TRANSCRIPT OF PROCEEDINGS: NATIONAL INQUIRY ON THE IMPACT OF CLIMATE CHANGE ON THE HUMAN RIGHTS OF THE FILIPINO PEOPLE, AND THE RESPONSIBILITY OF THE "CARBON MAJORS," IF ANY, FIRST HEARING, NOVEMBER 6 TO 7, 2018

MS. JOANNA SETZER:

So, good morning, everyone. On behalf of the Department of Law and the Grantham Research Institute of the London School of Economics, I welcome you all to this special occasion. A very warm welcome also to those who are not present in the room but are watching via live stream—and these people might be just here in London or anywhere in the world—and this has been really a very special aspect of this whole process. I am Joanna Setzer, a British Academy Research Fellow here at the L.S.E. I am delighted and honored to be here with you to host the Commission on Human Rights of the Philippines today and tomorrow. These hearings in London are part of a much broader context of the National Inquiry on Climate Change that is being conducted by the Commission to investigate the responsibility of major carbon emitters for alleged breaches of human rights that are associated with climate change.

As social scientists and legal scholars, we are following it closely. This is the path breaking Inquiry and its impacts might be really felt in relation to the past, the present, and the future. So looking at the past, this Inquiry shows that it is possible for human rights victims to be heard for transboundary harms. In relation to the present, this Inquiry confirms that the patterns of extraction, production, and consumption that we have are already adversely impacting the very basic right to life. Looking at the future, this process reminds us that governments and corporations have positive human rights obligations to mitigate climate change. So I am sure that over the next two days we will continue to learn from the experts, and from the witnesses that will present here. And most of all, we are looking forward to the findings and recommendations that will result from this process.

So enough for me, I would like to introduce you to Commissioner Cadiz. Commissioner Cadiz is the focal Commissioner for Business and Human Rights, Environment and Sustainable Development Goals at the Commission on Human Rights of the Philippines; and he has been handling this petition over the past, three (3) years already. And so it is our honor and pleasure to have you here. Thank you very much, Commissioner. I wish you a very productive and fruitful day today and tomorrow. Thank you.

COMMISSIONER CADIZ, CHAIR OF THE INQUIRY PANEL:

Thank you very much, Joanna.

Let me just put into context what we are doing here, in addition to what Joanna has already stated earlier… In 2015, a Petition was filed before our Commission to consider the adverse impacts of climate change on the human rights of the Filipino people, and the possible role of the so-called Carbon Majors in this phenomenon. In December of that year, we declared, in a side event during the conference of parties in Paris, that we were opening an Inquiry into the allegations contained in the petition before us.

In 2016, we began our Inquiry, which consisted of key informant interviews, round table discussions, and public dialogues with communities affected by extreme weather disturbances attributed to climate change. Also integral to our Inquiry are public hearings, where we listened to duty-bearers, stakeholders, and experts, aside from the parties, themselves. The phenomenon of climate change, as it impacts human rights, is really a global issue. Thus, we have decided, in opening this Inquiry, to engage the global community in this dialogue, to help us understand the issue that has been brought before us. Our coming here to London symbolically underscores this point. Our coming here to London symbolically underscores the point that climate change calls for a global discourse.

But coming here is also, for us, a matter of due process. Coming here, we wish to reach out to the parties alleged to have a significant role in this phenomenon… to listen to what they might have to say in regard to the allegations against them. We are here only to perform our duty to inquire into the issue brought before us. We do not pretend to have compulsory powers over any party to compel them to participate in our Inquiry - not in the Philippines, and certainly not in New York and not in London. And we certainly have not entertained any notion that we have the power to award damages for or against any party in this Inquiry. We understand and respect the principles of territorial jurisdiction, subject matter jurisdiction, and party jurisdiction.

Our Commission, in the conduct of this Inquiry, operates on the principle of moral persuasion, not compulsion, and we extend our gratitude to those who have accepted our invitation to be resource persons in this Inquiry. In agreeing to open this Inquiry, it did not mean, of course, that we were already accepting any or all of the Petitioners' positions on this issue. The Petitioners must still establish, obviously, the merits of their petition in a fair and transparent

process by presenting their witnesses and other evidence, which should be open to challenge by Respondents, should they wish to do so.

So thank you to the London School of Economics for lending their facilities to our Commission for this Inquiry. Our Inquiry Panel today is composed of Dr. Pedro Walpole, S.J., as consultant to this process, Commissioner Karen Gomez-Dumpit, and myself, as Panel chair.

Thank you again, and we are now ready to receive and listen to our first resource person.

MS. SETZER:

So we now call on Ms. Joni Pegram, a resource person invited by the Commissioner. May we request Ms. Pegram to give a brief introduction of yourself, what you do, and what you will be presenting today. Thank you.

MS. JONI PENGRAM:

Sure. Thank you very much for inviting me in this Panel to contribute in this groundbreaking Inquiry. My name is Joni Pegram. Many people say Pegram and that's fine. I am the former UNICEF-UK senior advisor on climate change and the environment, and I am also an independent expert on child rights and climate change and the founder and director of Project Dryad, which is an organization that seeks to mainstream child rights in climate and environmental policies nationally and internationally. And in that capacity I assisted UNICEF-Philippines to draw and submit an amicus curiae brief to the Commission last December and I'll be presenting those findings today and I think that presentation will be, hopefully, available soon. I do have it on a USB, if required.

While we wait, I can just briefly say a few words about UNICEF, an agency of the UN devoted to solving the world's children's problems. UNICEF is present in one hundred ninety (190) countries and territories. Its mandate is to be the guardian and to uphold the UN Convention on the Rights of the Child, which is the most widely ratified international human rights treaty in the world—by every single state in the world, except one.
UNICEF has identified climate change as one of the greatest threats to child rights, and certainly UNICEF-Philippines observes that in their work. In that light, I am happy to have the opportunity to present our key findings to the Commission.

I'll start with the wide ranging impacts of climate change on child rights, how they undermine virtually every right that's enshrined in the Convention on the Rights of the Child. I'm so sorry to start with a rather glum note. Although I know the Commission has heard a harrowing testimony already. Obviously, talking about the impacts on child rights, it's still always rather distressing. And I'll then talk about the obligations of states in this regard and the responsibilities of businesses.

The key starting point is, very simply, children are not little adults. They're not simply little adults. They are among the most vulnerable to climate change for three (3) key reasons.

First of all, childhood represents a unique period of rapid physical and mental development, particularly between birth and the age of five (5). And this is when children's bodies are most vulnerable to the conditions that climate change and environmental risks exacerbate. As a result, children experience distinct and disproportionate harm from climate-induced changes in their environment, including impacts that have potentially lifelong consequences, and the most disadvantaged and marginalized children are at particular risk.

Second, little children make up one of the largest groups affected by climate change. Many of the countries identified as being among the most vulnerable to the impacts of climate change also tend to be those in which children account for a large share of the overall population. And projected demographic trends are set to consolidate that situation.

And, finally, despite being least responsible for the cause of climate change, children are obviously among those that will bear the heaviest burden of its future consequences. They will live longer, they will face more profound crisis during their lifetime and escalating impacts over time as well. I think that the Philippines obviously illustrates this convergence of children's vulnerabilities very clearly. The country has consistently ranked among the top five (5) countries most vulnerable to the impacts of climate change in the world, and it also has a large child population. In 2015, thirty-eight percent (38%) of the population was under the age of eighteen (18), and that compares to a global average of thirty percent (30%); and eleven percent (11%) was under the age of five (5).

So I want to start with a series of slides illustrating the various climate related impacts on child rights. So here we have a handful of extreme weather events and disasters, we have flooding and children are at high risk of injuries and also mortality and many children lack the strength to stay on their feet, for example, in strong currents, and even in shallow water. In the case of typhoon Haiyan, we know that almost six (6) million of the fourteen (14) million people affected were children.

Although information on the final child death toll is not available, the government did confirm that ninety-two percent (92%) of fatalities occurred in Leyte. And according to the 2010 census, children between the ages of ten (10) and fourteen (14) years old comprise the largest group in this province, patient outcomes and their future livelihoods. The next two (2) largest age group are between five (5) and nine (9) and from zero (0) to four (4). We are looking at a large number of children among the highly affected. And drowning was found to be the principal cause of these deaths.

National outcomes in their future livelihoods... Modelling suggests that an estimated additional seventy thousand (70,000) Filipino children will be malnourished by 2050 due to the impact of climate change, representing an increase of four percent (4%). Next slide please.

Now if we look at disease and the right to health, children are also highly susceptible to many infectious waterborne diseases that become more prevalent in the context of droughts, floods and extreme weather, particularly when damage to essential water and sanitation infrastructure occurs. Diarrheal diseases are another major cause of mortality for children, responsible for over half a million deaths of children under five (5) in 2015, the fourth leading cause of death of under five (5)-year-olds in the Philippines.

Rising temperatures also increase the incidence of vector borne diseases, such as malaria and dengue fever. The global burden of these diseases is already heavily concentrated on children. Seventy percent (70%) of all deaths from malaria in 2015 occurred in children under the age of five (5). The World Health Organization projects that climate change will cause an additional 60,000 deaths from malaria among children under the age of fifteen (15) by 2030. In the Philippines, malaria is already endemic in certain provinces, but the WHO projects over one hundred fifty (150) million people will be at risk of malaria by 2017, under both high and low emissions scenarios.

Climate change can exacerbate air pollution. It does not cause air pollution, but it can exacerbate the toxicity of certain pollutants, including ozone, and it increases the frequency of wildfires and drought. Air pollution causes approximately six hundred thousand (600,000) deaths of children under five (5) every year. Many more suffer from disease and disability with lifelong consequences and children, again, are more susceptible to air pollution than adults for many reasons. They have smaller airways, they have a developing immune system, and these are easily overwhelmed by infections. They breathe more quickly than adults and they take more air per unit of body weight as well. Acute respiratory infection has been identified as one of the top three (3) causes of mortality in children under five (5) in the Philippines.

The final impact is on the right to education. Climate change has been recognized as an emerging and persistent barrier to the right to education in the Philippines. Impacts include destruction of school infrastructure, loss of nutrition, which means that children find it hard to concentrate during the day, and loss of school days due to physical and mental health impacts, and higher dropout rates due to pressure on household incomes, for example. The government has identified damages incurred from disasters as one of the key causes of shortages of classrooms and school materials as well. Typhoon Haiyan damaged or destroyed over three thousand (3,000) schools and day care centers. Many large schools were also taken over as evacuation centers, and this resulted in a sudden disruption in education for more than a million preschool and school-aged children.

I've tried to provide a snapshot of the multiple ways in which child rights under the Convention on the Rights of the Child are undermined. That's really just a snapshot because you could list many more ways in which they are affected. I've tried to also highlight the way in which they are distinctly and disproportionately affected by climate change compared to the population as a whole.

Despite these clear impacts, and despite the fact that the U.N. Convention on the Rights of the Child has been almost universally ratified, children's rights remain overlooked in international and national policies and action on climate change.

The UN Convention on the Rights of the Child does address, though not explicitly, climate change. It is one of the few human rights treaties to explicitly recognize the importance of a healthy environment in the context of the rights of the child that it enshrines. And the Committee on the Rights of the Child has gone much further through its general comments and various concluding observations that relate to climate change in its dialogue with state parties.

Over the past couple of years, there have been a number of significant reports that have moved this area forward, and have really clarified the states' heightened obligations towards children. And this includes a flagship report from UNICEF in 2015 on climate change, on the day of general discussion that the Committee on the Rights of the Child held in 2016 on child rights and the environment, as well as the Concluding Observations that I have mentioned to various states, and the detailed analytical study submitted to the Human Rights Council on Child Rights and Climate Change. The Office of the High Commission on Human Rights, John Knox, the former U.N. Special Rapporteur, has given testimony, as well as produced a report earlier this year on child rights and the environment, addressing climate change and clarifying State's obligations, too.

Perhaps the most significant indication of the evolving recognition in this area is the adoption of the historic Paris Climate Change Agreement, the first-ever international environmental agreement to explicitly recognize human rights, including children's rights in that context as well. And that was a major step forward.

So just to set out what these obligations are... These heightened obligations can be categorized as an obligation to ensure that children's rights and best interests are our primary consideration with respect to both mitigation and adaptation measures. The Office of the High Commissioner for Human Rights Study clarifies further. This entails limiting global warming to no more than one point five degrees Celsius (1.5°C) above pre-industrial levels and focusing adaptation measures on protecting children that are most vulnerable to the impacts of climate change. States must also ensure that the measures they take themselves to respond to climate change do not—in and of themselves—undermine child rights. So this is really about ensuring that sufficient safeguards are in place for child rights.

In fulfilling these obligations, States have procedural duties including assessing and collecting climate information on climate related impacts on children, making information available and public and accessible to children through, for example, child-friendly and language-appropriate materials, upholding children's rights to participate and to be heard in climate policy dialogue and decision-making processes, and providing access to effective and tiny remedy for harm.

These obligations also extend to harm caused by corporations. The Committee on the Rights of the Child, it its General Comment No. 16, recognizes the environmental harm resulting from business activities, which can undermine a wide range of child rights. The Committee clarifies that states must require businesses to conduct mandatory child rights due diligence to identify, prevent, and mitigate the impact on child rights, including across their business relationships and within global operations.

States should also ensure children's access to effective redress mechanisms for violations of their rights that result from business activities, including those caused by business enterprises like extraterritoriality when there's a reasonable length between the state and the conduct concerned. I think this is very interesting for the Commission's Inquiry and has obvious implications for the role and responsibilities of businesses in relation to their contribution to climate change and its severe impacts on child rights both at home and abroad.

And particularly interesting, I think, is attribution models... increasing sophistication in terms of drawing a cause and effect.

The General Comment No. 16 from the Committee also highlights the critical role that agencies such as national human rights institutions can play in providing remedy for children for harm encountered due to business activities in particular through, for example, proactively investigating and monitoring abuses and imposing sanctions on businesses, where they have regulatory powers that enable them to do so.

The violations of child rights also trigger the human rights responsibilities of corporations themselves, as set down in the U.N. Guiding Principles on Business and Human Rights. But what is perhaps less known are the children's rights and business principles established by UNICEF, Save the Children, and the U.N. Global Compact. These seek to elucidate the UN Guiding Principles with regards to children specifically, and they clarify that businesses should respect and support child rights in relation to the environment: firstly, ensuring that business operations do not adversely affect children's rights; secondly, reducing greenhouse gas emissions from company operations and promoting sustainable resource use; and, thirdly, identifying opportunities to prevent and mitigate disaster risk and support communities to adapt to climate change.

So businesses should also comply with the Committee on the Rights of the Child's recommendations, as laid down in its General Comment No. 16 as well.

To conclude, I have tried to set out that, there's much greater understanding of the nexus between child rights and climate change and how a wide variety of these rights are being undermined. These violations clearly engage the child rights obligations of states and the responsibilities of businesses. The challenges lie in translating these obligations into urgent required action. As I said, near the beginning of the presentation, many countries do not consider child rights at all in formulating and implementing policies and action on climate change. And that needs to change urgently.
The Philippines does have a proud tradition of incorporating consideration of children. It is one of the few countries that do so. And in that light, we would really like to flag that up as a model of best practice internationally. Obviously that's the Climate Change Act of 2009, which requires all climate change plans and programs to be pro-children. The Children's Emergency Relief and Protection Act of 2016 is a global standard for protecting children during emergencies and disaster situations such as those that occurred following typhoon Haiyan, and these acts follow the Philippines' progressive record in recognizing children—an instrument with intergenerational equity, in some of the earliest environmental protection cases worldwide.

The Commission's Inquiry is clearly continuing in this vein, in terms of explicitly recognizing both the heightened vulnerability of children to the effects of climate change, as well as the particular importance of access to justice and effective remedy to youth petitioners.

And so, by adopting a child rights approach and the best interest of the child as a primary investigation, we believe the Commission has an unprecedented opportunity to set a benchmark for upholding and championing children's rights in the context of climate change, building on the Philippines' record in this area, and bolstering ongoing endeavors worldwide.

So thank you very much for your attention. And thank you for allowing me to contribute to your Inquiry.

PANEL CHAIR CADIZ:

Thank you very much, Ms. Pegram. Before we start asking questions, would you have a printed document of your presentation?

MS. PEGRAM:

Unfortunately I don't, I'm sorry. That's why I had to read from my laptop, but I can send it by email.

PANEL CHAIR CADIZ:

May we request that you do, so we can have it printed and then duly marked so that we may consider that in the draft resolution? But, provisionally, can we now assign a marking to the documents which you will be submitting for the record?

ATTY. SHAM JIHAY (CLERK OF THE INQUIRY):

We will be marking the CV of Ms. Pegram as "PRP-16."

PANEL CHAIR CADIZ:

PRP-16?

CLERK OF THE INQUIRY:

PRP-16 and the signatures there will be "PRP-16-A". The presentation will be marked as "PRP-17" to the number of pages which will be submitted.

PANEL CHAIR CADIZ:

Alright, so…

Dr. Walpole?

DR. PEDRO WALPOLE, SJ:

Thank you. I am aware of the report that recently came out. What's very helpful is how you understand this as evolving, you know, basically through the U.N. processes. How else do you see this UNICEF document being more widely utilized?

MS. PEGRAM:

Yes, I hope that it will be. So obviously the Philippines has identified climate change and environmental risks as a growing threat to children's right as evident in the Philippines, of course. They conducted a landscape analysis on the impact of climate change on child rights. And it was from that that we drew the contents, the amicus brief that we've submitted to you. So this is an increasing area of focus for UNICEF Philippines.

I know that they are already engaging with the government to sort of bring forward youth empowerment and child rights in the sense of recognizing children's voices because children of course feel very strongly about the issue. There will be a program of work going forward as well from the UNICEF office there; that represents a sort of wider movement within UNICEF. Many UNICEF country offices are seeing the impacts of climate change on traditional areas of UNICEF's work, protection, water, health and sanitation etc. And I'm looking to address and to be involved in those discussions on climate change with everybody essential to upholding children's rights.

DR. WALPOLE:

Thank you.

PANEL CHAIR CADIZ:

Thank you, Ms. Pegram. Commissioner Dumpit, do you have questions for the witness?

COMMISSIONER KAREN S. GOMEZ-DUMPIT:

I don't.

PANEL CHAIR CADIZ:

Alright, I have no further questions. Thank you very much, Ms. Pegram and we look forward to your submission of the presentation.

MS. PEGRAM:

Thank you very much.

PANEL CHAIR CADIZ:

Thank you very much. May we have our next resource person?

CLERK OF THE INQUIRY:

Commissioner Cadiz...

PANEL CHAIR CADIZ:

Yes?

CLERK OF THE INQUIRY:

I'm sorry to inform that Dr. Jaap Spier was not able to come here. So maybe Dr. Paul Ekins will be called in as our next witness.

PANEL CHAIR CADIZ:

Alright. Are counsels for the petitioners ready to present their first witness for today?

Alright, we welcome Dr. Paul Ekins, OBE, as the first witness for the petitioners. Counsels, would you like to introduce your witness and give us a brief exposition on what he will be testifying on?

ATTY. PAUDAC:

Good morning, Commissioners. Dr. Paul Ekins, OBE has a PhD in economics from the University of London. He is a professor of resources and environmental policy and director of the UCL Institute for Sustainable Resources at the University College London. He's also the deputy director of the U.K. Energy Research Center in charge of his resources and vectors team. And in 2002 to 2008, he was a member of the Royal Commission on Environmental Pollution. He was also special advisor to the Environmental Audit Committee of the House of Commons, and in 2007 was a specialist advisor to the Joint Parliamentary Committee on the Climate Change Bill. He was also a member in 2010 to 2011 of two ministerial advisory Panels, and in 2011, he was appointed as vice-chairman of the DG Environment Commissioners, a high level economists' expert group on resource efficiency. In 2013, he was appointed to the international resource Panel of the United Nations Environmental Program, or UNEP, and was the lead author of the IRP's Report on Resource Efficiency commissioned by the G7 Governments and presented in Japan in 2016.
He was one of the two co-editors of Unit 6 Global Environmental Outlook GEO-6, which is a U.N. flagship environmental report, and which will be presented to the UN Environment Assembly in 2019. At the UK New Year Honours List for 2015, he received an OBE, the officer of the Order of the British Empire for services to environmental policy. We are calling Dr. Paul Ekins, OBE to discuss the paper he co-authored entitled the Geographical Distribution of Fossil Fuels Unused When Limiting Global Warming to 2°C published on January 7, 2015 at the Nature and International Journal of Science. Commissioners, Dr. Ekins is now ready to present the highlights of his presentation.

Commissioners, we'd like to manifest that Dr. Ekins submitted to us four (4) documents, pre-marked in Manila, as "SSSSSSSS" to "SSSSSSSS-1," that is a Statement of Paul Ekins, consisting of two (2) pages, pre-marked as "SSSSSSSS" to "SSSSSSSS-1," and his signature as "SSSSSSSS-1-A;" his Curriculum Vitae, consisting of sixty-six (66) pages, as "TTTTTTTT" to "TTTTTTTT-65;" his printed PowerPoint presentation entitled "Fossil Fuel

Risks: What Remains Unburnt When Staying Below 2°C, consisting of seven (7) pages, as "UUUUUUUU" to "UUUUUUUU-6;" and, finally, the main paper entitled "Geographical Distribution of Fossil Fuels Unused with Limiting Global Warming to 2°C, consisting of sixteen (16) pages, pre-marked as "VVVVVVVV" to "VVVVVVVV-15."

PANEL CHAIR CADIZ:

Just for the record, will our clerk confirm the exhibit submitted and pre-marked in Manila, as manifested?

CLERK OF THE INQUIRY:

For the record, the documents mentioned by counsel have already been pre-marked as manifested.

PANEL CHAIR CADIZ:

Okay, thank you very much. Dr. Ekins may now proceed.

DR. EKINS:

Fine, thank you very much. Good morning. Thank you for inviting me to participate in this important Inquiry. As we stated, I would like to talk about a paper that was published in the journal Nature in January 2015, which was the first analysis of which fossil fuels in which geographic regions would need to remain unburnt if the world were to limit carbon emissions to what climate scientists believe is the quantity that would be required to be limited to remain below two degrees Celsius (2°C). I'm going to take you very quickly through that, and then on what I think the implications of that paper are for the business community. So I think you're operating the slides? Or am I operating the slides?

ATTY. PAUDAC:

You can operate it.

DR. EKINS:

There we go. Yep, that's fine. Okay. So in order to arrive at these kinds of estimates, you have to use models of various kinds, and the results are models that depend on three (3) crucial factors of the robustness of their structure and we use the times integrated assessment level the U.C.L. has created through the work that I have done with the U.C.L. Energy Research, the U.K. Energy Research Center, but clearly there's the possibility of the input assumptions and then there's the quality of the data. So all those three (3) issues are very important and I'm very happy to take questions on any of those aspects once I've taken you through the results. And if those three (3) elements are adequately represented in the model, then I think it is possible to take the model results, the integrity of their analysis seriously.

So what this model tries to do, it's a model of the global energy system and you can see the sixteen (16) regions in different colors that the model divides the world's energy system into. It's technologically detailed by which I mean there are thousands of energy-related technology in the model and the model is part of the family that was developed by the International Energy Agency in the 1970s. It's been used… it's been developed consistently since then by hundreds of researchers for many years. They're very complicated diagrams. In the bottom right is a very simplified version of the model. You can see that it has a climate module on the far left that enables you to ask the model to limit temperature increases to a certain amount, and we limited the temperature, increased two degrees Celsius (2°C). It then starts with a comprehensive analysis of all the earth's energy resources, fossil fuels, uranium, solar, wind, biomass, and then tracks those through various stages of energy conversion, energy transmission and distribution and final energy… final use in the right hand.

And during that process, it tracks the number of environmental impact, including, of course for our purposes, carbon emissions. It's an optimizing model, which means that it delivers its results on the basis of a least cost scenario than the current context. What that means is that it uses the cheapest energy resources first, wherever they may be located. The fossil fuel module is an extremely detailed one, with over eight thousand (8,000) individual oil fields, and probabilistically determines their decline over time, the discovery of new oil fields and the use of new oil fields and obviously it does the same for gas and coal, in addition to all the other energy sources that I have mentioned. It starts by, you estimate the kinds of energy services that you will require in any particular five (5)-year period. So it operates in five (5)-year periods. That's to say what will be the distances travelled in these different regions by various means of transport? What will be the quantity of heating fuel, what will be the quantity of industrial fuel? And those estimates come from mainly economic models because there's a fairly well-established

relationship between economic development and energy use and the model then computes which resources will be used to satisfy those energy service demands at least cost. And the constraint that we put on the model was that it was not allowed to admit more than a certain amount of carbon in order to keep the temperature to within two degrees Celsius (2°C). This is widely referred to as the carbon budget. And while there is some uncertainty about the two degrees Celsius (2°C) carbon budget, we used the number at one thousand one hundred (1,100) gigatons of CO2 to be emitted before 2050. That was the number that comes out of the scientific literature.

So these different input assumptions are obviously very important for the evolution of energy use in the global energy system over the next thirty-five (35) years when we published the paper, regional growth, global population GDP, growth rates, costs and rates of low carbon technology deployment, fossil fuel production costs and availability of alternative energy sources, temperature rises, and climate policy. In the work that we've done with this model, we've run an enormous number of scenarios with varied assumptions, and we are reasonably satisfied with the plausibility of the results that we get out. And as I say, we've done quite a bit of sensitivity analysis. I can go into the details of those various assumptions later, if you want me to. I am satisfied that they are more or less mainstream assumptions arising from mainstream economic literature, from engineering estimates of the various costs. As I say, there was an enormous amount of work done on the fossil fuel production costs and availability for this particular study etc.

So this shows you the kind of input that goes into a model of this kind. The top left hand picture is a model of the global oil resource. The top right hand picture is a model of the global natural gas resource. And the bottom left hand panel is a model of the global coal resource. So this is the fossil fuel resources taken from a very wide range of sources like BPs, statistical move, review of energy in the United States geological survey, and others. You can see each of the little colored bars in each case represents an oil field and represents the cost of oil extraction that we've estimated, the cost of fossil fuel extraction for each of those fields. So what the bottle does, as you can imagine, it's a cost-minimizing model. It will use those fossil fuels up to the limit of the allowed carbon emissions and it will use the cheapest resources first.

The bottom right panel is a rather special panel. You can see the green bars on the left that represents the carbon budget and the ranges of the carbon budget that had been estimated between now and 2050. And you can see the orange bars estimate of the quantity of carbon that would be emitted where the fossil fuels to be burned. So you can see that we've got two colors in the orange bars, the dark orange bars and a dark brown bars are those that are classified as reserves, and the carbon emission contained in those is about three (3) times as much as the dark green carbon budget. And then the light

brown bars are the non-reserve resources, the difference between those two (2) being the non-reserve resources, we know that there, but with current technologies, they are not extractable at economic costs. So it's the dark brown ones that are extractable at economic costs.

This is the research question that we asked ourselves: which regions contained fossil fuels that should stay in the ground to stay within the two degrees (2°) carbon budgets on the right hand? It's on the front page of the paper Nature, which is very much publicly accessible. And I've told you that burning all the current fossil fuel reserves exceed the two degrees (2°) carbon budget by about three (3) times. We asked what oil, gas and coal are and are not developed within the carbon budget and who owns these. By all means, we meant which geographical regions are they located in, although we have another model that actually identifies the corporate ownership of these reserves, but that's not the subject of the present research.

So you can see the kinds of detail that one has to go into in order to produce a paper like this. On the left hand panel there you've got the full range of estimates of gross domestic product projections from the IPCC database of climate scenarios. You can see there's a very wide, a wide variety there. GDP is important because, as I said, there is a pretty clear relationship between gross domestic product or gross world product and a global energy use. The right panel shows that many different sensitivity analyses that we did for oil, gas, and coal, which are the three (3) colors in the panel. The two (2) D.S. on the far left was our two degrees (2°) scenarios. So when we limited carbon emissions to the budget, that was the proportion of oil, gas, and coal that is burned. You can see that on the far right, we did three degrees (3°) scenarios and five degrees (5°) scenarios and you won't be surprised to see that that resulted in substantially more fossil fuel use; and then in between you've got lots of sensitivity analyses where we varied, for example, on the two (2) on the left, next to D.S., you've got F.F.C., there's a fossil fuel costs. So we varied the fossil fuel price. Then the next one, the availabilities of bioenergy is high or low, the availability of oil high and low in terms of depletion etc., gas a high and low etc. So we put the model through its paces, trying to make sure that we do a wide range of various possibilities by varying the input assumptions as I described to you.

And these are the key results. I'll stress again, these are reserves and not resources. The full resource base of the planet in terms of fossil fuels is several times that, but one of the headline results point to coal as the most carbon intensive of the fossil fuels. You can see that eighty-two percent (82%) and that's the bottom right hand number—eighty-two percent (82%) of the world's coal resources are not burned in a two degrees (2°) scenario. About half of its gas reserves are not burned and about a third of its oil reserves are not burned. And if we look at the different numbers, you can see that for oil

it's the Middle East that has the largest unburnt resource for gas. There are a number of places – the Former Soviet Union, which is a F.S.U., and again the Middle East have the largest proportions or the largest absolute quantities of gas unburned. For coal, it's the United States and again the Former Soviet Union, India has quite a lot of unburned coal, Europe, quite a lot of unburnt coal, China quite a lot of unburned coal and O.C.D. Pacific which is mainly Australia, of course, so those are broadly the results and they put into pretty stark reality the challenge of the two degrees (2°) climate target is because all those resources are owned by either governments or countries which are intending to burn all of them, all of them. And were they to do so, shows a global climate change and global average global warming going up to at least five degrees (5°) and probably six degrees (6°) or seven degrees (7°).

Those are the trajectories for the different fossil fuels from the five degrees (5°) scenario and the two degrees (2°) scenario. It's quite interesting. I don't need to spend a lot of time on it. Obviously coal is the most affected fossil fuel. It's the most carbon intensive fossil fuel and the model suggests that coal use needs to drop pretty dramatically, more or less immediately. Oil similarly stays at a plateau for a bit and then falls off pretty quickly. Gas is an interesting one because it is the least carbon intensive fossil fuel, and obviously it's very difficult to change the economic structure of the world's energy economy overnight. And so quite a lot of gases used right the way through to the 2050 scenario.

There's very little or no arctic resources being used in the model, although obviously they are there. The oil sands in Canada only get produced if the energy inputs into oil sands are decarbonized. In other words, you use an enormous amount of biomass instead of the natural gas used at the moment. And we've got two panels that show that the availability of carbon capture and storage technologies doesn't make an enormous amount of difference. If you don't allow carbon capture and storage, our model does a low carbon capture and storage and you'll see that eighty-two percent (82%) there for coal, but that, only that then becomes eighty-eight percent (88%) unavailable for burning if you don't allow carbon capture storage.

So what are the implications and conclusions? Well, politicians are clearly not yet facing up to the implications of their climate change commitments, this is absolutely clear. They've all signed up with Paris to below two degrees (2°) ambition, and yet we can see, in no country in the world a policy on fossil fuels that ensures that these reserves will stay in the ground—very few licensing constraints for fossil fuel exploration that I'm aware of. So that's very strong climate change implications. The previous presentation showed you what the implications of that climate change will be for some of the poorest people in the world as well as for children. So politicians have a lot of work to do.

Corporates, who are being petitioned against, people from the fossil fuel companies, they clearly don't yet believe that politicians will limit greenhouse gas emissions because their business plans are predicated going forward in the future on burning a very large proportion of the reserves that are currently in their balance sheets and in their corporate reports. They also finance lobbying and misinformation campaigns to prevent the required political action, as a very considerable amount of evidence of that shows in the United States, but actually globally. We need to be aware that if we stick to a two degrees Celsius (2°C) limit, new discoveries cannot lead to increased aggregate production. For a country like the U.K., that's very significant. There was no European shale gas used in our model runs. If the U.K. was suddenly to produce a lot of shale gas—and be aware that the U.K. government is currently trying to do just that—the question I ask is what other fossil fuels elsewhere in the world will not be produced if we start producing that shale gas? To stick within two degrees (2°), you can have no increase in the aggregate production and these kinds of results obviously draw into very great question.

New investment in exploration and production of new reserves. Given that every new reserve that is discovered and is produced in order to stay within two degrees (2°), which is what countries committed to do, some other fossil fuels somewhere else would not have to be produced. I've visited northern Norway and had debates with the oil company which can produce oil in the Arctic. You have seen in our model, no arctic resources are produced in the model. So if we start producing, then which resources elsewhere should not be produced in order to compensate for that? Those kinds of questions are not even starting to be considered either at the corporate or the political level.

I think that's probably it. So I'll just finish with a few remarks. What do I think the implications of that offer to businesses? Well, the standard response of businesses, of course, is that they are producing a product that people in societies demand and use, and that clearly is true. We all use fossil fuels; our economy is pretty well dependent on them. So for me, what I'm looking for is a transition, a way out for the businesses. We now have very wide range of renewable resources, many of which are almost as economical as fossil fuels. I believe, in some eighty (80) countries, renewable resources are already fully economical. A responsible and moral business aware of its commitments to human rights and social welfare, should you be planning an exit from fossil fuels? And we know from the recent one point five degrees (1.5°) report in the IPCC it should be planning that pretty fast. My study there, was for two degrees (2°), obviously to keep to one point five degrees (1.5°), we are talking about a significantly smaller carbon budget and the IPCC gives us only twelve (12) years at current emission rates to stay within that one point five degrees (1.5°).

So I would be looking for businesses, fossil fuel businesses to be transitioning away from that. This is not a hopelessly idealistic aspiration. There are many businesses associated with the World Economic Forum now with an increased interest in what they call science-based targets to do with the environmental impacts that result from business activities. A number of businesses are signing up to science-based targets. Well, with regard to the climate science and carbon emissions, we know very well what those climate science-based targets should be. As far as I am aware, no fossil fuel corporation has yet signed up to them. And it's that I would be looking for over the next immediate future, and what I hope your Commission can help to ensure. Thank you very much.

PANEL CHAIR CADIZ:

Thank you very much, Dr. Ekins.

Dr. Walpole? Commissioner?

COMM. GOMEZ-DUMPIT:

Thank you very much for your presentation. I'm just wondering, where else have you presented the results of the study, and have you presented it to any carbon majors that are impleaded in this case?

DR. EKINS:

Well, they would need to invite us to present it to them, and they didn't find it exactly convenient study for them. We presented it very widely to the financial sector in London and particularly emphasizing that conclusion that are about new investment in fossil fuels because we believe there's a very significant, a prospective stranded assets in the fossil fuel sector and indeed we are not alone in thinking that the Bank of England, as you will know through its task forces, recommended that companies should report on that carbon emissions because of the climate related risks involved. We've presented very widely. We were very gratified at the media coverage that this paper had. There have been various calculations that this paper had more media coverage in 2015 than any other climate change paper. People have become more aware of it.

I would say the Canadians didn't like it very much either.

COMM. GOMEZ-DUMPIT:

Just another question. You mentioned the cost benefit between existing alternatives as against fossil fuels. Could you elaborate on that? Is it really going to be competitive to use renewables instead of fossil fuels at this point? I understand that we do want to use renewables, but I just want to get a sense of your opinion on this.

DR. EKINS:

That would certainly depend on relative prices. That is a very important question. Certainly at oil prices and comparable gas and coal prices at current level that's about Eighty Dollars ($80) a barrel at the moment. Renewables in eighteen (18) countries are cheaper than that. Mexico, Chile, Dubai... the whole range of tropical and subtropical countries that have a lot of sun, this costs definitely lower than fossil fuels, in terms of new plant. It is getting to the stage wherein it is much cheaper to build new solar panels.

Obviously, if that becomes a common trend, the cost of fossil fuel is going to fall and because the cost of fossil fuels rises up—those curves that you were seeing—if we stop using fossil fuels to the same extent you can expect the price to come down. And indeed we saw that very clearly in the recession after 2009.

So, in a way, renewables are having to run harder and harder just to keep up because the more people go for renewables, the softer will become the oil price, which means that the comparison of the relative prices between them is going to change. But what is undoubtedly the case is that these renewables are very affordable and there's absolutely no reason why therefore countries which have good renewable endowments—in the UK obviously it's not sun but it's very much wind—should not be installing these instead of fossil fuels. And obviously what an economist like me would be interested in, is seeing a global carbon price because that would then compensate for the falling price of fossil fuels and would ensure that the fossil fuel majors and fossil fuel consumers start paying the real cost of the fossil fuels they're using, which as you can see from the previous presentation are very great and very hard and we simply have to stop using the atmosphere as an open sewer for our carbon emissions.

COMM. GOMEZ-DUMPIT:

Thank you very much.

PANEL CHAIR CADIZ:

Dr. Ekins, are you aware of any study of the carbon majors investments on renewable energy? Could you provide us more or less an idea of what percent of their capital investments go into renewable energy research?

DR. EKINS:

Well I can't give you an accurate figure right now, but I know it's very small. The two (2) oil majors who make the most noise about this are Shell and BP and they have a sophisticated public relations operations to the effect that over time they're going to move towards renewables. But they are doing so at an incredibly slow rate and the proportion of their investments in renewables is tiny. By tiny I mean certainly less than ten percent (10%), whether it's five percent (5%) or three percent (3%), or whatever. And that's not entirely their fault. I remember very clearly fifteen (15) years ago both Shell and BP... you remember the big branding of BP that it was going to go beyond petroleum? The current chairman there was very keen to have that kind of transition.

But, frankly, governments didn't step up to the plate and companies have to make profits. So if BP had stayed on that track they would have lost even more money than they did, compared to a company like Exxon which has never shown the slightest interest. So while I think Shell and BP don't invest enough in renewables, at least they invest something in renewables, and they recognize the reality of climate change and that they need to move away from fossil fuels. That is not true for all the oil majors. I singularly mention Exxon as an example.

PANEL CHAIR CADIZ:

As a follow-up question to that, do you have any idea, in terms of percentage, how much more they're investing in continued fossil fuel exploration or exploitation?

DR. EKINS:

I am not really the right person to be asked that again. I haven't got numbers off the top of my head, but it's certainly billions. I would be pretty confident it's tens of billions it may even be hundreds of billions. Some of that is absolutely necessary because oil fields deplete, obviously, if they were not to invest anything in fossil fuels. Before we have electric vehicles, for example,

on a wide scale. The world would simply grind to a halt because we are completely dependent on oil for our transport system globally. So some investment is definitely necessary, but the investment that I'm particularly critical of is the investment in new exploration and discovery because we know about plenty of reserves that we can't afford to burn. Discovering more of them will simply mean that those choices become more difficult for the countries that are concerned.

PANEL CHAIR CADIZ:

When will it make economic sense for these major carbon fuel producers to shift to renewable energy? I understand that this is a market-driven decision - for them to invest more on carbon fuels than on renewable energy. But do you see any economic trend or factors happening in the future that would provide impetus for them to finally invest more on renewable energy?

DR. EKINS:

There is one typical example of a company that chose to take the transition first. Historical evidence though is not good and it seems that they prefer to go bust rather than change their ways. It's very difficult for a fossil fuel company to make that transition. The skills are completely different, and these are very highly capitalized, very capital-intensive, very skilled engineering firms in terms of extracting substances from the earth. Photovoltaics or wind companies do it completely differently.

There was this Danish oil and natural gas corporation called Dong Energy that has given up oil and natural gas entirely and is now one of the biggest offshore wind installers in the UK. And they've even changed their name to Orsted, as Dong was clearly not relevant when they're not doing any oil and natural gas anymore. So it is possible to do that, but Dong was not exactly an oil major, and it was largely a state-owned company, as well. Presumably, it was a bit easier to do that in a country that had very significant expertise in wind power, which it was able to build up.

So we can see that those transitions can happen but it is extremely challenging and it's notable to me that BP—fifteen (15), twenty (20) years ago—went into solar panels in quite a serious way. So BP solar was a significant company. It lost a very great deal of money partly because it was too early. Solar panels were still not as cheap as they are now but partly it's just a different business and it was a business that I don't think they were particularly good at. So, yeah, these transitions are very difficult and I think a large number of them will probably go bust rather than make that transition.

PANEL CHAIR CADIZ:

Thank you, Doctor.

COMM. GOMEZ-DUMPIT:

Just a follow-up. I just wanted to find out your thoughts about state responsibilities, or what roles can states perform so that we can move and transition towards renewables? And then maybe just talk some more about the global carbon price, how is that going to take effect, if you say that global carbon price should be able to control the cost, the falling cost of fossil fuels, and not making them more attractive again to invest in?

DR. EKINS:

On state responsibilities, I am an economist, not a lawyer... But obviously states are supposed to be looking at the welfare of their citizens, the present, the current generation. Actually the future generation arguments in terms of climate change are becoming less and less relevant because the current generation is being hit very hard by climate change.

Climate change is about as difficult a political problem as it would have been possible to imagine for States to deal with. Because it's what economists call an aggregate public good problem. That's to say, in order to make an impact on the issue you've got to have most states cooperating. That was the enormous importance of the Paris conference, as opposed to the Copenhagen conference, the major states expressed the desire to cooperate on this issue. There's absolutely nothing any individual state can do on this by itself, even the United States, if it had a president that was keen on doing something on climate change, which of course we know it doesn't at the moment.

