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WHAT IT WILL TAKE TO DELIVER ON THE PARIS CLIMATE AGREEMENT

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PARTICIPANTS:

Introduction:

KEMAL DERVIŞ
Vice President and Director, Global Economy and Development
The Edward M. Bernstein Scholar
The Brookings Institution

Moderator:

AMAR BHATTACHARYA
Senior Fellow, Global Economy and Development
The Brookings Institution

Panelists:

SRI MULYANI INDRAWATI
Managing Director and Chief Operating Officer
The World Bank

ROBERT ORR
Dean, School of Public Policy, University of Maryland
Under Secretary-General and Special Advisor to the Secretary-General on Climate Change
The United Nations

LORD NICHOLAS STERN
Chair, Grantham Research Institute on Climate Change & the Environment
Professor, London School of Economics
President of the British Academy

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P R O C E E D I N G S

MR. DERVIŞ: Good afternoon, everybody. Welcome, and welcome above all to our panelists, our four panelists here up front. It's a wonderful event to be together and just so that we all feel with climate change, we're all here before the storm hit outside.

First I would really like to thank Lord Nicholas Stern for joining us today. He is I think for most of us in a way the kind of father of climate change, economics and climate change policy. The science, of course, was around, but many economists kind of ignored it and it's with the Stern Report, the famous Stern Report that really hit the profession. So to have Lord Stern here is really a great honor and a great pleasure, and I'll say a few more words afterwards.

A great honor and pleasure also to have Sri Mulyani Indrawati, the managing director and COO of the World Bank. As you know she was minister of finance in Indonesia, a very successful minister of finance. But what I want to stress is in a way it was you who brought the finance ministers of the world with the Bali dialogue to kind of really focus on climate issues, on sustainability issues. Finance ministers had a way of leaving it to the environment ministers or maybe the development ministers, and it's really thanks to your leadership that things came together.

And Robert Orr, my old friend and colleague -- not old, young friend and colleague -- from the United Nations who is under secretary-general, advisor to the secretary-general on climate issues, but also dean of the School of Public Policy at the University of Maryland.

And then we have Amar Bhattacharya. I won't tell you how many years we know each other. He's also been absolutely extraordinary in focusing on policy issues. He was the director of the G-24, secretariat at the IMF and the World Bank. He's now a senior fellow with us here in Global Economy and Development, but he is also internationally as active and as global and as networked as anybody would want to imagine. So, Amar, thank you. You did a lot in putting this event together and, of course, in the whole time that lead to it.

The topic is really how to implement Paris. Nick Stern wrote a very good book. It came out about six months I think before this Paris event. Things have moved on. Let me just maybe make three points, which one is a Brookings point.

We are celebrating our 100th anniversary and Global Economy and Development our

10th anniversary. But the next strategy we're putting forward towards our stakeholders and our board of trustees is really that governance is the binding constraint on human progress at this point. And by governance I don't mean government, although government is a big part of it. I mean governance in a multilevel and multichannel way, and Paris was really quite an illustration of that. There were governments, of course, but there were also cities, regions, private sector NGOs. And I think more than technology itself and more than availability of finance, it is how to bring together these successful coalitions, and how to then get them to work on implementation. I think that in many areas of policy that we face is really the binding constraint. U.S. corporations are sitting on $2 trillion of funds. I think it's something like, you know, more than they're ever had, something like 13 percent of GDP, and yet not enough investment is taking place. So the importance of governance and that was illustrated by the Paris event.

And then two more points, which I think are important, is finance may be around for some, but as Amar often stresses and I think Sri Mulyani, also you have stressed it, finance is not around for all and it is not there where it is needed most, for the massive financing of sustainable infrastructure over the next decades. And I think this is one of the key topics of the debate. We all talk about a very low interest rate, close to zero, but in developing countries and emerging countries when you try to borrow for long-term infrastructure, you face a very different financial kind of world. So how to bridge that and bridging that gap actually helps maybe overcome what Larry Summers has called secular stagnation because there seems to be a savings glut in the world. There seems to be not enough investment. There are all these needs and some of these savings don't translate into investment.

And then the last point I want to make before leaving it to the panel is, of course, investments have to be profitable and one way or the other I think carbon pricing is still crucial. If we don't have some form of price structure that makes these things that have such high both private and social returns, but makes them profitable given government policies and pricing policies, we'll have big trouble. So I hope that the issue of carbon pricing will be addressed by the panel. So with that, thank you again very much, and I leave it to Amar to conduct the discussion.

MR. BHATTACHARYA: Thank you very much, Kemal. I was going to say since four of us moved up here; I was going to auction four seats in the front. But unfortunately they're already occupied with the exception of one. So thank you all for coming.

I just want to put Paris a little bit -- everybody I think in this room probably knows Paris very well, but it's good to start with a frame and then I want to turn it over to this great panel that we have.

So Paris really was a game changer in many regards, and I'll give my personal take. So the first thing about Paris -- I think in Indonesian we would call it [speaking Indonesian]. The puppet show was started a long time before Paris, and in particular there are two features that made Paris very different. One is it was no longer about an "us" and a "them," but about "we." So it became really that countries came to this very much with what we are going to bring to the table, recognizing that others would come with their own commitments. And this was in the form of the Intended Nationally Defined Contributions as a way to express commitments coming in even to the process.

And the second feature of Paris that's very different is this principle of it's a framework that applies to everybody. There are 195 different countries, but the framework within which action will be done is shared and joined. So that's very important about Paris.

The other thing that happened in Paris is these actions that were put on the table may not have added up to the ambitions, but at Paris leaders reaffirmed -- in fact, went beyond reaffirmation of a commitment to climate that way extends beyond what was on the table before. In particular, the 195 countries agreed that we would move to net zero carbon in the second half of the century, and on the mitigation side the goal was to hold temperatures well below 2 degrees and preferably to 1.5 degrees.

There were also commitments, very important commitments, made on adaptation, on loss and damage, and yes, on finance. And I think what is particularly interesting about the finance piece was for a long time the finance piece had been really paralyzed in what are you going to give to us? And here there was recognition that the success of finance was an enabler of bringing about an accelerated transition. So the discussion on finance was not about the billions or the hundreds of billions, but about how you move trillions of dollars that are needed to move towards a low carbon transition. There was also focus on capacity building, on technology transfer, very much on verification and transparency on a global start date, recognition that this was an every-five-year process and that every five years you would have to ramp-up the ambitions. So I would say it was really a way of coming together, but what's also very important about Paris is it's not just 195 countries that entered the discourse. It's a set now not only of countries, but of businesses, of civil society, of public citizenry, and indeed if it had not been for global citizenry, I don't think leaders would have come under the pressure that they came under in Paris.

I have been working very much, actually a lot with Nick Stern, on the aspects of finance supported very much by colleagues of the New Climate Economy. But I also want to stress that there are many other dimensions other than finance and sustainability infrastructure. There is very important action to be done on forestry, very important action to be done on adaptation, and the challenge of Paris right now is really translating the commitments into concrete action.

So what I hope that we will in this panel do is discuss what are the international and national actions that are now needed to really breathe concreteness into the Paris agenda and what is the role of different players? So with that let me turn it over to Lord Stern. He is, as Kemal said, the most eminent thinker on this issue, but he's also the most important action player. So with that, Nick, the floor is yours.

LORD STERN: Thank you very much, Amar and Kemal, for putting it altogether and to Bob and Sri Mulyani, my friends, for joining this. I can't help thinking of Casablanca, you know, "We'll always have Paris." Of course, they didn't get anywhere after Paris really. So this is going to be different, it's how you ramp up after Paris.

