

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, FOURTH HEARING, SEPTEMBER 27
TO 28, 2018

SUSAN KATH:

Okay. Well, good morning everyone. On behalf of the Vance Center, I'd like to welcome all of you to the New York City Bar Association. The Vance Center, located here at the Bar Association, is an international pro bono, non-profit program of the Bar Association. We bring together lawyers, NGOs, and other partners worldwide to work on international justice initiatives. We have an environment program, a human rights and access to justice program, and a good governance program, among many others.

We are delighted and honored to be hosting the Commission on Human Rights of the Philippines today and tomorrow. As you know, the Commission is conducting an inquiry on climate change to determine its impact on the human rights of the Filipino people, and the role of the top fossil fuel producers in the world. We hope that over the next two days, as we hear from everyone including, as you know, many leading experts on these issues, we will all be better educated on the substantive aspects of the climate change dialogue; and that with this visit to New York City by the Commission, we will all benefit immensely from the opportunity to experience this inquiry and this dialogue in person.

It's now my honor and pleasure to introduce Commissioner Roberto Eugenio T. Cadiz, who is the Commissioner on sustainable development goals, business and human rights, environment and international humanitarian law and peace at the Commission. He chairs the Inquiry Panel here in the Petition. I'll introduce him. Please come to the podium. Thank you.

COMMISSIONER CADIZ, CHAIR OF THE INQUIRY PANEL:

Thank you very much, Susan. It's our great honor and privilege, as well, to be here with you, and to be conducting our (fourth) round of hearings here in New York.

For those of you who are not yet aware: In 2015, a petition was filed before our Commission, seeking to frame climate change as a human rights issue. We accepted the case, even if we could have easily... even if it was more convenient for us to dismiss it. Nobody would have questioned our decision if we had done so. Many challenges were filed or interposed concerning our Commission's decision, among of which is... that we did not have jurisdiction over the parties to the case. The parties are the so-called carbon majors, most of whom do not have business presence in the Philippines.

Our jurisdiction over the subject matter was also questioned. They said that we had no jurisdiction to handle or hear cases involving civil and political rights, I mean, economic, social, and cultural rights, and that we only had jurisdiction under our constitution to handle civil and political rights.

Citing the case... a particular case in the Supreme Court, *Simon vs. Commission on Human Rights of the Philippines*, that stated so... that we could only deal on issues involving civil and political rights.

At the same time, our country is visited by an average of twenty to twenty-three typhoons every year. In 2013, we were visited by the strongest typhoon in recorded history, internationally known as Haiyan, locally called Typhoon Yolanda, where, in the blink of an eye, six thousand people were dead. And this was attributed to extreme weather disturbances as a result of climate change. It was further alleged in the petition that climate change was being exacerbated by the business operations of the carbon majors.

Given this factual setting, we in the Commission decided that we should at least give the Petitioners a chance to prove their case. But we just want to clarify, because there are certain misunderstandings, especially among those who are not lawyers, that, by opening the Inquiry, we had already agreed with the theory of the case of the Petitioners, which we, I mean all lawyers, know is not the case. We have just opened the process for the Petitioners to prove their case. After we opened the case, we quickly realized that there was no precedent that we could look back to... which could guide us in navigating through the inquisitorial process, because this Petition is the very first petition in the world framing climate change as a human rights issue, and filed before a human rights commission. In deciding to hear this Petition, we had to create a process. Given the fact that there are no legal precedents, it was our duty to imagine a process that is called for under our Constitution as a National Human Rights Institution, as a Commission on Human Rights of the Philippines. So, although we knew that we had no enforcement jurisdiction over most of the parties impleaded in the petition, we had adjudicative jurisdiction over the issues raised by the petitioners. And we also knew that we have a constitutional mandate to investigate all allegations of human rights violations of the Filipino people.

In debunking the allegations that we cannot hold a hearing involving economic, social, and cultural rights, we simply said that... that kind of dichotomy between civil and political rights, on the one hand, and economic, social, and cultural rights, on the other, is no longer a valid dichotomy... that human rights are interconnected. They are interrelated. They are indivisible. You cannot talk of civil and political rights without considering economic, social, and cultural rights. This is the evolving consciousness of humanity, and, therefore, it is time to revisit our constitutional mandate... it is time to revisit the original decision of our Supreme Court saying that, effectively... holding that there is still a dichotomy between civil and political rights and economic, social, and cultural rights.

We continue to open space, to make space available for the Respondents, in case they do decide to participate in our Inquiry. So far, they have not formally entered their presence, but some of their lawyers have been attending our hearings incognito, I mean de facto, observing the proceeding, taking notes, but never stepping up to elucidate on their respective positions.

We have defined our process as non-adversarial, or dialogical. We said from the very beginning, when we announced that we were accepting the case, that we had no intention to award damages, because we do know that we have no enforcement jurisdiction and we have no power to award damages over parties. We said that we also were not going to issue threatening orders because we do realize that we operate on the principle of persuasion, rather than compulsion. If certain parties do not want to appear before us and recognize our processes, then so be it, but we will proceed with our dialogue.

We said that our process will be inclusive, meaning even non-parties who have something to say on the issue of climate change can volunteer to participate, and if they feel that they can contribute something to the dialogue, then we will listen to them. We said that our processes would be transparent as it is now.

This is our 7th hearing. We've had six (6) hearings in Manila; all have been webcast live, as it is, I believe, happening today also. And we said that we will be, despite the absence of certain parties... we will stick to the principles of due process. And we also said that this dialogue, being a dialogue around the issue of climate change - which is a global issue, not only an issue that we have in the Philippines - will also be a global dialogue. And that is why we are here now in New York. And that is why, next month... is it next month, or in November, we will be in London under the auspices of the London School of Economics - Joana (Setzer)'s there.

We all know, we in the Commission know, that National Human Rights Institutions are not courts. We are not bound by the restrictive concepts of territorial and enforcement jurisdiction. NHRIs operate on the basis of their

mandates to promote and protect human rights. As such, we should be able to navigate through legal technicalities, and help in the establishment of guiding principles which, perhaps, can later on be transformed into binding treaties.

So, in pursuit of our mandate, we have conducted field investigations, we have had community dialogues, we have had public hearings, we have had focused group discussions, we have had round table discussions. We've been around, consulting people, not only through this process of a public hearing. Many universities and academic institutions, NGOs, have actually submitted already in this dialogical global process their amicus briefs to our commission, and which, by the way, have helped us a lot to navigate through this case.

So, what do we hope to come up with after we terminate the process? We want to be able to help establish clear mechanisms and processes for redressing human rights victims as a result of climate change. We want to help establish standards for corporate reporting of activities involving greenhouse gas emissions. We want to clarify and vindicate rights connected with climate change justice under international and regional human rights mechanisms. We want to be able to outline a minimum core of rights and duties relevant to climate justice, and we want to be able to develop a model statute on legal remedies for climate change victims. And there may be many more, depending on the outcome of our... of our process.

So our presence here in New York really exemplifies the global character of the climate change issue and we... we really appreciate the New York City Bar Association's hosting us in this part of the process. Thank you very much!

ATTY. TRISHA ISABEL FERNANDEZ (CLERK OF THE INQUIRY PANEL):

Thank you very much, Commissioner Cadiz, and good morning, everyone. I am Trisha Isabel Fernandez, the Clerk of the Philippine Inquiry Panel. Thank you very much for being with us today. We are requesting that cellphones be put on silent mode while the session is on-going. The Inquiry Panel members present here today are Philippine Human Rights Commissioners Leah C. Tanodra-Armentanto, Commissioner Gwendolyn L. Pimentel-Gana and Inquiry Panel chairman Atty.Roberto Eugenio T. Cadiz. Doctor Pedro Walpole, SJ, assists the Commission on Human Rights of the Philippines in this Inquiry. The Panel has sent notices to all of the parties regarding today's Inquiry inviting them to participate therein.

The Petitioners here present today are represented by Ms. Mayo-Anda, Ms. Paudac, and Ms. Kristine Casper. We also have with us here later today, Mr.

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John Knox, as invited by the Inquiry Panel to share his knowledge and expertise. The Panel has not received any response from the Respondents.

PANEL CHAIR CADIZ:

Thank you very much, Ms. Fernandez. So, as earlier stated, the Respondents are not represented here today despite our invitation, and we respect that, but we continue to send out our invitation to them. We do want to hear their side of the case. So without further ado, Counsels for Petitioners, are you ready to present your witnesses?

ATTY. HASMINAH D. PAUDAC:

Yes, Commissioners. Good morning, Commissioners, and good morning, Dr. Walpole. May we call on our first resource person, Ms. Marinel S. Ubaldo?

PANEL CHAIR CADIZ:

Please go ahead.

ATTY. PAUDAC:

May we request for another microphone for our resource person?

PANEL CHAIR CADIZ:

Here, perhaps you can use this.

UNNAMED PERSON:

Press the button on the side until it's green.

UNNAMED PERSON:

It's green already.

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ATTY. PAUDAC:

Ms. Marinel S. Ubaldo is a Filipino youth Super Typhoon Haiyan or Yolanda survivor. She's here to share her experience, as a youth who experienced the wrath of Super Typhoon Haiyan that struck Tacloban City in November 2013, and how it impacted her basic human rights and changed her life as a survivor. Commissioners, before we proceed, we would like to manifest that Ms. Ubaldo submitted her statement, "*Salaysay ni Bb. (Statement of) Marinel S. Ubaldo*," pre-marked as Exhibit "MMMMMM," that is sextuple M, to "MMMMM-5" and the signature of Ms. Obaldo "MMMMMM-5-A." Commissioners...

PANEL CHAIR CADIZ:

Thank you very much. Ms. Abrina, would you confirm that such markings of this exhibit have been made by the commission in Manila?

MS. ABRINA:

We confirm, for the record, the pre-marking of such document as exhibit "MMMMMM" to "MMMMMM-5," and the signature of Ms. Marinel Obaldo as Exhibit "MMMMMM-5-A," for the record.

PANEL CHAIR CADIZ:

Alright, thank you very much. You can proceed, Counsel.

ATTY. PAUDAC:

Commissioners, now, Ms. Ubaldo is ready to present the highlights of her story.

PANEL CHAIR CADIZ:

We're ready to listen to you, Ms. Ubaldo.

MS. MARINEL S. UBALDO:

Good morning, everyone, I'm Marinel Ubaldo, a 21-year old social work student who is trying to live a normal life after surviving from the wrath of

Super Typhoon Haiyan. I'm currently doing my internship in a community in Basey, Samar. I grew up in Matalino, Salcedo, Eastern Samar with fun memories of a happy childhood playing on a white sand, near the shore on the coast facing the Pacific Ocean. I grew up not worrying about food since we are living on a coast with abundant produce. My father is a fisherman. He did not need to sail far to catch fish. The ocean always provided for us. Growing up near the Pacific Ocean, I have been used to typhoons. It's nothing new to me. Our house has always endured every storm, and we seldom need to evacuate... not until Super Typhoon Haiyan happened.

On the night before Haiyan struck, we have no more electricity. My whole family, we were at the evacuation center, which was ten (10) meters away from our house. I brought an encyclopedia with me, so I can just read until the storm passes. My bag was filled with my phone, my charger, my notebook, and pen. I did not bring any clothes with me because I thought we could go home immediately when the storm subsides. It had always been that way. Never did it cross my mind that we will have nothing left of our home... but only one-fourth (1/4) of its flooring and about three (3) of its columns. We did not really know what the storm surge meant until we experienced it ourselves.

Around three (3) a.m., on November 8, 2013, everyone was panicking as the winds became more intense. We wanted to evacuate again because there might be a tsunami. I saw a woman, carrying a child who almost had her head cut off because of the GI [Galvanized Iron] sheets blown away by the strong winds. I couldn't fully describe what was happening at that moment. There were plenty of families with their children in tow rushing to seek refuge in our evacuation center because their evacuation center got destroyed. The doors, the windows, the roof of the building we were in were also destroyed. Many of us got injured because of the broken glass, windows, and flying debris; and eleven (11) people died in our village. I went back to our house even though the winds were still strong, as I wanted to see if we still have a home to go back to. Though it was still dangerous for me to go back, I also wanted to save a box that has a sentimental value to me. That box was very special to me because it was filled with my personal things, my literary works, the medals and certificates I earned in school. For me, that box symbolizes who I am. My achievements, my self-worth. Nothing was left of our home and losing that box also felt like losing my identity, my dreams, my significance as a person.

