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CHINA'S ENVIRONMENTAL AGENDA: LOCAL TOLLS AND GLOBAL GOALS

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P R O C E E D I N G S

MR. LI: Good morning, and welcome. I'm Cheng Li, director of John L. Thornton China Center here at Brookings. Thank you for joining us this morning.

These days, the environment may not be at the top of our minds when discussing China in Washington. However, the environment is not only one of China's greatest and most complicated challenges, it is also a challenge that is highly relevant to the global community.

Today, our event will explore China's environment agenda and how this rapidly developing country fits into the global fight against climate change. China faces a host of serious ecological challenges within its borders affecting the water, air, and soil. The commonly cited statistics are astonishing. An estimate of 60 percent of the groundwater in China is polluted. More than half of all water resources do not meet safe drinking standards. Sixteen of the world's 20 most polluted cities are in China, a statistic that manifested itself in the drastically increasing number of lung cancers there. About 16 percent of China's soil is polluted, as is 20 percent of the country's farmland.

The Chinese leadership is now taking these environmental issues more seriously. The country has adopted a number of ambitious goals to limit carbon emissions, address polluted water, and shift its energy sources. An interesting development is that Beijing has recently named top leaders in provinces and the cities as heads of the rivers and the lakes. (Speaking Chinese) in Chinese, you never heard that term until a few years ago but this term was created to make these local leaders accountable for water quality.

The U.S. and China are now experiencing environmental issues and weather anomalies. It's not in isolation, nor can either country address them alone.

Yesterday, the United Nations released a landmark report highlighting the immediate consequences of warming by 2.7 degrees Fahrenheit. The project impacts, including worsening food shortages, wildfires, coastal flooding, and a mass die off of the coral reefs, which may be failed as soon as the year 2040.

Our ability to address this common challenge will be critical to shaping the future of China, the United States, and the world. At this particular moment of stress in U.S. China relations, it is especially important to realize where cooperation is not only still possible but absolutely imperative.

We are so pleased this morning to have an excellent panel of speakers who will help us better understand these issues. Their bios are available in the handout. I would like to highlight that two of our panelists, Professor Scott Moore and Dr. Barbara Finamore, who have new books also available outside. Congratulations to you both. And I assume that, Scott, you began this book project as a junior fellow at Brookings. Thank you so much. I'm very happy for you.

Professor Joanna Lewis has been a frequent speaker at Brookings. And welcome back.

Last, but not least, thanks to Dr. Carter Brandon, who has graciously agreed to moderate, as well as speak on our panel. After each of our panelists speak, we will have time for audience questions. And finally, I invite you to join our conversation and follow us on Twitter as our handle #brookingschina.

Now, I will pass this mic to Dr. Brandon.

(Applause)

MR. BRANDON: Thank you very much. It's great to be here.

Before we start a panel, I always like to get a better sense of who's in the

room. So I'm just wondering if very quickly, if you consider yourself somewhat knowledgeable, not necessarily a specialist, but very knowledgeable about China already, just raise your hands.

Okay. So really only a quarter to a third. Okay, good. Welcome those who aren't specialists in China.

How many are very, sort of specialists in environmental or climate change issues? Okay, over half.

And how many are interested particularly in energy? Okay, about a quarter. How many even water in particular? About the same. How many natural resources? Okay, about the same. Good. Maybe the same people; I don't know.

I mean, I'm one of those people who are interested in climate change and environment, so I'm here because I lived in China from 2008 to 2012 with the World Bank, and during that time we had an excellent opportunity to engage with the Chinese Government on their growth path and sustainable development, and I'll talk about that later.

But first, we have an excellent panel, as you heard. Specialist in water, specialist in energy, specialist in climate change and environmental law. So you do have the bios, but I'll introduce first Jennifer. I'm sorry; Joanna. Joanna Lewis, who is a professor at Georgetown University. Her recent book which is out there is Green Innovation in China. I think green and innovation are words that we'll hear a lot about today. So feel free to save your questions until later.

The format will be we'll talk five, seven minutes each of this, have quick questions for clarification, and then afterwards have a panel discussion.

So, Joanna, thanks.

MS. LEWIS: Great. Thank you, Carter.

My book is old now but I'm working on a new one, so I hope to have that shortly for you all.

So I saw a headline last week that said "China wins U.N. environmental award, fires up coal plant production." I don't know if any of you saw that as well. I think we've seen a lot of headlines like this recently and I think this really perfectly captures the contradiction that we're all seeing today in China, because China can, in fact, simultaneously be the world's biggest polluter and the leading developer and deployer of clean energy technologies. And not just because it's a big place, a diverse place, but because of a complex web of competing political priorities, which simultaneously permit both things to occur. And that's what I want to talk to you about this morning.

So starting with the positive side on what's happening on clean energy, I get asked all the time, is China really a leader in this space? So let's look at some of the most recent numbers. China is leading global investment in what is now a $300 billion a year global clean energy industry. China has been, by far, the largest contributor to that total for several years now running. China is now the largest user of wind power, solar power, almost any other renewable energy technology you can think of. In fact, China installed more solar power than fossil power last year.

If you look at what China is actually building -- and I'll talk about the fossil side in a moment -- but China installed more clean than dirty energy in terms of installed capacity, and primarily they're installing wind and solar. Solar actually has been surpassing wind in the last few years.

China also produces and uses around two-thirds of the world's electric cars. And of course, this would be a more positive thing if more of China's electricity

came from nonfossil sources, but this is, of course, emerging technology. China is playing an extremely important role in both manufacturing and deploying.

This, I think, is particularly interesting. China has now 2.7 gigawatts of offshore wind power installed. And I don't know how many of you follow this industry. The U.S. by comparison has a paltry 30 megawatts installed. It's off the Coast of Black Island where I was recently if any of you have been there. So, you know, this is, again, emerging really where wind power technology is going. These are very large advanced wind turbines, and China is really starting to become a leader in that areas as well.

One area that I think is particularly important to watch is that China is also very strong, not just in building these technologies. I think we all know China can build a lot of wind turbines, you know, build a lot of solar panels, but they're increasingly becoming extremely strong at scaling up and commercializing clean tech innovations. So this includes, you know, you can look across the board at metrics that really start to capture this. Like, the value-added that China is adding in the clean tech supply chain, clean tech company revenues, renewable -- or looking at clean tech late stage private investment, the number of mergers and acquisitions, IPOs in this area, the number of publicly traded clean tech companies, and even the number of patents. These are all areas that are increasing rapidly in China. So it's not just sort of, you know, megawatts being added. It's actual investment in the innovation of these technologies, and they're becoming more and more, I think, the global base of innovation in a lot of these emerging clean tech technologies.

Of course, we know there have been some growing pains in these industries. There have been major curtailments and over subsidizations, sort of misuse of subsidization within the renewable sectors. There's a variety of reasons for this. Part

of it is poor market signals. Part of this, I think, is the political power of entrenched legacy industries in China, like the coal power industry. This is not that different than what we see in this country and other countries as well. But I'm increasingly confident that these are being addressed.

To look at the curtailment issue, for example, the first half of 2018 we see curtailment in wind power significantly improved, decreasing more than 10 percent this year in the northern and northeastern Chinese provinces, which have been key for wind power development. So that's actually a trend that's relatively new and is certainly positive because we had a situation where a lot of the wind power that was being installed was not being integrated into the grid.

So I want to now turn to coal and what's going on there. There have been new reports coming out in the media that China is building coal power plants. They've restated the construction of many coal power plants that had been previously halted. By some reports, this construction of new plants is equivalent to the entire coal fleet we have in the United States today, between 200 and 300 gigawatts. And this, of course, is despite government policies restricting the building of new coal plants as part of air pollution, energy intensity, and carbon intensity targets that China has, all of which are quite robust.