Even China... The two biggest emitters could not address this issue by themselves. So the single most important thing that brought the Paris Agreement together was when the US president and the Chinese President shook hands on the subject, and said we're going to cooperate on this. And then of course the European Union is important and then you've got a whole range of other countries that need to cooperate—Brazil, South Africa, Indonesia, India. The other countries... it's impossible for a country even like a UK or like the Philippines to address this issue by themselves. We will need to do something... But there are incentives for us to wait for what's called a free ride, to hope someone else does something while we don't have to do anything, and therefore get competitive advantage for our businesses. The incentives for that are very great. As we know, the Paris Agreement was an

enormously important agreement but we also know that states are not yet committing to anything like enough emission reduction to keep us within two degrees (2°), let alone one point five degrees (1.5°).

As an economist, on the carbon price point, I'm always very surprised that people say that this is so unbelievably difficult, because I've spent much of my academic life studying environmental taxation in various forms and actually it's a no brainer. No one would be saying, at least I wouldn't be suggesting, that countries should charge a global carbon price and then put all the money into some kind of big global pot because, obviously, politically that would be very difficult.

But to have a carbon price which countries then keep the revenues themselves to use for their own purposes... Governments need revenue. Most governments tax employment in order to get revenue. Which is, economically, a very sub-optimal thing to do, because employment is a good thing. You're making it more expensive, therefore you reduce the quantity of employment that employers want to offer.

Taxing carbon instead, to have lower employment taxes, would make an enormous amount of economic sense. And I've done a lot of modeling around that particular proposition. So I find it hard to imagine really why countries find this so difficult.

But the fact of the matter is they do find it politically very difficult to introduce carbon taxes and certainly there's no sight of the global carbon tax on the horizon any time soon. I hope we won't have to see too many more heartbreaking pictures that we saw from the Philippines for policymakers there to start taking those responsibilities and those ideas pretty seriously.

PANEL CHAIR CADIZ:

I have a follow-up question on carbon taxation. Carbon taxation is different from carbon fuel taxation... Am I correct, Dr. Ekins?

DR. EKINS:

No, carbon taxation is a tax levied on all fossil fuels in proportion to their carbon content. So oil, gas, and coal are obviously the three (3) most important ones. They have different carbon contents per unit of energy and so you would tax them at different rates per ton of fuel or per unit of energy but you tax them at the same rate per unit of carbon that they emit when they are burned.

And why they are so convenient for countries, especially if I may say so, developing countries, many of which don't have very well-developed fiscal systems, is that oil gas and coal normally enter the economy in a few dozen ways.

Only big companies, either domestic companies or importing companies bring this stuff in and they are much easier to tax than normal citizens. And so, taxing fossil fuels as soon as it comes out of the ground, if you're a fossil fuel producer or as soon as it comes into your territory, if you're a fossil fuel importer, is a relatively easy thing to do. And there's quite a lot of... most countries are already engaged in carbon taxation. Most countries are engaged in energy taxation of some kind. Although many countries still subsidize fossil fuels, which of course is a doubly bad thing to do because you're making them cheaper than they would otherwise be.

Many countries are engaged in energy taxation but relatively few countries actually have identified carbon taxation as being a major fiscal instrument for both revenue raising which is important and for the incentive effects for changing the relative prices of carbon fuels as against renewables. If the current carbon price in the European emissions trading system is about 20-30 euros a tonne – it goes up and down, but it's relatively high at the moment – if there were a global carbon price of 20-30 euros a tonne like in the EU, renewables throughout the tropics would be substantially cheaper than fossil fuels. So it would make an enormous difference to the economic signals that companies would have in terms of installing this energy capacity.

PANEL CHAIR CADIZ:

Thank you very much, Doctor.

Alright, counsels, would you further examine your witness?

ATTY. PAUDAC:

Thank you for that beautiful presentation, Dr. Ekins. You mentioned about transitioning, that the companies have to transition out fast, and you also mentioned that they have to submit responsible business models or plans. Do you have any recommendations for these transitioning companies? These responsible models, business models for these companies? For you, how should it look like? And what is the ideal setup?

DR. EKINS:

Well, companies will do it in different ways. The companies that I think are particularly interesting are not the fossil fuel companies, with the exception of Dong. I think Dong is very interesting as they took a high-level corporate decision that they were going to focus on offshore wind, which they built up with very great expertise. So they've become exclusively, more or less, offshore wind producers.

NG is another interesting company—an example really of electricity companies that use the fossil fuels. It's really interesting to see how those companies have reacted to the kind of climate change issues. In a country like the UK that used to be extremely dependent on coal—some eighty (80) to ninety percent (90%)—in 1990, which isn't so long ago, electricity was generated by coal, we then shifted for purely economic reasons to a far greater use of gas. And then from about the year 2000 we started thinking about renewables. The same companies that used to be very dependent on coal for their power production now have very significant renewable component. So that the UK is now generating about thirty percent (30%) of its electricity from renewables. So we've kind of seen how that transition takes place.

Companies have done it in different ways. Some companies have sold off their ore coal and their coal and gas-fired power stations all together. So Scottish Power was the most recent one. Some companies have split themselves into two—one company does renewable power generation; the other sort runs the legacy assets of their fossil fuels. RWE and EON, two big German companies, are examples of that. And one can imagine that they'll be trying to manage those legacy assets to get as much value out as possible before they finally die. And then the company will simply put all its investment on its renewables company. I guess it's that sort of model that you might expect the major fossil fuel companies to adopt—were they to become convinced (which they are not at the moment) that governments were going to stick to two degrees (2°). As soon as they become convinced of that, and as soon as governments make it very clear that they will take the 2° seriously, these companies would shift much faster.

ATTY. PAUDAC:

Thank you for that, Dr. Ekins. Just one last question. Your research is based on the premise that policymakers have generally agreed to the average global temperature rise caused by greenhouse gas emissions should not exceed the two degrees Celsius (2°C), as reported. But in your statement, you also mentioned that a one point five degrees Celsius (1.5°C) carbon budget is considerably below the one thousand one hundred gigatonnes (1,100 Gt) of

carbon dioxide carbon budget used for the two degrees (2°) scenario which you have already discussed. This means that keeping global warming to one point five degrees (1.5°) would require considerably more fossil fuel to remain unburned. Can you please elaborate more on that because I understand that you will be conducting further research?

DR. EKINS:

Yes, we have already done that. Again there's a certain amount of uncertainty as to what the one point five degrees (1.5°) carbon budget is, but the numbers are around six hundred (600) instead of one thousand one hundred (1,100) so it's not much more than half the current two degrees (2°) carbon budget. So it makes a lot of difference in terms of fossil fuel use. At the moment, annual emissions are something like forty gigatonnes (40 Gt) of carbon. Well, if you multiply forty (40) by twelve (12), you get four hundred eighty (480), and that's close to the one point five degrees (1.5°) carbon budget. That's why the IPCC Report mentioned about twelve (12) years left at current levels of emissions.

ATTY. PAUDAC:

That will be all for Dr. Ekins.

PANEL CHAIR CADIZ:

Thank you very much, Dr. Ekins. Before we proceed to our next resource person, we can take a 15-minute break because you skipped one witness and we have time for coffee.

So we will resume our session… quarter to 11. Okay, thank you very much.

[Break]

MR. ADAM MATTHEWS:

Thank you very much for allowing me to speak. I have two roles: one is, I'm director of Ethics and Engagement for the Church of England Pension's Board, which is a pension fund that provides pensions for the clergy in England and those that work with the Church of England. We're two-and-a-

half billion pound pension fund. And as such we're invested globally in many companies and in different asset classes.

My role within the board is to ensure we have policies on particular issues such as climate change, ensure implementation, and then to also engage companies and asset managers on those issues of concern to us.

We are an ethical investor. We ensure that we align our approach with the ethics of the Church of England. And I also co-chair the Transition Pathway Initiative or TPI, which is an initiative of asset owners to understand the transition and how it impacts on the major carbon emission companies. And this Initiative is now supported by funds with over nine trillion dollars ($9 T) of assets and based at the London School of Economics Grantham Research Institute.

In terms of what I was looking to present this morning, let me know how long you'd like it, I can go into different levels of detail, but I can also give you a summary of the Initiative, what we're trying to do, how we look at transition, and would then be happy to answer any questions.

PANEL CHAIR CADIZ:

You can take it from there, just proceed and we will just ask questions after your presentation.

MR. MATTHEWS:

Please do so, and if there's anything I'm saying that is already beyond my topic, please do feel free to stop me because sometimes I get too carried away. Anyway, you obviously already have paper copies of the presentation.

One of the challenges, as an asset owner, we've had was really to understand how you can measure the transition and its impact on companies. So how can you measure individual companies, whatever sector they're in, if they're in the high emitting carbon sector? How do you measure them and track their behavior against the sort of transition that's required on a sector-by-sector basis? So we, as asset owners, obviously we're owners through shares in companies, we wanted to create a tool that could enable us to have that level of understanding, consolidate a lot of the information that companies distribute and present it in a way accessible to and usable by asset owners and the wider investment community.

The reason for this is that clearly we need to understand the risk that we're carrying in our portfolio. As I say we're a pension fund, we invest, we need to provide pensions into the future fund. As a growing one, we're a long-term investor. Clearly companies are exposed to climate risk, potential risks that we're carrying in a pension fund. And, therefore, we needed to understand, we needed something that was very clear that I could use. Both to understand the risks and, equally, to focus the conversations or dialogues that we have with companies in which we are shareholders. So that was the sort of impetus behind creating TPI. There's a lot of great information out there. Companies are producing a great deal of information, but the challenge was we didn't feel it was in an accessible format for asset owners to really interact with.

But how do you cut through, to know what actually they're doing, and how does that translate into being able to monitor their performance, going forward, particularly in alignment with below two degrees (2°), which is an objective that we share. Just to note from the Church of England's Pension Board's perspective for 2015, we produced a climate change policy that set out our approach and framework to the issue of climate change. And that really mandated us to engage. We did make some disinvestments at that point from companies that we felt would not manage the transition, largely companies that derive more than ten percent (10%) of their revenue from the production of thermal coal and tar sands. And at that point, we sold a number of companies that we just felt were not going to make the transition or weren't worth the effort of engagement with. We didn't see their really having long term prospects in relation to the transition that needed to occur. But that meant that we still remained invested in the vast majority of companies across oil and gas, diversified—mining, cement, steel etc., and we wanted to be able to engage with them meaningfully to help them transition and ensure that we've used as asset one that we had.

So that was the impetus behind TPI. We found common cause with a number of other investors. I'm just going to sort of skip through a few slides. We're keen that this is very much an open tool, it's accessible. It's on the London School of Economics websites. It's an open source initiative to serve the wider finance community as well as their own needs.

We do two (2) things: We track basically the management quality of a company. We look at the competencies at the level of the board. Do they have policies in place? Have they measured their carbon impacts and all the steps that you would sensibly expect a company to take, to manage the issue of climate change as a systemic threat to their business model?

The second part is… Okay, a company can take all these sensitive steps. Now how does that actually correlate with their future likely performance? And so we are keen that you could have these two (2) aspects brought together in one

tool so you could look at both—in effect, two (2) lenses of a glass rather than what, I think, previously a lot of people have just looked at the management quality side. And I think bringing the two (2) together was quite important. Our partners, as I've mentioned, the London School of Economics Grantham Institute, FTSE Russell, the data provider who assesses and tracks the university companies and the principals' responsible investments, and provides the broader outreach to the investment community.

As I mentioned we have a large number of funds now from asset managers to asset owners. We sort of add nine trillion dollars ($9 T), and growing quite rapidly.

So what does this actually do and how do we do it? So looking at page four (4) on your slides you've got the overview of the TPI tour. As I say, it's management quality, carbon performance. Our latest results, we've looked at sixty-four (64) fossil fuel producers—coal, mining, oil, gas, fourty-one (41) electric utilities – and we've also looked at other sectors such as cement and paper and steel and auto. The design principles... we're very clear that all of our assessment should be based purely on publicly available information. It should not be from other sources of information that you can refer to, like third-party research providers. But we wanted... this is what the company puts on its formal reporting and its disclosures, we wanted the tool to track purely on that. So when there are gaps, that's because there isn't the disclosure. We wanted to show that this is very much aligned with the recommendations of the Task Force on Climate Finance related disclosure or the TCFD which we feel has been a very important initiative. We sort of made an informed guess in terms of the kind of recommendations that will come out. We've now aligned the tool to very much pick up those recommendations from Governor Carney's Task Force. We have pitched this in a quite high level of aggregation. So on the management quality assessment it applies to all companies, whatever sector you're in, but on the performance it is specific to different sectors. And I'll just explain that in a moment.

So, in your paper copy on page five (5), looking at management quality we basically rank companies. I say this is generic to all sectors across five (5) levels. A zero rating is attached to a company that is just completely unaware, not engaged in climate change as an issue, and doesn't have a policy. Ranging up to level four (4), you have a company that is genuinely engaging with climate change at a strategic level of the board, has made clear responsibilities of directors, and has a level of disclosure that we can track and really sort of trying to plot their company's business plan forward against the issue of climate change.

The second assessment is carbon performance on the bottom of page five (5). Here, basically we're looking to measure companies on a forward projection

against the Paris goals. And here on this graph you've basically got the Paris pledges for the planet, the nationally determined contributions, the commitments governments made of 2015, and you've got the two degrees (2°) benchmark as well, and we are introducing a one point five degrees (1.5°) benchmark in due course as well.

And over this you've got three (3) fictional companies. These are actually companies but without names on them. You've got the red company completely not aligned, yellow in between the two, sort of aligned with current regulation or plan to be aligned, and the agreeing company that is aligned. As I say, this is sector specific and I'll explain that as we go forward. So in terms of the latest results, looking at management quality, you can see clearly, climate change is a systemic threat to the business models of these companies. And yet you still have a number of companies very much in the early stages of trying to understand it. There's even one at level zero, and yet you also have quite a significant number at level one. But again you have the vast majority as sort of around level two, level three and there's a considerable number that are in this sort of highest level of strategic assessment.

Really, trying to understand climate change as spread across sectors is sort of a challenge. There is an interesting correlation possibly to be drawn out between utilities, which is a sort of more regulated sector, and therefore that sector has potentially progressed more in terms of performance versus other companies. So looking at management quality, on page seven (7) of your paper copy, the average company building capacity, and that basically means they've explicitly recognized climate change, business risk and opportunity, and made clear policy commitments for emission reduction targets, disclosing operational emissions as well. For this assessment, the first time that we actually did for some companies in these sectors, we actually introduced an extra level of a four-star company, which basically is a company that has hit all of the recommendations or all of the indicators that we have, underlying the management quality assessment. And here you do have two (2) oil and gas companies that are actually hitting all of the indicators. And you have a couple of coal mining companies as well.

So they are taking all of those steps that we, as investors, feel are important in terms of addressing climate. And if you look at trends in management quality, and as I say, this is the first time we've been able to assess, reassess fifty-four (54) companies since the launch of TPI in January 2017. And there you've actually been able to see a reasonably significant amount of movement. I mean seventeen (17) of fifty-four (54) companies have actually changed in the space of just over a year. Eight companies have moved up by explicitly recognizing climate change as a business risk and opportunity, and another six (6) have moved by setting emissions reductions targets.

I would note that the vast majority of the progress is at the lower levels rather than at the high levels, but there has been some movement into level four as well. So at the bottom of your page eight (8), I think, this is the challenge that we still have as investors and those that engage with companies. You still have this graph here, which basically highlights the blue, where there are existing disclosures, and red where there aren't, of the companies in this latest round of particular assessments. And there's still a large gap of disclosure required in this sector, public disclosure in the company reporting. And so that's something that we are engaging against and we would expect that picture to change quite significantly. Moving onto carbon performance, which I think is really key because this translates into actual projected performance: Are you reducing emissions against these benchmarks, set in terms of the Paris agreements?

I'm going to do utilities because we can't yet do oil and gas and mining. And I'll explain why as we come on to that. I think utilities gives you a basis upon which to understand what we're trying to do, and why we want to do it in the gas and mining, and the progress we've made with that. Because we have made some progress with oil and gas.

On carbon performance here, we've assessed the thirty-seven (37) electric utility companies and basically we've looked at hertz (Hz). Their emissions targets are relatively common in electricity utility companies. But quite a few are still missed. And if you look at 2020 the top sort of donut—this is called the circle thing—about a third of them are actually in line with two degrees (2°) and actually below two degrees Celsius (2°C). A third aren't disclosing yet and a third is not aligned with current regulations but do have some disclosure.

So in terms of this sector, actually broadly, it's a better picture than other sectors that we've assessed. And as the further you push out 2030, a number of companies that are actually disclosing increase, that decreases, and those that are actually aligned with two degrees (2°) and below two degrees (2°), is an even smaller number. But nonetheless there are some in that space, and I think that is one of the things we are covering, that are able to set pathways in line with below two degrees (2°) objectives for the sector. So it's quite an important finding, but equally there really is a big job to be done from investors and regulators in the sector as well. I would highlight that this sector is more regulated; therefore, seeing the longer-term targets 2030 is possibly greater in this sector than the other ones we've assessed.

So this is what we want to be able to do really in any sector. And so the challenge we've had with coal mine and oil and gas has been that there hasn't been a similar level of disclosure as there has been in, say, the electric utilities or the auto sector. And so we've been working with Professor Dietz and his

team here at LSE in terms of trying to find a methodology that could really capture the future performance of oil and gas companies and mining companies against these benchmarks.

Earlier this year, we published a discussion paper that set out an approach that drew in very heavily from recent announcements that Shell had made, really looking at them becoming a primary energy producer and looking at the whole life cycle emissions which includes scope plans, go to scope three emissions. And we've developed a methodology that we're just about to update with the release tomorrow. I'm happy to share that information with you tomorrow. We've sought a lot of feedback and we've received feedback from the owners in the gas sector, from other investors, and other academics. The update we'll have tomorrow will actually say where we are in benchmarking nine (9) of the ten (10) largest oil and gas companies, as to where they sit today.

And then for projects, on the targets that they have... I think some of those results are quite revealing in terms of the sector. But it's fair to say that the two (2) companies have actually really changed the dynamic in the gas sector. Shell and Total, have both set forward an ambition to basically transition their business – typical primary energy producer, in the case of Shell—to really align with Paris around 2040, and to sort of go on a trajectory that removes or reduces the carbon intensity. That's quite a significant change, which has enabled us to begin to assess companies on their public disclosure. And that really has come around because both Shell and Total have made losses in the last quarter of last year, which has suddenly enabled us to engage with a company that is not just in certain emission reduction targets related to scope one or two, which is about twenty percent (20%) of their net impact, but all of their impacts. And so I think that's been quite important for TPI—to be able to now develop this methodology. We will be updating this tomorrow.

With mining, we're in the same discussion with diversified mining companies to find the methodology based on their public disclosure, and we're in a constructive dialogue with a number of diversified mining companies around an appropriate methodology similar in nature to the one that we've developed for gas. And then we will be publishing that document probably in the first quarter next year, 2019.

So TPI really is a tool. We wanted an independent academically rigorous tool that could give asset owners and investors an understanding of where disclosure was, the level of capacity companies had at management level, and how that correlated to their management capacity. Those are their future performance. We've covered about one hundred eighty-seven (187) companies so far across seven (7) different sectors. We are moving into other sectors.

Really, investors are starting to use TPI in a number of ways. The first is just to understand the risk that we're carrying within our portfolios. It's also been integrated by a number of funds on the basis of understanding the risk into investment that help inform the decision-making that funds are taking. It's really beginning to help, I mean our pension fund has an objective to align ourselves to below two degrees (2°).

To actually do that in a meaningful way, you need tools such as this. I think TPI is helping us to begin to make that kind of commitment and journey and understand what it means within our holdings. We've announced that we are looking to create an index on the stock—six hundred fifty (650) million of our funds in passive index that track the global indexes. We're now looking at how can we integrate TPI's assessment into our index so that those companies assessed positively are proactively rewarded, and underweight those that are not assessed positively.

And we're looking to construct that with FTSE. We've invited other funds to join us in trying to ensure that passive investments can be much more integrated with climate objectives.

Equally, fund managers are beginning to be required by some asset owners to report using TPI in relation to their major holdings. We've integrated it into the way that we vote. So we've begun to vote against chairs of companies assessed at level zero (0) and level one (1)—an assessment that's not good enough in terms of where you are as a company, particularly given your size, and that this is an issue that is so significant to your sector. Ultimately, it's a tool that is underpinning lots of engagement. So the global initiative of investors that has been launched to engage on climate change, Climate Action 100, is the first time all global investor networks are collaborating for the first time.

It's a Thirty-Two Trillion Dollar ($32 Tn) collaboration covering every region of the world and that initiative is going to be utilized in TPI as part of the assessment framework for tracking the performance of companies against that engagement. And that's over the next five (5) years. Now it has been launched, and TPI is utilized in that regard.

Next steps, I mean, our ambition is really to sort of broaden the scope of coverage for our companies. The assessment shares the best practice that's emerging amongst the investment community and really helps to underpin the dialogues between investors and companies that we're invested in. I've put in your packs a bit of detail in terms of the benchmarking of carbon or even gas, and as I say our update will be available tomorrow. We'll update this.

So actually, rather than go into this, I can just submit the paper tomorrow with updates where we've got to. But this goes through some of the methodological challenges that we've had and how we've approached it in this sector.

It also shows that you can benchmark. Here on page fourteen (14) of your paper, we have benchmarked the steel sector. We've done the same on the auto sector at page fifteen (15). On top of that game, benchmarking all the major auto producers, is Ford.

So that's TPI. I do need, I'm afraid, to do this last one because I have to. They give the disclaimer, the most exciting slide.

PANEL CHAIR CADIZ:

Thank you very much, Mr. Matthews. How do you quantify… how do you assess the seriousness of the companies that you invest in, in terms of being more climate-conscious in their operations? Quantitatively, do you look at the actual capital portfolio? How much goes into renewables and stuff like that?

I asked this question to our earlier resource person, but they did not have exact figures. But since you are actually engaged in investing your funds, would you have quantitative data to share with us?

MR. MATTHEWS:

No, not enough data. I mean, I'm here as the co-chair of the Transition Pathway Initiative. I can obviously offer some perspectives as an asset owner. I suspect chief investment offices are probably the best to place some of the questions.

We manage all funds through managers. So we look at how our managers through tracking funds, as I've mentioned. And they just simply track the market.

We have a number of ethical exclusions that we apply on a range of issues, but as I say we're trying to develop an index for tracking funds that takes the craft of TPI because we feel that's probably the most effective way to understand a transition in a company. A company like Shell, I think, is setting out to the path where they're looking to basically transition from oil to gas and to other energy sources.

I think they're set in a path that I think gas companies somewhere will pursue and that would involve obviously investments in renewables and a range of

other areas. It's also dependent on carbon capture and storage. We do look at these things in detail with companies. We do talk to them and we can see renewable assessment. I think there's a legitimate question: is a non-gas company well-placed to become a renewables company? That's still a live debate, even when you'll see that the debate is lying at the moment... I won't say it's wrong. I think it's very much for the companies to sort of set out their strategies.

And their plans are there for us to interact as long as there's sufficient disclosure to really understand what they're doing and the sort of mix of their energy. I think you'll see different strategies emerge. Some will be potentially transitioning, in the way others could potentially stop exploring and just run down their existing reserves and cease to be a company in due course. So I think those are the options that are out there. The funds look at the risk based on TPI's assessment tools.

We find TPI's tool most effective in sorting and profiling our holdings. Obviously we're a diversified funding in infrastructure of asset classes. And so it's just a part of our investments, this trend of trying to influence the behavior of big businesses to become more climate conscious. Obviously you're one of the investors who look deeply into this. Among the global investors, what percent of this community would you say have a climate consciousness sensitivity that the TPI has? Well, as I say, we've got funds of nine (9) trillion of assets. Are they all utilizing TPI's assessment tools? By becoming a supporter, TPI doesn't prescribe you to utilize in any way but to be open about ways you use it, share good practice and experience that. So we know that there's a larger group of funds, very significant funds utilizing TPI in a variety of ways, trying to really understand the transition and the complexities of it.

It's really important in relation to engagement I think, if you look at the trend of shareholder resolutions. This is one way of being able to look at the conversation, of engaging. You've seen an increase in numbers of resolutions with significant numbers of investors voting in favor of things related to climate change. You had a series of resolutions in the UK about disclosure, very much about disclosure, and how you integrate this into this issue at the board level. They received very significant support because the companies back those resolutions.

There is ninety percent (90%) support for a resolution in opposition to management at Exxon. That support was very significant. The vast majority of the shareholders of one of the largest companies in the world recognized Exxon needed to be more open to climate change, they were successful in that resolution which sought further disclosures. We as a pension fund, filed shareholder resolutions related to corporate lobbying and there you've seen

initially we got eighteen percent (18%) support. You've seen the same resolution two (2) months later achieve forty-six percent (46%) support. So there is a trend. The market is beginning to recognize this as something that has to be addressed and the number of resolutions is one way of looking at how investors are taking this. There's still quite a long way to go on this. I think the fact you've got Thirty-Two Trillion Dollars ($32 Tn) of assets aligned around the goals of Climate Action 100, which are quite clear they're about aligning the businesses of one hundred sixty (160) largest carbon emitting companies in the world to below two degrees (2°), you've got an enormous amount of the market aligned with achieving that. You've also got others that may not be part of that but also pushing at those same objective. So I think you've got a very different picture at the moment, and over the next four and a half (4 ½) to five (5) years, I think, you'll see a lot more. It's a trend that's growing any one way. But can I say, honestly, have the markets fully embedded this understanding? I don't know. I think there is still a lot more to go.

PANEL CHAIR CADIZ:

Can you talk more about climate risk as an investment consideration? What exactly do you mean by climate risk? Is it more of a financial risk? Or is it what climate change imposes on the business operations of companies? Or both?

MR. MATTHEWS:

As I said we're an ethical investor, and therefore we've approached the issue –the impact of climate change on society, on the poorest, and the need to basically change the global economy from one that is driven by fossil fuels to one that is low-carbon – as an ethical concern. So for us it's an ethical concern. But we also look at it as a financial risk. Governor Mark Carney, the governor of the Bank of England, has set out quite clearly the challenge.

I think investors need to understand the financial risk here. You have a risk that a company is utilizing shareholders' funds in activities that—let's say a thermal coal production—that just isn't profiled to meet a two degrees (2°) world. So there you've potentially got a company that could be developing new thermal coal production that's never going to be used; meaning, that asset is not worth its current price. The risk is you actually invested in something at today's rate that actually, ten (10) years down the line, is worth considerably less. And so that's the risk. You've invested in a group of companies valued at actually only a fraction of their real value because society's moving on regulations, we're going to be using less thermal coal, less oil et cetera. And

so therefore you're trying to understand that risk, and TPI is a tool that helps to understand that. It's an effective entry point to understanding. It's sort of clear and accessible. I think if you go into much greater detail, you would look to your fund managers to really embed that level of understanding as well.

PANEL CHAIR CADIZ:

Would you consider potential exposure to lawsuits a financial risk?

MR. MATTHEWS:

Well, we look at the risk of regulation impacting on the ability, on the way companies are operating. There does seem to be an increasing number of lawsuits and clearly we're watching and monitoring to see what the outcomes are because that potentially exposes a risk. So it's prudent to be equally aware of that. Equally, pension funds are under legal challenge themselves to demonstrate that they are meeting their fiduciary responsibilities to actually understand risk and they're understanding the risk of climate change so we were cognizant of that aspect of legal challenge as much as the ones companies are also facing.

PANEL CHAIR CADIZ:

Thank you very much, Mr. Matthews.

DR. WALPOLE:

Thank you for this input this morning. It's very interesting to understand how some of the companies are changing and the role of greater availability of information. One of the things you mentioned was about the Global Investors Network. Is this a sort of informal network or formal?

MR. MATTHEWS:

There are formal investor networks globally. There's the Principles for Responsible Investments, which you can sign up to and that has a sort of best standards, you know. I'm also a member of the Institutional Investors Group on Climate Change, which is the European investor network that looks to work on climate change in Europe and their equivalent in different regions of the world. And then there is a global initiative which is being formalized

between those investor networks called Climate Action 100, which is basically a collaboration focused on utilizing our position as an engager and a shareholder to move companies onto paths that are consistent with two degrees (2°).

DR. WALPOLE:

Okay, so there is a global initiative emerging. What's happening, I mean we're dealing with investments in companies, how are you viewing, you know, the downstream use of fossil fuels?

MR. MATTHEWS:

From the perspective of TPI, on a sector-by-sector basis, we've looked at, for example, in the gas sector, looking at the disclosure which has been purely around the production, you have a number of companies with scope one and scope two emissions.
But now you have companies, such as Shell and Total, with emissions reduction ambition, taking into account the full lifecycle of their products so they're covering NS scope one, NS scope two, to NS scope three. Trust us, that's a very significant development for both of those companies and the implications for the wider sector. And the paper that will be released tomorrow from TPI, I think, speaks more to the widest sector where there are gaps in commitments and targets and company disclosures related to that. But you've got two (2) companies that are producing plans that accounts for people's use of that product, which to some extent they're in a very difficult position, they can't actually control how people use it. Society uses petrol and diesel etc., yeah, and yet they're willing to pursue such an ambition... move through different energy provisions that reduce their impact.

DR. WALPOLE:

As said earlier, you know, one country cannot change this entire process, neither can one company. A lot of the challenge really remains at the consumer level... so there are choices. In part, you know the downstream effect and how it impacts on the products.

MR. MATTHEWS:

Well I think that's the challenge that companies face. Society has its needs and demands. It's the challenge for regulators as well. How do you change the

shape of your economies that are dependent and have grown on fossil fuels? What's the path that changes the wider behavior, that moves away from fossil fuels. You have an example about the use of plastic. At the moment, currently, my children now want straws banned, anything with plastic. I mean you've had that sort of cut throughout society... you see what the impact is.

But I think none of this is gonna be either this or that. It's gonna be everything. And so it is that sort of broader partnership I would say between governments, companies, investors, and society to move toward the path and ensure that we can bring those that could at least effectively protect us from the impacts of climate change. So I think we've got to do this all together. This is an enormous challenge. But I do think we're beginning to see some very significant changes happen in some key sectors, and that shows that the debate is very current at the moment. But there's still a big gap in regulation, which drives personal behaviors as well as.

DR. WALPOLE:

Thank you, Mr. Matthews.

PANEL CHAIR CADIZ:

Counsels, do you have questions for the witness?

ATTY. MAYO-ANDA:

Thank you, Mr. Adam Matthews. In the management quality you showed us, are human rights impacts being integrated? Are they being looked into?

MR. MATTHEWS:

They're not, not explicitly in this. These are very much looking at the indicators, I can send you the version. But there's not an explicit link into that. There is a move involved at the just transition, looking at how the transition will impact communities, as well as workforces. I think that conversation may be a place for that understanding to emerge, in terms of how you look at that connection. As it stands, this looks very sort of binary: Does the company have a policy on climate change? Is someone nominated with responsibility on the board to manage climate change? Are they publishing their emissions? So sorry, it's quite clear in those regards, but it doesn't explicitly cover that.

COMMISSIONER CADIZ:

Thank you very much, Mr. Matthews, for sharing your experience and knowledge with us. Thank you.

Counsels, would you prefer to proceed immediately to your next witness before we break up for lunch?

ATTY. MAYO-ANDA:

Yes, Commissioner.

PANEL CHAIR CADIZ:

Alright. So can you introduce your next witness?

Thank you again, Mr. Matthews. For the record, we will be marking Mr. Matthews' submissions as Exhibit PRP-19.

All right, has that been properly captured into the records? Thank you very much.

CLERK OF THE INQUIRY:

Okay. Again for the record, Commissioner, the presentation of Mr. Matthews entitled "The State of Transition in Key Energy Intensive Sectors" is marked as exhibit "PRP-19."

PANEL CHAIR CADIZ:

All right, so the previous resource person signified that he will have an updated report tomorrow. We will also request that such reports be submitted, so we can properly mark them as exhibits too. Provisionally, we shall mark that as Exhibit PRP-20, just for the record.

Okay, thank you very much. Counsels, you may now introduce your witness.

ATTY. MAYO-ANDA:

Good morning again, Commissioners.

Our next resource person is Dr. Roda Verheyen. She is an environmental lawyer with many years of experience in international environmental law and policy. She has written her PhD doctorate on "Climate Change Damage and International Law" and now works in her own law firm specializing on environmental and planning law in Hamburg, Germany. Dr. Verheyen was previously a director of the Climate Justice Program, which she founded in 2002. Her active cases to date include a case brought by a Peruvian house owner against a major energy utility company, claiming cause for a risk reduction measure to protect his house from a major glacial outburst flood; cases against development consents and permits for coal power plants in Germany and Poland; as well as cases involving mining permits and planning acts. She co-represents a people's climate case brought by families in and outside the European Union against insufficient climate targets for 2030. Commissioners, Dr. Rhoda will share information with us today about three (3) climate change litigation cases that she's handling: one that I've previously mentioned involves a Peruvian farmers' case against RWE, one of the respondents in this case, and the ongoing case of Urgenda in Netherlands, which actually show the relevance of human rights with respect to the impacts of climate change. This fact has just been confirmed by an appellate court in the Hague. Dr. Roda submitted to the Honorable Commission twelve (12) documents, which have been pre-marked last October 24. The first eleven (11) documents which include her signature have been pre-marked as "BBBBBBBB" to "BBBBBBBB-3" until "LLLLLLLL" to "LLLLLLLL-19" and the twelfth (12th) documents have been pre-marked as "XXXXXXXX" to "XXXXXXXX-12." May we request for confirmation from the lawyer?

PANEL CHAIR CADIZ:

Clerk, can you confirm, please?

CLERK OF THE INQUIRY:

For the record, we have previously marked documents mentioned by Counsel, statement of Dr. Roda Verheyen consisting of four (4) pages, as "BBBBBBBB" to "BBBBBBBB-3" and signature of Verheyen, "BBBBBBBB-3-A." Then we have her curriculum vitae consisting of one (1) page, "Exhibit "CCCCCCCC;" next would be the printed PowerPoint presentation of Dr. Verheyen entitled: "Climate and Human Rights, Four Cases from Europe," consisting of eight (8) pages, "DDDDDDDD to

DDDDDDDD-7;" then the claim of Mr. Paul Ananias Luciano Lluiya Provincia de Juarez Peru against RWE AG represented by CEO Mr. Peter Terrium, consisting of thirty-nine (39) pages, "EEEEEEEE" to "EEEEEEEE-38;" the transcript of the decision of Mr. Saul Ananias Luciano Lluiya Provincia de Juarez Peru versus RWE AG, represented by the Chairman of the Executive Board, Dr. Roth Martin Smiths, consisting of seven (7) pages, "FFFFFFFF" to "FFFFFFFF-6; the Higher Court of Hamm, Court Order for the hearing of evidence, Mr. Saul Ananias Luciano Lluiya Juarez Peru versus RWE AG represented by the Chairman of the Executive Board, Dr. Roth Martin Smiths, consisting of four (4) pages, "GGGGGGGG" to "GGGGGGGG-3;" "Climate Change Could Destroy this Peruvian Farmer's Home, Now He is Suing a European Energy Company for Damages," consisting of four (4) pages, "HHHHHHHH" to "HHHHHHHH-3;" "Armando Ferrao Carvalho versus the European Parliament Council, Summaries of the Plea in the Law and Some of the Arguments Relied on the Application," consisting of five (5) pages, "IIIIIII" to "IIIIIII-4;" Frequently Asked Questions About the People's Climate Case, consisting of four (4) pages, "JJJJJJJ" to "JJJJJJJ-3;" "Decision of the The Hague District Court, Urgenda Foundation versus the State of Netherlands, Ministry of Infrastructure and Environment case number C / 09 / 456689 / HAZA 30 - 1396," consisting of fifty-five (55) pages, "KKKKKKK" to "KKKKKKKK-54;" Decision of The Hague Court of Appeals, the State of the Netherland versus Urgenda Foundation Case number C / 09 / 456689 / HAZA 30-1396, consisting of twenty (20) pages, "LLLLLLL" to "LLLLLLL-19;" and lastly, "Continuation of Dr. Roda Verheyen's Exhibit, Application and Complaint, Greenpeace EV, represented by the Board Roland Hipsolin, Martin Kaiser, Hongkong Strass 10 20457 Hamburg Against the Federal Government of the Federal Republic of Germany, Federal Channel," consisting of thirteen (13) pages, "XXXXXXXX" to "XXXXXXXX-12." That would be all, Commissioner.

PANEL CHAIR CADIZ:

Thank you very much, Clerk. Counsels, you may now examine your witness.

ATTY. MAYO-ANDA:

Thank you. Dr. Verheyen, you may proceed.

DR. RODA VERHEYEN:

Thank you. I am very honored to speak before the Commission. I will try and be comparatively brief but I cannot be open to questions because I believe that your questions might focus on the actual case I have against one of the defendants or respondents. But I thought it would be of value for the Commission to see how human rights and climate change are perceived by the courts, in general, and not just in the civil case so I am taking those four (4) cases from Europe with your permission.

Okay. Human Rights at the outset, it's important for the discussion... maybe later on. There are vertical and horizontal applications. So human rights application directly against a private entity which is very much enshrined in the Philippines Constitution is horizontal application. So you have the state and the citizen, where the human rights applies, and this is mostly what we do in the EU. We rarely have horizontal application between... Sorry, I think I used the wrong words just now—horizontal and vertical. Exchange them, sorry.

In the EU what we do mostly is just look at state duties, and not so much on direct duties of businesses. However, that is very important between private entities. Human rights do play a role and they play a very important role as well both on the EU side of things and, in my jurisdiction, in Germany. Because states use human rights to interpret states and courts, I have to say, use human rights to interpret contracts or existing statutory law to come to just decisions. And this is what has happened for example in Hamm where you can directly see and read how the human rights approaches have influenced the reading of originally civil law provision in the civil law code. Neither the EU nor Germany, as I put here, provide for direct horizontal application.

But there are many existing laws and duties, one of which I use in the RWE case, which actually do nothing else than balance rights of subjects against each other. So you know the tri-party, the tripartite kind of methodology in human rights—respect, protect, and fulfill—so we're really talking about balancing the respect against each other when we're applying civil law. And I just thought I'd put this in front, so that you also understand why it is very novel for me to actually speak with respect to a direct application of human rights towards businesses. And I will try to draw that circle, for full circle at the end of the presentation.

I think it's actually a very novel approach and it could be very helpful in my view looking at the practical implications of climate change today because I represent real clients and they have real problems. Their human rights are already being encroached on and they have real difficulties trying to find the

legal pathways that they need to have their human rights protected. So this is a very helpful approach. It also helped shape my understanding of human rights… preparing for this presentation.

So climate change is largely regulated as an environmental issue, and it is still unfortunately regulated mostly on the basis of the precautionary principle. So we're working on some kind of discretionary level maybe... if we want to protect somebody, right? But as such, anthropogenic climate change has of course been confirmed by courts all over the world. I've only put a couple of the cases here where you can clearly see that. There is no question, I will stress, there is no question in any court, be it in Germany or in Australia, or in many other countries where such cases have been heard, that anthropogenic climate change is there and has to be dealt with to some extent by the law.

So the law, be it existing or shaping, has to be applied to a problem which is, as we've heard this morning, of universal importance. And one of the speakers I think said it's such a huge problem, it couldn't have been designed better to pose a larger problem.

But this is just to show that this is not something that we have to debate and argue over. This problem is recognized. What we have to overcome is the application. And the actual shaping of the duties of standard of care. And this is I think what we're seeing now with most of the cases that are ongoing. So climate change as a threat to human rights is also now explicitly recognized, and because it is such a recent development I would like to quote to you the resolution of the Committee of the UN High Commission on Human Rights on its 8th Session of 12 October: "corporate entities are expected to respect the Covenant rights, and courts and other Human Rights mechanisms should ensure that business activities are appropriately regulated to ensure that they support rather than undermine the efforts of states to combat climate change." And this is the UN, I mean, a very respected body that has published on human rights and the environment and climate since 2009 but took the one point five degrees (1.5°) IPCC report as a new hook to actually make it very clear that climate change is a human right threat and it is such a threat already today. We're not looking into the future, and we're not dealing with a precautionary issue anymore.

We have the courts in the Netherlands that I will talk about later explicitly stating that climate change is a human rights issue. We also now have codes, for example the French, which recognizes standards of care of businesses looking at climate change and human rights in particular as well. So again I don't actually think that that is something that needs to be accepted anymore, I think not only in this room but throughout the world. It should be pretty clear that we're dealing with a human rights issue here. The question is how to make it tangible, how to actually work with it in court, all with respect to for

example my clients who are already facing all these problems in their agricultural undertakings, mostly applying law that wasn't made to deal with climate change.

So I want to talk about these fearful cases from Europe, Netherlands and Germany, as has already been introduced. I don't have to repeat it—three (3) of them I bring myself, or am part of the legal team bringing them. One is from Urgenda, a foundation in the Netherlands, whom most people here in the room know very well because they basically begun the first case of this kind.

They are very different in scope and target, and with respect to defendants as well. But they all enshrine one idea, that is, that climate science can be applied and hoped that you can attribute changes in the physical environment to climate change and that you can actually pinpoint to somebody who is responsible: be it the respondent, in this case, RWE, or a government not living up to its duties, constitutional or international.

So these all involve, to one extent or the other, human rights interpretations. So this is the first case which will probably be of most interest to this Commission—the case against RWE brought by my client, a Peruvian house owner who lives in the City of Huaraz. It is all about these glaciers that you see there and this laguna, the natural glacial lake which exists everywhere in the Andes and in many other places in the world. And there's a huge risk of a glacial outburst, flood, which will essentially kill many people and devastate the entire city of Huaraz.

This is the flood risk map and the little yellow arrow you see there is my client's house. So this is what we started off with. There was this person who was aware of climate change, who was a mountain guide himself, who sees the melting of the glaciers each day and he said well, what can I do?