Three days after Haiyan, we were left in isolation. We had nothing to eat but cassava. We had no food, no electricity, no water, no secure shelter. We had no change of clothes, so we were all wet and cold. I was so confused and devastated of the reality I was facing. I was sixteen (16) years old and was about to graduate from high school when that happened. I wasn't even sure if I can graduate high school, let alone continue my college education. I lost my books, my uniforms. How can I continue studying when my parents cannot afford to send me to school anymore because we have lost our livelihood?

For three (3) months, I was not able to go to school because it got destroyed. March 2014 came and we needed to fast-track all the lessons, so we can graduate by April 2014. After Haiyan happened, it seemed like my future even became more uncertain because my parents did not earn enough to send me to college. Luckily, I got a scholarship. I was able to work, facilitating trainings on climate change mitigation and adaptation. I would also sell school supplies. I had no choice but to do it, so I can sustain my needs. Our fishing livelihood stopped for months because my father's boat was broken and there were no fish to catch. We couldn't also bear the thought of eating fish that may have fed on the dead bodies of our dead neighbors and the people we know. My father had to sail far to catch fish but he would end up with little to nothing. There was a huge depletion on the fish catch. And it made surviving even more difficult.

It even came to a point when my mother couldn't handle it anymore, so she left us for good. And, thus, our family suffered... faced with another dilemma. I was already in my first year of college in Tacloban when my father told me the news. As time passed, my father suffered from depression. He barely ate and slept. He couldn't bear to go fishing anymore and he became suicidal. Knowing that your family is in that painful situation made things worse, but I had to remain strong.

Five (5) years after, my nerves still get the best of me whenever I hear the crash of ocean waves. I get anxious and restless when it rains because I fear that another Haiyan will happen again. It took me three years before I was able to go to the ocean again. It's sad because the ocean was our childhood friend. We grew up together. It has always provided everything we need. But now, whenever we look at the ocean, there's always fear because we will never forget how it took everything from us. Thank you.

ATTY. PAUDAC:

Thank you, Ms. Ubaldo. Commissioners, that would be all for Ms. Ubaldo. She's ready to answer your questions, if there are any.

PANEL CHAIR CADIZ:

Thank you very much, Ms. Ubaldo, for coming here today to share your experience. The Commissioners will have no questions for you.

Counsels, are you ready to present your next witness, or do you have questions for your resource person?

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ATTY. PAUDAC:

We don't have further questions, Commissioners. May Ms. Ubaldo be excused?

PANEL CHAIR CADIZ:

Alright. So we are now ready to listen to your second resource person for today.

ATTY. MAYO-ANDA:

Good morning, Commissioners. Our next group of resource persons are Ms. Christina Cocadiz and Ms. Candice Sering. They are Filipino-Americans who survived hurricane Sandy. May we call them here, Commissioners?

PANEL CHAIR CADIZ:

Oh, they will testify as one group?

ATTY. MAYO-ANDA:

Yes. But Ms. Christina Cocadiz will be sharing her experience first followed by Ms. Candice Sering. They will actually share their experience as survivors of hurricane Sandy in October 2012, how such extreme weather event impacted on their human rights and how it changed their lives as survivors.

PANEL CHAIR CADIZ:

Excuse me, Counsel. For the information of everyone, this is one of the innovations which we have made in our process. As you see, two witnesses are simultaneously testifying. This is to encourage them to, sort of... support each other, so that there'll be no hesitancy... sort of to handle each other.

This is not normal, but this was a request made by the Petitioners, which we think is reasonable. We don't see any reason why they should not be allowed to sit together and do a sort of a community testimony. So, please go ahead.

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ATTY. MAYO-ANDA:

Thank you, Commissioner Cadiz. I would like to manifest, Commissioner, that Ms. Christina Cocadiz and Ms. Candice Sering submitted certain statements which have been pre-marked. The statement of Christina Cocadiz dated September 19, 2018 consists of five pages pre-marked as "NNNNNN" to "NNNNNN-4" and her signature as "NNNNNN-4-A;" and the statement of Candice Sering consisting of six (6) pages has been pre-marked as "OOOOOO" to "OOOOOO-5" and her signature as "OOOOOO-5-A."

PANEL CHAIR CADIZ:

Will our Clerk confirm this submission and markings?

MS. ABRINA:

For the record, we confirm the pre-marked documents and the sub-markings therein.

PANEL CHAIR CADIZ:

As manifested, all right. Thank you very much. Counsels, you may proceed.

ATTY. MAYO-ANDA:

So Ms. Christina Cocadiz will share her experience first, followed by Ms. Candice Sering.

MS. COCADIZ:

Good morning. My name is Christina Conanan Cocadiz. I'm thirty-four (34) years old. I currently reside in Ridgewood, Queens. I was born and raised in Detroit. My father is from Quezon province and my mother is from Aklan. I currently work as a youth worker in a social services agency. I have only been in the Philippines about five times, twice as a child and three times as an adult. And my connection to the Philippines is really manifested in my community work as a community organizer with Gabriela New York.

So, at the time of Hurricane Sandy, in October 2012, I had been living in New York City for two years, and working in the neighborhood of Red Hook,

Brooklyn for several months in a restaurant called Hope & Anchor, a neighborhood restaurant. I had just moved to Red Hook from another neighborhood in the month before hurricane Sandy hit, so I was very much looking forward to living near my workplace, four (4) blocks away. My friend, Candice Sering over here, was also my co-worker. We're both servers and bartenders and members of Gabriela New York; and had also built community with many of my customers; and my roommate was actually a customer of mine before we started to live together.

I had only heard about Hurricane Sandy through my customers and co-workers. I had been working back-to-back shifts at the restaurant. At that time, it was important that I pick up as many shifts as possible because I had just moved. By the time I found out that the storm was severe enough, that the subway would close, I cannot afford to leave work in order to evacuate, in addition to not being sure where I could go. I don't have family in New York City and I also was cat-sitting for my roommate, so I had an obligation at my apartment and to my customers. So when the restaurant closed a day before, I went home... walked home because the subways are already closed, and prepared to sit out the storm. I was texting my friend Candice to make sure that we were okay because I knew that she was also staying in the neighborhood. I was in communication with my neighbor downstairs who had sent his family away to evacuate. Red Hook, the neighborhood is the peninsula surrounded by water designated as Evacuation Zone A, meaning that there was a call from the city to evacuate, mandatory evacuation. However, as I mentioned, that did not seem to be an option for me.

When the storm started to come on Monday, there were some reports of flooding. Where I was living it was just mostly raining, so I sat in my third-story window looking out, watching people on the street, waiting for the heaviest part of the storm. It wasn't until evening when there was a storm surge, the winds became stronger, the rains became heavier, and I started to see flooding. First there was flooding coming from the northern part of my street. I expected it to come from the southern part of the street and wasn't really expecting the water to be coming from different directions as it did. And it rose so quickly that there were cars... drivers trying to evacuate last minute, trapped in the water. And some people would walk away from their cars, and at that point it was maybe four feet or so.

And there's a green flash from Manhattan, from my window I can see the skyline, and at that point, I believe, that's when lower Manhattan lost power and then there was a transformer across the street directly across my window that blew out, exploded, sparked, and then that's when all the street lights went out and when I lost power. And I texted my family and I texted Candice. I was also nervous to call people because I didn't have a smartphone. I had a flip phone at that time. I didn't have internet access. When the power went out, I wasn't sure when I would have power again. I wanted to save that.

And in the morning, I was glad to see that the water had receded, but there were cars all over the streets, there were oil markings all over the streets, and there was still no power. And I talked to my neighbors; I went down to the restaurant. The restaurant was actually very lucky and that many of the other businesses have been flooded on the first floor, including in my apartment building, the first floor was a business and at least four feet of water damaged the inside of the store. And it took about six (6) months for them to recover, but our restaurant was only close for three days. However, at that time, I still lost income, and even when we did open it was minimal. A lot of community members came just for the heat, just for food, for community. So I didn't have power. There's also no street lights in my part of the neighborhood. I didn't have heat or hot water. I didn't have gas so I couldn't even heat my water for at least two (2) weeks. In my memory it was two (2) weeks but I've also asked other people and it may have been as long as four (4) weeks. And so I was fortunate enough to have the restaurant where I could go for some food and then I was also staying with Candice because she had received power a few days later, and so I was very fortunate to have a fellow Filipina *kababayan* (compatriot), a friend and co-worker nearby. It was really the sense of community that helped me through it.

But it was also very cold. There was a snow storm two (2) or three (3) days later, I wanna say. Also, people were passing around supplies. Everyone, whenever you would go out in the evening, you'd have to take out your flashlight or your headlamp. I remember a lot of customers telling me they had to draw baths, in order just to bathe themselves because it was very cold and there was no other way of bathing.

I do also just wanna mention that it has been difficult to process... how difficult the experience was, even though I experienced such a small part of how devastating a natural disaster can be. I had a fortune of having a community, but you know, seeing my neighbors having to throw away all of their possessions, seeing people wait in line and knowing that they were elderly people and children who needed medication. Red Hook is also where the largest housing projects are in Brooklyn, the Red Hook Houses, and seeing the community really struggle for their basic needs, you know, these are all hidden, they still affect many of the people who have experienced Hurricane Sandy. And for me, as a Filipino, I can't really separate the experience that I had as a survivor, I suppose of Hurricane Sandy, with what I have heard from Marinel from the experiences that I had as a participant of Gabriela's Women's International Solidarity Mission a year after typhoon Haiyan. I also had the privilege of visiting survivors of Typhoon Haiyan; those experiences are very much tied together because of the impact of basic rights that people didn't have a place to shower, didn't have shelter, didn't have a livelihood and even now, I wanna say that our restaurant that we used to work at has even closed. You know, for many different reasons, but also many people ended up

leaving Red Hook. One, because of the trauma of the experience; two, that the cost went up and so people were not able to sustain the standard of living there; and then we lost customers. And so I think there were other economic repercussions of climate change and now I don't even live there because of the standard of living.

ATTY. MAYO-ANDA:

Thank you, Ms. Christina. Can we listen now to Ms. Candice Sering?

MS. SERING:

Good morning, and thank you for this opportunity to be able to share and also to allow us to sit together. My name is Candice Sering. I'm forty-two (42) years old, a resident of Red Hook, Brooklyn, where hurricane Sandy hit. I still reside there. I'm a union representative of the New York State Nurses Association and a general member of Gabriela New York. Just a little bit about myself. I was born and raised here in New York. My parents migrated here in the seventies and they're both deceased. I'm the youngest of three (3.) Both my *ate* and *kuya* (older sister and brother) live here in New York City, but that's the extent of my immediate family here. I largely grow up disconnected from the Philippines, up until my adult life. I had travelled to the Philippines maybe when I was four (4) and I was deeply traumatized because McDonalds wasn't there yet. But as an adult, I went back with my mother to visit her family there in Lianga in Surigao and then subsequently have been visiting the Philippines to forge ties with my family back there. I would liken just for context the neighborhood of Red Hook to my father's hometown of Dapa, it's a small barrio in Siargao and I have been going back home pretty much almost every year for the past decade; largely to see my family but largely to participate in missions and integrations with Gabriela where I can get to connect more with understanding, you know, where my family is from.

So, in terms of my experience of climate change and understanding that, my first experience of a hurricane was in New York in the eighties (80s.) Then not again until 1998, when I lived in Puerto Rico, doing an exchange program at school, I experienced Hurricane George, out of power for a month and almost lost the full semester of school. Being out of power and water was a disorienting experience. Puerto Rico reminds me a lot of the Philippines. And then when Hurricane Irene hit in 2011, before Hurricane Sandy, we had been told to evacuate and so I did. And so I stayed with my sister, and the hurricane actually didn't hit us badly. I think the neighborhood of Red Hook is a very resilient community; a very tight-knit community. All of the neighbors know each other and there's a very distinct culture because of the fact that the neighborhood is far away from a train. I can explain, in terms of New York

City, when you're not near a train it's like you live in another island because you are not as accessible.

So that time, I evacuated out of safety and concern and when hurricane Sandy was announced to be hitting again I think there was a sense of desire and significance for myself to stay with fellow neighbors who were staying, in some strange sense, guard our neighborhood. So we stayed. Tina as well, I know was nearby. We surveyed the storm in the morning, it didn't seem that bad. We all understood that there were certain risks of staying. I live on the fourth floor in my apartment, so I did not experience ground floor flooding fortunately, but was able to watch the storm from my window. I lived closer to the coast than Tina and agreed that there was this idea that the water would come in from one direction, but actually surrounded the entire neighborhood. And the storm really hit at night so being able to see what was happening on the ground was a little bit difficult, but you could hear things like the electricity, seeing them from afar combusting, and a general sense of like anxiety. Actually talking about it now, it's still present.