So the question is, how is this going to impact China's goal for Paris, for example, to peak its carbon emissions before 2030? I think going back a few years is helpful to give a bit of context of what's happening in China's coal sector. So since 2013, we've actually seen a sizable decline in coal consumption in both the power and industrial sectors in China, which are the two largest drivers of coal demand in China's economy. And this led, of course, many people to say, you know, coal use has probably

already peaked in China, is on a downward trend. This has very positive implications for carbon emissions.

But there are many pressures on China's largest coal consuming sectors to reduce coal consumption. Coal power plants are being targeted by a number of government policies to increase efficiency, reduce pollution. Very soon, if not already, they are being captured by the new National Carbon Trading System, which is going to include the power sector for the first phase, and many energy intensive industrial sectors, including iron and steel plants are being ordered to shut down as part of a broader goal to transition away from energy intensive industries.

So I think what is less clear is sort of whether these trends can continue. We see recent plant operation closures around the country put real pressure on local governments to deal with slowing economic growth, reduce local employment. I think we see often this real dichotomy between what the central government is pushing at the high level, these high level targets, and then the local government's ability to meet them. This is, of course, not new to many of you who study China, but I think it's really interesting to see how this is playing out with these recent coal sort of rebuilding or restarting of construction. I think overcapacity in the coal sector or in the power sector, which is what we've had for the last few years, has put a lot of pressure on coal plants who, you know, they have these long-term contracts. They want to sell their electricity because that's how they make money. But if you have overcapacity, there's preference usually given to the renewable facilities, and then you have this sort of battle between who gets to sell their electricity. At the local level, you have a real interest in essentially using locally generated electricity because of the way that the revenue is collected, and often renewables, unless you live in a province that has strong renewables, you know, in your

backyard, you are essentially being forced to import renewables from other provinces and there can be sort of adverse implications to that from a local budget perspective.

So I think while it would be premature to assume China's emissions trajectory is on a path of long-term stagnation or decline, I do think China is still in good shape to peak well before 2030 due to the numerous energy and environmental policies, which as I mentioned are actually doing quite well, and the increasing share of nonfossil energy.

The last thing I want to talk about before my time is up is about what's happening in energy and climate governance in China. I don't know how many of you are following this, but every few years we've actually seen the ministry in charge of climate change in China change. When I first started working on this a couple of decades ago, this was really viewed more as a scientific issue. Then it was viewed more as a foreign policy issue and sort of moved accordingly to the ministries in charge of these issues. Then, it became most recently an energy and development issue regulated by the National Development and Reform Commission, China's main development ministry. And now it's been moved to this newly created mega environmental ministry for a variety of reasons. You know, I think when climate policy was under NDRC as it was until recently, it seemed like reeling in coal was a priority. This was the government agency that is in charge of approving all new power plants. They regulate energy pricing. So while they weren't a climate ministry or an environment ministry, there were a lot of synergies, of course, between climate and energy policy in China, and having NDRC also cover climate policy I think was really quite powerful. Now we see this shift, and it's unclear whether this new environmental ministry really will have the power to stop the construction of coal plants because, again, that's still a part of NDRC's purview, whereas

the new MEE as it's called, is going to be administering the new carbon market. They have a lot more experience on the emission trading side. So the idea is to do sort of a multi-pollutant control simultaneously, which makes sense for air pollution and sort of co-benefits between air pollution and climate change but can be a little bit more challenging if the root of the problem is really about halting approvals of new plants and trying to get at these tensions that we constantly see at the local level.

I think another area of concern is just how at the local level we have always seen the Environment Ministry very understaffed. And so, again, this is something that NDRC had a lot more capacity, and it's not clear how that's going to ramp up.

So in conclusion, I think a combination of this ministry we're shuffling, and I should say, in addition to the U.S. election and the currents of global politics on climate change have contributed to China's scaling back some of its plans for domestic policies, including its emissions trading system. We've certainly seem bilateral cooperation between China and the U.S. scaled back dramatically under this administration. I know Barbara is going to talk about this in more detail. And so I think, unfortunately, we're in a situation where China is still doing what they can on clean energy, but we are seeing very few countries sort of really ratchet up their agreements under Paris. And of course, with the most recent IPCC report, this is only going to become more important going forward.

So I'll stop there and look forward to discussion. Thank you.

(Applause)

MR. BRANDON: Thank you, Joanna. That was a qualified assessment of will they continue to reduce emissions, continue to reduce the rate of increase and

peak before 2030 or not given the governance in technology and coal investment.

So Barbara is not next; Scott is next. But Barbara will answer your qualified assessment because she just wrote a book called “Will China Save the Planet?”

So anyway, first, we’ll hear from Scott. Scott is a professor of -- he’s a political scientist and the director of the University of Pennsylvania Global China Program. He recently left the World Bank, so he’s an ex-colleague. And we’ll talk about water issues, both local and transboundary.

MR. MOORE: Hi. Good morning, everybody. Thank you, and thanks again to the China Center for hosting us. As Director Li mentioned, I actually started my research on water policy and politics in China as a pre-doctoral fellow here with the China Center. So it’s a real pleasure to be back and be speaking about it, especially alongside some very distinguished specialists who I’ve learned a lot from. And I think we’ll continue to do so this morning in our discussion. So thanks again.

So I’m now with the University of Pennsylvania, and I can’t resist just a very brief plug at the outset to say that we have a new interdisciplinary China program, the Penn Global China program, which I’m the director of. We also have a new center for energy policy, the Kleinman Center for Energy Policy, as well as an even newer water center. So we’re very interested and pretty well resourced in the sustainability area, and I’d invite those of you who are interested in those issues to check us out and follow us.

But with the topic at hand, so I think speaking about energy and climate issues in China needs no introduction in terms of its importance for the world at large. For water though it may be worth kind of saying a few sentences at the outset as to why I think those issues matter for us here, as well as for the planet more generally. And essentially, that rationale breaks down into two parts.

The first of those is that in the kind of water sector, water resource management area, China has probably the world's most ambitious set of policies and initiatives underway to try to tackle the whole range of water resource issues, and those broadly speaking are scarcity, pollution, and quality issues, as well as flooding. And I'll, of course, talk more about what those policies are. But I think even more importantly now, the reason that these policies, these initiatives and China's sort of broader stance on water resource issues really matters is because of the Belt and Road Initiative. I'm sure many of you are familiar with this, but this is sort of the grand concept for China's kind of strategic development policy that envisions building out a lot of connectivity throughout Eurasia. And as part of that initiative, there's an increasing set of investment in water sector projects, especially hydropower. So what we're seeing increasingly is that as part of that initiative, the policies and practices that China has implemented at home in the water sector are increasingly being exported, and therefore, affect countries far beyond China's borders.

But briefly, looking back internally, I think it's also may be interesting to kind of step back and speak a little bit about the significance of kind of water resource management and Chinese politics and in Chinese governance. So I think this is something that's a little bit hard for us to fixate on because in the United States, water management is a pretty niche issue. It's something that the U.S. Army Corps of Engineers deals with, but pretty specific parts of the government. In China, it has an importance that's much broader and it's impacted politics and governance I think to a much wider extent than is the case here. And a lot of that is actually interestingly going back to the Civil War period, pre-1949, a lot of the subsequent Communist Party leaders were guerilla fighters. A lot of the campaigns, really important campaigns in that Civil

War were fought along the Yellow River. And this is a river, a basin in China that has historically been, as many of you probably know, subject to the sort of recurring cycle of flooding and drought, caused immense misery. And as part of the guerilla campaigns that were being waged by the early communist leaders, they became really attuned to these sorts of issues. How do you protect people from flooding? How do you try to alleviate drought? And that interest or that kind of fixation carried over into the post-war period when there was some of the earliest policy conferences that were called under the People's Republic had to do with water conservancy as it was called. Irrigation for the most part and flood control.