So we proceeded to look. Does he have any avenue on the international level, on a human rights level maybe, even claiming against his own state? What is possibly effective? This is where we turned to, after some consideration, a legal basis and claim for the entire procedure that's been going on since 2015. It is essentially a nuisance provision that can be found in most codes all over the world. As set out here, if property is interfered with by means other than removal or retention of possession, the owner may require the disturber to remove the interference. So the owner is my client and the disturber is one of Europe's largest emitters, RWE.

So we're not talking about future effects and we're not talking about an injunction. We're talking about historic emissions. That needs to be very clear, which is of vital importance to my client and many other people around the world because what we're talking about here is already occurring damage

or risk due to climate change today. We're not talking about one point five degrees (1.5°) or two degrees (2°) scenarios. We're talking about risk or damage today. And that is the same for all of the cases that I have taken. That's sometimes very difficult to make people understand that while on the Paris level and on the—I don't know the term—diplomatic level, people keep struggling about one point five degrees (1.5°) or two degrees (2°). We're there where I'm in the middle of it. And you know this, you know much better than anybody that this is what would work. What we really have to grapple. There's this huge gap between regulation and the need to achieve climate protection. So this case isn't about injunctions or climate mitigation. It is actually about what you would probably call adaptation. It's about protection measures and the request is as I've put out here, to determine that the respondent RWE is liable, proportional to its level of impairment. So level the emission globally of one point four percent (1.4%) to cover the expenses to actually remedy the problem. So this is the kind of request that you put into the court papers. But what it's really about is let RWE pay in relation to its actual liability or responsibility for climate change protection measures. It's actually quite simple.

So the facts subject to procedural proof, I mean, apart from all of the legal issues that we had to deal with, applicability and jurisdiction of German courts and German law, we of course have to deal with the question: is this actually provable? Can you prove this in court? And many people have told me you will never be able to prove anything like it!

Yes, you can, and I'm convinced of it. Otherwise I would never have brought this case. And why do I think this? Because I have been dealing with climate science for many, many years and I have seen the development of climate science and I believe that using climate science and applying it to the law and to the way courts have to decide and are obliged to decide in each individual case to render justice—you can actually prove that it was climate change.

And I have tried to differentiate some sort of level of proof that you would have to actually come to in this case. And I will demonstrate this later on and you've already got the evidentiary questions posed by the court in this case, but essentially—is there a risk? Yes, you can use IPCC science or local science. What is the role of the trend with regard to the actual risk? Because, of course, there was always some kind of lake that might overflow.

But the risk has been augmented, increased immensely. Is there a human signal in the regional temperature trend? Can we prove this? Yes we can. How significant is it? Can we prove it? Yes we can. That is IPCC science. And it is now even stronger with each report coming out. You can see that there is higher evidence, higher probability rates assigned to these kinds of statements you've already heard or will hear more evidence on attribution science. But

I'm sure just from what you have heard from Sophia Marjanac from Client Earth and others, you will know about attribution science and the IPCC.

So then the last issue really is even if I can prove that it is climate change that is increasing the risk, what is RWE's share? So can I actually say, yes you've been part of this? Can I somehow make it tangible? And this is where we, like the petitioners, have used Rick Heede's work and you've already here heard from Rick Heede and to make it tangible—and I have to make that very clear—accepting that Rick Heede's work is not finite and it's not perfect, but in my view it doesn't have to be either because procedural rules in all jurisdictions around the world are actually made to deal with uncertainties and estimations. Because when you go to court to deal with a car accident do you have a scientific statement saying it was forty-nine point two percent (49.2%) your fault and sixty-two point seven percent (62.7%) yours? No, you do not. And that is what courts do every day. And they have to do it on climate change as well.

So this is what this is. What we've put forward and what happened was that the respondent in this case, RWE, discounted us on all accounts legal and factual. The only thing RWE did not discount as untrue was that there is anthropogenic climate change. Everything else they refuted and rather than putting forward their own data or compliance reports on emissions, they simply called into question all of our evidence. So if you are asking, to what extent I think that company is actually living up to its direct human rights duties? I would say I don't think that that has been applied yet in that respect because they're approaching this case from a purely civil law point of view. They're defending themselves from an action that could be anything about anything at all and that is only a threat to the business. So I have not seen that RWE has in any way shaped up or lived up to its own responsibility in this case, so far. Even if I have to say and stress explicitly, it has conducted a very fair trial and procedure with me on this particular case, I do not think that we can say on this case that RWE has actually enshrined its own responsibilities with regard to observing human rights.

So the case was lost initially in the first instance. This is that slide, the reasons were given as there is no legal concession. The "but-for-test" which lawyers know very well you know "this event had not, would not have happened but for your contribution" is not met. The risk would be there even without the contribution by RWE and also interestingly RWE does not significantly contribute to climate change.

So this is something that would be of interest to this Commission I think, because RWE interestingly also contributes to climate change in the area of point five percent (0.5%). It matters on what you look at—scope 1 or scope 2 emissions or also scope 3 emissions—and that is the same as the Netherlands

or Belgium. So we're talking of an entire country here. And that has consistently been the case ever since the foundation of the company until today. It is still the same very high amount of emissions coming out of their installations.

So we went to appeal and we won essentially. And I, and why do I say I won? I will come back to that in a minute. The case was heard and decided on every general legal issue by the High Court. The High Court is a very well respected civil law court in Germany, right below the last court of resort, the Federal Civil Court.

So this isn't some small district, insignificant court. It is a very well respected civil law court and what they said essentially was there is legal causation, partial responsibility is sufficient even if it's point five percent (0.5%). It is possible that RWE contributes to climate change and therefore also to the flood risk and generally, yes, there is responsibility of large emitters.

That in itself was for me, historic. Which is why I put historical in the slide, and so the court then of course had to order evidentiary phase to start because we have contended lots of facts and they were all refuted because obviously this is what civil procedures do: adversarial procedures do that. So we've now moved into the evidentiary phase, exactly what RWE wanted to prevent from the outset.

So we're now looking at experts being appointed and you have the evidentiary questions in Exhibit 4, the order, which has the questions at the end. So you will see how the court has divided these evidentiary questions and we're moving towards receiving evidence from independent experts. Not mine. Not RWE's, but the court has appointed them.

And I again point out that similar provisions to this paragraph 1004 is existing in many other jurisdictions. So this would be it for now with the RWE case.

Moving quickly now to the other slides.

We have brought in May 2018 in the EU courts an action called a "People's Climate case." I represent ten (10) families, mostly farming and tourism related businesses, family businesses against the legislature in the EU for unambitious climate targets. This whole case relies very much on human rights in the form here of the culture of fundamental rights, the EU Charter, which is in many areas very similar to what you will know as international human rights instruments. And we're relying on the right to education. We have children as part of these families claiming that they're being prevented from going to school, and that they are inflicted with health problems due to heat. We are using freedom of occupation, freedom of property, and all sorts

of other principles that are enshrined in EU treaty, so are much more EU law. And we're asking the court action—on the basis of these human rights infringement that are already occurring—to ask the legislature to come up with better climate targets that are doable.

The third case, which is the most recent one, is very similar but even closer to the problem because they are farming families that I represent. And they are asking the German government to do what they've said for eleven (11) years they would do—that is, the National 2020 target which is a reduction target that they're now no longer implementing. Interestingly also because there is a very high influx of opinions from carbon majors saying that you shouldn't act too hastily. So again the role that these companies play is questionable.

Possibly of interest to this Commission is the following, to show standing and to actually win this case. I have to show that the over emission brought about by not meeting this reduction target can by itself harm these individual families. So we're talking about one gigaton (1 Gt) that will be over emitted. So we're using the climate budget or the carbon budget idea that we heard about this morning, and what we're saying is: if you don't meet this target, there is a consequence and the consequence is an over emission of one gigaton (1 Gt), which is pretty much if you look at it from a global perspective. So again here we are saying you can show attribution. You can show a temperature response for this one gigaton (1 Gt), you can today do that. So in this case, again I have to rely on science, and we work with very well known climate scientists in these cases.

So the last slide is the Urgenda case. As it is not mine, I will just try and give a very short overview and really pay respects to the many people who made this possible because I think it's really a leading example internationally.

There are nine hundred (900) citizens and the Urgenda Foundation brought this case, the defendant is the Dutch government. The first instance of success came already in 2015, that is before even Paris; and the second instance the government appealed mainly on the basis of constitutional considerations and it lost. So this is the first time a court in the world has ordered the government to do climate protection. This is important I think because the government is legally accountable for not taking sufficient action to prevent harm but this also has to do of course with the government having to act and regulate businesses which takes us back to what the Commission has just proposed governments to do and to try and regulate businesses in the form that they will actually reduce their emissions as well.

Because when you fully look at it, a government doesn't really emit itself that much. It's you know, it's about allowing other people to emit. The way human rights were enshrined in this case is very interesting because in the court of

first instance and the court of second instance, the Courts made it very clear that climate change is a human rights issue. They didn't even debate it very much. There was no question about it and then what they proceeded to do was simply to use the human rights provisions to interpret a duty of care, duty to protect and thus in this particular matter, I would assume that you could use human rights and benchmarks in the same way to actually fulfill a human right with respect to regulating others. Which is not what they did here. They only set the target. Yes, so they're not deciding about which measures to take. So the outlook for me really and as you've now understood, my RWE case and all the other cases are still ongoing so is Urgenda because it is possible that the government will appeal to the Constitutional Court.

I believe that climate change litigation is increasing not just because the problem has become more tangible and more provable, but also because we have such a huge gap between what we need to do and what we're actually doing. And that is just something in the situation like this where this standard of protection is simply so low there is a very good reason to activate the court. So I believe that that will be increasingly the case. And if there is any value for the international community in this undertaking that you are doing here as a Commission, I think it will be to actually use the immense amount of knowledge and also scientific insights to enable such cases brought by real people with real problems.

Climate change and the infringement of human rights are being argued... The relationship between public international and national laws and human rights standards will be interesting to disentangle. This is where I come back to what I started off with the way and the question of whether and to what extent we can actually start arguing human rights directly in a vertical manner, as we're discussing here. And I would actually go so far as to say if we do not have strong enough governments to actually deliver the kind of level of protection that is needed, it might be that citizens simply have to try and work vertically in this manner. It will be interesting in many jurisdictions in the years to come.

The last bullet points here are: Real impacts mean real people; a regulatory response will be needed. This is what I would wish to come out. I would probably ask the Commission to make a recommendation to the Philippine government to think about statutory ways of making companies responsible for past emissions and also to suggest international instruments to make that tangible on an international level. Because I simply do not think that it is just for people like my client to take these cases against huge multinational companies, you know, the David-and-Goliath problem. You might think that I have fun doing it, but actually I would rather not. I would rather have proper regulation within democracies, within the rule of law that we can apply in the future to actually save all our children. To be honest.

So I'm very open to any kinds of questions you might have.

ATTY. MAYO-ANDA:

Thank you very much, Dr. Roda, for such an interesting, incisive and enlightening presentation. My first question would relate to your experience in the RWE case. Could you explain how the petitioners established the responsibility of the respondent company here? I think you're aware that in the Philippines we have sea level rise and other similar impacts.

Dr. Verheyen: Yes I would, I mean, the way we did it in the RWE case was to go step by step. We started with, as I said, with Rick Heede's work, simply relying on absolute emissions as the contribution. So we were equaling emissions with impacts, which of course is scientifically not entirely correct.

But as I said procedurally it is possible to rule only on that basis. Because when you look at it legally you only have to consider the contribution, the willful contribution of your respondent or defendant. And that simply is the emission that is coming out of installations.

We went a step forward, obviously because of the way the defendant argued that—and I have to share this because it's quite astonishing. RWE put forward in its written material essentially the following: "I cannot prove that there is an impact from RWE's emissions because all of RWE's emissions could have been taken up by sinks and the oceans." I mean the court in Hamm simply laughed that argument away and said "that is ridiculous because everybody could say that. That is simply not that. That does not work."

Obviously there is no legal theory to underpin this. I mean, I actually think there is but I believe that you can, when you add up all of the emission contributions, then proceed and work on the temperature response for each of these defendants. The temperature response science has evolved very much. It normally looks at temperature response globally so you will have seen these. I'm not sure whether you've seen these graphs done on historic responsibility of countries with the associated temperature response. So we took that science and applied it to the emission, absolute emission numbers of RWE.

Everything we did, I have to stress this again, was done on the basis of IPCC science. We only evolved or took other science when we did not have directly applicable IPCC science yet. And I think that's very important because in a court of law you will need to really make a statement as regards the IPCC science. There is no more authoritative statement on climate science than in the IPCC reports.

So in the end, when we took this step further and actually looked at temperature response, we ended up with a higher percentage of actual contribution to the problem than if we were working with pure emission data. We did have a discussion about provision of data and this was in one of the slides on the procedural proof. Obviously I don't actually know myself how many tons of coal RWE has actually burned over the years. That is in their databases—for RWE the data only applies from the sixties. So we will have missed a lot, I mean, honestly, millions of millions of tons that were emitted before.

But overall, on the basis of this reasoning, both on the absolute level of emissions and the temperature response, the court explicitly said that you can pinpoint the contribution of one single company to actual climate change on the ground. And as I said, climate science is evolving so fast I have now seen the first drafts of actual temperature response models for a regional temperature rise, rather than just global. And once we start doing that, the gaps close. In my view, there is no evidentiary gap to be understandable.

ATTY. MAYO ANDA:

Can I proceed, Commissioner? I am curious about the high court of Hamm's categories for collecting evidence. Perhaps you can share with us.

DR. VERHEYEN:

Yes, the civil law procedure in Germany is an adversarial procedure so you have to present your evidence and the other side refutes it. But if you refute and present on the same level, you substantiate it then the court is then free to select its own experts. We don't have a jury system so basically the court is meant to be as objective as possible, so it then proceeds to elect and task its own evidence givers. So this is the function of these questions that you will have seen. They are being posed to particular scientists.

For the first question on the risk, for example, the court has appointed a hydrologist and on the second set of questions on climate change and contribution, it will be a different set of scientists that will be appointed. The problem there of course being that such engagement of scientists actually is very costly which is why it would be much better and much more accessible to people who have a real problem like my client, if there was specific regulation that would take you beyond this kind of case-by-case proving.

ATTY. MAYO-ANDA:

Thank you.

DR. VERHEYEN:

You're welcome.

PANEL CHAIR CADIZ:

So the RWE case is now on appeal...

DR. VERHEYEN:

Yes, it's on appeal. But we're in the evidence phase. So it's actually as if we're on the first instance.

PANEL CHAIR CADIZ:

Yes, and have you already started presenting your evidence?

DR. VERHEYEN:

We have presented our evidence since starting the procedure itself, since 2015. We've been sending science statements back and forth with the defendant, and as I said in the first instance, the court ruled on a general legal level that we would never be able to actually finish the case, so it didn't even look at the evidence. So now this Court has looked at the evidence and deemed it good enough, so that it will actually now appoint its own expert to actually look at the regional issues and the problem of percentage of responsibility.

But if you ask me: have I presented sufficient evidence to actually win the case? Yes, I have. I don't perceive any gaps in my reasoning.

PANEL CHAIR CADIZ:

And the court already recognizes the science, solidly recognizes the science behind?

DR. VERHEYEN:

Well, it can only recognize it so much because what we have had so far is very much on the legal level so the discussion and the orders that we've received are on the legal. But the court has said that it is evident that any contribution in terms of emissions also contributes to climate change. So this kind of high-level evidence was already appreciated by the court, yes.

PANEL CHAIR CADIZ:

And RWE, in this case, did not present their own set of witnesses to dispute your scientific evidence?

DR. VERHEYEN:

That is actually a very interesting question. Through the procedure, RWE has been clearly advised by scientists but, unfortunately, they did not disclose which scientists' work, even though I asked many times. They are not legally obliged to do so. But what they did present was many scientific papers and opinions and collections of data which in their view refuted my allegations. So it's basically paper against paper. But the only IPCC scientists that have stood up and said yes this is correct are my witnesses who've been very straightforward in their reasoning. I've put forward statements by a glaciologist who's an IPCC lead author and also two (2) other climate scientists who are well respected.

PANEL CHAIR CADIZ:

The appellate court… is it still in the process of selecting the scientists who will inform it on the issue?

DR. VERHEYEN:

No, the first one has been appointed.
PANEL CHAIR CADIZ:

And that person has not yet submitted its findings?

DR. VERHEYEN:

No, the scientist has not submitted any findings yet.

PANEL CHAIR CADIZ:

And how long already has that person been appointed by the court?

DR. VERHEYEN:

Not very long, about a month.

PANEL CHAIR CADIZ:

All right, thank you very much, Dr. Verheyen.

DR. VERHEYEN:

You are very welcome.

DR. WALPOLE:

I would briefly, if it's appropriate, ask: Doctor, what sort of scientific evidence was provided by the company. How would you understand the articles presented etc. and the quality of that research?

DR. VERHEYEN:

We had a very high level of discussion. In the written procedure, RWE presented articles, for example, on the Albedo effect on glaciers, yeah, arguing that essentially, I couldn't prove that it was climate change on many different levels.

Articles on the influence of El Niño in the Andes... The interesting thing for me—I mean I'm not a climate scientist obviously—when you take a case like that, you have to try as much as you can to actually delve into the science yourself. Otherwise, you won't be able to present it... you also have to be sure that you present it in a way that is still understandable. That's the real challenge, and I mean for me, every time it's a challenge.

But I would qualify the kind of evidence that RWE put forward as deflecting the absolute obvious: and that is that each ton of carbon contributes to climate change. You know very well respected scientific authors and papers…

DR. WALPOLE:

But they're not in the sense comprehensive of the whole picture, if you, well…

DR. VERHEYEN:

That depends on... I mean, the picture in this case is two (2) glaciers receding and melting and a level of water in a glacial lake increasing and posing a risk. And, on the other hand, whether or not these glaciers have increasingly melted due to climate change. So if that's the whole picture, then yes it was very encompassing, the scientific exchange.

COMM. GOMEZ-DUMPIT:

Doctor, how are your clients now? How are they coping? I just want to know. Yes, at present.

DR. VERHEYEN:

Well, my clients are less worried now because they have now installed an early warning system at the Laguna up there, so at least he can be warned if the Laguna bursts. But that won't of course protect his property, not only that, you know, protect himself and his family. He has not been subject to pressure or anything like that if that is what you are hinting.

There was a bit of a misunderstanding in the community sometime, whether he was actually asking for money... which he's not. This, the whole claim, is constructed in such a way that he only receives any money if it goes directly to the protection measures. There is no damage claim involved, and apart from that he is coping very well. He's actually just received a highly regarded prize in Germany for his exceptional endeavor to make transparent the plight of the normal man who's already impacted by climate change. And so I think right now he's got some energy again. This is a very tiring exercise for all of my clients including the families that I represent from Kenya. Yeah, it is not something that you do lightly. It's something that bears on you. It's something that unsettles you.

COMM. GOMEZ-DUMPIT:

Yes, thank you. Just a thought, what about the Peruvian government? What has been their engagement? What has been their role?

DR. VERHEYEN:

The Peruvian government or the Congress just conducted a hearing on the situation of the City of Huaraz and the Laguna where my client appeared, as well as experts from the local authorities, regional authorities, and the authority charged with regulating the glaciers or assessing the glaciers. And I think there is some degree of discussion now about actually implementing the protection project that we are asking.

COMM. GOMEZ-DUMPIT:

Thank you, thank you very much.

PANEL CHAIR CADIZ:

Thank you very much, Dr. Verheyen, for spending time with us to educate us on this issue.

If there are no more questions, I would like to present the next witness now. He may have to leave by 1:00 p.m. So may we request Dr. Jaap Spier to come to the resource stand?

All right, thank you very much, Dr. Spier. We apologize for the slight delay. We thought that you would be available at 1 o'clock. Apparently, we were mistaken. So you may proceed directly to your testimony.
Could you briefly introduce yourself, what you do, and what you intend to share with the Panel Inquiry today?

DR. JAAP SPIER:

Thank you, Mr. Chairman. Thank you also for the invitation. But first of all, a point of clarification. You are now also talking about a testimony. I was invited for a dialogue and my observations have to be considered as part of a dialogue. I'm not going to testify.

PANEL CHAIR CADIZ:

Alright, alright, Dr. Spier. Well taken.

DR. SPIER:

Surely, to make the point explicitly. Well, to state today the final part of my career, I worked for the Supreme Court for nineteen (19) years before my retirement. After my retirement, I have two (2) honorary chair: one at the University of Amsterdam and one at University of Stellenbosch in South Africa. I mostly devote my time to climate change topics, everything pro bono. What a group of people and I have tried to achieve is to map legal obligation of the main players. Does that suffice for an introduction?

PANEL CHAIR CADIZ:

Sure. Yes, you may now proceed with your presentation.

DR. SPIER:

Thank you very much. Indeed. As per our exchange of emails, I would like to talk about "The Principles on Climate Change Obligations of Enterprises."

If you are aware of the Oslo principles, there is a group that was active in drafting these principles—Justice Brian Preston, a retired judge of the European court of human rights, Thomas Pogge, Elisabeth Steiner and Prof. Tiambao Qin, James Silk, Philip Sutherland, myself as reporter, and my associate reporter, Daniel Witte.

And why did we start working on the Oslo and the enterprise principles? Well in our group there is a gap in the debate. The debate is often very useful but also rather abstract and very few people seem to care about concrete obligations of the major players, states, enterprises and investors. The Oslo principle try to discern the legal obligations of states. We unfortunately could not reach agreement on the obligations of enterprises and that's why—partly new, partly old—we started working on that in much more detail, than what we had in mind when we were drafting the Oslo principles.

The enterprises principles are in the meantime endorsed by many distinguished lawyers and many of them justices from supreme courts from

all continents and one of them is your former Supreme Court Justice, Hilario Davide, Jr.

The principles, in our view, is most important, teaching us how we can keep global warming below two degrees centigrade (2°C). They are not about compensation, that's perhaps an important topic but we simply don't address that topic.

Mitigation, in our view, is by far the most important challenging topic, and it is increasingly important to do so, and that's also why your Commission does such an important job. I count just the merits of that kind of research. I'm a lawyer, I'm not a climate change scientist, but according to recent research we have to reckon with sea level rise at the rate of five to eight (5-8) meters, not in our lifetime. But still we have to reckon with thirty (36) hurricanes, and the latest news that the oceans are soaking up more heat than estimated, that means that emissions must be reduced by twenty-five (25%) more than previously estimated.

Your Human Rights Commission understandably asked me specifically to talk about human rights law. Our group believes that it will even be better to focus on as many legal sources as possible. That means international law, although that is not directly applicable to enterprises, also environmental law, to liability law, a series of code of conduct and governance guidelines, listing requirements, and also case law and academic writings.

And as to human rights law, you are probably aware of a very recent judgment issued by the Court of Appeal of the Hague on the Urgenda case. The court upheld an earlier judgment that the state is required to reduce its emissions by twenty-five percent (25%).

Unlike the Court of First Instance, the Court of Appeal largely based the judgment on human rights. First, Article 2 of the European Convention on human rights and natural life, and secondly Article 8 on family life. My colleagues and I know of course that there is a debate on the question whether human rights are of much value in relation to enterprises. We believe human right law is important also in relation to enterprises.

First, we realize of course that not all regions have specific human rights legislation or conventions. But according to the prevailing view, human rights law vests obligations to states but that's not to say that they are irrelevant in relation to enterprises. We believe they still are. Why? Well at the very least human rights law can and could and should allow you the use of your core domestic law and file a petition based on domestic law. And secondly, an increasing number of code of governance and guidelines and all the sources

promotes that enterprises have to comply with human rights law, that's often endorsed by many enterprises.

Well if that is the case then they can't be surprised that others draw the conclusion that apparently enterprises have to comply. That is also what they are saying themselves. For more details I refer to the commentary at the end of my presentation, I will give you a hard copy of both the Oslo principle and the commentaries.

Environmental law also plays an important role. Why? Well there are interesting developments, for example, the Global Pact for the Environment developed by a group chaired by Laurent Fabius and the Declaration on Environmental Rule of Law issued by many senior judges, and they clearly link environmental law with climate change. Well that means that it matters and it also seems to follow these documents and all the documents that they also believe that enterprises have obligations in the face of climate change.

All principles are based on our group's interpretation of the law. Of course, there are laws, these are our interpretation of the law. So many distinguished lawyers have endorsed our principles, show at least that we did not terribly do bad, but again, we may be mistaken. But we did not only look at as many sources as possible of the law, we also looked at how the law will likely develop. Why? Well how does law work? You know that, in some states, mitigation will start and then after a couple of years courts will issue judgments. And for clerical purposes on paper, not on ideas perhaps but for clerical purposes, those ideas will be applied to effect, hence it makes sense to take into account how the law will likely develop. Well then as to the concrete obligations, I have to explain the Oslo Principles. In a minute I will explain why.

The Oslo Principles say that we first have to discern the carbon level of a specific year based on the precautionary principle, and on the idea that global warming has to be kept below two degrees (2°). We can come to that at the final part of my presentation. The resulting figure have to be divided by the number of people living in our planet. Hence we have the permissible emission allowance per person. If you multiply that with the number of inhabitants over a specific country, you have the figure that is the acceptable level of emissions of that country. Some countries, mostly developing countries emit less, all those developed countries emit more. In our view, our country has to reduce its emissions within a year as we explain in commentary to the other principle, to the permissible grant.

Well we have discussed this at some length—how to deal with the reduction obligation of the enterprise. And there is no obvious answer to that question, we realized that. It would've been possible to submit a formula for the

manufacturers to take into account. Many factors have to be taken into account. Well perhaps it should have been seen from a strictly legal angle, the better solution, but it would be completely pointless. Such formula can be applied. Nobody has a clue how to balance the various factors. So that's also not a brilliant idea and we couldn't think of anything better than an enterprise. At least as a rule of thumb, an enterprise has to reduce its emissions at the same rate as the country in which it is based. That means that's Bayer, Germany has to reduce its emissions at the same rate as Germany. And General Motors US the same rate as the U.S. According to the Oslo principles, countries pledged to reduce its emissions by a certain percentage. Such a scenario makes sense for enterprises in those countries to reduce their emissions at the same rate.

Then, for your purpose, an important topic, something we have really discussed at length—how to attribute emissions. In our view you have to count the emissions caused by a specific enterprise. Unless the emission is caused by the products or services, put on the market by the enterprise. In relation to big oil, we don't agree that big oil is the one and only problem. We don't think that that's right. There are many reasons for the fumes.

First, oil as a very essential fuel would mean that all others would argue: we don't have obligations. No, big oil has and they have to solve the problem. Not the slightest chance that they can solve the problem. Secondly, as a matter of fact our world still needs oil and gas. That's really regrettable. And the sooner we can get rid of it the better, no doubt about that. But for the time being, we need it and it would be a bit strange to tell them: well you are no longer allowed to provide what we need because we are unwilling to curb our emissions because we need it.

Also we doubt there would be a sound legal basis for the submission that the emission caused by products and services put on the market by an enterprise have to be attributed to the manufacturer. You could argue that way but we don't think that that is a very sound argument. Also the calculation would be very difficult. How to calculate the emissions further down the carbon supply chain? Last but not the least, if big oil will have reduction obligations, enforcement will be difficult, to say the very least. How to enforce the obligation of say, Gascorp. That won't be easy.

Back to the idea that as rule of thumb enterprises have to align with the reduction obligation of the country of residence. We realize that you can't lump all enterprises together. We realize that some already did a lot, others didn't do anything at all. There's a lot in between. We know that it may be fair to distinguish between those enterprises. With a lot of you, if you couldn't think of anything better, again you have to listen to countries. And then again

you have to make a difference between countries complying with all obligations to countries that don't.

Obviously countries that comply with all obligations have more resolve than countries that don't comply with all the obligations. If a country does comply with their own reduction obligations and for clarity's sake that means more than their fair share in the Paris Agreement—because they are usually insufficient—then it has the right to strike a different stance and be more lenient to some and be more demanding with other places as every country does not comply. If a country does not comply, it has the same possibility, but all other places together should at least reduce their emissions at the rate necessary. And in delegating the key, who will take into account Principle 3.1?

Then we have a principle about what we have labelled global enterprises. It doesn't make much sense to lump together domestic enterprise in a developing country and an enterprise which is a subsidiary of a multinational based in, say, the Netherlands, or Germany, or the United States. We have developed a formula and that formula is not perfect. We are very open about that in the commentary. In borderline cases always have to use common sense. But as a rule of thumb, we believe that subsidiaries belonging to a group of enterprises with their seat in a country that emits more than the permissible quantum has to reduce its emissions below a permissible limit, at the rate of the world at large.

That means that the subsidiary of, say, General Motors in Nigeria emits at the rate of the world at large. Nigeria is clearly a country that emits less than permissible so if you would apply our formula, the enterprise, the subsidiary, won't have any leadership obligation because we believe it was fair.

In line with the Oslo principles we believe that it is perfectly reasonable that enterprises reduce their emissions if that can be achieved with no or very little cost. And all of that should speak for itself. For example that means that if an enterprise can choose between an energy supplier that provides energy based on fossil fuel and an energy based on renewables, and price is the same, then they have to opt for the supplier that provides energy based on renewable energy.

We also believe it is fair to require a payback for an enterprise that incurs cost. If for example it will be possible to install solar equipment, by doing so, in a couple of years the investment will pay back. It seems perfectly reasonable to require such an investment.

Of course there are again difficult cases. For example an enterprise has to make a choice between acquisition or installing solar equipment. Well it's not

hard at all to answer that question. Another example, if a subsidiary of a multinational which has to reduce its emissions at the rate of the world at large could reduce its emissions further by investment that will pay back, but would have the choice between high wages and such an investment. Then we don't dare to say that the enterprise is not allowed to pay the higher wages… more important cases but the principle as such makes sense.

We also believe that enterprises should be free from activities or putting products and services on the market that emits an excessive amount of greenhouse gases. Well you can debate at length what excessive means and probably as time progresses the yardstick would become stricter and stricter.

One of the solutions is you can look at competitors and if they emit significantly less well that's at least a reason to believe that the emissions of a significantly higher emitting product, service or activity is excessive. And then the enterprise has a choice. Either to phase out the product, service, or activities or to take countervailing measures. That doesn't mean that there's no longer a market of some products and services. It has always been the case. Asbestos is a perfect example.

In our view, an enterprise has to consider the emissions of his supplies. Well to consider means more than taking the books, so much is clear. For the time being, we think it will avoidably be big. And my personal guess is that over time we can and have to become more demanding. In our view, according to the commentary, the mere fact that a product by a specific provider, by a specific supplier is cheaper than the product of his competitor is not necessarily a justification.

We have a series of principles for scenarios and enterprise that comply. Happy to go into detail but for the sake of time I could imagine that you prefer me to refer to the commentary about the Principles 12 and 13 and 16. These exceptions are strict, they are deliberately strict. We are very keen to avoid all kinds of excuses that'd be way too easy and it will be very easy for enterprises to think of reasons why they can't comply and well some of those reasons may make sense, very understandable that they make a point. But if we would go along with that kind of argument we can't solve the problem. So we really have to be strict.

And then a brain teaser, a minimal causation. In our view, minimal causation is not preferred. It doesn't speak for itself, we know that. Some academics strike a parallel with asbestos. Firstly, I strongly believe that the parallel doesn't make sense. Why not? Well if you compare the manufacturers or employers in asbestos area with the contribution of the single enterprise to the global problem, well, I can't avoid saying that the contribution in relation to the global climate change program is negligible in relation to the causation

caused by individual enterprises, in this case, the asbestos. Still we strongly believe minimal causation is not defense.

And perhaps surprisingly, our view, is endorsed by the US Supreme Court in Massachusetts versus EPA [Environmental Protection Agency]. It is endorsed recently through the Urgenda judgment, which is about the obligation of the state and not the obligation of the enterprise. And that's different, I realize that, but the argument, to put it very briefly, can be true that the law has nothing to offer in relation to climate change. And as my own addition that would mean the law is only mitigated and that is very unsatisfactory if you don't think that that is true.

And then that's controversial, we know that and we don't hide it. In our view enterprises and states can't argue well. But if you look at domestic and international law, we are not under obligation to reduce our emissions at a higher rate. We are saying, and that is slightly off in stating our case, we're saying that if our principles are more demanding than what domestic and international law requires, enterprises have to comply with the principles. That of course is too general, that is not entirely true. What we mean is enterprises have to reduce their emission at the rate necessary. And that almost certainly more than the domestic and international law apparently requires, at least more than the Paris Agreement. If countries would comply with the Paris Agreement, we will end up somewhere between two point seven degrees (2.7°) and three point six degrees (3.6°), hence much more must be done. Since enterprise cannot visibly argue with our view, that's all we have to do.

And then we have a series of principles about disclosures. When I started working on this project, my personal view was disclosure matters of course, but that's not awfully important. And the more I think and the more I read about it, the more I believe disclosure obligations are very important. Why? Well they will bring business leaders to their senses. If they have to figure out the consequences of climate change for their enterprises, they will understand that they must do much more than most of them currently do. And it makes it much easier also for investors to assess whether enterprises do a good job and comply with their obligations.

And happy to go into detail of the disclosure obligation, but up to you whether you like it or whether you want me to refer to Principle 18-23 disclosure, and 24 impact assessment.

Irrespective of your choice, I promise to come back to the idea that enterprises and states have to reduce their emissions to avoid passing the two degrees (2°) threshold.

Of course we would strongly prefer if global emissions would be kept at below one point five degrees (1.5°). No doubt about that. We doubt whether there is already a strong legal basis for that. That legal basis is not the Paris Agreement. The Paris Agreement says well below two degrees (2°), we know that, but what does well below mean? Is it one point eight (1.8), one point nine (1.9), one point seven (1.7)? We don't know that. And if you can't stick to a concrete figure, you can't develop a formula that is workable. And last but not least—that is too courageous. I know it, we know it.

If you would have developed principles that will be perceived as crazy or awfully ambitious nobody would listen. It will be ignored altogether. And well if you have to make a choice between, in our guess, be ignored or be overly courageous our choice would be somewhere... hopefully it will work and will be accepted.

And last but not least, unless you would like me to go into detail about this more. Some people have also argued, well these principles are nice but they are not ambitious enough, the path to two degrees (2°). I beg to differ, we beg to differ. If states would comply with the Oslo principles, if enterprises would comply with the reduction principles, we can keep global warming to two degrees (2°).

Well they may not do it but we can't help that. Exactly because compliance will solve the problem, we don't think that what we have submitted is insufficiently courageous. The path I accept, the point again, it should be by one point five degrees (1.5°).
Would you like me to go into detail about disclosures or would you prefer to read it yourself? It's actually quite clear.

PANEL CHAIR CADIZ:

We can read the details ourselves.

DR. SPIER:

Okay. And I have for you both books and the commentaries.

COMM. GOMEZ-DUMPIT:

Thank you.

PANEL CHAIR CADIZ:

Yes, thank you, Dr. Spier. But we might have questions for you.

Okay, just a slight question… You talked of enterprise obligations in the same level as state obligations under the Oslo Principles and the Paris Agreement?

DR. SPIER:

We firmly believe that both states and enterprises have discernable legal obligations to reduce the emissions and a lot more. It's not ideal, we admit it, but if you read the commentary, we are very open about points where you can debate whether we are right or wrong.

In our view, the best—not perfect, but the best solution—is to align the primary reduction obligations of enterprises versus those of the state in which they are active. And well again it would have been nicer and in a sense preferable to map a series of factors that have to be taken into account. Based on balancing those factors, you have to figure out what this specific enterprise has to do would have been possible. That would work.

PANEL CHAIR CADIZ:

How about in a scenario where the state does not impose any obligation regarding, for example, the Paris Agreement? Does that free all the enterprises within that state to also not align with certain obligations?

DR. SPIER:

No, definitely—thank you for the question—definitely not. First there are exceptions no doubt but most states prefer that they should do. Even if enterprises would reduce their emissions in accordance to their State's commitment, which we refer to as their "stakes," that would not be enough. Nor do we think that you have to look at the Oslo principles and the Paris principles, and you will have to develop a new formula that can secure that emissions are going to be reduced at a rate necessary. And that's not what Paris Agreement does.

We are not criticizing the Paris Agreement please don't get me wrong. I'm a realist and I very, very much admire the people who drafted and endorsed Paris Agreement. It was the very best that they could achieve those days. I

don't blame them but it is not enough. And in fact they could do a better job. Now well I don't blame them, but we really have to solve the problem.

And sticking to something that is very insufficient can't be labelled as well that's enough. Is that an answer to your question?

PANEL CHAIR CADIZ:

Thank you very much, Dr. Spier. Will the Counsel for the Petitioners have questions to our resource person?

You've raised a lot of interesting points that has never been raised in the previous public hearing, so I hope you can make yourself available either by Skype or email. We would be interested in pursuing certain points that you raised.

DR. SPIER:

Of course. Please do and thank you so much for the opportunity.

PANEL CHAIR CADIZ:

Thank you for coming here, too.

Alright, I think it's already time for our lunch break. It's way past 1 o'clock, and we will be back by 1:30? Alright, so we'll have a long late lunch after 1:30.

All right. Thank you very much again, Dr. Spier.

DR. SPIER:

Thank you.

[Lunch break]

MR. BEN SCHACHTER:

Thank you, Commissioner, and apologies for the time limit issue. We are sorry that we weren't able to get to sort it out a bit better.

My name is Ben Schachter. I am the Focal Point on Climate Change of the Office of the UN High Commissioner for Human Rights. I am joined today by my colleague Lena Wendland. She is the Chief of the Office of the High Commissioner on Human Rights, Economic and Social Issues Section and our most senior expert on business and human rights.

Allow me to thank you for the invitation to participate in the National Inquiry on Climate Change by the Commission on Human Rights of the Philippines.

Before I continue can I just ask if you are hearing me all right?

PANEL CHAIR CADIZ:

Yes, we can hear you well enough. You can proceed.

MR. SCHACHTER:

Okay, great, thank you. Today, I am going to talk about climate change and its impact on the effective enjoyment of human rights, and human rights obligations of States that can be derived from there.

Lena will discuss the human rights responsibilities of businesses in the context of the United Nations Guiding Principles on Business and Human Rights.

I'm going to begin by highlighting the mini resolutions of the Human Rights Council on climate change. These resolutions have been adopted by the Human Rights Council on a nearly annual basis in 2008. In the first such resolution, Resolution 7 / 23, the Council expressed concern that climate change poses an immediate and far-reaching threats to people in communities around the world, and requested the OHCHR to prepare a study on the relationship between climate change and human rights.

In the second resolution, 7 / 24 in 2009, the Council noticed that climate change have, in fact, a range of implications of direct and indirect effects on the enjoyment of human rights that will be felt most acutely by those segments of the population who were already in a vulnerable situation.

I'm going to submit a larger statement in writing but I won't be submitting all the resolutions to you, as there have been a number of them since then.

Starting in 2014 those resolutions have also taken on a development asking the Office of the High Commissioner for Human Rights to focus on specific thematic areas. So the Resolution 26 and 27 emphasized the need for all state to enhance international dialogue and cooperation to address the adverse impacts of climate change on the enjoyment of human rights including the rights developments and cost for dialogue, capacity-building, mobilization of financial resources, technology transfer, and other forms of cooperation. The office put together a panel discussion focusing on food security and the rights of developments in the context of climate change. Resolution 29 / 15 asked the office to look at the issue of climate change impacts on the enjoyment of the right to health, Resolution 32 / 33 did the same thing for climate change and its impact on the rights of the child, Resolution 35 / 20 looked at climate change and human mobility, including effective means of implementation for climate change mitigation and adaptation.

And the most recent resolution of the Human Rights Council on climate change and human rights, number 38 / 4 which was adopted in July of this year, highlights that climate change directly and indirectly impact on the effective enjoyment of a broad range of human rights including, *inter alia*, the right to life, the right to adequate food, the right to enjoyment of the highest attainable standard of physical and mental health, the right to adequate housing, the right to self-determination, the right to safe drinking water and sanitation, the right to work, and the right to development, and called upon the office to organize a panel discussion on gender responsive climate action for the full and effective enjoyment of women's rights.

The council has also regularly addressed the issue of the impact of climate change on human rights in the context of its work on human rights in the environment, for example resolution 1611, 1910, 25, 21, and 28 11. These resolutions make it clear that climate change is a human rights issue. And in the course of carrying out the mandated reports, panels and activities on this subject, the OHCHR has clearly articulated both the impacts of climate change on the effective enjoyment of human rights and the human rights obligations of states in the context of climate change.

So I'm going to tell you a bit about how climate change actually affects our rights. The adverse effects of climate change including the increasing frequency of extreme weather events, and natural disasters, rising sea levels of flood, sea waves, drought, desertification, water shortages and the spread of tropical and vector-borne diseases are all well documented in reports of the Intergovernmental Panel on Climate Change, and can't be denied. These phenomena directly and indirectly threaten the full and effective enjoyment

of a range of human rights aforementioned. The negative impacts of climate change are disproportionately borne by persons and communities already in disadvantaged situations. Going to geography, poverty, gender, age, disability, cultural ethnic background, among others, have dastardly contributed to the serious impacts on human lives. I'd like to add that you just consider just one right: the human right to life. According to the Universal Declaration of Human Rights, everyone has the right to life, liberty and security of person. The International Covenant on Civil and Political Rights reiterates that every human being has the inherent right to life. All states have committed to respect, protect, promote and fulfill the right to life. This entails, at the very least, that states should take effective measures against foreseeable and preventable loss of life. According to the fifth assessment report of the IPCC, greater risk of injury, disease and death will be due to increased adverse effects of climate change. The World Health Organization has estimated that between 2030 and 2050 climate change is expected to cause approximately two hundred fifty thousand (250,000) additional deaths per year from malnutrition, malaria, diarrhea and heat stress alone.