Still living in Red Hook, I think that it has changed immensely since hurricane Sandy. I will say that I was fortunate during the storm to have lived nine (9) feet above sea level, I believe. So the flooding in our building was largely in the basement. We were without power. For us it was only a few days and because of the privilege that I had, to know that I had power, I was able to go and mobilize the community, to figure out who needed urgent help, like a friend who had to be evacuated from her completely flooded apartment. She lost everything inside, and we were able to salvage some things. It is very difficult to explain the sense of... when you are all very close in your community... to see that happen. These are the kinds of things that I'm not anticipating. It's also a little embarrassing because like, you know, this is, you know, we're in New York City, and hearing Marinel's story is also something that impacts us as Filipinos. Sorry.

So I still live in the neighborhood. I think, after the storm, so many people lost a lot. Our neighbors, people we care about, you spend many years with... and the kind of mass exodus of community members was very noticeable. And after the storm hit, the restaurant where we worked together had flooded in the basement, just like in my home. We were able to open the restaurant again and get back into business, I would say, in maybe two weeks... a week maybe to immediately start serving the community. We're the only restaurant in the community that didn't get totally destroyed, and we immediately started serving food. I think part of the triggering thing is having heard so many community stories. Serving people food was extremely exhausting because, day in and day out, we relive the trauma of everyone's loss, how people couldn't stay, how people had to start over their lives.

I think of the gravity with which we're seeing the storming, the flooding, and the rebuilding... Just this past month, I think, my building was able to finish their hurricane Sandy Rebuild to try and make the building better. But with the kind of paranoia and anxiety that you experience, recently, even with just rains in the New York City, I'm thinking about Typhoon Ompong. You have a deep sense that this is going to be the norm, which is not the norm.

And so I think it's important to find a way to be able to put pressure on whoever it's possible to... be it the big polluters or be it governmental systems where the infrastructures are not there to immediately respond. I think of our neighbors in the Red Brook Houses, a low-income community with six thousand (6,000) members... They were out of power and water for months and we're talking elderly people. So I think there's an urgency to want to make sure that there is some sense of preparation to not have this happen again to our community.

And so the mass exodus after the storm, a lot of our neighbors that we were close to left, a lot of people stopped coming to the restaurant, which did eventually close. And now we're seeing a change in buildings that were condemned, not being rebuilt, into condominiums... where rich people have come in and really changed the dynamics of the community. So I think that there is a different sense of what it looks like to live in this neighborhood. It is now one of the most expensive neighborhoods in Brooklyn to live in because it is by the waterfront, even though it is a flood-prone area. I'm fortunate because I won a housing lottery to live in that neighborhood, but I can't say the same for people like my former neighbor Tina, and for friends of mine who have decided that they cannot sustain their living in an area where they don't know whether or not their homes are safe.

So I thank you for the opportunity to speak on this. I neither want to say that it is important just in understanding this is what a climate... a natural disaster looks like in New York City... Considering the conditions in the Philippines, we hope that there's something that could be done. Thank you.

ATTY. MAYO-ANDA:

Thank you, Christina and Candice. Commissioners, they're ready for any questions.

PANEL CHAIR CADIZ:

Thank you very much, Christina and Candice. Commissioner Armamento will field in some questions for you.

COMM. TANODRA-ARMAMENTO:

With the permission of our Chair, may I first ask my questions to Ms. Cocadiz, did the city government take steps to prepare you and the other residents of New York City for Hurricane Sandy?

MS. COCADIZ:

There were press conferences, I believe. I heard most of my information second hand through customers and co-workers and my boss at the time. There were police cars that drove around telling people to evacuate. But, otherwise, it seems like maybe there were resources out there, but I didn't personally receive any support.

COMM. TANODRA-ARMAMENTO:

Okay, thank you. I have another question. Did you experience any change in your lifestyle after Hurricane Sandy?

MS. COCADIZ:

Immediately after or long-term?

COMM. TANODRA-ARMAMENTO:

After Hurricane Sandy, whether short-term or long-term.

MS. COCADIZ:

As I have mentioned earlier, I did not have heat, power, gas, so I couldn't even heat my water. There was no power, so the neighborhood streets were all pitch black in the evening. So everyone had to keep a flashlight on them. After a week or so, there was a police light erected directly outside of my apartment building to illuminate the street. That was a little stressful for me because the light was directly outside of my bedroom. So it was illuminating the street but also difficult for me to be comfortable in my own apartment.

And in terms of long-term, I think the emotional trauma in the effect of hearing and experiencing all of the stories from our neighbors and their loss and grief, and you know even my own neighbor in my building, he is a

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business owner and also a resident. So it was just his family, his business, and me and my roommate in the building. That was the common situation actually in Red Hook where there were many small businesses and residents who lived either nearby or above. And so knowing also many small business owners in our community there was, I remember a lot of frustration because there were offers from the government to support with loans but that was not something that was helpful to these small businesses where their personal lives are very much wrapped up with their business lives. And so, I think, because I work in a small business in that neighborhood, that also became a part of my community. I feel like, for years afterwards, at least the next year or two (2,) it is very difficult to not bring up Hurricane Sandy to Red Hook, and that living as a resident of Red Hook was very much tied to the experience of Hurricane Sandy.

COMM. TANODRA-ARMAMENTO:

If you can quantify your loss because of... as a direct effect of Hurricane Sandy, how much will it be in dollars?

MS. COCADIZ:

I think about income it's difficult to quantify. I lost three (3) days of income from the restaurant, but even though we were open... several hundred dollars, maybe even a thousand, maybe even more because I was thinking about how my rent was raised afterwards, utilities became more expensive, and there were real estate and building repercussions that increased our rent. So... because I know all the buildings had to replace their utilities; most utilities in Red Hook were in the basement, which is another reason why many people were out of power for such a long time. And, in general, water, gas and electricity have increased since then. So I would say then, a couple thousand without really knowing exactly.

COMM. TANODRA-ARMAMENTO:

Thank you. May I again ask Ms. Sering two questions.

MS. SERING:

Yes.

COMM. TANODRA-ARMAMENTO:

The same questions that I asked Ms. Cocadiz, if you can like quantify your loss, how much will it be in dollars and then if it's non-monetary, can you inform this body what are those losses that cannot be quantified in dollars?

MS. SERING:

I would say I can't quantify it in dollars. It's more about emotional loss, loss for the community, and time spent on figuring out how to rebuild a very small community. And also loss of vital community members who were vested in Red Hook. So I can't quantify it in dollars what it looks like when you talk about what does your lifestyle look like now. It's very different to not have that sense of community, to not have new members of Red Hook to live in the neighborhood as if Sandy had never hit. And to know that everything, all the cost have gone up in the neighborhood. There are no... very little affordable places to eat in the neighborhood. There is a grocery store that was completely torn apart. We didn't have that grocery store for several months; and quantify the time that it takes to do groceries from out of the neighborhood. We were lucky again we had access to the restaurant where we could eat there, but if we don't have that access, I do not know what it would look like to... need to get out of the neighborhood to find somewhere to eat, like it would have been another extra layer of a change.

COMM. TANODRA-ARMAMENTO:

You mentioned changes in the community, so did your lifestyle also change? Did you adjust, and have you succeeded in adjusting to the effect of this Hurricane Sandy?

MS. SERING:

I stopped working at the restaurant. As I said, there was an exodus of community members, a decrease in customer base, and so finding other work made sense. So now I work in the Bronx. So that takes me out of a neighborhood that I deeply love, so there's a distancing from a community where I felt more deeply tied to, that's harder to build, neighborly relationships the way it was before and that's just like the economic impact of developers coming in and finding opportunity in the neighborhood that has been, you know, destroyed.

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COMM. TANODRA-ARMAMENTO:

Thank you very much.

PANEL CHAIR CADIZ:

Commissioner Gwendolyn Pimentel-Gana will be asking questions.

COMM. PIMENTEL-GANA:

Good morning.

MS. COCADIZ:

Good morning.

COMM. PIMENTEL-GANA:

Okay, how long have you been a resident of Red Hook?

MS. SERING:

I've been there since 2005, so more than thirteen (13) years now.

COMM. PIMENTEL-GANA:

So up to now? How about you?

MS. COCADIZ:

I moved to Red Hook in September 2012 and moved out July 2018.

COMM. PIMENTEL-GANA:

So in the course of your living in Red Hook, how many times have you experienced typhoon? Was typhoon Sandy the first ever?

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MS. SERING:

Two thousand eleven (2011), Hurricane Irene... that hurricane did not hit us badly. Subsequently, and this is a shift in what the climate looks like, right? Subsequently, since then there have been many heavy rains...

COMM. PIMENTEL-GANA:

Yes.

MS. SERING:

And that's the piece of the anxiety that is caused when there are heavy rains... knowing whether or not the neighborhood will flood. Actually, prior to hurricane Irene and hurricane Sandy, the neighborhood is always prompt of letting... So it has been a long understanding that this is a neighborhood that's below sea level. I just happened to live just above sea level.

COMM. PIMENTEL-GANA:

So the same with you Tina, that's the experience?

MS. COCADIZ:

Yes, I was not living in Red Hook at the time before Hurricane Irene, but I'm also very familiar with the resignation of all the Red Hook residents that this is a flood prone area. And my neighbor, my former neighbor, who lived below me was born and raised in Red Hook, and he also stayed because he said that there had been many rains and hurricanes and that they had survived through them, so... that's not my personal experience.

COMM. PIMENTEL-GANA:

So what made Hurricane Sandy different from the others? Was it just the intensity of the storm? Okay, so there was flooding... I mean it's a natural occurrence in Red Hook, so what do you think is the cause of the flooding?

MS. COCADIZ:

My understanding is that it was a storm surge. So there was a storm surge that happened in the evening that coincided with the high tide and the full moon. So that intensified the flooding in the evening and caused the surge to increase the flooding to greater heights, and ended up flooding the neighborhood.

COMM. PIMENTEL-GANA:

So you think it's just a natural occurrence. Do you think that man contributed to this flooding? Do you think it had anything to do with the practices of the people in Red Hook, in their normal way of living? Do they think it contributed to the flooding at all?

MS. COCADIZ:

Well, knowing the people who are born and raised in Red Hook and who have experienced other storms, and North Easters who have survived all of them, this particular storm was very intense. That was something that they had never seen before. And I think that is something that many people all over the world can relate to with natural disasters, sort of, people being used to knowing that California is prone to fires, that the Philippines experiences typhoons. But the fact that there are these super storms that are increasing with frequency and intensity, I think this is one example of that.

COMM. PIMENTEL-GANA:

So you're saying that even if Red Hook is actually below sea level and you've experienced flooding before, this time is worse?

MS. SERING:

Yeah. I would say really that this is not natural, I would say that. The flooding is one thing when it's coming from one direction, but the surge that increased the amount of water that was coming through a nearby Gowanus Canal, which is actually a Superfund site that's polluted, allowed the storm surge to push the water up so much from all different directions. That to me is not natural. The storm surge intensity and the warm winters where trees bloom... I have not seen in Red Hook; I don't think that's necessarily particular to Red Hook but the disparity and the way that the weather is not predictable, as it used to be in seasons... We have, you know, in New York North East, four (4) seasons. Having warm winters where flowers bloom and what are called bombogenesis

winter storms, I mean, we can talk about having multiple bombogenesis storms since then... It's the intensity and the frequency. And I would directly relate that to the kinds of gases and the kinds of things that are coming into the environment. I understand the Philippines is also a place prone to storms. It's the intensity, just what is it...

COMM. PIMENTEL-GANA:

Do you think that the community of Red Hook can do anything to mitigate such effects on your environment?

MS. SERING:

I think that they tried before Hurricane Sandy... Sandbags, I think they are attempts to block the sea... a seawall... But they don't... I don't feel like it's something easily predictable as in the past. I don't know that that's a realistic thing considering where we're located. There's a trend, it seems, if you're by the coast, you get away from the coast. So I don't know that that's necessary preventable.

MS. COCADIZ:

Right, and I think it also has to do with livelihood. If your livelihood is by the water, and that's something that we both saw in Tacloban, if your livelihood exists in that neighborhood and by the water, then that's where you stay. Why would you leave your livelihood? And I don't think that it's the responsibility of the Red Hook residents to ensure that they continue to have access to basic human rights in the face of natural disasters. I think that is the responsibility of governments. I think that it's the responsibility of transnational corporations that have the power to change what... how intense these storms can be. And I don't think it's the responsibility of the residents to ensure their basic human rights.

COMM. PIMENTEL-GANA:

Okay, thank you.