I want to speak about delivery, ramping up, urgency, but in the context of a global agenda and we now, and it's remarkable, we now have a global agenda. In 2015 we had the Sustainable Development Goals and we have the Paris agreement, so there is an internationally-agreed sense of direction. And both of those are actually quite remarkable. I mean compare Paris and Bretton Woods: Bretton Woods, 44 countries, one dominant country, and blood everywhere; in the last 30 years, two World Wars and a Great Depression. It had to be obvious that collaboration to deal with problems, to integrate ourselves, had to be better than what we were doing before. That's, as it were, the human beings together looking back and learning from extreme experience. Now, 44 countries, one dominant, evidence clear. This was 195 countries, mercifully there is no longer one dominant country, and we are anticipating, we were looking forward, thinking about the risks we are creating and the problems that we were bringing on future generations.

From that perspective it was remarkable and it was partly the risks that increasingly people are understanding more deeply, but also -- and this was fundamental -- it was about seeing how to do it and seeing that this was the growth story. The growth story in the shorter run as we build up the infrastructure because that's the heart of this; the growth story in the medium run as we launch innovation and discovery, and the only growth story on offer in the longer run because if we pursue high carbon or we make the high carbon attempt, we choke it off through the very hostile environment it would create. So those two together, the growing understanding of the great risks, but together with seeing what's possible.

So the countries of the world agreed in Paris because they wanted to. Now that sounds banal, but not because people forced them to, because they wanted to, and the reasons that they wanted to were good reasons and reasons that should stand. So it was a remarkable thing, but it's an understandable thing. And what we have to do is to build on that understanding to see how we go forward.

So how do we take that global agenda, particularly in the context of a world economy that is flagging for some of the reasons that Kemal set out? So the global agenda, Paris and the SDGs, but in the context of a challenge that has been central quite rightly so to the G-20 and others of how do you rekindle growth. So this is the story of implementation. It's not just implementing the Paris agreement in some narrow sense. It's a still bigger story even though the Paris story by itself is a big story. So that's the challenge and how we have to think, and sustainable infrastructure is at the heart of all of this.

Now there are other things at the heart of all of this, but this is the biggest thing at the heart of all of this. I mean you can do the numbers in various ways, but it's something like 70 percent of emissions are associated with infrastructure and its use, something like 70 percent of the infrastructure that's going to be built in the next 20 years, and it will be infrastructure that will be extra in the next 20 years will be 1.5 to 2 times all the infrastructure that already exists. We can do it well or we can do it badly, and the consequences of doing it badly are intense. The consequences of doing it well are very attractive. So this is the story. This is those 2.7s. Multiply 2.7s together and you get roughly a half. That's why I say this is at the core of the story, but it's the biggest thing at the core of the story.

So how do we make that happen? And we have to emphasize the sense of urgency in all this. I've emphasized it already through the illustration of the infrastructure that's going to be built. But think about the urbanization that's taking place. It will go from 50 percent of 7 billion -- all round numbers here -- to around 70 percent of 9 plus billion by mid-century, ballpark 3.5 billion to 6.5 billion. Now the argument doesn't matter whether the increase is 2.5 billion, 3 billion, or 3.5 billion. You can see that this is a story of urbanization because the demographics study's off. And as the fraction in cities goes up, the increase of that fraction slows down. So this story of this next 20 years when we're going to invest 1.5 or 2 times the infrastructure we already have and this story of urbanization over the next 3.5 decades, those cities will be shaped in the next 20 years. This is really urgent. If we get it wrong, we lock in high carbon infrastructure and we commit ourselves to cities where you can't move, and you can't breathe, and you can't be productive. That sounds like a bad idea, especially if you put it in quite such an analytical way that I've just done. But the points that I've made numerically are actually very hard points. You can fiddle around on the margins, but they're real. And so this is the sense of urgency that we have to bring to the table. And that's a problem with climate because the effects are down the track, but actually the action is extremely urgent.

So what do we do? We have to think about the policies, and we have to think about the finance. And I hope in the discussion we'll go into some detail. What are the policies? Well, we would stop doing mad things like subsidizing hydrocarbons in various ways, including, of course, all the pollution that they bring. And unpriced pollution is letting people do something very damaging for nothing. That's a subsidy in my book. It's a subsidy in the IMF's book, too, and they did a nice job on that.

But those numbers are huge. If you kill through air pollution a fraction K of your population each year -- I'll give you the numbers for the U.K., but let's get the algebra correct -- if you kill a fraction K of your population and a valuable life is M times GDP per capita, then the cost of that in terms of fraction of GDP is K times M. We kill in the U.K. 30,000 a year through air pollution, 1/2000. The value of statistical life usually around 100 times GDP, 100/2000, 5 percent of GDP and that's in the U.K. Now, some countries are worse than the U.K. in terms of air pollution. So the numbers there are very big, so stopping doing the stupid things is big, so stopping subsidizing carbon, acting strongly on air pollution. Those numbers in terms of policy numbers are very big. And you've got to do it in a way that's clear and credible and long lasting. So as well as the policies, the institutions matter, too.

Now there's a whole range of market failures that matter here, obviously the greenhouse gases and the pollution, but so too the R&Ds, so too the capital markets, so too the network structures that are so important behind all this, so too the information. You've got half a dozen market failures here that the policy story has to pick up and different kinds of policies and all of those six that I mentioned matter. They're not small ones. I always put carbon pricing first, but this isn't a Chicago world where they've got one problem, just fix that, and the wonderful, competitive, entrepreneurial spirits of the world sort out everything else. It's not quite like that, another five imperfections. So we need as it were that kind of dynamic public economics that looks at the way capital markets deliver, looks at R&D, looks at innovation, looks at learning. There's a real policy story. It's hard, but we can see how to do it, and it's got to be clear and credible.

The other part of the story is the finance story. We've got to be -- the kinds of infrastructure investments we're talking about are going to move from -- I'm always the great numbers person on this -- but we're going to move to around 3 trillion or so a year to 5 plus trillion a year in that process I just described. The challenge is to release that, make it happen, and make it happen in a way that's sustainable. So partly it's the policies, but partly it's the finance. And what we've got to do is change cost of capital from 6, 7, 8, 9, 10 percent and the high cost of capital that Kemal referred to, bring them down to 2 or 3 percent. And we can do that and the Multilateral Development Banks have a very powerful role to play, so do the regulatory structures. But clear, strong, and stable policies bring down the cost of capital, too. I was six years as Chief Economist at the EBRD. At some point there were companies who could have at that point bought the entire EBRD. They had the capital to buy out everything we did. They wanted to come with the EBRD because of the extra security that it brought in the bringing down of the cost of capital. Multilateral Development Banks can draw people together. It's not some investment bank -- I mean call it Goldman Sachs, for example -- that rings you up and says I've got a wonderful deal for you, Amar. You just relax. You just send the check and I'll sort it all out. A Multilateral Development Bank brings people together in a constructive way. They can build up the skills. There's all sorts of reasons. Now they can play and must play a much bigger role in this game if the cost of capital is to come down. Again, we can see how that can happen with moderate adjustments in the gearing ratios with capital injections that can be actually quite modest, but have a very big effect through the multipliers that we all know.

So there's a story then of the problem itself, which is very big in getting the right kind of infrastructure investment going. It fits with the big story of the global agenda, and we can start to see the detail of the policies and finance. So that's what we have to get on with.

MR. BHATTACHARYA: Thank you, Nick. Bob, you were one of those driving the Paris agreement from the inside, and you had a unique role in catalyzing a lot of the let's say positive energies that were put together that Kemal mentioned. More recently you also were the architect of a very important meeting here in Washington on the Climate Action summit, which I think demonstrates this tremendous broadening of stakeholder involvement. Topics you took up are absolutely central to what Nick was mentioning. So whether you want to talk about Paris or you want to talk about now the post-Paris agenda, the floor is yours.

DR. ORR: Thank you very much, Amar and Kemal, for bringing us together here. I'm very glad to see that Paris can still command a standing-room-only room, especially here at Brookings.

