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CHINA'S ENVIRONMENTAL CHALLENGES AND U.S. RESPONSES

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FIRST SESSION

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CHINA'S ENVIRONMENTAL CHALLENGES AND U.S. RESPONSES

TUESDAY, SEPTEMBER 21, 2021

CONGRESSIONAL-EXECUTIVE
COMMISSION ON CHINA,
Washington, DC.

The hearing was held from 10:00 a.m. to 11:56 a.m. via videoconference, Senator Jeff Merkley, Chair, Congressional-Executive Commission on China, presiding. Commission members present: Representative James P. McGovern, Co-chair, Senator Jon Ossoff, Representative Tom Suozzi, and Representative Michelle Steel.

OPENING STATEMENT OF HON. JEFF MERKLEY, A U.S. SENATOR FROM OREGON; CHAIR, CONGRESSIONAL-EXECUTIVE COMMISSION ON CHINA

Chair MERKLEY. Good morning. Today's hearing of the Congressional-Executive Commission on China on "China's Environmental Challenges and U.S. Responses" has come to order.

The United States and China face many challenges related to the environment, from protecting air and water at home, to global action to address climate change. This hearing will expand the Commission's understanding of these issues at a critical time. We are less than six weeks before the world meets in Glasgow for COP26, the pivotal United Nations climate conference. The events of this summer demonstrate the ravages of climate chaos, from the deadly flooding in Zhengzhou in central China to raging wildfires and heat waves in the American West. And as the world heads into COP26, we face a stark choice: We can take urgent, bold, transformative action to transition to clean and renewable energy, or we can resign ourselves to ever-worsening impacts to our lives, our livelihoods, and our economies.

Each of us has to do our part. Governments, especially China and especially the United States, must come to Glasgow ready to do their fair share. This hearing will shed light on the status of China's climate commitments and compliance, as well as other pressing environmental issues such as the fight for clear air and clean water; the actions of non-governmental organizations to push for local accountability; the effects of climate change, grassland management, forced ecological migration, and mining on Tibetans; and the downstream effects of Chinese dam projects on other countries—those are hydro-dam projects.

This Commission is dedicated to faithfully and accurately reporting on all the issues we cover, including the environment and climate change. And this hearing will provide perspective on areas of

successful environmental governance as well as on violations of human rights and the rule of law. China is helping spearhead a shift toward dramatically greater production of renewable energy sources at the same time as it leads the world in building out coal infrastructure, both at home and through the export of coal-fired power plants through the Belt and Road Initiative. The Chinese government now prioritizes environmental protection and gives space for some elements of civil society to operate at the same time that it continues to harass and detain rights advocates like those documented in the Commission's Political Prisoner Database.

Even where China takes positive steps to protect the environment, the government's repressive and authoritarian nature can produce tragic human consequences. In this hearing we'll hear from a leading supply chain expert whose research uncovered evidence that the modern slavery Uyghurs are subjected to in Xinjiang and through the government's labor-transfer programs extends to China's massive solar industry. The global economy must transition as quickly as possible to renewable energy sources like solar, but we cannot do so on the backs of slave labor.

We need to help the solar industry transition to sustainable supply chains that respect human rights, and that means diversifying supply chains away from reliance on those that use forced labor. It means building up the domestic manufacturing base here in the United States and in other countries abroad. And, most urgently, it means that the House of Representatives must pass, and the President must sign into law, the Uyghur Forced Labor Prevention Act that Senator Rubio and I led in the Senate, and that my co-Chair leads in the House.

I look forward to all of our witnesses' testimony, and I hope this hearing will demonstrate that the United States can, and must, prioritize both climate action and the steadfast defense of human rights. We need to do both. We cannot trade away human rights for cooperation in other areas of the relationship with China. Fortunately, China has its own domestic incentives to take climate change and environmental protection seriously. I hope this hearing will deepen our understanding of how China can respond to those incentives and take urgent action, just as the United States must do here at home.

I'd now like to recognize my co-chair, Congressman McGovern.

[The opening statement of Chair Merkley appears in the Appendix.]

STATEMENT OF HON. JAMES P. MCGOVERN, A U.S. REPRESENTATIVE FROM MASSACHUSETTS; CO-CHAIR, CONGRESSIONAL-EXECUTIVE COMMISSION ON CHINA

Co-chair MCGOVERN. Well, thank you, Mr. Chairman, for convening this timely hearing on China's environmental challenges. You know, for more than 15 years this Commission has monitored the Chinese government's policies on the environment because of the nexus between respect for human rights and the rule of law and a society's ability to address environmental problems. The people of China continue to struggle not only with air and water pollution and other hazards, but also with obstacles to the ability to advocate for change or seek remedies through their government.

This hearing comes five weeks before nations of the world gather in Glasgow at the UN climate change conference. China and the United States are the top two emitters of greenhouse gases. Solving the climate crisis will require both cooperation and a robust and genuine effort within each country to change its regulatory regime and consumption behavior. President Biden's top climate envoy, former Secretary John Kerry, has been engaged with his Chinese counterparts on bilateral cooperation, but we in America also need to do our job. We must pass robust domestic legislation to reduce our greenhouse gas emissions, transform our economy, and ensure future generations' right to a habitable planet.

There is no trade-off between the environment and the economy. We can create millions of good high-wage green jobs that ensure economic prosperity and reduce our carbon impact. Now, I understand that some experts give the Chinese government positive marks for addressing climate change at a macro level. I look forward to hearing the assessment of our witnesses. Further, I would like to understand the extent to which Chinese officials' decisions are guided by their sense of the country's self-interest, in terms of the economic and social consequences of a warming climate.

This is important to know as the U.S. Government figures out the modalities of cooperation with China. Chinese Foreign Minister Wang Yi has explicitly linked cooperation on climate with other issues. He essentially threatened to halt cooperation if the U.S. did not back off criticism of their conduct. Is this a tactic to get us to stop caring about whether the Chinese government is committing genocide against the Uyghurs, erasing democracy in Hong Kong, or jailing human rights lawyers? How do we respond?

Environmental progress in any country depends on action at both the national and local level. A focus on the Chinese government's climate commitment should not deter us from looking at what is happening on the ground. This Commission has reported on the Chinese government's increasingly tight grip on NGOs and civil society, which has affected the environmental sector. Lack of transparency and uneven enforcement are obstacles. Environmental researchers and advocates have been suppressed and detained, including ethnic minorities. Those jailed include former Xinjiang University President Tashpolat Teyip, who was investigating pollution from coal mining, and Tibetan Anya Sengdra, who campaigned against illegal mining and poaching in Qinghai.

We are also interested in threats to the ecology of Tibet. The Tibetan Policy and Support Act, which I was proud to sponsor, sets out U.S. policy on the environment and water resources on the Tibetan Plateau and directs the secretary of state to support collaborative research, encourage input from Tibetan nomads, and promote a regional framework on water security. So I hope to hear about practical steps we can take toward these goals.

Lastly, there is the solar industry's role in Xinjiang. We need to deploy more solar technology, but we cannot abet the forced labor that the U.S. Government has determined is used to produce solar components. Can the United States Government encourage diversity in solar sourcing to reduce reliance on tainted polysilicon from Xinjiang? Does the coal burned to produce this material undermine

climate goals? I want to thank you, and I look forward to your testimony.

As I said earlier, I'm convening a Rules Committee meeting at 10:15 on the continuing resolution to keep the government open so I'm going to be in and out, but I thank you. Mr. Chairman, I yield back.

[The prepared statement of Co-chair McGovern appears in the Appendix.]

Chair MERKLEY. Well, thank you very much, Congressman McGovern. And thank you for working to keep the government open.

I'd like to now introduce our panel. Dr. Jennifer Turner is director of the China Environment Forum at the Woodrow Wilson Center. For 18 years she has led creation of meetings, exchanges, and publications focusing on a variety of energy and environmental challenges facing China, particularly on water, energy, and green civil society issues. She is a widely quoted expert on U.S.-China environmental cooperation, as well as climate-related challenges and governance issues facing China. She also leads the Global Chokepoint Multimedia Reporting Initiative.

Second, Dr. Jessica C. Teets is associate professor in the Political Science department at Middlebury College and associate editor of the Journal of Chinese Political Science. Her research focuses on governments and policy diffusion in authoritarian regimes, specifically the role of civil society. She is the author of "Civil Society Under Authoritarianism: The China Model," and co-editor of "Local Governance Innovation in China: Experimentation, Diffusion, and Defiance." Dr. Teets was recently selected to participate in the Public Intellectuals Program created by the National Committee on United States-China Relations and is currently researching policy experimentation by local governments in China.

Dr. Emily Yeh is professor of geography at the University of Colorado. Dr. Yeh conducts research on nature-society relations in Tibetan areas of the People's Republic of China, including the political ecology of pastoralism, conflicts over access to natural resources, vulnerability of Tibetan herders to climate change, and more. She is the author of "Taming Tibet: Landscape Transformation and the Gift of Chinese Development."

Ms. Nyrola Elimä—and I apologize if I'm not pronouncing your names correctly; hopefully, I'll get them right shortly—is a supply chain researcher at the Helena Kennedy Centre at Sheffield Hallam University. She lived and studied in Xinjiang for 19 years and worked as a customs broker and in import/export in Shanghai, Beijing, and other cities in China. She co-authored a report that revealed the scope of forced labor in the solar supply chain in Xinjiang.

We're now turning to our first witness. And who's up first? Jennifer Turner, are you with us?

Ms. TURNER. I am, indeed. Can you hear me OK?

Chair MERKLEY. We can hear you, yes.

STATEMENT OF JENNIFER TURNER, DIRECTOR, CHINA ENVIRONMENT FORUM, WOODROW WILSON CENTER

Ms. TURNER. I love it when technology works. Thank you very much, Chair Merkley, Chairman McGovern, and respected members of the Commission. Thank you very much for giving me the opportunity to present today and dive deep into some of China's climate commitments and clean energy transition. Probably diving deeper in the Q&A. We're going to be brief here right now.

To keep it brief, I have three main points that I want to make that we can discuss later in more detail. Number one, China is accelerating decarbonization of its energy sector, but there are contradictory trends that have the potential to slow it down. First of all, as mentioned already, for the past 9 out of 10 years, China has been number one in clean energy investments and leads the world in wind, solar, EVs, super grid development, batteries, algae for energy—I mean, you name it, they're investing in it. And this kind of investment has been bringing down the cost of these clean energy technologies around the world. But also, as was mentioned in the introduction, there are some other risks with this.

Now, the number two trend here was that China has made significant progress in decarbonizing their energy sector. I often say it's like turning the coal Titanic. I mean, they've dropped their dependence on coal in their energy sector from 71 percent in 2009, and now it's down to about 58 percent, but the country is still number one in existing and planned coal-fired power capacity. On the green side, just a couple little stories. China installed more than 70 gigawatts of new wind capacity—that's over half of what the U.S. has right now, in 2020.

Now, despite the high number of installed wind and other renewables, China still loses wind power due to low turbine quality, grid connection problems—they are still building the grid up, but it takes time—insufficient battery storage, and most importantly, I think, for the Commission here—is that there's governance challenges. Grid operators and provinces will still give priority to coal—sometimes with Beijing's permission, sometimes not. Now, to get around the grid problems, in 2019 and 2020, the central government decided they're going to go into offshore wind. And today, in two years, they now have a quarter of the world's offshore wind, with fewer connectivity problems.

The second trend to note: China is meeting its Paris commitments, but they need to go much more aggressive—bolder and deeper, to hit their own 2030 CO2 peak and 2060 carbon neutrality goals. The 13th Five-Year Plan really is what galvanized so much of the most recent investments and policy changes that made things cleaner and greener domestically. But the 14th Five-Year Plan was pretty disappointing. It even allows for a little bit of increased coal. My testimony gives lots of bullet points in talking about the different kinds of domestic measures that are taking place with the grid expansion. I particularly am fond of the solar-powered Darwinism, where in 2018 they cut all their feed-in tariffs. Then two years later, half of the private companies were gone. So survival of the fittest. And we're going to see that trend again with, probably, EVs, batteries. It's just how it works there.

Now, the number three point, which I know everyone's quite concerned with, of course, is that in the first five years of China's Belt and Road Initiative about 80 percent of the energy investments were in fossil fuels, and that, ostensibly, between 2013 and 2018, nullified China's own domestic progress. The good news is that there appears to be a slowdown. In 2019 and 2020, about $47 billion worth of coal projects were suspended or terminated. Suspended doesn't mean stopped. Tsinghua University issued a report that if China continues with these coal Belt and Road projects, it will nullify all the efforts of other countries to bring down the carbon footprint.

There's been a lot of bad press about this, on China. The Japanese are stopping their coal investment. It's possible that Xi Jinping's push for greening the BRI may end up decreasing the coal investments. The U.S. Government, the Biden Administration is also—as we all know—very much pushing climate action at home and internationally, so there is a perfect window here for the U.S. and China to embark on, let's say, a climate change space race. It may be difficult to work as closely as we did in the past, but there are lots of opportunities, and thinking about—we could go deeper in the Q&A—but how can we either in parallel or together work overseas.

I think if you look at some of the past models of the U.S.-China climate and clean energy cooperation, there's some super models of clean energy research centers that brought together business, national labs, NGOs, mainly U.S. NGOs, to work on electric vehicles, renewable energy, cleaner coal, and, my favorite, don't forget, energy efficiency in buildings. Major carbon footprint in both the U.S. and China. I know it's not as exciting as solar and wind, but those are some of the kinds of issues that could happen.

I think I'm going to stop here because I probably hit my five minutes or over, sorry, and we can continue in the Q&A.

Chair MERKLEY. Thank you very much, Dr. Turner.

[The prepared statement of Jessica Turner appears in the Appendix.]

Chair MERKLEY And now we're going to turn to Dr. Teets.

STATEMENT OF JESSICA C. TEETS, ASSOCIATE PROFESSOR, POLITICAL SCIENCE DEPARTMENT, AND ASSOCIATE EDITOR, JOURNAL OF CHINESE POLITICAL SCIENCE

Ms. TEETS. Great. OK. I would like to start by thanking Senator Merkley and Representative McGovern and their staff for inviting me to testify today. I'm really looking forward to hearing from my fellow panelists, who are all experts on Chinese environmental governance. I feel like I'm already learning a lot.

My remarks today will focus on China's changing environmental governance, and the role, specifically, of environmental NGOs. The central point I wish to emphasize today is that environmental governance has improved in China under Xi Jinping; however, this progress comes at the expense of citizen participation and local policy experimentation.

Before 2013, China suffered from what we sometimes call a policy implementation gap. This is because local officials were concentrating solely on economic growth and didn't enforce the environ-

mental regulations. What we've seen, then, is that Xi Jinping has reduced this gap by utilizing more central government authority to enforce regulations. This is a more top-down model. But also, there's been a shift towards more market-based approaches, such as payment for ecosystem services, emissions taxes, and the establishment of a carbon market.

This new environmental governance model uses three main tools. One is environmental targets for promotion, and these are often in place of the former economic targets for local officials. The second is digital monitoring tools, and this is so the information about water quality or air quality isn't controlled by local officials but is sent directly to the Ministry of Ecology and Environment. The third main tool is environmental inspection teams. These are sent to cities and provinces as a way to incentivize local enforcement. There's also a role, though, for environmental NGOs, and this is mostly collecting information, but also sometimes bringing public interest lawsuits against polluters and local government.

Since 2015, environmental NGOs have been allowed to file lawsuits against local officials and firms for pollution. However, this was really a very confined space, so only the biggest NGOs qualified, courts would only hear certain cases, and these suits were expensive and time consuming. Despite these challenges, we did see that bigger groups, like Friends of Nature, have filed several lawsuits and won these cases. I think in a hopeful sign, we saw last year that Shenzhen adopted a new policy that should allow a more diverse set of environmental NGOs to bring these lawsuits, and they did this by trying to exempt or cover court fees so it's not so expensive. I think many hope, as we've seen in the past, that Shenzhen will serve as a pilot case for future national regulations.

We also see that many environmental NGOs use public pressure campaigns on local leaders to increase enforcement. I think one really well-known example is the Institute of Public and Environmental Affairs, IPE. They rank local governments and firms through pollution maps, and these are available on their website and via apps. Another tactic that I've written about that I found really interesting is the use of humor to focus public attention. So, for example, in Zhejiang province there was a swimmable rivers campaign, and this used social media to create a competition for local officials to swim in the rivers that they had just certified as clean water, sort of an Erin Brockovich strategy. Not surprisingly, most local officials were not willing to take them up on this challenge, but the public pressure that was generated captured the central government's attention. This led not only to better water quality in Zhejiang, but also to the creation of a citizen scientist river guardian program.

Despite the restrictions that we've seen developing in civil society in the last decade, environmental NGOs are still playing a fairly active role in environmental governance. In fact, this is probably the most open policy space in China for civil society. They face the same challenges as other groups, though, in registering groups and projects, needing to establish party cells in the bigger groups, and also with fundraising. After the passage of the foreign NGO law and the removal of international grants, it had to turn to government grant programs, and this influences the types of projects that

they can take on. All of these constraints result in bifurcation where you see that the bigger groups are able to play a pretty prominent role, but the smaller groups really struggle to survive.

However, unlike other issue areas, this is an area of concern for Chinese citizens. We see lots of smaller groups of citizens active in this space. There are homeowners associations doing sort of NIMBY-style movements, like protesting waste incinerators in their neighborhoods. There are also a lot of campus environmental clubs and so there are a lot of young people who are interested. Based on citizen interest and also Xi Jinping's personal interest in environmental protection, I think this likely means that domestic politics will support the continued push on environmental enforcement. I think that the policy agenda might be narrower as groups focus more on government priorities. But these groups also might have better access to policymakers to change regulations.

I also think that there's still room for the U.S. to engage with a people-to-people strategy, mostly at the local level, trying to focus on local issues in common. Dr. Turner pointed out the reduction of coal. We have states in the United States and provinces in China that both have that in common. We could also focus on skills development with these environmental NGOs—not funding them but developing skills. And also building relationships between local officials who will become the next generation of leaders. I have more concrete suggestions, but I'll save those for the Q&A. Thank you, and I look forward to your questions.