So water issues sort of have the salience that's continued into the present day, although now it's mainly in the form of trying to address pollution and scarcity issues that have arose as part of China's rapid development. Many of you I am sure are familiar with kind of the issues around air pollution and air quality in China where that's become a pretty significant political issue that the government has paid increasing attention to in recent decades. That's certainly been mirrored in the case of water quality, and increasingly, you're seeing the government, the part express sort of, I would say, part of its legitimacy or stake a little bit of its claim to legitimacy as being able to tackle those issues and those sort of consequences of economic growth that are seen as very negative.

And so as a result of that kind of set of issues, that salience in sort of Chinese politics, the government's embarked on some really amazingly ambitious initiatives. Probably the headline version of that is something called -- often called the three red lines policy. It's actually technically called the most stringent water resources management administrative system, but most people just call it three red lines or

(speaking in Chinese). And those three red lines are first of all to establish a cap on total national water use. And that's something that to my knowledge at least, no other country has tried to do to really say we're going to set this hard limit on how much water our entire country is going to use. And in China that's been set at $700 billion cubic meters of water per year. That's supposed to be hit by 2030. And in addition to that, they've set targets for water quality, water pollution, as well as water use efficiency. So trying to basically say that you get more economic output for the water that you use. So it's essentially a metric that's R&B per cubic meter.

Again, I don't think any other country, certainly the size of the scale of China, has tried to implement that ambitious a policy. And in addition to that, China has built one of the world's largest water diversion projects, the South-North Water Transfer Project that tries to eventually divert 45 cubic kilometers of water per year from essentially the greater Yangtze basin to the greater Yellow River basin, one of the world's most ambitious infrastructure projects. And in addition, the last thing I'll just mention as part of this whole set of initiatives, Director Li mentioned something called the (speaking in Chinese) or river chief system. This is really an interesting example of I think the degree of attention that the Chinese Government pays to water resource issues because one of the holes in this policy framework that China has established is that as ambitious as it is, it often falls apart in terms of getting different officials at the local level to cooperate with each other. And that's something that in water is particularly important because if you think about a river that flows through multiple provinces, cities, municipalities, you need to have some degree of cooperation to ensure that pollution doesn't flow from one jurisdiction to the other to try to ensure that flood control practices protect everyone along that river.

So what China did essentially is just say, okay, every provincial leader, mayor, now has a new responsibility and that is to manage the water in your jurisdiction. So it's sort of like if the federal government all of a sudden said, governor of Virginia and Maryland, in addition to now being governor of Virginia and Maryland, you are also now responsible for your section of the Potomac and making sure that every mile that the Potomac flows through your state the water is clean, that your state isn't diverting more water than they're licensed to do so. Very unusual policy but I think illustrates just the degree of attention that the government is paying to water resource issues in particular.

So the way that that's increasingly going to affect other countries, that sort of set of priorities and issues, is again through the Belt and Road. At the moment, Belt and Road projects, and it's a very sprawling initiative, so sometimes it's quite difficult to define what the projects are and where the investment is directed. But for the most part, it's been so far directed primarily at hydropower. There are a lot of signs that policies and standards are being put in place at least a fairly broad level to try to mitigate some of the environmental impacts of those projects. But it's still very unclear that those standards will really have much of a concrete impact, particularly because a lot of the way that those standards are supposed to be implemented is through a memoranda of understanding that involve the host government where these projects are being constructed, as well as the Chinese firm that is typically responsible -- primarily responsible for construction. So that gets into the question of do these local governments in places like Nepal or Senegal, do they have the capacity to really enforce these standards and regulations even where they exist?

We do also see a little bit of investment through the Belt and Road and water supply sanitation and irrigation projects globally. But that's so far been much more

limited. Going forward though, I think that's where the greatest sort of potential for Chinese investment lies. Certainly, the need is vast throughout Eurasia and Africa in terms of improving water supply sanitation and irrigation water needs.

So I think that if the kind of standards and policy framework around those water sector Belt and Road initiatives can be tightened up and implemented, they could have potentially quite a beneficial effect. But up till now that's far from certain.

So let me stop there and I'll look forward to some discussion. Thank you again.

(Applause)

MR. BRANDON: Thanks, Scott.

One theme we've heard from Joanna and from Scott also is this tension -- I'm going to bring it up later, and I'm sure Barbara will as well -- between the national government sending these overarching targets and how well do the provinces response. How well or do they even -- or do they try to skirt around the issue.

Okay. The third speaker is Barbara, who has been involved in China longer than most of us. Twenty-five years of being asked what's the difference between NDRC and NRDC. NDRC is a very prominent acronym in China, as Joanna said, is the major development ministry. Anyway, Barbara will talk about some of the issues related to climate change and U.S.-China collaboration. Thanks.

MS. FINAMORE: Thank you, Carter. And thank you to the Brookings Institute for inviting me here today to join this very distinguished panel.

As Carter said, Joanna gave a qualified answer to the question of what will happen in China given all the work it's doing to dethrone Old King Cole and catalyze the clean energy revolution and jumpstart the electric vehicle industry, all chapters in my

book, along with China's leadership in green finance. And the critical importance of this Belt and Road Initiative. Certainly, those competing policy initiatives, the policy priorities that Joanna alluded to do tend to give one a bit of whiplash as these issues move back and forth. It is a pitched battle and even though China has done more perhaps than any other country to lead the clean energy revolution, the latest developments in the coal plants make it clear that this is not an easy thing to transform the world's second largest economy and electric system from one that has historically run on coal to clean energy.

So my book really delves into those competing priorities, the unprecedented challenges that China faces, including the resistance from local government that we heard. And you'll have to read the book to figure out the answer.

But what I wanted to say is this new report that came out yesterday lends an unprecedented urgency to this issue. As we heard at the beginning, in order to avoid the very worst impacts of climate change, and China is one of the countries that's most vulnerable to the impacts of climate change, it is going to require a fundamental transformation in the way that we obtain, store, and use energy. And the good news is that China has already begun that process and brought down prices worldwide. Basically created an electric vehicle industry from scratch -- virtually scratch in just five years to become the world's largest -- is now the second largest leader in green bonds and so forth.

But in order to get to no more than 1.5 degrees, every country needs to accelerate its efforts to cut back on coal to virtually zero by 2050. So China should be working to accelerate the closure of new coal plants, rather than licensing new ones. But the question is whether these coal plants will run, to what extent they will run, and given the rapidly plunging cost of solar energy.

So the IPCC report says that international cooperation is a critical, enabling mechanism for getting us where we need to go and avoid going where we just cannot survive. And so there is a lot, despite Trump's embrace of beautiful clean coal and the slapping of tariffs on China's solar industry and so forth, and abandoning of any form of climate science and so forth, there is still huge potential for collaboration between the United States and China. And includes the United States. States and cities are taking the lead for now. And there is a lot of areas of potential collaboration. But I want to say that my understanding is that, I mean, we were asked to discuss whether China's national goals and international goals are in conflict with its local goals. And I have come to the conclusion that all of the goals that China sets are, including its climate goals, are in its own self-interest. Long-term self-interest. And I would argue that enhancing collaboration between the United States and China is in the long run in each country's own self-interest as well. So right now we're seeing a lot of protectionism, a lot of incrementalism, a lot of obstructionism.