I think the nice frame that Nick just laid out, that there were two very important differences about Paris that made things work. I mean we had so many points to this process, it wasn't working, and the first was the recognition of the price we're paying has been steadily going up. I've had the pleasure to travel the world with the secretary-general. Unfortunately, one of the things that you get to see when you go to every corner of this planet is increasing impact and everyone can measure that in their own local way. So I agree entirely with Nick that that was a push factor. But the pull factor I would say is even stronger on this agreement, which was the second point that Nick credited the opportunity narrative, the fact that governments and other players recognize that there was opportunity in this. It wasn't just the necessity.

So how do we coax forth from an opportunity narrative to hard interest-based investments across a whole range of areas that need increased investment? Because I'm sitting up here with all this finance and economic firepower, I'm going to focus on governance because that's one where I think at least I won't be quite as much in the shade of these two on either side of me here.

The governance piece of this equation is huge, and I would not underestimate how novel what happened in Paris was. We have tried many times, and I would say in my time at the U.N. over the last decade to coax forth a broader, not just a multilateral model, but a multi-stakeholder model for governing global public goods. There are many reasons why we underprovide public goods and underprovide global public goods in particular. But this is a particularly vexing area and even one and a half years out from Paris, the common assumption was that climate would drag the SDGs down, that these two needed to be handled kind of separately because the development agenda was the positive agenda and the climate agenda was the negative agenda and could pull down the positive development on development. I think that assumption about what would pull what and what would pull what down were inverted in the course of the year and a half or so leading up to both the SDGs and the climate accord.

Interestingly, how did we get to a sense of going from the rhetoric of mutually reinforcing goals in global development and climate change? I think the governance piece of this is central because we broadened the base of the discussion fairly dramatically. This was a negotiation among governments, but make no mistake about it. The governance were accompanied every step of the way of this process by not just companies, not just finance houses, but the citizens in the streets, the NGOs, the academics pumping studies into the bloodstream in various countries and various decision-making processes. This is an ecosystem of governance that looks, tastes, and feels dramatically different that it did two and three years ago. So it's a big deal, that what happened in Paris is really the first I would say embodiment of a new governance dynamic, but it is fragile. It's powerful, but it's fragile. It's fragile because it is intrinsically decentralized. There is no guiding hand that is going to push all of this, whether individuals, institutions, or marketplaces. So it's a very decentralized equation. It is also an axiom that each one of those constituencies that I mentioned has a different bottom line. And how do you get the different bottom lines to at least add up or to overlap enough on a Venn diagram that they will act together. And so I think the governance equation is about holding all of these different constituencies, the multi-stakeholder reality that we live today together, to achieve three things that otherwise they would not achieve.

First, as Nick mentioned and Amar mentioned, speed. Time is of the essence. Everything we don't do today is something we have to do two or three times more of tomorrow or ten times more of tomorrow, so speed, scale, getting good solutions into a lot more hands a lot faster. And the third, in addition to the "S" of speed and scale, I would say a strategic coherence. You can't just attack the climate equation piece by piece. Amar mentioned the Climate Action 2016 summit that we held recently in Washington, D.C. Getting multiple institutions to host a single event on climate action was an interesting exercise, not easy. But the power of bringing all those different institutions together was I think demonstrated quite signally. The problem, however, is that at the end of each one of these meetings, everyone looks at each other and says where's the next meeting and who's convening it? And the answer is we have many platforms. We have many international platforms for harmonizing our finance policies, and I think Sri Mulyani rightfully got credit for bringing Finance Ministers together in a new way. So there's a platform or platforms in the finance space that that's happening. There's a U.N. platform or multiple U.N. platforms. You have business platforms. You have all these different platforms. But what is the strategic intent of these actors? There is a point at the end of each one of these successful, multi-stakeholder summits or gatherings where everyone says okay, not just where are we going to meet next, but who's going to call the play? What are we going to do together? So if we agree to stay together and we agree to keep moving together, who is actually going to give us that direction?

And I think here the governance equation is going to keep evolving fairly rapidly. This won't be owned by any single institution. I think the umbrella of the United Nations was absolutely central to the success of Paris, but the U.N. cannot by itself keep all of these actors in the field. The arm is much broader than the reach of just the U.N. And I think here there a couple of aspects to the governance equation that we need to pay particular attention to. Yes, we need to keep all these actors in the field and yes, we need to prioritize and give some strategic direction so that they stay in the field. And Amar mentioned that the key areas in which we organized the summit here in Washington, other meetings will organize it slightly differently, but we know what the wedges of the pie are that we have to address. We need to lower the transaction cost and make sure that the coalitions that are in the field around land use, and the coalitions in the field around energy, and the coalitions in the field around transportation or infrastructure stay in the field and that we make it easier for those coalitions to keep moving.

We also need to leave some space open for new entrants to this coalitional approach, not to shut the door and say we figured it out. There's exactly eight pie wedges. Here's who runs each pie wedge, and off we go. We were very excited by the entrance of lawyers, the global legal community coming in at Climate Action 2016. I will fess up that while I've been strategizing for years which constituencies we need to develop and where they are, I never thought of the lawyers. There's a lawyer at the elbow of every CEO making every decision, doing due diligence, talking about risk equations. There's a lawyer at the elbow of every international institution. There's a lawyer at the elbow of every NGO, of every finance house, and we hadn't thought to bring that constituency into the heart of this discussion. So late entrant, but very important entrant. So now we had 80,000 lawyers represented at the meeting. They've now called a play for how to organize the global legal community to support this agreement. We need to keep thinking about which are the next constituencies that we need to weave into this tapestry of global governance.

Another element of the governance equation that I would really underscore is the southern dimension. It's not just years at the U.N. that has me viscerally conditioned to look at the composition of a room the minute I walk in. And in climate discussions for years and years you would walk into the room and it was a dominantly northern clientele. It was a dominantly northern finance base. It was a dominantly northern crowd. But that is changing, but it's not changing fast enough, especially on the governance side of the equation. You look at the boards of directors of all the different companies, the different national and international institutions, you still see a lot of the same faces. We do have to get very serious about being on a crash program of bringing southern voices into the heart of the governance equation at all levels. Easier said than done, but we are making some progress.

And lastly, I would point to an element of the governance equation that is very sensitive, and one always speaks about it in either code words or just very carefully. And that is about the institutional arrangements of how to govern this regime. Member states negotiated this deal if you're a U.N. person. Governments negotiated this if you're coming from a national government. But that is a framework. The governments created the framework. To actually manage the moonshot, which is the rapid transition to this new economy we're talking about, that's not the frame of reference we need to be using. And so on the institutional side I think we have to work our way towards hybrid governance arrangements, which acknowledge that there are international governance arrangements in place. There are national governance arrangements, and there are corporate and private governance arrangements. And that part of what we have to do is actually harmonize and leverage the different strengths of those different governance arrangements. So I really welcome Kemal's focus that Brookings is going to spend its next 100 years on governance. More power to you. We need it.

Lastly, I would simply recognize that I think a number of people in this room that I see I know. I'm actually very heartened that I don't know a number of you in the room. This used to be a very small club of people talking about these issues. And you almost knew who was going to be in the room each time you went to go speak at an event like this. I'm very excited that I don't know a lot of you in the room and that there are new entrants to this issue. And I think we need to get a range of those new interests and new individuals and new institutions into the governance arrangements as fast as we can.

MR. BHATTACHARYA: Thank you, Bob. I think that was a fascinating take on governance because actually in a way Paris might be a way of pressuring a change in the way we approach global issues. So I think it actually is quite significant.

But I am struck that a lot of the failures of governance in this -- I mean this is a case of rising to a high level of governance. But it's also as you started by saying where we for two decades failed on the governance front. So Paris is a very interesting case of having gone from "bad boy" to "good boy." But I also would say that in the case of Paris, it's also a case where the sinners became the best saints, particularly the U.S. and China leading the way. So it was also a very important kind of leadership change in Paris that happened.