Chair MERKLEY. Thank you very much, Dr. Teets.

[The prepared statement of Jessica Teets appears in the Appendix.]

And now we're going to turn to Dr. Yeh.

STATEMENT OF EMILY T. YEH, PROFESSOR OF GEOGRAPHY, UNIVERSITY OF COLORADO BOULDER

Ms. YEH. Thank you. I'd like to start also by thanking Chair Merkley and Co-chair McGovern and the Commission for this opportunity to speak briefly about several of China's major environmental challenges. The first one I want to talk about is challenges facing Tibet. The most significant one for Tibet is anthropogenic climate change, and that's because it's interconnected with all other aspects of the environment and thus with culture, economy, and society. The Tibetan Plateau is warming significantly faster than the global average, and what's important here, as elsewhere, is not average temperatures but rather increased intensity, frequency, and duration of extremes.

Here are some ways in which it's mattering for Tibetans: first, because it means melting permafrost and glaciers. In some places lakes are rapidly expanding, inundating grazing lands. This is leading to a dramatic loss of grassland, decreased livestock health because of salinization of soil, and ultimately displacement of pastoralists from rangelands. Second, rural Tibetans have become extraordinarily dependent for income on caterpillar fungus, which is a prized Chinese medicinal. It's especially important for income for former herders who have been resettled, but the harvest is declining, in part due to climate change.

Third, climate change is leading to hazardous events—landslides in particular, and to a lesser extent on the Plateau, glacial lake outburst floods. Fourth, rangeland degradation. The government has traditionally blamed herders and a tragedy of the commons for rangeland degradation. But there's increasing evidence that it's really climate—temperature and precipitation—that drives vegetation, rather than overgrazing, and this has made it increasingly difficult for herders to maintain a livelihood, which is important because, again, Tibetan cultural practices, identity, and language have greater vitality in rural areas. Rangeland degradation is also mobilized as a reason for resettling herders.

Finally, hydrological changes. Of course, melting glaciers, thawing permafrost, and changing precipitation patterns have downstram effects of flooding, drought, and changing timing of the hydrological cycle, which impacts fisheries and agriculture. And locally there's more water in the short term, and probably drought in the long term.

Second, there's a series of environment-related policy challenges for Tibetans. One has to do with rangeland privatization. Traditionally, grasslands were managed in common. Starting in the '80s "a tragedy of the commons" assumption—not well backed up in science—was adopted which has led to privatization of use rights and fencing. That's led to a whole series of problems that I can talk about.

This has continued, together with reductions in livestock numbers—again, based on unwarranted assumptions. And these policies in Sanjiangyuan, an area of Qinghai, which is called the source of the Three Rivers—Yangtze, Yellow, and Mekong—are being combined with ecological resettlement. Between 2004 and 2010, 55,000 herders in 10,000 households were resettled, purportedly for ecological reasons. What I want to emphasize here is that it's been dubbed a climate adaptation strategy, but increasing ecological evidence suggests that it's really not adaptive for the climate.

We know that climate change has negative effects for vegetation, but these effects are modulated or made less bad by moderate grazing. So, climate adaptation is crucial, but we need to be careful that these policies are actually adaptive. Of course, these policies also have very severe social effects. Many settlements are poorly built, without adequate water or sanitation infrastructure. Living standards have declined due to subsidies not keeping pace with inflation.

Herding is a very complex set of skills, but former herders generally don't have the ability to enter the job market, so many resettled Tibetans live on government subsidies and the sale of caterpillar fungus. More importantly, of course, resettlement also undermines traditional ties to territory, and thus works together with current assimilationist trends to erode linguistic and cultural continuity. And now there's also ecological resettlement policies happening in the TAR.

Mining has traditionally been a flashpoint of protest. There is some evidence that the ecological civilization push that Dr. Teets talked about has shut down many small mines, while larger ones continue.

Weather modification is something else I want to flag. It's heavily institutionalized within China, and that's likely to become more common with climate change. It changes precipitation patterns, and it can have negative localized effects.

Chinese dam projects downstream are a separate issue. All I want to say here is that dams are being built like crazy. You know, partly because it's an outlet for capital investment and because it is purported to be part of the strategy for becoming carbon neutral. I think calling them carbon neutral is quite problematic. Large dams change river function downstream, leading to problems for fisheries and agriculture. And in 2019, there were—there is documentation from satellite imagery that there was adequate water during the wet season upstream but an unprecedented drought downstream. And that was because of withholding of water upstream, so that downstream electricity could be generated at higher prices.

Finally, I just want to mention—because what Dr. Turner talked about is so important—that we have to remember—I think it's really important as we get to negotiations to think not just about China as being the largest—China and the U.S. being the largest annual producers, because even though it's true, China's historical per capita production of greenhouse gases is still quite a bit lower. What's really important to emphasize is that China is building so many coal-fired power plants, and that this power capacity is not needed.

There is a severe overcapacity right now. If it stopped building power plants today, China would have more than enough through 2030. And I think that we have to remember that these new plants have a lot of embedded emissions, which have long-term consequences for climate change. And I also think that a political-economic analysis shows that this is not so much about just policy implementation failure, but about China capital needing a place to go. And so these environmental issues have to be tied up with economic cooperation as well. I'll leave other things to the Q&A, as I am out of time. Thank you.

Chair MERKLEY. Thank you very much, Doctor.

[The prepared statement of Emily T. Yeh appears in the Appendix.]

Now we're going to turn to our fourth witness, Ms. Elimä. Am I pronouncing your name right?

STATEMENT OF NYROLA ELIMÄ, RESEARCHER, HELENA KENNEDY CENTRE AT SHEFFIELD HALLAM UNIVERSITY

Ms. ELIMÄ. It is correct, Nyrola Elimä.

Chair MERKLEY. Welcome.

Ms. ELIMÄ. Thank you. Chairman Merkley, Chairman McGovern, and distinguished members of the Commission, thank you for offering me an opportunity to testify.

The solar industry is vulnerable to forced labor in Xinjiang because 95 percent of solar modules rely on one primary material—solar-grade polysilicon. In 2020, China produced nearly 75 percent of the world's polysilicon, which includes solar grade and electronic grade. The four largest producers in Xinjiang alone accounted for 45 percent of the world's solar-grade polysilicon supply. Hoshine

Silicon Industry, the metallurgical-grade silicon producer—input into polysilicon—with the highest production capacity in the region, has participated in the state-sponsored forced labor transfer program in Xinjiang.

All four of Xinjiang's largest polysilicon manufacturers—Daqo, TBEA, Xinjiang GCL, and East Hope—have reported their participation in labor transfer or labor placement programs, and/or are supplied by the raw materials companies that have. Daqo alone is supplier to the four largest solar module manufacturers in the world—JinkoSolar, Trina Solar, LONGi Green Energy, and JA Solar.

Professor Murphy and I identified 11 companies engaged in forced labor transfers, four additional companies located within industrial parks that have accepted labor transfers, 90 Chinese and international companies whose supply chains are affected. Lastly, manufacturers at the various stages of production of solar modules—from the raw materials to metallurgical grade silicon to polysilicon to wafers to panels—were complicit in forced labor.

However, forced labor wasn't the only problem in the solar supply chains. Moving manufacturing to Xinjiang, where they're producing polysilicon using coal-based energy, helped China to cut everyone out of the market by making the price of polysilicon very low. Coal is cheap and it's heavily subsidized in Xinjiang. To encourage polysilicon companies to move to Xinjiang in the mid-2010s, the government promoted the development of the Zhundong Coal Power Base, which has powered the polysilicon giants that moved into the region. Companies moved to Xinjiang around 2015 and 2016 and became fully operational in 2018.

From that time, most other polysilicon markets in the world have changed their business model to not produce the polysilicon anymore. The global solar industry faced limited but feasible alternatives to source solar materials tainted by forced labor in Xinjiang. They are: (A) technologies that don't use polysilicon at all; (B) polysilicon manufacturers that don't use Xinjiang input at all; (C) emerging technologies that have previously been priced out of development because of China's low prices.

It is critical that the U.S. enforce the Tariff Act to ensure that Xinjiang-made goods, which are both bad for human rights and for the planet, are not reaching United States consumers. And as our evidence shows, these violations reach all the way to the raw materials, and there can be no part of the supply chains that is unaffected. Pursuing alternatives to Xinjiang supply chains requires multiple organizations and governments to harmonize strategies. This is not only the U.S.'s responsibility. Therefore, I urge the U.S. Government to work with the EU and other allies, including my own Swedish government.

I am grateful to the Commission for the opportunity to also relate my personal story. My cousin Mayila was sentenced to six and a half years in prison after being accused of financing terrorism. She was convicted for transferring money to Australia to help her parents buy a house, which was both legal at the time she made the transfers and facilitated by the Bank of China. The Chinese government knows she is innocent because I have sent evidence that can prove her innocence to the Xinjiang government multiple

times, with the help of international journalists. In order to deliberately convict an innocent person, the Ghulja Public Security Bureau fabricated evidence. She was forced to sign a false confession under threat of torture, and this false confession was used as evidence to convict her.

In addition, authorities falsely claimed that her parents in Australia, "were members of the so-called 'Eastern Turkestan Liberation Organization,'" an organization we had never heard of. Mayila's parents want to seek justice through the international legal system for their daughter, but they have been told there isn't much a lawyer can do when it comes to the crime that the Chinese state committed. We did everything we could, to the extent that Chinese officials have threatened me and my family for speaking out publicly, but still all our efforts have failed to bring her justice. Thank you.

Chair MERKLEY. Well, thank you.

[The prepared statement of Nyrola Elimä appears in the Appendix.]

Chair MERKLEY Thank you very much. And thank you for sharing your own cousin's experience, which illuminates the descriptions you have in your testimony of how initial incentives gradually or steadily proceed to high pressure, including extreme punishment, as you've described. We're now going to enter a period of questions. And I think we're doing seven-minute periods. And my team will make sure that I don't go over those seven minutes. And then we'll turn to Co-chair McGovern, if he is back, and if not, I believe Congressman Mast will be up next, just to get this started.

I wanted to begin with some questions for Dr. Teets. I was struck back in 2015, Dr. Teets, about when an individual who had been an investigative reporter for China Central Television, Chai Jing, proceeded to do a documentary called "Under the Dome." It was a searing examination and a reference to Chinese citizens living under this dome of polluted air. I remember she was particularly motivated because she was pregnant with her first child and became very, very concerned about what the health impacts would be. It seemed like there had been a lot of cooperation, including government cooperation, with her production of that documentary, but then also an enormous backlash from other parts of the government that hate criticism or anything that makes things look bad, or might encourage citizens to protest, so it reflected this division.

Can you give us some sense of how from that time forward we have seen the government under President Xi become really committed, in a way, to enforcement of environmental rules? Has citizen concern really played a big role in creating more space in this area as opposed to many other areas, where we see that it's very hard for citizens to be engaged in public interest law, or women's rights advocates, or civil society advocates? But in this space, there's a little more room for pressure in how that dynamic exists. Dr. Teets.

Ms. TEETS. That's a really good question. I think that what you're seeing in civil society in general, but also with environmental civil society, is that if groups keep protests or their focus much more narrow, that isn't seen as threatening. One of the problems with the release of that documentary was how quickly it went

viral. People were watching it in lots of different countries. They were talking about it and so it was sort of the victim of its own popularity. The cases that have been more successful have really been focused at the local level. They haven't been focused at the national level, so there isn't a national indictment of current leaders. So usually, the framing is to focus on local challenges, like, you want to build a waste incinerator in Shanghai, and the local people say: We don't want that. If they keep those protests local like that, it seems that the government is more responsive.

Chair MERKLEY. So what we're seeing, I think, if I followed your testimony right, is smaller NGOs are being squeezed out. So you've got larger national—and these are China-based NGOs. The government doesn't want mass protest, but they are kind of responding by saying: Hey, we're going to encourage enforcement. We're going to address this, but we're going to keep a really tight rein—an authoritarian rein if you will—on addressing this, but also allowing pressure on local officials. As long as they don't criticize the national power structure. Is that a way to portray it?

Ms. TEETS. I think that's exactly it. It's basically, this top-down model doesn't mind citizen participation, but it has to go through the right channels. (There are some areas, like Xinjiang or Tibet, where we see that these are just no-go areas.) There are very few open spaces there. The environment's much more open, but still it's a top-down model. So you're supposed to do things in the appropriate way, through the appropriate channels, and your focus has to be local.

Chair MERKLEY. Our Commission staff—the Congressional-Executive Commission on China—has been monitoring cases this past year of harassment and, in some cases, detention of independent NGO advocates for their environmental activism. Li Genshan is an example, Zhang Baoqi, and Niu Haobao. Authorities also briefly detained a teenaged advocate, Howey Ou Hongyi, after she staged a global climate strike in Shanghai municipality. So are these individuals—is the government taking action on these individuals to remind them that, no, we're not going to tolerate any broader criticism? Or why are these folks being targeted, given the government's overall sense that they do want greater environmental enforcement?

Ms. TEETS. Again, most of the cases that are targeted like that are sort of victims of their success, in that whatever method they're using or whatever message or platform they're using, they usually get a lot of attention. So that sort of protest sort of triggers this government response that's pretty much about protecting themselves and deflecting criticism. Most of the protests that I look at that are successful, again, are really focused on a specific issue—like citing the chemical factories, citing of an incineration facility, the water quality in a particular river. They're really focused, and when the government begins to act to address those issues, they cooperate with the government. So, again, I would say that really the only rules, if you want to call it something like that, are to keep the issues focused locally and keep them specifically on certain issues. It can't be about climate change or pollution across the whole country.

Chair MERKLEY. Thank you very much, Doctor. And Ms. Eliṁa, I wanted to turn to your testimony. I'll just get started here before my time will run out, but first I wanted you to explain to folks the difference between, essentially, forced labor in Xinjiang and then forced labor transfer which, in my understanding, is essentially persons under the same huge restrictions of forced labor are transported out of the province to other areas to provide a workforce, but it's still very much the same problem of, essentially, slave labor. Do I have that right?

Ms. ELIMÄ. Yes.

Chair MERKLEY. Yes. Thank you. You talked about how the market had really blown up for solar-grade polysilicon in a very short period of time. And one of the subsidies is very cheap energy coming from coal. But were there other subsidies that the Chinese government provided to essentially take over this world manufacturing sector?

Ms. ELIMÄ. Because of the cheap energy prices—there are a lot of factors behind this. Product has been so cheap, not only in the solar industry but also in the salt industry, because of the cheap energy prices that were available to the international competitors. If I can use solar as an example for polysilicon, as it is made in Xinjiang; it is a heavily coal-energy consumer product. That purification process requires extremely high temperatures, consumes significant electricity, and makes the coal-fired Uyghur region an ideal location for a polysilicon producer. But this is not the only fact. Another one is that the Xinjiang Prefecture governments have provided significant finance and tax incentives to the companies that move to or build a facility in Xinjiang. Then when it comes to the local government, they will add incentives. The third one is, of course, the labor transfer program.

Chair MERKLEY. OK. Very good. I think my time is up. Yes, I'm getting the nod, so I'm going to come back, but I really appreciate you laying out the details of the impact on forced labor strategies. I know we use this term "forced labor," but I want folks to understand just how horrific this practice is. It's tied to a broader set of strategies that essentially involve what both Democratic and Republican administrations in the United States have determined is genocide. So thank you very much.

Ms. ELIMÄ. Thank you.

Chair MERKLEY. We'll turn now to Congressman McGovern if he is back. I don't believe that he is. Hard at work trying to keep our government from getting shut down. So that would be Congressman Mast if you are present. If not, we're turning to Congresswoman Steel.

Representative STEEL. Thank you very much, Mr. Chair. You know, this is a really interesting issue because, you know, we've been hearing from all these speakers regarding how it's been regional. But since the Chinese government is top-down, do you truly think that China cares about being transparent and accountable for these environmental issues? Anybody can answer that. And you know what? I really didn't hear much about what China's government wants to do other than, you know, all local governments have been working. So if anybody can answer this, I'd be grateful.

Ms. TEETS. I would be happy to go ahead and take the first stab at it, and other people can join in. I don't think that the Chinese government necessarily wants to be open and transparent about environmental information outside of the government, but what they do want is transparency within the government. So they want the transparent flow of information about what's happening at the local level to go to the Ministry of Environment and Ecology, and they also want it to go to the central government. So they want to know what's happening at the local level, but they're not necessarily interested in that information being shared out widely.

They have responded to citizen complaints and tried to make their data more widely available, so clean air measurements, clean water measurements. But there is a lot of criticism that this information isn't updated all that frequently, and it has sort of a clean bias, so that the information that's reported usually shows better conditions than what other people are finding. So I think that's what we're seeing, is that the accountability and the transparency is within the government and not out to the people. My fellow panelists might want to add to that.

Representative STEEL. Can I just add to that question then? How many people in China are having serious health effects due to the Chinese government's pollution? Do we have any true data? Because it seems like it's very hard to get any data out of the Chinese government.

Ms. TURNER. I mean, there has been over time—I mean, more so back with the air-pocalypses back in 2012 and 2013 where there were numbers like 1.2 million people dying early because of respiratory problems. Then we saw studies like, even Greenpeace China partnering with the Beijing School of Health, you know, looking at hospital emissions and making estimates. So I think that there is a fair amount of transparency in that there has been research done in that space. And I think that it was that kind of research. And I thought, again, fascinating to have, you know, NGOs partnering with health researchers. And there's a big network—a growing network of health researchers in China who are making their voices heard.