But in the long run, the openness is going to be more strategic in opening up the markets for these clean technologies, including electric vehicles, including solar power and wind. And including building electrification. And shipping, low carbon shipping, a major growing source of CO2 emissions. Heavy duty vehicles. These are areas where the technology has been proven but as the IPCC report says, it's been proven, but at scale, at the speed of the development of these technologies has been incredibly rapid. But to move up to the scale necessary, it's going to require cooperation between the two countries, the two largest greenhouse gas emitters at a minimum because right now, even though the scale of solar energy, wind energy, electric vehicles, heat pumps and so on is higher than it's ever been, it's still only a tiny fraction. So some

of the areas where the U.S., whether it be states, cities, and hopefully eventually the federal government can collaborate with China is on coordinated R&D. Innovation is essential in all of these industries in order to bring the price down.

And sharing of intellectual property, it's already happening. The U.S.-China Clean Energy Research Center is one of the few areas of continuing bilateral cooperation between the U.S. and China on electric vehicles, on building efficiency, on carbon capture and storage. But the countries can do much more. There have been some very good reports on this by the Stanford Steyer Center on solar energy and by the Asia Society, which I recommend to all of you because what they're saying is the countries should work together to expand the market, whether it be by standards, harmonization, by opening the market, by coming up with joint standards, and by sharing intellectual property in order to develop that innovation. Information sharing is something that was at an all-time high under the Obama administration and how has dwindled to almost nothing.

Although I was just at the Global Climate Action Summit in California and was really heartened by all the commitments that were being made by the states, by private citizens, by cities and by private sector. But also, collaboration with civil society. My organization has been working in China for over 20 years. For example, on the shipping industry, we bring the parties together to help strengthen enforcement and incentive programs, and public private partnerships. We work with ports. We work with shipping companies. We work with the federal government and the state governments. Working together is the way to really move ahead to the next level. And China's leadership that we help to promote on shipping then led to international standards, a new international maritime organization requirement that basically requires every ship

everywhere in the world to start using low sulfur fuel starting in 2020. So these impacts can go global, and we hope to see that on each one of these areas.

Innovative financing on solar power. It's the United States that has the lead on innovating financing mechanisms for solar power, but China also is leading the world in green financing, and this can be of very big importance to developing countries and most vulnerable countries.

So all in all, I feel like a lot of what's been happening in China lately on the coal industry, like in our country, is dominated by short-term thinking. You know, China is going to make sure that it meets its 2020 targets for air quality, for coal capacity, for mandatory coal consumption cap, but it figures in the short term it can afford to be a little bit lax in order to meet its economic goals. But what's required for China's own interest, United States' own interest and the future of the planet is to look at the long term, how we can work together to avoid climate catastrophe.

Thank you very much.

(Applause)

MR. BRANDON: Thanks, Barbara. Let's hope you're right. Certainly, a please for these two countries to do more given the current trends.

Okay. I actually had a short PowerPoint but there's no facilities here so I'm going to walk you through visually just a few short graphs.

Now, I mentioned I was in China for a few years, and we were asked by the DRC -- it's called the Development Research Center, which is the -- or Development Research Council, the think tank to the state council to do a longitudinal study of the Chinese economy. The specific question they asked is how can China grow to be a high-income country? This was 2010.

Now, one graph I was going to show you was called the Middle Income Trap. It's not a great economic area of theory or anything like that, but it's an empirical truth. Many, many countries rise to a level of upper middle income status -- think Mexico, Brazil, Egypt, Malaysia, Turkey, et cetera -- and very few since World War II have become high income. Japan was the first in the '50s. South Korea was the second. And then some small countries -- Israel, Ireland, Singapore. Greece just barely made it. So there is this phenomena, and China said we don't want to be like all the other upper middle income countries. We want to be a high income country. How do we do it?

Okay. You know, they have terms like the ecological civilization, harmonious society, but they really wanted to know how do we double income, per capital income between 2010 and 2020, double, and double it again between 2020 and 2030? That's four times growth. Then, they would be high income status.

So we did this great study. Well, I thought it was a great study, but it was also well received. It had five themes to tackle this question.

First, what are the structural reforms? Fiscal mainly, but also financial sector.

Second, which we've heard a lot about is innovation. It turns out that the real key to becoming a high income country is to innovate, generate value added above others to brand your technology and earn what Apple earns on an iPhone, not earn what China earns on an iPhone. The lead author of that innovation chapter is in the back of the room, Shahid Yusuf, so if you have any questions about innovation, you have many experts in the room.

The third topic was green growth. China knew it was the most polluted country on the planet, and it also knew that it couldn't grow to high income status given

the environmental challenges it faced, which Director Li mentioned at the beginning.

Fourth, it had some social imbalances, social issues. If you know China, the hukou system, the social security system, health system, these were all issues.

And fifth, what were China's relations to be with the rest of the world? The kind of issues Barbara was talking about.

So these are the five themes. So I'm going to talk a little bit more about the green growth theme, but it's tied to the fiscal, it's tied to innovation, and it's certainly tied to social. And tied to international.

So first, they were the most polluted country. What were the arguments to convince them that green growth would be good, long-term economic policy? Again, as Barbara said, what are the long-term interests that current trends, which are desperately negative, air pollution is getting worse, water pollution is getting worse, land degradation is getting worse, soil contamination, toxic waste, fishery die off, et cetera, coral reefs. How do we not only level these trends but improve them?

Well, the economic arguments, first, there were inefficiencies in the economy, distortions in the economy. For those of you who study economics, Pigovian taxes, pricing can mop up some of these externalities. There were a lot of gains to be had in terms of wasteful use of natural resources, including energy.

Second, innovation. There is a sense that the clean and green technologies that China could produce would be, frankly speaking, a gold mine. Not every country -- Kenya, Peru -- can't develop a new technology and make a big buck on the world market unless they're really lucky. But China, with the first mover advantage and economies of scale could make a lot of money exporting technologies. We projected that. They quietly asked us to keep it private. They said, we don't want the world just to

think that we're being selfish, but in fact, it was hundreds of billions, if not a trillion dollars in experts of green technologies, such as electric cars and hydropower and efficient coal plants, and you know, not just the construction but the financing and the services and the management, et cetera. So this was a big area of opportunity.

Now, a lot of countries, when they talk about green jobs, realize that they're going to lose some jobs and gain some jobs. So there's this balance to be had, such as in the U.S. We're going to lose some industries, gain some industries. But in China, with this vast export potential, it was a lot of upside opportunity. So that's the second reason.

The third reason, you know, as we lower risks, better management of environmental issues, you have fewer floods. You have -- well, floods is one example, but disruption of supply chains, et cetera. So you can manage your risk which has a direct economic gain.

Fourth, which is completely obvious, but less economic in a way, is the public health benefits. Now, when we first -- we, the World Bank before I was there -- first started to value the damages because of air pollution, it was estimated about 750,000 people would die a year from air pollution in China. They were very sensitive about that. They asked us not to publish it. They said we don't care if you publish the economic value of the damages, but we just don't want you to talk about people. So we published the economic values, and of course, smart people very quickly said, well, the statistical value of life, that means 750,000 people are dying every year in China. They had a fit. This was 2008. By 2012, we apologized and said we're really sorry. The number wasn't 750,000. It was actually more like 1.2 million. It was going up. WHO was on board. The Chinese universities were on board. We had workshops with the 100

most polluted cities in China every year. They were on board. Quantifying, measuring, getting the cities and the mayors behind us led Li Keqiang, now premier, deputy premier at that time, to say the war against pollution is equivalent to the war against poverty. This was 2014.

So there was real progress. They went from saying we can't acknowledge the problem to we can master this problem. And they put targets in the five-year plan and the five-year plan is incredibly powerful.

And then the last reason why we argued economically for this improved sustainable development has to do with natural resources and ecosystem services which are your water, your agricultural land, your forestry, your fisheries, all the stabilization, carbon sequestration, all these services that are essentially nonmarket, but they add up and the appreciation grew.