Sri Mulyani has come out and said you may be at the bank, but your engagement in climate goes back a long time. You also come from a country with the largest forest resources or most in the world, and you also played a very important role when you were there on the policy side.

As Nick pointed out, the role of the Multilateral Development Banks is key. The leaders of the Multilateral Development Banks made really a very pivotal commitment in Paris. And when you look at the implementation of the actions that Nick talked about, the Multilateral Development Banks are crucial. You personally have also stressed very much the impact on low income countries and the most vulnerable countries and the need to focus on that and you've recently written an excellent blog on it.

So I just wanted to turn a little bit to two questions. I mean in the implementation agenda, what are the priorities? But also, what do you think the Multilateral Development Bank community can bring to the table?

DR. INDRAWATI: Thank you very much for inviting me for this wonderful big crowd here on climate change. It's very, very encouraging to see that many people now are interested to not only attending, but I think actively playing a role in how to make this commitment to become the real effective implementation.

Within that kind of spirit, that's exactly what the World Bank is now trying to do. I mean right after or before the Paris or during the Paris meeting and right after that we launched what we call the Climate Change Action Plan. I mean the role of the Multilateral Development Bank is very unique in terms of not only in the financial sector because we call it bank, that's why we have the financing power in this case, but we also have the knowledge as well as the convening factors. And our ability to always like participating or even in this case adopting or implementing global public good agenda, for example, like climate change, in the context of the country is the strength of a very unique role of our institution.

So within this Climate Action Plan that we are having, you mentioned, Kemal mentioned earlier, I mean in the past, the finance minister never talks about climate change except if it has become a cost. So really mainstreaming the discussion of climate change within the finance ministry is actually very, very important and what we call an achievement of recognizing the need to take this issue up to the upstream level that is on a policy level.

So the one thing in designing the Action Plan is actually trying to develop and use the competitive advantage of our role and uniquely try to combine within the global community. I don't have to repeat all the why it is and why this is important. Why climate change is also important for the bank because without doing anything, doing nothing, meaning that by 2030 we are not going to achieve the poverty reduction, but instead is going to have additional 100 million people pushing down to the poverty level because of the climate change. It's also clear in quite a lot, in many of the implications on the development side.

So the why side is there. The how side is at least from the country point of view -- 140 countries signing the INDC and becoming NDC. And many of them are now asking the World Bank Group, because we are also actually working as a private sector side to really not only advise them, but really working on institutional and policy and financing. So this is the unique of us is actually we can work from the upstream policy institutional level up to the downstream in financing and then also leveraging or crowding in many of the private sector or other sources. And then with that kind of operation, we are going to be able to capture the knowledge and using that knowledge to then give it to other countries or clients.

So this is the area of the Action Plan that we are having different strategy of implementing it. It's emphasizing the implementation, the convergence between the global agents into the country implementation plan. Transformation in terms of ability to, what Nick said, is not dismiss as useful, but you will screen each of your investment plans and policies in order for you to be able not only addressing the issue of development, but at the same time you are addressing the issue of adaptation or mitigation. It really depends. So when you're talking about, for example, like energy, this is one of the most important pillars within our Action Plan and is actually on renewable energy. We are not only scaling up in terms of the building of the solar, but up to the grid level of how we are going to clear the distribution that will enable this renewable energy now put within the grid. The solar is one with a very big story that we are having both in India and Bangladesh, but now we are expanding a lot in Africa.

We are also talking, for example, on the most important challenge on development. At the end Nick mentioned by 2050 we're talking about 9 billion people, mostly urbanized. They need more food. They need a space to live. So designing the urban, but at the same time creating food security, is going to be very, very important. And in our Action Plan we're really like working by choosing 30 cities, doing the Action Plan on how the policy can be designed and actually making the city workable, become also productive. But at the same time, it's going to be less carbon intensive.

When we talk about land and water, this is going to be like one big issue. We are discussing about the forestry; 50 countries are going to be within our Action Plan until 2020. And then we are discussing with which pilot that we can work more in real action that then can be used for other locations.

So in a way I think for the Bank the issue of implementation even has been discussed before even the final meeting of the Paris. When everybody having a lot of fun in Paris, although I think I know that everybody was quite -- because I think the situation in Paris after attacks was not really -- but that may be also another that cleared the momentum. At the time the Bank, even months before that, we already discussed internally within the Bank how we see this INDC, which we see growing from many of our client countries. We look at it and then we think about how we are going to support the country ownership.

As you all or maybe many of you are familiar with the development work, one of the most ingredients which is very important for any successful development policy or action, is actually ownership of the country. You cannot as an international institution even with money, sometimes you can a little bit clear they have attraction. But the most powerful in actually making sure that the result can be really like delivered is when the country have ownership. And with this climate change meeting in Paris and with more than 170 countries have this INDC, 140 countries our clients, we see that at least the countries are already announcing it, that they have this commitment. We know that even if you implement that, it's not going to be at this 2 percent, 2 degrees in this case. But still within that context we see that there is really a growing ownership from the country to try to show their contribution to reduce their emission. And then we look at all this Action Plan and their commitment, then we'll see how we are going to strengthen their commitment to become a credible action.

So that is the area. It's really different. Now the World Bank is also developing the Action Plan for each region. As you know the way that we operate globally, we divided the global operation into six different regions. Sub-Saharan Africa is the first who actually have a very detailed Action Plan from the smart agriculture activity, which is very critical for Sub-Saharan Africa investment and infrastructure from renewable energy up to transportation, up to even industry on a truck capacity and how to make them more efficient, less emission.

And then also in designing the city, that is all the area that we are discussing. And now this Action Plan for other regions like South Asia, East Asia. Each region has its own Action Plan, which I think the emphasis is going to be different. Sub-Saharan is going to be different from East Asia because maybe in East Asia is more on an energy or urbanization and transport is going to be big. But we also put, for example, policy as a very critical institution and policy. You mentioned about governance in this case.

The issue of the fuel subsidy is huge. For many of our countries, I mean even now with the oil price very low, which is actually a very good opportunity for many countries to address the issue of policy. This we use our instrument, for example, our budget support in order for us to be able to strengthen or in this case to change, reform, their policy in order for them to be able to be conscious then of their commitment to contribute on this NDIC.

So we then discussed, for example, in Indonesia one thing. We talk about Egypt another thing, in which they're talking about the subsidy reform. Countries like Pakistan, India may be advantaged because they are major oil importers. At this very moment it's very important for them to change and reform their fuel subsidy. That's one thing.

The second policy, which is very, very important, which is on our Action Plan, is the carbon price. Even before the Paris meeting, the World Bank is already convening more than 90 companies plus local government and state, head of state, to then implementing it. I think we announced that by 2020 we want to double from 15 percent to 20 percent of all this carbon emission to be committed in adopting the carbon price, and by 2030 we are going to even increase and double it further. So that's on a policy level that is very important. It may not be like link it, but it actually has very significant impact in terms of not only using the resource for the right infrastructure investment, but also addressing the issue of the climate change.

I think the last thing that you mentioned about the forestry. This is the area that the World Bank is also working. There are 50 countries. We are going to use very specific 15 locations in which we are going to do the Action Plan which is supporting the REDD+ in order for them to be able to implement. I think from my own experience, all those list of actions is something that is easier to put it in Action Plan like the one that you can just click. The hardest part is actually on the real implementation because really shifting the resource, something you have to deal not only with the policy, but institution, but also the political economy side. Let's say if you're talking about the forestry or you're talking about the fuel subsidy, the fuel subsidy is not at the low oil prices easier for you to do, but you have to make sure that you are also creating a safety net so that when the oil price increases, the government is not going to have to go back to this what'd you call it, fixed price, that then clearing a distortion especially for the renewable energy. Forestry is the same thing. It has something to do with the opportunity costs of preserving the forest, but at the same time they want to have their economy benefit. There is an institutional aspect in terms of governance, law enforcement, which is something that's beyond the forest management itself, but it's still within the country owned. So how or what bank can actually provide something that is actually a win-win and at the same time shifting the fundamental incentive so that the institution is going to be conscious then with the commitment of this climate change.