That was one of the fires that really lit the war on air pollution, because we did—right before the war on air pollution we saw lots more protest, public—on social media, not just on the streets. So they are responsive, and they do see that if they're not transparent on, for example, pollution information, you know, the monitors, right? It was required under the Air Pollution Action Plan that all cities had to—it had to be open to the public what the—if you're meeting the PM2.5, or ozone, or other kinds of leading pollutant targets. There was one example where U.S. NGO Natural Resources Defense Council partnered with a Chinese NGO. They did a study of how the cities were performing on reporting their data openly. Well, they were reporting their data, but did they meet the goals? They found out that—I think this was back in 2014, 2015—that of the 80 cities, only 7 were actually meeting the goals, and that information was made public. That was a sign that the central government was using information, just like Dr. Teets said, to pressure the local government. But we've seen NGOs that are not only producing maps of government data, but my favorite is the—do you

know the story of the foul and filthy river campaign? No, maybe not. OK.

I know Dr. Teets does know—the Ministry of Environment and Ministry of Housing, they sent out on social media—I guess trying to be cool—that, hey, citizens, if you see a foul and filthy black, stinky river, take a picture of it, geolocate it, and let us know where it is. And they were just—can I use a water pun?—they were inundated with data. They didn't know what to do with it, so a number of NGOs started helping them to build maps on this so the government can kind of help monitor. There have been intriguing situations. In this case, citizen science data, the government wanted to respond, and had to turn to an NGO to help them do it.

So there's not always—there's not transparency on everything, but there is still—I think there is political space, elbow room, like Dr. Teets said, but I think she would also agree with me that that space is constricting—becoming a little bit tighter these days.

Representative STEEL. So it's a little tighter. The Paris agreement started in 2016, and then one of the speakers said they met their targets. So it seems like they're actually underreporting the amount of coal they consume and other stuff, because it seems like we never really get the right true data from the Chinese government. So when they met the Paris agreement targets, really—you don't know if they were really met or not. It depends on how they are reporting it, right?

Ms. TURNER. Well, what has been helpful over the past—you know, I've had a front row seat for 21 years looking at China, energy, environment, and climate stuff, and I've really seen over the past decades that a lot of Chinese and international energy experts, they keep their hand on the pulse of this. A number of them said quite a few years ago that China probably met their Paris commitments a few years back, and so that's just kind of a—I mean, it's almost like they're holding back the good news. But that tells us—that's why China needs—they probably can and should go bolder.

But we're hearing this call coming from China's own energy experts that they can do more. And I think with the construction of the coal-fired power plants—I mean, the central government greenlighted them, as Dr. Yeh said. Maybe they won't end up opening them, in which case maybe they won't lock in the carbon, but in which case, they've wasted money, right? I think that if there was maybe more political space in the area of coal-fired power plants, because that's probably one area—Dr. Teets, wouldn't you agree—that we don't necessarily see protests outside coal-fired power plants? That if you had, you know, more citizen participation, that that would actually lead to better climate policy in China, particularly in this space. And that's something that we've kind of lost some of over the past few years.

Representative STEEL. Mr. Chair, if I have time, I cannot really see if I have time or not, I have one more question. Is it OK to proceed?

Chair MERKLEY. Congresswoman Steel, why don't you go right ahead. We will expand the time available, and do stay around, because I think we might have time for a second round.

Representative STEEL. Great. Thank you very much. So I'm going to just—do you think that the EU and the United States have truly tried to hold the CCP accountable, or turn a blind eye for economic gain? I can get a response from anybody.

Ms. TURNER. Well, I can talk. I don't want to be—you know, kind of the Irish in me wants to talk a lot, but anyone else want to jump in?

So, you're saying, kind of turning back the clock a little bit, that during the Obama Administration, and even under G.W. Bush, he also started building up U.S.-China conversations on cooperating on energy and climate, but it really accelerated in the Obama Administration. That that, I'll call it, climate diplomacy, did have the effect of probably putting on some pressure. Maybe it is this "cooperative competitors" kind of angle. We saw that even in the space of the IPR challenges—which has been a rightful, huge complaint against China for stealing clean energy technologies from foreign companies.

In the clean energy research centers, for building energy efficiency, renewable energy, electric vehicles, in addition to developing the technologies there was some work on trying to hammer out joint IPR. We have seen that the Chinese government itself, I mean, starting back around 2006–2015, that they realized that their own domestic innovation was coming under threat because other Chinese companies were stealing each other's IPR. So we have seen that—again, the enforcement can be probably selectively lax, but there is movement, so that some of the trendlines are looking promising.

I guess the way I'm kind of—hopefully, you feel like I'm not evading your question, just trying to answer—that when there was more interaction on energy and environmental issues, that it wasn't just done to hold them accountable, but in effect it does. You know that both countries are moving forward. I mean—it led to the U.S. also accelerating our own solar and other kinds of clean energy projects.

Ms. YEH. I guess I would add that yes, I think the U.S. has been interested in its own economic position and issues. It's also very difficult for the U.S. to hold China accountable on something like coal-fired power plants because it's a global problem, and China knows that. China is going to look at what other countries do as other countries try to hold it accountable. So I think we absolutely need to focus on embedded emissions and things like pushing China to have a coal consumption cap with regulatory consequences, commit to stop building coal-fired power plants. But the U.S. can't do that effectively without reining in its own emissions, within the way that China is framing things.

Representative STEEL. Thank you very much. I yield back.

Chair MERKLEY. Thank you very much. I want to go back to Ms. Elimä. You say in your testimony that the United States should enforce the Tariff Act. I think you're referring to the 1930 Tariff Act, which specifically said that it's illegal for the U.S. to import products that were made with forced labor. Do I have the correct reference that you are making?

Ms. ELIMÄ. Yes.

Chair MERKLEY. The Uyghur Forced Labor Prevention Act that Congressman McGovern and I have been both involved in basically clarifies that indeed if products are made in Xinjiang it's presumed that they are made with forced labor, so that the Tariff Act would apply. Is there currently sufficient capacity or resources to produce polysilicon—solar-grade polysilicon—outside of China? Or would that manufacturing base have to be rebuilt very quickly?

Ms. ELIMÄ. Yes. There are three caps to building opportunities that require urgent investment. The first one is expansion of the U.S. manufacturing capacity for the whole solar supply chain, from cores to the module. The second one is expansion of alternative technologies like thin film. This is already happening and should be given support by the Biden Administration. The third investment is the development of the new technologies that were previously too expensive to be pursued because China's polysilicon was so cheap. The U.S. should encourage development banks like the IFC, even USAID, to support projects internationally that would build capacity, and to strictly apply the monitoring process to ensure that expansion does not simply lead to more human rights abuses.

This comes through expansion of already existing metallurgical-grade silicon to wafer facilities around the world, such as in Malaysia. Second, building a new capacity in India, which obviously the Indian government is keen on. But the reality, yes, all of this costs money and time, but this is the right time for it, when urgency is so clear and commitment to infrastructure and renewable energy is so global. So I think it is not just the U.S. Government that should be investing. This can be multiple organizational, multiple governments that seek to expand the capacity.

Chair MERKLEY. Yes. I would summarize that by saying it's very appropriate for President Biden and other international leaders to come together and create a massive initiative to source—develop supply chains for either, as you put it, the alternative technologies, new technologies, but also supply chain for polysilicon—solar-grade polysilicon—so that this dilemma is eliminated. Earlier this year the solar energy industries association issued a solar supply chain traceability protocol, and they urged multinational solar companies to shift supply chains out of Xinjiang. However, several experts on China's forced labor programs contend that the Chinese restrictions on auditors and the movement of Uyghur workers to firms all over China, make traceability of forced labor extremely difficult, if not impossible. Do the solar industry's current traceability protocols allow firms to audit their supply chains for forced labor sufficiently?

Ms. ELIMÄ. I want to say something I observed during my research and over the last few months since our report was published. We watched the corporate decision makers contort themselves trying to figure out how to respond to the question of forced labor in solar supply chains. We have also watched the consultants descend on them, offering on-the-ground audits on the Xinjiang factories, which is strictly impossible. We also heard all the slick technologies, which cannot identify Uyghur forced labor and which use completely unreliable questionnaires, which they expect Chinese companies would use to self-report their abuse.

This won't work. And the companies have no leverage to remediate the situation on the ground in the Uyghur region because the Chinese government, they have restricted companies for complying with the U.S. Government sanctions. So even if they interview the workers about their rights it is completely unreliable because when they tell the truth—these Uyghur workers—the consequence is they are sent directly to the internment camps. So how are we going to get the real answer from the Uyghur region?

Chair MERKLEY. Yes. Extremely, extremely difficult to get credible information. But we know certainly from many different sources about the actual way that the citizens are being treated inside Xinjiang and the Uyghur community. I think it just reinforces why we need international efforts to really distance ourselves from any products made in Xinjiang and particularly to develop alternatives to polysilicon produced there.

I want to turn to Dr. Turner. And can my team just tell me how much time I have left? Ah. Seven minutes goes so quickly. So Dr. Turner, you talked about "airpocalypses" in your testimony. Can you explain to us what those were, and how those have affected citizen advocacy in China, and the government's response?

Ms. TURNER. Oh, it was amazing—I mean, it was exciting to see the response. Back in 2012, 2013, 2014, we started seeing in Beijing—off the Richter Scale of PM2.5, particulate matter 2.5, very small air pollution that was just—you couldn't see the building across the street. As a side note, I have friends in Liaoning who said it's been like that for years there. But when it hits Beijing, you know, it's critical.

The U.S. Embassy at the time—I don't know if you know this story, how they started—they put an air quality monitor on the roof of the embassy and started tweeting out—or WeChatting out, at that point, what the air quality was. And then next to that what the Chinese government had. Also citizens started flying kites, with citizen scientists taking their own monitors or, I think, Dr. Teets, you probably know the one where some NGOs were renting out air quality monitors. Citizens started becoming really empowered to say, We don't believe that the air is moderate, and we're seeing that our government's scale on what was a moderately polluted day was—I mean, it was toxic. I mean, you can't see across the street.

So, I mean, it really was the citizen response, and then Chai Jing's movie too, which as you noted was brought out—you know, Chinese news media organizations, they helped launch it. But it wasn't theirs to launch and so it kind of tells you that at the time there were a lot of disgruntled people. So I think that's why we did see really quick reforms, besides just campaigns. It wasn't just a campaign. There was an air pollution action plan. They changed the basic environmental law that was going to require that if local governments did not meet air quality standards you would lose your investment, your economic development investments. Local governments—you wouldn't get your promotion.

So the air pollution issue started; it changed the laws and there were more hammers on local governance. Then it started moving over to a water pollution action plan. I don't know if you know this, but for every little river in China there's some local official who has

been made a river chief. What makes me laugh totally—you'd love this as a legislator—evidently if you are a river chief, you have lifetime responsibility and culpability, so even after you're retired, they can come back for you.

I don't see how they could do it, but definitely a case of trying to light a fire to get local governments to enforce the rules which, of course, we know for many years, you know, starting back with Deng Xiaoping: I don't care what color the mouse is—or, you know, cat is, just catch the mice, right? Local governments were told, just develop, and environment wasn't a priority. So in some ways—China, in their own way, may be starting to create little federal checks and balances which didn't exist before. I definitely went right through your seven minutes, sorry.

Chair MERKLEY. Thank you very much, Dr. Turner. I'll fill in with a question while we're waiting for resolution of a technical problem. I want to turn again, Dr. Turner, to you. China has pledged that they will reach peak CO2 emissions before 2030, but that's not a commitment to any absolute reduction. Certainly, it's basically a statement that they're going to increase production of CO2 up through 2030, and yet, we are in this kind of zone red or red-alert stage, as the international scientists have described it, in terms of climate.

Is there international discussion with China that China needs to step up and do more than talk about expanding their carbon production for another nine years, that they need to reach peak and start decreasing in absolute terms very quickly? Is there any receptivity at all among the Chinese leadership, President Xi, and so forth, to international discussion of China as the largest producer of greenhouse gases in the world—the United States is second in that—that China has to show their international leadership by moving much faster and that they should use Glasgow as an opportunity to provide a much more bold strategy?

Ms. TURNER. Yes, even within the Chinese government, Chinese energy researchers—Tsinghua University's report that said that on the overseas side, there does seem to be some receptivity because there's been a lot of pressure, and even a lot of the countries where China was putting in coal are starting to say that they don't want it, even though we do know that the need for electricity—I mean, think of Pakistan; something like 30 percent of the people don't have steady electricity.

But, you know, for years people have been talking about, and maybe this is the moment, where China—if done with clean supply chains—I mean, they've done a lot with solar, with wind, but also energy efficiency. Again, a lot of that was really expanded under partnerships with the U.S.—building energy efficiency. I mean, something like 50 percent of China's CO2 emissions is embedded in both the construction and the running of buildings, and creating better standards, greening the supply chains. Actually, there's a Chinese business NGO that has been working on—they've developed a certification method for buildings that more and more cities and building operators are adopting so that there's—I know it's not just a coal question, but if China can start moving on some of these other really good success stories within China that aren't co-related . . . Again, demand-side management, energy efficiency, those are

some of the things that could also be incredibly helpful, and even the grid. We do know that they are starting to build more grid power lines. In Southeast Asia, some of that is linked to the hydropower, and maybe Dr. Yeh can go into a little more about what that could mean, because if not coal—I could punt it over to Dr. Yeh—but if not coal then probably hydropower in some places, and what does that mean? I mean, that's the tricky part.

Maybe I'll let—I don't want to put you on the spot, Dr. Yeh, but maybe you want to jump in?

Ms. YEH. Yes. I do think that China's building a lot of hydropower, which is very problematic downstream, but it's important to emphasize that China doesn't need more power right now—it really has more than enough. So what is happening I think is that they want to spend the money somewhere, they want to spend the capital on these big, large infrastructures, including hydropower, and I think part of the global conversation, including with China and the U.S., needs to be that large hydropower isn't carbon-neutral—that it produces a lot of carbon emissions during the building, that the reservoirs have a lot of methane emissions, which is worse than carbon dioxide. So certainly big hydropower is in many ways damaging as much as the coal-fired power plants are.

Chair MERKLEY. Very good. Meanwhile, I wanted to focus on this point, because in your testimony, you talk about the greenhouse gas emissions from large dams, and normally we think about hydroelectricity as a much cleaner, greener version; it has a large impact on the stream. Coming from Oregon, we are really focused on the huge impact on salmon and so forth; also, the still water can be warmed up by the sun more; it changes the temperature of the stream. So there's a lot of effects, but still, when it comes to production of energy, we normally think of it as carbon-free, and yet you talk about large dams as a source of greenhouse gas emissions, and you started to just now address why large dams actually produce greenhouse gases, but can you go back through and highlight that point? Because I think that's a very unexpected observation.

Ms. YEH. Yes, it has to do with the reservoirs, so I'm talking about large dams that have large reservoirs that flood a lot of biomass, and the decomposition of flooded biomass in organic materials generates methane. So that's what I was referring to in that case.

Chair MERKLEY. So methane bubbling up out of the water behind the dam.

Ms. YEH. Yes, and these reservoirs are often very large.

Chair MERKLEY. Does that continue over time, or are we talking about an initial kind of decomposition of flooded biomass that after a year or two that effect disappears, or are we talking about also biomass that's swept down the stream, gets trapped behind the dam, and then decomposes?

Ms. YEH. Swept down the stream and trapped in the reservoirs. As the reservoir is filling and expanding it takes much longer than a year or two for the methane—for that decomposition to happen for vegetation that's already there, and new biomass that may be swept in. (One study has suggested that reservoirs from hydropower have produced 1/4 of all human-caused methane emissions.)

Chair MERKLEY. And this produces far more methane than if the biomass that's swept in the stream normally had just continued down the stream without a dam?

Ms. YEH. Yes.

Chair MERKLEY. OK.

Ms. YEH. Because methane is produced in oxygen-poor conditions at the bottom of reservoirs, but not in flowing streams.

Chair MERKLEY. That's a very interesting point that I had not heard before.

I wanted to turn to this question: You talk about caterpillar fungus, and most people have no idea what it is that you're referring to in terms of how this product became what it is and how it became a significant source of money to people in Tibet and how it might be—being affected by climate. So can you address caterpillar fungus?

Ms. YEH. Yes, it's a particular kind of fungus that parasitizes a kind of moth, a ghost moth, and then it moves it to the surface and it takes over the larvae and grows a fruiting body out of its head. It's been used in Chinese medicine for many hundreds of years, but it really took off in the 1990s as there were some reports that the Olympic team had taken caterpillar fungus and it produced miraculous results for them. It was also used in SARS, so it's become worth more than its weight in gold. It's really become a very, very, important source of income. For people who don't have other forms of livelihood, resettled herders; they can go back to harvest it.

So because the products of rural Tibetans are worth very little on the market—you know, grain and their animal products can't compete in the market, so they really rely on this, many people rely on this for up to 80 percent of their income. There are reports of declines in harvest. There's some evidence that because there are so many people going to harvest them, there is some overharvesting going on, but a lot of it also has to do with habitat shift as a result of climate change and melting permafrost. So it's not found in areas where it used to be found. The importance for Tibetans is in part that it's really helped them navigate resettlement and the demands for cash in the changing economy.

Chair MERKLEY. Well, one of the things that you described is how the Chinese government policies have relocated nomads and pastoralists into villages of houses, often far from where they used to live and with significant social and cultural effects. Is this a policy that is publicly justified by talking about "the tragedy of the commons" and the overuse of rangeland, the sharing of rangeland, or is it essentially—are we seeing the effect of climate change on the rangelands?

Ms. YEH. There are effects on the rangelands of climate change in some places, particularly where it's getting drier rather than wetter, but this policy has been publicly stated as an adaptation to both climate change and to overgrazing. It's also stated as a development policy, which I would argue it is not, but this idea that living in a city and living in a settlement is more developed and modern than being a pastoralist is very strong, and it is certainly marketed to the public in that way. My argument is that it's really not adaptive to the climate. So even where the government has recognized that climate change does have some effects on the rangeland

but saying that this is a form of adaptation, I think that's very problematic because completely removing grazing actually doesn't help the rangeland because it's evolved with grazers over millennia.

Chair MERKLEY. So is this process really kind of wiping out a significant sector of Tibetan culture and tradition?