Now, in 2012, my prediction was China would do pretty well on the pollution problems because they're easily quantified. The government is full of engineers. Technology comes to the rescue. And in fact, they've done, you know, they've tackled, like we've heard from Scott on water, they've tackled air pollution phenomenally. They're not there yet. But my pleasant surprise is they've tackled natural resources as well. Massive schemes to promote ecosystem services, to promote land stabilization, to reforest, to preserve biodiversity. Again, they're not there yet, but these targets are incredibly important.

So when we quantified all these damages and I had a list of things that we quantified, yes, we could show empirically China and also India slightly behind as the most polluted country, and the value of these damages were around nine percent of GDP. And the value of the damages that are faced in the U.S. or even Japan or even

Germany or South Korea were much less, say on the order of one to two percent of GDP.

So the agreement was, not with us but among themselves, was we can meet those rich, high income countries. Benchmarking these countries was very powerful. We want to improve our environment to be commensurate with Japan, Korea, U.S., Germany, et cetera, and we had a plan. Because then by quantifying it you can break it down. So much is energy sector, so much is water pollution, so much is fisheries, et cetera, forestry, and they had a plan by 2030, and it has been a very useful roadmap. And again, that's what in my view led the government to recognize these issues and to increasingly quantify.

So that's basically my summary that the nexus between environmental issues and economic growth is clear. The nexus between local environmental issues, which are their own pollution that affects their own people, the water scarcity, the water pollution, et cetera, is clear. The nexus to climate change and carbon emissions is kind of clear. Why? Because China is now the biggest emitter by far. And climate change is affecting China itself pretty severely already. So what we would say in China was climate change is, in fact, a little bit endogenous. They are, in fact, affected by their own carbon emissions much more than any other country. So they have that environmental incentive to do something about climate action. Not just generally the world is not prepared for passing the two degree world. They don't want it for themselves knowing what the impacts will be.

So we have this nexus between local environmental issues, global environmental issues, and governance. Now, is it working all that well? Not yet. You've heard some examples, kind of mixed examples. We have mixed collaboration with the world. We have mixed energy implementation. We have some new water targets. I'm

going to ask Scott, how the hell are these national targets going to filter down to local managers? But we have some clear pathways.

So with that, I want to thank your panel. Why don't you please come up and we'll open it up. And if the room is silent, we will start asking each other questions.

(Applause)

MR. BRANDON: Okay. I saw one hand here, two hands here. Okay, great. Please.

SPEAKER: Hi, Carter. Hi, Barbara. Hi, Joanne. I don't know Scott.

One thing I didn't hear you touch on was the role of China and its development and investments in poor countries, and particularly in Africa. And from my work there, China has a pretty bad image. And specifically, while I've never confirmed it, I'm told they're dumping some of their polluting industries as they get shutdown in China and just shipping them to Africa and Sri Lanka and other countries. So just interested to hear your comment on that.

MR. LI: Thank you. Will you please identify yourself?

MR. MILLER: I'm Alan Miller. I'm retired from the World Bank and IFC.

MR. BRANDON: He was number four but go ahead. We'll take four and then we'll break.

MR. ROSE: Herb Rose, number four.

I wonder, you mentioned innovation as one of the elements important to rising to the top tier level of a developed country. And I wonder about the theft of intellectual property and how much that has contributed, such as patent infringement, things like that in that development and whether or not you can expect this to end in the foreseeable future.

MR. BRANDON: Thank you.

Over here?

I had the same question by the way.

MR. ANDREWS: Hi, my name is Steve Andrews with the Congressional Executive Commission on China. Thank you for the great presentations.

My question is, there's been a lot of sort of concern about sort of the shrinking space for the media in civil society in China and the sort of criticism that a lot of China's environmental protection efforts are top down. And so sort of looking back at Taixing and under the dome, that seems like a big tragedy to me. But even more recently we saw with Nur Bekri, the deputy director of NRDC, as well as the director of NEA, he was extra legally detained just last month, so he was in charge of the co-policy. Very little independent reporting on why. And just last week, Victor Mallet from the Financial Times, he was denied a visa in Hong Kong. Not environmentally related but clearly an indication of the difficulty of independently reporting on China. So I was curious if you could comment on that. Thanks.

MR. BRANDON: And there was one more over here. Yes, please.

MS. FAISEL: Thank you. I'm Marina Faizel, an Afghan-American journalist. A couple of questions.

One, I think, Scott, you mentioned about the unusualness of the new strategy to really bear down on a local level to hold local officials responsible for stretches of rivers and qualities of water. And that brings to mind the whole Michigan water problem and now the U.S. administration's stepping back from commitment to environmental issues. Isn't democracy about holding local officials responsible for the provision of goods for their people? Could you put that in context and compare the two

systems?

And my second question is about the One Belt, One Road Project. Afghanistan has had in recent years some struggles with Iran with its efforts to build new dams and those efforts have become points of contention with Iran, for example. China has been involved in various projects in Afghanistan, including Mes Aynak, the copper mine that sits on top of Buddhist civilization artifacts that really should be kept for preserving Afghan culture. And yet, that's a point of contention, of course, because the costs of getting involved on that level need to be spelled out and China largely is reluctant to get involved in issues that might become difficulties between the varying sides in Afghanistan, the Taliban. Obviously the Buddhist remnants under Mes Aynak is part of a legacy that outdates the legacy of Islam in Afghanistan. How does the cooper excavation and doing right by Afghanistan's culture and legacy, and looking into the future how this country can be brought into the One China, One Belt Road can be tied into this? Thank you.

MR. BRANDON: Great. We have five great questions if you count her two, so let's just go down the line.

MS. FINAMORE: Yeah. There is -- I'd like to talk about this Belt and Road Initiative because your question, Alan, about the Chinese investments in Africa are very much tied into that. So for those of you who aren't aware, and Scott did mention this briefly, this is perhaps the largest infrastructure investment program the world has ever seen. The estimates of the total investment by China range from $1 trillion to $4 trillion to $8 trillion, and we shall see what it ends up with.

But the Belt and Road Initiative as China envisions it covers 70 countries in four continents, including Africa, including Central Asia, and together these countries,

including China, are responsible for 60 percent of the global carbon emissions. So how China uses this investment, what it focuses on, is it clean technology or is it, in fact, dirty technology dumped by the industries that are being shut down or restricted in China is going to really define and determine to a large extent our ability to make global carbon goals.

And so, in fact, since 2000 to 2016, China has invested quite a bit in coal plants in other countries. And so this is a disturbing trend. In recent years, China itself, or leaders in green finance in China admit that emissions from these investments could be triple those of China if they're not transformed to clean energy. I would hope that as the economics of solar and wind power continue to improve and the costs continue to plummet, the recipient countries will recognize that it's in their own interest to look for clean energy investments rather than coal power. Coal power is not going to solve energy poverty problems around the world.

In fact, some have estimated that it's soon going to be cheaper to build new solar and wind plants around the world than to buy the fuel for coal plants. So China is in the process. They have said that they're developing standards for their overseas investment. We hear reportedly that they're going to be mandatory rather than just guidelines which they are at the moment. However, even if they are mandatory, enforcement is always going to be a very key problem. So that's why groups like ours have launched a green Belt and Road Initiative. Like our Coal Consumption Cap Initiative, it's bring together key stakeholders within China to try and develop local champions for greening the Belt and Road Initiative. But it's a long way to go as Carter said.

One promising fact is last year, China sold $8 billion worth of solar

equipment to Belt and Road countries. Now, that may not seem like much, but that alone made China the leading provider of environmental goods and services in the world. So hopefully, this is a trend we'll see continue to develop. But again, I would reiterate that greening the Belt and Road Initiative and doing the things that you've described as well as in China's own self-interest because of its impact, the impact of climate change on China itself, because it is a world leader in technology. Also, in energy efficiency. The cheapest, cleanest, fastest form of clean energy. And so I would hope that again, these long-term interests are going to be the determining factor as we go forward.