So that is the area that we are all trying to do. Of course, the World Bank is using as a group attracting more private sector IFCs, increasing not only investment using our own resources, but in mobilizing many of the private sector in order for us to be able to participate in an investment. So I'm glad that this is going to be like the real challenging is on implementation side, so the next meeting we will be able to come up with what is can be done and what is actually need to be supported further.

MR. BHATTACHARYA: Thank you very, very much. So I mean my take of this from this discussion is first that there is now a global agenda as Nick pointed out. But also as Bob said, at the end of the day now we don't see climate development and growth in conflict. That's a very important change that has taken place, so the directions are very clear.

I thought, Sri Mulyani, you talked at great length in a very precise way about the importance of implementation at the country level, and I think the framework that you laid out was very persuasive. So I want to press a little bit on the question about what Bob said, which is does that give us sufficient speed and scale and actual outcomes? And to be a little bit contentious about it, I'll give you a calculation that a colleague of Nick's has done academically, but a very important one, which is if you look at the existing stock of infrastructure and look at how much carbon it would put out there, it pretty much eats up all the carbon budget that is there. And now we are talking as Nick said of 150 percent increase in infrastructure. And to be fair, most of that is in the developing world that doesn't have the infrastructure. So it would not be fair to say you can't have the infrastructure because you will use up the carbon budget.

So in this issue of scale and of speed and urgency, how does one manage that tradeoff? And then the second question I have in that regard is really the challenge of finance. So yes there is plentiful finance, but the reality is that finance still costs too much in many emerging markets and developing countries. Even in a country like Brazil, the cost of finance for infrastructure is 10, 15, 20 percent and you just can't finance infrastructure at that kind of cost. So how does one bring down as Nick was saying the cost of capital and what role can we play? I mean in a way the MDBs are doing that, but how can one do that in a higher scale using very much I think approaches that were mentioned? Plus, of course, you can react to anything else anybody else said, so I just want to go for a second round and then we will open it up to the floor. Nick?

LORD STERN: Thanks very much to Bob and Sri Mulyani from whom as always I learn a lot. On governance, I think that one thing we learned from Paris is that the quantities, the Nationally Determined Contributions, the quantities are not legally binding. But the process of commitment, coming together, revisiting measurement, and so on is legally binding and in this it's peer pressure, seriousness of commitment. There is no police force from Mars or judiciary from Jupiter that's going to enforce this and that's why it's so important to have something that people really want to do and then they feel obligated to do it because they've said they would. And I think that process, the legally binding process, is actually quite strong and I would bet that it would stand.

So what about the governance of the emissions themselves in the Nationally Determined Contributions? Again if you look back to Cancun where we had the promises for 2020, on the whole -- and there's some exceptions, of course -- but on the whole the big blocks, China, Europe, U.S., are going to come in in 2020 not far away, perhaps even better, than they said they would in Cancun. So the voluntary story on the numbers seems to come with greater ambition because you don't sort of err on the side of caution because somebody's going to give you a hard time in some formal punishment sense. But I think going legally binding on process, but voluntary on the numbers, was actually quite an important part of the story.

A second aspect I'd emphasize is there were quite a lot of implicit promises and some explicit promises. The explicit promises were around R&D and some implicit promises within that about sharing; quite a lot of implicit promises, some explicit, but quite a lot of implicit promises about how the finance was going to come. So I think delivery on those promises, explicit or implicit, delivery on the finance is going to be very important. So this is not governance by enforcement. Remember the word governance, at least I think in the Oxford English Dictionary which is good enough for me, is the manner of governing. It's the manner of governing. How it takes place and how we behave within how it takes place. And the kind of institutions that we're involved with have a big part to play in that process in good will, delivery on explicit as well as implicit.

The second thing I wanted to say is the actors. Cities and mayors, given what we've already been saying about urbanization, cities and the governance of cities is going to be very important, and how cities learn from each other, how cities share up ideas, how cities do common procurement, which set standards for their buses or whatever it might be. They have great ability to shape what will happen. Does it work somewhere? Well, go and find a city that has tried it out. That's very powerful. The power of example will operate more quickly and effectively at the city level than at the country level because countries can always find well, that doesn't quite fit. We're different from that. But cities see more commonality, so the power of the example I think can be much stronger. So the international development groupings, the financial institutions, I think focusing still more on cities would be a very big part of the story.

Business is enormously important. Increasingly, we're doing -- businesses are doing well by doing good, and I know -- how many of you are old enough to know Tom Lehrer? Only a few, but it was a dope peddler who did well by doing good in Tom Lehrer. But more and more the businesses are doing well by doing good because it matters to their customers where something is sourced. It matters to their employees. Mercifully, a lot of our students don't want to go to work for bad people, and they see bad people as people who despoil the planet and the environment. Shareholders don't want to go there. So increasingly businesses are doing the right thing because it is the right thing, and we should respect that, but also because it makes sense. And there again I think we're seeing much more the power of the example.

The last thing I want to mention is finance because that is at the heart of the whole thing and that's why Amar and I and others are trying to spend as much time as possible with Finance Ministers, so we hang around with Sri Mulyani. She knows how finance ministers behave. Some of us have worked for finance ministers and have some feeling also. But they set the policies. They set the policies. They complain if you're asking for too much. You've got to show that it makes sense, show that it makes sense fiscally, show that it makes sense from the point of view of risk, show how a political economy can be overcome. I think we can do all those things, but the right interlocutor for policy is finance ministers. Environment ministers are on the whole lovely people, not all of them, but on the whole they are. But the power is in the hands of the finance ministers and it doesn't matter whether they're lovely or not, they have the power and we have to be persuasive through the things that matter to them -- the political economy, the risks, the public, the fiscal, and so on -- and we can.

The pension funds and financial institutions increasingly they're doing better by insisting on high standards in the companies they invest in. Companies that are flaky on one dimension, they're probably also flaky on another dimension. And this dimension, particularly on carbon, is going to become increasingly important. And Mike Bloomberg is going to -- Mike Bloomberg's committee working for the Financial Stability Board is going to come up with reporting protocols by the end of this year and that could really be a game changer. In other words, companies have to report the riskiness of what they're doing, the physical risk, the litigation risk, but above all the risk that people are serious about Paris. So many companies are betting that we're not serious on Paris. That has to be flushed out into the open because well, it's very risky not only for the world, which is most important in my view, but it's risky for their shareholders. And if you make a massive bet against Paris happening and you stake your firm on that, that's a risky bet. And, of course, we're working to make it as risky as we possibly can. So that again I think is going to be an important part of the story.

I don't want to repeat what I said about the Multilateral Development Banks, but I do think the combination of policy that's clear and stable and sound and sensible from the point of view of making markets work well, that will bring down the cost of capital and the MDBs' presence will bring down the cost of capital. And the skill is going to be able to put those two together on the kind of scale that we need.

MR. BHATTACHARYA: Thanks, Nick. Bob?

DR. ORR: I think the new governance model is all about creating the conditions for a race to the top. This is about creating positive pressure, positive competition. I like Nick's no police from Mars and justice from Jupiter. It is absolutely true. I've been asked by journalists over and over. So who is the judge on the Paris accord? Where is the authority going to be to say who is doing what? And I say this isn't just about peer pressure. Well, peer pressure is a very powerful tool, but it's not the only tool. Peer pressure backed by market pressure is a lot more persuasive than any kind of a formal international mechanism that till tote people's performance and then try to punish them accordingly.