Ms. YEH. Yes, I would say yes. In some cases, herders are supposed to move for 10 years and then they're technically allowed to go back, but after selling off your livestock, after not having income, after that really dramatic change it's really hard for people to go back. Tibet is a traditionally rural society. They have a lot of ties to territory, territorial deities, land practices, and those are broken by these processes.

Chair MERKLEY. You note something I think is very important, which is you have a complex set of skills in being a herder and that those skills do not translate when you're moved into some housing complex far from your roots in terms of being able to make a living.

Ms. YEH. Yes, that's correct.

Chair MERKLEY. Let me check in again on our House of Representatives team and see if there's anyone else lined up.

Representative SUOZZI. Yes, Senator. Congressman Suozzi here.

Chair MERKLEY. Congressman Suozzi, welcome, welcome, welcome!

Representative SUOZZI. Thank you. I really apologize to the witnesses and to you, Senator, and to everyone on the staff. I was at a Ways and Means thing; there are a few things going on down here in Washington, as you know, so I apologize for my tardiness.

And please forgive me, witnesses. I've read some of your testimony. I wasn't able to be present for a lot of it.

But, Senator, I always like to talk about the fact that when Nixon went to China back in the '70s we thought that the more that China was exposed to our way of life the more they'd become like us—they'd adopt our theory about capitalism; they would adopt our ideas about democracy—and clearly that hasn't happened. And China is—just really bad actors. We see the Chinese Communist Party putting people in forced labor camps. We see it with the Uyghurs. We see what they've done to the Tibetans for a long, long time. We see what they do in Hong Kong with arresting young people and jailing dissidents and stopping anybody from speaking out. And, you know, we really have to—and we see what they do with us economically, as far as stealing technology and just cheating, more or less.

So now the environment, which is something near and dear to me, certainly, and to, I'm sure, everybody here on this call—they're contributing to the destruction of the world right now. I mean, I guess we all are in some ways, but they're not waking up to that reality, and we have to figure out how we can hold them more accountable to get on board with a worldwide effort to address climate change.

I was looking at the statistics—I don't know if you've all spoken about it here today, but in 1990 global greenhouse gases from China were 9 percent of the world's emissions, and today it's 24 percent, so it's gone from 9 percent in 1990 to 24 percent of greenhouse gases today. America has gone from 17 percent of green-

house gases in 1990, but now we're down to 12 percent. Now, a lot of that is because just the amount of greenhouse gases has gone up so much and we've got a lower percentage, but we are aggressively moving in our country to try and address this, or at least we're trying to. But climate change is a global security issue. If there's one place that the Democrats and Republicans have found common ground when it comes to the environment, it is related to the national security threat of climate change. One of the more gratifying things I saw happen early on in my career in Congress is I was on the Armed Services Committee—I forget if it was 2017 or 2018—but they included climate change as being a national security threat in the NDAA, the National Defense Authorization Act, and the Republicans voted for it nearly unanimously; I think there was one vote no. Then they tried to take it out on the floor, but 45 Republicans voted with all the Democrats to put it back into the bill, which is that we had to look at climate change and its effects on sea rising—sea rises, population shifts, and everything else it's doing to threaten the world's security.

So I want to ask the witnesses, what can we do to really wake up the world to the fact that China's bad actions are not limited to forced labor camps? It's not even that the world realizes that yet; they're not limited to the treatment of ethnic minorities like the Tibetans and the Uyghurs. It's not limited to the arrest of students and to dissidents and to journalists. They are destroying the world's environment. I mean, how can it be that in the midst of climate change and all the concerns that we have, that 58 percent of energy consumption in China is still coal? So what can we do to tell the world about this and get this out there more effectively?

I'm going to ask Emily to go first.

Ms. YEH. Yes. Thank you for your question. I actually think it's important to remember that China has a national plan on climate change and that its per capita emissions and its cumulative emissions are much lower, so while I believe that China's coal-fired power plants and its continued building of them is a huge problem in the context of overcapacity, I don't think "China's a bad actor" is the message that will actually resonate with action in China or that accounts for what the U.S. has done.

Representative SUOZZI. So their challenge—they're saying that their goals, which you just noted, are not to take effect until 2060, and they're going to continue to increase their global greenhouse gas emissions from now until 2030; they're hoping they'll peak by 2030. Is that satisfactory to you?

Ms. YEH. No. I think there should be much more aggressive action, but I also think that the aggressive action has to be matched by the same commitment from the U.S.; otherwise, I don't think China will—I think the framing of that cumulative development matters a great deal to how people in China and how people, policymakers in China will think about what it is they need to do. I do think—I mean, Xi Jinping's—there are many problems with the way in which environmental protection has been implemented, but you do see dramatic changes on the ground in terms of need for protection and the shutdown of mines, the increase in renewable energies and so forth.

Representative SUOZZI. But you'll agree that it needs to be more aggressive, wouldn't you?

Ms. YEH. I would agree. I would agree and I think that's true around the world. Absolutely I think we're in a climate crisis right now.

Representative SUOZZI. So, Jennifer, do you agree with Emily that, you know, they're not bad actors, that they're really trying the best they can and——

Ms. TURNER. The scale of China, the speed of their development, and the fact that they are the world's factory, I think numbers say that—I think they're probably still true—that something like 25 percent of their electricity goes to producing things for export, so that it's a little bit of a shell game. I mean, that our investment in China to produce products that then we buy back here, I mean, the CO2 stays with China. You know, it's kind of like Las Vegas, right? It stays there. China is going to meet, and they probably already have met their 2030 goal, but I think some of it, too, is that they need to—and not just China—other countries also need to kind of focus more on absolute emissions, and it's tough. I mean, keep in mind that between 2013 and 2020 I think China—something like 2.5 million coal workers lost their jobs. We've had the same problem here, but again, the problems in China, it's on steroids, just by the sheer numbers of the large population. But all this investment in renewable energy, energy-efficient buildings. they are really rapidly ramping up clean-energy jobs, but you could say that while it's at a smaller scale, we are experiencing some of the same challenges here because the people who lose their jobs in West Virginia and other coal areas, we don't exactly necessarily plug them right into the renewable-energy projects. There's lots of local pressures. China is top-down, but there still are pressures from below. We talked about it before you came in, too, that some of the issues that local governments and grid operators—they like coal. It's easy to work with, and that China's—unfortunately, a lot of the plants that are in the pipeline in China to be built that were recently greenlighted, a lot of them—they're not needed. I mean, Dr. Yeh mentioned that briefly. And there's a good chance they won't even get turned on, and that's the tragedy. They're wasting money. They could have used that money elsewhere.

Representative SUOZZI. I don't want to hog all my time here, Senator. I know that Senator Ossoff just came on as well.

So let me just say that, you know, I'm going to try and get some more information about what transpired today so I can listen, but I'm intending to continue to be much more aggressive in my trying to portray China as a bad actor, because the forced labor—I'm really influenced by the forced labor camps of the Uyghurs and the fact that those exports that you were talking about, a lot of them come from the Xinjiang region, where they're putting people in forced labor camps and doing forced sterilization and what people have described as crimes against humanity. So when I see a bad actor like that and I see a bad actor when it comes to stealing technology and when I see the arrest of people in Hong Kong, when I see the treatment of the Tibetans, I can't credit them that they're doing the best they can regarding climate change either. So I'm going to re-

main being a little bit more aggressive about this. I'm willing to be educated more.

Thank you very much, and I yield back, Senator.

Chair MERKLEY. Thank you, Congressman.

Senator Ossoff.

Ms. YEH. May I say one thing? Just that I totally agree about Xinjiang, but I do think it needs to be disaggregated. The Chinese government isn't one person and there're lots of different interests at stake. I think we will make more progress by having some form of cooperation in places where there can be cooperation and that that will actually be the only leverage that the U.S. has on these other issues that we care about, like Xinjiang.

Representative SUOZZI. Well, I'm fully supportive of the President's effort—our President's efforts and President Xi to try and disaggregate and be cooperative on the issue of climate. I'm totally for that, but I want to see results. Until I see results, I'm going to continue to put pressure on aggressively about the bad actions of the Chinese Communist Party and the way that they treat people just inhumanely. And I think that we need to continue to put that pressure on and then they can see this climate change cooperation as being an opportunity to put on a better face to the rest of the world.

Chair MERKLEY. Thank you, Congressman. I want to make sure Senator Ossoff has a chance to get his time in since we had technical difficulties before, and then we'll come back to you, Doctor.

Senator Ossoff.

Senator OSSOFF. Thank you, Mr. Chairman, and I hope that the technical issues are resolved.

Ms. Elimä, would you please characterize the extent of forced labor in solar supply chains—for example, the production of polysilicon ingots, other inputs to solar technology—in China and specifically in Xinjiang?

Ms. ELIMÄ. When it comes to forced labor in Xinjiang, this labor transfer program, it indeed exists in other part of China. But in Xinjiang alone the power to elevate and initiate the program, which includes the surplus labor and labor transfer program, is designed on logic that indigenous people who don't actively participate or refuse to participate are affected by separatism, extremism, terrorism. So if a person does not comply with the state-sponsored labor-transfer program offered to them, then they're seen to be radicalized and a potential terrorist that can be sent to the internment camp.

So the Xinjiang government, central government, and local government, who practice this labor program also seem to give a lot of incentives to a company like the metallurgical company Hoshine and polysilicon companies in Xinjiang. And then, when these products are made by forced labor, then they sell it to the module company. In fact, JinkoSolar, the world's second largest module company, itself also participated in this labor transfer program. So ever since—because the polysilicon and the ingots can be blended, it's legitimate to say that almost the entire worth of the panel has been affected by forced labor. So this is not specific—one company participates in forced labor, so we don't buy from them. The root of the problem is Hoshine sells to Daqo which sells to the entire world.

So it's impossible to say we don't buy from the one company. It's tainted by the entire supply chain.

Senator OSSOFF. So just to summarize, Ms. Elimä, your response, am I correct—and please correct me if I'm wrong, but am I correct in characterizing what you just said—that the entire solar supply chain originating from Xinjiang is potentially tainted by the use of forced labor?

Ms. ELIMÄ. Yes, because the raw material is not always sold just to the companies inside Xinjiang and other cities in China. They also sell directly to the world. For example, Hoshine Silicon, they sell the silicon-based production to the United States. So a lot of stuff has been tainted here—not only the polysilicon, metallurgical silicon, the solar-grade silicon is also included in electronic grade silicon. So not only the solar, actually, most of the——

Senator OSSOFF. Thank you, Ms. Elimä.

And the Biden Administration has taken two actions, both of which are positive: first, moving to stop imports of silica-based products from companies believed to use forced labor, and also announcing a goal to utilize solar energy for 45 percent of the nation's electricity by 2050, which is vital to reducing greenhouse gas emissions and averting catastrophic climate change outcomes. Do you believe we can meet those goals—45 percent of our nation's energy-production mix from solar—without relying upon forced labor-derived products from western China, unless we build our own domestic solar industry so that we are independent of these Chinese supply chains? Isn't it necessary that the United States have its own solar manufacturing supply chain in order to build this solar energy generation capacity without relying upon supply chains that may be tainted by forced labor?

Ms. ELIMÄ. It doesn't have to be built only in the United States. I mean, we still can [unintelligible] expansion, like, the already existing metallurgical-grade silicon-to-wafer facility in Malaysia, and we can also still build new capacity in India. It doesn't have to be only in the United States. And I don't think these are the only things the United States should be investing in. Like I mentioned before, the United States should work with its allies to expand these capacities that the global chains require.

Chair MERKLEY. Senator Ossoff, I'm going to intervene here.

Senator OSSOFF. Yes, Mr. Chairman, go ahead.

Chair MERKLEY. I'd be a little more flexible, but your seven minutes are up, and Co-chair McGovern has returned from his Rules Committee and hasn't had a chance to participate yet, so I want to enforce those seven minutes and turn to Chair McGovern.

Co-chair MCGOVERN. Thank you. I want to thank Senator Ossoff for his questioning. I want to ask unanimous consent to insert in the record a statement from the International Campaign for Tibet on China's environmental challenges and the U.S. response.

Chair MERKLEY. So ordered.

Co-chair MCGOVERN. Dr. Yeh, thank you for your testimony and your dedication to research on the grasslands of the Tibetan Plateau. Your work helped inform my staff as we put together the Tibetan Policy and Support Act. The legislation directs the State Department to engage with the Chinese government, the Tibetan people, and non-governmental organizations to encourage the partici-

pation of Tibetan nomads and other Tibetan stakeholders in the development and implementation of grassland-management policies. So in your testimony, you say "direct international pressure is sometimes useful; at other times it can lead to unintended consequences for some PRC citizens." How big is the window, if any, for cooperation on grasslands in the current political environment?

Ms. YEH. Thank you for your question. I think there is probably room for encouraging and working with an increasing number of Chinese scientists who are also saying that there are problems with past policies and the assumptions. I think social science work by direct policy engagement feels very, very difficult to me right now because of all the restrictions that are—the ways in which all the environmental NGOs and grassroots associations within Tibetan areas have been shut down, pretty much. But I do think there is an increasing number of Chinese scientists who are starting to see the flaws of ecological migration, for example, and some of those problems. So I do think scientific engagement should be encouraged. I just feel like right now, very direct statements of problems are not welcome.

Co-chair MCGOVERN. So you also say that China is very likely to point to the U.S.'s own record on a variety of issues, and this should be taken into account when framing policy. Would a genuine domestic policy commitment to climate help demonstrate U.S. sincerity, do you think?

Ms. YEH. I believe so. I believe so. I mean, that's certainly been the easy talking point that the Chinese government has used for a very long time.

Co-chair MCGOVERN. To Dr. Turner: China's 14th Five-Year Plan adopted in March of 2021 and covering the years 2021 to 2025 would allow continued increases in coal production to 2025, support investment in new coal-fired electric capacity, and set a first-ever target for minimum energy-production capacity. What do you see as the implications of China's 14th Five-Year Plan, if any, for China's effort to achieve carbon neutrality by 2060?

Ms. TURNER. Well, there's hope that maybe some of this will change because, in some ways, it contradicts some of the bigger, longer-term energy plans that are out there. I should note that it seems that the 14th Five-Year Plan is a bit silent on the fact that some of these—the 200 in-planning plants—again, not all of them will be built, but a number of them are replacing older plants with these newer ultra-supercritical plants. But then I keep going back to, they currently are over capacity on coal, so it doesn't seem very logical. It's kind of like a local jobs plan.

If I could just do a quick—just to reflect back on the previous question about—keeping in mind that I think there's also another opportunity with China heading up the Convention on Biodiversity and there's going to be a fall virtual—I don't know, is it virtual?—there's going to be a meeting in the fall and another one in the spring; they split it up. Now, the U.S. and China have worked together for decades on cooperating on national park development, and the biggest park, Sanjiangyuan—I have to ask Dr. Yeh: Did they actually open it yet? It was supposed to open last year. Did they open it yet?

Ms. YEH. They implemented a ranger program, but there's no legal framework and it doesn't seem to be actually operating as a park yet.

Ms. TURNER. Yes, but what's notable is that one of the—I had my last meeting before the March closure where we all ran out the door with our laptops under our arms—it was about U.S.-China cooperation on national parks, and the Chinese looked at what we did in ours and said, Well, you chased out your Native Americans—and luckily our park system folks said, Don't do that, and that while it's not yet formalized, there are quite a few Tibetans who are raising their yaks in this gigantic national park. And I remember one of my favorite discussions, questions was to the park service guy who was saying that, well, you know, the Chinese said, well, we should get rid of these yaks, and they're like, no, no, no, no; wildlife is good in parks. And they saw it as a real way to attract tourism but also just to maintain how the grasslands have been maintained for millennia, that Dr. Yeh had mentioned before. So continued engagement on the national parks can maybe promote—correcting the mistakes that—you know, not making the same mistakes that we did with that.

But again, there's also the climate issue, too, that China is—one of Xi Jinping's big goals, too, is to plant more trees—this is great, but maybe opportunities to call out the fact that China's soybeans, leather, and beef imports from Latin America are leading to growing deforestation there, so it's kind of like this little dichotomy of what happens at home and what happens abroad, a little different, but we are seeing the European and U.S. legislators kind of coming together and talking about, Well, what can the U.S. and Europe do to raise the bar and standards on preventing this kind of deforestation that, of course, has big ramifications for climate change, so the EU and the U.S. could be the ones that set the global standards.

Chair MCGOVERN. Well, thank you. I know my time is up.

Ms. TURNER. We're putting a lot of things together in that one, but yes.

Co-chair MCGOVERN. I appreciate that. I appreciate all the panelists. I've read all your testimony and I heard some of it while I was in the Rules Committee.

But let me just say this: The environment, protecting our planet is a human rights issue, and the United States and China both have self-interest in getting this right, ultimately. At the same time, it can't be an either/or, with Let's talk about the climate and let's not talk about some of the other things that are happening that are quite disturbing right now. So we're going to have to thread that needle. But again, the motivation for China, just like the motivation for the United States in dealing with the climate crisis, is—there is self-interest; both countries owe it to their people and to the world. Your contributions here were very, very valuable.

I yield back, Mr. Chairman. Thank you so much, and thank you for accommodating me.

Chair MERKLEY. Thank you, Co-chair McGovern, and I know you were doing important work in trying to set up a strategy, so the government is not shut down at the end of September, so, much appreciated.

We are running out of time, but there are two topics that haven't been addressed that I think would be valuable to address.

Dr. Turner, you note in your testimony that China has started using various market mechanisms, including an emissions-trading—I think scheme is the word, I believe, used, or maybe it was "system"—ETS—that I think was implemented just earlier this year. What sector of the economy is covered by that, and is it up and operating? Is it too soon to evaluate whether it could have any particular value in motivating reductions in global warming gases?