PANEL CHAIR CADIZ:

I just have two questions. Are you both dual citizens?

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MS. SERING:

I am.

MS. COCADIZ:

I am not.

PANEL CHAIR CADIZ:

How about Christina?

MS. COCADIZ:

I'm a U.S. citizen.

PANEL CHAIR CADIZ:

But you're entitled to... because you're born of Filipino parents. Are your parents Filipino, dual citizens?

MS. COCADIZ:

No, my parents are naturalized citizens.

PANEL CHAIR CADIZ:

Alright. My second question to both of you is slightly off-tangent. How long have you been a volunteer of Gabriela?

MS. SERING:

I'm going on a decade, since 2008.

PANEL CHAIR CADIZ:

You've been with Gabriela since 2008?

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MS. SERING:

Yes.

PANEL CHAIR CADIZ:

And how about you?

MS. COCADIZ:

2010.

PANEL CHAIR CADIZ:

2010. Did Candice recruit Christina to Gabriela?

MS. COCADIZ:

No...

MS. SERING:

No, actually we met there.

MS. COCADIZ:

Yeah. So I had been volunteering in Michigan with the Filipino Community Center of Michigan as a way to reconnect with, you know, my heritage, and I was moving to New York and I had asked some friends about how I can stay connected to the Filipino community. And somebody recommended Gabriela or at that time was called Filipinas for Rights and Empowerment. And so when I joined, Gabriela was doing a theater piece about Filipino domestic workers and Candice was the director and I have a background in technical theater so then I became the technical director and that's how our friendship started.

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MS. SERING:

We did a lot of work around the labor export policy and the migration of Filipino workers here, and the play was an opportunity for the women that we work with to be able to vocalize their stories of separation from family which is very much connected to this notion of whether or not you can maintain your livelihood where you are... it talked a lot about family separation, and the roots of why they leave the Philippines.

PANEL CHAIR CADIZ:

Thank you very much. Dr. Walpole, would you have questions?

DR. WALPOLE:

(shakes head)

PANEL CHAIR CADIZ:

Alright. So we don't have further questions for both of you.

MS. SERING:

Thank you.

PANEL CHAIR CADIZ:

Thank you very much.

ATTY. MAYO-ANDA:

Thank you, Christine and Candice.

MS. COCADIZ:

Thank you.

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PANEL CHAIR CADIZ:

You are now excused. Atty. Fernandez, what's in store? Are we going for a break?

CLERK OF THE INQUIRY:

Yes, we will be taking a short coffee break. Kindly reminding everyone if you could sign up in the registration sheet outside, and, also, refreshments are served at the back.

PANEL CHAIR CADIZ:

What time do we resume?

CLERK OF THE INQUIRY:

At eleven, sir.

PANEL CHAIR CADIZ:

Alright. Thank you very much.

[break]

CLERK OF THE INQUIRY:

Good morning, everyone. We shall be resuming this session.

Commissioners...

PANEL CHAIR CADIZ:

Thank you very much. We shall now resume our proceedings. Counsels, may we now hear your next witness?

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ATTY. PAUDAC:

Thank you, Commissioners. We call on our fourth resource person, Dr. Brenda Ekwurzel, a senior climate scientist and director of Climate Science for the Climate and Energy program of the Union of Scientists. She's here to discuss attribution research specifically the research she co-authored, "The Rising Global Atmospheric CO₂, Surface Temperature, and Sea Levels from Emissions Traced to Major Carbon Producers" and other matters relevant to this inquiry.

Commissioners, before we proceed with her testimony, Dr. Brenda Ekwurzel actually submitted four documents. First is the statement of Brenda Ekwurzel dated September 20, 2018 consisting of six pages, pre-marked as "EEEEEEEE" to "EEEEEEEE-5." We actually jumped the marking because it was just submitted to us last Friday. And the signature of Brenda Ekwurzel is "EEEEEEEE" to "EEEEEEEE-5-A." The other document she submitted is her Curriculum Vitae consisting of two pages pre-marked as "FFFFFFF" to "FFFFFFF-1," and, finally, the printed PowerPoint presentation consists of forty-two (42) pages pre-marked as "GGGGGGG" to "GGGGGGG-41," Commissioners. May we ask for the confirmation?

PANEL CHAIR CADIZ:

Atty. Abrina, please confirm.

ATTY. ABRINA:

We confirm for the record the markings of such documents.

PANEL CHAIR CADIZ:

Counsel, I just noticed that in Exhibit EEEEEEE...

ATTY. ABRINA:

Yes?

PANEL CHAIR CADIZ:

There's a signature appearing on page three (3) that does not contain the proper marking. Is it just in my copy?

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ATTY. PAUDAC:

Yes, Commissioner, in your copy. The marked exhibits are with the Clerk, Commissioners.

PANEL CHAIR CADIZ:

I see, because there's some marking... alright. Thank you.

Okay, please proceed.

ATTY. PAUDAC:

Thank you, Commissioner. Dr. Brenda, can I just address you as Dr. Brenda?

DR. EKWURZEL:

Sure.

ATTY. PAUDAC:

I am having a hard time with your surname.

DR. EKWURZEL:

Sure. No problem.

ATTY. PAUDAC:

Okay, Dr. Brenda, please start your presentation.

DR. EKWURZEL:

Thank you, and good morning, Commissioners. Thank you, Dr. Walpole. Thank you, The New York Bar Association, for the opportunity to share the information with you this morning, especially in relation to the science of attributing the causes of climate change.

So I wanted to share a story, about over a hundred years ago, Svante Arrhenius calculated how much increases in atmospheric carbon dioxide would increase the global surface temperature. And before we look at how well Svante Arrhenius predicted the future, and in particular the consequences of overloading our atmosphere with carbon dioxide, let's review the difference between the science of detection of change versus the science of attribution of the causes.

So I'm gonna use a non-climate example first. This is a classic example in the State of California of a detection of change. In this case, it's the dramatic drop of the land surface between 1925 and 1977. And the scientist who was discovering this change illustrated this through the signs of this pole. Now this is the science of attribution of the causes of why that land surface dropped. In this case, it's excessive ground water pumping, which allowed the upper soil layers to dry out and compress and compact. And which was by far the single largest cause of subsidence. This is a direct quote from the United States Geological Survey and different scientists, based on the history of science studying this particular problem. And there have been solutions based on this attribution of the cause.

In the case of climate change, I'm going to refer to a quote way back 1995 Second Assessment Report of the Intergovernmental Panel on Climate Change. They said back then that detection and attribution studies attempt to distinguish between human driven and natural influences on the climate. So detection of change is the process of demonstrating that an observed change in climate is highly unusual in a statistical sense but does not provide a reason for that change; so that's the detection of climate change. Now attribution is the process of establishing the cause and effect including the testing of competing potential hypothesis.

Okay. So here's the findings of detection of change in climate. Warming in climate system is unequivocal and since the 1950s many of the observed changes are unprecedented over decades to millennia. Now this statement is from the Intergovernmental Panel on Climate Change which supports an international process of assessing all the relevant published peer-reviewed research and studies. And they make key statements that are the safest foundation on the state of scientific knowledge at the time of publication, and these knowledge policy makers can count on. That's the basic level of change.

So let's show how attribution has changed with these five assessment reports. The first one was published in 1990 and the fifth assessment report was published in 2013. So, by the time of the most recent fifth assessment report, this is the attribution statement that they made: "It is extremely likely that the human influence has been the dominant cause of absorbed warming since the mid-twentieth century, the 1950s." Now the IPCC is very precise and defines extremely likely as meaning ninety-five to one hundred percent (95-100%)

probability of an outcome or result which is about as far as scientist will go this is the cause. This is the state of warming.

Okay, let's dig a little bit deeper. Well, let me just, first... This is a science graph that's showing different natural and human influences that can, in the vertical, warm the surface temperature of the earth or in the negative numbers, cool the surface temperature of the earth. And when you look at it you will see that there's... over in the far right, there are these bar charts... there is a gray bar and a green bar and if you look at the volume of that, that by far is carbon dioxide and well mixed greenhouse gases such as methane and other heat trapping gases. So in other words, we already know that the largest cause, some of the other natural and human influences, they kinda balance each other out and the biggest shift in change is this carbon dioxide and well mixed greenhouse gases in the atmosphere. So you can see the evolution in every single year of that change over time. And we can put this into climate models and that's how we see that evolution of change over time and drill down and get more specific results. I kinda called this graph the Rosetta stone for scientist on climate. This is what's happening and this is what's changing.

Okay, let's look at fossil fuel emissions. So this is a graph that Rick Heede published... in the red, it's showing that looking at the ninety (90) largest industrial carbon producers, it's basically two-thirds of the emissions of all industrial emissions of carbon dioxide and methane. So these are a really rich data set because we have a data from 1854 until 2010, and you can see that not only did Rick Heede concentrate on the extraction of fossil fuels and the release of carbon dioxide and methane including in cement manufacture; that's what the extraction and production face. Also, when you create a product and you sell it to the public and you know it's gonna be used for energy use, we know that it's gonna be combusted. Coal, oil, gas... it's gonna be combusted for energy. You know that that's what you're selling the product for and that also releases carbon dioxide into the atmosphere. So every single year from 1854 to 2010, we have data, self-reported by these companies about how much product was extracted and sold, and you can calculate just how much every year went into the atmosphere.

So I had the opportunity to work with Rick Heede on this data set and colleagues from the University of Oxford and the Union of Concerned Scientist to essentially incorporate this data that are tied to the ninety (90) largest industrial carbon producers in a well-established climate model and we could determine how much carbon dioxide and excess trapping of heat resulted. And that, in turn, helped us determine how much surface temperature the earth warmed and we can determine how much the seas are rising. So you need a carbon cycle energy balance, to use technical terms, model to calculate the... what matters to most people, how much the seas are rising and how hot is it during extreme events, for example.

Okay, so here's a cartoon kinda showing. So by the time we get to the year 1880, the data starts in 1854, we see that the natural sources of heating and the natural sources of cooling as well the human influences of heating and human influences of cooling are still pretty much in balance. There, we just have a natural Earth. It's not much... we don't detect much change. But of course, by the year 2010, the end of this published data set in 2014, that we could use of the time of our publication, you can see that the natural and the human influences that are heating Earth are far out of balance to those that are causing the Earth to cool. So we have global warming.

So the publication is freely available for anyone to download to see all the data and all the results. It was published in the peer-reviewed journal, Climatic Change. And you can see co-authors Ekwurzel, Boneham, Dalton, Heede, Mera, Allen and Frumhoff.

Here is the basic bottom line of the results. Between 1880 and 2010, emissions tied to the ninety (90) largest carbon producers contributed forty-two to fifty percent (42-50%) of the global mean surface temperature over that time period. It's a substantial and significant signal just from the ninety (90) largest carbon producers.

Eighteen eighty to two-thousand ten (1880-2010) emissions tied to these ninety (90) largest carbon producers contributed between twenty-six to thirty-two percent (26-32%) of the global sea level rise up to the year 2010. Now remember, the seas take a while to respond to warming. It takes a while for ice sheets to melt and shrink, to contribute. It takes a while for the ocean to warm. So the past emissions will still play out to sea level rise continuing to rise. So this is the low-end because this is just what has happened to the year 2010.

I want to say that scientists around the world have been working diligently to improve on our study of attributing the causes of the changing weather patterns that we're seeing. So we have extreme rainfall from hurricanes and the science is indicating that there are many signals within climate change that are enhancing the precipitation that falls in a typhoon and there are many understood physics for why this may be happening. So we're getting to a point of attributing that human influence climate change is increasing the precipitation intensity of typhoons, hurricanes, and cyclones. We also are seeing extreme heat as a very clear and robust signal. We also see that storm surge is also increasing.

So there are other types of extreme events where the science is still evolving... We detect the change, we have observed major changes and the science of attributing all the various natural and human influences affecting those causes are, you know, still evolving. But typhoons, the rain from typhoons, extreme heat, storm surge, we have very robust signs about that.

It's even got to the point that scientists are looking at very massive extreme events such as the 2003 European heatwave where tens of thousands of people perished and lost... it was a tragic event and working with public health officials in understanding all the other aspects of what's going on and what increases vulnerability to an extreme weather event above and beyond what would naturally occur. Scientists are working together to not just understand the changes in extreme heat, but understand how that is interfacing with our human infrastructure systems of public health and so forth.