The most recent IPCC report on one point five degrees (1.5°) makes it clear that the impacts of climate change will increase substantially according to the magnitude of planetary warming experience. In other words, our climate actions now are important to the future including the success of the 2030 agenda for sustainable development.

It is for this reason that the Human Rights Committee in its recent general comment on the right to life stated that environmental degradation, climate change and unsustainable development constitute some of the most pressing and serious threats to the ability of present and future generations to enjoy the right to life. The obligation to respect and to ensure the right to life, and in particular life with dignity, rests on measures taken by state parties to preserve the environment and protected against harm pollution and climate change caused by public and private actors. Increasingly, the right to life has become the subject of climate litigation. In the Urgenda case, a Dutch appellate court found inadequate state action to mitigate climate change with respect to the right to life under Article 2 of the European Convention on Human Rights.

In the pending case of Friends of the Irish Environments versus Ireland, the UN Special Rapporteur on Human Rights and the Environment has issued a statement on the human rights obligations related to climate change with a particular focus on the right to life. It is clear from these examples that the impacts of climate change on the effective enjoyment of the human right to life are real and that in some cases they are just disabled.

Indeed, the charter of the UN Universal Declaration of Human Rights, the International Covenant on Economic Social and Cultural Rights, and the

Declaration on the Right to Development all make clear that the human rights obligations of states require both individual action and international cooperation. Under these instruments, states acting individually and collectively are obligated to mobilize and allocate the maximum available resources for the progressive realization of economic social and cultural rights, as well as for the advancement of civil and political rights and the rights to development. Failure to adopt adequate measures to prevent ongoing and foreseeable human rights harms caused by climate change breaches this obligations. State must therefore take measures to mitigate climate change and prevent its negative human rights impacts, to ensure that all persons particularly those in vulnerable situations, have adequate capacity to adapt to change in climactic conditions and to take all necessary regulatory and policy measures in order to mitigate the contribution of business actors, private and public, to climate change and ensure respect for human rights.

OHCHR key messages on human rights and climate change further highlight the essential human rights obligations and responsibilities of states and other duty bearers and their implications for climate change-related agreements, policies and actions in order to foster policy coherence and help ensure that climate change mitigation and adaptation efforts are adequate, sufficiently ambitious and non-discriminatory. It is now clearer than ever that these human rights obligations should inform climate action including the implementation of the Paris Agreement in their respective human rights obligations when taking climate action. Now having introduced the human rights impacts of climate change and some of the resulting human rights obligations of states, I would like to turn to my colleague to discuss the climate-related responsibilities of businesses under the UN Guiding Principles on Business and Human Rights. I will be happy to submit these statements, the longer version in writing along with relevant sources. And I have to apologize that I have to leave this hearing early in order to be in another meeting.

PANEL CHAIR CADIZ:

Thank you very much, Ben. We would eagerly await your submission of your statement which will be provisionally marked as Exhibit "PRP-22." Now we can proceed to listening to Lena.

MS. LENA WENDLAND:

Thank you very much, Commissioner Cadiz and distinguished members of the Commission on Human Rights.

It's an honor for me to appear before the Inquiry Panel on Climate Change. I regret that it's not possible for me to join the Inquiry Panel in person and also that I will have to leave immediately after my presentation. I have been invited to share information and I quote "on business and human rights and the obligations of the private sector concerning climate change."

As an expert on business and human rights, specifically on the interpretation of the UN Guiding Principles on Business and Human Rights, I will outline what I consider the most relevant provisions of the UN Guiding Principles to the Commission's Inquiry. As a disclaimer, I should stress that I will frame my remarks in general terms and will not pronounce them the responsibility or leader liability of specific companies or groups of companies.

So getting into the substance of my presentation and as you will know the UN Guiding Principles constitute an authoritative global framework on business and human rights. Following their unanimous endorsement by the UN Human Rights Council in 2011. The guiding principles comprise three pillars: the state duty to protect, the court's responsibility to respect, and access to remedy.

The three pillars are mutually reinforcing: setting out a framework of distinct but complementary duties and responsibilities of states and business enterprises respectively, while also maintaining the focus on the rights of those whose human rights have been adversely affected by business activities to an effective remedy.

While the Commission's Inquiry concerns the responsibilities of the so-called carbon majors for the adverse impact on climate change and human rights, I would recommend that the Commission considers the full spectrum of the UN Guiding Principles and not just focus on pillar 2.

The first pillar, pillar 1: The state duty to protect the first foundational principle of this pillar reads, "States must," and I emphasize "must," protect against human rights abuse within their territory and third parties, including companies. This requires taking appropriate steps to prevent, investigate, punish, and redress such abuse through effective policies, legislation, regulations, and adjudication. The "must" in this paragraph in this UN Guiding Principle 1 is one of the only two (2) "musts" in the whole document. And it reflects that the duty of the states to protect against human rights and to inspire third parties is founded on existing international legal obligations that all states have under the various human rights treaties that they have ratified. And so this is not a voluntary provision. This is in fact the provision that restates existing legal obligations of states.

The operational principles elaborate on the general state regulatory and policy functions that should be deployed to prevent harm and introduces the notion of a smart mix of measures—national and international, mandatory and voluntary—to foster business respect for human rights.

When contemplating its recommendations, the Commission, in my view, should consider the full range of such smart mix of measures "that a state can take, alone or in collaboration with others to prevent and mitigate human rights impacts of climate change linked to the activity."

Pillar 1 also considers what a state can do to prevent or mitigate harm when there is a close state-business nexus either because the business is owned or controlled by the state. Or where the state conducts commercial transactions with business enterprises, for example, in their procurement activities. The Commission can consider making recommendations to the government about integrating provision on mitigation of climate change in, or may change its own relationship for example with regard to government procurement, including but not limited to situations where there is a business relationship with any one of the companies that are the particular focus of this Inquiry.

Some elements of Pillar 2 are considered relevant to the present Inquiry:

- First, the corporate responsibility to respect human rights means to avoid infringing on human rights, and address human rights impacts with which a business enterprise is involved;
- Second, the corporate responsibility to respect human rights applies to all companies irrespective of size, sector, operational context, ownership or structure;
- Third, the responsibility to respect refers to all internationally recognized human rights understood as minimum as so expressed in the international bill of human rights as well as the principle concerning fundamental rights set out in the ILOs Declaration of Fundamental Principles and Rights of Work;
- Fourth, the responsibility to respect requires that business enterprises: a) avoid causing or contributing to adverse human rights impacts through their own activities and address such impacts where they occur, or b) seek to prevent or mitigate adverse human rights impacts that are directly linked to the operations, products and services by their business relationships even where they may not have contributed to those impacts;
- Fifth, in order to meet their responsibilities to respect human rights, business enterprises should, and I quote, put in quotation mark "know and show" coming directly from the commentary of the UN Guiding Principles, they should know and show that they respect human rights. This means that business enterprises should undertake human rights

due diligence to identify, prevent, mitigate and account for how they address their impacts on human lives;
- Sixth, the responsibility of business enterprises to respect human rights is distinct from issues of legal liability and enforcement which remain defined largely by national law provisions in relevant jurisdictions; and
- Seventh, where a business enterprise contributes or may contribute to an adverse human rights impact it should take the necessary steps to seize or prevent its contribution and use its leverage to mitigate any remaining impact to the greatest extent possible.

Where there is no contribution but the impact is nevertheless directly linked to its operations, products or services, the enterprise should use leverage to seek, prevent, or mitigate the impact.

Where a business enterprise has identified that it has caused harm or contributed to harm, it should cooperate in remediation through legitimate processes.

And there's obviously a lot to unpack in all of these points and I won't have the time to do so in detail. So I just want to highlight the general points that I've made, taken from Pillar 2. I would like to just highlight again a few of them.

Pillar 2 of the UN Guiding Principles applies to all companies including the one singled out for attention by the present Inquiry. The company is expected to use its leverage to prevent or mitigate impact to human rights to the greatest extent possible. Again, that's where the company has contributed to harm.

Where company is linked to the harm through its operations, products or services the expected action is to seek to prevent and mitigate the harm. So, a slightly different standard.

The responsibility to remediate harm in Guiding Principles 22 is limited to situations where it doesn't directly identify the company's contribution to harm. It should be emphasized again that attribution of responsibility—and thus responsibility for remediation in the UN Guiding Principles—is distinct from issues of legal liability or enforcement, which as I already mentioned remain defined largely by national law provisions in relevant jurisdictions.

I will now turn my remarks to Pillar 3 of the Guiding Principles: Access to Remedy. Pillar 3 provides: "States must," and this is the second "must" in the UN Guiding Principles, again denoting it's clear link to existing international legal standards, "States must take appropriate steps to ensure through judicial, administrative legislative or other appropriate means, that those affected by business-related human rights abuse have access to an effective remedy."

While the UN Guiding Principles emphasize that effective judicial mechanisms are at the core of ensuring access to remedy, the Guiding Principles recognizes the role of both effective state-based and non-state-based grievance mechanisms as potential avenues for remedy.

There's a multi-year project mandated by the Human Rights Council aimed at enhancing the accountability and remedy of all categories of mechanisms covered by Pillar 3. I would like to invite the Commission to consider the guidance produced by OHCHR as part of the accountability and remedy project when developing its recommendations from this Inquiry in the area of remedy.

The second phase of the project covers the role played by state-based non-judicial mechanisms, such as national human rights institutions, in providing remedy may be of particular interest to the Inquiry.

In the limited time, let me just briefly touch upon a few points that I think is relevant to the Inquiry, and this concern still access to energy. The first is situations where an enterprise does not accept that it has caused or contributed to harm. So in these situations, where an enterprise contests an allegation that it has caused or contributed to an adverse impact, it follows from Guiding Principle 22 that it is not immediately expected to provide for remediation itself unless and until it is obliged to do so, for instance by Court decision, or the conclusion of another binding grievance mechanism.

However, the corporate responsibility to respect implies a responsibility to cooperate in good faith with legitimate processes designed to settle grievances either through judicial or non-judicial means even when the enterprise can contest the allegations made against it.

The final point I want to touch upon is remedying in the context of contribution which I think is where much of the Commission's attention is focused, and the notion about differentiated share of remediation where more than one company has contributed to an adverse impact, the question arises whether or how to allocate differentiated responsibility to remediate.

The principle remains that all companies that have contributed should provide or cooperate in remediation through legitimate processes. This carries an expectation that a business enterprise contributing to human rights abuse should provide remediation appropriate to its share in the responsibility of harm. And that obviously raises a number of issues. It is not possible to stipulate in general terms, pro rata responsibilities of involved companies in different scenarios. The exact allocation of different companies' share of the harm will depend entirely on the specific situation and should be determined. In this instance, through the remediation process which should involve a

grievance mechanism. If the implicated companies cannot reach agreement on their respective share of responsibility for the harm, it may prove necessary either to involve a neutral third party or a mediator, will turn to adjudication.

So this is the end of my prepared remarks. I thank you again for this opportunity, for the invitation to participate, and I do regret that time prohibits me from engaging in Q&A and further exchanges. But I hope the contribution would be of assistance in your work, I thank you.

PANEL CHAIR CADIZ:

Thank you very much, Lena. We will not take much more of your time, because we do recognize that you have to leave already.

We really appreciate you... (sharing) with us today your knowledge on this. But please... we might get in touch with you again, and we would (like to) request you to send us, by email, your presentation today, which we can then mark as one of our exhibits.

CLERK OF THE INQUIRY:

For the record, Commissioner, we will be marking Lena's presentation as "PRP-23"—corresponding to the number of pages of the PowerPoint presentation. Have a good day. Thank you.

PANEL CHAIR CADIZ:

So, Dr. Surminski, please introduce yourself and tell us what you do, your area of expertise, and then you can proceed with your presentation already.

DR. SWENJA SURMINSKI:

Thank you. Many thanks for the invitation. I am honored to share some insights in this important Inquiry. And may I just say that the Philippines is close to my heart. I've been there three (3) times. I'm going there again in December and I've met many people who have dedicated their working careers to dealing with climate risk in the Philippines. Very humbling and very impressive.

Yeah. So this topic is also close to my heart. I'm speaking here as a researcher. I work at the Grantham Research Institute here at the LSE and I lead our work

on adaptation research. So I look very much at the impact site and on climate change and climate risk. I am also a member of the Loss and Damage Network that was set up to actually bring together practitioners and scientists who work on climate impacts, particularly in the context of the UNFCCC work around loss and damage, the Warsaw International Mechanism. And we've been trying to bring together academics and practitioners to foster the dialogue and provide new insights. This is sort of an emerging area that needs further dialogue and further research, and engagement of practitioners is necessary.

So I was asked to talk about adaptation, loss and damage and also the use of financial instruments. I'm very happy to focus on that. You know this notion around financial instruments is an area that's very close to my heart. I've worked a lot on insurance instruments and I've also followed the debate and the discourse that has emerged around loss and damage, and the use of financial instruments starting with the proposal of Oasis about using insurance as a way to address compensation. So I've been closely engaged in those discussions and I will briefly touch on that. But it's also important to say that maybe there has been a little bit too much focus on insurance because I think it has clear limitations.

I think we also need to focus on innovation and actually be a bit more creative in coming up with new instruments that can help address loss and damage. So that's the starting point. To begin with and to talk about perspectives, you know how this whole topic of climate change... and human rights where this is embedded. I'm not an expert on human rights but I understand climate risk and climate impacts and you know the awesome damage. And I think it's important to reflect on how we usually tend to look at this topic. So you know, you have these two pillars—one is the mitigation side dealing with the causes, the other side is adaptation—so you know what we can do to prepare and manage the impacts.

But then I argue there's a third pillar and that's looking at handling the impacts that are already being experienced and that will continue to be experienced. And how do we handle that at a global level either at the UNFCCC through global agreements, or how is this also handled nationally, across communities. And often, there's also this climate justice element. It is important to see how these three pillars actually interact and work because I think it's really important when you start talking about adaptation to recognize that there are clear limits to adaptation. And adaptation is important and you know there are huge deficits and capacity gaps particularly in many developing countries.

The notion that we can just adapt ourselves out of this problem, this is wrong. I think that's important to recognize. It underlines the importance of mitigation so all hands on deck to address the cause of the problem. I know that the focus here is on carbon emitters in terms of companies.

I think in full honesty what we also need to reflect on is our lifestyles. And you know I'm sitting here, I'm flying around, I've got four (4) children, I'm part of the problem as much as those who produce emissions. I think it really helps to understand and put this a little bit into context. So a lot of the work that's happening around adaptation is then put into the context of sustainable development. I think that while it is really important to understand the climate element, and how climate change is driving this in general terms and in terms of development, you know it's not only the climate causing problems. We also continue to create risk and we create them on a daily basis. We create them through wrong development policies, wrong infrastructure investments. And this is basically happening all around the world.

So while we're focused here on the climate dimension, I think it's really important to also see this as part of an effort that looks at other aspects—how we invest, where we invest, where we live, how we live. And this was also something that was brought home by the IPCC, this perspective. When you look at climate risk you know obviously there is the hazard which is the climate dimension. But then it's also bad exposure and vulnerability. And you know in my work that's really important to see these three (3) things together. The problem is obviously with climate change, that the hazard is changing, but at the same time exposure and vulnerability are also moving often in the wrong direction and it just creates a big, big challenge. And I think that's a really important thing to keep in mind particularly when we're talking about addressing this and also compensating for this. Because it's not as simple as just saying well the climate is changing and hence you know we have all these terrible consequences of it. There is a dimension to it. But there are also other things at work, which I think are important to recognize.

And this leads to this notion of integrated climate risk management. And I think the discussion that has emerged over the last decade or so has really started to capture this idea that there are different approaches to managing climate change. And usually it's seen under adaptation. So these are the things that can be done to help deal with the risks, and I won't go into detail...

These are all very important. There are thresholds and also the question of who can adapt, and who has actually the ability and the capacity? Obviously then it's a question of who needs to pay for that and who needs to support those who don't have the capacity and the ability to adapt to reduce the vulnerability? So I think this is a useful starting point.

But there's always the notion when you say climate risk management, saying oh yes, just the thing that we need to get better at it. And then everybody will manage their risk and it's all going to be great you know. The risks are so

huge and significant that while that is important, that can't be the whole response or the whole solution to it.

Just to reiterate this point I made initially, there is a lot of focus on trying to rein in and reduce emissions and sort of keep the rest up to a certain limit. But at the same time, we just carry on creating risks. You know, through as I said having a very imbalanced approach to development. This is really important for us to keep in mind.

And when you look at how funds are currently being spent, particularly around responses to climate events and disasters, we are usually very much on a post-event response and quite understandably if something terrible happens, like in the Philippines. Typhoons, you so obviously know, you then need to address that, and you need to respond and fund that. But we know that is not just on purely economic terms but also on humanitarian terms. It would be so much better, if we become more resilient by spending more money upfront and invest in risk reduction and prevention. And that's a really important point. To me it is part of the loss and damage discussion because that's the way to also keep loss and damage, we try to prevent and reduce loss and damages.

About innovative financial solutions, for example, the Zurich Flood Resilience Alliance brings together some private sector companies and focus on investment solutions. I'm just bringing that up as an example.

I was asked to look at the role of financial instruments. I always say it's a little bit of the pet project of you know, I think understandably, of people at a global level because financial instruments are obviously very attractive for many reasons. The scale of the risks are so large that we need different kinds of financial instruments. We also have quite useful experience with financial instruments.

So the question is, can we just apply that and can we also use this to shift financial flows around, and help us deal not just with the climate impact but also with reducing mitigation and investing into renewables? And so financial instruments are clearly part of the solution. And particularly under the Warsaw International Mechanisms and the Executive Committee on Loss and Damage, there has been a lot of focus on financial instruments. This diagram is taken from one of their publications. And, yeah, there is scope to use some of these instruments to come up with new ways of addressing climate impacts and losses. But it's really important to identify the right instrument and to also understand which instrument is effective. What are the potential downsides? And then ultimately also what sort of logic is behind those? I mean a lot of these instruments work quite well in the context of industry, private sector, or governments in highly industrialized countries. Can they also be applied to

countries where particular communities are at risk? And you know I think that is a very valid question to see how some of these instruments might play a part in that. And then the next question, can they also be used to address loss and damage? Can we call it the compensation site of these three (3) pillars? I will close by leaving you with some thoughts on this, because there is a notion that, we think it's very much on insurance, under these loss of damage discussions, it's a different term to compensation. And I think that's probably a correct observation. But the question is are there other proper mechanisms—and insurance could be one—but there could be other mechanisms that could help facilitate flows of finance, what we might call compensation agreements. And I will close with some thoughts on that.

So, yeah, insurance has received a lot of attention in this discussion and I think there is a lot to be said about why it is an attractive tool. There is certainly a place for it, but it has clear limitations, particularly when we look at extreme events versus slow onset events. I mean most of the experience with financial instruments has been on the extreme event side. And they are mechanism to help transfer funds. But under loss and damage, what you really need to do is to look at helping to reduce risk. So this resilient element needs to be in there. This is what we call curative role to helping to compensate, to actually have this degree of fairness in allocating funds, according to those who need it, from those who kind of caused the problems, to those who are actually now impacted by it.

So we've done an investigation and we looked at how insurance mechanisms might do these things – the prevention role, the risk reduction role, and then the compensation side. And you know it's there. It is feasible but not in the way that currency insurance is used, and it comes back to what I said earlier who's actually able to take action to reduce risks? And you are also paying the premium for these insurance instruments, the way that a lot of these insurance mechanisms are set up. It's those at-risk schools that pay the premium, and then it helps them. It's a tool that helps them deal with the finances. Whether that is satisfactory to those who are calling for a proper loss and damage mechanisms... I don't think that that will satisfy all of that, so I think we need to look at innovative approaches. And with those sort of brief comments, I will leave. But I would be very happy to pick up on any questions you have and also flag that. There is one in my opinion, the first-ever book on loss and damage that was produced by the Loss and Damage Network that has just been published. It's going to be open access and it includes a lot of different perspectives: the legal, the philosophical side, science side, and some of the people that contributed. I will make sure that that will get distributed to them, to the Commission.

PANEL CHAIR CADIZ:

Thank you, thank you very much, Dr. Surminski.

COMM. GOMEZ-DUMPIT:

I am just curious. You mentioned insurance as one mechanism. But are there other financial instruments that you can elaborate on, I saw in your diagram, I think, catastrophe bonds, maybe you could elaborate on that further?

DR. SURMINSKI:

Catastrophe bonds are currently used... it's basically a hedging tool, so it's basic. It's used in the financial markets, government, to also hedge the risk. It's focused on making funds available in the case of an event. And that's an important aspect. What those bonds don't do, they don't really look at the underlying causes. They don't look at risk, at risk reduction aspects. So there are currently discussions to change and to come up with innovative funds. One example is a resilience bond that you can actually link to this idea of reducing risk in investing, let's say, in better infrastructure, that makes a city more resilient. You can link that to a catastrophe bond. So that's one example. Yeah I mean there are other discussions happening. Contingency finance is often about providing funds to help deal with a disaster. And I think that's important. But we also need to make sure that, they really also provide funds, to make sure that we do not carry on creating new ones.

COMM. GOMEZ-DUMPIT:

Thank you.

PANEL CHAIR CADIZ:

Counsels, do you have any questions to the witness?

ATTY. MAYO-ANDA:

You have mentioned about compensation agreements. Can you elaborate on that?

DR. SURMINSKI:

Well, I know that's the term when you go to UNFCCC meetings... You usually not talk about compensation as such because it's not recognized in the official language. But I think if we're all honest it's been the driving force behind the discussions around loss and damages.

But what do we do to help those who are experiencing negative impacts of climate change? Who then, because of their very little historic emissions might consider, that they haven't caused the problem? But they are negatively impacted?

So I think this idea of compensation is making sure that there is some form of financial recognition. I think you can spin it very wide. I'm not a legal expert and I know that, that term also creates an expectation that there will be money flowing. I think to some extent adaptation and adaptation finance was intended or also designed to address that. So a lot of development projects used adaptation to create adaptive capacity. And this is a recognition that there's a duty to do that.

But then the question is compensation. Can we then take this more specifically into looking at single events, at attribution? That's a new territory also for these instruments, for financial instruments.

ATTY. MAYO-ANDA:

Do you think, from your experience, is there a growing interest in this discussion? With respect particularly to companies, is there an openness, a willingness to deal with these things?

DR. SURMINSKI:

Well, it's difficult to give a general answer to that. I think observing this, it's not a new topic. It's been pushed for a long time by AOSIS (Alliance of Small Island States) from low-lying island states who also have made sure that it stays on the public agenda. I think it was often considered as a sort of niche aspect when you look into the global negotiations, for example.

I think that has changed. We have the Warsaw International Mechanism. It's more recognized that people pay more attention, this let you look at what's being discussed. In my mind, we've been very good at discussing it, but not so good in actually coming up with new solutions. And do I think there's more interest in this? Yes, certainly. There is growing awareness now, that we

recognize that we are not on a very good, well no, things are not looking very rosy, when it comes to the climate projections and trends, and there is now also growing recognition that, there might be some liability questions and litigation arising from that. So I think this is getting the attention, yeah.

ATTY. MAYO-ANDA:

Thank you. Commissioner?

PANEL CHAIR CADIZ:

I got one more question... You said earlier that you've been to our country at least three (3) times, and you've worked with some of our agencies in adaptation programs? Did you see any policy gaps? Did you see any absence of programs or deficiency in programs in our country's dealing with the issue of climate change and its adverse impacts on human rights?

DR. SURMINSKI:

I was very impressed with the sheer number of policies and plans that exists on this topic—be that on the disaster risk side or the climate adaptation side. Part of my work was actually to establish what exists and that was difficult enough because there are lots of different projects at the city level and some municipalities. And you know there are some really interesting examples were actually planning and risk understanding has now been taken on board. For infrastructure planning, this has also become legal requirements for municipalities.

The sort of gaps might arise when it's unclear who's responsible. So you have the national government being in charge of some of these policies and some of the funds that flow from that. Then you have the regional, municipal and then other local associations. There is a feeling that sometimes there is some bit of confusion about who is driving some of this, who can access some of the funds. Yeah, I mean that's probably not surprising. But this was an area that I noticed in particular when talking to some of the cities. The capacity to actually understand the ownership, of who is in charge, that seemed to be quite challenging.

PANEL CHAIR CADIZ:

All right, thank you very much, Doctor. We have no further questions and, again, we appreciate your coming here to share with us your expertise. Thank you.

I just want to ask our clerk... are there documents that have been submitted in relation to the testimony?

CLERK OF THE INQUIRY:

For the record, we have "Exhibit PRP-24..." corresponding to the number of pages.

PANEL CHAIR CADIZ:

Thank you again.

Shall we have one more witness? We had a very short lunch. Maybe we can take a 15-minute break before we proceed to the last witness. Is that all right?

Okay, thank you.

[Break]

PANEL CHAIR CADIZ:

We can resume our last session already. Our resource person, Ms. Linda Siegele, will share her expertise on climate change law and policy. Ms. Siegele, can you briefly introduce yourself and what you would be sharing with us?

MS. LINDA SIEGELE:

Thank you, Commissioners. Thank you for inviting me here. And for this long day, of putting up with me as the last presenter. I'm very happy to be here. I'm a lawyer by training. I teach at the university level on climate law and policy. But I also provide legal and policy advice to a number of developing countries in the international climate change regime, in particular, on adaptation, and loss and damage to the adverse effects of climate change.

I've been doing this for nearly thirteen (13) years now. So I've seen the law, the international law in this area grow considerably in the last thirteen (13) years.

So what I'd like to do if it's not too legalistic, is I'd like to go through some of the provisions of the UNFCCC and the Paris Agreement, as they relate to adaptation and loss and damage. We have heard Dr. Surminski speak a little bit about it. She drilled down a little bit deeper.

I will be taking a more legal perspective on both of those two (2) issues.

What I'd also like to do is try and map across some of the human rights issues and elements that we spoke of today, and find them or identify where they might be found in these two (2) international legal agreements that you have: the UNFCCC and the Paris Agreement. A lot of what we've been hearing, I believe, has come from a human rights perspective and it's not as clear from the climate change perspective that human rights is well incorporated, as I believe many of our experts would hope.

So what I will try to do is show you where I believe human rights issues can be found in these legal agreements. So that's an extra additional step of my presentation today. So let's get started. My objective in coming here today is to identify where adaptation and loss and damage to the adverse effects of climate change are addressed under the UN Framework Convention on Climate Change and the Paris Agreement. I would like to try and find a human rights nexus inside the provisions of these two (2) agreements and take a look at the institutions and stakeholders involved in ongoing work on these two (2) strands under these agreements and in identifying stakeholders, attempt to identify vulnerable communities but also business interests.

I'm a lawyer and I like words, but I won't belabor you with reading all the way through this, but I wanted to point out to you, in the UNFCCC we see mention of adaptation in a number of areas.

First of all I'd like to say that the UNFCCC does not mention human rights at all. So it's really focused on addressing climate change and its impacts. In the preamble to the UNFCCC, the parties have recalled the no harm principle which is a critical principle in the petition before you. Article 2 which sets out the objective of the Climate Change Convention actually uses natural adaptation of ecosystems, food security, and sustainable development as measures for how well parties are meeting the objective of the Convention itself, which is to stabilize greenhouse concentrations in the atmosphere at a level that would prevent dangerous human interference with the climate system.

There is no definition of adaptation in the UNFCCC but there is a definition of what adverse effects of climate change are and that is one of the critical pieces of the petition itself and so I think this definition is important. Adverse effects of climate change mean changes in the physical environment or biota resulting from climate change which have significant deleterious effects on the composition and resilience or productivity of natural and managed ecosystems, or on the operation of socio-economic systems, or on human health and welfare. I believe certainly that last piece of the definition starts to bring in the human rights aspects of the adverse effects of climate change.

We heard a lot about guiding principles and in various different scenarios today. The UNFCCC has its own set of principles and a number of the principles that I believe are relevant, to considering the adverse effects of climate change. But also the potential human rights links are those—the specific needs and special circumstances of developing country parties—especially those that are particularly vulnerable to the adverse effects of climate change should be given full consideration. I believe this really speaks to a number of the vulnerable groups that were mentioned in the Petition before the Commission.

And where there are threats of irreversible damage, the lack of scientific certainty should not be used as a reason to postpone taking action. This is an articulation of the precautionary principle which is also a principle that is outlined and set out in the Petition in front of the Commission.

In addition, parties have a right to promote sustainable development, and sustainable development is certainly a key aspect of the rights that the Petitioners are asking to be protected. And finally, under commitments—and these are the obligations of parties—all parties must cooperate in preparing for adaptation to the impacts of climate change. This is an obligation among states and they've agreed to that obligation. And this includes climate change considerations into the social, economic, and environmental policies of countries as well as promoting wide participation and raising public awareness related to climate change. That is an obligation that all parties have.

Developed country parties must provide financial support to developing country parties to help them meet the costs associated with meeting these commitments, including those ones mentioned above, and there are also provisions in the commitment category to provide finance, technology transfer, and potentially insurance solutions to developing country parties that have special needs and considerations associated with the adverse effects of climate change.

So that gives you a bit of a snapshot of where adaptation, and loss and damage is—a newer issue that's coming out of the Paris Agreement. I'll talk about that shortly where adaptation sits in the UN Framework Convention on Climate Change and the potential links to human rights issues, and certainly principles that are articulated in the petition before you.

I'll shift now, again don't be alarmed by the amount of text and how small it is. I will attempt to summarize here. But if this document is something you want to refer to later I wanted to be fairly comprehensive. So we're looking at the Paris Agreement now. And in the Paris Agreement we actually do have a separate article on adaptation, and a separate article on loss and damage.

So you can see the evolution of the notion of these issues in law and as priorities for the country's developing a global response to climate change and so we have a far greater articulation of these issues in the Paris Agreement and a broader set of obligations in terms of addressing them.

The Paris Agreement has a number of important "preambular" paragraphs of which I'm sure many of you are familiar. Again it starts to unpack some of the issues that the Framework Convention set out in its original objective. It recognizes specific needs and special circumstances of developing country parties, especially those that are particularly vulnerable to the adverse effects of climate change. And surely those countries that are vulnerable are those countries which have vulnerable populations. Many examples of vulnerable populations were set out in the Petition before you.

The Paris Agreement preamble emphasizes the intrinsic relationship between climate change and sustainable development and the eradication of poverty. So it draws a link between addressing climate change and addressing sustainable development needs and poverty needs. It recognizes food security as a fundamental priority. Again that's coming directly from the Convention and its objective. It notes the importance of ensuring the integrity of all ecosystems and it acknowledges that parties should respect, promote, and consider their human rights obligations when taking action to address climate change. This is a very important provision, even if it is in the preamble of the Paris Agreement. It sets a context for party's action to address climate change. It must be consistent with their human rights obligations. And this is an important difference between the Framework Convention and the Paris Agreement.

On Paris Agreement, Article 2, which sets out the purpose of the Agreement, one of the purposes is to strengthen the global response to the threat of climate change. Certainly for the countries I support limiting global average temperature to an increase of one point five degrees Centigrade (1.5°C), which

is critical. We heard we've had some debate about two degrees (2°) and one point five degrees (1.5°) today.

For the countries that support one point five degrees (1.5°), the goal of this one degree (1°) and one point five degrees (1.5°) limit will significantly reduce the risks and impacts of climate change. We heard about a little bit more about risks and how to address them in the previous presentation. Increasing the ability to adapt to the adverse effects of climate change and foster climate resilience is another purpose of the Paris Agreement.

The Paris Agreement Article 7 is the one that addresses adaptation. It creates a global goal on adaptation. It creates a mechanism for measuring what and how close parties are to reaching that goal. And it also recognizes that adaptation is a country-driven approach and it should take into consideration vulnerable groups, communities, and ecosystems and draw upon the best available science. And certainly we heard from Dr. Jaap Spier today that the best available science in the climate change process comes from the IPCC but also the adaptation and approaches to address adaptation should take into consideration traditional knowledge of indigenous peoples and local knowledge systems which I know is important to you, certainly to the petitioners in front of you.

Then finally we have Paris Agreement Article 8, which is the loss and damage paragraph. It recognizes the importance of averting, minimizing, and addressing loss and damage, and our previous presenter gave us a little bit more detail on how that should be done. It asks parties to understand, to enhance their understanding on how to act and support action on loss and damage. And it identifies a number of areas where this understanding needs to be enhanced, including events that may involve irreversible and permanent loss and damage, non-economic losses that you can't measure through market systems, and resilience of communities' livelihoods and ecosystems.

I think it is particularly relevant to this Petition finally and we talked a little bit about the compensation issue. I'm not really talking much about decisions made under these two (2) agreements, but in this case, I would like to point out a provision of the decision taken in Paris to adopt the Paris Agreement itself. And I'll read this provision partly: "Parties agreed that Article 8 of the Agreement, the loss and damage article, does not involve or provide a basis for any liability or compensation."

So in essence it appears, based on this provision that, this discussion around liability and compensation has been taken off the table in terms of approaching loss and damage under the Paris Agreement. However, it's a decision that don't legally create additional obligations for parties. It's a decision that represents what parties agree on at the time. But it is possible to change a

decision. So the fact that this liability and compensation provision is in a decision, reduces its level in terms of legally binding nests under international law. Also the terms liability and compensation were not discussed in any level of detail when the Paris Agreement was adopted. Therefore, it's not exactly clear to whom these terms apply whether it's to state parties or private entities etc.

So while this seems like a fairly challenging limitation, two (2) approaches to addressing loss and damage under the Paris Agreement, it shouldn't preclude others from developing international legal principles around liability and compensation for the adverse effects of climate change. And in fact, seven (7) small developing island states, in ratifying the Paris Agreement made declarations around this provision which read as follows: that the acceptance of the Paris Agreement and its application shall in no way constitute a renunciation of any rights under international law concerning state responsibility for the adverse effects of climate change and that no provision in the Paris Agreement can be interpreted as derogating from principles of general international law. Therefore, those declarative statements from parties, I think, set this provision on loss and damage and liability and compensation, in perspective.

What I'd like to do is just go over a few of the institutional arrangements that have been set up under the Convention process in the Paris Agreement for addressing the adverse effects of climate change and in looking at these institutional arrangements, try and draw out who some of the stakeholders are. Not all stakeholders in the convened climate change process are state parties. There are stakeholders that are certainly non-state parties, including the private sector, civil society and institutions.
The Adaptation Committee was established in 2010 well before the Paris Agreement had been envisioned to promote the implementation of health enhanced action on adaptation in a coherent manner. Some of the current work that's being done on adaptation by the Adaptation Committee is strengthening engagement of relevant institutions, organizations, frameworks, networks, and centers outside the UNFCCC process. In the work plan of the Adaptation Committee, one of their key objectives is to address adaptation by drawing on the expertise of outside institutions, organizations, and individuals. The Adaptation Committee also provides guidance on ways to enhance support, including finance, technology, and capacity-building, and promotes the exchange of information particularly as it relates to the most vulnerable. We heard Dr. Surminski talk about the Warsaw International Mechanism and it's Executive Committee for Loss and Damage. The Warsaw International Mechanism was established under the Convention, but provision in the Paris Agreement says that the governing body of the Paris Agreement will also have the authority to guide the work of the Warsaw International Mechanism. So this mechanism spans both the Convention and Paris Agreement processes.

There are three (3) functions of the Warsaw International Mechanism: enhancing knowledge on comprehensive risk management. Again we heard what that means in some detail, strengthening dialogue amongst relevant stakeholders, and enhancing action and support, including finance for loss and damage. The Executive Committee has a five (5)-year rolling work plan. It looks at building long-term resilience of countries, vulnerable populations and communities, therefore it's relevant to a number of the stakeholders in the petition.

And there is a body that was created called the Fiji Clearinghouse for risk transfer which includes an interactive database of information that allows experts outside the Convention, the area to provide information on loss and damage to parties. There was a Taskforce on Displacement set up under the Executive Committee in 2016. And it has finished its first tranche of work and will be recommending to the conference of the parties in December at the international climate change conference, a number of recommendations on how to address displacement, that of migration or general human mobility issues caused by the adverse effects of climate change. And finally the Executive Committee also works on cooperating and facilitating on areas such as slow onset events and non-economic losses.

This is my final slide. What I'd like to do is to try and give a bit of a prognosis or a future read on where we go, where we're going with adaptation in the Paris Agreement. And primarily adaptation and loss and damage in the international climate change regime.

As you know the Paris Agreement came into force before parties had an opportunity to set the rules for how the Paris Agreement should be implemented. That rule-setting process is due to end at the end of this year at the Conference of the Parties in Poland in December.

And some of the expected adaptation and loss and damage related outcomes are guidelines on preparing an adaptation communication that can be posted to an international registry. So raising the profile of adaptation, including allowing parties themselves just to express their priority needs and implementation and support needs on adaptation. And post it to an international registry.

There has been some work on facilitating the mobilization of support for adaptation, and loss and damage has been included in a number of areas in the Paris Agreement architecture, including bi-annual reporting on action and support and periodic stocktaking of implementation of the Paris Agreement.

Thank you.

The Executive Committee to the Warsaw International Mechanism will be recommending ways of addressing climate related displacement. Based on the recommendations of the Task Force on Displacement, there will be a paper that's coming out in June of next year on financing for loss and damage which will form one of the inputs into a review of the Warsaw International Mechanism on loss and damage at the end of next year. This review amongst other things is an opportunity to look at how the Paris Agreement may enhance the work on loss and damage in the Convention and Paris Agreement process.

Finally I'd like to raise the issue of the IPCC special report on ono point five [degrees] (1.5°). I do believe that, this is a groundbreaking report and that it has the potential for really changing the game in terms of how climate change impacts are addressed in particular for those who are most vulnerable to them.

There will be some work to do to recognize the messages from the IPCC report and bring them into the climate process. Some of these messages I believe need to be brought into the climate process to really push forward the international work on addressing the adverse effects of climate change, that the limits to adaptation will have already been reached by the time the one point five [degrees] (1.5°) limit is reached. And at two degrees (2°), there is a much higher chance of irreversible losses. And those irreversible losses will be occurring in vulnerable developing countries. That's a really critical message

Another important message is that holding warming to one point five degrees centigrade (1.5°C) is feasible and it is likely to have considerable sustainable development benefits. What stands in the way is the lack of real commitment to ambitious action for many governments and non-state actors, and that government commitments are far from sufficient and will not achieve the Paris Agreement warming limit of one point five [degrees] (1.5°). It also sets a roadmap for how to reach the one degree (1°) point, how to remain within the one point five degrees (1.5°) limit, that is, to switch urgently from fossil fuels to renewables, decarbonize the electricity sector by mid-century, to halve global carbon emissions in the next (ten) 10 years, that's by 2030, and to phase out use of coal completely by 2050.

That, too, is my parting shot for all of you today. Climate change and the impacts that vulnerable countries are experiencing now and will experience in the future, I think, have really been set out very clearly in this latest IPCC report.

I'd be happy to answer any questions, and thank you for your time.

PANEL CHAIR CADIZ:

Thank you very much, Ms. Siegele. Dr. Walpole will ask questions.

DR. WALPOLE:

Thank you very much for this OP on what's happening. I know you're talking a great deal about loss and damages, but I'm wondering what your thought might be in terms of how we can help or engage IPCC to recognize more directly human rights, the present lack of it there? Would presenting to them... how would you see that as a value?

MS. SIEGELE:

I do believe that the IPCC does take socio-economic impacts and cultural impacts et cetera into account when it assesses the science on climate change. But I think what we have to be realistic about is that the IPCC has a mandate. And its mandate is to assess the state of science on climate or climate related issues. Therefore, it can be fairly restrictive and, like I said, I believe one of the benefits of this special report on one point five degrees Celsius (1.5°C) is that there is a broad consideration of not only the physical impacts of climate change but also the socio-economic, including economic aspects of the impacts of climate change.

I think in terms of approaches to human rights... again we have to be honest about the fact that the climate change regime really is looking at its objective of trying to stabilize green gas emissions. It's clear that that has to be done within a time frame, that we do have dangerous impacts, which are human rights impacts. And that we have time to adapt. It's looking more and more like it's going to be a very challenging objective to meet, but I think we have to be realistic about what the IPCC can consider given its mandate.

PANEL CHAIR CADIZ:

Thank you very much. Petitioners' Counsels, do you have questions for the witness?

ATTY. MAYO-ANDA:

Thank you, Ms. Siegele. You mentioned that commitments of governments are not sufficient and not enough. Do you see that this international legal

framework would be sufficient to be able to address the grievances of local communities affected by climate change? Specifically we were thinking of ways by which communities affected by climate change can recover costs?

MS. SIEGELE:

Yeah, the agreements are state-to-state agreements. The obligations and commitments that states take on and I believe this is the role for international human rights law because states have obligations to their citizens to defend their human rights. And I believe that is the point that links, between state obligations under the international climate regime, the Convention and the Paris Agreement and in international human rights and the defense of human rights.

There are certainly under the adaptation strand of work and the loss and damage strand of work under the Convention, there is consideration of impacts on local communities and vulnerable populations. And I think a couple of examples are certainly this Task Force on Displacement, which really does look at the impacts on vulnerable populations facing climate change impacts.