Ms. TURNER. Thank you for that question. Well, in Europe, it takes a long time to get an emissions-trade system on board, and China started planning about it in 2015, so a little bit of a "Groundhog Day" situation where we launched it, we didn't. But now there's a national one launched and it does focus just on the power sector, which, of course, we all know is the main source of CO2 emissions. Still a work in progress, but I should note that in the EU, once they formally launched it, it really took them 10 years to get it right. So I think it's one of these, maybe, institutions in waiting. I mean, it's being implemented; there's a lot of work. Before COVID there were a lot of U.S.-China exchanges; the Energy Foundation was also very instrumental early on in helping the Chinese researchers figure out what it was. So there's some slippage in that maybe the caps for the coal-fired power plants aren't as hard as they need to be, but some of this is just also to educate them on how it works. But I think it's something, too, that maybe Dr. Teets might know, that this is an area—there were some more technical NGOs that have been involved on it, but it's maybe not as much of a space where there's a lot of Chinese NGO action.

The bigger, possibly more important kind of technology changes really are with grid reforms and pricing. Again, one of those nonsexy kinds of issues to talk about. But those kinds of changes I think offer even more promise in reducing carbon emissions than in the near term for ETS. But ETS, it's still good. We have smaller regional ones in the U.S. We don't have a national one. Then there's that whole price on carbon question. I'm not—oh, I said it. You're like, don't say that question. China's not responding well to the carbon border tax that the Europeans have floated up. I guess maybe the U.S. is not as happy with that either. But, yes, there is some movement. It's——

Chair MERKLEY. Well, the United States had a strategy that worked extremely well on sulfur dioxide and it's always an, Oh, well, we had such an impact in such a short period of time; it was off-the-charts more successful than we anticipated, reducing sulfur dioxide dramatically at very low cost, so we keep thinking it must be possible with carbon. But as you know, we don't have a national system, but I do think monitoring China's system will be interesting, comparing it to our regional systems and the European system to see what's working and not working and why, because it certainly has kind of this power, as in various pricing strategies, to try to incentivize reductions that are much harder to sometimes just dictate.

There's another area that we haven't talked much about and we are—yep, OK, a vote's underway over here in the Senate, so a very short answer. And I must apologize; I'm going to have to close the

gathering, but I just want to take note of this discussion of Greening the Belt and Road Initiative. The criticisms the United States and others have leveled at China for financing some 200-plus coal plants around the world at the very time that it's so essential that we be reducing international dependence upon fossil fuels. There really isn't time to have you address this in any significant way, but I want to note that that's an area where I think it's really important for various nations, the United States, China, with others, to say, What are strategies in international finance? What is the World Bank doing? What is the IMF doing? What is the United States financing strategy? Because we are still not ending our financing of fossil fuel projects around the world. I've been holding conversations with the Biden Administration saying, Just say no; just say no, we will not do this anymore; and they're insisting on exceptions and strategies that kind of decline over time, but we're in such a code-red moment now that I think more abrupt or dramatic or bold action is necessary.

I can only give you about 30 seconds to respond, if you'd like, Dr. Turner.

Ms. TURNER. I also want to toss this over to Dr. Teets.

Yes, I mean, I think you're right. With the U.S., we walk the walk, talk the talk; that helps. But also, Dr. Teets, do you want to say anything about the Chinese NGOs that also have been kind of lighting the fire on Green BRI?

Ms. TEETS. Yes, and I know we're almost out of time, but thank you. The area where we do see that engagement is really helpful is especially around technical standards setting, and this is where the NGO and the research communities in China are really learning from Western counterparts. And I believe that this is where engagement can really function well.

The earlier question of "should we engage with China or not": I think we absolutely should. They haven't adopted our governing principles, but they have adopted a lot of our governing tactics, like public comment periods on laws, and judges and judicial behavior. So I think engagement is really valuable, but focusing more on technical skills and specific tactics will be most useful.

Co-chair MCGOVERN. Thank you very much, Dr. Teets and Dr. Turner and Dr. Yeh, and Ms. Elimä. We so appreciate your expertise being brought to bear in this discussion. I think that this is an area of wrestling with the challenges with our different strategies and policies and economies between the United States and China but with both having an enormous stake in the future of this planet and having very, very oversized roles in how humankind, how human civilization tackles this moment.

I hope that that dialogue with China, despite our criticism of China in other areas, I hope cooperation can be sustained and enhanced in this area. I know that China has made a point of saying, as a way to respond to pressure and to stop criticism of Xinjiang and the treatment of the Uyghurs and treatment of citizens of Hong Kong—that you can't divorce climate policy from everything else, but, really, the moment demands that while we may argue and debate and disagree over many other things, in this area the world is looking to China and the United States to really lead the way. As the largest carbon dioxide producers, it's essential that we

work together to have dramatic reductions, far beyond what we're currently committed to. And I hope the conversation in Glasgow produces some important advances in the plans of the major producers of climate gases around the world.

So with that, I will note that the record will be open through close of business on Friday for any additional submissions from members of the House or Senate for the record, and that this gathering of the Congressional-Executive Commission on China is adjourned. Thank you.

[Whereupon, at 11:56 a.m., the hearing was concluded.]

A P P E N D I X

PREPARED STATEMENTS

PREPARED STATEMENT OF JENNIFER L. TURNER

Chairman Merkley, Chairman McGovern, and respected Members of the Commission, thank you for the opportunity to present and have a discussion with you today about China's climate commitments and clean energy transition. I will make short comments on 3 topics that can be explored more deeply in the Q&A, in my written testimony and after this session.

The UN just issued an update on the world's progress in addressing climate change with a sobering conclusion that even if nations fulfill their current Paris greenhouse gas reduction commitments, the world is still headed to catastrophic global warming by the end of the century. So China and the rest of the world need to act more aggressively.

(1) CHINA IS ACCELERATING DECARBONIZATION OF ITS ENERGY SECTOR, BUT CONTRADICTORY TRENDS SLOW IT DOWN

CHINA IS #1 IN CLEAN ENERGY INVESTMENT AND LEADING THE WORLD IN WIND, SOLAR, EVS, AND SUPER GRID DEVELOPMENT

Today, China is the world's largest producer of solar panels, wind turbines, batteries, and electric vehicles—in great part because it has been the top investor in clean energy for nine out of the last ten years.[1] In 2020 alone, China installed more than 70 GW of new wind capacity.[2] To give a sense of scale that is slightly over half of the total U.S. installed wind (111 GW). Wind power is in the air here as well. In 2020, with Texas leading the way, the United States installed 14.3 GW, a record year. Despite the higher numbers of installations, China still loses wind power due to low turbine quality, grid connection problems, insufficient battery storage, and grid operators and provinces still giving coal priority. One strategy to help improve wind connectivity was a big push in 2019 and 2020 to build offshore wind, bringing it closer to large population centers.[3] Today, nearly a quarter of all offshore wind capacity is in Chinese waters.[4] Just one example of how China often moves fast on such infrastructure projects.

CHINA HAS MADE SIGNIFICANT PROGRESS IN DECARBONIZING THEIR ENERGY SECTOR, BUT THE COUNTRY IS STILL #1 IN EXISTING AND PLANNED COAL-FIRED POWER CAPACITY

Since 2011, China has burned more coal than all other nations combined.[5] And China is currently responsible for roughly one quarter of annual global greenhouse gas emissions,[6] which is over two times more than the next nation, the United States, at 11 percent.[7] Of all of China's CO2 emissions, half comes from energy, with steel production being the next largest source.[8] China currently has more than 1,000 existing coal plants and coal accounts for 56.8 percent of the country's energy consumption.[9] This is a drop down from 2009 when coal made up 71 percent of China's energy pie. As part of the war on pollution that kicked off in 2014, the government accelerated closures of old coal plants and accelerated renewable investments. In 2015, the Chinese central government initiated a traffic light system for the construction of new coal plants in the provinces. Most provinces initially had red lights, but with the economic slowdown over the past two years, most plans for coal plants have been granted green lights.[10] Currently, there are plans to build 200 new coal plants.[11]

Throughout much of the 2000s and 2010s, seven Chinese cities topped the ranks of being most polluted in the world.[12] In 2013, Beijing saw the world's first "airpocalypse" with particulates more than 30 times the recommended volume.[13] In 2016 when China laid out its 13th Five Year Plan, a maximum target was set at 1,100GW of coal nationally.[14] Since then, air pollution has fallen by 25 to 35 percent in most major cities.[15] Today, the situation has improved, but Chinese cities still account for 42 of the top 100 most polluted cities, attributed increasingly to the

growth in private vehicle ownership.[16] In Beijing and Shanghai in 2020, almost 50,000 deaths were linked to smog and the economic costs related to this air pollution are estimated at 23 billion dollars.[17] The Chinese government's climate action and decarbonization efforts are propelled in great part to mitigate the threats to human health from air pollution as well as increases in economic damage from floods, droughts, and sea-level rise.

(2) China Is Meeting Its Paris Climate Commitments, but They Need To Set More Aggressive Targets To Hit Their 2030 CO2 Peak and 2060 Carbon Neutrality Goals

China Climate Commitments & Compliance: Across the spectrum of decarbonization investments and the reduction of CO2 emissions, China has proven a leader, but sometimes governance challenges and competing priorities have slowed down some low-carbon efforts.

At the 2020 UN General Assembly, Chinese President Xi Jinping promised that China will peak carbon emissions by 2030 and be carbon neutral by 2060.[18] To reach the 30/60 goals the government has instituted new plans and investment to continue transitioning to green, renewable energy sources, continuing its expansion of super grids and electric vehicles, as well as intensifying energy efficient building regulations. The government also has made major promises to increase forest cover as carbon offsets and include non-CO2 short-lived climate pollutants like methane, nitrous oxide, black carbon, and hydrofluorocarbons.

China's Paris Agreement NDCs: At the Climate COP26 in Glasgow, China will be announcing new Nationally Determined Commitments to accelerate reduction in greenhouse gases. China has reached most of its UN Nationally Determined Commitments ahead of 2020, which has promoted many Chinese and international experts to argue that China could go bolder and deeper with these new commitments, most notably shifting China's targets to be total emission reductions rather than per unit of GDP. However, China's 14th FYP released in spring of 2021, calls for a minor increase in the maximum annual coal output to 4.1 billion tons, rather than any decrease from the current output of 3.9 billion tons.[19] Critical for the economy, not just the environment, the 14th FYP also targets a reduction in CO2 emissions per unit of GDP, from 18 percent to 13.5 percent by 2025.[20] China has one of the most carbon intensive economies and the costs of pollution on health and economic growth underscore China's motivation for decarbonization.

China's National Carbon Trading Scheme: Building on many years of exchanges with U.S. and E.U. experts, China launched its National Carbon Emission Trading (ETS) Scheme in early 2021. China's plans for an ETS began in 2015, but had been delayed many times since then. Eventually in 2018, the Ministry of Ecology Environment (MEE) launched several small pilot ETS schemes with different prices and voucher quotas. The first nationwide ETS scheme began in 2021 and only covered the power sector, consisting mostly of SOEs. These energy companies account for half of China's CO2 emissions and 12 percent of the global total. The ETS trading scheme will next be expanded to cover the industry sector which accounts for another 30 percent of China's CO2 emissions.[21] Unlike other ETS schemes, China's ETS is not cap-and-trade, rather it is just trade. MEE issues quotas to companies whose CO2 emissions are above a determined threshold (currently 26,000 tCO2). Companies must then record and report their emissions and pay for credits used. Unused credits could be sold on the market, and companies can be forced to purchase credits when emitting more CO2 than they have credits for. Eventually, China's ETS will expand to cover all economic sectors in China. Most recently, the MEE released a revised draft of the ETS scheme that increases penalties for non-compliance and other market measures such as a mechanism that prevents the price from changing more than 10 percent per day.[22]

China's Super Grid Development: Because much of China's installed renewables had historically been in the far-flung Xinjiang province and energy lost in transmission along with curtailment meant that in order for these projects to really reduce coal in a meaningful way, they began constructing a new super-grid to tie the nation's energy sources together.[23] To help get more renewables on the grid, over the next four years, installed battery capacity is expected to balloon ten-fold from 3 GW in 2020 to 35 GW.[24] This boom could not only fuel China's EV industry and improve renewable energy storage, but could also bring down global prices on batteries.

China's Energy Mix Transition: Additionally, while China's grid capacity is currently made up of only 10 percent non-hydro renewables, Beijing has mandated an increase to 30 percent by 2030.[25] This will be done by installing more than 1.2 bil-

lion kilowatts of wind and solar power.[26] In 2020, China added a total of 135GW of wind and solar, which equaled half the year's global total.[27] Yet, in the same year the world as a whole still added 60GW of coal, most of this was either in China or financed by China.[28] Renewable energy jobs are a booming sector, but like the United States, China also struggles with transitioning its coal sector workers. China has shed some 2.4 million since 2015.

China's Frictions Between Market and State/Provinces and Center: While the Chinese government has said it wants to open the clean energy market for private enterprise, it still sets all of the targets from Beijing.[29] Thus, according to Anders Hove, a researcher at the Oxford Institute for Energy Studies, the markets are seized by fear and unable to act freely. For example, the National Energy Administration and National Development Reform Commission issued a joint statement setting the target for wind and solar installs as 240GW each,[30] but when the market got too hot too quickly, the government removed key subsidies. The freeze on solar PV tariffs in 2018 led 50 percent of the private companies to close by 2020. This kind of solar power Darwinism weeds out the weaker companies.[31] While China had initially instituted a feed-in tariff to incentivize offshore wind projects, this fee paid to suppliers was gradually reduced to the point that it will end entirely next year. This pushed some offshore wind projects underwater financially.[32]

(3) China's Overseas Fossil Fuel Investments Were Nullifying Domestic Decarbonization, but Overseas Coal Investments Are Now Slowing Down

IS THERE A GREEN BRI?

There is an endless need for investment to bring stable and clean electricity to the developing world. For example, between now and 2040, 60 percent of new energy demand will occur in the Indo-Pacific.[33] This energy hunger catalyzed China's expansive Belt and Road Initiative (BRI) to prioritize energy investments in its first five years. Research from the American Enterprise Institute pegs total Chinese overseas investment at more than two trillion dollars as of 2020.[34]

Within the roughly $200b China has invested in energy infrastructure abroad, just over half has been spent to create 100,000 MW of fossil fuel generated electricity and less than five percent has been spent on wind or solar.[35] However, trends show that with the accelerated push for and declining cost of renewables, coal usage is projected to be non-competitive and lead to stranded assets.[36]

The 2019 Decarbonizing the Belt and Road report, from Tsinghua University's Ma Jun, states that the combined CO2 emissions from all of China's Belt and Road Initiative energy projects—including planned and under construction—will far exceed the Earth's remaining carbon budget, even if all nations meet their Paris Accord goals.[37]

Chinese outbound FDI peaked in 2017.[38] Annual BRI spending dropped some 43 percent in 2020,[39] due in part to the suspension or termination in 2019 and 2020 of Chinese-backed coal projects worth about $47b. In the first half of 2021 China financed no new coal plants in countries involved in the BRI.

One of the most promising pledges toward a "Green" BRI could come in the form of the Belt and Road Bankers Roundtable Mechanism (BRBR) green bond and the Belt and Road Green Finance Index that were announced at the Second BRI forum in 2019. These policies could allow several large banks from China and Europe and elsewhere to form a universal ranking system for BRI projects and swappable bonds that would allow for accelerated financing of low carbon projects.[40] In the last seven years, China has invested in 12 GW of wind and solar projects in South and Southeast Asia—this is equivalent to 21 standard coal plants.[41]

POTENTIAL U.S.-CHINA CLIMATE CHANGE SPACE RACE?

In the April 2021 U.S.-China Climate Crisis Statement, both countries agreed not only to make improvements in domestic decarbonization, but also to prioritize investments and finance to decarbonize developing countries. The International Renewable Energy Agency (IRENA) says that the world needs to increase investments in renewable energy by tenfold to 4.4 trillion dollars each year until 2050 if we are to seriously limit climate change impacts.[42] This massive need for renewables is but one example of how the global market for clean energy and low carbon technologies is vast, with plenty of room for Chinese and U.S. investments.

The current tensions in the U.S.-China relationship make it difficult for the two to collaborate as closely as they did for decades. U.S.-China cooperative competition around clean energy galvanized both countries to undertake more aggressive climate mitigation action and ultimately promulgate a bilateral climate agreement. This

past cooperation offers models of how the two countries could collaborate with developing nations.

During the Obama Administration, the two countries created a unique form of bilateral collaboration focused on clean energy innovation—the Clean Energy Research Centers that brought Chinese and U.S. national labs, NGOs, companies, and researchers together to jointly develop clean energy technologies—from renewable energy and clean diesel, cleaner coal, and energy efficient buildings to water-energy technologies and EVs.

China currently accounts for half of all electric vehicle sales globally[43] and over 90 percent of e-buses in the world are operating in China. China's new energy vehicle credit trading program was actually modeled on California's Zero Emission Vehicle (ZEV) Program.[44] China excels at investing in hard infrastructure and technologies like electric vehicles, but developing countries also need assistance with technology enabling legislation, such as the ZEV program. The United States remains a major technology innovator. In the EV space, the United States is stronger in vehicle-to-grid technologies and in regulatory space. Energy storage projects in the United States are projected to triple from 2020 to 2021 and account for half of the installed battery capacity in the world by then. And Europe, too, will see a drastic uptick of 70 percent in installed storage.[45]

The Better Utilization of Investments Leading to Development (BUILD) Act, instituted as section 1401 of Public Law 115–254 in October of 2018, rejuvenated the U.S. International Development Finance Corporation. In cooperation with the U.S. Department of State and USAID, the DFC currently has an appropriation from Congress of 33 billion dollars.[46] The DFC recently announced its investments will be net zero carbon by 2040.[47] Additionally, the newly crafted bill "Strategic Competition Act of 2021" has a large portion based solely on the energy infrastructure investment competition between the United States and China.[48] Meanwhile, the U.S. International Trade Agency has helped American businesses to invest nearly 200 billion dollars abroad.[49]

During his remarks at the September 2021 Major Economies Forum, President Biden reiterated his plan for a historic investment to "build a clean energy future that creates millions of jobs and ushers in new industries of the future" and more than triple American investment in energy infrastructure modernization abroad by 2024, up to $100b/year.[50]

A greener BRI and reinvigorated U.S. investment into clean energy infrastructure and regulatory structure, along with parallel efforts by Europe, could represent a Green Marshall Plan for the world.