Now if you just look at the temperature that would have happened if this summer event happened without heat-trapping gasses in the atmosphere, and then re-run the models and have the amount of heat-trapping gasses that are in the atmosphere from human activities; in the summer of 2003, human-induced climate change can increase the risk of heat related mortality in central Paris by seventy percent (70%), and twenty percent (20%) in London. So attribution is going to the new frontier of trying to understand how can we improve or help systems to deal with this new reality of risk that's different in London and different in Paris. What do we have to do to adapt and to better protect people? So this is how science can help and form and protect communities and build more resilience.

Let's take the case of Hurricane Sandy that we've heard about this morning. So research has been published that a largely human-driven global sea-level rise of twenty (20) centimeters during the twentieth (20th) century caused Sandy to flood an area of the New York City metropolitan area that was seventy (70) square kilometers larger than if that exact storm, Sandy, happened and hit New York a century ago. So that's kind of types of attribution where you kind of take just the storm surge signal, not other aspects of Sandy that are also influenced by climate change, just the change in global sea level rise. So you can see how you can parse different aspects of a typhoon or hurricane, and figure out what could have been different, and it can translate into cost. I saw some studies that said around two billion dollars of extra damage could be attributed to human-caused climate change in New York City metro area.

This is another hurricane that had biblical storm once in two thousand (2000)-year rain event over the City of Houston, and the bright pink areas you see is a one-in-a-thousand-year rain level. It is a huge amount of rain on an area that really did not have infrastructure during the Hurricane Harvey to handle it.

So the attribution studies specific to this event showed this findings: "Global warming made the precipitation about fifteen percent (15%) more intense or equivalently made such an event three (3) times more likely to happen." So we're changing the odds, we're changing the amount of water falling and you

can see that there were homes that were indeed flooded up, you know, starting to approach the roof line.

So we come to this picture of Super Typhoon Haiyan or Yolanda and I know that I'm referring to science that was published by Suria et. al. and I think the numbers have increased, but at the time of this 2015 publication, it was citing some national statistics that more than six thousand (6,000) people lost their lives and a million dwellings were destroyed in Super Typhoon Haiyan. And I'm sure you're aware of much more recent figures and statistics on this.

What's interesting in this particular study, they're starting to look at how can we assess whether Typhoon Haiyan is different from other typhoons? And so what they did, and this is not running a computer model, is just take a first look at a typhoon and the three closest typhoon that went over a similar track as Yolanda or Typhoon Haiyan. And they found that one in two, in the paths in the 1897, it was hitting the Pacific... the leading edge of it was coming in at the same strength and intensity based on the paleo evidence of the intensity.

What happened was though... here is looking at the San Pedro Bay and this is the difference in water level between Typhoon Haiyan storm surge and that typhoon in 1897. So it's just a first look. We're seeing that Typhoon Haiyan was more intense, had larger maximum wind coverage, and the more winds you have the more you're whipping up the seas, and the more you can push more water on to the land especially a vulnerable bay like this, that can concentrate the water and push it up, and the storm surge was about twice above the height of the 1897 event in San Pedro Bay. And scientists are going to continue to study and see how much of Typhoon Haiyan, if you were to remove heat-trapping gasses in the atmosphere and run the model, and see how strong would it have been, cooler sea surface temperatures, less warm atmosphere, all these factors that can increase storm surge, intense precipitation, and the power intensity of the typhoon. So this is just an early indication of the difference between the historical typhoon and this one.

And as I was writing the statement, I was looking at Super Typhoon Mangkhut and tragically, we know the cascading consequences of this are still unfolding and I just wanna thank you for the opportunity to share just a little bit of some of the science that is informing typhoons and the concerns that you have in your Inquiry, that you are looking at today. Thank you very much.

PANEL CHAIR CADIZ:

Thank you very much. Commissioner Leah?

COMM. TANODRA-ARMAMENTO:

May I know what is the name or how do you call the scientific method you are using to attribute climate change as the effect of the emission of fossil fuel? Do you have the name for that method?

DR. EKWURZEL:

So, the science of attribution, you were saying? Yes. Essentially, there are many ways to detect change and also we have sensors. We've been measuring the atmospheric carbon dioxide in the atmosphere and we've been measuring how much is changing with the response in the ocean. So there's a lot of different signs or sciences; we are measuring a lot of these with satellites and everything else. The other aspect is the understanding how the earth ocean atmosphere works and the signs of putting that into calculation and models to understand where we are most sensitive, and we've also studied past changes in climate to understand natural cycles in the past. And we also know from that, that the earth is very sensitive to changes in atmospheric carbon dioxide or methane. So that's how we can attribute different causes in the past, present, and we can use this to project into the future.

COMM. TANODRA-ARMAMENTO:

Another... last question Director Brenda. My concern is to establish causability. How will I be able to attribute that this climate change is the effect of X percentage of fuel emission caused by these Carbon Majors? If I make a report, how will I present that?

DR. EKWURZEL:

Sure.

COMM. TANODRA-ARMAMENTO:

Thank you.

DR. EKWURZEL:

And that's the science I was directly involved with. What we did was use well-established climate models. The Intergovernmental Panel on Climate Change and we use that same approach. And we had all the forcing of all natural and

human causes that scientists have been using, and that's how we understand the change. With the addition of Rick Heede's data set that every year how much carbon dioxide and methane are tied back to specific companies, that's how we can run the model and remove every single year ExxonMobil, Chevron, Saudi Aramco, we keep removing them and then we see how much cooler the surface temperature Earth would have been in 2010, see how much lower the seas would've been and then you can attribute to specific companies how much change has happened in these global indicators.

COMM. TANODRA-ARMAMENTO:

Thank you.

PANEL CHAIR CADIZ:

Commissioner Gwen?

COMM. PIMENTEL-GANA:

Well I was just amazed in what you said now that you are able to attribute to companies in terms of their contribution to the global warming. So in terms of the Typhoon Haiyan, are you able now to quantify the... yeah.

DR. EKWURZEL:

So, in principle, just like the extreme heat event in Paris where they looked at that specific event and then they figured out how much heat has changed because of the human influence in climate change, the same thing with Hurricane Sandy, and the same thing with Hurricane Harvey. In principle, we can do it for all human activities already. All scientists would have to do is incorporate the annual data from these carbon producers and rerun the models, remove them, reintroduce them, run sensitivity tests. Do all the same of eighteen (18) global climate models that are used and you can assess that sensitivity and see... It's a big enough signal. We expect that you would be able to see the results because this is the largest source of change. The emissions tied to these ninety (90) entities, and the other ones are smaller so it's just harder to, you know, add them all up but you see the total, it's two-thirds (2/3) of the signal of emissions. Total industrial emissions, so it's big. So, in principle, scientists have the tools and it can be done. It's just that it has not been done yet.

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COMM. PIMENTEL-GANA:

Ah okay, so you have not done a study on Typhoon Haiyan yet?

DR. EKWURZEL:

No.

COMM. PIMENTEL-GANA:

But you are able to in the future, with the... yeah.

DR. EKWURZEL:

The largest scientific community who's used to studying the hurricanes and running those models would have to do that.

COMM. PIMENTEL-GANA:

Is this science already accepted generally by the...

DR. EKWURZEL:

It's peer-reviewed. It's been accepted, lots of people are downloading it. They're citing the study and there's even on-going research looking into ocean acidification which is important in the Coral Triangle of the Philippines and also extending this research.

PANEL CHAIR CADIZ:

Dr. Walpole.

FR. PEDRO WALPOLE:

Sorry, just to bring back to some of the basics for us who are working with it. You keep on mentioning peer reviews, could you explain to us why they are important or the role they play?

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DR. EKWURZEL:

Sure.

FR. WALPOLE:

Yeah.

DR. EKWURZEL:

It's very important to have other scientists or specialists in climate in different aspects of modelling, different aspects of global sea level rise, global sea surface temperatures, in this case, to read a study and look at the methods very in-depth and the supplementary online materials, and test and see if the methods that were published follow well established science. So that they would accept the findings of the study. That's why peer review is important. It's also important that you don't necessarily, you know, you don't pick who peer-reviews. An independent journal sends it out to who they sense would be good peers to check your work.

FR. WALPOLE:

Okay. Thank you. If I may ask, I am interested in what you were saying that with the climate change, you can measure the increase, there's an increase precipitation from typhoons. Could you just explain that a little further.

DR. EKWURZEL:

Sure. Essentially, what happens is as a typhoon is turning, it can draw energy from a warm surface ocean, and if you have more energy, you're whipping up a lot more wave caps and you're bringing that into this vertical circulation that starts becoming part of this whole typhoon, and its circulating. The other thing is climate change – the change in the atmosphere... it's warmer than a century ago, and it can hold more water vapor. And so when you have times where a storm is coming thru and can organize that water vapor into becoming part of the storm, that means that when its coming on land, it's more likely to have around fifteen percent (15%) in many cases, more precipitation falling. And if your infrastructures, your bridges, your roads, your homes, are not ready for what already a hurricane, a typhoon, that type of precipitation is huge and so you're increasing something huge, another fifteen percent (15%), that could be the breaking point for people's homes, their rivers, valleys, bridges, and

things like that. And so that's one way that precipitation both at warmer atmosphere, the warmer sea surface temperature and energy of the storm.

PANEL CHAIR CADIZ:

I just have a few questions, Dr. Brenda. You referred to detection science? And you have detected that there's a significant increase or change in climate, and you referred to attribution science. You were saying that this change is due to anthropogenic causes. What model did you use to do these studies? And are there other models that, if applied to this phenomenon, would produce the same conclusion that you have?

DR. EKWURZEL:

Yes. So we used the Carbon Cycle Energy Balance model that the parameters we used were calibrated to the large global climate models and all the historic fossil fuel, total fossil fuel emissions, total volcanic eruptions, the variations in sun spots, you know sun activity, all of those land use change we change it to farm land or you know, the reflectivity of the surface. All of these things that we know are relevant with the climate that all climate models use. They're all internationally available data sets that we plug into the model and the calibration to be able to reconstruct earth's temperature, and test it all the time in the IPCC. That's what our climate model is, based on that research, and the parameters are widely accepted within the uncertainties. You see a range of our results because of climate sensitivity and how the Earth responds, there's a range of possible known variation of global surface temperature say with doubling atmospheric carbon dioxide.

PANEL CHAIR CADIZ:

So you're saying that whatever model you use to do this study, it will produce the same conclusion?

DR. EKWURZEL:

Essentially... We can have lots of models and refine... maybe narrow the range or maybe lengthen a little bit. It doesn't take away from that, the primary cause, fossil fuel activities. That's the primary cause of change. And to make it more specific, we're going through the exercise with the Heede data set to say you can tie it back to specific carbon producers 'cause looking at that graph of all the factors, people lose sight of that, the major causes are fossil fuel use.

PANEL CHAIR CADIZ:

Anthropogenic.

DR. EKWURZEL:

Yeah. Human activities... The continued extraction of fossil fuels means that would be a huge risk for typhoons and other climate related matters.

PANEL CHAIR CADIZ:

And you based your study on the initial work of Richard Heede?

DR. EKWURZEL:

The bulk of the work that we did is based on years of climate modelling and science, and so the first runs we do are reconstructing the temperature that we already have with all the known forcing, and then we add in and calibrated to the observations of some temperature change and atmospheric carbon dioxide. And then we add in Rick Heede's data to be more specific in our attribution. So our calibrating exercise has been done by climate modellers over and over and over before.

PANEL CHAIR CADIZ:

And you would say that the accuracy of your findings is in the vicinity of 90%? 90-95%?

DR. EKWURZEL:

Yeah, eighty to one-hundred percent (80-100%), eighty to ninety percent (80-90%) and we welcome more scientists to come in, work with the data, refine it so that the public and the world can know and have better understanding of all the factors that are influencing our climate. And so we welcome any improvements from anyone. We want scientists to work with this data and have it be publicly available. In fact, I think, researchers could dig up and figure out the numbers from publicly available data and reports from financial institutions that climate modellers can put in their model real time.

PANEL CHAIR CADIZ:

And you would say that the Union of Concerned Scientists have basically accepted these findings of yours? There's a general consensus within this Union?

DR. EKWURZEL:

Yeah, a lot of people are referring to it and citing it. A lot of people have downloaded the paper and the process of peer-review. People publish and either improve or keep on working and we want people to work on this and we want better data from fossil fuel companies so that we can all improve our understanding. It won't take away from them the basic finding, I'm confident of that.

PANEL CHAIR CADIZ:

Alright. Thank you very much. Are there other questions for our expert witness?

Counsels, there are no more questions from the Panel, would you like to follow up with questions to your witness?

ATTY. PAUDAC:

Thank you, Commissioner for the opportunity. I would just go back to the discussion earlier regarding peer-review because we had Richard Heede before in Manila, so I'd like to ask how is Richard Heede's Carbon Major research viewed in the scientific community?