As far as some kind of remuneration—finance and financing action—on addressing the impacts of climate change, in particular, potentially irreversible losses is a challenge right now in the climate change process. It's a challenge that developing countries are calling for additional financing and additional requirements and I believe that, that is the route towards addressing some of the issues that local communities are facing in terms of adverse impacts.

ATTY. PAUDAC:

Just an additional question, given your expertise and your extensive research about this topic, have you come across possible models or laws or policies that could be adopted domestically that would help communities address their grievances? Have you seen those models or laws?

MS. SIEGELE:

I haven't. I'm not that familiar with any grievance mechanisms. The models or the legislation plans policies that I'm familiar with, that I believe are fairly progressive, are ones that combine climate change adaptation and disaster risk management considerations into a unified policy. The process by which those joint plans are put together, brings together different government sectors and

agencies and a set of expertise around how to address disasters at the local community level. And I'm thinking of these types of laws and policies, in quite small island countries where there is very little distance between the government and local communities. But these policies don't include a grievance mechanism as far as I'm aware.

PANEL CHAIR CADIZ:

We have no further questions for you, Ms. Siegele. Thank you very much again for accepting our request to come here to share your expertise with us. It's been a long day, a really long day. We shall adjourn and resume tomorrow at 9 o'clock. Okay?

Oh, I am sorry, but, before we formally adjourn, our Clerk, of course, will read into the records the marking of exhibits.

CLERK OF THE INQUIRY:

So for the record, Commissioner. We will be marking the PowerPoint presentation of Ms. Siegele as "PRP..." to "PRP-25"—number of pages consisting of the PowerPoint presentation will be submitted to us.

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MS. ANNALISA SAVARESI:

Good morning, everyone. I'm here to open today's session of the hearings of Inquiry by the Philippines' Human Rights Commission. I am honored to be here. My name is Annalisa Savaresi, and I am lecturing Environmental Law at the University of Stirling, Scotland. I've followed closely the work of the Commission and provided excellent advice in this context. Yesterday, in the first set of hearings, we heard the experts and the resource persons invited by the Commission. Today we will be hearing the experts and resource persons invited by the petitioners. The hearings would conclude today with this session. But I'm hoping that both of you who are based in London will join us tomorrow evening for there will be a public debate on the Inquiry where Commissioner Cadiz will be present. The details on how to attend may be found on the website of the Grantham Institute. Now without further ado, I leave the floor to the Commission for today's important work. Thank you very much.

PANEL CHAIR CADIZ:

Thank you very much, Annalisa. Without further ado, we can start with our session.

May we have the formal entry of appearance of the counsels?

ATTY. MAYO-ANDA:

Respectfully appearing, Commissioners, Grizelda Mayo-Anda, legal representative for the Petitioners.

ATTY. PAUDAC:

Good morning, Commissioners. Respectfully appearing Hasminah D. Paudac, legal representative for the Petitioners.

PANEL CHAIR CADIZ:

Thank you very much, Counsels of the Petitioners. Before we listen to your witnesses, are there counsels here representing any other party who might want to enter their appearances or be recognized by the Panel in this court… in this room today, sorry.

There being none, Counsels, you may now begin presenting your witnesses.

ATTY. PAUDAC:

Good Morning, Commissioners. For today, we will start off with our first resource person, Ms. Marielle Trixie J. Bacason.

Ms. Bacason is a Filipino research nurse who's currently working in London after experiencing super typhoon Yolanda or internationally known as Haiyan. She is here today to share her experience as an overseas Filipino worker and a youth who experienced the wrath of Super Typhoon Yolanda, or Haiyan, that struck Tacloban City on November 8, 2013, and how it impacted her and her family's basic human rights and changed her life as a survivor.

Commissioners, before we proceed, Ms. Bacason submitted to us a document entitled Statement of Miss Marielle Trixie Bacason dated October 22, 2018,

consisting of seven (7) pages, which was pre-marked in Manila as "NNNNNNN" to "NNNNNNN-6" and her signature was pre-marked as "NNNNNNN-6-A." Ms. Marielle, we will be asking the clerk of the Commission for the confirmation.

PANEL CHAIR CADIZ:

Could you confirm with the Commission the pre-marking as manifested?

CLERK OF THE INQUIRY:

For the record, the documents mentioned by her counsel have been pre-marked.

PANEL CHAIR CADIZ:

Alright. Thank you very much. No other documents?

ATTY. PAUDAC:

None, Commissioner.

PANEL CHAIR CADIZ:

Alright, please begin your examination.

MS. MARIELLE TRIXIE BACASON:

Good morning, everyone. My name is Marielle Trixie Bacason. I'm a research nurse currently based here in London and I am a super typhoon Haiyan survivor. I moved here in 2016. I was born and raised in Tacloban City. My dad has been working abroad since 1991. I have three (3) siblings. At that time of the typhoon, my older brother was working in Dubai and my older sister was working in Manila. So I was living with my younger brother who was nine (9) years old, with my mom—a strong authoritative figure in our family. We also lived with our grandmother who was seventy (75) years old. At that time I was working as a nurse trainee in a government hospital. My parents broke up when I was, when we were, still, sorry, in primary school. So we lived in a small house, a fifty (50)-year old bungalow, but it was in a relatively

nice area of the town. We never had any floodings. We never had any community problems. It was generally like a nice neighborhood.

In Tacloban, we're used to getting typhoons, but at that time, even if we were used to getting typhoons almost every year, I still didn't know what "storm surge" meant. So, on a random evening I was scrolling through my newsfeed, Facebook newsfeed, there was a post saying that with this incoming typhoon the water levels will rise to up to five (5) meters. I didn't really pay much attention to it because our area was not [a] flood zone; it's not a visibly coastal community. So I thought generally we're at low risk. But because our house was an old, fifty (50) year old bungalow—part concrete, part wood—we didn't have much faith in it. So we—I know that some other families in Tacloban also chose to do this—we decided to stay in a hotel in downtown area and then we convinced our relatives to stay with us.

So in the evening before the typhoon, it was quiet, it was the calm before the storm. But then on November 8, 2013, at 6:00 in the morning, we woke up to the strong whistling noise, the strongest sounds of the wind. And in our hotel room there were massive glass windows. We felt like any minute it could shatter unto us. My little brother, my baby cousins, they had to move to a smaller room at the back side of the window of the hotel building just so they wouldn't hear all these loud noise. My grandmother, everyone was just praying. We were staying at the second floor of the hotel. From where we were, we could see the water level rising, until the ground floor was fully submerged. You can see the water… the cars floating. And it lasted a few hours. Later that day it subsided and then we saw the extent of the damage to our city.

It was just… you see all the debris, all the trees uprooted, like not a single leaf. And you can't even distinguish the roads because everything was just covered. There were some dead bodies as well and then, at that time, my mom saw it. But then she was demanding that, "Can you get us a tricycle? We need to get home." And we were explaining to her, "can you not see there are no tricycles, there's not even roads here and to where." We remained at the hotel, at the second floor. Later that day, we saw people with massive pushcarts filled with grocery items. And so we were wondering, we asked, are the shops open? And they said, "Oh no, you take things, you don't have to pay." It was then that I understood what looting was. Fortunately, we were able to prepare before the typhoon, so we had some canned goods. We had some rice that we managed to extend. But most families were not able to prepare these resources before the typhoon. Unfortunately, they had to resort to looting. Our only problem at the hotel at that time was clean water.

We had no access to clean water. And then we found out that one of our relatives' house was not that damaged and then they had access to clean water.

So we decided to walk from the downtown area of Tacloban. We walked like a couple of hours to get to my relative's house. And that was not an easy walk. I was with my little brother, with my grandmother, all my cousins. We were walking through this apocalyptic scene of the city that we grew up in and then they had to see like, all the debris like, they had to see the dead bodies. There were dead animals. We had to tell them like, can you look away, can you just look that way because you don't want the kids to see all these things. And also, in the next few days, there were rumors of massive warehouses being forced open. People getting killed and raped in the dark. Prisoners and rebel groups from the mountains attacking the houses that were not badly damaged. We were there. There was no power. There was no electricity, there was no radio or news to verify the truth. It was only three (3) days after the typhoon, when we finally had reception.

I managed to speak to my sister for the first time to tell her that we're okay, we are all okay. And then she was very worried. She said, you need to leave Tacloban right now, there's no way that you can rebuild from what has happened. Luckily there was one motorbike in my uncle's house that was working. So immediately, we went to the airport to try to buy tickets. On our drive to the airport, there was just about enough space, passageway on the roads, for the motorbikes to pass. In some instances, you would be like, inches close to an arm or some dead bodies. Like, the road was really that busy until you get to the airport. We, I saw the desperate situation of everyone trying to leave Tacloban. There was no internet, we can't buy online, so we had to pay cash only. They give you a claim stub.

So we had to do a couple of trips because the first number that we got on the first day was not served. So we had to go back again the next day just to get tickets at a week later. The earliest available time was …. but we were feeling very unsafe staying in Tacloban. We had an uncle who was working for the navy, and then there was a military vessel that was going to Cebu, the big city in the next island. Fortunately, we managed to sign up to get to that boat. So we went aboard with five thousand (5,000) other Taclobanons. As we were leaving Tacloban, it reminded me of a scene from Hunger Games, when they were showing District 12, and I was saying to myself like, I will never go back to this living hell again.

And then we got to Cebu where we met our family. We saw our relatives. They were able to collect some help, some donations. We got some clothes to wear, and when we were there, it was quite nice, and I realized that all the material things you can lose them and you will always get some help. But at the end of the day it's having your family around. It's having friends and people to support you. That is what truly matters. We also got to spend Christmas together, so it was really like a good experience. But then we had to go back to Tacloban, that's our life. My brother has to go back to school.

So, in January, we decided, okay, enough of the fun times we have to go back and try to rebuild.

We stayed with a relative's house because my mom couldn't rebuild our severely damaged house. It was fully submerged in water. So when we saw it, it was all covered in mud, with a refrigerator in the living room. Like it was just in a whirlwind. And it was at that time when I saw my mom, like, the strong authoritative figure that I knew she was, just not that, she was just breaking down. She had no job because she was in the real estate business and it wasn't particularly flourishing at that time. She was feeling demotivated. It was my first time to see her doing the chores, like manually washing our clothes. My little brother had no nanny. So I had to look after him, and they were looking for a school nurse in the school where he goes to.

So I was working there. I was paid two hundred fifty pesos (PhP 250) a day, that's just over three pounds (£3) or one thousand three hundred pesos (PhP1,300) a week (under twenty pounds [£20]). I would use this money to buy groceries for the family because my mom had no income. My dad was still sending some support, but because we were sharing with a relative's house, we still had to contribute. I just suddenly felt like there was a lot of responsibilities compared to what I used to do. I had to work as a part-time server at night because my friend has a burger joint and I was using this money as my drinking money, like, an attempt to bring my social life back. At that point I was realizing how people really treat you when you have nothing because I grew up with people treating us nicely, as my dad was working abroad. My mom was super generous. And now when you're stripped of everything, what's left of you is yourself and what you make of it. At that point, my mom wasn't standing up for us, when she normally did, like, I saw her role shifting from someone who's a provider into someone who had no income.

My young little brother was only nine (9) years old at that time. He should just be having fun, like, his problem should only be school. But he had to go through all these traumatizing events, and there was no psychosocial support for him. None for any one of us. It was all just trying to recover together. And then at that point I realized, like, I have to step up. I have to be the strong person because my mom was not. It really drove me at that point to be the ambitious person that I am today. It ignited a certain drive in me that I can't be like this. I cannot be treated like this anymore. I eventually started to build a network from the Burger place where I was working. It was next to a bar where the NGO workers would hang out in the evening. I got to meet some people. Eventually I got involved in disaster relief work. I met some researchers who were looking for translators or someone who could do community interviews with them. I felt like I was in a privileged position because I could speak the language. I can speak *Waray* and I could

communicate in English. And also it was very eye opening for me because I got to see communities that I wouldn't normally go to. I was, I realized, a stranger in my own city and I'd like to know Tacloban even more.

I was able to voice out what my fellow Taclobanons needed. And then I had the renewed appreciation for my own hometown. I enjoyed doing that type of work. It was really, what my colleagues also thought was, most satisfying. But after a few years, the funding has stopped. So it wasn't sustainable as a career. In 2016, they were mass-hiring nurses for the U.K., which fortunately I qualified. And so here I am today, as an overseas Filipino worker, like I still am.

Having experienced that typhoon, I still can't help but worry a lot whenever I hear news about all this big super typhoon hitting the Philippines again. But I know that at this point, somehow people are doing some disaster preparation. It's just such a shame that it took thousands of lives before people started acting up.

Growing up, I thought that the strongest category of typhoon was number three, but, in my lifetime, they had to create a new category five, which I experienced. So, it's scary to think what more is there to come. Will my family, will Tacloban, and will my country be prepared for it? Thank you.

PANEL CHAIR CADIZ:

Thank you very much. Ms Bacason.

Commissioner Karen will have questions for you.

COMM. GOMEZ-DUMPIT:

Hi, Marielle, *maupay nga aga* (good morning). I just want to ask you, as you related, when you moved to the hotel where you were staying in downtown you saw the floodwaters rise. How rapid, or how slow, could you describe that incident?

MS. BACASON:

Yes. Most of us were staying at the backside of the hotel, in this back room. Only the men were brave to watch the water through the windows. I would just peep in like every so often to see. So it's hard to track down, but every like, half-an-hour I would check what's happening outside. I would go see

through the window and I saw the water, like it's up to this level, and then after half-an-hour when I checked again, it was fully submerged. I think it was in a span of an hour, it happened I think.

COMM. GOMEZ-DUMPIT:

Yeah. So, the water reached just the first floor, and you were on the second floor, right?

MS. BACASON:

Yes.

COMM. GOMEZ-DUMPIT:

And which area is this in Tacloban?

MS. BACASON:

It was Justice Romualdez Street, so center of downtown.

COMM. GOMEZ-DUMPIT:

So just the center of downtown.

MS. BACASON:

Yes.

COMM. GOMEZ-DUMPIT:

And then when you were working, when you were networking with other aid workers, how was the recovery like? This was in a span of when Typhoon Haiyan, passed by the Tacloban area. What date was that? Well anyway… from that time and then when you were networking with the NGO workers and when you were working at the time at the Burger joint? That was in a span of how many—three (3) months, two (2) months?

MS. BACASON:

I was working... that took about a year. I guess.

COMM. GOMEZ-DUMPIT:

One year, and how was the recovery that time?

MS. BACASON:

So in terms of recovery period, personally, I'm getting to know them. I got some projects which financially was helping a little. They would pay, say Ten Thousand Pesos (PhP 10,000) for a two (2)-week project. It was a good opportunity because these were international students looking for a research assistant. In terms of family, my mom at that time still didn't have a job. So I still was feeling a bit obliged to still support them. So it was helpful because then I was having, like, some projects financially. But then in terms of my family, my mom's income was still not quite back yet. Then socially, it was helpful for me because I felt like I was able to help my community anyway, like, I was able to voice out their problems as well.

COMM. GOMEZ-DUMPIT:

Thank you. Thank you.

PANEL CHAIR CADIZ:

Dr. Pedro.

FR. WALPOLE:

Thank you very much. I know that this is very difficult to go through many times, but in the process, hopefully we all go a little deeper. Today I think is the eighth (8th) [of November 2019], that's the fifth (5th) anniversary of Typhoon Haiyan. So my question is more in terms of how you feel these last five (5) years? Has your mother, your little brother, others recovered?

MS. BACASON:

Yes, we managed to move out from my relative's house and now we're renting our own little apartment near my brother's school. Having our own space is quite a good step to regain our self-confidence. Slowly, my mom's real estate business was up again. So my mom, slowly through the years, has managed to get some income again; my brother's back to school. My brother, he's nine (9), doesn't really talk about that experience. But I'm sure that would still have some effect on him having experienced that at a very young age.

Personally for me, it is what drives me to be here. Like before, imagine my worries were like, superficial, but then having experienced that, it opened my mind to what you could lose, and it is okay to lose material things. It's okay, but family is what's core. So it has somehow realigned my priorities in life. I could. Yeah.

FR. WALPOLE:

Okay. From what you're saying, you re-echo I think a lot of what other people have said when they were caught in the storm—that it's really through the family being able to hold it together and through the local community that life begins again. It's not through the physical rebuilding, but it's through the social rebuilding. See, that was the most important... in the sense, you would...

MS. BACASON:

Of course the physical is important in a way because the structure is what would make you feel secure. When you feel secure, you feel like you would be able to do more, you would be able to protect your family if you have a physically good space. But yes, for me personally, I find the emotional, social, most important.

FR. WALPOLE:

The core of what's there, you speak in one sense in behalf of thousands, millions of people. Because this in subsequent typhoons continue to be a disaster; that if there is no typhoon, there isn't a disaster, right? Even a category one or two, it often isn't a disaster. How would you want this expressed to, shall I say, a global economy that still invests in a, particularly notably, a carbon economy?

MS. BACASON:

Yeah. So we can see definitely that the world is changing. Like the climate is changing and to know that there are companies who contribute a lot to this, the big polluters, we call them. All I ask of them is to consider the long-term effects of what they're doing. The most convenient and the cheapest way is not always what's best for humanity. So choosing more sustainable options to allow resources to last longer to, well, help the planet.

FR. WALPOLE:

Okay. Thank you. Thank you very much.

PANEL CHAIR CADIZ:

Thank you. Counsels... have questions to your witnesses?

ATTY. PAUDAC:

Thank you for sharing your story, Ms. Marielle. Just to clarify, did you feel compelled to have to leave Tacloban as a result of that super typhoon Haiyan?

MS. BACASON:

Like I mentioned earlier, honestly, my working with a community was what I thought the most satisfying thing I've ever done, and I really enjoyed being able to communicate with my fellow Taclobanons and then being able to communicate their concerns to NGOs that could help them. So it was a very fulfilling job and it was also financially rewarding somehow. It was just unfortunate that it was not sustainable. Like the researchers were only there for this period. The funding for the NGOs only lasted for this period. And so, yes, when the opportunity came to work as a nurse in the U.K., just like thousands of others. I'm like, okay, that could be a career option for me. So, yes.

ATTY. PAUDAC:

Thank you for that, so as an overseas Filipino youth worker, what are the challenges that you face?

MS. BACASON:

Of course number one is being away from your family, especially during any challenges when you're not there, to be physically with them. And also I'm not like, I'm the sole provider for the family, I'm still there to assist. I still feel obliged to contribute to the family. For some people, they just earn their money and that's theirs for them to spend, for travel and for everything. Whereas for me, I still have the sense of responsibility that I feel for my family.

ATTY. PAUDAC:

Just one last question, Commissioners. You mentioned about going to communities in Tacloban, and hearing their stories.

MS. BACASON:

Yes.

ATTY. PAUDAC:

So based on your experience, of course as a survivor, what are the immediate needs that you think need to be addressed?

MS. BACASON:

So definitely what people need is livelihood, like, something for them to provide income, and an efficient way for disaster mitigation. Community disaster preparedness programs be put in place, I think. And educating everyone, that is what is needed by communities.

ATTY. PAUDAC:

That would be all, Marielle.

MS. BACASON:

Thank you.

PANEL CHAIR CADIZ:

Commissioner Karen has a question for you.

COMM. GOMEZ-DUMPIT:

Yeah. November 8, 2013. Tomorrow is November 8. So that's five (5) years. Has your family recovered or surpassed the hardship that was brought by typhoon Haiyan?

MS. BACASON:

I would like to think yes. I would like to think that as a family we try to be as resilient as we can be. We tried to make the most, of course, every family would always have ups and downs financially. But that is not the only measure. It is part of it. But as a family, emotionally, we grew and bonded together, we are able to communicate more, and just support each other more. So, yes, I would like to think that our family has somehow bounced back.

COMM. GOMEZ-DUMPIT:

What was the amount of time—in three (3) years, four (4) years--you've fully recovered?

MS. BACASON:

That's a difficult question because it's not something you wake up today and you say, oh, I'm recovered. I would say, maybe three (3) years, I think around that time we started to do get along better.

COMM. GOMEZ-DUMPIT:

Okay, thank you, Marielle.

PANEL CHAIR CADIZ:

This is really not a question for you, but a comment... A thought entered my mind while you were testifying that, when you lose your livelihood, when you

lose your home, when you have no food, no water to drink, then it impacts on your dignity, which is at the base of all human rights… civil, political, economic, social, and cultural rights.

So if there are no more questions for Ms. Bacason, can you, Counsels, present your next witness already?

Thank you.

COMM. GOMEZ-DUMPIT:

Thank you, Marielle.

MS. BACASON:

Thank you so much. Thank you for having me.

ATTY. MAYO-ANDA:

Good morning again, Commissioners. We would like to call on our next resource person, Ms. Veronica Cabe.

PANEL CHAIR CADIZ:

Good morning, Ms. Cabe. Okay, go ahead, Counsels.

ATTY. MAYO-ANDA:

Thank you Commissioners. Ms. Veronica Cabe is a volunteer community organizer for the Nuclear Free Bataan movement. She is a survivor of Typhoon Ketsana or *Ondoy* in September 2009. And she is here, Commissioners, to share her experiences on various typhoons that hit the Philippines, particularly relating to her experience as a survivor of typhoon Ketsana, which we call *Ondoy*, on September 26, 2009 in the Philippines; and how this impacted her life, her family's life, her basic human rights and how this experience has changed her life as a survivor. But before we proceed, Commissioners, Ms. Veronica Cabe submitted a statement entitled "*Salaysay ni Binibining Veronica Cabe*" (Statement of Ms. Veronica Cabe) dated October 25, 2018. We would like to have this reiterated, the statement consists of seven (7) pages which just has been pre-marked last October 24, 2018 as

"AAAAAAAA" to "AAAAAAAA-6" and her signature in that statement has also been pre-remarked as "AAAAAAAA-6-A." And we would respectfully request the clerk of the Commissioner to confirm this.

CLERK OF THE INQUIRY:

For the record, the document mentioned by counsel was pre-marked last October, as manifested by counsel.

PANEL CHAIR CADIZ:

Exhibits what?

CLERK OF THE INQUIRY:

Exhibits "AAAAAAAA" to "AAAAAAAA-6" and signature as "AAAAAAAA-6-A."

PANEL CHAIR CADIZ:

Alright. Thank you very much. Please proceed.

ATTY. MAYO-ANDA:

You may now proceed, Ms. Veronica Cabe.

MS. CABE:

Magandang umaga po. (Good morning.) Good morning to everyone. My name is Veronica Valdez Cabe. I am forty-five (45) years old, the eldest in the brood of five (5). My parents are Fatima Cabe, a housewife, and my father was… I am currently doing volunteer work as a community organizer for Coal and Nuclear Free Bataan Movement, that is based in Bataan province of the Philippines. I am one of the Petitioners and I come here to share my experiences on how my life and my family's life have been affected by the series of floods that have struck the Philippines, and I believe is caused by climate change.

I come from a very modest family. We are not rich and my sisters are just ordinary employees. In 1981, our house was demolished in Tandang Sora and

we were relocated in Marikina. I was in grade two that time. I was eight (8) years old. Marikina lies on the eastern part of Metro Manila. It is near the Pasig River. We then lived and built our community, built our lives in that community for thirty-seven (37) years up to now.

And throughout my life, I have seen how typhoons and floodings have caused our family so much hardships. The first experience was when I was in grade six. I was very scared because I was carrying and I was holding my younger sister's hands while we were going to the evacuation center, while there was already a flood. But this is not the worst because the worst was Typhoon Ketsana, known as *Ondoy* in the Philippines, in 2009. I was not home that time but my parents were there with my sister and her children. I was really worried because my mother was sixty (60) years old and my father was sixty two (62) years old. I was desperately looking for help, I was trying to contact everyone, my friends who may know rescue agencies, local government units, soldiers or anybody who has the capacity to rescue my family in the middle of the flood that was rising up to the level of the roof of our house. I was blaming myself that time because I could not get home, and going home and being with my family was the most important thing during that time for me.

I was ten (10) kilometers away from my home, waiting for so many hours in Mandaluyong. The whole Metro-Manila was flooded, and we were stranded. I braved the floodwaters for seven (7) hours just to get to my family in Marikina. I had to find a way to bring them food through flood waters, waist high, carrying pots of rice, cooked rice and adobo. I was aware that at that time my family has not eaten anything for more than twenty-four (24) hours, sitting on the rooftop of our house, on the rooftop of the two (2)-storey house, and under the cold rain. I also brought some dry clothes for them to change because they've been drenched in the rain for so long. And when I finally saw them, I was relieved. I was happy because they were safe. My mom almost cried because she thought that they would never see me again or they would be drowned in the flood.

I saw them cleaning already. The house was covered with mud, up to the knee. The months that followed were spent cleaning, removing the mud from the roof down to the floor—cleaning, washing clothes, and salvaging anything that we could still use because everything was lost. Even personal belongings, underwears, toothbrush, all was lost. And, my father, unfortunately, had leptospirosis—at that time, the outbreak of leptospirosis became an issue. And my father had to be treated in the hospital for two (2) days, he survived fortunately. But I have neighbors who did not survive the leptospirosis and died because of that disease. The floods have changed our lives. I felt like parts of our dignity was lost because we felt displaced.

We felt displaced, we didn't have our own space. We were forced to live with friends who were willing to share their homes with us. We were separated from each other. My nephews lived in another relative's house. We relied on relief goods and donations for months. I recall every day I had to queue in line and wait for hours, half a day every day, waiting for possible relief. We did not know if relief would come and then line up again for another day. And then relief goods were thrown at us, and I saw my neighbors struggling against each other just to get their share. It was chaotic that time. The government was not ready for an *Ondoy* flood that time. And one important thing is that we had to borrow money from anyone because we did not have money.

Our daily life was disrupted. Unfortunately, our sufferings did not end with *Ondoy*. The story didn't end with *Ondoy*. Unfortunately, the sufferings that we have been through, continued at the time when we were rebuilding our lives. The series of floods brought about by monsoon rains have caused flooding. Again, I clearly remember three (3) incidents of flooding. We lost everything again, everything that mattered to us. After years of struggling, rebuilding and recovering, I knew the typhoon would come in and wreck everything we have put up over the years. When would this situation, when would this devastation stop? How can we survive? When would this process of recovering and rebuilding end?

Ondoy and the flood had been cruel to us. It took everything away from us. Until now we have yet to get back to our old house that was damaged by a series of floods. My family's health condition deteriorated over the years. My mother, who went through a lot of psychological distress after *Ondoy*, has Alzheimer's now. And my father, who has undergone a lot of stress, also unfortunately died a month ago. Before he died, he kept asking us again and again, "*Kelan ba natin mapapagawa 'tong bahay*? (When can we get this house fixed?)" The day that he died, he was there in the old house. We just let him because he needed to eat. He was asking and wondering when we can finally rebuild our house? Some people would say, "Why couldn't you move out?" I'm wondering why it's so easy for them to say that because in reality, it is not easy because we do not have money. We do not have the means to be relocated again. Besides we have been relocated there in 1981 by the government, so are we going to move again?

So that's simply our question. And I think this is my reality and for many Filipinos this is their reality. Many Filipinos do not have the choice but to face and survive the storms and typhoons, and floods and the consequences that come with it. Not having water and electricity and not knowing that your family is safe. This is what I ask, "Do we really have a choice?" I have chosen. I have chosen to dedicate twenty-four (24) years of my life organizing communities that have been affected by coal and nuclear power in different parts of the Philippines. I have seen how poor communities have become even

more vulnerable to the impacts of climate change. I believe that through this petition, our stories and our voices can be heard. I hope that people of influence would listen to us. I believe that governments and corporations have the choice to choose people over profit, and businesses have a right to do business, but us we also have the right to live. That would be all.

PANEL CHAIR CADIZ:

Thank you very much Ms. Cabe.

Commissioner Dumpit?

COMM. GOMEZ-DUMPIT:

Maraming salamat (Thank you very much),Veronica. I thank you for your, story. I just want to know, you said you never got to rebuild. In your community, how many or would you say that most of the people in your place have not been able to go back and rebuild their homes after Ondoy?

MS. CABE:

My community is one poor community. I think Fr. Walpole knows that because it has been an apostolate community for the Jesuits back then. So half of the population was poor, are poor, even now are poor. Those who have the capacity, they move out; and us and all, most of the neighbors I have stayed with the same condition with houses that haven't been rebuilt until now. And although some have, were forced to sell their land, so that they could rent. And for us, we just decided to rent a house. It was just last August. We were devastated again by another six (6) foot high flood water inside the house.

COMM. GOMEZ-DUMPIT:

So what was the government's response? From what you've said, you were relocated by government as well. And knowing that every time there's heavy rain, not even a typhoon but monsoon rain, it would flood. So what was the government's response to this? The local government and also the national government?

MS. CABE:

Yeah. Local government right now is very fast in a sending warnings to the community. And they're very much on the watch. If there is a typhoon, they will always make warnings to the people that with this level you have to evacuate. And I think I can recognize that the relief operations are more sophisticated now. Unlike in *Ondoy*, strangers will throw relief goods at us, or we have to line up for the relief, but no relief will come. So that's how our *Ondoy* experience was. But now it's different. We have an evacuation center that was, I think with the system now, organized. So that's the only thing I know. We would want relocation or resettlement that would be permanent, if they need us to be relocated again. Maybe the relocation would be carefully planned so that we can never be affected again by the floods.

COMM. GOMEZ-DUMPIT:

But this is always the reactionary program.

MS. CABE:

Yes.

COMM. GOMEZ-DUMPIT:

What about prevention as you said, any assistance from government in rebuilding or relocating, and has there been any announcements or any dialogue with the community?

MS. CABE:

I don't know anything about that. I am not aware of any relocation plans. But before they have demolished houses near the river. So that's, I think, that's ten (10) meters away from the river. I don't know. I don't know if I'm correct but that's how the government has responded after *Ondoy*. But the large bulk of the community is still there, still remains.

COMM. GOMEZ-DUMPIT:

Still remains. Okay. Thank you. Veronica. And I'm sorry for your loss.

PANEL CHAIR CADIZ:

Thank you.

Dr. Walpole?

FR. WALPOLE:

Thank you. It's very hard to ask questions as such because I know a part of the context, as you say, anytime *Habagat* [comes] you got flooded. *Habagat* is just the continuous rains and there is no storm but the Marikina river you're on, which is like a migratory river, it's a meandering river. If you didn't cement it, it would actually start to move off and eat half of both sides. And certainly the local government cannot finance the entire walling on that length of a river. So, for me, you bring out two (2), I think amongst many. One is this persistent sense of forthcoming terror, as to whether you're going to be affected or not, and I think that this is the nature of all these events.

Once you've gone through one of these disasters, psychologically it's disastrous because on the first sense of rain you feel you are going to be caught again. Your explaining that yes, the local government response is very genuine to the disaster when it hits. The challenge there seem to be, with the Paris Agreement, how to access the finances that can start to move on a preventative level? And these finances, as I understand, have not materialized, and this cannot be given by the local government. I think we need to remember, and partly we stress here, what choice do we have? I think that that's crucial. That's where their hope comes by which people can move. The government has tried different relocation. Have you been to any of the relocation sites there? They are more to the east.

MS. CABE:

Yeah, it's, farther from Marikina. It's far from our work. My sisters would not allow us to go there because it's far from their work.

FR. WALPOLE:

Yeah. So this affects, again, livelihood, the cost of transportation.

MS. CABE:

Yes. Children are studying.

FR. WALPOLE:

Yeah. And the other dimension of it is many of the sites are subject to landslides. Cherry Hill was the first disaster. And many other areas since. So people are forced to move from floodwaters to landslides and back again.

MS. CABE:

Yeah. And some of my neighbors who lived near the river, who were relocated in Montalban, also reported that they are also affected by another flood. So it's a series of, you know, flooding everywhere they go.

FR. WALPOLE:

Yeah. Perhaps what I draw from your recommendations, this choice, how do we present this to people who are responsive? But have you had any involvement with—I heard, you deal with coal in Bataan—the Commission on Climate Change?

MS. CABE:

That's the challenge. That's the challenge right now because I've been working with communities affected by coal pollution, and the health issues that the communities have been experiencing. Unfortunately, the companies that are involved are not really giving us time to talk with them. So it's still a work in progress. The challenge for us also is to make them listen to us, and to take our suffering seriously.

FR. WALPOLE:

Thank you.

ATTY. MAYO-ANDA:

Thank you, Commissioners. Thank you, Ms. Veronica Cabe, for sharing your experience. I think you have a good sense of the needs of the community having been a community organizer. And also, based in Marikina, what do you think would be the needs of these communities, including yours that could effectively support them, protect them from the next disaster?

MS. CABE:

I think at a policy level. Maybe one, the community needs some policy that could set stricter rules for business to consider the rights of the community. They are doing their business in the community, and they should not just think of their profit. They should consider the consequences and impacts to the community of their business. And, I think, they should make stricter policy on greenhouse gas because I believe greenhouse gases cause typhoons and floods, and to make a significant change on how they conduct their business. Being responsible is one, second being considerate to the needs of the communities.

Like in Bataan we don't really need another coal plant. Coal plants—even before the community understands climate change—are wreaking havoc on the houses and lives of the people there. So it's compounded, the violations have been very obvious, but they just ignore it because they think we are just people who are after their money. So it is really crucial for the companies to listen to us and for the government to protect us, to protect the rights of the people and not the business.

ATTY. MAYO-ANDA:

Okay, building on that and also from Father Pedro Walpole's question a while ago, what other recommendations would you want to put forward to the Commission so that the needs of the communities impacted by climate change can be also responded to, and your rights protected as well?

MS. CABE:

Yeah. On the needs of the community, one is to be responsible for the consequences, especially damages. Because conducting their business in the community sometimes or most of the time had an effect which the community were not ready. Like if you are just a tricycle driver and the pollution makes you sick, you would be forced to go to the hospital, and you will be forced to

stop your work, and who will feed your family? For example, you are a fisherman or a peasant... in the community they're saying the average yield have been reduced. The fishes have gone, their usual fishing grounds have been taken away from them by these companies, by these coal plants. So, and even their homes were taken away from them because issues of dislocation and demolition have been the major issues in the community with this, with this presence of the businesses.

So I think for the government and for the company I think they should really consider the rights of the community. They should consider and listen to the voices of the community because it is very crucial to the community that they are being considered as part of the society. Not just their own interest, not just the business interest, not just for the profit that they would get. We are part of the community also, for them they are just conducting business. We also have the right to a healthy environment. We also have the right to breathe healthy clean air. These are the things that the communities that I'm organizing right now face. In particular, we don't need another coal plant. We don't need another big fossil fuel polluter project that would be constructed and operated in the communities.

And maybe the government should consider that, also, because right now the Philippines does not have a policy that strictly prohibits building more coal plants. Yeah. Because as far as I know, during Noynoy Aquino's time, there were only seventeen (17) coal plants. But right now we already have twenty six (26) coal plants operating. And in Bataan alone, we already have more than five thousand (5,000) megawatts of coal-fired power plants operating in just two (2) municipalities. Can you imagine that? Where do we get our clean air?

ATTY. MAYO-ANDA:

Okay. Thank you. My last question, Commissioners, is, now that you're in London, Veronica, closer to the headquarters of Respondent carbon companies here, what message would you like to convey today?

MS. CABE:

I've been following and attending this Petition in hearings since day one because I am one of the Petitioners. But since then, they have not shown up until now. They're still a no show. So maybe I can ask, I can still appeal to the Respondents or the big polluters to please listen to us. Consider our sufferings seriously and remember that we also have rights because we are also human beings like you. And yeah, I'm here in London and I'd like to

appeal to the people in London because we are living on a very different lifestyle. Help us influence the governments of the world to consider the sufferings of the vulnerable people and communities.

ATTY. MAYO-ANDA:

That would be all, Commissioners. Thank you.

PANEL CHAIR CADIZ:

Thank you, Ms. Cabe.

We can now have a coffee break for fifteen minutes. All right now, in the program it says "break up to 10:45." I think we should follow that because you might upset the schedule as what happened yesterday. So let's just stick to the schedule.

So we'll break up to 10:45 a.m. Thank you.

[Break]

PANEL CHAIR CADIZ:

All right, we can already resume our session. Counsels, can you introduce your next witness?

ATTY. MAYO-ANDA:

Good morning again, Commissioners. Our next resource person is Dr. Myles Allen. He is a co-author of the Intergovernmental Panel on Climate Change special report dated October 8, 2018. The special report refers to global warming of one point five degrees centigrade (1.5°C). He is also the head of the climate dynamics group of the University of Oxford's Atmospheric Oceanic and Planetary Physics [Department] and is a principal investigator of the distributed computing project Climate Prediction Net. And we are presenting him to the Commissioners to discuss the distribution of recent climate change in assessing what these changes mean for global climate simulations of the future.

But before we proceed, Commissioners, may we confirm that Dr. Myles Allen submitted a statement and curriculum vitae which have all been pre-marked last October 30 and to reiterate the Statement of Dr. Myles Allen consisting of three pages, pre-marked as "PPPPPPPP" to "PPPPPPPP-2," his signature as "PPPPPPPP-2-A," and his curriculum vitae as "QQQQQQQQ" to "QQQQQQQQ-2." The last one is a printed PowerPoint of Dr. Miles Allen entitled "Attributing Harm to Greenhouse Gas Emissions: Principles and Current Status" consisting of thirteen (13) pages pre-marked last October 30 as "RRRRRRRR" to "RRRRRRRR-12" and we understand from Dr. Myles Allen that this has been also updated.

PANEL CHAIR CADIZ:

Alright, thank you very much. Clerk, would you confirm the markings as manifested by counsels?

CLERK OF THE INQUIRY:

Yes, Commissioner. For the record we confirm the manifestation of the counsel as to the pre-marking of the documents mentioned.

PANEL CHAIR CADIZ:

Alright, thank you very much. You may now begin.

ATTY. MAYO ANDA:

Dr. Myles Allen, please proceed with your presentation.

DR. MYLES ALLEN:

Thank you very much. I am very happy to have the opportunity to speak to you. I know you've had testimony from a number of other witnesses who've talked about the attribution problem. Particularly Sophie Marjanac who gave you an overview of the whole attribution challenge and Brenda Ekwurzel who also presented to you on the challenge of linking emissions to rises of global temperature and sea level. So I am going to focus on the basic principles of attribution, where we are at, and make comments about, in particular, the "avoidability" questions. So, these are the topics I will cover. You have a copy of my PowerPoint, if you don't mind, I just noticed as they were being waved

around there are notes on the PowerPoint, and they don't always appear in the printout. So if you have an electronic version you will find there are notes on most of the slides. These notes may be helpful to you, to remind you of some of the key points in my testimony. You are welcome to them and I am also very happy to follow up with any points of clarification as well.

So I wanted to talk about several questions. First, the very basic one of how we quantify the contribution of past emissions to large scale warming. Then I will talk about the specific example of typhoon Haiyan, super typhoon Yolanda, and how we relate the large scale changes to specific weather events. And then we look at some specific examples of actual impacts of large scale changes. Focusing on health and economic growth, those are just two (2) examples of impacts from the recent one point five degree (1.5°) special report from the IPCC.

Finally, a little bit further out of my core area of expertise but something I would like to draw your attention to is the question of whether harm was avoidable. And I think this is particularly relevant to these discussions. For example, in a recent court case in America, which I was involved in providing a tutorial to the judge. This was a case of San Francisco and Oakland against a number of fossil fuel companies. The decision in that case really turned on the avoidability question not on the scientific proof of causation. The court accepted causation in effect but argued that the actions of the companies were unavoidable. I think I am paraphrasing, I am not a lawyer. But that was what I got from the findings, and I think this issue of avoidability is very important for these discussions and I will therefore speak to that briefly at the end.

So, first of all, on the question on how we quantify the contribution of past emissions to large scale warming. First of all is the incontrovertible fact that the world is warming , which is fortunately now generally accepted. This slide shows you monthly global temperatures relative to the late nineteenth (19th) century which is a period considered by the IPCC to be representative of pre-industrial conditions. Of course, the late nineteenth (19th) century was not before industrialization, but the combination of a number of volcanoes going off during that period and a cooling natural trend means it's assessed to be more or less representative of where we would be if we had not increased our greenhouse concentration in the interim.

The question we face is how much of this warming is due to human influence? That's a challenge, one of the fundamental challenges which the IPCC has addressed for many years. On this slide, I've just sort of illustrated this problem with two (2) possible responses to anthropogenic drivers of climate change. That's the increase in greenhouse gases and other forms of pollution. And then the dotted lines, the dotted blue line, so possible responses to natural drivers that would be changes in the power output of the sun and of volcanic

eruptions. And you can see there's a range that I've just shown you. I could show many more. I have just shown you two (2) options. And so then the question is, how do we know how much of the warming is due to human influence? And we can't just use models to answer this question because the uncertainty and the model responses is very high if we just look at the models on their own.

So what we do is we compare these expected responses to human and natural influence. We know when the volcanoes went o, Pinatubo of course is one which is very familiar to everybody here. But some of those other major volcanoes over the past record, for example, the Krakatoa eruption in the 19th century, and we know when greenhouse gas concentrations started going up rapidly. So we know a lot about when we expect changes to have occurred, but we don't know from the models alone how big those changes should be expected to be.

So what we do is we estimate the size of those changes from the observations and this shows you the best estimate we have of the size of human-induced warming shown in orange, natural warming and cooling shown in blue, and the combination shown in red. And as you can see, the red pretty much accounts for the large-scale warming. There's no big, sort of mysterious, missing warming to be explained there and it also shows you—because the orange line is pretty much on top of the blue or the orange line is pretty much on top of the red line—at the moment that all of the warming that we've seen over the past century or the best estimate is due to the increase in greenhouse gas concentrations and other forms of pollution from human activity. So the important point to stress here is that these estimates of the size of human influence on climate, don't actually depend on a climate model to give you the size of that influence.

