance of that discretion.

Another set of questions, and Ian, this is maybe a good one for you, since you may have thought about this. The role of developing countries. So, you've emphasized that these carbon price floors don't have to be the same everywhere. But that if are differences, they are agreed differences, right? Like, so, if you want to be part of this agreement, you've got to have your price floor and, you know, if you want to be, you're going to have to get the acceptance from other countries about what that floor is. But, as you said, and maybe this is just clarifying question is, this is not an agreement about assistance to developing countries, right or climate finance or mobilizing the Green Climate Fund or whatever. This is among major emitters talking about how they're going to reduce those emissions. Is that right, Ian?

MR. PARRY: Well, it is, but we need to think strategically about how we can entice low income emerging market economies like India into this type of arrangement. (Audio drops) quite reasonably. They have very low per-capita emissions, very low historical emissions. So, it's entirely reasonable to expect that a banned (phonetic) country's, in addition to setting strict standards for themselves, part of this agreement could be some bargain about, well, we'll help transfer some critical technologies to you. Maybe, even more broadly, (inaudible) bargain over vaccine development or something. Some other broader system to try to help.

But I think these are the sorts of things that can be negotiated. Ideally, we want to save a country like India. It's very important to have in the agreement, what do you think is fair in terms of other assistance measures that entice you to the agreement to help you, you know, to compensate you for the costs of cutting emissions.

Although, I will say that from moderate price floors, the costs of a country like India are really pretty small, at least if we measure them as economists usually do by changes in consumer and produces surfeits in fossil fuel markets. We're only talking about something equivalent to about naught .1, naught .2 percent of GDP, which is certainly manageable and, in addition, if you would have a large domestic environmental co-benefit to scaling back coal use and reductions in air pollution debt. So, advanced countries -- it wouldn't take much revenues from advanced countries to kind of offset these efficiency costs for India, if that was needed to be part of that agreement.

MS. MORRIS: Yeah, one of the things I really like about this proposal is the opportunity to share best practices and policy design and how it's kind of a facilitated role there. I'll give you an example. So, we have, people don't know this, a tax on coal. It's very small, but it funds black lung disability trust fund. So, we have a very efficient, well-administered excise tax system on some fossil fuels. And we've been kind of hectoring India and others for years to put a tax on coal. And they finally did it and then we never said anything.

What I liked about this arrangement is people get together and say, hey, good for you. You're pricing coal, how can we help you? Can we share our methodologies, you know, how do we identify taxable entities? How do we manage the flow of funds? How do we measure tax liability? What do we do with the revenue? I think there could be an ancillary agenda there that really talks about how do you do this.

Okay, we've only got a couple minutes left. I want to go back to this idea of price equivalence of non-priced measures right? So, this is tricky. And I'm not sure if this is what we want to start with. But the idea that we have some regulatory program, maybe we do some modeling and try to demonstrate, oh, well, that's equivalent to a $10 per ton of CO_2 tax. What do you guys really think about that?

MR. PARRY: Well, we have heard that it's extremely important flexibility provision to have in the agreement. Because for some countries, they're just not ready for carbon pricing. Or for other countries, they may be ready for a modest level, but not sufficient to meet the price floor requirement. So, we have heard very strongly about meeting with the Board of Directors earlier this week that this provision is important to entice in countries where carbon pricing is just politically very difficult.

So, what do we have in mind? You do some modeling, maybe it's an external organization, perhaps, the International Energy Agency looks at, well, if you impose a $50 per ton power price, your emission, and nothing else, you emissions in 2030 would be this. So, you tell us some other plan, maybe it's trying to promote a lot of the same behavioral responses through a regulatory approach. You tell us what you envision for emission rates for vehicles, energy efficiency standards and so on. We'll model it and then check that it achieves the equivalent emissions reduction.

In fact, in our own spreadsheet tools, which Simon Black manages, we can do these sorts of analyses quite easily, albeit that this is for amore rudimentary way without a lot of detail. But we can easily do these sorts of modeling exercises that indicate what sorts of policy packages would approximately achieve the same emissions outcome as a carbon tax. So that's what we have in mind.

MS. MORRIS: We've only got 30 more seconds, what would you like --

MR. ALDY: In 30 seconds, I would say it is critically important, well, you can just say that the (inaudible). Because the approach in Paris is to give the parties discretion on how they design their domestic programs. We're not going to get everybody to agree on a carbon tax. That's not the proposal here. So, we have to design a system that acknowledges and incorporates that approach that we have under Paris. But I think it's -- the devil is in the details. But I'm thrilled that Simon Black in on the case at IMF, one of our recent graduates from the Harvard Community School, who worked on this report and working with Ian and the rest of his colleagues there at the IMF. So, I'll finish with that, Adele, thanks.

MS. MORRIS: Okay, so we're out of time, you guys. Thank you, everybody. Thank you Ian and Joe and your managing director, and Stephanie, and everybody who's helped put this together, my wonderful technical team at Brookings. You all take a look at the report and follow us on Twitter and stay engaged, and thanks again.

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