DR. EKWURZEL:

Sure. Well, Rick Heede, a lot of people respect that he spent years going around the world getting these annual reports from 1850s, and so that was quite a heavy, heavy lift. What he did with those reports of how much bituminous coal did the company extract versus anthracite coal. He essentially used already internationally established standards when you burn bituminous coal you get a certain level of carbon released, trapping gasses into the

atmosphere when you burn. It's different than when you burn anthracite coal. So when the company reports this much of this type of coal and you put it in to those international standards for how to calculate what it would be based on lots of study by many other internationally respected researchers. In fact, they're part of how you get your country emissions, this is already being done. He took that approach and applied it to... basically we're going from... it's very hard to calculate all the different places where people use fossil fuels and emit. It is much more direct to go right to the source, how much did you pull out of the ground and how much did you sell? That's the upstream, that's the start. I think when we're counting it once it's all distributed amongst all the countries and waiting several years later from many countries to spend lots of resources tracking it, which we need to do both, and we're going to miss them I think on the downstream end. So, I think, I look at this as the start and it's good... it's much more direct. It might help us if we keep improving that data and have it publicly available for climate scientists to use all the time.

ATTY. PAUDAC:

Can I have a follow up question, Commissioner? Based on your expertise, do you think there is more or less certainty now as to the role of this emission of carbon... of these Carbon Majors or fossil fuel companies... in fuelling or driving climate change?

DR. EKWURZEL:

Yes. I think people are surprised that it's only tied to just a few, ninety (90). Some are merging, so now it's maybe eighty-five (85) or so companies. At this point, some are buying other companies but you inherit the whole history of that company you buy and merge with. So I think it's a surprise to some how big the signal is, I mean, up to half the temperature rise.

ATTY. PAUDAC:

Just one last question, Commissioner. What will happen if these fossil fuel and cement companies continue their businesses-as-usual plans, in your expert opinion?

DR. EKWURZEL:

There are some very real thresholds of the Western Arctic ice sheet, ocean acidification that are not that far away if we were to continue unabated extraction and production of fossil fuels. If the countries hold on to that Paris

Climate Agreement, we could avoid many of the consequences and delay the pace of sea level rise for centuries, and that could potentially start within this century at a much higher pace.

ATTY. PAUDAC:

That would be all for Dr. Brenda.

PANEL CHAIR CADIZ:

I just have a follow up question, Dr. Brenda. These findings of yours attributing the cause of climate change to the 90 top Carbon Majors... I know it's been put out there in the public... but has there been a specific attempt on the part of your Union of Scientists to send these findings to the Carbon Majors? I mean, just send the volumes of findings to them and invite them to respond to these conclusions you've made?

DR. EKWURZEL:

Yes. Well I mean it was published in the peer reviews so absolutely they have the right to publish and to comment or reply and things like that. My colleagues have also talked to fossil fuel companies because they are also doing independent look at actions and making sure that fossil fuel companies are stating the accurate science that we discussed today that humans are the primary cause of the warmings since the 1950s. Anything less than that is not in line with the science the colleagues have issued. There's gonna be a report coming out about the fossil fuel companies. We had the time to talk to them, and there's been a healthy dialogue. So they are very well aware of the work and we are proud to share it. And some of the original science that we have learned were published by fossil fuel companies. Early on when I was a student at Columbia University up the road, reading about isotopes in the atmosphere. How can we tell that fossil fuel is a carbon atom going into the atmosphere? That's some of the science I learned as a young grad student and it helps us understand how to do the science today.

PANEL CHAIR CADIZ:

And are the Carbon Majors in admission? Are they accepting the finding that the cause of climate change is generally attributable to them?

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DR. EKWURZEL:

Well many scientist within fossil fuel companies know this, have stated this.

PANEL CHAIR CADIZ:

Scientists representing the Carbon Majors have accepted your findings?

DR. EKWURZEL:

The Carbon Majors, I am not aware of that activity. That fossil fuels and that extracting fossil fuels and using it for energy, many scientists have... just like Arrhenius did a hundred years ago. That's what he said, it was from fossil fuels. And he said this is what's gonna happen if we keep burning these fossil fuels. So it's no mystery to scientists who have been studying this. But the specific study, I am not aware that there are some, you know, statements about it, and we welcome any fossil fuel company to publish research and perhaps there might be some more data that they have access to that wasn't available and we would welcome being able to have that to incorporate them, to run their own studies.

PANEL CHAIR CADIZ:

Alright. Thank you very much. Any more questions? Counsels, you might want to ask questions.

Thank you very much, Dr. Brenda.

(To counsel for petitioners) Are you ready to present your next resource person?

ATTY. PAUDAC:

Do we have time, Commissioner, because it is already 11:44?

PANEL CHAIR CADIZ:

Are we now on lunch break? We just had our...

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CLERK OF THE INQUIRY:

Yes, Commissioner...

PANEL CHAIR CADIZ:

Alright.

CLERK OF THE INQUIRY:

Until one o'clock.

PANEL CHAIR CADIZ:

Alright. So there being no further questions, and we're taking a break and we resume at one o'clock. Thank you very much.

CLERK OF THE INQUIRY:

Ladies and gentlemen, we shall be resuming this Inquiry session.

PANEL CHAIR CADIZ:

Thank you very much. Attorneys Mayo-Anda and Paudac, are you ready to present your next witness? Can we hear them already?

ATTY. MAYO-ANDA:

Yes, Commissioners. Good afternoon, Commissioners. Our next resource person for today is Ms. Katherine Lofts, a human rights and environmental lawyer and legal research fellow at the Center for International Sustainable Development Law, and former Executive Editor of the International Journal of Sustainable Development Policy. She's here to share her expertise on economic, social and cultural rights, and economic change, and how climate change acts as a threat multiplier. Before she makes her presentation, Commissioners, may I be allowed to also manifest the pre-marked exhibits?

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PANEL CHAIR CADIZ:

Please go ahead.

ATTY. MAYO-ANDA:

Ms. Katherine Lofts submitted four (4) documents which have all been pre-marked last September. The first is a Statement of Katherine Lofts consisting of twelve (12) pages pre-marked as "PPPPPP" to "PPPPPP-11" her signature as "PPPPPP-11-A," her Curriculum Vitae consisting of two pages, pre-marked as "QQQQQQ" to "QQQQQQ-1," her printed PowerPoint presentation on "Economic, Social, and Cultural Rights in Climate Change" consisting of eleven (11) pages pre-marked as "RRRRRR" to "RRRRRR-10," and lastly, a document entitled "Economic, Social, and Cultural Rights in Climate Change: A Legal Reference Guide" consisting of one hundred twenty (120) pages pre-marked as "SSSSSS" to "SSSSSS-119."

PANEL CHAIR CADIZ:

Atty. Fernandez, would you confirm the pre-marking?

CLERK OF THE INQUIRY:

Commissioner, we confirm for the record the pre-marking of such documents.

PANEL CHAIR CADIZ:

Alright. Thank you very much.

(To witness) We can now proceed to hear you.

ATTY. MAYO-ANDA:

Thank you, Commissioner Cadiz. So Ms. Katherine, you can now make your presentation.

MS. KATHERINE LOFTS:

Sure. Good afternoon, Commissioners. Good afternoon, Dr. Walpole and to everyone gathered here today. Just before I begin, I wanted to point out that

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in the statement that I submitted that was just referred to, there are a few very minor corrections that I've submitted. It's basically at the level of punctuation, and then some very minor sort of superficial things and I believe that the legal representatives will be ensuring that the corrected document is submitted but it's nothing very substantive.

ATTY. MAYO-ANDA:

Yes, Commissioners, we will submit a manifestation indicating that.

PANEL CHAIR CADIZ:

Alright. If it's nothing... it's just typos you mean?

MS. LOFTS:

Uhhh or just....

PANEL CHAIR CADIZ:

But we would appreciate if you could submit the corrected one, even if they're just typos.

ATTY. MAYO-ANDA:

Yes, Commissioner, we will endeavor to submit the corrected version.

PANEL CHAIR CADIZ:

So we can now proceed to listening to Katherine?

MS. LOFTS:

Wonderful. Thank you. So I'm very happy to be here today to share my testimony on the issue of economic, social, and cultural rights on climate change, and in particular the way that climate change acts as a threat multiplier with respect to these rights.

So, as mentioned, I am a lawyer and a legal researcher with the Law Governance Society Lab at McGillian University, as well as a legal research fellow at the Center for International Sustainable Development Law. My statement and presentation draw on a range of international reports and declarations as well as on the publication that was mentioned that I also submitted which is the ECA. It's a legal reference guide called "The Economic, Social, and Cultural Rights in Climate Change: Legal Reference Guide" published in 2013.

My presentation today will be in three (3) parts. I will begin by addressing the relationship between climate change and human rights in general terms, describing how the adverse effects of climate change impair fundamental rights in the Philippines and also around the world, and the ways in which climate change acts as a threat multiplier with respect to these rights. I will then discuss responsibilities of both State and corporate actors with respect to climate change human rights harms. Finally, I'll turn to an examination of climate change impacts on specific economic, social, and cultural rights.

So as we know, the Philippines is amongst the world's most vulnerable countries to climate change. The country faces a wide range of both rapid and slow-onset of climate change impacts and it's important to know that these are not a merely projections of future impacts. Many of these impacts are already being felt in the country, and this morning we heard incredibly moving and heart-wrenching testimony from Marinel, a Super Typhoon Haiyan survivor who spoke of her devastating experiences. We also heard from Candice and Christina about their experiences, and I know that in previous hearings you've heard other testimonies from Filipinos describing what they have experienced and what they have been through. So these impacts are happening now and they range from extreme weather events such as typhoons to other impacts that maybe slightly more subtle such as changes to rainfall patterns across the Philippines. So these are just some examples of the kinds of impacts that are being felt and these impacts are expected to worsen considerably over time as greenhouse gasses continue to accumulate in the atmosphere.

So, as numerous international experts and bodies have already recognized, the effects of climate change have profound repercussions for the enjoyment of a wide range of human rights. This point is, by now, uncontroversial. As the climate changes, the impacts on ecosystems, the frequency and intensity of natural disasters and of other slower-onset events, and the potential for things like increasing conflict will all affect a number of rights including the rights to life, the rights to water and sanitation, to adequate housing, health, education, and even the right to culture. The rights to equality and non-discrimination, to self-determination, and to economic, social, and cultural development are also implicated. And in addition, I think that it is also important to note that the mitigation and adaptation measures that States take

in response to climate change also have the potential to impact on human rights.

So climate change also acts as a threat multiplier. With respect to its impact on human rights, and what I mean by this is that climate change actually exacerbates existing vulnerabilities and it reinforces social inequalities. So the consequences of climate change will disproportionately affect those individuals and communities who are already in positions of vulnerability and this includes people such as women, children, older persons, indigenous peoples, migrants, rural workers, persons with disabilities, the poor, and also people who are living in particularly high risk areas. So for example coastal regions which you've heard a lot about already today, people in low-lying areas, and of course we also know that certain countries will be disproportionately affected as compared to other countries. So, as I just mentioned, the Philippines is amongst those countries that is consistently ranked amongst the most at risk and the most vulnerable to climate change impacts.

So in addition to exacerbating these vulnerabilities and reinforcing these inequalities, climate change impacts also makes it much more difficult for governments to meet their existing human rights obligations towards those citizens. So, for example, climate change adds incredible additional stresses on things like infrastructure and the provision of government services and require, you know, tremendous financial and human resources to address. So all of these puts additional strains on governments when they're trying to meet and fulfill the economic, social, and cultural rights of their citizens.

I'd like to turn now to the human rights obligations of States and corporate actors. Beginning with State's obligations, it's well recognized that States have an obligation to address the human rights implications of environmental harms and that this obligation extends to the impacts of climate change. So States' obligations in this regard entail three (3) types of duty. There's a duty to respect, to protect, and to fulfill human rights. The duty to respect human rights is a negative obligation. This requires us States to refrain from taking actions that would interfere with or curtail the enjoyment of human rights. The duty to protect human rights is a duty to protect against violations by third parties. And so this would include the duty to protect against harms caused by private actors, by businesses, and corporate actors as well. And then finally, the duty to fulfill human rights is a positive obligation on States. And this requires States to undertake measures to ensure the realization of rights for all members of society. It's important to note that these duties apply equally to all categories of human rights. And Commissioner Cadiz mentioned this morning that increasingly this distinction between economic, social, and cultural rights and civil and political rights is sort of broken down, and a key tenet of the human rights is that they are indivisible and interconnected, and

so these obligations are required of States to respect no matter what kind of right.