We estimate them directly from the data. So this is an observationally driven quantity and we are now at the base. We can now say we are now at one degree (1°) plus or minus point two degrees (.2°). There's a range of uncertainty in that and we're increasing at point two degrees (0.2°) per decade. This was one of the key findings of the IPCC special report. I'm very happy if you want to ask me questions about anything, as we go along, that's much easier. I'm very happy for you to interrupt me.

So we know that the dominant cause of the observed large-scale warming, global scale warming, is human influence on climate. But how do we quantify the impact of that large-scale of warming on extreme weather events and obviously a particularly relevant example to the Philippines is the example of Typhoon Haiyan, super Typhoon Yolanda. And I'm going to focus here on a particular paper by Takayabu and co-authors, which I was not involved in as an author. So I'm speaking to this as a scientist assessing the literature. And

in fact I would… I don't think you've specifically heard from Dr. Takayabu on these hearings. I went through the proceedings to see, and I would actually commend if you have time in your schedule to actually get direct testimony from one of the authors of this paper. The full references given there and they will be able to take you through that study. I mean, they did the work so I can tell you what I understand they did. But obviously it's always good to get the first hand impression and this scatter plot here, what they did in this study was they said they asked the question, "Okay. Suppose the large-scale conditions was such that a typhoon would occur, at the time it did when typhoon Haiyan occurred in the Philippines, how would the typhoon had been different if we had not caused that large-scale warming?" So they asked if they changed the overall conditions. There's been roughly half a degree of warming over that period in the vicinity of the Philippines and not as big as the global scale warming. And there's also been a course, large-scale changes in the composition of the atmosphere. There's more calm outside there and so on because of past emissions.

What did those changes do to the evolution of the typhoon? And what this Scatter plot tells you straight away is the answer is not certain. It's not like a situation where, you know, you can't think of this as like a billiard game, a pool game where the ball sort of, one ball hits another ball, the ball moves in a very predictable way. This is a much more chaotic system. And so you can't say precisely in any individual instance how an external driver like the large-scale warming will affect the evolution of a chaotic weather event, like a super typhoon. But what we can say, for example, there are cases here, if I just... These dots show you simulations which include human influence in the horizontal and simulations that exclude human influence in the vertical. And so they're paired up because they're all started from the same conditions in each pair. And then as the typhoon evolves, – either including the half degree of warming from the sea surface temperature increase and the changing atmospheric composition or notes – they see what difference it makes to the evolution of the typhoon. And so these are some cases. I've just highlighted two (2) of them here, where we essentially see a higher maximum wind speed in a case without human influence than we see in some of the cases with human influence included. So it's not the case that in every case when you include human influence, you automatically get a bigger typhoon as it's very clear from this plot. The dots are mostly to the right of the line, one (1) line. So we see on average an increase in maximum wind speeds if human influences [are] included, which implies a higher probability of the very high winds that were experienced during Super Typhoon Haiyan.

This plot which is taken directly from their paper is expressed in terms of meters per second, which is what physicists like to use. But in more familiar units, sixty (60) meters per second, these corresponds to two hundred sixteen (216) kilometers an hour. So you can see the probability of these greater than

two hundred (200) kilometer an hour winds are significantly increased when you include human influenc, the impact of past greenhouse gas emissions in the simulations. And they then went on from this to look at the implications for the storm surge heights in the Gulf of Leyte, which you heard from a direct testimony in these hearings from people affected by that storm surge. And here you can see that if they take the average of their simulations, which include human influence, that's the top panel there, you see more red color in the top left of that plot, so higher storm surges on average occurring when human influences included.

You still see storm surges, when you have these simulated typhoons without the effects of human influence, but the storm surge average height is slightly lower. And it's of course because this is a computer simulation, they can go in and quite a lot of detail and work out exactly why the storm surge is bigger when human influences [are] included and the crucial point that they found in their paper, very interesting point, was that the highest storm surge was almost entirely due to the higher winds. Many people think because sea level is rising, you automatically get higher storm surges. But actually, sea level and storm surge interacting is quite complicated because a global rise in sea level makes the bay deeper. And actually, that partly compensates for the impact of the rise in sea level. So you can't just say because the sea levels rise, you will get a higher storm surge for the same size of storm, but if you have a bigger storm, you get a bigger storm surge.

So we can say, with confidence, we are seeing an increased risk of these very powerful storms. And that's what's driving the increased risk of these very high storm surges. So this is the way we have to understand these weather events. Just to reiterate, it's not that human influence on climate made this super typhoon inevitable. It's not that it could not have happened without human influence on climate. Lawyers like to talk about the "but for" question, you know, "it's not true that... but for human influence, this could never have happened." But you can see that from the results of this study, which I commend to you. It's a very well constructed study, very carefully executed study. You can see how human influence on climate has exacerbated the impact of that storm and made the highest winds experienced more intense.

So the next question is, okay, so that's looking really at the meteorology, looking at a meteorological event and looking at a storm surge. How do we actually quantify harm on people, on ecosystems [due] to a large-scale warming or extreme weather? So I'm going to give you a couple of examples here. Obviously the range of harms is very large and this Commission has a very broad brief to address all kinds of harm. So I was just going to start off by looking at the sustainable development goals. I appreciate that there's still a lively argument whether there is a human right to sustainable development. I'm not a lawyer, I can't comment on that. It seems plausible to me, but some,

I know that that's something that lawyers like to argue about. So I'm going to use these sustainable development goal areas to focus on. On the health one, No. 3; and one on the work and economic growth, No. 8 as just two (2) examples to talk about how large-scale climate is impacting on our ability to achieve our sustainable development goals. These are now results from the one point five degrees (1.5°) special reports published a few weeks ago.

This addresses the health question and it shows from a paper that was cited in the reports, [Ana Maria] Vicedo-Cabrera and co-authors looked at the balance between the number of people dying from extreme cold on the left and the number of people dying from extreme heat on the right and how that balance changed between present day conditions, one point five degrees (1.5°) of warming, and what's shown here between one point five degrees (1.5°) and two degrees (2°) of warming. So we are asking what are the avoided impacts of limiting to one point five degree (1.5°) compared to allowing warming to rise to two degrees (2°) because of course the brief of this report was to try and say what's the benefit of limiting warming to one point five degrees (1.5°).

One thing you can see immediately is there's a lot of spread between different regions. Some regions we actually see very little impact and indeed in northern Europe we actually see more reduced cold deaths. Then we see increased heat deaths. It's important to estimate... these are estimates with substantial [ranges] of uncertainty. But that would suggest that, you know, the net impact on cold- and heat-related deaths in northern Europe is actually slightly positive in the sense that more people die from cold in winter in this region than by from heat in summer in an average year, specifically in Southeast Asia. There's also a breakdown in the paper which I've given you the reference there, and it's in the notes, there is a breakdown in the paper, by country, and the Southeast Asia figures [is] representative of the Philippines.

We see a greater prevalence of increased heat deaths due to hot conditions, then reduced cold deaths due to cold conditions, which is understandable. [The] Philippines is a warm country. It's probably not a country where there are very many deaths due to extreme cold. You can also see, and this is also representative in the Philippines. That's quite a big range of uncertainty in the net impact. But we are starting to be able to quantify the net impact of different levels of warming on human health and specifically the most extreme manifestation of human health, human mortality. So this is an example. There are many examples given cited in that report and this research is proceeding very rapidly. There's a lot of interest in the health impacts of climate change. And I'm just giving you this one as an example that's particularly relevant because they give this regional breakdown of how climate change is affecting individuals and health in different parts of the world.

The second example I'd want to focus on is the impact on economic growth. So again, one of the sustainable development goals, number eight (8), is economic growth, and what we see here is the impact of a one point five degrees (1.5°) of warming over the century relative to no further warming after today. So we are now at one degree (1°), on economic growth in different countries and in the world as a whole. So you can see the highlighted purple countries on the map are countries where economic growth is significantly reduced even by an additional half a degree of warming. So it's important to stress even one point five degrees (1.5°) wouldn't mean climate change is harmless. Even if we'd limit climate change to one point five degrees (1.5°), it doesn't mean it's harmless, it doesn't mean it has no impact on economic growth. And we can also see that the countries that are primarily affected are those in the tropics, all are developing countries particularly sensitive to small levels of warming. There's a very clear reason for that.

The climate in the tropics, particularly in marine regions like the Philippines, doesn't vary very much from year to year. So half a degree of warming means that a big change compared to average fluctuations in climate in that part of the world. And the same goes for some Sub-Saharan Africa as well. If we look at two degrees (2°) warming, we see a rather more concerning picture. So you can see many countries are now significantly impacted in terms of their economic growth at two degrees (2°) of warming relative to the present. All of those countries that have experienced significantly lower economic growth over the course of the century if they… go to two degrees (2°) instead of limiting warming to one point five degrees (1.5°), and if we compare one point five degrees (1.5°) to two degrees (2°), we can actually see a significant benefit for some countries of limiting warming to one point five degrees (1.5°) relative to two degrees (2°).

Those countries are mainly concentrated in Sub-Saharan Africa, where countries are particularly vulnerable to the impacts of small levels of warming. It's important to stress here, oh, I'll just draw attention to some countries at two degrees (2°) of warming in this modelling study. And it's important to stress this was a study based on observations of the relationship between global temperatures and economic growth over the past forty (40) years. So this wasn't based on a model of the world economy, or national economies. It was based on actual data of how the GDP has responded to variations in global temperature. And you can see there are some countries that—if the relationships we've seen in the past hold in the future, and that's a big if of course—and it's an assumption you have to make in this work of course; some countries are projected to modestly benefit from a small amount of global warming. These, as you would expect, are countries where it's already very cold and their economic growth is curtailed by very cold temperatures.

So those, but unfortunately, when we look at the countries as a whole, you can see this, you can't read all the names of the countries here. But I hope you can see the general picture. There are actually two (2) countries right up at the top that are green and those are countries that might benefit significantly from a warming of two degrees (2°). But then you can see the whole lower half is purple. So these are all countries that will significantly reduce economic growth as a result of two degrees (2°) of warming. And I'll just focus in here so you can read the names. Unfortunately, the Philippines is one of those countries that is projected to actually experience significant reductions in economic growth at both one point five degrees (1.5°) and two degrees (2°) of warming. So even at one point, even going from the current level of warming to one point five degrees (1.5°) of warming is projected to significantly impact the economic development of the Philippines.

So that's focused on the question of whether there is harm. I've given you two (2) examples of documentable harm from the rise in global temperatures that's attributable to these emissions. And finally, I just wanted to say, as I mentioned at the beginning, I wanted to take my last five (5) minutes to talk about the question of where the harm is avoidable. So whether, in particular, the defendants in this case (the fossil fuel industry) could have taken an alternate course of action. Was there anything else that could have been done? I think it's an interesting question because it was clearly a question that preoccupied the courts in San Francisco, for example, when they were discussing the case of the cities of Oakland and San Francisco against fossil fuel companies.

So the first question on avoidability is foreseeability. Was the warming foreseeable if you couldn't see something coming? Again, I'm not a lawyer. But it seems reasonable for me to say, well, it's hard to say you should have avoided it if it was impossible to predict. So this picture is actually from a paper by William Nordhaus. He's the economist who just won the Nobel Prize for economics this year. And it's a figure from a paper he published in 1977. So I really emphasized so you can see that it's the kind of figure—we have much better graphics and modern papers, but, you know, this is back in the 1970s. You can see the dashed line there represents Bill Nordhaus' estimate of how global temperatures would evolve in response to the ongoing rise of greenhouse gases they were documenting and were projecting to continue due to fossil fuel use over the next few decades.

And you'll notice immediately. So the observations he had, the solid line, we're at the time experiencing a global cooling. And there were even headlines in the papers in the late 1970s talking about a coming ice age. So this was not an extrapolation. This was because he understood what was going on and because other scientists at the time understood that carbon dioxide would have a warming impact on global climate. He made this prediction that

we would see this large scale warming. And if I just lay this next to each other, this is what we've seen and I've colored it – global temperatures – red here. This is exactly the same data that I showed you at the beginning, the observed global temperatures and (with sort of Power Point magic here) I can slide the observations over Nordhaus' prediction and you can see, I think that's not possible in the print out.

But if you look at the screen, you can see he got it exactly right. He said that around 2017, we would see about one degree (1°) of warming. So this was in 1977 at a time the newspaper headlines were worried about a coming ice age and this information was not just available to Bill Nordhaus. He was a very clever guy, but he was drawing on results from the climates, the mainstream climate science community at the time, like [Syukuro] Manabe and [Richard] Wetherald, where key-modeling papers that informed Bill Nordhaus' work. A couple of years later, the Charney report, the first national assessments led by Jule Charney, looked at the evidence for human influence on climate and concluded indeed what we would expect, if carbon dioxide emission levels continued to rise, we would expect warming of this kind of magnitude.

So it wasn't just niche knowledge confined to a particular economist. This was reasonably well-established knowledge by early 1980s. And indeed you've heard from other witnesses about the knowledge that was available within the fossil fuel industry. And indeed this discussion was also available. You can see in the papers of the fossil fuel industry that they were also well aware of the potential for this large scale warming. And this is, as I've stressed already, predominantly due to ongoing emissions of carbon dioxide. I showed you this figure before. If I just add to that, the dotted line here shows how temperatures would have evolved if we hadn't committed any more carbon dioxide after the mid-1980s. So take zero carbon dioxide from the mid-1980s and you can see that roughly forty percent (40%) of the warming to date is due to carbon dioxide emissions since 1986.

So we are adding to the warming very rapidly. You can see there is still some warming in the dash line because there are other emissions going on. Methane has gone up as well. But the bulk of the warming we're seeing is due to carbon dioxide and it's accumulating very rapidly because carbon dioxide emissions have increased. So finally, we address the question of whether these carbon dioxide emissions are an inevitable consequence of the provision of cheap energy.

So if we want to provide affordable energy, is it essential that we put carbon dioxide into the atmosphere? This is a fundamental question that I hope this Commission will think about. So let's just look at this. This is a figure I've added; this is not in your notes. It's a figure drawn directly from the one point five degrees (1.5°) reports. I've added it because it was quite widely reported

and the sort of the headline people drew from this was that in those scenarios there's the bar on the left. You don't have it in your papers, I'm afraid. If you just focus on the screen and the PowerPoint provided, I'm sure that petitioners will pass this onto you.

Many reporters—I'm picking up on the one point five degrees (1.5°) reports—made a big fuss about the fact that we were talking about spending up to two point eight percent (2.8%) of global GDP investing in the global energy system in a scenario that limits warming to one point five degrees (1.5°). That's a huge amount of money. What it doesn't tell you is that we are already spending a substantial amount on our energy system anyway. So what we're comparing here, the baseline scenarios right over on the left that correspond to the sort of business-as-usual case when we carry on investing in fossil energy. The right hand bar corresponds to the investments required to deliver an energy system that's consistent with a one point five degrees (1.5°) level of warming. You'll see that delivering the one point five degrees (1.5°) consistent energy system is more expensive.

It's around forty percent (40%) more expensive, but of course it delivers you an energy system that fits the purpose for the rest of the century. Whereas if you wanted one point five degrees (1.5°) or well below two degrees (2°), if you build the high fossil energy system on the left, you potentially have to throw it all away in the mid century. So, this two point eight percent (2.8%) of global GDP is quite misleading number because it neglects the fact that actually it's a choice of where you invest your money. It's not as if you're spending money on that you wouldn't spend any other way, when you're trying to build an energy system that's fit for a one point five degrees (1.5°) future. And if we put this in context that's the same, this is the same figure. I've just squished it down so that you can see it. And this headline, everybody said, "Oh, it's going to cost two point five percent (2.5%) of GDP…." well, let's just compare that to what we spend on energy. So that's what we spend every year on energy in the world. Okay, so we're talking about that difference, which is the cost of delivering a one point five degrees (1.5°) stable climate represents roughly less than one percent (1%) of GDP and less than ten percent (10%) of our current annual expenditure on energy. In that context, I find it hard to argue this is completely unaffordable.

What could the industry specifically do? Can I have like, two (2) more slides, two (2) more minutes? Yeah, that's okay. I'm sorry I've slightly gone over. What could the industry itself do? I just want to draw your attention to one thing that is within the industry itself. As indeed the counsel for the defendants in this case in San Francisco repeatedly stressed the emphasis they placed on carbon capture and sequestration—getting rid of CO_2 generated by burning fossil fuels—as a way of reducing their impacts on global climate. So the industry itself is emphasizing the opportunity for reducing impact on global

climate by capturing CO2—disposing of it underground rather than releasing it into the atmosphere. Okay. So this technology is coming from the industry. In the broader academic community, the importance of this technology is hotly debated. As far as the industry is concerned, this is a key part of the mitigation, of their portfolio of mitigation options.

And these lines here show you the below two degrees (2°) scenarios considered by the IPCC—scenarios in which emissions are reduced to limit below two degrees (2°). And as you can see, they all fall off the colored lines here, all fall off and reach net zero sometime in the second (2nd) half of this century. I could show you exactly the same scenarios, plotted as it were, the way the industry would like you to see them, where instead of showing you the total level of emissions, I'm showing you the fraction of carbon we dig up that is sequestered. And to get emissions to zero, that fraction has to reach one hundred percent (100%). That's not a scenario. I think that's just a fact. Yeah, it's net zero means one hundred percent (100%) capture. Yeah. It doesn't tell you anything about how much you're capturing. But it's got to be one hundred percent (100%) every time you burn the CO2 ,or equivalent amount of CO2 ,has to be captured and got rid of out of the atmosphere.

So you can see here, obviously we reach one hundred percent (100%) capture in the second half of this century in all of these scenarios. But you notice immediately, first of all, if you delayed the deployment of CO2 disposal in this way, you get the really high costs in the future. That's a very important point that you know, the longer it's delayed, the more expensive mitigation becomes. But we also see that these are scenarios that start around 2020 or so, in active mitigation efforts by 2030 to 2040, they are sequestering, capturing and getting rid of around twenty percent (20%) of the carbon dioxide generated by the burning of fossil fuels. So this technology is not new. It was available in the 1980s. It was discussed widely in 1980s and a decision was made not to deploy it. If we had actively deployed carbon capture and sequestration at the rate that it is deployed in these cost-effective scenarios for meeting our climate goals today, we would now be at twenty percent (20%) sequestration or thereabouts, and we wouldn't have a climate problem because we'd be on a path to one hundred percent (100%) sequestration before we reached one point five degrees (1.5°).

The industry could have done this internally. They could have passed on the cost onto their customers. But it would not have made fossil fuels unaffordable because the cost of twenty percent (20%) sequestration is in the order of adding ten dollars ($10) to the cost of a barrel of oil. Ten dollars ($10) is not small, but it's much less than the amount by which the cost of a barrel of oil has gyrated over the past few decades, anyway. So the crucial point is that wasn't, in my view, and I'd like you to consider this. There was an alternate course of action available to the industry. Thank you.

PANEL CHAIR CADIZ:

Alright, thank you very much, Dr. Allen. You said so many things.

Can you give us ten minutes to digest information? Can I request, as Chair of the Panel, to take a ten-minute break so we can ask more informed questions?

DR. ALLEN:

Absolutely. No problem.

[Break]

DR. ALLEN:

I'm a physicist by background, but I'm mentoring now—two-thirds of my time in a school of geography, one-third in the department of physics. I work a lot on policy implications, but I was working on the physics for twenty (20) years—it was more complicated than before the next ten (10) years. Actually, it's quite simple, atoning for my past sins making it more complicated, one of the things that really came out of the one point five degrees (1.5°) report is ambitious climate goals. They make it harder, but also made it simpler. It's very clear what we need to do. When you're talking about two degrees (2°) or three degrees (3°), there's still, you know, many different options. When you're talking about one point five degrees (1.5°), there is really only one option.

PANEL CHAIR CADIZ:

All right. We should be resuming our session now.

Commissioner Karen Dumpit will be the first to ask questions.

COMM. GOMEZ-DUMPIT:

So, thank you very much. Your presentation especially also linking it with the SDGs is much appreciated. I have a couple of questions. My first question is this, was warming foreseeable by the industry? Interestingly enough, you mentioned William Nordhaus' study on strategies for control of carbon

dioxide in 1977, and you said that this was available already at that time. So if this was available, if this knowledge was available, could you just clarify or give other, perhaps, information about how the fossil fuel industry knew about this knowledge? Because it's easy to say that knowledge was available. It's easy to declare that. But how can we know, what are the indicators that tell us that they knew about it? So how did they act on this knowledge? It's easy to say they just ignored it, but I want to be able to know what kind of actions would tell us that they knew about this study.

DR. ALLEN:

I only know of one very clear case which was an internal document. I believe a consultant of ExxonMobil, who had presented to them on CO2 induced warming and stated that this was an internal discussion within ExxonMobil; made a point that at the current rates of emissions, and the way emissions were growing, they were looking at two degrees (2°) of warming which is almost inevitable. And so this, the other thing I didn't mention, when I mentioned this figure, is that it also indicates the first time to my knowledge that anybody had said that two degrees (2°) of warming was really an upper limit. I mean, so Bill Nordhaus actually draws that line at two degrees (2°) there. And he says, well, that's the limited fluctuations we've seen over the past one hundred thousand (100,000) years. It was kind of a guess at that time, but he got it about right. I mean, it was informed by knowledge of past climates and so that indicated that as soon as, if we went past that we were into terra incognita as far as the climate system was concerned. We hadn't really been beyond that, so it was a plausible suggestion for limits and the fact that current emission trends would take us to two degrees (2°) by mid-century or the middle of the 21st century was clearly discussed within these internal documents of the industry back in the 1980s. So this was pretty widely understood knowledge back then.

COMM. GOMEZ-DUMPIT:

The Exxon internal documents were actually leaked documents, right? They never acknowledged that these were their documents, but it was leaked by a…

DR. ALLEN:

Okay. So the status of these documents would not be something I'm an expert of. I was shown this as part of the preparation for the San Francisco case. I believe it is not disputed that the documents were genuine.

COMM. GOMEZ-DUMPIT:

We established in other hearings that it was never acknowledged that it was theirs. But they never also disputed the veracity of these documents. I think this is about it. Thank you.

FR. WALPOLE:

More to re-echo what I'm hearing from you, this is on one level. Many new insights are coming as a result of the IPCC one point five degrees (1.5°) report. And you were saying that things become much clearer at one point five degrees (1.5°). Yeah. We had some presentations earlier on, that we're talking about the two degrees (2°) increase and that seemed to get a little murky because of the time projection that is involved in that. But the one point five degrees (1.5°) makes it immediate. Yeah. And therefore if I'm correct, it simplifies many of the arguments. Would you like to clarify that?

DR. ALLEN:

On two fronts, if we don't do anything, we will reach one point five degrees (1.5°) pretty soon. Sometime between 2030 and 2050. So, you know, we know where we're going and we know what the impacts will be. Where we would see, for example, seventy percent (70%) loss of the world's warm water corals at one point five degrees (1.5°), if warming continues after that we see effectively extinction of the world's warm water corals. So that's one example of an impact, that's very clear between one point five degrees (1.5°) and two degrees (2°). So it's not hard to predict the impacts of one point five degrees (1.5°) because we're already seeing the beginning of them, and given that we are at one degree (1°) now, we're already seeing the beginning of the impacts of a one point five degrees (1.5°) of warming.

On the other side, that's in terms of simplifying the case of saying what the impacts are. On the other side it also simplifies the case in saying what needs to be done to stop the warming. Carbon dioxide accumulates in the climate system. Warming will continue as long as we continue dumping carbon dioxide into the atmosphere. If we continue using fossil fuels, we would have to capture every time it's generated, and that's going to be pretty hard. We don't actually have technologies that can do that at the moment and we have to desist from using fossil fuels. But unless we do that, the world will continue to warm. We are on a path to reach one point five degrees (1.5°) quite soon. We have a similar amount of time to reduce net carbon dioxide emissions to zero if we're going to limit warming to one point five degrees (1.5°). You

don't need a climate model to do that. It's a matter of geometry. You know, you're here, you want to limit to here, and you haven't much time to reduce the rate of warming to zero in order to limit the warming. And so this is where, you know, at these very ambitious climate goals, if the climate goes over here. You might say, well, we can take all sorts of routes to it. Okay, but if the climate goal is nearby, you've got only one option, emissions have to go down, and they have to go down fast.

FR. WALPOLE:

We are certainly learning about the vulnerability that's happening in other reports. We can link the social vulnerability to the science at this stage.

DR. ALLEN:

Yes. I mean, one of the areas that has really advanced over the past decade has been the science linking global changes to extreme weather and the attribution science. You've heard about this in these hearings, and that allows us in particular to clarify vulnerability to extreme weather because most of the impacts of climate change that affect people manifest through extreme weather and as we improve our understanding of the links between global changes and extreme weather, we make that link ever clearer. And that's one area where the science has really advanced very rapidly over the past decade.

FR. WALPOLE:

Okay. Thank you very much.

PANEL CHAIR CADIZ:

Professor Allen, aside from reducing carbon emissions, you were also talking about sequestration of carbon dioxide, the technology of which was already available decades ago. Is it still feasible now as a remedial measure to avert reaching one point five degrees?

DR. ALLEN:

It is absolutely available as a remedial measure. That's probably a, quite good word to use because it is no longer enough. The task of addressing the problem simply by relying on capturing carbon as it burns, we'd probably at the stage

now where you couldn't just rely on that. You'd have to do other things as well. It's an interesting question if we'd started a serious carbon capture program in the 1980s—and by serious, I mean one similar to these scenarios that we now run, looking at what it would take to limit warming to well below two degrees (2°)—whether that would have been enough to have at least put us on a path to limit warming to one point five degrees (1.5°). I guess we may never know that, of course, because it's a counterfactual, but it's an important counterfactual to think about. And one of the points I made, which perhaps was not emphasized when I was speaking, obviously include the cost of waste disposal of carbon dioxide, the main waste product of the fossil fuel industry. At the moment, it's disposed off just by dumping it in the atmosphere. So if the industry had decided to dispose of its waste responsibly, not dumping it in the atmosphere, that would obviously eventually make their product more expensive. It adds even twenty five percent (25%) capture, I would add ten dollars ($10) to the cost of a barrel of oil. If you go up to higher levels of capture, you might actually end up with the challenge of having to recapture carbon dioxide from the atmosphere to get it back out of the atmosphere after you'd released it, as you pointed out. In the discussion, at the moment the desired rule for available technology is absolutely one hundred percent (100%) capture at source. It can get very expensive.

And that would, of course, if you included the cost of the waste disposal in the cost of fossil, rules that would make fossil fuels progressively more expensive and that would encourage, of course by the natural operation of economics, an orderly transition away from the use of fossil fuels. When a resource becomes more expensive, we tend to use less of it. That's just the way the economy works. So an orderly transition was available to us. I would say it still is available to us, but the window for maintaining it as an orderly transition is diminishing rapidly.

PANEL CHAIR CADIZ:

Are you suggesting that the carbon majors now still engage in this remedial measure? Is it a responsibility of these businesses to do that?

DR. ALLEN:

Right now, it's the responsibility of anyone who benefits from the continued use of fossil fuels and I would include myself in that. I, like everybody in this room, I use fossil fuels. I should be paying to develop an ability to get rid of the CO2, the primary waste product from the use of fossil fuels. All scenarios indicate that if we're going to meet our one point five degrees (1.5°) goals, we will be disposing of carbon dioxide in some way, possibly just with land use

changes, but probably involving active capture from the atmosphere through bioenergy and carbon capture or some other technologies in the second (2nd) half of the century. But at the moment nobody's really doing anything to develop the capacity to get rid of that CO2.

To put this into perspective, every year, we don't reduce emissions, we are dumping another forty (40) billion tons of CO2 into the atmosphere, which will have to be scrubbed out of the atmosphere by the next generation if we are to meet our climate goals. We are doing nothing to make it easier for them to do that so we're just expecting the next generation will somehow develop the technology to get rid of that CO2 and they'll pay for it at the same time that they're paying for dealing with all the impacts of climate change.

I have kids. That strikes me as outrageous and I think that's the transaction we need to be focusing on here. And so when we say today's fossil fuel industry could be paying for the development of that waste disposal capability, it's very important to recognize the fossil fuel industry includes its customers and that includes me. I would have no problem with paying extra for the use of fossil fuels that I continue to make today because I live in a country which is entirely dependent on fossil fuels. So I could not stop using fossil fuels myself. You know, you probably took an airplane to get here, but none of the cost of the fuel in that airplane was spent on disposing of CO2, some of it could have been, and if it had been, we would be on a path to a very different climate future than the one we're on at the moment.

PANEL CHAIR CADIZ:

Are you suggesting that the only reason why we… at least the carbon majors, have not engaged in this remedial measure which they should have done many decades ago, is financial? Is it because they don't want to increase the cost of fuel, which is, of course, a market-driven decision? Is it all about the financials?

DR. ALLEN:

First of all, it's not for me to say whether they should have done that, that's for you to say. But I'm saying they could have done it at a cost. And obviously they're in a difficult sort of prisoner's dilemma type of a problem, that any company that started doing this would be at a disadvantage against its competitors. I have no doubt they would argue, well, we would have loved to have done it, but, you know, then it would have made our fuel more expensive than the competitors' fuel and then we'd have gone out of business. So that's really a question for you to consider when you have a group of defendants

who could have done something together but didn't. Who is responsible? I don't know. I'm not a lawyer. You'll be hearing from Henry Shue who will also look at this question later today. In fact you know, there's a nice sort of link between this and the ethical and moral implications of these questions.

I think that's really something for you to consider. Would there have been any way for this industry, somehow working together, to get rid of its waste in a responsible way? And there are examples in the past, this very industry, for example, through the IPICA initiative, decided together to use double-hulled tankers in the early 1970s. In the 1960s, they were using these old, single-hull tankers, where if the tanker ran aground, the oil spilled out and that was terrible for the environment. It was also quite bad for the industry. And so they had a collective incentive to work, but no single company could adopt double-hull tankers because then it would make their fuel more expensive. So they actually got together and agreed to regulate and compel all to use double-hull tankers. Now that's an example. It does shows it is possible for an industry to get its act together to do the environmentally responsible thing even though it would make the product more expensive. They worked together to do so, they could have taken a similar approach with carbon capture and sequestration in the 1980s and then said, "Right, we're going to have to be at twenty percent (20%) by 2010, let's do it."

And if this industry had decided it needed to be at twenty percent (20%) sequestration by 2010 in the 1980s, looking at all the other things they've done, I would have absolute confidence that they would have done it. This is a phenomenal industry. That's ten percent (10%) of the world economy. It can do a lot.

PANEL CHAIR CADIZ:

What is the status of the San Francisco case that you earlier cited?

DR. ALLEN:

The judge denied the petition. The plaintiffs lost that particular case. I commend the judgment to you. It's a very intelligent judgment, the courts focused on this avoidability—whether the companies themselves had a responsibility or whether it was a sort of social responsibility of governments to just regulate the energy markets in a different way. The courts concluded that they could not see clear individual responsibility that could be applied to the companies. I think, as lawyers, you should read the judgment. I'm not a lawyer. That's my reading of it.

I think the question we need to ask ourselves is: "Is there an alternate course of action available that would not involve these companies immediately going out of existence—immediately stopping what they're doing—that would actually substantially mitigate the impact of their activities? Even today, if these companies would start an aggressive program of carbon capture and sequestration that would get them to fifteen percent (15%) by the 2030s, that might not be enough to get us to below one point five degrees (1.5°), but it might be enough to get us to below two degrees (2°).

PANEL CHAIR CADIZ:

So the court heard that, even as their activities impacted climate change, these companies could not have avoided doing those activities?

DR. ALLEN:

The court argued that the benefits of continued use of fossil energy would need to be weighed against the impact of that continued use of fossil energy on the environment. And that was something that only a government could do. The companies couldn't be expected to do that, and that therefore the court had no role in assigning liability. So I mean, I think it's something perhaps to discuss with Henry Shue when he comes in this afternoon by Skype, you know, this is what he does. He's a moral philosopher, so he thinks about responsibility. All I'm saying is what would have been, as a physicist, what would have been technically feasible. And then, well, where the responsibility lies is something for you to elucidate further.

PANEL CHAIR CADIZ:

Counsel for Petitioners?

ATTY. MAYO-ANDA:

Thank you Dr. Myles Allen. Thank you for your very informative presentation. You mentioned Dr. Brenda a while ago, could you confirm whether you are a co-author of that study?

DR. ALLEN:

I was co-author of that Ekwurzel study, that's right.

ATTY. MAYO-ANDA:

Thank you, and what do you think is the significance of that study to this current Inquiry?

DR. ALLEN:

Well it showed that it was straightforward to attribute some fraction of the observed increase in global temperature and global sea level to the emissions resulting from product sold by a well-defined group of individual companies. It gave a methodology for breaking down contributions. The numbers are interesting in that the fractional contributions from individual companies, and none of them are particularly large. The energy industry is not like the IT industry. We don't have like, four (4) companies dominating, in the way that Amazon and Google and so on dominate in IT. We do have more companies involved.

I think that probably has some bearing on the response of the industry. Because the industry was more split up, it's really more difficult for individual players in the industry to actually take a progressive role addressing the climate issue because of competition within the industry. So I think the numbers are interesting – the numbers involved, I mean they're not unmanageable, eighty (80) or so companies really capture most of the problem. But, you know, as I say, it's still eighty (80), still quite a lot.

ATTY. MAYO-ANDA:

Okay. Based on the attribution studies, what types of impacts are foreseeable in the Philippines and Southeast Asia, and what should the Philippines be prepared for?

DR. ALLEN:

Well, the Panel should hear from specialists in climate change impacts in the Philippines. This is not my brief, you know. The marine regions of the tropics are particularly vulnerable to changes, in storm and typhoon frequency, obvious impacts that we are studying very carefully at the moment. And there's a pretty clear evidence, across the tropics as a whole, the risk of the most intense typhoons has increased, within individual regions. There remains some continuing argument but there's also, of course, the simple impact of rising temperatures increasing the risk of heat waves. In very large urban areas, these risks can be further exacerbated by the feedback effects of the

island that affects and enhance the effect of a large scale warming, which of course make the health impacts doubly problematic. And air quality, the way climate change interacts with air quality is also particularly important for health. So these, I mean, are just some examples, from the top of my head, of impacts that I know. A city like Manila would be particularly vulnerable, as a sort of mega city in the developing world, to those kinds of impacts.

ATTY. MAYO-ANDA:

You mentioned about the San Francisco cases. Are you aware of other cases against fossil fuel companies?

DR. ALLEN:

There are other cases. I forgot to mention earlier, I believe, that case is under appeal. The judgment was promulgated in June, but it's currently under appeal by the cities. And there are a number of other cases in progress, yes.

ATTY. MAYO-ANDA:

Right. My last question is, if you're aware whether any of these fossil fuel companies actually use attribution science to look into the impacts of their activities, or the impacts of climate change to their activities?

DR. ALLEN:

I am not aware. But one interesting case, it's also on public record, the defense in the San Francisco and Oakland cases did not dispute the assertions of attributable warming, large scale warming and attributable harm. They focused on what was known when, so there was quite a lot of discussion about what was known in 1990 and what IPCC reports say at different stages, and there's a lot of different discussion on that. There was no serious debate about my work. So, in a sense, I came away a little disappointed because I was expecting an argument. But there wasn't one.

ATTY. MAYO-ANDA:

Okay. Thank you very much, Dr. Myles Allen. That would be all, Commissioner.

DR. ALLEN:

Thank you very much.

PANEL CHAIR CADIZ:

Alright, at this point we still have a few minutes before we break into lunch, and I would invite any member of the audience right now… if you have questions to the witness which might also educate this Panel, then you're free to do so. Anyone from the audience who would want to ask questions?

All right, there being none, thank you very much, Dr. Allen. We really appreciate the knowledge that you shared with us. We will now go into lunch and resume at… oh, side issue there...

Thank you very much.

[Break]

PANEL CHAIR CADIZ:

Alright, we can resume our session already. Oh, the lights were turned off so that you can view the screen better. We may start now. Let's resume our session.

Petitioners, are you ready to present your witness?

ATTY. MAYO-ANDA:

Good afternoon, Commissioners. We are presenting our next resource person, Dr. Henry Shue, Professor Emeritus of Politics and International Relations at Morton College of Oxford University and a senior research fellow at the Center for International Studies. He will discuss with us his papers on "Responsible for What? Carbon Producer, Carbon Dioxide Contributions and the Energy Transition;" and "The Nexus on Climate Justice Preventability and Protection" in 2014. The third paper is "Climate Dreaming" 2017. But before we proceed, Honorable Commissioners, we would like to reiterate the documents submitted by Dr. Henry Shue. He submitted to the Commission six (6) documents. The first is his Statement dated October 21, 2018, consisting of eight pages, pre-marked last October 24, as "VVVVVVV" to

"VVVVVVV-7." His signature as "VVVVVVV-7-A." His curriculum vitae consisting of thirteen (13) pages pre-marked as "WWWWWWW" to "WWWWWWW-12." Another document is a paper "Responsible for What? Carbon Producer, Carbon Dioxide Contributions and The Energy Transition" consisting of eight (8) pages pre-marked "XXXXXXX" to "XXXXXXX-7." The next refers to Certificates for C.C.S. at Reduced Public Cost Securing U.K.s Energy and Climate Future Energy Bill 2015, consisting of eight (8) pages pre-marked as "YYYYYYY" to "YYYYYYY-7." The next is his paper on "Climate Responsibilities of Industrial Carbon Producers," consisting of fifteen (15) pages previously marked as "XXXX" to "XXXX-14." This was marked as part of the testimony of Dr. Richard Heede last August 2018 and the sixth (6th) document is his paper on "Climate Dreaming Negative Emissions, Waste Transfers and Irreversibility," consisting of fourteen (14) pages pre-marked "ZZZZZZZ" to "ZZZZZZZ-13." Can we request the clerk of the Commissioner to confirm this?

CLERK OF THE INQUIRY:

Yes, Commissioners, we confirm the markings, as manifested by the counsel, of the mentioned six (6) submitted documents.

PANEL CHAIR CADIZ:

Alright. Thank you very much. We may now listen to your witness.

ATTY. MAYO-ANDA:

Thank you, Commissioners. Good afternoon again. Dr. Henry Shue, you may now proceed with your presentation.

DR. HENRY SHUE:

Thank you. It's an honor to be invited to this very important proceeding, and I am grateful to you for allowing me to present to you via Skype because I think, you know, that it's the election in the United States yesterday. I wanted to be here to try to do what I could to block the dysfunction of army and protection now on its way. I might mention to Skype people, I am not seeing a video of you. That's maybe not that essential, but just so you know I can't see anything from your side. What I want to talk about is the proposition that, for decades now, fossil fuel companies have been selling a product that's unsafe and in fact very dangerous, and that is inflicting harm on people. I've

been asked to explain this and why we continue selling a form of energy that produces carbon emissions released into the atmosphere that is clearly objectionable?

It's important not to treat the changes as such as some sort of tragedy. It's a result of human decisions, decisions to act or not to act. And so when harm is done, it's called on. Now, the Commission has already received very persuasive testimonies about the causal connection between fossil and carbon emissions from the combustion of fossil fuel and the damage to the climate, like the rise in temperature and the increase in the temperature of ocean water, which make cyclones more ferocious. For example, I believe in New York, you heard from Dr. Brenda Ekwurzel, and I know this morning you heard from my other, colleague Dr. Myles Allen. And so, you have already received a very clear account of the extent to which the carbon emissions are indeed producing the changes in climate that are harming people, but also responsibility doesn't necessarily bring moral responsibility because there may be some justification or excuse for a harm that someone has caused.

So first, one needs to know: is human action causing harm? Then one also needs to know, is this causation of harm violating any moral principle which makes it wrong because it might not? For example, if someone cuts open your body that's a physical harm, but if she is a surgeon and is removing some foreign object from your body, then she's causing you physical harm but it's not wrong, in fact, it does you good. So we can't just settle for saying that carbon emissions cause harm. We have to look into the moral principles involved. That's what I was asked to talk about. The moral principle in question is actually extremely simple. The most simple version of it is do no harm. That's a principle that any of us know as the Hippocratic oath that doctors take. But of course realistically it's not possible literally to do no harm. What the principle really means is do no avoidable harm. Then to the next question: if someone has caused harm, was it avoidable or unavoidable, and was there some excuse for it?

Now we know that climate stability is the pre-condition for society as we know it. It's a pre-condition for productive agriculture, for safe housing, and for many of the other activities of a civilized society. Some of those activities are absolutely essential, like subsistence food, shelter, and clothing. The most severe harm that we can do is to violate basic human rights and the effects of carbon emissions have in fact violated some of the most basic human rights. I've given you reference and Prof. Simon Pirani explained very clearly how the combustion of fossil fuels has violated the right to life, right to health, and the right to subsistence. So although I'm happy to talk about that in the question time, I'm going to go over it now because I think it is quite clear that the harms done by climate change in fact violate human rights. I'm happy to talk more about that later, if you like.

So is there any added excuse for anyone including fossil fuel companies to continue to do something like sell fossil fuels which will be burned and put carbon emissions into our atmosphere? Is there any excuse for continuing to do this? They originally defended themselves by saying that they were basically ignorant, that they didn't realize that carbon emissions were undermining the climate. We now know that that was a lie. That's not true. And I've given you some citations to some studies on this. It's not true for two reasons. One is that the fossil fuel companies themselves employ some of the world's best scientists. They were studying the effects of carbon emissions in their department as well and they knew that carbon emissions were undermining the climate. So it's simply not true that the companies didn't realize they are undermining the climate. They know it from the early scientists, first of all, and second, back in the 1980s, the knowledge that the combustion of fossil fuels was undermining the climate is so widespread that, for example, the United Nations was already forming the intergovernmental panel on climate change in the late 1980s.