But how will that work? I think Nick just underscored a couple of the key constituencies where you see this race to the top. The unit of analysis of cities, the competition between cities for investment is fierce. It's within countries and it's globally. And it's very interesting to see how that competition is playing out. It's not just an international beauty pageant. If you get 20 mayors in a room, they all call their city the most beautiful in the world, and I'm sure they are. If you live there, it's the most beautiful in the world. But they are constantly competing for investment. Now interestingly, if you go into any corporate boardroom these days, too, it's not just a beauty pageant anymore either because those institutional investors -- the trillions, not billions, the pension fund managers that are trying to allocate huge chunks of capital -- they are starting to actually pay attention to this equation. You can't make enough return if you're leaving your money where you've always had it. You are going to have to get into new markets and start new kinds of investments and that is going to change the equation. The question is can it change fast enough?

So creating the conditions for the race to the top is partly about structuring these competitions -- structuring the competition among cities, structuring the competition among companies, structuring the competition among countries. And this is one of the dynamics I am most pleased to see. Governments are now truly competing to see who can move faster and it is not just for bragging rights. It's not just heads of state want to go to a meeting and say see I'm better than you are. It is about putting themselves in a position to be able to attract investment from various pools of investment. So I do think that creating conditions for a race to the top, is the essence of that governance equation that we're talking about.

One last observation I would make and have experts on both sides of me. When we talk about the finance equation, we're always thinking about where's the new finance coming from? I do think that we are on the cusp of a real shift on the subsidy equation. It has been like pulling teeth to keep a subsidy conversation on the global agenda. But each time it's had, it's a little more serious, it's a little more robust. And I do think that if we can find and directly apply better uses of those subsidy monies, so instead of just saying you need to save the climate, so lower your subsidies on hydrocarbons, you do need to see what you do with that money. The alternate use of that money is the most powerful incentive for both political and market players. And there are countries that are doing really interesting experiments in this. I think the Bank has been facilitating some structured analyses of those experiences. I think getting that out there could accelerate this market. And I do think that if you look at some of those experiences, they stand the possibility of really speeding up this equation because when you start moving big subsidy numbers into new uses and it pays off for you politically, socially, environmentally, then you will do more.

MR. BHATTACHARYA: Sri?

DR. INDRAWATI: I think when you talk about speed, demonstration is very important and that's why this example is very important. And if we are talking about a certain climate change policy that make them more attractive and that then creating, as everybody mentioned earlier, the competition to do the right thing, that is very powerful. That's why we are using the convening power of the Bank in which we are inviting mayors or in this case the local government and then they can see oh, I can do that. I mean I'm not going to underestimate this because we really have the real experience like, for example, doing business. Now in India, Prime Minister Modi is always top and everybody is saying I want to become on the top of doing business. So they are now looking at okay, what is the methodology; how to measure it, how we have to improve, which policy or institution it needs to be. I mean this is exactly the same thing that if you want to talk about speed and they see really the example, whether you start from the city management, renewable energy, you're talking about agriculture that can be.

Second, I think you're talking about speed meaning that you limit the leverage, if you have resources easily, I think Nick mentioned earlier, the World Bank has the balance sheet. Of course, if you combine IBRD, IDA, IFC, and MGA, we end up with maybe around $160 billion. But if you're only using our own equity plus our own internal leverage, or if you attract other partners, including especially private sector, using the instrument that we can introduce, guarantee, so we don't even using the equity but providing guarantee the country or a company can attract or crowd in. That can be much, much bigger. It can be one to five IBRD to one to 20 to IFC and it can multiply even 100. That is exactly what you call speed in which then when every dollar of resource remitted you can attract more through the instrument. And we are now really innovating.

The third is, of course, in many countries the concession of financing, and you talk about the price in this case, Amar, and this really is the issue of many developing countries. They feel that they are victim of all this climate change and that's why they're entitled to have financing which is below the market rate. And we are actually providing with the financing at the concessional level. What we are doing now, climate change is priority, and we are now in the process of mobilizing the IDI in which one of the five team that we are going to implement is actually on climate change. And why it is important on this concessional financing, first we are going to show using this money that our project within the Bank is going to be climate change, meaning that we are going to screen all the projects in terms of how much emission and the social impact of this emission even up to the level that more upstream that is our systematic country diagnostic is not only what is affecting this country in terms of poverty reduction or shared prosperity, but we also see how this country can be more sustainable. So in terms of the diagnostic at the very upstream level before the Bank decide in which this country we will prioritize to support this country in this policy, whether policy on the fuel, whether on renewable, on agriculture, transport, then we are actually using this systematic country. The impact is actually beyond only the Bank operation. We use the instrument and this diagnostic we can combine with what we call the P4R, one dollar like the sanitation project that we are doing in India. We loaned for $2 billion. They use their own money for $24 billion, not only income of the money that matters a lot, but in terms of the government know own that this is very important and we need to measure the result in order for them to be able to deliver according to the goal that they have.

So it's really in terms of what you call interest rising and affecting at the very policy upstream level using sometime limited resources, but you have the highest impact. Then you're going to have what you call the scale up and the pricing which is right. Of course, the bottom line again we have to deal with the distortion and that's why the carbon prices are very important. If you only apply the carbon price, of course, it cost them about what level is right, but also it's only limited. But if that limited city, for example, is going to be a very powerful city or visible globally like Beijing, that will be really a big example. So we are not going to it's not just another city, but a city which is suffering from the pollution and they are now applying this. That can be a very, very powerful of how we are going to create the effect that then create speed.

So the Bank is really trying to use our resources, developing our instrument, convening using the example, the knowledge, in order then to create more other policymakers to see that actually this kind of thing can be done and it can be done this way. And actually it can achieve result during your administration because sometimes politician -- I was finance minister, why should I do that? It is actually a long-term investment. It will maybe in the next two governments. I'm no longer actually there in my office, why should I do it? So if they see that this can actually serve that kind of interest, you actually try to use this narrow interest, but then for the greater public good result, I think that can be very powerful.

MR. BHATTACHARYA: Well, thank you very much. I'm sure there are going to be a zillion hands going up, and we don't have a zillion minutes. So I'm going to be fairly -- I'm going to use what I call a geographic dispersion method. I just will make sure that way it's a randomized sample. I start with the gentleman right here. Go ahead.

SPEAKER: Thank you, everyone for your remarks. My name's Timothy Cheung from Clearview Energy Partners. My question is for Lord Stern. This weekend the Financial Times quoted something you said or wrote and I don't remember exactly, but I think it was something to the effect that there's an alarming gap between the Paris pledges and what fossil companies are assuming. So I wanted to know if you could elaborate on that and why you think that is and whether that's hopeful self-preservation or they just don't believe in the Paris process? And I think you touched on why that might be changing in your remarks today, but if you could talk about what would happen if these companies truly do believe in the process and start to think about that. Thank you.

MR. BHATTACHARYA: We're going to collect a few questions. I see Frances, the mistress of forestry.

SPEAKER: Okay, so you know what I'm going to ask about. So Kemal started us out by talking about Lord Stern's report ten years ago and how it really turned on a light bulb over the heads of economists. But the other thing that it did is put forests up there as a key part of any credible mitigation strategy. Ten years later REDD+, one of the most constructive negotiation streams and yet mainly it remains a great idea that hasn't been tried. Really big finance hasn't been mobilized. So my question to the whole panel is why not? What keeps us from understanding forests as infrastructure that we're destroying? It's not that we're not investing. It's the only safe, natural, carbon capture and storage technology that we have. What is it that keeps the World Bank's client governments from articulating forest protection as a credible investment opportunity and translating that domestically? Why aren't forests on the table as a worthy target of these subsidies that we're taking away from fossil fuels? So across the board, why aren't forests getting their fair share?