Under the International Covenant on Economic, Social, and Cultural Rights, States have immediate obligations to take steps towards the final realization of human rights. Let me refer to this as being called progressive implementation... progressive realization of rights. And, finally, States have to guarantee the exercise of rights without any kind of discrimination. So this is an important part. Sorry it should have been on that slide.

States, in addition to ensuring the enjoyment of human rights within their own national jurisdictions, also have obligations to respect human rights beyond their borders. So the “Maastricht Principles on Extraterritorial Obligations of States” sets out States’ human right obligations in this respect and affirms that all States have obligations to respect, protect, and fulfill human rights within their territories as well as extraterritorially, and they also provide the steps that States must adopt and enforce to protect economic, social, and cultural rights in cases where the harm or the threat of harm originates on their own territory and also in cases where there’s a reasonable length between the State concerned and the conduct that it’s seeking to regulate. And there has been a recent advisory opinion of the Inter-American Court of Human Rights... it’s really a landmark advisory opinion on the environment and human rights, which re-affirmed that human rights depend on the existence of a healthy environment and the court actually ruled that States must take measures to prevent significant environmental harm to individuals both inside and outside of their territory.

Moving on to corporate obligations. Corporations also have a responsibility to respect human rights. The U.N. Guiding Principles on Business and Human Rights enshrine standards for non-State actors in meeting their human rights responsibilities. So the U.N. Guiding Principles are really a set of principles that clarify the duties and responsibilities of both states and companies to protect and respect human rights in the context of business activities and also to ensure access to an effective remedy for individual and groups who may be affected by such activities. And so a couple of points I think to keep in mind with respect to the guiding principles is that they really clarify and elaborate on the implications of existing international human rights standards and they refer to and derive from States’ existing obligations under international law. So they do not create new obligations. It’s really a crystallization and clarification of existing obligations. In particular, these standards affirm that business enterprises should respect human rights. This means that they should avoid infringing on human rights and should address any adverse impacts that could occur, and this responsibility exists independently of whether or not States themselves fulfill their human rights obligations. So these obligations of corporations and obligations of States are complementary in this way.

Corporations are held then according to guiding principles to what is sort of referred to as a “Know and Show” standards. So this means that companies are required to know what their impacts are so they must carry out due diligence activities and they must assess the actual and potential human rights impacts of their activities, and then they must also provide for and participate in effective remedy processes via either judicial or non-judicial grievance mechanisms, for example.

I'd like to move on now to an overview of some of the ways in which climate change threatens the realization of specific economic, social, and cultural rights as codified particularly in the International Covenant on Economic, Social, and Cultural Rights, which I will refer to as ICESCR because it is a mouthful, as well as in other core international human rights treaties.

What I am about to say by no means is an exhaustive catalogue of the ways in which climate change impacts affect these rights but rather it's just to give a sense of what some of these impacts are. And again, as I mentioned earlier, I will be addressing each of these rights individually but of course it's important to understand that all these rights are considered to be indivisible, interdependent and interrelated and so we see a lot of overlap between say, something that impacts on the right to food and then something that impacts on the right to health or life or other things like this. And for this reason, I also would just briefly mention the right to education and the right to culture, although these weren't specifically mentioned in the Petition, but I think that they overlap a lot with some of the rights that were mentioned by the Petitioners.

So to begin with, self-determination and development and the text that you see on the slide here is taken of its article of the ICESCR and all of the following slides will have a text from the ICESCR even though it's not marked. So the ICESCR affirms that all peoples have the right to self-determination stating that, by virtue of that right, they freely determine their political status and freely pursue their economic, social, and cultural development. We know that both the economic and the non-economic cost of climate change are immense, we heard some of these this morning, and poses grave grave threat to the realization of sustainable development and to self-determination including in the Philippines. So for example the 2017 Philippine Climate Change Assessment notes, in terms of costs, that in the area of health, human health alone, the potential impacts of climate change are projected to be between five and nineteen (19) million dollars by 2015 in terms of loss of public safety, increased vector water-borne diseases, increased malnutrition from food shortages, just from those causes alone and that's not even to mention those costs that cannot be easily quantified or cannot be easily counted or put into monetary terms.

The impact of climate change on a range of economic sectors and services, including agriculture, fisheries, energy, transportation, all of these various sectors will also diminish the Filipino's ability to enjoy, contribute to, and participate fully in economic, social, and cultural development, and it will make it much more difficult as I mention for the government to ensure the realization of the right to sustainable development and to ensure other economic, social, and cultural rights in the country.

With respect to equality and non-discrimination, the Committee on Economic, Social, and Cultural Rights has emphasized that discrimination undermines the fulfilment of economic, social, and cultural rights for a significant proportion of the world's population. And I've already mentioned the ways in which climate change has a differential impact on different segments of the population and can affect people who are already in vulnerable positions in different ways. So climate change may infringe on the right to equality and non-discrimination because the failure to reduce carbon emissions and the failure to adapt adaptation measures will have a differential impact on different countries, different communities, and different individuals.

The Office of High Commissioner for Human Rights has similarly found that negative impacts on climate change will have a disproportionate effect on individuals, groups, and peoples in vulnerable situations including the various groups that I've previously mentioned.

Turning now to the right to work and to social security, climate change may have an effect to right to work in a wide number of ways including by provoking significant economic transformations. So for example, with the expected bleaching of coral reefs due to increased temperatures and ocean acidification, and with changes to ecosystems and to wildlife stocks, different industries will be affected including for example the tourism industry. In certain locations, for example, tourism may decline and that could result to the loss of employment. That's just one example. Other slower-onset events such as increased temperatures, differences in rainfalls, water salinization and other things will affect the agricultural sector and this will impact livelihoods. And indeed, in the context of the Philippines, UNICEF has stated that subsistence livelihood and rain-fed agriculture are particularly threatened by climate change.

Climate change impacts may also decrease access to safe working conditions. For example, more intense heat waves can result in greater risk of injury, disease, and death amongst workers. With respect to right to social security, this is also impacted by climate change, and this way I think represents a really important legal guarantee that's aimed at ensuring the right of everybody to live with human dignity in situations of social distress. So for example in old age, in cases of illness or other unforeseen circumstances, we can see that there are tons of interlinkages here between climate change and social security

because climate change is really adding stress to a wide range of pre-existing social issues. And at the same time it has the effect of decreasing access to basic necessities. And so once again, this additional stress is caused by climate change to have a disproportion impact on certain segments of the society.

Climate change is progressively threatening food security. So the IPCC has stated that all aspects of food security are potentially affected by climate change, including food access, utilization, and price stability. Variability on rainfall, changes in arable land, pests, drought and all of these things are projected to increase crop losses and to reduce agricultural production and this threatens the availability of food. At the same time, access to food can be affected by a damage to crop fields and infrastructure, destruction of livelihoods that are caused by extreme weather events such as typhoons, and these factors can in turn lead to higher levels of malnutrition. The impacts of climate change on the right to food will also have a disproportionate effect on the developing world and also on impoverished communities within the developing world and within poor countries.

In the Philippines, the agricultural sector is strongly affected by climate change and the increasing frequency and intensity of extreme weather events such as tropical cyclones are already having a detrimental effect on food security. The impacts are expected to worsen over time. So, for example, models predict that an estimated seventy thousand (70,000) additional children will be malnourished in the Philippines by the year 2050 due to climate change impacts.

The rights to sanitation and water will be impacted by climate change and is indeed already being impacted by climate change, so loss of glaciers and reduction of snow cover are projected to negatively affect populations that rely on water, for example, on mountain ranges. While other extreme weather events, increase in temperatures, changes in precipitation, etc, will impact water supplies for human consumption and agriculture.

The Office of the High Commissioner of Human Rights has noted that climate change will thus exacerbate existing stresses on water resources and compound the problem of access to safe drinking water, which is already a tremendous problem. And, currently, access to safe drinking water is actually denied to an estimated one point one (1.1) billion people globally and is a major cause of morbidity and disease. The extent to which the right to waters is affected will also depend on the extent of global mean temperature increases. So the IPCC has estimated that a one degree Celsius (1°C) temperature rise would result in approximately eight percent (8%) of the world's population experiencing severe reduction in water resources. Well, that amount will jump to fourteen percent (14%) at a level of two degrees Celsius (2°C) warming. And then, of course, the right to sanitation is intricately interconnected with the right to water because the primary cause of

water contamination and diseases linked to water is poor sanitation. So things like rising sea levels, storms, flooding, landslides, all of these have a tremendous impact on infrastructure and services that are related to sanitation. So, for example in the Philippines, flooding and intense rainfall can damage and contaminate water sources increasing the prevalence of illness such as diarrhea, which is one of the primary causes of death in children under five.

Climate change will impact on the right to housing in many ways. The Office of High Commissioner for Human Rights has observed that sea level rise and storm surges are already having a direct impact on a number of coastal settlements, threatening homes, infrastructures, and other services. And we heard, for example, the testimony this morning about how devastating Super Typhoon Haiyan was for people's homes and for that critical infrastructure in communities and the neighborhoods. In the Philippines, we also have a situation where many poor people in the urban areas already lack access to infrastructure and basic services and they may live in settlements that are located in low-lying coastal areas and are particularly vulnerable to things like flash flooding, sea level rise, and landslides.

The right to health, of course, is connected to and depends upon the realization of a number of other rights and is very closely connected to the right to life and so many of the things that I've already mentioned such as right to food and other rights are very intimately connected with the right to health. So the United Nations Environment Programs has noted that climate change is already having a negative impact on health. And projected climate change scenarios will result in a lot of worsening health impacts. In the Philippines, the World Health Organization has identified several priority health issues that are linked to climate change and these include risks from infectious and vector-borne diseases, sea level rise, heat-related dust, and undernutrition or malnutrition.

Climate change is also linked to increased rates of mortality. The World Health Organization has projected that climate change will cause approximately two hundred fifty thousand (250,000) additional deaths per year in the period from 2030 to 2050 due to increased malnutrition, malaria, dengue, diarrhea, and heat stress alone. A study commissioned by the Climate Vulnerable Forum placed that figure at a higher number, an additional seven hundred thousand (700,000) deaths per year, and that by 2030 climate change would already be responsible for four hundred thousand (400,000) additional deaths per year. So these are tremendously high numbers. And in addition, climate change impacts pose significant risks to mental health, and I think this is a point that was particularly underlined by the speakers this morning, just really highlighting what the impacts have been in terms of mental health, of their own and of their families, their mental, psychological, and emotional wellbeing. And this has also been backed-up by studies.

And then the last two (2) rights that I just wanted to touch on are the right to education and the right to culture. So the right to education may be impacted by climate change in a number of direct and indirect ways. Direct ways include damage to infrastructures, for example, damage to schools themselves, to transportation routes, to powerlines that provide electricity to school. This is very physical and immediate ways in which the right to education may be impacted. But other sort of less direct ways as well, so for example increases in poverty that are linked to, you know, effects on livelihood caused by changes in climate may actually force children out of school and into the workforce. So this will impact to their right to education. And in the context of the Philippines specifically, UNICEF has stated that climate change poses a severe threat to children's education in part because the increasing frequency and intensity of extreme weather events has lead... will lead to suspended classes and will seriously disrupt school attendance.

And then finally, the right to culture. Climate change can impact on the right to culture particularly in so far as the culture is closely connected with the natural environment. And so for example, traditional livelihoods and ancestral traditions of many indigenous communities are particularly dependent on natural resources that may be threatened by climate change. And also climate change related displacement and migration may also threaten the right to culture as communities are dispersed and forced to relocate. This can disrupt cultural practices and social cohesion.

So just to conclude, climate change is a clear and massive impediment to the realization of economic, social, and cultural rights. And both States and corporate actors alike have a responsibility and have obligations to address the human rights impacts of climate change. So while States are bound to respect, protect, and fulfill human rights, corporate actors have a responsibility to avoid infringing on the rights of others and to address any adverse human rights impacts with which they are involved.

So I'll leave it here for now and I welcome your questions. Thank you.

PANEL CHAIR CADIZ:

Thank you very much, Ms. Lofts. Commissioner Leah Armamento will have some questions for you.

COMM. TANODRA-ARMAMENTO:

I just have one question. I didn't get your presentation regarding the relationship of... or how climate change directly affects the right to self-

determination. Can you give me like a concrete instance how it will be affected? Thank you.