So first one needs to know: is human action causing harm? Then one also needs to know, is this causation of harm violating any moral principle which makes it wrong because it might not, for example, if someone cuts open your body—that's a physical harm—but if she is a surgeon and is removing some foreign object from your body, then she's causing you physical harm but it's not wrong. In fact, it does you good. So we can't just settle for saying that carbon emissions cause harm. We have to look into the moral principles involved. That's what I was asked to talk about. The moral principle in question is actually extremely simple. The most simple version of it is do no harm. That's a principle that any of us know as the Hippocratic oath that doctors take. But of course realistically it's not possible literally to do no harm. What the principle really means is do no avoidable harm. Then to the next question: if someone has caused harm, was it avoidable or unavoidable, and was there some excuse for it?

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In any case, one of the most startling findings in that Ekwurzel paper, which you have references, is that more than half of all the carbon emissions that have been emitted, more than half of everything that's been emitted since 1880 has been emitted since 1986, the chart says that clearly. Look at all the emission since 1880—more than half have been emitted since 1986, so even if it's true—and it's not—that the fossil fuel companies didn't know about climate change in the 60s, 70s, and 80s, they certainly knew by the late 80s, by 1986 and yet half the emissions have occurred. Since then, in fact, ignorance couldn't explain the behavior because now that they know about climate change, they still haven't changed behavior, so actually there was no connection.

Now it's very uncontroversial that if a firm is selling a dangerous product, they have to do something about it, and there are two ways to do something about it: substitution and modification. Those are the two options we'll talk about in a bit. For selling something that's dangerous, one thing you can do is stop selling it, sell something else. That's what I call substitution. You know you're selling the product that's undermining the climate, you move into some other products. We're talking about what fossil fuel companies could, decades ago, have started developing—solar energy, wind power, whatever they chose, a source of energy that didn't undermine the climate—that is substitution. The other alternative is modification. You can keep selling your product, only if you modify it in some ways. If it's dangerous, instead of substitution, the fossil fuel companies could, if they had wanted to, follow the path of modification. And that would have meant developing something like carbon capture and storage.

The specialty work of the IPCC on keeping temperature rise to one point five degrees (1.5°) says this about carbon capture and storage: "While the technological maturity of capture options in the power sector has improved considerably, the costs have not gone down between 2005 and 2013 due to limited learning in commercial settings and increased energy and resources costs." This limited learning in commercial settings is the result of the fossil fuel companies not seriously investing in our carbon capture and storage which they could have done. They were engaged to harm, they had two ways to stop the harm. One was to substitute some other product: wind or solar. The other was to develop carbon capture.

They didn't seriously do either one. I want to make clear by the way that I'm not categorically endorsing carbon capture and storage, I'm making a conditional statement that if a company wants to sell fossil [fuels], they have to capture the emissions. I am not saying sell it and capture the emissions; what I'm saying is you can't sell it and not capture them because it's more morally wrong to inflict severe harms on people, and it violates basic human rights.

Now I realize that in talking about things like substituting alternative energy or developing carbon capture, I'm heading into a controversy of policy. Capturing moral responsibility sounds vague. That is not good enough to just say you're doing wrong, then stop. We, all of us, also need to think about how to stop it, because the fossil fuel companies have failed on their oath to stop doing harm. It is of course now time for governments and non-governmental organizations like the Philippines Commission on Human Rights to force them to do the right thing. I think practically all economists agree that there ought to be a price on carbon, and that's probably the best way to do this is carbon taxes. This is something that governments should have done a long time ago, but certainly should do now; this doesn't mean that the fossil fuel companies have any lost responsibility.

They have the responsibility not to do harm, and they should be eliminating the harm either through substitution or modification. That's responsibility no less than it ever was. But since they haven't fulfilled their own responsibility, the government now has the responsibility to stop them anyway through carbon taxes. Some of the fossil fuel companies are now saying, "Oh, right, carbon taxes are a good idea. Let's have carbon taxes in the United States." The carbon tax proposal that they endorse is one called Baker-Schultz carbon tax, but buried deep in that proposal is the removal of all legal liability from fossil fuel companies where all of the harms picked up. So actually that bill is what the Los Angeles Times calls a "toxic quid pro quo:" get the carbon tax reducing the harm, meanwhile give the fossil fuel companies a "get out of jail free" card by eliminating their legal liability for all the harm they have already done. Absolutely no reason why the introduction of the carbon taxes should

include the elimination of legal responsibility on the part of the fossil fuel companies. A much better proposal, for example, is one from a group called the Citizens' Climate Lobby and another from the Carbon Feed and Dividend.

As I said, if fossil fuel companies are going to continue to extract fossil fuel, to sell them, then the emissions have to be captured. There is a mechanism for this, which I quote here in testimony: it would be perfectly possible for governments to introduce a certificate system that would say, "If you're going to extract or sell fossil fuel, you have to have a certificate that specifies the amount and you have to begin to capture carbon emissions from that fossil fuel." It wouldn't be realistic to require one hundred percent (100%) capture in the beginning because the fossil fuel companies haven't developed the technology that is exactly adequate. But, quickly, companies should be required to capture a higher percentage. If the technology is not available, then the fossil fuel company cannot be certified to extract and store fossil fuel, except for fossil fuel companies that can develop that adequate technology.

Finally, let me just quickly mention there's now a lot of talk about carbon removal and some people are saying we don't have to worry so much about either substitution of non-emitting tools like solar and wind. Don't worry about carbon emissions because the carbon can be removed later. I think this is a very dangerous idea. I just want to quickly point out a couple of reasons why. The first is that none of these technologies have been adequately developed because few corporations have invested in them. So there's no guarantee that they are adequate, but certainly not adequate now. Secondly, one of the carbon capture technologies that's talked about the most is one that I'm sure you're familiar with, bio-energy carbon capture and storage. Any form of filing, including this one of course, means growing a lot of biological material which takes a lot of plants and water. I think there's a great danger of other kinds of environmental colonialism because this will rely heavily on any solar power energy including the patch.

There's a real danger to food when we see land for the production of food taken out for carbon capture. Finally, we shouldn't rely on removing later, as meanwhile, the mushrooming emissions may have caused irreversible damage. On one hand, it's true that carbon emission into the atmosphere can, in principle, be taken out again, so the accumulation of carbon in the atmospheric accumulation may grow too large. We may be able to remove the carbon and bring it back down again, but that doesn't mean that everything will just be the same because, meanwhile, while the accumulation of carbon is so large, changes may occur like the melting of permafrost, the irreversible melting of ice sheets, and those changes may well continue. In fact, they might even cascade. I refer you to a very sobering study on how such changes could cascade. I think I'd like to stop now and take questions. I'd like to just

make sure again, for the technical people, I can't see anybody there. It may not matter as long as I hear you.

ATTY. MAYO-ANDA:

Can you hear me, Dr. Shue?

DR. SHUE:

Yes. Yes, I hear you.

ATTY. MAYO-ANDA:

Well, we haven't met personally, but we talked. I'm one of the legal representatives of the Petitioners and I'd like to raise some questions.

DR. SHUE:

Yes, please.

ATTY. MAYO-ANDA:

Our first question is, do you believe that the Respondents in this case and other fossil fuel companies have the ethical responsibility to assess and disclose the risks that the business poses to various stakeholders, especially communities most vulnerable to the impacts of climate change?

DR. SHUE:

Absolutely. The principle that I'm appealing to, the very simple one that "you should do no avoidable harm" means you have to assess what the risks of harm are. What we call risk assessment is simply working around, investigating and seeing whether what you're doing might harm someone. The responsibility not to harm people fundamentally includes the responsibility to see whether what you're doing is harming people and, as I emphasized in the initial statement, you change your own behavior so that you stop engaging in harm. But of course we don't want to treat other people as passive. Other people are acting agents and so if you give them information, they can take steps to protect themselves.

So one of the important features of a risk assessment is communicating the risks to everyone involved so that the other people can act on the information you've given. If you're not studying the risks of your behavior, you're not taking seriously your obligation not to harm people. And if you're not communicating those risks, you're not bringing the other people into a position where they can protect themselves.

ATTY. MAYO-ANDA:

Thank you, Dr. Shue. You mentioned about responsibility. Perhaps you can elaborate further on how would that look like in the context of vulnerable communities, like communities in the Philippines, vulnerable to the impacts of climate change?

DR. SHUE:

Right now, in terms of climate change, we're moving from mitigation to adaptation or loss of damage. So as I said in my written statement, I only talked about one responsibility this afternoon, which is the responsibility not to do avoidable harm. But there are lots of other responsibilities. We've tried to say one thing reasonably and clearly, but as I said responsibility of course is if you have harmed someone, you have the responsibility to make them whole, to restore the damage that's done.

The US government doesn't like for people to talk about compensation, and of course the fossil fuel companies don't like to talk about it either. But again, the moral responsibility questions here are not rocket science. They are the principles that mothers teach children all over the world, that is, if you make a mess, you should clean it up. And the fossil fuel companies have been making a mess for decades and they're continuing to go right ahead and make a bigger mess. And so, first of all, they should stop. Second, they have to compensate people for the damage that has been done.

We now know that storms generated over the ocean come more severe when the ocean becomes warmer, and the oceans are becoming warmer because there are carbon emissions in the atmosphere.

ATTY. MAYO-ANDA:

Last question. As you know, Professor Dr. Henry Shue, none of the Respondent companies have actually participated so far in the dialogue, and I would like to get your perspective on how a company, who actually upholds

human rights, how should it ideally respond to this Petition, or to any of the cases pending now against fossil fuel companies?

DR. SHUE:

First, I think it's disrespectful of them to not respond and not take the Commission seriously. And that's insulting to the Commission. The Commission deserves to be taken seriously. But secondly, they have something to say, they should say it. I expect they disagree with some of the things I've just said. That's fine. If they think what people are saying are mistaken, all they have to do is to formally explain why they say so and give their point of view. The history of many of the fossil fuel firms has been a history of evasion, secrecy, and deception. And now we know much more than they admitted. They have not participated in the public discussion. When they do participate in public discussion, they do it in a misleading way, like the examples I gave at the Baker-Schultz Carbon tax, where they say, oh yes, on top, carbon tax. And it turns out our proposal frees them from legal responsibility. So they think what they're doing is okay. They should come in and say why and discuss it with the rest of us.

ATTY. MAYO-ANDA:

Thank you very much. Dr. Shue. Commissioners?

PANEL CHAIR CADIZ:

Thank you very much, Dr. Shue.

Okay, our panel would be asking questions. Here is Dr. Walpole.

FR. WALPOLE:

Sorry, I'm invisible to you.

DR. SHUE:

It's okay, as long as I can hear you.

FR. WALPOLE:

We've been very interested in what you've been tracking here from a moral perspective. One basic question I would like to ask is whether you are familiar with the Oakland in California vs. Chevron corporation, Exxon?

DR. SHUE:

No, I'm not.

FR. WALPOLE:

Oh, okay. Because there's been quite a discussion of that earlier as to the basis of the first decision there. One brief question before I hand over. Most of... are you still able hear?

DR. SHUE:

Yes.

FR. WALPOLE:

Okay. The moral argument is something that really doesn't enter in the legal dynamics. In fact, it comes in through the human rights, that's the strength of it. But human rights, diminishing in many contexts, at the moment. So how best could we, in a very economic context, present the moral argument, because it's not holding in the courts at the moment. They are certainly not compelled by moral arguments.

DR. SHUE:

Well, it is a challenge. And of course, as you know very well, the end of legal arguments and the end of moral arguments are different to some extent. But, first of all, human rights in particular of course are embodied in a strong and international law, international covenants and, elsewhere. So insofar as the harm that's being done, the Commission is underscoring human rights. It's violation of international human rights that's being done by companies. I realize it's, strictly speaking, no way to enforcement. But I think it's important to point out that the kinds of harm being done is not a peripheral matter. People are being killed on the ground. These violations of human life may be difficult

to enforce legally. I've tried to stress that argument, very much parallel to the argument about cigarettes and cancer.

The tobacco companies, I don't know the legal technicalities, but basically tobacco companies were found to have been selling a product that is harming human beings. And this was an activity that they were told to stop. It seems to me that some lawyer is able to argue it's okay to do it. But it would be a strange kind of society in which people are free to inflict bodily harm and death. Other people believe, as much they liked, as long as it was a profitable activity, that's not illegal.

FR. WALPOLE:

Thank you. Thank you very much.

PANEL CHAIR CADIZ:

Good afternoon, Dr. Shue, this is Commissioner Cadiz. I have some questions.

Thank you very much for inserting a philosophical dimension to this dialogue or conversation on climate change. You did mention that the problem is that the carbon majors are selling unsafe and dangerous products. But isn't it the problem also that we continue to buy these - consume and partake of these - unsafe and dangerous products? What do you have to say to that?

DR. SHUE:

Well, in many cases, they haven't had an alternative. Other people need energy and there was a time when that energy was the most portable energy possible. Luckily, that changes. One of the best use of that page is that economically alternative energy has become competitive in price with fossil fuel. So people do know. But, I think it's important to understand the power of our energy systems. The global fossil fuel energy system is a monster of an institution involving, you know, mining coal, drilling oil, sending supertankers around the world, running refineries, pipelines, all kinds of service stations, and other forms of delivery service. This is a huge energy system. And it's completely unrealistic to think that someone who needs energy but doesn't want to be implicated in the fossil fuel energy system can somehow just walk away from it. This is a huge all-encompassing social and economic system that it's very difficult for individuals to escape. So I don't buy the argument that the people are also at fault because they buy the product.

We have the argument. People need the gear. A fossil fuel at one point was the only gear that we can get. Later, it wasn't the only one, but the only one they could afford. And so I think there's a sole responsibility on the part of the rest of us. To make available a no-carbon energy to people, and of course that's one branch of the argument I'm making about fossil fuel companies. They don't want to go down—don't or can't go down—the route of extracting and capturing. They can go down to the substituting and that might be better than in any case of providing people with something that is safe. You can't blame people for buying something that fills a need that needs to be filled, like electricity that lights lamps so your children can study, or cook your food, warm your house. If you can't blame them, providing the only thing that's available, the rest of us have to make other things available. And that's one service model companies could perform now in partial compensation for their previous behavior.

PANEL CHAIR CADIZ:

Thank you very much. Another question… you made an analogy between the carbon majors and the cigarette companies. Right now, there are warnings, clear warnings on... cigarette box, saying that smoking can kill you, smoking can cause cancer and all sorts of diseases. If somebody intelligent enough reads that warning on the cigarette pack and still insists on buying and consuming that product, who would be more responsible? Would you say that there is an equal responsibility for the damage to the health of the consumer, equal responsibility on the part of the manufacturer and the consumer?

DR. SHUE:

Very good point. The purchase of the cigarettes is the decision of an individual consumer. I myself would be inclined to demand the cigarette companies. But the argument has been that decision of individual consumer... that case, in point of view, is quite different because here we are talking about a product that's not harming individual persons who choose to use it. We're talking about a product that is undermining the climate of the whole planet, and so I can't see any argument for anybody either providing the product for free. And that's why I think it's to be continued to be sold. The carbon needs to be captured and it's impressive and you cannot do that. We don't want to do that. And you can't sell this. This is not, I realize I'm the one who made the parallel, and there are some parallels, but you just bought out one very important lack of parallel that this is not an individual choosing something that harms that individual who made a choice. This is an activity that's undermining the

planet, that causes damage to people everywhere, and other species dependent on New York.

PANEL CHAIR CADIZ:

I'm not arguing for or against the fossil fuels at this point in my dialogue with you. Now, I'm just exploring the philosophical elements of the point that you raised here. But do we, us consumers, not have, in fact, the option, for example, of buying... setting up windmills, or buying solar panels, instead of purchasing carbon fuels. Is that option not available to us all?

DR. HENRY SHUE:

It's available to some people. But that is more expensive? You know, as I said before, the good news is that we're reaching a point where it is in fact economical for people to do things... I think that it's still true that no one is free to inflict serious harm on other people. So if someone said, oh, I know that if I use solar panels, I wouldn't be undermining the climate, but lots of people have no choice really. If we're buying the fossil fuels and the emissions are not being captured, we are undermining a lot of other people. So that's why I said, in the written testimony, I think we should gradually make it impossible for people to use fossil fuel if the carbon is not captured. And if that can't be done, can't capture, then you won't be able to use the fossil because it just emits carbon and undermines the whole planet.

PANEL CHAIR CADIZ:

Just to explore further this dialogue… if the carbon polluters, the carbon majors, were to put in all their products: "Consuming our products is dangerous to your health…"

DR. SHUE:

Sorry, I didn't get that. If the carbon maybe…

PANEL CHAIR CADIZ:

…Put on their products the warning that fossil fuel is dangerous to your health, would that exculpate them from any form of moral or legal liability?

DR. SHUE:

I don't think so. They've already done a lot of damage. That would be a meaningless standard. But, knowingly, they have been doing damage for decades now. And I think that finding since 1980, sorry that you mentioned, half the emission since 1880 have been since 1986. It means half of the emission was done since college and they have not taken responsibility for damage.

PANEL CHAIR CADIZ:

Yeah, but that's speaking of the past. Starting today, henceforth, for any hypothetical damage that may be caused by their product, would they still be liable after putting up a fair warning?

DR. SHUE:

Well, they might. If they're not, then they're not responsible. They will do something else again. I mean, you know, many fuel companies will pull our legs. Why is that? For example, disease and heart disease from particulate matter, you know, lots and lots from burning coal. Even if I am the controlling partner, I'm not sure I would live. Am I answering you? You have a true-to-life question.

PANEL CHAIR CADIZ:

No, I get your point. Well, one final question, professor… If the carbon majors were, hypothetically, to stop selling their products, all sorts of products based on carbon, by tomorrow, will they be legally liable? Will they be open to suits from the public for not selling their products?

DR. SHUE:

I think that even if they stopped selling everything immediately, they would still be liable for the damage they've already done.

PANEL CHAIR CADIZ:

No, but would they be liable for not selling their product starting tomorrow? If tomorrow all the carbon majors were to say "all right, our products are not good…"

This is just a hypothetical, morality dialogue... if they say tomorrow, "we agree with you that our products are bad, and, henceforth, we will stop selling all our products…," would they be opening-up themselves to suits, legal suits, from governments and from the public, for not selling their products? What do you think?

DR. SHUE:

You mean, people might say, well, we need energy and you fellows, you're harming us?

PANEL CHAIR CADIZ:

Yes. All the cars or airplanes, all the energy plants. Would they be opening themselves to that liability if they took that position?

DR. SHUE:

Well, of course they're not going to think that hard to worry about it. I don't know that anybody has an obligation to provide people with something that they need. I mean, you know, people need food. Does that mean the farmers are obligated to follow it? Or as a doctor or as a librarian, I know that people need food. Am I under an obligation to be a farmer? And so I don't. I mean I admit, I never thought about what would happen if all stopped selling bombs; I don't see why it stopped. But of course they have enormous resources and it would be better to invest in the development of alternative energy. It's ridiculous that they're still spending vast amounts of money exploring for possible… and we all know that the existing reserves are about five times the amount of fossil fuel that could not be safely burned unless you had some wonderful carbon capture technology. All that money going into exploration and development... So there's no need to just stop. What they should do is invest in alternatives and do something. I guess they have enough. Pardon, decide whether they really have an obligation to do that, and they would certainly move. Great benefits if they use their resources to find another way. People do need energy. So it's a very false choice of either sell fossil fuel all

throughout or don't do anything. They have lots of choices. They should do their target.

PANEL CHAIR CADIZ:

Yes. I actually agree with you that, in fact, the greater challenge now is to invest more into transitioning from bad fuel to renewables and cleaner fuel that will protect our environment.

Thank you very much.

ATTY. MAYO-ANDA:

Thank you very much, Dr. Henry Shue. Thank you for taking time to present testimony today.

PANEL CHAIR CADIZ:

Thank you very much, Dr. Shue. Alright...

DR. SHUE:

Glad I did help further the work. I appreciate your attention.

PANEL CHAIR CADIZ:

We appreciate that and we'll continue communicating with you. Thank you.

DR. SHUE:

Yes. Okay.

PANEL CHAIR CADIZ:

Can we proceed, Petitioners' Counsels, with your next witness?

ATTY. PAUDAC:

Thank you, Commissioners. Our next resource person is Dr. Dylan Tanner, executive director of Influence Maps C.I.C., C.B.C., a U.K.-based non-profit that maintains a basic analysis platform detailing how the world's leading corporations and trade associations, and the lobbyists they fund, are influencing and impacting the implementation of policies and regulations dealing with climate change. These include policies which seek to implement the targets of the Paris Agreement established in 2015 by the United Nations Framework Convention on Climate Change or FCCC, dealing with greenhouse gas emissions issue with adaptation.

Dr. Dylan Tanner will share on European corporate influence in climate policy action. He has submitted statements, to be precise, three (3) documents. First is the statement of Dylan Tanner dated October 21, 2018, in eighteen (18) pages, pre-marked as "MMMMMMMM to MMMMMMMM-17." His signature was pre-marked as "MMMMMMMM 17-A." The second document is his curriculum vitae consisting of one page that would be marked in this exhibit as "NNNNNNNN." And finally the printed PowerPoint presentation entitled "Petition Requesting for Investigation of the Responsibility of the Carbon Majors for Human Rights Violations or Threats of Violations Resulting from Impacts of Climate Change" consisting of eleven (11) pages. We just premarked as "OOOOOOOO to "OOOOOOOO-10." May we ask for confirmation from the Honorable Commission?

CLERK OF THE INQUIRY:

We confirm the markings, as mentioned. Except that the signature of Dr. Dylan Tanner is marked as "MMMMMMMM 14-A" for record purposes.

PANEL CHAIR CADIZ:

Is that correct? Alright. So it's the same AAAAAAAA.

Okay. You may now proceed to present, Dr. Dylan Tanner.

DR. DYLAN TANNER:

Thank you very much, and good afternoon. I am Dylan Tanner, executive director of Influence Map. And my colleague, Edward Collins, is somewhere there, and he has an encyclopedic knowledge of lobbying by the oil majors and will help me in the Q&A if need be. So thanks for the opportunity to

appear before the Commission in this manner on this important topic. It's in the interest of not just the people of the Philippines, but also the global community that the activities of the carbon majors on climate change be placed under scrutiny, and they be held to account for any wrongdoing. My statement is an outline or analysis which shows how the carbon majors continue to undermine the global progress on climate change. While they may or may not be directly denying climate science anymore as they did in the past, their continued lobbying activities are tantamount to denying civil societies around the world the ability to implement needed policy and regulatory measures on climate.

The need for this strong policy response was highlighted by the recent IPCC reports in October, relating to one point five degrees Celsius (1.5°C) warming. And we should remember that these carbon majors are companies with stakeholders in society and they rely on a social as well as legal license to operate. And this license may be revoked if they don't alter their behavior relating to climate change. Paraphrasing the CEO of Royal Dutch Shell earlier this year, on their actions on climate change, he stated that "our corporate priority as regards the company's social license to operate is hanging in the balance these days."

I'm going to explain about influence method, our methodology, and why we're qualified to give evidence on this topic. I will say a brief statement about the need for strong climate policy, and who has articulated what. I will go into a brief history of climate denial by the carbon majors. our evidence essentially starts at about 2010 and it's related to ongoing activities. I will delve into more details on that, and then two examples of egregious lobbying by the carbon majors in the European context, and in the U.S. context as well. And then wrap up with my conclusions. As mentioned, influence map maintains a public-facing analysis platform detailing how the world's leading corporations and trade associations, and the lobbyists they fund, are influencing and impacting climate change policy.

We are funded by philanthropic foundations with the objective of maintaining this information resource in an open source manner to various stakeholders. These stakeholders include campaign groups, investors, shareholders of the carbon majors, research institutions including academia, policymakers, and the world's media. Our work has been used in the U.S. Senate by Senator Sheldon Whitehouse in his attempts to reduce the impact of oil companies on U.S. climate policy. our work has been featured in over a thousand media articles in the last three years, including The Economist, Reuters, C.N.N., Bloomberg, and more. And just for clarity here, some of our funders, it's open source on our website. Here are some of our stakeholders.

I think a key group to note here is the investment community, particularly the world's pension funds, like the San Francisco Employees' Retirement System. These pools of money, these pension funds, multi-trillion dollar, some of them have beneficiaries. They're concerned about systemic climate risk in those assets, those portfolios. And they are extremely concerned about the ongoing activities of fossil fuel companies, including the carbon majors, holding back needed climate policy, which may impact their portfolios and the livelihood of their beneficiaries.

We work with the Climate Action 100+ process, an engagement effort by three hundred ten (310) investors with over Thirty Trillion Dollars ($32 Tn) in assets under management, engaging with one hundred (100) of the most important, systemically important, companies in relation to climate change. Quite a few of the carbon majors are in that group of companies. So our research, our analysis of climate lobbying directly feeds into the investment engagement process with those companies. And there you can see some of our media activity.

So I would say a little bit about our methodology as it is. It will come under scrutiny in this process we devised in 2015 in response to a demand for an analysis on this topic. Its evolution was done in conjunction with the Union of Concerned Scientists who has a strong interest in this area. Our methodology is overseen by an advisory group and continues to evolve, according to external suggestions.

Importantly, it ensures the assessment of corporate influence over policy is done in an objective and consistent manner, allowing the resulting analysis and metrics to be relied on to compare with corporate behavior. The definition of policy influence is derived from a 2013 U.N. Guide on Responsible Engagement with Climate Policy that sets out the different activities considered to be important in influencing government policy and regulations. The company positions are measured against benchmarks which are stated by mandated bodies like the USCPA, IBCC, and others. We rely, almost entirely, on public disclosures, mostly by the companies themselves, under various circumstances. And so, for a particular company, we score one hundred (100) or more pieces of evidence for the carbon majors. It's a very dense evidence on this topic. The resulting metrics can be regarded as a pattern of corporate behavior. So the full details of our methodology, an open source, is on our website.

I will give you a bit of a background on how the world assesses companies when it comes to climate change. Traditionally, companies have been assessed based on their emissions and scope. Scope 1 means their direct emissions; scope 2 means the emissions of their supply chain; and scope 3 means the emissions of their products. We introduced the idea of a carbon

policy footprints, which can't be measured in tons of CO_2, but is possibly equally and possibly more important than the physical admissions of each individual company. This is a concept which was introduced before we came along a Harvard Business School paper in 2011 by other academics and researchers. We were the first organization to put numbers behind it and then analyze it so that companies could be compared on a like for like basis. I will go briefly into a little more detail on our methodology because it's important for our conclusions.

It's quite an involved process. We score a batch of two hundred fifty (250) of the largest industrial companies in the world. It's important that we score and look at their associated lobby groups in the same manner. And, so far, we assessed thirty (30) of the largest carbon majors, and I list in the appendix the ones that we have assessed with their scores. So under our system, each company receives a score, a total score from zero to one hundred (100), zero being absolutely egregiously against climate policy and one hundred (100) being fully supportive. Of course, all companies are somewhere in the middle score. Under fifty (50) indicates opposition to Paris, the line to climate policy.

We also measure the level of activity, intensity of activity. And this is very important because it indicates a strategic mandate to lobby either positively or negatively. So if we have a score below fifty (50) and a very high engagement and intensity, that indicates that the company from the top down has decided to lobby against a climate policy consistently. And that is the behavior that we're seeing in the carbon majors. And furthermore, we did another assessment, looking at the economic size of the companies overlaid with the intensity of their lobbying and the nature of lobbying, positive or negative.

And we found that actually almost all of the impacts of climate lobbying globally is conducted by a small batch of giant multinationals and thirty-five (35) of these are on the negative side. And, um, BP and Exxon Mobil, Heidelberg Cement, Occidental Petroleum, Royal Dutch Shell, and Total, all carbon majors, a group very influential and very consistently negative on climate.

So I will remind you of how the world decided that there's a need for strong climate policy. The IPCC, established in 1988 by the United Nations to address the issue of climate change from a scientific viewpoint, has made statements to policy-makers stating that a rapid progress may be made by regulatory and economic measures by governments. And taking this lead, many regional and national bodies have attempted to regulate greenhouse gas emissions. The U.S. EPA in 2009 established that greenhouse gases are a threat to public health. This laid the basis for the Clean Air Act.

Because of that, the U.S. EPA also proposed the Clean Power Plan, lobbying of which I will cover later. The European Climate Change Program was established in 2000 after the ratification of the Kyoto treaty and its flagship, a E.U. emissions trading scheme, was proposed in 2005, and again I will cover the lobbying and watering down of that by industry later on.

So we have a clear guidance on the need for strong policy from mandated bodies who studied the climate science, as well as the science of policy. And this process has been underway for about two decades since the Kyoto Treaty of 1997. We've seen in those two decades very little progress on binding meaningful policy, anywhere in the world. And we regard the key factor in that has been consistent opposition from powerful industrial interests, particularly the carbon majors and their lobbyists.

So I imagine the Commission has heard evidence on climate denial, particularly emanating from the United States. I will go over this very briefly to set the scene for where our evidence start.

A study by Harvard University in 2008 found that Exxon Mobil has misled the public over a multi-decade period on climate change two years earlier. The New York State Attorney General and other regulators announced investigations into, and I'm quoting here, whether ExxonMobil and other fossil fuel companies may have violated various racketeer and consumer or investor protection statutes in their communications regarding a global warming. In other words, they were lying and deceiving the public. The attorney general does not bring such charges lightly so we can take this as credible evidence of serious malpractice.

Two points to a wider system. Systemic attempt by industry didn't deny climate science and regulatory action during these early years. The Global Climate Coalition, or GCC, an industry grouping, was set up in 1989 and disbanded in 2001 when it became politically unviable to continue. According to a 2015 research by the Union of Concerned Scientists, GCC members integrated analysis from the EPCC and other climate models into their own business while publicly criticizing these models and rejecting them. So they were taking the learnings of the climate scientists planning for the future in their companies and at the same time denying the very science and denying the need for regulations. This has been documented by the Los Angeles Times and others. GCC past members include Exxon, Shell, B.P., Chevron, among many powerful trade groups representing other carbon majors.

Our analysis of a climate change law begins around 2010. By this time, the GCC had long been disbanded. Fossil fuel value chain companies started to publicly accept some of the scientific findings of the IPC, saying they support the Paris Agreement and the need for strong action. However, our research

shows them to have continued attempts to undermine efforts by publicly mandated bodies to act decisively on climate change. So they've hidden tactics, their tactics are more hidden and more subtle, but the results are the same.

The remainder of this statement provides comprehensive data-driven evidence demonstrating these lobbying efforts continue unabated. I would also like to point out, sorry, point to the influencemap.org website, which archives over 50,000 pieces of scored evidence from 2010 and 2011 onwards on the carbon majors and other companies and their lobby groups documenting this behavior and clearly its impractical to include that knowledge base on paper—an Appendix 2 to my statement there. The examples I gave are representative of patterns of behavior exhibited or shown by that database.

Here, in graphical form, illustrating my points that the tactics have changed but the results and strategy remain the same. So you have the CEO—in the timeline of Exxon—denying the climate science in 1997, in 2001 urging George W. Bush to pull out of Kyoto. By 2000 and 2012, Rex Tillerson, still seeding a doubt as to the validity of climate science. By 2017, the Exxon has largely not stopped denying the science and the urgency to act, but their trade associations have not. The very powerful trade organization API, American Petroleum Institute, CEO Jack Gerard said, we don't support unnecessary redundant costly regulations. This guy gets paid Thirteen Million Dollars ($13M) a year. So he must be doing something right or excellent.

Exxon is not alone in this strategy. We detect similar activity from the European carbon majors, Royal Dutch Shell, and others. They've all polished up their topline P.R. in climate change, recently stating support for the Paris Agreement, asking for a price on carbon, vague statements that do not actually commit them to doing anything. It's just P.R. Meanwhile, they're undermining critical renewables policy in Europe. Among other things, I'm pushing for a policy which will favor their own product, gas, pitching it as part of the solution to climate change. The trend we've noticed on influence map is a shift of focus by these companies to strongest anti-climate lobbying through powerful external lobby groups. It's difficult for these companies now to say things publicly, but their trade associations are doing that dirty work. A large part of our research project is to track these lobby groups, to track their links to the companies that fund them.

Highly powerful and oppositional groups include the American Petroleum Institute I mentioned and the National Mining Association in the US, Fuels Europe, Business Europe, and others around the world. I'll go into more details on these, but I want to point out at this stage that not all corporations are negative on climate policy. We've detected a groundswell of genuine support by companies whose business models favor a low carbon energy

transition and I just want to give you a snapshot of our corporate analysis, on the horizon, whether they support or oppose climate policy on a global basis; on the vertical level of activity. So you'll see our friends, Exxon, Shell and the carbon majors in the upper left strategically opposing, and companies like Unilever; Jolla is a Spanish utility going full tilt into renewables.

Similar situation—Nestle, Apple have committed to one hundred percent (100%) renewable energy now, and so it leads the policy pathway. So these companies are essentially in a struggle against the carbon majors, but they're outdated business models for the ambitious climate policy. Unfortunately, the upper left still have the upper hand; they're still winning because they have a history and legacy of tactics. They have the gridlock on the most powerful lobby groups. The other side is just not lobbying actively enough to counter this.

So I want to say a little bit about these lobby groups since this is where the current anti climate lobbying is going on. So much research by the Union of Concerned Scientists on the U.S. landscape, and the University of Westminster pointed to the profound impact these trade groups have on climate policy. And this was published around 2014 and 2015 timeframe. So our scoring intrinsically incorporates the relationships that companies have with these trade associations in a detailed, subtle way.

And due to their prominent role in climate lobbying, we did a research in 2017 determining which were the most powerful, absolutely oppositional trade groups around the world on client and the climate agenda. There's a ranking available on our website, but I will point to the U.S. Chamber of Commerce, the National Association of Manufacturers, Suffolk, which is a European Chemicals Association, Business Europe, that Cross-Sector European Association, the American Petroleum Institute, and several business federations in Japan as well. We tracked which companies with the deepest and widest network have ties to powerful oppositional lobby groups. And we come back to good friends. Exxon and Shell, having the numbers, rank one and two in the deepest ties to oppositional climate lobbying groups. And French oil major Total is in there, at number five. Again, this is a public-facing research, a report published late last year.

So to recap, our research shows the carbon majors, particularly the large integrated oil companies, present the most powerful oppositional force against policy on client progress, on climate policy, both as individual companies and through their networks of powerful lobby groups. And here is yet another graphical image of that struggle between oppositional and supportive trade associations here. The opposition are outgunning the supportive ones completely by their size, their funding, and their historical legacy and connections with policy-makers around the world. But now I want to delve

into two case studies of climate lobbying that had a profound impact on the ability of the world to really address climate change in the last decade. I should repeat these are just representative cases, important ones, but they're by no means isolated. We could come up with another ten (10), to fifteen (15), to twenty (20) examples from around the world.

The European Emissions Trading Scheme [ETS] launched in 2005 by the European Commission is a cornerstone of the E.U. policy to combat climate change. It focuses on emissions from industrial and power facilities. It was designed to cover forty-five percent (45%) of greenhouse gas emissions. Since the first efforts to formulate the E.U. ETS in 2002, more recent 2018 research, including ours, shows European industry lobbying consistently weakening or blocking it. Research from both Influence Map and by the University of Westminster points to a core group of trade associations, including the powerful groups representing European oil and gas and cement as being the key forces behind this blockade. Influence maps' detailed tracking implicates various carbon major companies either directly or through their trade groups. BP, Cemex, Heidelberg Cement, Italcementi, Lafarge, Holcim, Repsol, Rio Tinto, Royal Dutch Shell and Total.

Now moving to the other side of the Atlantic, the Clean Power Plan, that U.S. flagship climate program, was halted by the US Chamber of Commerce-led lawsuit in early 2016. This was before Trump. This was the culmination of many years of systematic opposition by corporate America from regulation on climate change. Influence maps analysis has compiled multiple hundreds of pieces of evidence of utility, coal, oil, and industrial interests directly opposing both the Plan and the E.P.A.'s authority to regulate greenhouse gas emissions. Carbon majors either directly or indirectly involved in this in a profound way include Apache Corporation, B.H.P., B.P., Cenovus Energy, Chevron, ConocoPhillips, EOG Resources, Exxon, Hess, Marathon Oil, Occidental Petroleum, Royal Dutch Shell, and Total—all carbon majors—illustrated my points. This is going on all around the world. And these carbon majors are global companies, some bigger than others, with global networks and with a similar strategy to avoid being regulated on climate.

As I outlined earlier, influence maps research has highlighted systematic inconsistency between the top line statements on climate change policy by Exxon, BP, Total, Chevron, and other carbon majors, and their direct or indirect lobbying activities, that is, it's no longer politically acceptable for these companies to oppose climate change agenda directly. So essentially their need to engage in green washing. That is deception. So this is a grave, grave concern to shareholders, hence their strong interest in our analysis. Shareholders like to understand what a company is doing, what they're saying, whether it's true, I'd like to understand their future direction and they can't because they're being lied to.

A Shareholder Resolution presented to Rio Tinto in 2018 the misalignment of its climate policy positions compared to that of its powerful lobby group. The Minerals Council of Australia relied on our analysis to inform the arguments and they put a Shareholder Resolution to the company to manage the issue about corporate governance. And just last week, key pension funds including the Church of England Pension Plans and Sweden's AP Fonden wrote to the CEOs of Europe's largest industrial companies on their climate lobbying and use of trade associations in particular to undermine critical European climate policy. Among the targeted companies displaying negative lobbying were carbon majors, Rio Tinto, Arcelor, Mittal, BP, Shell, and R.W.E.

So it's not just us saying this. There are well-funded public pension plans with the mandates to protect their assets on behalf of and for the benefit of future generations—they are stepping up action on the carbon majors in their current activities. So I'd like to conclude now. Carbon majors operating both individually and through global networks and lobby groups continue to systematically oppose ambitious and urgently needed climate policy recommended by the E.P.C.C. and other mandated bodies to tackle climate change. This is increasingly inconsistent with our top line statements and can be considered as deception. This is a particular concern to their shareholders in the form of the pension funds.

This pattern of deception follows their direct climate denial in the past and could point to liability for climate change damages going forward. Thank you.

ATTY. PAUDAC:

Thank you for your presentation, Dr. Tanner. We mentioned earlier that the carbon majors, specifically Shell, BP, Exxon, Total, Chevron in their P.R. materials are still continuing to do this strict oppositional strategy against a climate policy. So do I take it to mean that their behavior towards lobbying did not change at all and they are continuing or pursuing that trend, which, as you mentioned, are very, very negative to the climate?

DR. TANNER:

Yeah. As I mentioned, they find it difficult to publicly say this stuff directly, but they are pushing their trade associations that have remained unchanged in their strategy. They have funding. I mean these are particularly the sector specific trade groups like the American Petroleum Institute and Fuels Europe. They have no other members, only the oil companies. So they are directly there. They are the voice of those companies.

ATTY. PAUDAC:

Thank you for that confirmation. Again, based on your extensive research and analysis of the documents of these carbon majors, have you seen any difference as to the lobbying strategies being employed by carbon majors in the U.S. and Europe? I'm asking that because most of the respondent carbon majors that we have here are actually headquartered in the U.S. and countries in Europe. So have you seen any difference?

DR. TANNER:

The nature of the influence tends to be more subtle in the European context, due to the difference in the way policy is formulated. I think in the United States it's very confrontational, as I mentioned, the lawsuits against the EPA, the Environmental Protection Agency. I mean that's not a subtle move – a lawsuit – by the Chamber and the trade groups. In Europe, the policy influencing tends to be gradual. It starts when the policies are first proposed by the Commission. Oftentimes they have technical staff working with the Commission on its formulation and it has the same impact. It's just different tactics to account for a different regulatory process.

ATTY. PAUDAC:

Thank you for that answer. After these hearings, I'm eager to hear is a submitting or issuing a resolution requiring perhaps—I'm not preempting the Honorable Commissioners—the submission of plans by these carbon majors. What do you think, how do you think the corporate reporting should look like, specifically on lobbying that would actually be useful for the consumers, for their investors, or for other stakeholders?

DR. TANNER:

I think it's particularly useful for investors who are taking the lead on this. We advise those investors to demand of the companies that they disclose fully and unambiguously their positions on these critical policy streams, and also their links to trade groups and lobbyists, and self-audit any inconsistencies between those two. InfluenceMap and others are prepared to fact-check those disclosures. And that can be an iterative process where six months later they can be held to account for any loose or inconsistent answers. So we think disclosure checked by a third party, then held to account possibly by

shareholders in some kind of legal way could drive this. And that's been shown to be important in the case of B.H.P., whose shareholders demanded that disclosure process. And Rio Tinto and others, I think, are upcoming. So this is the important trend, a public disclosure, a detailed disclosure with third party checking.

ATTY. PAUDAC:

Thank you, Dr. Tanner. That will be all.

COMM. GOMEZ-DUMPIT:

Thank you for your presentation. I just want to get more clarity in your methods compared to another presentation that we heard yesterday. Was it yesterday that Transition Pathway Initiative? In their case, they actually engaged the carbon majors. So to what extent has your organization directly engaged the carbon majors in your methods?

DR. TANNER:

We don't engage with them because we are measuring something which relates to their messaging, public messaging. And so if it's not in the public domain, we can't include it in the scoring. In other words, the best is the impact. So we looked into public documentation. If there's nothing they can say to us that will change our assessment, other than what they say publicly.