MR. BHATTACHARYA: The gentleman with the paper.

SPEAKER: Thank you very much for a great presentation. My name is Elliott Hurwitz. I was a contractor at the IBRD for 20 years. I worked in the international evaluation group with Kyle Peters and Reuben Landami whom some of you may know. I was here about a month ago and I saw Homi Kharas whom you may know as well. I asked him about the Asian Infrastructure Investment Bank. I'd like anybody on the panel, please, to discuss the effects of the Chinese Development Program on international environmental programs. Thank you very much.

MR. BHATTACHARYA: I take the gentleman right in the back.

SPEAKER: Dan Kahneman from the University of California, Berkley. I was delighted to hear the comments about carbon pricing. But I still fear that even with the discussion of acceleration, it's much slower than we would need. And I wonder about the mechanisms that have gotten some reasonable discussion and play, such as using government procurement, fee-bates as a method to take some of those negative subsidies as starting grounds to give governments the chance to opt-in, just like Lord Stern said in the beginning about a way to do those things much more quickly than simply perhaps waiting for the Chinese market to launch, which is some of the narrative. And perhaps the 1.5 degree high ambition coalition provides an impetus to act early. I don't know what you would think about some of those methods to accelerate the process.

MR. BHATTACHARYA: Yes, ma'am.

SPEAKER: I'm Mitzi Wertheim with the Naval Postgraduate School. I knew Bob when he was at the CFR. I started the energy conversation in Washington. I was asked in 2004 to start bringing people from the Defense Department together and we created something called the Energy Conversation. And, in fact, the Department of Defense was cited in the most recent issue of Scientific America about being such a leader, in which they have been. My question for you is how do you tell your stories so the general public who are not experts can understand it? It's incredibly complex. It's incredibly independent. We do not educate people to think that way. And I guess what I want to tell everybody is you need to go see this new film called "Time to Choose," which just opened up last Friday at E Street and done by this brilliant filmmaker who has his Ph.D. in political science from MIT, Charles Ferguson. It is the best story I've seen about forests, all of the climate issues related to the energy problems as well. But I want to get back to saying if you don't the general public to understand it -- and let me just give you one quick example. There was an article last week in The Washington Post about the way to deal with coal is to have the government buy up all the coal companies in the country. So I just looked up how many coalminers are there in West Virginia -- 183,000. You're going to put 183,000 people out of work? And jobs hasn't been a part of your conversation at all.

MR. BHATTACHARYA: I can assure you it's part of the thinking. Let me stop there because I can see the clock and I apologize that we took more time than we should have, but I did want you to have the opportunity to listen to these really excellent interventions.

So I think we have a pretty diverse set of questions on which to maybe round off the discussion. And I think it was a good balance between what I would call the drivers of why we are interested, but also the politics and the political economy challenges. So I'm going to go in reverse order. I'll start with you, Sri Mulyani.

DR. INDRAWATI: Well, on the forestry within the Bank we are going to do for this 50 countries with ten countries in which we are going to do the large-scale, multisector that really in this case you're going to present the case and also really try to look at the climate change fund or forestry fund that can be effectively used. So we really would like one to focus on what is implementable for this area and taking advantage of the REDD+ before with all the strengths and weaknesses.

On the AIIB and the -- of course, the AIIB work with their own safeguard policy in this case, the Asian Infrastructure Investment Bank --

SPEAKER: When you use acronyms, you leave a lot of us out of the story.

DR. INDRAWATI: Okay. So the AIIB is the new investment infrastructure bank created by China, which now I think is more than 50 countries as a member, United States and Japan I guess in this case. They have their own safeguard policy, but we are working with them. The need for the infrastructure is huge, so the question for us is, of course, how we are going to partner by creating a better influence in terms of the standard for them. So we are signing the MOU in terms of how we are going to co-finance. It could be co-financing. It could be parallel financing. And then the question about what kind of procurement and safeguard which then for the Bank using our standard and social which I'm sure you are familiar with working with the Bank is going to be adopted. So that kind of thing is going to be the way that we think the constructive cooperation will create much more a better standard rather than lower in standard.

I think the question about the carbon price, I'll leave it to Nick in this case. Definitely and really adopting with the level as well as this is workable and creating more for the private sector to not only seeing as a price, but internalizing within their investment is going to be very critical and that's why -- I mean in the past maybe they look at the carbon price and whether they are credible enough, predictable, and that's why they have the ability to change the decision at the micro corporate level up to the public level I think is going to be very important.

I'm not sure about -- I think the first question is for Nick. The last question is about how you explain to the public. I think the general public now with the climate change, anything happens with the weather they always link it to the climate change whether it's happening flood in Paris, the hurricane, the thunderstorm. So there are so many that now general public always immediately link it so you have actually in terms of more common understanding of the public that the climate change has become the issue whether they become the source or then create the modification to find the solution is going to be one of achievement already with all this real now with so many actually happening. Many countries which I say most for the World Bank line, they really see not really a choice, so for both the policymaker and the public because they really suffer. When you talk about the drought now because of El Niño, we are talking Ethiopia which before they build with the social protection up to 6 million debt and needs to be scaled up to 11 to even 16 million in order for them to be able to withstand this season with this El Niño that affecting their harvest. They're really seeing it. They understand it, and they want to have it. Senegal in which we built or we supported the government in building and developing a seed, which actually can withstand less water in a drought with more crops, 1.5 ton more every year. That will be something that really for them that you see the problem, you expect solution, and we have to deliver. That will create what you call in the public understanding that this is a challenge that we have to address and that's why we really need to take an action.

I think price and market is going to be very powerful. I come from Indonesia. Jakarta is the most traffic jam country now or city in the world I guess, and people now suffering from that. It's not that they don't understand about the climate change, suddenly now they also see that they need to do the public transportation investment in order for them to reduce not only on the climate change, but also for their own good. So there are so many things that I think can be done in a more easier way to communicate to the public, but I agree with you that there are still a lot of things to be done from just linking what is the weather situation with what is the climate change, and then what is policy action and the consequence of the lifestyle of the people.

MR. BHATTACHARYA: Bob?

DR. ORR: I'm going to take a quick run at three of the questions, first the energy companies. Most energy companies are now calling themselves energy companies, but their origins are something different. They're oil companies or they're coal companies, or they're a very specific source. We have to watch very carefully the success of those companies that came from one source of fuel and are diversifying. Watch Saudi Aramco, the world's largest oil company is going to become the world's largest energy company. It's not going to be smooth. It's not going to be easy, but it can be done. And if western oil companies don't move as fast as Saudi Aramco, they will lose in the marketplace. So there are a whole range of approaches, of the oil companies in particular, to diversifying to become real energy companies, but I think that we need to call it out and that will help incentivize.

Secondly on forests. Why can't forests get their fair share? Forests are like water. Hey, it's there. It's free. It's all ours. Obviously, we have to -- in public goods problems forests are one of the toughest in terms of our global commons. I think the answer is in part what we've started, but need to accelerate dramatically, is to make this not just a public-private equation, but it has to be a government-corporate-investor-activist equation. We need all of those constituencies lining up around the land use agenda. And when we started with treating forests as a forestry issue only and not as a consumer goods issue, we left a lot of people on the sidelines we didn't have to. So in 2014 when we started getting the private sector conversation, the consumer goods forum together with the public conversation about REDD+, we started to see some very different things happen. We need to get this all the way down to the consumer and I think that's where you'll see things move.