I want to thank my team: Eli Patton, Justin Bernstein and McKenna Potter for their assistance in research for this testimony.

[Endnotes begin on the following page.]

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PREPARED STATEMENT OF EMILY T. YEH

Thank you for this opportunity to speak briefly about environmental challenges facing Tibet and the effects of Chinese dam projects downstream.

ENVIRONMENTAL CHALLENGES FACING TIBET

ANTHROPOGENIC CLIMATE CHANGE

The most significant environmental challenge currently facing Tibet is climate change, insofar as climate change is interconnected with all other aspects of the environment and thus also with culture, economy, and society. The Tibetan Plateau is warming significantly more quickly than the global average. As elsewhere, what is most significant is not the rise in year-round average temperatures, but rather changes in extremes. Existing and projected changes in intensity, frequency, and duration of climate extremes are faster on the Tibetan Plateau than for China as a whole or for other places at equivalent latitudes.

The following are a few highlights from the latest climate science about the Tibetan Plateau (from the 6th IPCC Report):

- Increase in heat extremes/maximum temperatures.
- Increased minimum temperatures, decrease in cold spells.
- Increases in permafrost temperatures-permafrost thaw (which further releases carbon, accelerating warming).
- Positive feedback (i.e., accelerated warming) from dust and black carbon (pollution, including from distant sources).
- Decrease in snow-covered areas, snow volumes.
- Accelerating loss of glacier mass and volume. This has led to increased glacial runoff.
- Decreased frequency and increased mean intensity of snowfalls, i.e., more snowstorms. Intensification of heavy precipitation more generally.
- Overall increase in precipitation over eastern Tibetan Plateau, but also significant local heterogeneity so that some places are getting much wetter and others drier, with significant implications for vegetation (on which livestock depend).

KEY WAYS IN WHICH CLIMATE CHANGE IMPACTS TIBETANS

- Inundation of grazing lands. Rapid expansion of lakes due to melting permafrost and glaciers, decreased windspeed (lower evaporation), and increased precipitation have led to dramatic loss of grassland, decreased livestock health and viability, and displacement of pastoralists from their rangelands. Thus, it contributes to drives to resettle pastoralists and loss of traditional forms of culture and livelihood tied to land.
  - From 1970–2010, total lake area on the Tibetan Plateau increased by 34%, with a faster rate of expansion occurring after 2000. The surface area of Lake Serling (now the 2nd largest lake) *doubled* over this period. In addition to loss of grazing land, the growing area of soil affected by saline lake water has caused further vegetation loss, expanding the radius of impacts.[1]
- Declining availability of caterpillar fungus. Caterpillar fungus (*Ophiocordyceps sinensis*), a prized Chinese medicinal, has become an extraordinarily significant source of income for rural Tibetans across the Plateau given low prices for agricultural and pastoral products and increasing demands for cash. Former herders who have been resettled are particularly reliant upon it for income. Harvests are declining as a result of climate change (frost-heave from permafrost thaw, changing soil temperatures, changes in habitat) as well as habitat disturbance and in some cases overharvesting, often from outsider harvesters (rather than local residents).[2]
- Hazardous events (risks to human life and infrastructure): permafrost thaw results in landslides; glacial lake outburst floods are also very dangerous, though these are more common in the southern Himalayas than on the Tibetan Plateau.
- Rangeland degradation—although Chinese government policies to turn pastoralists into ranchers, or to move them out of pastoralism through ecological migration continue to be predicated on assumptions of herder overgrazing, there is now a significant body of evidence that precipitation is a more important driver of vegetation change than grazing intensity and thus that climate change is the most crucial driver of rangeland degradation. This makes it increasingly difficult for herders to maintain a livelihood, which in turn is important because

Tibetan cultural practices, identity, and language often haver greater vitality in rural areas and in association with traditional territories than in large cities or resettlement sites.

- Habitat degradation more generally, due to the cascading effects of changing temperatures and precipitation (especially raising minimum temperatures above the critical 0-degree threshold) affects Tibetan livelihoods as well as wildlife.
- Hydrological changes affect downstream communities as well as those on the Tibetan Plateau. Hydrological changes due to melting glaciers, thawing permafrost, and changing precipitation patterns have downstream effects on flooding, drought, and timing of the hydrological cycle with implications for fisheries and agriculture (see below). Locally there is more water in the short term but likely drought in the long term, again also leading to degraded vegetation.

ENVIRONMENT-RELATED POLICY CHALLENGES FOR TIBETANS

RANGELAND USE RIGHTS PRIVATIZATION, FENCING, AND OTHER POLICIES THAT ASSUME HERDERS ARE THE PROBLEM

Pastoralism on the Tibetan Plateau has a history of about 8,000 years. Historically, pastoralism was largely transhumant, livestock were privately owned, and grassland was managed as common property. Common use of lands allows mobility and flexibility, which are key to pastoralism systems around the world given their ecologically patchy and heterogeneous nature. In China livestock and pastures were collectivized in the 1950s. Livestock were decollectivized/privatized in the early 1980s.

Beginning in the 1980s, the state became concerned with grassland degradation at the same time as agricultural models of land use privatization started to be seen as appropriate for rangelands as well. Policymakers began to adopt the view that a "tragedy of the commons" induced by collective use of land led to overgrazing, and that this, combined with herders' ignorance, was leading to degradation. As a result, the government began to implement the 'rangeland household responsibility system' or the privatization of grassland use rights to individual households. This was accompanied by a push toward fencing of boundaries as well as the building of houses, particularly on winter pastures. In addition to correcting a purported (but not actual) "tragedy of the commons," this was targeted at converting traditional pastoralism into a Western-style, sedentary and privatized ranching model, which is seen as more "modern" and developed.

These policies are based on several problematic assumptions. First, widely cited reports about the extent of degradation were not based on rigorous studies and are likely to have been exaggerated.[3] Second, recent studies increasingly find that climate change, particularly changes in precipitation, are much more important than overgrazing as a driver of vegetation cover changes on the Tibetan Plateau.[4] Third, they fail to account for the fact that trampling is more damaging to grasslands than grazing; the concentration of livestock around winter pasture as a result of privatization has resulted in greater trampling and thus increased degradation. Fourth, in some cases degradation is related much more to past state-directed activity, such as efforts to drain wetlands or cultivate grains on pasture, than to current grazing.

In some places, these policies have thus resulted in increased rangeland degradation due to the concentration of grazing and trampling. This is particularly the case where households have been allocated only one year-round pasture rather than seasonal pastures, and where allocated pastures are small, poor in quality, or lack water resources. Other problems have included growing inequality; increased labor demands because cooperative herding becomes much more difficult; increased vulnerability to snowstorms due to the loss of flexibility; and increased rangeland disputes due to division. A number of recent studies have found that where common grazing by multiple households has been maintained or restored, soil fertility, vegetation cover, and species richness are better compared to single-household pastures.[5]

Nevertheless, these policies of grassland division and reduction of livestock numbers have continued to be the dominant policy emphasis. In 2003, a new program called *tuimu huancao*, often translated "Retire Livestock, Restore Rangeland," was launched across the Tibetan Plateau. Like other policies and programs, implementation has largely occurred earlier on the eastern Plateau and only later in the TAR (Tibet Autonomous Region); implementation has also varied significantly. In addition to deepening the implementation of rangeland division, it also designated different zones for rotational grazing, grazing bans of 3–10 years, and permanent grazing bans. In the Sangjiangyuan (Source of the Three Rivers) area of Qinghai it was also combined with ecological migration, discussed below. This was followed in 2011

with a destocking policy ("Rangeland Ecological Protection Compensation Mechanism") which pays a subsidy to pastoralists for not grazing, or for not exceeding calculated carrying capacities in areas where grazing is still allowed. Both implementation and reactions have been mixed. In many places, pastoralists state that calculated carrying capacities are less than the number of livestock required to sustain a livelihood.

ECOLOGICAL MIGRATION

The area of the headwaters of the Yangtze, Yellow, and Mekong Rivers ("Sanjiangyuan") in Qinghai province, often dubbed "China's water tower," is considered especially important for China's ecological security. As a result, the implementation of *tuimu huancao* there has been combined with ecological migration, the resettlement of Tibetan herders to new housing complexes that are usually built on the edge of existing towns and at a significant distance from original villages. From 2004–2010, based on government statistics, a total of approximately 55,000 herders in 10,000 households in the Sanjiangyuan area were moved into 86 settlements.

This has led to extraordinary transformations of traditional pastoral life, but with dubious ecological benefit. Ecological migration has been dubbed a "climate adaptation" strategy, but available ecological evidence suggests that it is not in fact adaptative. Experimental studies have demonstrated that climate warming leads to a variety of negative impacts on vegetation, but some of these negative impacts are modulated (made less severe) by moderate grazing.[6] In other words, given that climate warming is happening, grassland conditions are worse with complete grazing removal than with grazing. Other experiments have shown that grazing exclusion does not increase annual productivity of dominant species. Climate adaptation is crucial, but it is necessary to carefully evaluate whether particular measures are actually adaptive. Although studies have claimed based on overall greening of the Plateau that such policies have worked, more nuanced studies suggest greening is likely attributable more to climate change-induced increases in precipitation (which is dominant but not uniform) than to grazing removal as such.

Of greater concern to this commission are likely the social costs of resettlement on a large scale. While the government has provided subsidies, these are often delayed and inadequate in the face of inflation. Many settlements are poorly built and without water and sanitation infrastructure. Resettled households, a large proportion of which were relatively poor (with few livestock), have in many cases found that their standards of living have declined due to their new and unaccustomed need to purchase fuel and food. A major problem is employment and livelihood after displacement. Herding entails a complex set of skills that are no longer relevant after resettlement. Although some efforts have been made for job training and to provide opportunities for employment, these fall far short of needs. Instead, many resettled Tibetans live primarily on government subsidies and the sale of caterpillar fungus.[7]

Studies of herders resettled from Sanjiangyuan have found that while there are new opportunities for access to some public services such as health care, household investment in productive assets has declined. The de-skilling of the rural labor force has worked together with other policies such as school consolidation to undermine the long-term viability of pastoral production. Some households are technically eligible to return to their grasslands after 10 years, but cannot because they have already sold their livestock, and do not have savings to purchase a new herd. Resettlement, along with broad political-economic forces and policies that encourage urbanization, also undermine traditional ties to territory (including territorial deities) and associated cultural practices. Resettlement thus works together with the current assimilationist push toward use of Mandarin Chinese to erode linguistic and cultural continuity.

In addition to the ecological migration program in Qinghai's Sanjiangyuan region, a program specific to the TAR was launched in 2017. The plan, "Extremely high-altitude ecological resettlement" calls for resettlement of 450 entire pastoral villages located at 4800 meters or above to lower-altitude areas by 2025. The rationales given are environmental (avoiding grassland degradation and competition with wildlife for forage) as well as for easier provision of health services and education.

In this project, resettled households (except those officially categorized as impoverished) are required to pay for a share of the cost of their new houses. These new houses, located largely in previously sandy and otherwise unused land, are reportedly of good quality. However, income is again a significant problem. The Chinese government has spent large amounts of money to create various new agricultural farms, but these can employ relatively few workers and former nomads generally do not have the necessary skills to work at them.

The government reports that all resettlement is "voluntary," which raises the question of what constitutes consent in the process of resettlement. There are no reports of threats of violence or demolition. Instead, these projects generally begin with a survey of how herders feel about moving. Following this, a variety of incentives are offered, and local officials begin to address the reasons pastoralists give for not wanting to move. Finally, for those who remain unconvinced, local officials begin to conduct individual "thought work" that mixes further incentives with warnings, for example about the withholding of future development projects; together these appear to have resulted in movement according to government targets. However, in some cases (as documented in Qinghai) households have also returned to their grasslands after resettlement.

MINING AND CONSERVATION

Mining on the Tibetan Plateau has long been a flashpoint for protest, given both general objections to mining, which is understood to deplete the essence or fertility of the land at large, leading to natural disasters, as well as specific objections to mining on sacred mountains. Protests against mining have been met with harsh repression.

There appear to be some real changes that have resulted from Xi Jinping's "ecological civilization" campaign, which has encompassed the current implementation of a new system of national parks and the specific designation of Qinghai and the TAR as regions whose prime function will be for ecological protection rather than industrial development. Since 2015, ecological civilization implementation has included increasing numbers of performance targets for government and Party officials related to environment and ecology (rather than only economic growth) as well as environmental enforcement based on findings by central-level inspection teams. Among other things, this has led to the shutdown of many of the small-scale mining operations that have had significant impacts on Tibetan land and livelihoods in the past. It also appears difficult for new mining operations to be approved if they are within the boundaries of parks or nature reserves. Several county-level mines have been closed due to the new Giant Panda National Park, for example. (Many small hydropower stations have also been closed in southwest China due to new environmental regulations.)

That said, mining operations that are large in scale and operate with significant backing of powerful central-level officials will almost certainly find ways to continue operation. Large-scale mining operations, such as the Yulong Copper Mine in the eastern TAR (Western Mining Tibet Yulong Copper Co. Ltd) and the Huatailong Mine in Gyama continue, while increasingly severe repression of dissent makes protest against such mines ever less likely.

WEATHER MODIFICATION

Weather modification (i.e. cloud seeding to produce or prevent rain/snow) is strongly institutionalized in China and may become more prevalent as a response to climate-change induced changes in precipitation patterns. These can have negative localized effects; weather modifications to combat drought have produced heavy rainfall that caused injury to livestock in Qinghai, for example. In one case, a gold mine in northern Sichuan (Amdo) engages in weather modification to prevent rain in summer, allowing mining to continue. Cannon blasts are loud, shells land on pastures, and pastoralists report it has led to localized decline in precipitation, worsening grassland conditions.

There are reports of a "Sky River" project to install and use tens of thousands of fuel-burning chambers on the Tibetan Plateau to seed clouds, with the goal of boosting rainfall on the Tibetan Plateau (diverting water vapor from the Yangtze to Yellow River Basin). This would almost certainly have unintended negative consequences for local residents, as well as regional climate ramifications.

EFFECTS OF CHINESE DAM PROJECTS DOWNSTREAM

The world is currently experiencing a second major global dam rush, this one led by China, which is rapidly building dams both inside its borders and around the world. As with coal-fired power plants, the continued building of dams within China is less about the need for power generation per se (given current overcapacity) but rather an outlet for capital investment and a way for China to seek to meet its target of becoming "carbon neutral" by 2060. The inclusion of large hydropower within the Clean Development Mechanism, despite its contributions to carbon emissions during construction, methane emissions from vegetation decomposition in reservoirs,[8] and other ecologically detrimental effects, has further bolstered dam con-

struction. China is home to half of the world's large dams and adds dozens more each year. Much of the new dam construction is taking place in southwest China (Sichuan and Yunnan province and the TAR); this region has the world's largest hydropower potential under development, with significant deleterious effects downstream for the countries of South and Southeast Asia.[9] Specifically, large dams change river function by trapping sediment as well as gravel, logs and other habitat features, leading to significant erosion and habitat damage downstream. Dam operation also significantly alters seasonal water flows and flood pulses. Both the reduction in water held back in reservoirs and changed timing of water can significantly damage fisheries and downstream agriculture.

Southeast Asia's largest lake, Cambodia's Tonle Sap, supports one of the world's most productive freshwater fisheries. During the monsoon season, the lake expands five or more times its dry-season size, becoming an important breeding ground for fish. The Tonle Sap floodplain is home to more than 3 million people and up to 60% of Cambodia's protein intake comes from its fish. In 2019, however, fish catches were reportedly only 10–20% of previous years due to the combination of climate change, and dams upstream on the Mekong and its tributaries, including (though by no means exclusively) those in China. Currently there are 11 mega-dams in China's section of the Mekong, with more planned in the future. New water resources monitoring using satellite imagery and GIS analysis demonstrated that in 2019, during the severe wet-season drought in the lower Mekong Basin, China's dams were restricting nearly all upper Mekong wet season flow.[10] Rainfall and snowmelt within China's portion of the basin were at or above average, yet China restricted more water than ever, leading to the unprecedented drought downstream.

In other words, contrary to claims that the lack of water was due to a lack of rain that China was also experiencing, this remote sensing and satellite evidence showed that the upstream dams "turned off the tap" to downstream countries. The rationale for wet season impounding of water was to generate maximum electricity output in the dry season, during which electricity market prices are significantly higher. The withholding of wet season water and unexpected releases of water during the dry season damages not only fisheries and other ecological processes, but also causes considerable economic damage. It is not clear whether there were disagreements between Chinese government actors who have pledged to release water during drought downstream and those concerned about the imperatives of profit making by Huaneng and China Southern Grid (both state owned enterprises) in this instance.

Furthermore, it is important to remember that all of this dam-building is happening in the context of higher future temperatures. This will continue to alter the seasonal profile of real hydrological droughts in the future. While there may be more water now due to glacial melt and permafrost thaw, climate change is likely to lead long-term to a decline in river flow (specific contributions of different sources to overall flow vary by river).

All of these issues point both to the urgent need for substantive dialogue between China and downstream countries, as well as the problems created by China's designation of data about water flow and hydropower operations as a state secret. China has never been part of the Mekong River Commission, established in 1995, and instead engages with it as a Dialogue Partner, one of several factors that have made the commission relatively ineffective. China established the Lancang-Mekong Cooperation Mechanism 2016 as its own initiative; to date, the emphasis has been on finance and construction of hydropower dams in Lower Mekong countries. China did sign a new agreement in 2020 to share hydrological data from two monitoring stations on the Lancang (Upper Mekong) year-round rather than only during the rainy season. Hopefully, this will lead to more transparency and cooperation.