Do you want to add?

MS. LEWIS: Yeah. I'll add my just two cents on that and then maybe talk a bit about the IP question that was raised.

So, I mean, I agree with everything Barbara said. I would just maybe add that, you know, China often is coming to a lot of these developing, emerging economies with technology, with very good rates of loans and capital. And occasionally, yes, China has sort of, you know, they run the gamut of technology. Right? Like, they have expertise in low efficiency coal power plants. They also are building some of the most efficient coal plants in the world. And I have some students who have been, this summer, just got back from doing fieldwork in Vietnam and Indonesia and elsewhere talking to these governments about, you know, when China sort of approaches you, who is it who is sort of making the decision about, you know, do you build a low efficiency coal plant? Do you build a solar plant? Do you build a hydro plant? And it's often the country's choice. Right? I mean, and I think that's part of the issue. Where if you look at the plans that countries like Vietnam have in terms of the coal plants they want to build over the next 10, 20 years, it's astronomical. Right? So even if China is going to be

building fewer and fewer, the plans, you know, these countries essentially look at the old China model and they say we want to do this. Right? We want to copy what China did. And raise our, you know, build our economies in this way. And they, often it's their decision. Right? And China just says, okay, well, we have, you know, a low efficiency coal power technology we can sell you. We're not allowed to build it anymore in our own country and so we'll give it to you cheap. Right? And so I think this is actually part of the problem. So not to let China off the hook, but I think this is a bigger conversation about how recipient countries can also be encouraged to look for the greener option. And a lot of that is a role the World Bank and others play, and increasingly, hopefully China's own International Development Banks about covering incremental costs or putting standards in place that would help provide low interest loans and stuff for the greener option.

On the IP question, just briefly, it's obviously a very complex issue. A lot of my work looks at within China's clear energy technologies actually tracing back to where they got the knowhow, the knowledge. Part of that is IP. Not the entire part. Right? I mean, there's only so far you can go with like a stolen blueprint. I mean, often we see in these technologies a lot of the actual valuable information is in what we call the knowhow. It's the more sort of qualitative, you know, how do you run these things? How do you make sure that it's not just the, as we call it, the hardware; it's the software and the sort of the more -- the broader environment in which these technologies are implemented. And so you can almost always trace China's acquisition of knowhow in these industries to something very straightforward, whether they went out and purchased a German engineering firm that was going bankrupt and used that to build up their own expertise in wind or solar technology. You know, there's great examples that I looked at in my research in the wind power industry where one of the leading Danish wind turbine

manufacturers, when they went bankrupt in 2003 and Vesta was acquired, what was left of them. This was NEG Micon. You know, they essentially, rather than hiring all the hundreds of staff in China that they had trained, they just let them go and all those people now, you know, are running some of China's most powerful wind companies because they had been trained by Danish engineers for decades and, you know, had the real expertise. And so, again, there's all kinds of forms of technology transfer, knowledge transfer that China has played a role in. And I think, you know, that's not to say there aren't still problems with IP theft. Certainly, many of these cases are documented, but there are fewer and fewer. Particularly, as China companies have IP to protect, they are putting much more pressure on the government to have better IP enforcement at home.

MR. MOORE: And I'll touch on the two questions that I think kind of revolved around local impacts of Chinese finance projects and the sort of Belt and Road more generally.

So my book, which actually I didn't talk that much about in my presentation, but it tries to explain why and when you get water conflict. Conflict over water. And the basic premise is that although a lot of times we think and talk and hear about the prospect of countries fighting over water, having conflict of some kind over shared water resources, that's actually both rare and unlikely. And in kind of contrast to that, conflict at the subnational level is completely pervasive, especially if you broaden the definition of conflict to mean not just forms of violence or warfare or anything like that but also political, judicial, rhetorical conflict. We have plenty of examples of that in the U.S. The southwest, as well as the southeast now more recently.

And I look at cases in a couple of countries. China is one of the most, I think, theoretically important though because it provides a number of interesting

examples where you have these types of conflict that occur, especially between provincial and local governments, and most particularly over pollution. Sometimes construction of a dam, something like that. But that occurs under a very centralized, authoritarian system. And I became really interested. You know, why is that so pervasive under this system? And a lot of the kind of my answer revolves around how kind of emotionally and politically resident water issues are even in contrast to other forms of natural resources, other environmental issues. There's just something about the kind of power of -- and this certainly gets to an issue like Flint -- that kind of politics go way beyond in some ways like the technical issues involved in water. They really are emotionally resident in a way that most of their policy areas are not.

And so I think when we think about the local impacts of investment projects, particularly in the water sector, that's really where I think to my mind a major risk in terms of the Belt and Road Initiative is that it will inevitably draw China into contact with these local conflicts. So again, I focus particularly on water. So I think those issues are particularly kind of in the forefront, but I think mining is another good example of lots of concentrated, often negative local impacts. So if you don't have good standards in place, I mean, this is something that at the World Bank, you know, we've spent decades trying to get right. I'm sure many people would argue, you know, we haven't quite gotten there despite that. But having standards, procedures, regulations in place, having mechanisms to consult the affected populations, all of those things, you know, it's not clear that there's a robust process for doing that for most Belt and Road projects. And it's difficult to generalize because the Belt and Road Initiative is so sprawling. It involves a lot of subsidiary and parallel initiatives. I mean, it's very hard to speak about it in one breath, but what I can tell you, and getting to the specific example of Africa and sort of local

pollution impacts, things like that, there are at least project level regulations in place very often. So one that I was particularly struck by, supposedly the Water Port Free Trade Zone, that's sort of one of the poster child Belt and Road Initiative linked projects in Pakistan, they've instituted a requirement that any enterprise that wants to set up in that zone has to pass an environmental audit and an EIA. Now, what that means, what it looks like, how rigorously it's applied, all open questions, but theoretically, that provision does exist.

The final thing I'll say just on this is, and again, I'm going to focus on what I know, which are water sector projects, the way that the Belt and Road kind of investments are shifting, you tend to see most projects that sort of have a public good component. So things like drinking water and sanitation projects, or irrigation projects, they tend to be basically like sort of ancillary to big highway, railroad, or pipeline projects. So they're almost local compensation for the effects of those bigger projects. And so they've sort of been approached more as like compensatory policies. I think going forward it would be a shame if that continued to be true because the investment needs in those sectors -- clean water, sanitation, irrigation modernization in Belt and Road countries are just really enormous.

And one very final point in that, you're also seeing an increasing number of transboundary projects as part of Belt and Road. So the hydro projects are the most evident example, but there's also a really interesting one that's in Ethiopia, Djibouti water supply project. And it involves a diversion for supposedly enough water to supply 700,000 people in Djibouti from the highlands of Ethiopia. That's not a region I know terribly well, but I would guess that there are some fraud issues there. And those are the types of things that I would expect to increasingly complicate and challenge BRI going

forward.

MR. BRANDON: Just to add quickly, when you think about this little bit on China in the development space helping other countries, when you think about who's involved, well, certainly, there's the Chinese Government with its own bilateral investments. A lot of Belt and Road. It's pretty opaque. You know, it's not like they've adopted international standards, international policies. So coming from the World Bank, what is our strategy to help countries? It is to strengthen the capacity of the recipient country, whether it's Pakistan or Nigeria -- it doesn't matter whom -- in terms of what would you expect financially? What would you expect contractually? What would you expect environmentally, et cetera?

Now, the local capacity is never going to be perfect, and certainly, there's no lack of corruption in the world, so the deals are never going to be completely transparent. But we at the World Bank do want to strengthen the role of countries themselves to better understand and monitor investments being made by China. So, but we've heard a couple things.