Lastly on Mitzi's question about the general public and messaging. Mitzi, you are absolutely correct. One reason we were successful in Paris is that there has been an up-swell of global public attention and more importantly local public attention to climate change and linking it to various phenomena people see around them. I would simply say the marketplace for information just doesn't happen on its own. We do need to facilitate that information flow and I will tell you social media gives you a platform, but you have to orchestrate. In 2014 at the Climate Summit we spent almost a year ahead of time networking with different organizations about what was coming, what would happen. The result was over 3 billion, billion with a "b," impressions about the Climate Summit, over half of the unique Twitter users in the world -- many of whom are in Indonesia, the world's highest per capita Twitter users in the world -- half of the world's Twitter users were talking about climate change during that summit. That didn't just happen. It's not because it was a cool issue that day. It's because there'd been a year of preparation. So we need to think in strategic terms about how to network these communities to sustain that kind of a conversation, and you can go viral and you can go global and you can sustain a global conversation if you do that kind of preparatory work and that's what we need to do.

MR. BHATTACHARYA: Nick?

LORD STERN: The first question was to me. The report in the FT was prompted by a letter that I wrote to the FT, which built on the submission that a colleague, Dimitri Zenghelis, and I gave to the Bloomberg Commission or Committee looking at protocols for financial reporting. And then I think, as I said in my earlier remarks, could be a real game changer when people have to reveal the climate risks that they're taking. Now a big part of that was betting against serious policy. If you wanted to summarize everything in a carbon price, of course, it's more complicated than that but our equivalence betting against a serious carbon price and betting the firm against a serious carbon price. So what we were arguing for is if that's what they're doing, it should be transparent. And it was prompted by a motion which the Church of England and others brought at an ExxonMobil meeting asking ExxonMobil to stress test their future planning against Paris implementation. And they got I think, I forgot the number now, 37 percent of the shareholders came in and said they want that, which actually was quite a big group, obviously not enough to pass the motion. So what you've got is a number of fossil fuel firms thinking ahead and changing and some dragging their feet. In this case it was ExxonMobil that was the example that we highlighted. And before Paris you got six of the European oil companies asking explicitly for a strong carbon price. Saudi Aramco is a very important example. So you're seeing change there, which is really quite striking, but you also see resistance because they built up a strategy, built their assets in a world without strong climate policy, and now they have to adjust to a world with. Some will deny and oppose for as long as they possibly can. Fortunately that's changing. So that's what prompted that particular thing.

On forests some things have been said, but I think the business story is very important. I mean the coalitions that Unilever and other big firms have been part of I think are changing the sourcing, for example, of palm oil and other things. And they're doing it because they believe it's the right thing to do, and they believe that increasingly their consumers will demand it of them. So one way of changing is through the behavior of firms motivated partly by good reasons and partly by pressure reasons, which is also a good reason, but pressure from outside.

I think the whole development story, as Bob mentioned, is extremely important on forests. A lot of this is about improving agricultural productivity outside the forests so you don't have to dive into the forests to make a living and, of course, also organizing forest ownership in a way that the use of the forest is more easily available to the people who live in the moor or close by.

There's one last thing I would make is that one thing that Paris really highlighted in a way that hadn't been before is zero net emissions. And the language of Paris, good language, was a balancing of sources and things and it's extremely important. Were we mad enough to stabilize it 4 degrees? God forbid it would be dead already. But it would still have to be zero net because all the while its zero positive, the concentrations go up so the temperature increases because it's the concentrations -- because zero net means stable concentrations. So whatever temperature you stabilize at, you've got to have zero net. Now zero net for 2 degrees is really 2070, 2080; zero net for 1.5 degrees is probably 2050 plus or minus 5 or 10 years. But that's the kind of ballpark that you're aiming for. And if we want to go zero net, you'd better be thinking about the seas. So I think that that language is going to change the game as well.

Carbon pricing, is it going to work fast enough? No. So I think we mustn't leave off the chase. But there are some things like regulation, procurement, getting rid of coal -- I'll come back to your question on that. Pollution, of course, is a very big part of the story and has changed the game in China already, beginning to change the game in India and other places. And remember, 13 of the 25 most polluted cities are in India, and none of that 25 are in China. That is surely beginning to change.

The gentleman who asked the question about the Asian Infrastructure Investment Bank has left. Homi was standing by the door. He mentioned Homi Kharas and maybe he's talking to Homi

Kharas outside there, somewhere. But basically the New Development Bank, which is the BRICS Bank, and the Asian Infrastructure Investment Bank, prompted by similar motivations, countries outside the rich countries, wanting to take their own initiative, wanting to move forward quickly, wanting to chart their own paths, and seeing that the existing institutions for them were not moving fast enough in terms of scale and not fast enough in terms of governance, and so that was a motivation to setting up those institutions. The New Development Bank, the BRICS Bank where Amar and I and Joe Stiglitz were very involved right from the beginning, announced its first loans in April this year. The BRICS, all the BRICS countries, five of them, and all five loans were on renewable energy. I don't think it's a matter of getting after these places, these new banks, to make sure they behave themselves. They're on a good path, and we should partner and celebrate and share. And I'm not always proud to be British, and I may not be very proud to be British on June 23, but who knows, but we did get after that quickly and it was important. And, of course, we're directly involved as the U.K. -- I mean not me, I'm in a university -- but directly involved in the U.K. in that story. So I welcome, absolutely, these new banks. I don't see them as potential criminals who need corrections. I see them as very good innovations who are thinking about the right thing.

Mitzi Wertheim, on the story and that is fundamental. There are great storytellers. Charles Ferguson is one of them. I did actually give an interview, quite a long interview, to him for that film. It's probably on the cutting room floor.

SPEAKER: I think it is actually. I apologize.

LORD STERN: But never mind, I'm sure -- I haven't seen the movie yet. There are other people like Yaniv Tous Petron who's a great French communicator on these issues in movies. I think the schools are absolutely fundamental. Some part of me thinks the future of the world lies in the hands of the geography teachers at school.

SPEAKER: But they have to have the material that can communicate to nonexperts and not at an 11-year-old's level worldwide.

LORD STERN: They do, but the students that keep coming into our universities that we see are actually pretty good on this stuff. I'm not saying it's easy and there are some people who are wonderful at it. But you've got to remember the problem. We're at 1 degree Centigrade. It's the problem I raised right at the beginning. This is human beings anticipating. It's not human beings seeing all the blood on the carpet. They're seeing blood on the carpet, but they're got to see that in the words of Ronnie Reagan, "You ain't seen nothing yet." This is 1 degree C. We're talking about risks of 3 and 4 degrees C. At 3 degrees C we haven't been at in 3 million years. Sea levels were about 20 meters higher than now. You're trying to get people to imagine something way outside the experience of homo sapiens and where they can see at the moment the rather nasty things at 1 degree C. So that communications problem is a problem of using the human brain to anticipate, and so we have to have the right kind of imagery, the right kind of storyline.

China has in its 13th five-year plan has allocated large sums of the planned finances to dealing with people -- dealing is the wrong word -- helping dealing with the problem of dislocation, helping people into other kinds of activities or where that's impossible, to some kind of social support. The UK has lost its shipbuilding industry. You have to deal with those problems by helping the people who are involved. And, of course, there are many more hundreds of thousands involved in renewable energy in the United States than there are in the coal mines. But, of course, they're different people. You can't necessarily just switch one person into another. So that process of transition is very important. It involves resources. It involves sort of arm-in-arm friendship and support and that should be a part of the process.

I should probably stop there.

MR. BHATTACHARYA: Thank you, Nick. We have gone beyond our time and I sincerely apologize to those whose questions we couldn't accommodate. The good news is this conversation will remain, will continue, and I think as Bob said, I mean the question is how do you keep pressure on real action and how do you find the right kind of circles in which to make it? But this kind of discussion is very important, and we at Brookings are fortunate that we have actually a very good internal team of people working on these issues. But we're also fortunate that we can collaborate with a lot of colleagues outside Brookings and the multilateral institutions as well.

So with that I would ask you to join me in thanking the wonderful panelists we've had.

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