Finally, the Mekong is only one of the major rivers on which China is building dams, with significant current and potential future downstream effects. In 2020, China announced plans to develop a hydropower dam on the Great Bend at the lower reaches of the Yarlung Tsanpo in the TAR, which flows into India as the Brahmaputra and then through Bangladesh. This extremely risky infrastructure near the disputed border, if built, would certainly inflame tensions with India.[11]

Chinese Coal-fired Power Overcapacity

China has positioned itself as a global leader in renewable energy generation through aggressive investments in wind and solar as well as low-carbon transportation manufacturing. Despite this, more than 60% of China's electric power comes from coal-fired power plants, and China is continuing to add capacity at an astounding rate. Since 2000, China has installed more than 810 gigawatts (GW) of new coal-fired generation capacity (which works out to the equivalent of about one plant per

week) and in 2020 China approved more than 38 GW of new coal power capacity. The total capacity now in planning or development is almost 250 GW.[12]

What is particularly important to understand is that this capacity increase is largely unnecessary because China currently has a significant overcapacity in electricity generation—it is producing far more than it can use. Its existing power capacity is enough to meet electricity demand through 2030, even if annual demand grows at a rate of five percent (which is not the case).[13] As a result, many plants are operating far below capacity, and renewable sources are often curtailed as a result. This overcapacity also has very significant implications for climate change given the embedded emissions of the newly built plants (i.e. those expected over the lifetime of the plants). Continuing to build plants locks in momentum toward further climate change. While many analyses focus on failures of policy implementation or insufficient marketization of the sector, political economic analyses demonstrate that the problems are not of policy implementation failure but rather China's macroeconomic capital accumulation and the need for capital to find a place to invest over long time horizons.

POLICY-RELATED RECOMMENDATIONS

Climate change will only exacerbate problems faced by both Tibetans living in the PRC and citizens of South and Southeast Asian countries living downstream from Chinese dams. Thus, continued U.S.-China cooperation following the April 2021 agreement is extremely important. What seems particularly important to focus on is not the fact that China is the biggest annual emitter (it is far behind the U.S. in terms of per capita and cumulative emissions). Rather, what is important is managing an energy transition in both China and the U.S., with a focus on how to avoid the locked in emissions of recently built coal-fired power plants and to commit to stop building new coal-fired power plants. More specifically and modestly, asking China to decommission its coal generators ahead of schedule on a yearly basis is an important first step. In the longer term, it is important to push for China to have a coal consumption cap that has regulatory consequences.

Care should be taken that efforts and agreements made toward action on climate change are not simply existing policies given new names, that they are based in scientific (including social scientific) evidence about what is actually adaptive (e.g. resettling nomads off pastures does not satisfy this criteria) or mitigatory, do not further marginalize those who are already marginalized, and do not have significant potential for future catastrophic consequences (e.g. solar radiation management should be put off the table globally). It is also important globally and bilaterally to move away from treating large dams as part of genuine strategies toward "carbon neutrality" given their greenhouse gas emissions and other damaging impacts.

It will be helpful to downstream communities for China to provide greater data transparency on water use, and to engage cooperatively on the use of transboundary rivers. Any efforts the U.S. can undertake to encourage this will be helpful.

China is currently in a period of heightened cultural assimilation, nationalism, and repression. Direct international pressure is sometimes useful; at other times it can lead to unintended consequences for some PRC citizens. The situation is thus quite fraught. In responding to U.S. policy and pressure, China is very likely to point to the U.S.'s own record on a variety of issues, and this should be taken into account in the framing of policy.

[Endnotes appear on the following page.]

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Sheffield Hallam University | Helena Kennedy Centre for International Justice

Statement before the Congressional-Executive Commission on China

Forced Labor and the Xinjiang Solar Industry

September 21, 2021

Testimony of **Nyrola Elimä**

Supply Chain Analyst
Helena Kennedy Centre at Sheffield Hallam University

Chairman McGovern, Chairman Merkly, and distinguished Members of the Commission, thank you for bringing us together on this very important issue and offering me an opportunity to testify.

Forced Labor in Xinjiang

In the spring of 2018, significant evidence began to emerge that the People's Republic of China government understood its system of detention centres and internment camps as merely one part of a massive transformation of the Xinjiang Uyghur Autonomous Region into a docile and lucrative economic hub.[1] While continuing to hold indigenous citizens of the region in internment camps without trial, regional and local governments shifted their focus to the creation of an enormous forced labour regime. This system had the explicit goal of employing practically every adult citizen and was accompanied by the justification that the programme would increase both the economic productivity and the "stability" of the region.

China has placed millions of indigenous Uyghur and Kazakh citizens from the Xinjiang Uyghur Autonomous Region into what the government calls "surplus labour" and "labour transfer" programmes.[2] The Chinese government claims that these programmes are in accordance with Chinese law and that workers are engaged voluntarily, in a concerted government-supported effort to alleviate poverty. However, employing government documents and state media reports, researchers have clearly identified that, as they are practiced in the XUAR, these so-called "surplus labour" and "labour transfer" initiatives are in fact mechanisms of a massive programme of compulsory labour.[3] Evidence reveals that labour transfers are deployed in the Uyghur Region within an environment of unprecedented coercion, undergirded by the constant threat of re-education and internment.

State-sponsored labour programs exist in other parts of China, but in Xinjiang alone, the programmes are grounded in the logic of labour as a strategy of anti-terrorism. For Uyghur people to resist state-sponsored programmes purportedly designed to encourage vocational skills and "poverty alleviation" would be to align themselves with the so-called "three evils," which are the rationale for the CCP's crackdown and criminalization in the Uyghur region, including the camp system.[4]

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[2] The State Council Information Office of the People's Republic of China, "Employment and labor rights in Xinjiang" [English version], September, 2020, Online.

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[4] Enshen Li, "Fighting the 'Three Evils': A structur- al analysis of counter-terrorism legal architecture in China," Emory International Law Review, 33:3 2019, 5-6, Online.

The CCP's labour transfer programme in the Uyghur Region is used to punish people with oppositional ideological views, to create a regime of economic development built on compulsory labour, and to discipline the masses whom they deem to be inherently deficient because of their race and religion. If a person does not comply with the state-sponsored labor transfer program offered to them, they can be branded as radicalized and a potential terrorist and can be sent to an internment camp. This is drawn directly from government directives. This is why the US government, lawyers, and experts on forced labor have determined that labor transfers as they are practiced in Xinjiang constitute forced labor.

Uyghur forced labor in the solar industry

The solar industry is particularly vulnerable to forced labour in the Uyghur Region because around 95% of solar modules rely on one primary material – solar-grade polysilicon.[5]
In 2020, China produced nearly 75% of the world's polysilicon, which includes solar-grade and electronic-grade. The four largest producers in Xinjiang alone account for around 45% of the world's solar-grade polysilicon supply. Hoshine Silicon Industry, the metallurgical-grade silicon producer (input into polysilicon) in the region with the highest production capacity, has participated in state-sponsored forced labour transfer programmes in the Uyghur Region.
All four of Xinjiang's largest polysilicon manufacturers– Daqo, TBEA (and subsidiary Xinte), Xinjiang GCL, and East Hope – have reported their participation in labour transfer or labour placement programmes and/or are supplied by raw materials companies that have.
Daqo alone is a supplier to the four largest solar module manufacturers in the world – JinkoSolar, Trina Solar, LONGi Green Energy, and JA Solar.

In the course of this research, we identified

1) 11 companies engaged in forced labour transfers
2) 4 additional companies located within industrial parks that have accepted labour transfers
3) 90 Chinese and international companies whose supply chains are affected
4) that manufacturers at various stages of production of solar modules -- from raw materials to metallurgical grade silicon to polysilicon to wafers to panels -- were complicit in forced labor.

However, forced labour wasn't the only problem in the Solar supply chains.
As of 16 years ago, seven companies headquartered in the United States, Germany, and Japan made practically all of the polysilicon needed to manufacture solar modules for the world; China had almost no presence in the polysilicon market. But by 2020, China produced nearly 75% of the world's polysilicon. The journey to this extraordinary market share only took 15 years, and it saw rapid acceleration in the last five.

[5] Bernreuter Research, "Solar value chain: how China has become dominant in all production steps for solar panels," Bernreuter Research Polysilicon Market Reports, June 29, 2020 [Updated August 18, 2020], Online.

Moving manufacturing to Xinjiang, where they are producing polysilicon using coal-based energy, helped China to cut everyone out of the market by making the price of polysilicon very low. Coal is cheap and it's heavily subsidized in Xinjiang. To encourage polysilicon companies to make the distant move out to Xinjiang in the mid-2010's, the government promoted the development of the Zhundong Coal Power Base, which has powered the polysilicon giants that moved into the region.[6] To better facilitate the growth of the new energy economy in Zhundong, the government planned an expansion of the railroad and airports into the otherwise largely deserted region as well.[7] Companies moved to Xinjiang around 2015-2016 and became fully operational in 2018. From that time most other polysilicon markets in the world have changed their business model to not produce the polysilicon anymore.

Some of the PRC's leading new energy giants have taken full advantage of the benefits of proximate and cheap coal to fuel their polysilicon production. Xinjiang GCL and East Hope both call the region home. TBEA has a coal plant there, and their factories for both polysilicon manufacture and other electrical products they create are located just outside.

The Zhundong Zone also had a strong relationship with the local labour transfers programmes before the camp system. Since 2016 and the increasing rise of repression in the Uyghur Region, labour transfers continued apace upon a backdrop of internment camps, supplying the PRC's solar industry with labourers who were compelled to participate. [8] The Human Resources and Social Security Bureau of Changji Prefecture, where the Zhundong coal mines are located, boasted in 2018 that it had conducted 11,631 transfers of surplus labour to date.[9] The compulsory programmes continue even now, supported by incentives provided by the social security bureau to companies within Zhundong for absorbing the transfers.[10]

The global solar industry faces limited but feasible alternatives to sourcing solar materials tainted by forced labor in Xinjiang. These are:

a) Technologies that don't use polysilicon at all.
b) Polysilicon manufacturers that don't use Xinjiang input at all.

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[6] "新疆维吾尔自治区国民经济和社会发展: 第十三个五年规划纲要" [National economic and social development of the Xinjiang Uygur Autonomous Region: Outline of the thirteenth five-year plan], May 2016, Online, 40.
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[10] Changji People's Government, "昌吉州决战决胜 脱贫攻坚系列报道之二" [The second part of a series of reports on Changji Prefecture's decisive victory in poverty alleviation], Weixin, July 2, 2020, Online.

c) Emerging technologies that have previously been priced out of development because of China's low prices.

It is critical that the U.S. enforce the Tariff Act to ensure that these Xinjiang-made goods, which are both bad for human rights and for the planet, are not reaching United States consumers. And as our evidence shows, these violations reach all the way to the raw materials, and there can is no part of the supply chain that is unaffected. Pursuing alternatives to Xinjiang supply chains requires multiple organizations and governments to harmonize strategies. This is not only the United States' responsibility. Therefore, I urge the U.S. government to work with the EU and other allies, including my own Swedish government.

Personal context:

I am grateful to the committee for the opportunity to also relate my personal experience of repression at the hands of the Chinese government. Over the course of three and half years, the Chinese government, especially the Ghulja city government, has inflicted significant pain to me and my family.

What the Chinese government did to my cousin can be described in a few sentences. Like so many other Uyghurs, she was first taken to the camp in 2018, released, then taken to the detention center again. She was then sentenced to six-and-a-half years in prison after being accused of financing terrorism. She was convicted for transferring money to Australia to help her parents buy a house in 2013, which was both legal at the time she made the transfers and facilitated by Chinese banks.

Behind this short description is Mayila and my family's 3 and half years of excruciating pain, day and night. The Chinese government knows she is innocent because I have sent evidence that can prove her innocence to the Beijing government, the Chinese embassies in the EU andAustralia, the Xinjiang autonomous region government and the Ghulja prosecutor's office multiple times with help of international journalists. In order to deliberately convict an innocent person, the Ghulja Public Security Bureau fabricated the evidence. She was forced to sign a false confession under threat of torture, and this false confession was used as evidence to convict her. In addition, authorities falsely claimed that her parents in Australia "were members of the so-called 'Eastern Turkistan Liberation Organization,'" an organization we had never heard of.

Mayila's parents want to seek justice through the international legal system for their daughter, but they have been told there isn't much a lawyer can do when it comes to the crime that the Chinese state committed. We did everything we could, to the extent that Chinese officials have threatened me and my family for speaking out publicly, but still all our efforts have failed to bring her justice.

Thank you.

PREPARED STATEMENT OF CHAIR MERKLEY

Good morning. Today's hearing of the Congressional-Executive Commission on China entitled "China's Environmental Challenges and U.S. Responses" has come to order.

The United States and China face many challenges related to the environment, from protecting air and water at home to global action to address climate change. This hearing will expand the Commission's understanding of these issues at a critical time. We are less than six weeks before the world meets in Glasgow for COP26, the pivotal United Nations Climate Conference.

Events of this summer demonstrate the ravages of climate chaos, from the deadly flooding in Zhengzhou in central China to raging wildfires and heat waves in the American West. As the world heads into COP26, we face a stark choice: We can take urgent, bold, transformative action to transition to clean and renewable energy, or we can resign ourselves to ever-worsening impacts to our lives, livelihoods, and economies. Each of us has to do our part. Governments, especially China and the United States, must come to Glasgow ready to do their fair share.

This hearing will shed light on the status of China's climate commitments and compliance, as well as other pressing environmental issues such as the fight for clear air and clean water; the actions of non-governmental organizations to push for local accountability; the effects of climate change, grassland management, forced ecological migration, and mining on Tibetans; and the downstream effects on other countries of Chinese hydro-dam projects.

This Commission is dedicated to faithfully and accurately reporting on all the issues we cover, including the environment and climate change. This hearing will provide perspectives on areas of successful environmental governance as well as violations of human rights and the rule of law.

China is helping spearhead a shift toward dramatically greater production of renewable energy sources at the same time as it leads the world in building out coal infrastructure, both at home and through the export of coal-fired power plants through the Belt and Road Initiative.

The Chinese government now prioritizes environmental protection and gives space for some elements of civil society to operate at the same time that it continues to harass and detain rights advocates like those documented in the Commission's Political Prisoner Database.

Even where China takes positive steps to protect the environment, the government's repressive and authoritarian nature can produce tragic human consequences. In this hearing we will hear from a leading supply chain expert whose research uncovered evidence that the modern slavery Uyghurs are subjected to in Xinjiang and through the government's labor transfer programs extends to China's massive solar industry.

The global economy must transition as quickly as possible to renewable energy sources like solar, but we cannot do so on the backs of slave labor. We need to help the solar industry transition to sustainable supply chains that respect human rights. That means diversifying supply chains away from reliance on those that use forced labor. It means building up the domestic manufacturing base here in the United States and in other countries abroad. And, most urgently, it means that the House of Representatives must pass and the President must sign into law the Uyghur Forced Labor Prevention Act that Senator Rubio and I led in the Senate and that my co-chair leads in the House.

I look forward to all of our witnesses' testimony. I hope this hearing will demonstrate that the United States can—and must—prioritize both climate action and the steadfast defense of human rights. We need to do both. We cannot trade away human rights for cooperation in other areas of the relationship with China. Fortunately, China has its own domestic incentives to take climate change and environmental protection seriously. I hope this hearing will deepen our understanding of how China can respond to those incentives and take urgent action, just as the United States must do here at home.

PREPARED STATEMENT OF CO-CHAIR JAMES P. MCGOVERN

Thank you, Mr. Chairman, for convening this timely hearing on China's environmental challenges. For more than 15 years this Commission has monitored the Chinese government's policies on the environment because of the nexus between respect for human rights and the rule of law and a society's ability to address environmental problems. The people of China continue to struggle not only with air and water pollution, and other hazards, but also with obstacles to the ability to advocate for change or seek remedies through their government.

This hearing comes five weeks before nations of the world gather in Glasgow at the UN Climate Change Conference. China and the United States are the top two emitters of greenhouse gases. Solving the climate crisis will require both cooperation and a robust and genuine effort within each country to change its regulatory regime and consumption behavior.

President Biden's top climate envoy, former Secretary John Kerry, has been engaged with his Chinese counterparts on bilateral cooperation, but we in America also need to do our job. We must pass robust domestic legislation to reduce our greenhouse gas emissions, transform our economy, and ensure future generations' right to a habitable planet. There is no trade-off between the environment and the economy. We can create millions of good high-wage green jobs that ensure economic prosperity and reduce our carbon impact.

I understand that some experts give the Chinese government positive marks for addressing climate change at a macro level. I look forward to hearing the assessment of our witnesses. Further, I would like to understand the extent to which Chinese officials' decisions are guided by their sense of the country's self-interest, in terms of the economic and social consequences of a warming climate. This is important to know as the U.S. Government figures out the modalities of cooperation with China.

Chinese Foreign Minister Wang Yi has explicitly linked cooperation on climate with other issues. He essentially threatened to halt cooperation if the U.S. did not back off criticism of their conduct. Is this a tactic to get us to stop caring about whether the Chinese government is committing genocide against Uyghurs, erasing democracy in Hong Kong, or jailing human rights lawyers? How do we respond?

Environmental progress in any country depends on actions at both the national and the local level. A focus on the Chinese government's climate commitments should not deter us from looking at what is happening on the ground.

This Commission has reported on the Chinese government's increasingly tight grip on NGOs and civil society, which has affected the environmental sector. Lack of transparency and uneven enforcement are obstacles. Environmental researchers and advocates have been suppressed and detained, including ethnic minorities. Those jailed include former Xinjiang University President Tashpolat Teyip who had been investigating pollution from coal mining, and Tibetan Anya Sengdra who campaigned against illegal mining and poaching in Qinghai.