First, a lot of the Belt and Road -- most of the Belt and Road are loans. They're not grants. So price is a factor. So I forget who said that cheaper technology is often what the country might want. So that's one issue. And then that gets to what are the environmental objectives or targets of the country itself?

So that's the bilateral program. But China, you've probably heard of the China Infrastructure Investment Bank. That is a multilateral bank, and they are fully endorsing World Bank and international standards in what they do. So if you go from the Chinese bilateral to the Chinese multilateral, it's a different world. So I give them credit.

Third, on the private sector side, there's a million corporations in China

that are investing in, you know, it could be anything from a tannery to a steel plant in Africa or Asia or elsewhere. It's very hard to get involved from the Chinese end in the private investment side in the corporations. So again, the burden is on the environmental impact assessment and the local consultation or whatever procedures in the recipient country.

But the fourth actor in all this are the banks who might be financing those Chinse corporations. And there's a limited number of Chinese banks. I don't know what the number is. It's probably either eight or 10, maybe 20. But it's a limited number that are financing Chinese investments overseas. And that is a control point where we've engaged, and not just the World Bank but others, in working with the banks on what our minimum environmental standards they would expect in their investments. And the banks have an interest in cleaning up their investments because of their downside risk if things go wrong on the pollution side.

So I guess what I'm saying is the banking system is quite progressive in helping. The Chinese multilateral engagement is quite progressive in helping. The Chinese bilateral engagement, less so and much more opaque. And The Chinse private sector, also less so and much more opaque is my quick summary.

We didn't talk about NGOs and civil society I think was one of the questions. I don't know if -- it's not going in the right direction in my view as the question said, but you're more recently involved.

MS. FINAMORE: No, that's right. And back to this IPCC report yesterday, they also emphasized the vitally important role that civil society can play, must play, has to play in climate issues worldwide. And this is no less true in China than anywhere else. So I could speak from the climate environment point of view.

You know, the good news is the public is concerned about climate change, and I think in large part that's because of the state-controlled media. We don't have the on the one hand, on the other hand media here where there's one scientist here and thousands over here. But oh, there are still questions on climate science. Okay, or junk science of our current administration. So people are concerned. And I think, of course, they're concerned about air pollution. And so what we saw I think that's very telling here is that at the end of last year, the last day of the year was when the targets that China set in 2013 for the air apocalypse had to be met. And China went way out of its way to ensure that those four-year targets were going to be met to the extent of shutting down a large fraction of the country's steel and aluminum production, which is short-term thinking again, as well as trying to address the issue of dispersed coal, coal burned in homes and small businesses around big cities like Beijing. And so this is important, that 20 percent of China's coal is used in these small scale uses. And China tried to shut that down in order to clean up Beijing's air pollution, to the extent that last winter there wasn't alternatives available, enough natural gas, or it was too expensive and so forth that a lot of communities were freezing.

But that shows something to me, that they are serious about because of the public concern about air pollution. And let me just say that's why I think this building heating collaboration is so important to bring down the cost of electrifying the building. But I think what we see here is China does recognize a role for NGOs, both local NGOs and foreign NGOs like mine, although it wants to, and is increasing its control. So NGOs, like mine, have had to register in China and, you know, and share our activities every year in plan and so forth. But I have to say so far we still see that the government recognizes the important role that groups like mine can and are playing in collaboration

with local NGOs, like Ma Jun's IPE. So we are moving -- we've been working with them for years on environmental issues. They use publicly available data from China and publicize that and the public helps to collect that data. And they are even sharing this collected data with Chinese banks so that they can look at these companies and say, wow, this company has a very bad environmental record. I don't think I'm going to work with them. Things like that. And the government recognizes that groups like Ma Jun's can work with local NGOs to help with enforcement of things like the New Blue Sky Plan that was announced this year. It's running for three years, with its focus on heavy-duty vehicles. The central government simply doesn't have the enforcement capacity to implement all of the initiatives that it's come up with on the climate and the environment.

So that's where we stand. It's a mixed bag, of course. But I think the public concern on climate and support for clean energy and concern about climate is still coming through and the government recognizes the valuable role even as it seeks to control it.

MR. MOORE: Carter, maybe if I could just -- a quick -- because I realize I totally didn't address your question, but I do think it is a very important one because I think that while it's very clear that the space for kind of civil society in China, meaning nonstate party affiliated civil society organizations is shrinking dramatically, they're still like filled by like an environmental bubble. So there is still more freedom and kind of emphasis on some type of participation. Social participation is probably a better phrase than like civil society participation in environmental protection efforts.

And so as Barbara mentioned, there's very much the sense of state capacity for enforcement and supervision is too weak and that it can be complemented by, for example, in the water sector, an interesting example is there's the spread of like

apps where you can basically like tag polluted waterways. And then within a matter of days you're supposed to, and at least I'm told, very frequently do get a response from the local Environmental Protection Bureau of whether they concluded that it was polluted and what, if anything, they're doing about it. So I do think it's still a little bit of an exception to the broader trend which I think in the case of the chief of Interpol, you need no better illustration of where things are headed at some level.

MR. BRANDON: I'd like to go back to -- yes, please?

Is there two or three questions? We have one, two, three, four. Great. Please.

MS. JOHNSON: Hi. My name is Blaine Johnson. I'm an analyst at the Center for American Progress. And I'm hearing a lot of counter arguments to what you're presenting that involve positioning, cooperation with China, some sort of Trojan horse where we might work together on climate change and all that, but as some folks pointed out, there are some examples from past engagement with China where it has resulted in an erosion of fair competition or compromising values like human rights and those sorts of things.

So I'd ask, how would you respond to those counter arguments? And what sort of checks need to be in place when we engage with China on issues that you all have highlighted to make sure that we're not compromising our values?

MR. BRANDON: Yes?

MR. KAMENSKY: Hi, Jack Kamensky with the U.S.-China Business Council.

A lot of U.S. companies with investments in China are leaders in environmental technology. For example, ways to reduce emissions from manufacturing

or water treatment. I just wanted to hear your thoughts on what you think the role that industry, specifically U.S. companies in China should be playing in environmental protection there, especially in this environment with increased U.S.-China tensions and concerns over IP. Thanks.

MR. MEYERS: Hi, Leo Meyers with Bank Information Center.

We are seeing China kind of cultivate a relationship with Israel, in particular in reference to innovation and technology. I was wondering if any of you had any thoughts or insights into that newly found relationship.

MR. BRANDON: I think over here.

MR. BURKE: Hi, Chris Burke with Congress and Bill Keating's office.

I have a question about ozone depleting chemicals. There was a set of stories this summer about how some of the chemicals may not have been phased out in China and the use is still occurring. And the question about either a lack of will or a lack of capacity to enforce kind of the international agreements on this. I wonder if any of the panelists would like to speak about how accurate do you think that kind of story is, or was it -- and then how does the government kind of handle that, which kind of brings us to part B of the question.

With the decline in the availability of outside kind of reporting, what are the good sources to find out what's really happening from say Washington, D.C., if reports are being censored or if reporters are being shut out, how do we know what's going on?

MR. BRANDON: Thank you. Well, we'll take a few of those now.

I know a lot about the ozone issue so I'll give a summary but we can talk later.

And the first couple of questions are still getting back to this idea of intellectual property, Trojan horses. No one actually addressed the current Trump --

MS. LEWIS: I can talk about it.

MR. BRANDON: -- push. You know, Trump, we think, thinks a lot about goods -- more than goods and services, just plain goods. But behind it is this idea of let's change the rules on intellectual property in China. So I wonder if you could talk about that a little bit and then we'll continue.

Maybe Joanna, you can start.

MS. LEWIS: Sure. Happy to.