COMM. GOMEZ-DUMPIT:

Okay. To what extent would you know in your organization, have you also engaged with, let's say, mutual funds. Sunlife. Yeah. Those companies that actually get people to invest. Like, sorry, but I'm not really a finance person, like Sunlife, or others. To what extent have they used the information that you put out there?

DR. TANNER:

They use it extensively. We were working with many investor processes, chiefly the pension funds which have a long-term horizon. They don't trade in stocks, like hedge funds. The ones you mentioned, Sunlife Insurance companies, also have long-term horizons and they have a mandate from their beneficiaries to protect the portfolio, and see the activities of the carbon

majors as a risk impacting wider society, and therefore their entire portfolio. So they want to do something, and they rely on our analysis to a great extent.

COMM. GOMEZ-DUMPIT:

Okay. Thank you very much.

FR. WALPOLE:

Thank you. This is a very aggressive information, well, it's a material in black and white and wherein I stand by. It helps us measure what's happening. One point I wanted to ask about for further information, you're saying that dilution of the European Union's Emissions Trading Scheme. I remember, a couple of years ago, a ton of carbon was running at about Five Dollars ($5)—Three Dollars ($3) to Five Dollars ($5)—a ton as a result of this system. But more recently, we were informed yesterday, that it has now actually gone up to Twenty Dollars ($20) to Thirty Dollars ($30) a ton and that they reduced the number of trading documents. So would you hold out some possibility that this trading system or others might develop a stronger hand or level of accountability?

DR. TANNER:

I certainly hope so. I don't think that Twenty Dollars ($20) a ton is a significant price on carbon. Maybe I'm going to defer to my colleague Ed there who has studied this and who has done research on the Emissions Trading System lobbying. Ed, do you have any comments to add?

MR. EDWARD COLLINS:

Oh, yeah. Okay. As you say, it has risen a little bit now. During that period when we studied the lobbying, the European policy makers were trying to bring in the forms so they could correct the failure there and that process was held up for a long time by industrial lobbying. So there were no immediate reforms then sort of dug into the long-term reforms as well. There has been some progress now and now you can see the price turning up again. But it should also be noted that sort of industrial trade groups or industries that managed to secure the large, what they call, "climate carbon leakage protection" on this. Which is essentially protecting them a long way from that pricing. And, therefore, some activities are actually reducing emissions. So

there's still a long way to go to make the effort as effective as it should be and a lot of the reason for that is the lobbying track.

FR. WALPOLE:

May I just ask what you consider to be a just price for carbon?

MR. COLLINS:

Well, I can refer to maybe the World Bank, something between forty to eighty (40-80) dollars to reach two degrees (2°). I guess that could be the benchmark.

FR. WALPOLE:

That's to reach two degrees (2°)?

MR. COLLINS:

Yeah, I think, but I'll have to check on it.

FR. WALPOLE:

So if it were point five degree (.5°) it would be even higher than that? Thank you very much.

PANEL CHAIR CADIZ:

Just for our transcription record... Could you clearly state your name and your organization?

MR. COLLINS:

My Name is Edward Collins. I manage the research, and a member of the same organization InfluenceMap.

PANEL CHAIR CADIZ:

All right. Thank you very much. Just one question, Dr. Tanner.

Yesterday we had a resource person in the name of Mr. Adam Matthews, the Co-Chair of the Transition Pathway Initiative, and Director of Ethics and Engagement of the Church of England. He specifically cited Shell and Total as the two major oil companies who are on the path to good behavior, which obviously is in direct contravention or contradiction to what you earlier stated... that they are among the top five bad behavior, bad-behaving companies. Are you familiar with this organization?

DR. TANNER:

Yes, and I'm familiar with Matthews. He's a good friend of ours.

PANEL CHAIR CADIZ:

Okay, can you comment?

DR. TANNER:

So the value of our analysis is that it's not black and white. Companies are not either good or bad. So everyone's on the scale, and if you look at a sector analysis, which I guess he was referring to, you know, the oil and gas sector, all of them score badly. Some of them score more badly than others, Shell and Total are near the top of very badly scoring sector. So, you know, they all received grades of D and F on our scale, whereas other sectors are A, B and C.

So that indicates still opposition, still highly problematic. A lot of it is due to their funding of these trade associations. I think that Transition Pathways Initiative takes a lot of their analysis from the statements of the companies directly, and that's, as I mentioned, improved. But we regard that as contradictory to their actual behavior and their external lobbyists' behavior.

PANEL CHAIR CADIZ:

Thank you very much for that. We have no further questions for the witness.

Counsels...

ATTY. PAUDAC:

Thank you, Commissioner. May Dr. Dylan be excused?

PANEL CHAIR CADIZ:

Okay, Dr. Tanner, you are excused from the witness stand.

DR. TANNER:

Thank you very much for this opportunity.

PANEL CHAIR CADIZ:

Thank you. Are we now going for a 15-minute tea break?

All right. Thank you very much.

[Break]

PANEL CHAIR CADIZ:

We may now proceed with our last set of witnesses. Counsels...

ATTY. PAUDAC:

Mr. Mark Campanale and Mr. Andrew Grant will present and explain how much carbon dioxide in the atmosphere and weather are supplied by the largest, publicly traded oil and gas producers, aligned with demand levels and consistent with values in our use of the carbon constraint resulting in different climate outcomes, using the tool known as the two degrees (2°) separation. It's available at twodegreesseparation.com.

Before that, may we briefly introduce our speakers or resource persons.

Mr. Campanale is the founder and executive director of the Carbon Tracker Initiative, a non-profit financial think tank based in London and launched in

2011. He has over 20 years of experience in investment management for large financial institutions and financial markets and research for the last ten (10) years.

Mr. Andrew Grant, on the other hand, joined Carbon Tracker in 2014 as a senior analyst, a leading researcher on oil, gas, and coal mines. He has authored a number of Carbon Tracker's major reports of these sectors, including the carbon supply cost curves scenario, series scenario analysis of the oil refinery industry in margin call, among others.

Mr. Campanale and Mr. Grant submitted eight (8) documents to the Honorable Commission, which were pre-marked. First is the curriculum vitae of Mr. Mark Campanale consisting of two (2) pages pre-marked as Exhibit C "OOOOOOO" to "OOOOOOO-1." The Curriculum Vitae of Mr. Andrew Grant consisting of two (2) pages pre-marked as "PPPPPPP" to "PPPPPPP-1," the printed PowerPoint of the speakers Mark Campanale and Andrew Grant entitled "National Inquiry on the Impact of Climate Change on the Human Rights of the Filipino People" consisting of six (6) pages pre-marked as Exhibit "QQQQQQQ" to "QQQQQQQ-5." The next document is entitled "The $2 Trillion Stranded Asset Danger Zone, How Fossil Fuel Firms Risk Destroying Investor Returns" consisting of thirty-one (31) pages pre-marked as Exhibit "RRRRRRR" to "RRRRRRR-30," the next document is entitled "Two Degrees (2°) of Separation, Transition Risk for Oil and Gas in a Low Carbon Growth" consisting of thirty-six (36) pages, pre-marked as "SSSSSSS" to "SSSSSSS-35." The next document is entitled "Two Degrees (2°) of Separation, Company Level Transition Risk July 2018 Update" consisting of twenty (20) pages pre-marked as Exhibit "TTTTTTT" to "TTTTTTT-19." The next document is entitled "Under the Microscope or Companies Climate Scenario Analysis: Meeting Investor's Requirements" consisting of one hundred one (101) pages pre-marked as Exhibit "UUUUUUU" to "UUUUUUU-100." And finally, the Statement of Mr. Mark Campanale and Andrew Grant dated October 21, 2018 consisting of fifteen (15) pages, pre-marked as "WWWWWWWW" to "WWWWWWWW-14." And the signatures thereof "WWWWWWWW-14-A" for the signature of Mr. Campanale, and "WWWWWWWW-14-B" for the signature of Mr. Grant.

PANEL CHAIR CADIZ:

Panel Clerk, would you confirm the manifestation of counsels for the Petitioners?

CLERK OF THE INQUIRY:

Yes, Your Honor, we are confirming the pre-markings.

PANEL CHAIR CADIZ:

In Manila? Alright. Thank you very much.

Counsels, you may proceed to present your witnesses.

ATTY PAUDAC:

Good afternoon, Mr. Campanale and Mr. Grant, you may now proceed with your presentation.

MR. MARK CAMPANALE:

Thank you very much, I will be giving the main presentation today and my colleague, Andrew, for the specifics of particular slides, and for any questions that the court may have. So just to give a highlight of what we're presenting today, Carbon Tracker, we were primarily focused on the relationship between the capital markets, stock exchanges, the banking system, financial regulators and the fossil fuel industry. Quite forward looking, we're interested not so much in what the companies have done in the past, but what the company is planning to do in the future. We're a non-profit financial think tank established in 2011 by myself and a friend who works in banking. And my background is in asset management. We're interested in trying to understand the signs that we know about climate change.

At one point, a new fossil fuel company raising capital in London for a new coal fired power station, new coal mine, new oil exploration was making noise every other week. If you took what they were doing together, it was unlikely that all of what they were saying could possibly be true, that they couldn't possibly burn all that fossil fuel reserves. And that led to the establishment of this think tank. Our goal is to align the energy markets and financial markets with climate reality, and we refer to the Paris Agreement. That's essentially what we mean. What do investors, the banking system, fossil fuel companies have to do to align their business plans with the goals of the Paris Agreement, which is to keep well below two degrees (2°) of warming above pre-industrial levels?

And what we try to do is map company by company, very often project by project, the probability of those companies and businesses keeping within these two degrees (2°) goals. We are funded by foundations. Every foundation that funds us is published on our website. We're not funded by government, we're not funded by companies. You can see the list of new funds, and so on, on our website and our non-profit's objectives are to explain climate risk to investors, to enable the shareholders of the companies to challenge company boards about their company's plans, engaging businesses to reassess the viability of their projects given these climate constraints over the next couple of decades, and to educate particularly policymakers as much as financial market participants. And I'm already thinking of the policy makers, financial market regulators, people responsible for accounting and disclosure standards.

We publish our research. Our first report, it's on our website, "The Carbon Bubble," a financial model, "Unburnable Carbon," was really addressed to financial regulators. How is it possible that most of the companies couldn't burn all of their reserves? But how is it possible that new companies could be raising money all the time to develop new resources or new reserves when the businesses that are already listed on the London Stock Exchange, New York Stock Exchange couldn't burn what they've already financed? This seemed to be a financial regulatory issue for us.

So this sort of question we asked on day one. If we took Exxon and B.P. and Glencore and Shell and all the other fossil fuel companies listed in the stock exchange, if we just took their reserves, which is the proven reserves plus the resources, what they planned, if we add up the cumulative carbon dioxide in their reserves, which is an equation that you could do, and once we come up with that number, we could test it against the carbon budget, how much CO2 could be released into the atmosphere before we exceed one point five degrees (1.5°), one point seventy-five degrees (1.75°), two degrees (2°) or three degrees (3°)?

And so the idea of a carbon budget, which is what we presented on this slide here, is very important. And what our research established is if there is a carbon budget, two degrees (2°) or nine hundred (900) gigatons of CO2, which is represented in this illustration by the green bubble, how much CO2 is sitting in the reserves? Now, reserves, is quite a technical definition by the Securities and Exchange Commission. And by regulators, it roughly means it's about a ninety percent (90%) probability of extraction at current market prices. That's the definition of a reserve. The lay person's definition of reserve is typically whatever a company owns under the ground is a "reserve." From a regulatory point of view that is incorrect, that divided into what's often called P1, P2, P3 resources are reserves. We typically carbon track and refer to the proven reserves, the P2 resources the company plans to do next. It's the raising capital all the time to explore for more, to develop the licenses that

they've acquired. And so the red, which is on the illustration, represents private and public companies.

So private state-owned entities, the public ones, the listed companies is two thousand eight hundred sixty (2,860) gigatons at the time we did the research. And so why do we call it a carbon bubble? We haven't called it a financial bubble. I want to be clear about that. We call it a carbon bubble, the overhang. The red doesn't fit into the green. Most of the reserves will have to stay in the ground. And if this simple observation is true, then the plans of the fossil fuel majors cannot be executed unless they have the consent of governments and the banking system, the shareholders and society. So that is a challenge. It's a forward looking one. It is a time period which goes over not a few years but many decades, and it doesn't represent all fossil fuel that we know about, which will be a figure that will be above that.

Now we know that coal is the most carbon intensive of the fossil fuels. And so there's a bit of nuancing that has to be done: if the coal industry declines very rapidly, then maybe there's more space for oil and gas. But if coal remains around for longer, then it means that there is less space. If you can use that phrase in the carbon budget for the oil industry and for the gas as well, and you can try and allocate the split between, that is what we're trying to do here, roughly. But the key to this really is how long the world remains with coal power that has consequences for everybody, particularly the oil and gas companies who will inevitably have to burn less. So timing is the important factor here. What this represents is, from the the IEA world energy outlook 2017, I want you to see here the cumulative emissions on the left expressed in gigatons of carbon dioxide.

And along the bottom is years. These are different scenarios used by the IEA, grays represented by current policy scenarios, oranges by new policy scenarios. And the blue is represented by the relatively new sustainable development scenario. And this represents cumulative emissions. And so what this tells us is somewhere around twenty (20), thirty-five (35), twenty-three (23), twenty (20), thirty (30) years, sometime around then, the world, based on current cumulative emissions, will break through the carbon budget of two degrees (2°). And, within a few more decades will break through the carbon budget of three degrees (3°), based on carbon scenarios. I mean, I understand the court would have said, I've heard the planet hasn't seen these levels of warming for hundreds of thousands of years. To squash this level of emissions and warming within a few decades, within the geological history of the planet, is unheard of to see this amount of change.

And it doesn't necessarily mean that the world will warm at that level within those decades. It will mean that the emissions in the atmosphere will have

accumulated such that we will pass through two degrees (2°) and three degrees (3°) of warming.

When we first published our research, and I'll refer to my written statement, I expected the companies to write me and my colleagues, disagreeing with the analysis, saying, you know, here are the... I wanted to find the errors, you know, when you do analysis, the best way is for people to review it and analyze it, to rerun the numbers themselves and then to explain. And much to my surprise, the numbers have been out there published for seven (7) years now, but we've had no response from any of the companies.

Some argued a little bit here was wrong, maybe review this, but essentially no one has challenged the numbers. I want people to challenge the numbers because the importance of accuracy and the analysis is fundamental to this. What we, I and my colleague Andrew sitting here, have done is we reviewed the numbers, seven years old, and we've not published this until today in the public domain. We looked again at what you'll see on this table. Here again is the proven reserves, not the resources. I want to be clear about this, not what they're planning to do, not what they are financing, but what has been financed, and this eighty (80), ninety perecent (90%) probability of extraction and current market prices. What this shows is, I want you to look along the bottom of a series of horizontal bars, running across along the columns.

And the lower one represents one point seventy-five (1.75) with a fifty percent (50%) degree of probability. Not the sixty-six percent (66%), which you would probably want to use the higher buys, two degrees (2°) again with a fifty percent (50%) probability, and what this shows you is the remaining carbon budget to two degrees (2°). And if you had a sixty-six percent (66%) probability to two degrees (2°) to one point seventy-five degrees (1.75°), that lower bar. Okay. What the columns show you is the cumulative carbon dioxide and the proven reserves of coal, which is represented by, how would you describe that color?

MR. ANDREW GRANT:

So yeah, the number of years remaining, at current extraction rates of those individual fossil fuels. So you can see for oil and gas, based on statistical review, as about fifty (50) years' worth of proven reserves of oil and gas at current rates. For coal, you look at over one hundred twenty (120) and that compares to twenty (20) to thirty (30) years worth of current emissions, in the one point seventy-five (1.75) and two degrees (2°) scenarios.

So a high level observation is that the remaining reserves exceed the carbon budget substantially by a factor of seven. And the reserves aren't declining as

you would hope they would do to get where you would want one to shift, in line with the remaining carbon budget. I think the observation that I would make from this is that investors, the financial market, hasn't yet adjusted to the reality of a dramatic shift that we need to make. But it also shows how many of the companies and the financial backers and the governments that license them have not altered, have not adjusted to where we need to be. And probably investors are assuming that there are no limits to what these companies can do. So when we first published our research, this is actually taken from 2011, so the numbers are off, are out of date, but it's to illustrate a slightly different point, which is what this shows you.

MR. CAMPANALE:

The bottom will show you the red and all of the potential emissions made up of the grade of that black and blue of gas, coal, and oil. And what we've done is ask whether these companies are listed on a stock exchange? So you can rethink the climate issue as a financial markets issue. What it tells you is that most of the financing of the fossil fuel industry is really coming from three financial centers, the two principal ones in New York for the New York Stock Exchange. And the other one is the London Stock Exchange. So while these projects may be in other parts of the world, the financial heart, the financial center, is London or New York. We've also put in Russia there because of the size of gas, probably roll stock from the few other companies, even though they have no such major financial center as the others.

And the Shanghai Stock Exchange is in there as well. We've had to move the bubbles around to fit the illustration. But it still is to rethink this in a different way, in the way that companies are responsible for what they plan to develop, the owners of these companies are also responsible, and the banking system and the investors are well aware of this situation. I think probably there isn't a financial center in the world that is more aware of the idea of stranded assets on carbon, other than London. It really has understood this. And Governor Mark Carney, the governor of the Bank of England, has made many important statements, wise statements about this.

It tells us that we need not only the companies but the financial markets who own the companies to move. We also need financial markets regulators to understand the challenges that we face in the decades ahead to move to a low carbon path. And you may want to take on this.

MR. GRANT:

Yeah, by all means. So thanks, Mark. So that's the sort of general view, underlying thinking of this Carbon Tracker that got us started. So going from that particular view of comparing reserves, numbers and carbon budgets, we then received a lot of questions through advises, "Okay, you know, we buy your analysis," and that, you know, as Mark mentioned, it hasn't really been challenged in any way. I think in fact it's been accepted by people like Chevron, B.P., and so forth.

The question was, okay, how do we figure out what or which reserves are attributed to which companies? So what we've done is to look at it through a sort of an economic basis comparison of supply and demand, bearing in mind the production costs of those projects and just taking the market logic that those companies, those projects with the lowest supply costs will be those that go ahead. So the scenarios we used for demand are those from the IAS publications published annually, on this chart here, I've marked three of them.

So the blue ones represent three of the other scenarios. The dashed line is their new policy scenario that's kind of a business-as-usual scenario that's just consistent with two point seven degrees (2.7°) of warming, a fifty percent (50%) chance of keeping warming at that level. The lighter blue line is the two degrees (2°) scenario, and the dark blue lines, the one point seventy-five degrees (1.75°) scenario, again, assuming a fifty percent (50%) probability of success, which you might think is not great odds and probably be right. But those are the component scenarios. However, when you move on from the numbers of reserves and carbon budget, they tell you the amounts you can produce and the amounts you plan to produce, but they don't tell you necessarily when that can be produced. So in order to take it to the next level and make that economic analysis, you have to look at the pathways of demand and supply over time.

So in the scenarios that the IEA uses, demand falls probably like one percent (1%) or two percent (2%) a year for oil. The example I'm using here, however, if one was to stop producing oil straightaway, stop investing in a new project, you'd actually find that supply would fall off a bit more quickly than that because production rate naturally declines if you don't keep investing in your field. So if I've put a notional five percent (5%) on here in terms of production, but it varies depending on the geology and the amount of infill drilling and that sort of thing, but generally speaking, the comparison of demand and supply pathways based on the scenarios implies that there is a need for some new oil and gas production, just not necessarily all of it, and certainly much less than it might be planned by the companies. Now most companies don't specifically link their plans to demand scenarios, although some do. For

example, Exxon Mobil is clear that it's world energy outlook is a basis of its business plan.

So I'll just move on. How long have we got left at this portion? Yeah. So this illustrates the framework that we use in order to decide which projects fit within that given carbon budget, and which ones don't based on their production costs. So that long smooth line is actually thousands and thousands of different projects. And again, I've used oil here just as an example based on an industry database. They are lined up in terms of the production cost, measured through what they call their break-even cost. So the projects at the bottom left are those that require very low cost in order to generate a return on capital. That might be those held by, for example, Saudi Aramco, very low-cost competitive reserves. Those at the higher end of the curve, those ones are more expensive to produce. Those light, perhaps the oil in Canada, which if we assume that there's limited amount of demand, more than enough supply, which is shown by the estimates of proven reserves. For example, if there's competition to fit that supply into a smaller amount of demand, we just assume the market is going to do the rest, the market will figure out which projects go ahead and there will be those ones that are most competitive, have the lowest cost. So the B2DS [Below two degrees] scenario that I've referred to there, that's the one point seventy-five (1.75), one that requires a lower amount of current projects, and those tend to be lower cost moving further up in assuming further level of high levels of demand. And again, the NPS scenario is the IEA kind of business-as-usual scenario.

It assumes there's currently announced and enacted kind of go-ahead policies but nothing beyond that. Whereas we'd hope to see continuing climate policy in the future. So that's how we segregate the risk between those different demand scenarios. So let's say a company assumed that new policies were going to go ahead with the M.P.S. scenario, and they planned for that with their project sanctioned activities. If it actually turned out to be the SDS [Sustainable Development Scenario], which is two degrees two degrees (2°), or the B2DS, which is one point seventy-five degrees (1.75°), then those projects in between those two dashed lines might be those ones that are in excessive requirements that end up in what we call stranding an investment, in other words, failing to deliver a good economic outcome for their investors. And those high cost projects tend to be mostly future projects for a couple of reasons. Firstly, because of the way that break-evens are calculated, capitals already sunk in existing projects are in the rear view mirror, and, secondly, as you know, oil is getting a little bit harder to find over time and you've got to go to more challenging places in the world and more difficult operating conditions in order to get it.

MR. CAMPANALE:

So just to frame this, when we look at this, when we look at the projects of any fossil fuel or oil and gas company, and we can use industry databases which we have access to. We find projects above Eighty Dollars ($80) a barrel break even. We know from this analysis that we have a reasonable degree of certainty that these will never be able to develop under two degrees (2°) or three degrees (3°) scenario—now with oil around Eighty Dollars ($80) a barrel, forget the figures. There were companies developing projects with breakeven prices above One Hundred Dollars ($100)—and we've seen them in the databases with figures of One Hundred Twenty Dollars ($120) a barrel—and have the common requests that those companies should be giving up those projects because this slide suggests that if you have projects with those high breakeven prices, you've got to let go. You got to retire them. You've got to hand them back. You've got to cancel them. You've got to lead them on reverse. And companies will say that we want the option to have them all booked to potentially develop, but there is a degree of chance here because a company can be planning this over ten (10) or fifteen (15) years. They'll sanction a project that may come on stream for many years. And so actually if the management of the companies and the board are making choices here, if they choose projects at the high end of the cost curve, they are essentially choosing to adopt a scenario which breaches the Paris Agreement. And so, in that sense, when you find new projects above Eighty Dollars ($80) a barrel, the other way of looking at it is they're sanctioning projects which will breach the Paris Agreement. It's the other way of looking at this analysis.

MR. GRANT:

Yeah, I think on that point it's worth noting that there's been recent volatility in commodity price over the last few years that has tightened oil and gas companies. A management team's focus is on the lower cost project, those which do tend to fit within the budget more. But certainly, in the years prior to that, there sanctioned very high cost oil projects that wouldn't fit within a carbon budget, if you were to calculate it on these economic terms. And you know, given volatility of the oil price in the future, it remains to be seen at what point these projects will start being dusted up again.

Okay. So on the next one, this is the aggregate picture of those individual projects. Why should shareholders care about this? Well, in terms of financial risk, what is the amount of capital that companies might spend on projects that don't fit within a given budget? And then if demands, hopefully, start to head down that line for a relatively good climate outcome, those projects might end up failing to deliver economic returns. What that means in terms of the capital that's invested in this project on this slide, sorry, you can see the two point

seven degrees (2.7°) scenario guys, you see coming up for five trillion (5 Tn) worth of capital expenditures over the next decade or so. If you move that down to the two degrees (2°) scenario, it's about... Unless if they go down again to one point seventy-five degrees (1.75°), there's no point..., the amounts of capital investment, they're involved in is very, very bad material.

And although—as Mark mentioned—coal is the biggest risk probably to the climate, in carbon emissions terms, being the most carbon intensive of the fossil fuels on average, the oil and gas industry has the greater capital intensity. We find that the oil and gas sector accounts for over ninety percent (90%) of the capsule.

And I'd like to mention as well that sort of high risk in those scenarios. Another thing to mention is the slight distinction between the reserves picture in terms of production over a certain period. So while state actors might own or have access to a majority of oil and gas in reserve terms, actually when you look at it through the lens of what people are producing today and over the next few years, what's critical is the risk that you find actually tends to be mostly with the private sector.

There are a couple of reasons for that. Primarily, the private sector tends to disproportionately own those high cost projects that we point out as being higher risk. And also, they represent a high proportion of daily production, they won't sit on reserves the same way that the Saudi government might. They want to produce as much as quickly as possible.

Okay. So let's move on. Having done this analysis at the industry level, determining which projects fit within which different climate scenario, using an industry database, we can then disaggregate and associate these projects with different companies. And say, okay, we know this project fits in the budget, this project doesn't erode what's owned by the same company. What percentage of that company's capital investment is potentially outside that budget? And then we've used that to create a metric that looks at the extent to which company business plans might have to change in the future or the opportunity for those companies to destroy value and what's the percentage of their potential capex that's outside, in this case, a two degrees (2°) budget. So that doesn't necessarily mean that those companies definitely plan to invest in those projects. It doesn't necessarily mean that, you know, if those projects were uneconomic, they'd keep pushing them anyway.

It's really a measure of opportunity. To what extent is the potential capital that would take to develop their portfolio? To what extent does that fit within a climate budget? Another point we have to be very clear on is that it is potential capital. It's not capital that's necessarily been committed or so. So there remains flexibility for companies to cancel that or not push ahead. With what

we've seen over the last few years, their response to market conditions, the industry's got very significant flexibility to do that, to react. So we see that as positive because we're talking about future projects that don't fit in the budget. It gives shareholders the ability to push and challenge them, to ask management teams how they see them physically.

MR. CAMPANALE:

So just to draw some high level conclusions. We can model most of the future production of oil and gas and coal. We know who's producing which project. Certainly for the publicly traded companies like Shell and Exxon, they are likely to be outside of two degrees (2°). As Andrew said, this is planned capital investment. They don't have to do it if they don't want to. The last point here on this slide is success in navigating that transition will be driven by management behavior from now on. Company boards and the shareholders and the executives know this situation. They also know that there is a limited carbon budget to two degrees (2°) until one point five degrees (1.5°) that require them to produce less. They know that there's more reserves than can be burned to stay below two degrees (2°), but they also know that there's no one mechanism that allocates the remaining carbon budget between governments and between companies.

What share goes to Exxon, what share goes to Shell? Is there a formula? We've tried to develop a formula using economics. What we want to propose is a global registry of all the remaining fossil fuel projects under development. And this registry should explain how much cumulative CO2 is in the reserves and what are the resources of those projects. There should be some kind of understanding as to which companies have projects which are outside of the one point seventy-five (1.75°) and the two degrees (2°) budget. And there should be discussion on how we retire and give up licenses. One of the paradoxes of the Paris Agreement is the signatories had carried on licenses for New Orleans gas exploration. On one hand, they sign an agreement to keep below two degrees (2°), while, on the other hand, they had thousands more new licenses for oil and gas exploration. It's a paradox, a situation that needs resolving. Carbon Tracker's perspective is that investors and regulators have a major role to play here. And the shareholders of companies have a role to play calling companies to account. There are new alliances such as Climate Action One Hundred, a Thrity-One Trillion Dollars ($31 Tn) alliance of pension funds and shareholders, all working together now to hold company boards to account for how they plan to achieve the Paris Agreement, with the limits set out by the science. Thank you very much.

PANEL CHAIR CADIZ:

Thank you very much. Mr. Campanale and Mr. Grant.

Counsels?

ATTY. PAUDAC:

Yes, Commissioners. I'll take it from the last statement regarding the investors and shareholders. You mentioned that you have engaged them. Have investors or shareholders taken any specific or concrete action in relation to your research findings?

MR. GRANT:

Well, I, characterize us as providing data to shareholders to power their engagements with the fossil fuel companies. As investors, they may invest with specific requirements themselves. We leave that to the management of the companies and the investors. So, for example, if the management of a particular oil and gas company is doing a great job and plans to develop offshore wind, and the shareholders want to do that, you're like, great, that's up to them. If they don't think that's the case—they and shareholders would rather not reinvest that capital but give it back as dividends—then it's up to them.

So we, you know, we stand back and leave that to the shareholders, having given them, I guess, the picture... Would you probably agree with that?

MR. CAMPANALE:

Yeah. So our job is to provide the analytics that the shareholders can use. The shareholders can ask companies to explain how the investment plans are aligned with the goals of the Paris Agreement. Now, in some respects a lot of the investment plans at Cleveland, with the Paris Agreement, need to explain the future of many of these companies? The companies want to grow, but it's not possible to grow in an industry that needs to decline. And so many of the companies are decarbonizing, putting in the average unit of production, for example, more gas. Many of them are thinking about how they do that. And you've seen that in the plans of the majors like Shell and B.P.

ATTY. PAUDAC:

You mentioned earlier about Shell and Exxon's appeal. I'm interested about ExxonMobil. Do you have any insights about the current lawsuit that they have in the New York Attorney General's lawsuits in the U.S. because we understand that the New York Attorney General sued Exxon Mobil over the alleged fraudulent scheme to systematically and repeatedly deceive investors about the significant impact that the future climate change regulations could have on the other company's assets and value. Do you have any insights and…
MR. GRANT:

I wouldn't consider myself sufficiently well versed in the details of the case to be able to comment.

MR. CAMPANALE:

I wouldn't come on the specifics, but I'm very familiar with the specifics in general. It isn't really about whether climate change is real or not. It is whether the information the company provided the shareholders was properly considered, was accurate in the way that they would provide information in normal circumstances to investments. You've got to provide a full and complete picture, under the S.E.C. rules. And I think the challenge is whether the company provided appropriate information at the right time to their shareholders. That's really the focus of that particular challenge.

In many ways, you know, you have this paradox that companies say we continue to invest now. The I.E.A. published figures of around $20 to $30 trillion to be invested in new fossil fuel development capacity in the oil refineries and pipelines, and so on, over the next couple of decades. Now what company is doing that? Are we being consistent with the signed agreements with governments in Paris? Where are the regulators trying to understand what's really going on? How do companies square this particular circle? That's something which I think everybody should be looking at, whether you're an accountant, or a lawyer, or a financial analyst, or a banker.

ATTY. PAUDAC:

Thank you Mr. Campanale. Just one last question. Embedded in this Petition is actually the call for your measures for transparency. We do have transparency laws in the Philippines, but not really specific to fossil fuel companies. So I'd like to know your insights about effective measures that we could be introducing in the Philippines with respect to transparency as to the activities of these carbon majors?

MR. GRANT:

Well, I think this disclosure of climate change risk is an emerging field. Over the last couple of years, and since the recommendations of the G20 for the Task Force on Financial Disclosures, there's been a huge increase in the amounts of disclosures made by oil and gas companies. But they're still marked by different approaches, even among the ones I would consider, you know, leading the pack in terms of disclosure. So I think there are a number of useful things that companies should provide, beyond, what they already do now. So the T.F.F.D. emphasize the importance of scenario analysis. I think that's beneficial to show to your stakeholders, how you approach managing climate change risks. But again, looking at it through an economic lens, we find the crucial things to concentrate on things like project costs, to what extent it may or could be disclosed, to what extent can the sensitivity of your company's value be affected by future changes in the oil price. So for example, in the U.S., companies have to disclose the N.P.V. or Net Present Value of the proven reserves, so more standardization of that sort of approach might be useful, amongst those, if I have I missed anything else...

MR. CAMPANALE:

I had spent some time figuring out one or two measures in 2013, Carbon Tracker's road to the Financial Accounting Standards Board and the United States. You can find the letter to the F.A.S.B.. on the Carbon Tracker website,carbontracker.org. In it, we asked every company to disclose the embedded CO2 in their reserves and resources. Now it's one thing to call them to publish this data on their own, or if the government requires them. With this published data, we would have a true picture of CO2, is it enough to take us to three degrees (3°), four degrees (4°)? Then we can start the honest conversation about who has to give up projects and licenses. Now my recollection on this—I have to go back to my notes—by my recollection, the Financial Accounting Standards Board reject this by seven nays to zero?

No one has brought it back in the last four or five years. We would like to see other international accounting boards and standards... One simple thing that the government of the Philippines could do, if it wishes so, is to require any oil or coal company in your country to publish all their reserves and resources as a licensing issue in the public domain. It's not a particularly difficult metric to do. There's a bit of secret sauce... different fossil fuels have different carbon intensity so you have to change it. It's very useful data. Then the world can have this honest conversation about who's in and who's out of this one point five degrees (1.5°) remaining carbon budget.

ATTY. PAUDAC:

Thank you for that incisive recommendation. So, Mark and Andrew, that will be all…

FR. WALPOLE:

Thank you very much. I would like to go back briefly just for clarification in terms of CapEx, the greatest risk being oil and gas. Meanwhile, if I look at many of the fossil fuel reserves, by companies, coal may be either number one or number two. Is that because coal is much dense, the reserves that are there are easier to extract and there's not such an investment in coal?

MR. GRANT:

I think there's a couple of different aspects... Firstly, coal is, generally speaking, more carbon intense than oil and gas. So now for every given unit of production, if you're measuring in CO2 terms, you see oil is more capital intensive. When you look at it, in capital terms, you see more kind of oil on that side of things. The reserves of coal are much, much larger in terms of current production levels than oil and gas. Well, it doesn't necessarily mean they all get produced, but there's that very, very significant quantities of coal out there. Yeah. So does that answer your question?

FR. WALPOLE:

Well, I recognize there's more carbon in it and that's why it goes way beyond any temperature recommendation. But it doesn't seem to have the same risk, from the financial side?

MR. GRANT:

So, yes, that's right, the extraction is a less capital-intensive business. You know, to develop an oil field, big oil fields might cost you Ten Million Dollars ($10M) or something, not the same for coal fields for the most part. So it depends on the measure you take—a minute—to look at the risk. But if you're looking at it in terms of the potential capital investment, then the gas industry dominated coal just by the nature of extraction. Yeah.

PANEL CHAIR CADIZ:

In general terms, if the oil and gas industry work to proceed with investment plans, as presented to their shareholders, how misaligned will the effect of their investments be, in terms of the Paris Agreement… the misalignment, because the Paris Agreement says "well below 2°C" standard?

MR. GRANT:

Yeah. So you got it right to point that out. We do a lot of modeling compared to two degrees (2°). The Paris Agreement was of course well below two degrees (2°), I'm sure at least one point five degrees (1.5°). And fortunately, there is a limited number of scenarios out there that go to those levels that we can use, certainly the right data that you need to model. So, without answering your question, it's really a question of the company's plan. Companies themselves might have a range of views over their planned projects that, sort of, increasingly go further out in time. It might be a project that they expect to sanction, but it's, you know, a few years off compared to a project that they've already, for example, green lit and committed the capital to.

So I think that's kind of a slightly, slightly tricky one to do. We can certainly say that if you add up all the projects that are out there that it's kind of a long way beyond the three degrees (3°), beyond the Paris Agreement objectives. I've never, never tried to translate it into that. That's great.

MR. CAMPANALE:

There have been some public statements. The chief executive of Shell said none of our reserves will be stranded. He said that about a year ago. The chief executive V.P. made similar comments just a few weeks ago in London. I think, in general, most companies, except one or two, basically say I don't believe any of our reserves will be stranded, which is another way of saying they think they're going to develop everything. I traveled a little bit over the last two years to attend live events and conferences. I was in Canada and I saw their Premier saying we must responsibly develop all reserves. I then went to Norway and heard the prime minister say, we must responsibly develop all of our fossil fuel reserves. And then a few weeks ago in Argentina, I saw the president say the country must responsibly develop all our fossil fuel reserves. Everyone wants to "responsibly develop" their fossil fuel reserves—companies, governments. Nobody wants to say, we must responsibly give up the right to some of our fossil fuel. This is the challenge. Everyone says I won't accept this unlimited carbon budget. Nobody wants to be the one to say,

we must be the one to give up our licenses, give up our exploration permits, give up our capital expenditure plans, give up all rights. And that is the central challenge we face today.

There's no agreement that essentially works out a formula and a global mechanism for countries to keep supply within the carbon budget. What we have are agreements to reduce, attempts to reduce demand and to reduce emissions. Now, reducing emissions is a tremendous objective. It's not the same thing as actually constraining supply. If you reduced down what we've presented today, how would you look at the, you know... We need to put in place a supply framework.

PANEL CHAIR CADIZ:

I don't know if I understand you correctly. But, earlier, you sort of stated that an $80 investment per barrel would produce or would breach the 1.5° target of the total investments on the pipeline? Can you tell us, on average, on an industry analysis, how much dollars per barrel the industry spends?

MR. GRANT:

So we tend not to focus on future oil price or production scenario. We focus on where the project stands relative to each other on that curve, which ones are low relative to the high cost ones and which ones are high relative to the others. Now you can imply a cut-off point there, in terms of marginal costs of production. That could tell what should be the last battle to go ahead. But the problem is if you put a number on it, you have the risk of giving a slightly misleading signal because supply costs can go up and down in time depending on the industry conditions. Over the last few years, when price has fallen down, there's been less activity in the sector. That means the cost of supply has generally fallen for a number of reasons. Just for example, it's cheaper to rent a rig... So we don't, we don't fix a rate. It's s all focused on that level of... that particular cut-offs.

We just say, okay, which projects are in, and which ones should not go?

MR. CAMPANALE:

So I put this slide back just to remind what it shows us. Any particular company could have very, very low cost of projects. Another company may have projects which require them to set very high oil prices to get an economic return and won't be published. In 2017, there's three (3) companies at the top.

There were sixty (60) to seventy percent (70%) of the upstream capex outside of two degrees (2°). And you've got other companies below that. Now companies are rushing, generally speaking, many of them trying to sell projects, to recall projects at lower cost to reflect a period last year when oil prices were down at Thirty Dollars ($30) to Forty Dollars ($40) a barrel.

Of course when oil was at Thirty Dollars ($30) to Forty Dollars ($40) a barrel, if your production goes through Eighty Dolars ($80), obviously, you know, companies were not producing, they weren't investing because they would get a negative return on capital. And so what we tried to do with the cost curves is essentially to say, look, if you're a company with projects above Eighty Dolars ($80) a barrel, then you're not going to be a winner in a climate constrained world where production is constrained. And the world's gonna be needing a lot less oil and gas. That's essentially the way to read this analysis.

MR. GRANT:

So we told them the issue with the gas price says it's like many commodity prices. The whole market is cyclical. They don't send all future information. There are a number of different feedbacks and things that go into it, which make the price go up and down over time. Those kinds of potential increases in the oil price give the opportunity to invest in projects that might end up not making any sense later on, as we saw over the period 2000 to 2014. So when the oil price was over One Hundred Dollars ($100) a barrel, a lot of companies still invested in projects. They probably wish they hadn't now.

PANEL CHAIR CADIZ:

Counsels, do you have any more questions for your witnesses?

ATTY. PAUDAC:

None, Your Honor.

PANEL CHAIR CADIZ:

So we have reached the end of our hearings here in London. It's four quarter. It's been a very fruitful two days for us in the panel. Thank you very much to all the resource persons, and to our host at the L.S.E. Before I end, I would like to reiterate our call to the Respondents to participate in our process. We are reaching the end of our Inquiry.

We will have two more hearings in Manila. In so far as our plans are concerned, we might extend… maybe two more hearings. After that, we're not sure. But, as of now, we still have two hearings in Manila. We continue to reach out to the Respondents. They still have an opportunity to say whatever they want to say, make statements, and present their evidence before we take stock, and before we start writing our report.

So, with that, thank you very much to everyone, and we'll see some of you in Manila again.

Anybody else in the room who wants to say something that we can put into the record? Joana, Annalisa, anybody?

DR. SAVARESI:

Just that if you could mention that we have a debate tomorrow evening. We look forward to seeing everybody interested in joining tomorrow.

PANEL CHAIR CADIZ:

So there's going to be a debate, but as I understand it, it's really a panel discussion. Where is the venue? We invited them, but we need to tell them.

DR. SAVARESI:

The Hong Kong Theater. from 6:30-8 p.m., on Human Rights and Climate Change. And our facilitator-moderator is here also. Would you like to say anything?

PANEL CHAIR CADIZ:

The Hong Kong Theater, from 6:30-8 p.m., and the topic is Human Rights and Climate Change. And our facilitator-moderator is here also... Would you like to say anything?

DR. STEPHEN HUMPHREYS:

Just welcome everybody please... Please be there.

PANEL CHAIR CADIZ:

Alright.

DR. SETZER:

So thank you again for coming. Thank you for having this very open discussion. I thank again the Commission that carried this in the best possible way—inclusive, conversational. We were delighted to be able to host you here, as well as to be a part of this process. We thank all the people who supported, students who volunteered to help, and everyone who came and spoke. Thank you very much.

PANEL CHAIR CADIZ:

It was our privilege to have been invited by you and to have conducted part of our Inquiry here. So, again, thank you very much.

What can I say? Have a good evening, to everyone. Thank you.

COUNSELS FOR THE PETITIONERS:

Thank you, Commissioners.

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