We are also interested in threats to the ecology of Tibet. The Tibetan Policy and Support Act, which I was proud to sponsor, sets out U.S. policy on the environment and water resources on the Tibetan Plateau and directs the Secretary of State to support collaborative research, encourage input from Tibetan nomads, and promote a regional framework on water security. I hope to hear about practical steps we can take toward these goals.

Lastly, there is the solar industry's role in Xinjiang. We need to deploy more solar technology, but we cannot abet the forced labor that the U.S. Government has determined is used to produce solar components. Can the U.S. Government encourage diversity in solar sourcing to reduce reliance on tainted polysilicon from Xinjiang? Does the coal burned to produce this material undermine climate goals?

SUBMISSIONS FOR THE RECORD

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CHINA'S PLUNDER OF THE TIBETAN PLATEAU: TOOL OF OPPRESSION

(By the International Campaign for Tibet)

The integrity of the Tibetan Plateau's environment is vital to global sustainability, political stability and the perpetuation of a distinct people, culture and centuries-old religion. For over six decades, the authoritarian People's Republic of China has deployed environmental destruction as a key tool in its campaign to systematically dismantle Tibetan culture in pursuit of expansionism, assimilation and hegemony. The result has wreaked havoc on ecosystems and human lives and will continue to do so without a coordinated response.

Situated about 4,000 meters above sea level, the Tibetan Plateau is a geographical region spanning 2.5 million square kilometers. In terms of total area, it constitutes one quarter of the present-day People's Republic of China.[1] The Tibetan Plateau deserves particular environmental attention. Its fragile and unique ecosystem has historically enjoyed protection by natural geographic barriers, as well as the conservationist precepts embedded in the Tibetan tradition embraced by its estimated six million inhabitants. The Tibetan Plateau is the world's third-largest repository of fresh water, after the South and North Poles. Many of Asia's major rivers originate in Tibet, and up to 2 billion people[2] across the Asian continent depend on their healthy flow.[3]

The Himalayan region and Tibetan Plateau are also rich in biodiversity, sitting at the intersection of three biodiversity hotspots—defined as the Earth's most biologically rich, but threatened terrestrial regions.[4] For centuries, Tibet's extensive, native grasslands have sustained Tibetans' nomadic way of life, one based on stewardship and respect for the natural world.

POLICY OF PLUNDER

Following its military takeover of Tibet beginning in 1949, the PRC's decades-long strategies of exploiting the Tibetan environment and oppressing its people have gone hand in glove, one reinforcing the other. This is particularly offensive because it denigrates deeply held Tibetan beliefs in the protection of all living things, as well as nature, which led to the evolution of successful environmental protection practices.

The environmental problems in Tibet today have become quite complex and cannot be viewed in isolation. A striking illustration is the PRC's declaration that it plans to construct dozens of dams on Tibet's rivers[5] in the decade ahead. Six of Asia's major rivers originate in Tibet, and up to 2 billion people across the Asian continent depend on their healthy flow. Such extensive damming will place the water supply of countries throughout the region at risk and under the Chinese government's control. Thus, denying Tibetans' self-determination over their own resources will create a cascade effect that also denies downstream countries the right to their self-determination, providing the PRC another tool to expand its global power.[6] Further, controversy continues to mount regarding the environmental and climate impacts of such massive dam building, including assumed emissions reductions.[7] Such evidence raises the need for a reevaluation of these colossal dams, call-

[1] Josephine Ma, 11 March 2009, "The double-edged sword of 'Greater Tibet,'" https://www.scmp.com/article/672872/double-edged-sword-greater-tibet

[2] "The Hindu Kush Himalaya Assessment: Mountains, Climate Change, Sustainability and People," https://link.springer.com/content/pdf/10.1007%2F978-3-319-92288-1.pdf

[3] Kumar, A. (2017), "Impact of Tibetan Ecological Disequilibrium on Lower Riparian Regions of Asia," The Tibet Journal, 42(2), 7–16. https://www.jstor.org/stable/90024489

[4] Critical Ecosystem Partnership Fund, 2019, "What is a biodiversity hotspot?," https://www.cepf.net/our-work/biodiversity-hotspots/hotspots-defined

[5] ICT: "Damming Tibet's Rivers," https://savetibet.org/damming-tibets-rivers-new-threats-to-tibetan-area-under-unesco-protection/

[6] Jamestown Foundation, "Beijing Boosts Its Position as a 'Himalayan Hegemon' Through Hydropower," https://jamestown.org/program/beijing-boosts-its-position-as-a-himalayan-hegemon-through-hydropower/

[7] https://www.internationalrivers.org/wp-content/uploads/sites/86/2020/05/intlrivers_wrongclimate_4.pdf

ing into question the PRC regime's greenwashing of its hydroelectric expansion as "necessary" to combat climate change.

Just one example demonstrates the potential severity of this environmental situation and its regional implications. In 2019, a severe drought caused water levels in the Mekong River to drop to their lowest point in more than 100 years. This affected millions of people in Southeast Asian countries living and working along the river. The Chinese government claims that low precipitation caused the drought and its impacts. However, experts underscored that China had used its network of dams to hold back water from the river, exacerbating the problem and leaving many without access to fresh water, according to a study by the Stimson Center.[8]

The Chinese government's forcible relocation of Tibetan nomads from their ancestral grazing lands is another illustration of the regime's strategy to exert control over the Tibetan people through the repurposing and destruction of ancestral resources. Based on available data, at least 1.8 million Tibetan nomads have been resettled in sedentary houses under PRC policies[9] in a two-pronged plan to erode Tibetan identity while cashing in on pit mining, logging, damming and other forms of environmental degradation.

A third devastating example is the PRC's indiscriminate past clear-cutting in the biologically rich Tibetan forests. This deforestation represents double indemnity. Forests are carbon sinks. Therefore, their removal has contributed to climate change, undermining global climate goals. Further, given that forests function to preserve watersheds and waterways, clear cutting has worsened and will worsen the region's water challenges.

Yet another stark example of China's integrated environmental and human rights violations is rampant, often unregulated, mining. Mines in Tibet create significant pollution and create costs that disproportionately impact Tibetans and the local environment. For example, residents are forcefully relocated to allow for new mines. Mines also threaten the health of humans, their livestock and the environment. The open-pit Muli coal mine in Tsonub (Chinese: Haixi) Mongol and Tibetan Autonomous Prefecture in Qinghai province (northeastern Tibet) spread a layer of black coal dust across the landscape, causing grassland degradation and the loss of permafrost (the layer of frozen soil that stores water for the benefit of surface ecologies).[10] Similarly, the Jiajika lithium mine in Lhagang (Chinese: Tagong) township, Kardze (Chinese: Ganzi) Tibetan Autonomous Prefecture, Sichuan province, in the Tibetan area of Kham, twice (in October 2013 and May 2016) leaked toxic chemicals into the local water supply, killing fish and local livestock.[11]

PUNISHING THE TRUTH

The PRC's policies have resulted in calamitous environmental disasters and when Tibetans protest against environmental damage to their homeland they are met with brutal responses from the Chinese Communist Party. Major recent incidents include:

- In 2009, toxic chemicals from a mine near the town of Lhagang leaked into the river, resulting in massive fish deaths.[12]
- 2010 saw over a thousand people in Drugchu die when landslides ripped through the deforested hills surrounding the town.[13]

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[8] Brian and Weatherby, Courtney, "New Evidence: How China Turned Off the Tap on the Mekong River," https://www.stimson.org/2020/new-evidence-how-china-turned-off-the-mekong-tap/

[9] "Cultural Rights and Climate Change," International Campaign for Tibet (ICT) submission to the Special Rapporteur in the field of cultural rights, May 28, 2020 (Data corroborated from Chinese state media reports, e.g. China Daily, 6 July 2012: "Over 1 million Tibetan nomads choose settlement," accessed on May 27, 2020, http://www.chinadaily.com.cn/china/2012-07/06/content_15555645.htm or Xinhua, 1 December 2012: "Massive nomad settlement to protect 'mother river,'" accessed on May 27, 2020, http://en.people.cn/90882/8041990.html.)

[10] The Guardian, 7 August 2014, "Illegal Coal Mine Encroaching on Nature Reserve in Northwest China," https://www.theguardian.com/environment/2014/aug/07/illegal-coal-mine-nature-reserve-china

[11] Tibet Watch, January 2015, "Environmental Protests on the Tibetan Plateau," https://tibet.net/wp-content/uploads/2015/02/environmental_protests_on_the_tibetan_plateau.pdf; "Tibetans Protest Against Pollution from Mining," Free Tibet, 9 May 2016, www.freetibet.org/news-media/na/tibetans-protest-against-pollution-mining

[12] Washington Post, "Tibetans in anguish as Chinese mines pollute their sacred grasslands," https://www.washingtonpost.com/world/asia_pacific/tibetans-in-anguish-as-chinese-mines-pollute-their-sacred-grasslands/2016/12/25/bb6aad06-63bc-11e6-b4d8-33e931b5a26d_story.html

[13] France24, "Heavy rain in wake of mudslides hampers rescue efforts," https://www.france24.com/en/20100812-heavy-rain-hampers-search-rescue-efforts-china-zhouqu-gansu-mudslides

- Also in 2010 Tibetans demonstrating against a mining operation in Palyul were gunned down by Chinese police.[14]
- Another mudslide at a Gyama mine in 2013 claimed 80 people.[15]
- That same year, hundreds of Tibetans were beaten and tear-gassed while protesting a Chinese mine in Dzatoe.[16]
- 2016 brought more protests as Tibetans and police faced off in Amchok in response to mining at Gong-ngon Lhari, a sacred mountain.[17]
- In 2018, a landslide in Jomda County and Palyul County blocked the main stream of Drichu River, forming a barrier lake that submerged multiple Tibetan villages.[18]
- In 2020, there were reports of contaminated water surface from the area around an illegal Chinese coal mine in northern Tibet.[19]

KARMA SAMDRUP: ENVIRONMENTALIST IMPRISONED

The case of leading Tibetan environmentalist and philanthropist Karma Samdrup, his two brothers, two cousins, other relatives and community members provides a concrete example of the extremity with which the Chinese Communist Party metes out punishment on individuals promoting environmental reform.

In 2009, Karma Samdrup, a well-known collector of Tibetan art and founder of the Three Rivers Environmental Protection Group, was detained following unsuccessful efforts to secure the release of his two brothers, Chime Namgyal and Rinchen Samdrup, who had been imprisoned after their efforts to conserve wildlife in their home area of Chamdo (Chinese: Changdu) Prefecture in the Tibet Autonomous Region. More specifically, Rinchen Samdrup and his younger brother Chime Namgyal were detained from their home after they accused local officials in their home area of poaching endangered species. In the end, Chime was tortured while serving a 21-month "reeducation through labor" sentence based on the spurious allegation that Namgyal had set up an "illegal" environmental organization that "illegally collected three digital disks of information and video footage about the environment, the natural resources and the religion of Changdu prefecture . . . provided pictures and material for the illegal publication 'Forbidden Mountain, Prohibited Hunting', illegally possessed reactionary propaganda materials from the Dalai clique abroad . . . and therefore severely interfere[d] with state power . . . ." (ICT translation from the Chinese RTL document).

In the case of Karma Samdrup, his wife and lawyer reported to the Associated Press (AP, June 22, 2010), that Samdrup told the (kangaroo) court that during months of interrogation, officers beat him, deprived him of sleep for days on end and drugged him with a substance that made his eyes and ears bleed. The PRC's mistreatment did not end there or even with just the three brothers. Their cousin, Sonam Choephel, also was sentenced to one and a half years of re-education through labor (RTL) in Beijing. Twenty villagers from Gonjo (Chinese: Gongjue) in Chamdo, the brothers' home area, were detained and tortured for 40 days after they went to Beijing to petition against the brothers' detention. Karma Samdrup's mother, who was then in her seventies, was beaten unconscious by police led by a party official.

Karma was sentenced to 15 years' imprisonment in 2010, and his current heath condition is reported to be very poor.

ENVIRONMENTAL JUSTICE

The plunder of Tibet violates the increasingly scientifically, pragmatically and ethically validated linkages between environmental progress and basic human rights. The need for environmental justice—policies that ensure self-determination, environmental protection and cultural preservation as well as equity—have become front and center in the pursuit of global sustainability. Examples abound, but little could illustrate this recognition better than the fact that the theme for the upcoming

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[14] "Four Tibetan Mine Protesters Detained in Palyul," https://tibetnature.net/en/tibetan-mine-protesters-detained-in-palyul/

[15] ICT, "Disaster in Gyama draws attention to impact of mining in Tibet," https://savetibet.org/disaster-in-gyama-draws-attention-to-impact-of-mining-in-tibet/

[16] RFA, "Tibetan Mine Protesters Vow to Appeal to Beijing," https://www.rfa.org/english/news/tibet/mine-08222013172832.html

[17] ICT, "Tibetans in Amchok protest mining project at holy Gong-ngon Lari mountain," https://savetibet.org/tibetans-in-amchok-protest-mining-project-at-holy-gong-ngon-lari-mountain/

[18] Central Tibetan Administration, "Unchecked construction could have triggered recent Jomda landslide-flooding in Tibet," https://tibet.net/unchecked-construction-could-have-triggered-recent-jomda-landslide-flooding-in-tibet-zamlha-tempa-gyaltsen-tibet-policy-institute/

[19] RFA, "Pollution from Illegal Coal Mining in Qinghai Creates Hardship for Tibetan Nomads," https://www.rfa.org/english/news/tibet/coal-08112020161828.html

United Nations Climate Change Conference (COP 26) in Glasgow, Scotland is to "adapt to protect communities and natural habitats."[20]

Other UN statements expand on this goal. In a recent press statement, the UN Special Rapporteur on Human Rights and the Environment David Boyd summarized:

> "Leaving human rights on the periphery is simply not an option, because rights-based conservation is the most effective, efficient, and equitable path forward to safeguarding the planet . . . indigenous people and local communities] "must be acknowledged as key partners in protecting and restoring nature . . . their human, land and tenure rights, knowledge, and conservation contributions must be recognized, respected, and supported."[21]

While being more thoroughly emphasized in current global environmental dialogue, the role of environmental destruction in cultural oppression certainly is not novel. In 2004, scholar Jared Diamond referred to the concept of "ecocide," describing it as "willful destruction of the natural environment and ecosystems through, a) pollution and other forms of environmental degradation and b) military efforts to undermine a population's sustainability and means of subsistence."[22] The Chinese government's past, present and planned policies in Tibet directly contradict the ancient and modern understanding of the inseparability of the human and natural world's shared fate. Achieving global sustainability—including avoiding the worst impacts of climate disruption—means no longer silo-ing environmental and human rights into conveniently separate political baskets. The Chinese government's human rights atrocities reinforce its harmful environmental policies and vice versa. State leaders must not allow these dual abuses to remain sanctioned by inattention during international environmental negotiations.

RECOMMENDATIONS

- **Tibet and COP 26:** The Biden administration and Congress must ensure that the environmental crisis in Tibet, including water security and rapid climate change, is addressed at the 2021 COP 26 meeting as a crucial part of any finalized negotiation. The Biden administration should consider holding a side event on the issue of the Tibetan environment.
- **Implement Current Law:** The bipartisan Tibetan Policy and Support Act (TPSA), which was passed by Congress and signed into law in 2020, addresses several of these crucial sustainability and security issues. The legislation states that the secretary of state will have to pursue collaboration with China and international institutions to monitor Tibet's environment and support the Tibetan people's efforts to preserve it.
- **Scientific Access:** The international community should promote the opening up of the Tibetan plateau for scientific research and international collaboration and facilitate the creation of a regional environmental council that discusses and mitigates environmental issues facing the Hindu-Kush Himalayan Mountains and the Tibetan Plateau. More thorough, regular and transparent cross-boundary studies will improve our understanding of the state of the ecosystem.
- **Environmental Justice:** The Biden administration and Congress should include environmental justice as a basic human right in multinational and bilateral treaties.

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[20] "Urgently adapt to protect communities and natural habitats," https://ukcop26.org/cop26-goals/adaptation/

[21] UNHCR Newsroom, "Human rights must be at heart of UN plan to save planet—expert," https://www.ohchr.org/EN/HRBodies/HRC/Pages/NewsDetail.aspx?NewsID=27393&LangID=E

[22] Jones, "Genocide," p. 27, citing Jared Diamond, "Collapse: How Societies Choose to Fail or Succeed" (Viking, 2004)

United States House of Representatives
Congressional-Executive Commission on China

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Witness Biographies

Jennifer Turner, Director of the China Environment Forum at the Woodrow Wilson Center

For 18 years, Dr. Turner has led creation of meetings, exchanges, and publications focusing on a variety of energy and environmental challenges facing China, particularly on water, energy, and green civil society issues. She is a widely quoted expert on U.S-China environmental cooperation as well as climate-related challenges and governance issues facing China. She also leads the Global Choke Point multimedia reporting initiative.

Jessica C. Teets, Associate Professor in the Political Science Department at Middlebury College and Associate Editor of the Journal of Chinese Political Science

Dr. Teets's research focuses on governance and policy diffusion in authoritarian regimes, specifically the role of civil society. She is the author of "Civil Society Under Authoritarianism: The China Model," and editor of "Local Governance Innovation in China: Experimentation, Diffusion, and Defiance." Dr. Teets was recently selected to participate in the Public Intellectuals Program created by the National Committee on United States-China Relations and is currently researching policy experimentation by local governments in China.

Emily T. Yeh, Professor of Geography at the University of Colorado Boulder

Dr. Yeh conducts research on nature-society relations in Tibetan areas of the People's Republic of China, including the political ecology of pastoralism, conflicts over access to natural resources, vulnerability of Tibetan herders to climate change, and more. She is the author of "Taming Tibet: Landscape Transformation and the Gift of Chinese Development."

Nyrola Elimä, Researcher at the Helena Kennedy Centre at Sheffield Hallam University.

Ms. Elimä lived and studied in Xinjiang for 19 years and worked as a customs broker and in import/export in Shanghai, Beijing, and other cities in China. She coauthored a report that revealed the scope of forced labor in the solar supply chain in Xinjiang.