I mean, I think what's interesting about sort of where you would say the Trump administration is on U.S. China, and I should actually say if you read Vice President Pence's speech, if you missed it, the transcript is available. I think in reading his position, at least the part of it that it gets at the trade-related issues, the issues about IP, about protectionism, these are actually not particularly partisan issues. I think this is actually an area where democrats and republicans are pretty much in agreement. And a lot of this language was actually part of the Obama administration bilateral discussions with China where the lists of things, right, that you're always trying to bring up, it's always about IP. It's about market access for U.S. companies. I mean, the issues have not changed. Right? It's the approach that's changed. Which gets at this question about, you know, so how do we engage with China? And either not compromise U.S. values as one of the audience members asked, and what is the role of U.S. companies in this?

So I think my issue with the current engagement is, again, it's not the kind of laundry list of things the U.S. would like to achieve, because these are actually important for the U.S., for China, for everyone, for the global regime. It's how we are

getting there. And basically, our current strategy of engagement is it's not engagement. It's, you know, it's essentially we are waiting. We just sort of put these tariffs and whatnot in place and then sort of hope that China says, oh, okay, you know, we've changed our domestic IP laws. We're just going to, you know, all of a sudden completely reform everything we're doing. I mean, I just think it's unrealistic. And not only that, it ignores the true need for capacity building on a lot of these issues in China that we were engaging on and now we're not.

You know, our top government intellectual property lawyers in this country were having very active dialogues with their counterparts in China on how to increase China's protections of IP which, you know, again, like very nascent. Their IP laws are just not as advanced. Their legal system is, you know, Barbara can speak to this more as the lawyer in the room, but this is actually an area where we were doing very positive capacity building, having discussions among lawyers, not just government bureaucrats but people who actually enforce these things in the courts. And there is a new generation I would say of Chinese lawyers. I engage all the time with lawyers being trained in China who are litigating in the clean tech sector who are looking to protect, again, Chinese companies who are competing with other Chinese companies. So this is really an emerging area.

I think it hurts us to not have these dialogues to get to sort of the last question because this actually is where we get a lot of our information, our ground truthing about what's really happening. You can't just read the state media and expect you'll get all the information. Right? A lot of the information we get as people who work in China is by spending time with our counterparts, with colleagues on the ground. And if we are sort of making it harder and harder to do that, that actually makes it, you know, I

think that really -- it affects China's ability to implement a lot of the changes that we actually would like to see as a country. So I don't actually think the goals are that different. It's really, as I mentioned, the ends to that. So I'll stop there.

MR. BRANDON: So a few years ago I remember IBM built a $400 to $500 million center in China to research clean cities and GE had a research center. What is your advice for American companies, either to try to take R&D operations to China or just to do business?

MS. LEWIS: I should mention, by the way, for people interested in this topic, there's a conference tomorrow I'm speaking at in Washington. The University of Chicago is convening on clean energy R&D and innovation. So if you're interested, there will be many other experts there.

But, you know, there's a reason why U.S. companies and other multinational companies are setting up huge R&D centers in China. It's because that's where the market is, and increasingly, that's where the expertise is. That's where the engineers are. That's where the mind power is. And, you know, it's not here. We could be setting up these centers here. And so I think this is, again, you see these companies acting with their fee. Yes, they have to be aware of concerns about technology appropriation, but I think usually these companies are very smart about how they do business there and the tradeoff is worth it because the market is just so valuable. Right? And you know, no one is twisting their arms to be there. You know, most U.S. companies that I have spoken to are not very happy with the current approach to things in China because it's not benefitting them even if that's the line that the administration would give as a rationale for current actions.

MR. BRANDON: Okay. I just realized we're running out of time. One

minute each.

MR. MOORE: Maybe just a very quick --

MR. BRANDON: Sure, please. Go ahead, Scott.

MR. MOORE: Okay, sure. So, yeah. So it was a really good last set of questions.

Even though we're talking here about environment, we can't and shouldn't ignore the fact that we're at a really, really low and dangerous point I think in U.S.-China relations, and that definitely suffuses a lot of things, including environmental issues. I would say that, you know, a lot of the issues we talked about, IP, some of the human rights issues, the result of that has been that the traditional pillars of support for kind of sustainable and moderate U.S.-China policy have crumbled in the last few years, so I think there's really not a lot of support for a more moderate policy, including one that involves dialogue or communication, cooperation on environmental issues. And I think that sort of underpins some of the things that we talked about.

I used to be at the State Department, and I think about that issue with respect to, you know, on the worst day when it came to cyber or South China Sea issues, we still had the bright spot as we called it of U.S.-China climate cooperation. Now we don't have anything like that. So whether it's climate change or something else, and certainly, I think this administration would argue it should be something else, but I think the value of having some kind of bright spot is really important.

The last thing I'll just say, and I'll certainly end on this, the question about Israel I think actually is significant because even as we sort of in the U.S., we've really kind of pushed to one pull on the IP issues and said, well, the threat of kind of violations or theft means that we need to dial back investment. We need to start limiting Chinese

student visas and things like that. Israel has, as far as I can tell, I'm not an expert, but they've sort of gone the other way and made what seemed to me from an external point of view some really interesting bets. Like, they opened a biotech focused R&D center in Guangzhou, and I do know enough that Israelis are pretty sophisticated when it comes to security issues, when it comes to IP issues, so you know, if they're sort of making this play, I do think there are still some significant benefits for the U.S. to be gained if we kind of approach these issues in a limited and sort of targeted, maybe sector by sector basis. And you know, I would argue that environment should be a real focus of that given both the market opportunity and obviously, importance to the planet.

MR. BRANDON: Thank you.

Barbara?

MS. FINAMORE: Just really quickly, when we talk about China cooperation with other countries, not just the U.S., I want to emphasize that it's not just coordinated R&D. It's not just innovation and IP issues, but really there's expanded scope for cooperation on policy solutions. And I think at this point China has built so much solar and wind that the key issues are, how does it make the structural changes to its power sector in order to fully integrate and accelerate the penetration of renewable energies here?

And countries around the world have been experimenting. These are issues that every country faces right now. The grid of the future, how to make grids more resilient, more flexible. How do you integrate storage, whether it's pumped hydro or battery storage? How do you incorporate demand side resources in order to really scale up wind and solar to where it needs to be. I mean, the IPCC report says renewable energy has to comprise 60 to 85 percent of our total energy mix by 2050.

So I just want to say, this is another area where California just is taking the lead on that, but many states in the U.S. are experimenting, but many other countries as well. So I think this is an area where China is going to need that cooperation in order to make that final push to transition away from coal.

MR. BRANDON: So we have a lot of consensus here that China needs to do more. They probably will. I can tell you from the World Bank in the early '90s, there were a lot of attacks to the World Bank. There was a campaign called Fifty Years is Enough. And what really opened up the World Bank was a lot of the environmental debate, transparency, safeguards. So environment can be a leading issue across development and across growth and across equity and social issues because it touches all those.

So if you heard a sense of optimism, in spite of what Scott said, that U.S.-China relations are really at a low point, but if you heard a sense of optimism, the environment can't wait. They are powerful sources. And unfortunately, we are also in a very bad place on the environment as we heard just a day or two ago. So if there's a point of optimism, it's got to be in the case of the environment.

Let's take the ozone issue offline. The Montreal Protocol was a very successful international agreement. It went from CFCs to HCFCs to now HFCs, but that middle category, which we thought was being phased out, you can, by studying the ozone layer and the ozone hole, you can look at residues. There's more than there should be, so there's allegations that China has been cheating on this. Under investigation. So I don't have a bottom line, but certainly, the world is wondering, is this a case where has China cheated in spite of all the money they've been paid to reduce their chemical footprint? So that's a very interesting but technical issue.

I'd like to thank the panel. I'd like to thank Brookings. And I'd like to thank all of you for coming. Thank you.

(Applause)

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