MS. LOFTS:

Yeah. Thank you for your question. So with respect to self-determination, in the International Covenant on Economic, Social, and Cultural Rights that's intimately linked to sustainable development. So economic, social, and cultural development, so the realization to the right to self-determination depends upon abilities of peoples to develop in a sustainable way, and so climate change, through the other examples I gave, undermines these economic, social, and cultural rights and it's making it a lot harder for sustainable development to take place; it's undermining gains in sustainable development, and so this in turn undermines the right to self-determination of communities and peoples.

PANEL CHAIR CADIZ:

Thank you very much. Commissioner Pimentel?

COMM. PIMENTEL-GANA:

Do you have concrete studies of how the rights of people in communities are actually affected by climate change? Do you have a study?

MS. LOFTS:

Yes, the legal reference guide that I referred to, the "Economic, Social, and Cultural Rights Legal Reference Guide," which has been submitted to the Commission, includes a number of case studies dealing with each of those economic, social, and cultural rights, particular examples, concrete examples of the ways in which these rights are affected. So that's one example. There's a number of studies that are referenced to my statement. I don't necessarily, right at the top of my head, have the answers. But I could certainly provide an updated statement outlaying very clearly all of the studies that existed, if that would be helpful to you.

COMM. PIMENTEL-GANA:

That would be helpful. And particularly example... cases in the Philippines. Have you gone through all of those?

MS. LOFTS:

Yeah. Absolutely.

COMM. PIMENTEL-GANA:

Okay. Thank you.

ATTY. MAYO-ANDA:

We submit. Commissioner, may I manifest as well, Comm. Pimentel, that the one hundred twenty (120) page document that she referred to actually contains the studies she mentioned.

MS. LOFTS:

Yes.

ATTY. MAYO-ANDA:

It's already included, specific studies which have been pre-marked as Exhibit "SSSSSS" so there are studies mentioned in the document. Unless there are other studies that...

MS. LOFTS:

I mean there are number of studies that are referenced in the document but I suppose I could provide those. I mean if there are ones that are particularly relevant. I would be happy to provide those in full.

ATTY. MAYO-ANDA:

So we will submit those additional documents, Commissioner.

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MS. LOFTS:

Yeah, for example there's a study by UNICEF Philippines that I reference several times in my statement, that is particular to children's rights and children's development in the Philippines, and that's quite a recent study.

COMM. PIMENTEL-GANA:

How about on cultural minorities? *Lumads* and indigenous peoples?

MS. LOFTS:

In the Philippines specifically?

COMM. PIMENTEL-GANA:

Yes.

MS. LOFTS:

I don't have one... at the tip of my fingertips, but I can certainly look into that. And if I find anything, I can certainly pass it along.

COMM. PIMENTEL-GANA:

Okay. Thank you.

ATTY. MAYO-ANDA:

Commissioner, I would also like to manifest that the UNICEF study has already been submitted because Dr. Rosa Perez already testified in Manila. Yes.

PANEL CHAIR CADIZ:

Dr. Walpole?

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FR. WALPOLE:

I just want to add to that. What's very important for us is one of the points that you mentioned. We'd like to understand more, the impact on rain-fed agriculture for much of our upland communities. So if there's any study on that it would be very helpful to have it.

MS. LOFTS:

Sure. I can certainly look into that as well. It's not my specific specialty obviously but I can certainly take a look into it.

FR. WALPOLE:

Thank you.

MS. LOFTS:

Welcome.

PANEL CHAIR CADIZ:

I have a question. You've made extensive studies on the nexus between human rights and climate change. Have you made a panoramic evaluation of climate change litigation in the different jurisdictions all over the globe? Is there a trend that you can point to in regard to the cases filed in court?

MS. LOFTS:

A trend with respect to their inclusions of human rights considerations?

PANEL CHAIR CADIZ:

Yes. Can you see a precedent that's developing among the court cases that have been filed and are still on-going? Are they winning? Are they losing? What's the trend? What's the overall global thinking regarding climate change and human rights?

MS. LOFTS:

Yeah. I think, as you mentioned, we've seen a real flourishing of litigation in relation to climate change. But it's been on a number of different legal basis, on all kinds of different basis, not necessarily including human rights, such as certain cases like the Urgenda case. Human rights have been sort of a part of that but hasn't been necessarily the primary claim at issue. I think we are starting to see human rights claims coming in but I can't sort of speak definitively on whether or not this is a growing trend, or how these are being decided by courts. In some cases it is fairly novel, and as you mentioned this morning, it's quite novel that the Commission is here doing this kind of claim. I think this presents a real incredible opportunity to begin to set some precedent in this respect to really sort of consolidate and crystallize human rights principles with respect to climate change in this nexus here. So I think that it is starting to become a claim that's arising in the litigation, but I think it is still quite new in terms of decided cases in different jurisdictions.

PANEL CHAIR CADIZ:

So would you say that, right now, there is no clear trend happening among the courts on the success or failure of rights violation cases... not necessarily human rights, but rights violations, in general, that's been attributed to climate change. So what's the general thinking of the courts around the world?

MS. LOFTS:

Yeah, no, I think rights claim in general come up in terms of constitutional rights or sort of rights of citizens not necessarily, specifically saying these are economic, social, and cultural rights, but saying that rights of citizens are being violated by, for example, inaction on the part of governments to regulate greenhouse gas emissions like in the case in the Netherlands. You know, I think, that over the last decade or so we've had increasing consensus and statements from a number of bodies, human rights bodies, Human Rights Council, the Office of the High Commissioner for Human Rights, the UN Special Procedures, we'll hear from John Knox later today. This increasing volume of consensus affirming the connection between human rights and climate change coming from these international bodies, I think, is starting to be taken into account in decisions, for example, by others, like the Inter-American Commission on Human Rights. I think it's becoming sort of a much more established concept in the realm of international law. And I think that we will start to see that come through in domestic decisions.

PANEL CHAIR CADIZ:

You mentioned the Inter-American Commission on Human Rights. What are the latest cases that have been decided by them? In 2015, they dismissed the Inuit Case. I don't know if you are familiar with that?

MS. LOFTS:

In 2005, yeah.

PANEL CHAIR CADIZ:

I'm sorry, 2005. Has the thinking of the Inter-American Commission on Human Rights evolved or changed since that time?

MS. LOFTS:

I do think it has. We had this very recent advisory opinion on human rights and environment that affirmed the connection between environmental harms and human rights harms. I don't have the reference right at the top of my head, but I could certainly provide it. That is a very recent decision that has affirmed this link. So I think that the thinking is changing and of course the 2005 Inuit Petition was really the sort of first Petition to make this link and I think, in the intervening decade and the few years, what at first seemed like an incredibly kind of novel claim has now become more of the orthodoxy and is relatively uncontroversial now, in a lot of ways.

PANEL CHAIR CADIZ:

Because science, as I understand from the sharing of the resource persons, is becoming more and more accurate in its findings in establishing certain relations, but the law and the legal bodies have not yet caught up with the science.

MS. LOFTS:

Yeah, and I think....

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PANEL CHAIR CADIZ:

I was wondering, because you did mention the Inter-American Commission on Human Rights... it's supposed to be one of the leading human rights commissions. I wonder if that would be a barometer, if you will, on the evolving thinking of human rights bodies. I want to know if they're catching up with the science of climate change and environmental issues, in general. Could you submit to us a short memorandum, just to advise us on how their thinking is progressing?

MS. LOFTS:

Yes, absolutely. And I think that you make a good point, which is that science has progressed, by leaps and bounds, in terms of the attribution science that we heard just earlier from Dr. Brenda and others that there have been tremendous advances in our ability to actually quantify and attribute causes and effect. So that's tremendously helpful for lawyers who are looking towards the best science to be able to inform the kinds of cases that they're bringing forward.

PANEL CHAIR CADIZ:

And if these scientific findings are being affirmed in judicial bodies, let alone commissions - National Human Rights Institutions - that can guide us also when we do our report.

MS. LOFTS:

Sure.

PANEL CHAIR CADIZ:

Atty. Mayo?

ATTY. MAYO-ANDA:

Commissioner Cadiz, Marcus Orellana already in his statement also manifested the continuing efforts of the Inter-American Human Rights Commissions, stating that there's a clear pathway for evolution towards that direction. So perhaps we can actually revisit that, Comm. Cadiz.

PANEL CHAIR CADIZ:

Alright. We would appreciate receiving memorandums from your expert witnesses on that. Maybe you could cite the top fifteen or twenty cases that have recognized the science of climate change, especially in regard to attribution, because that's what we are also looking into... the attribution aspect.

Are there other questions? Okay. Thank you very much.

ATTY. MAYO-ANDA:

Comm. Cadiz, may we be allowed, I'd like to ask one question to Ms. Katherine.

PANEL CHAIR CADIZ:

Please go ahead.

ATTY. MAYO-ANDA:

Ms. Katherine, as a human rights lawyer, what resources do you rely upon to actually determine the interference of climate change with human rights?

MS. LOFTS:

So a lot of what I've relied upon are sort of the studies that have been conducted at the international level. I've mentioned a lot of studies and statements by the bodies of the Human Rights Council, the Office of the U.N. High Commission for Human Rights, and the U.N. Special Procedures, as well as I think Islers' work in this. It is incredibly important to look into the best available science, the attribution science that was mentioned earlier. I think it's important for lawyers and policy makers to be informed of the latest scientific developments to come up with the most effective and the best resolutions.

ATTY. MAYO-ANDA:

Does this include IPCC reports?

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MS. LOFTS:

Yes, exactly, the IPCC Fifth Assessment Report, reflecting a global consensus amongst scientists. I think it is a safe scientific report on which to base policy because it sort of tends to be on the conservative side of things. It is very consensus based, it represents consensus in the science, and so I think that's a very important resource for lawyers and policy makers.

ATTY. MAYO-ANDA:

Thank you, Ms. Katherine.

PANEL CHAIR CADIZ:

We have no further questions for Ms. Katherine. You may be excused.

MS. LOFTS:

Thank you.

PANEL CHAIR CADIZ:

Who will be your next witness, Atty. Paudac?

ATTY. PAUDAC:

Yes, Commissioner, thank you for that. Our sixth resource person is Mr. Kert Davies, the Director of Climate Investigation Center who has been working on climate change policy since 1998, and specifically in monitoring corporate opposition to climate progress. He's here to share evidence of fossil fuel companies, trade associations, and other organizations engaged in decades-long campaign to undermine climate science and action and discuss other matters relevant to this inquiry.

Before he proceeds with his testimony, Commissioners, he submitted eight documents pre-marked last week, first is the Statement of Kert Davies dated September 17, 2018, consisting of six pages, pre-marked as "TTTTTT" to "TTTTTT-5;" his signature as "TTTTTT-5-A," the second his Curriculum Vitae, consisting of one page, pre-marked as "UUUUUU," the third document, the printed PowerPoint presentation entitled "Evidence of Fossil Fuel Companies, Funding of Climate Science Denial, and Climate Policy

Interference” consisting of thirty-nine (39) pages pre-marked as “VVVVVV” to “VVVVVV-38,” the fourth document is the bibliography of the PowerPoint presentation consisting of nine pages that was pre-marked as “WWWWWW” to “WWWWWW-38.” Then the next document is “Dealing in Doubt: The Climate Denial Machine versus Climate Change” consisting of 66 pages, pre-marked as “XXXXXX” to “XXXXXX-65.” The next document is the “1998 Global Climate Science Communication Plan,” consisting of eight pages, pre-marked as “YYYYYY” to “YYYYYY-7,” then the next document, “The Matrix of Exxon Climate Denial Funding 1992-2017,” consisting of two pages, “ZZZZZZ” to “ZZZZZZ-1,” and finally the last document, the “Climate Files Post Index,” consisting of two pages pre-marked as “AAAAAAA” to “AAAAAAA-1.” May we ask for the confirmation, Commissioner?

PANEL CHAIR CADIZ:

Atty. Abrina, would you confirm the manifestation?

ATTY. ABRINA:

For the record, we confirm the pre-marking of the exhibit... the aforementioned exhibits and the sub-markings therein with further corrections. The Statement of Mr. Kert Davies consists of nine (9) pages in our records and, as Counsel has manifested, they have five (5) pages...

ATTY. PAUDAC:

Sorry, Commissioner. Yes, it's nine (9) pages. We confirm it's nine (9) pages, so it's “TTTTTT” to “TTTTTT-8;” apologies for the error.

ATTY. ABRINA:

That... that would be all.

PANEL CHAIR CADIZ:

Alright. Thank you very much. Are you ready to present your witness?

ATTY. PAUDAC:

Yes Commissioner, Mr. Kert Davies, the floor is yours.

MR. KERT DAVIES:

Okay. First of all, thank you for this invitation to participate in this very unique process and I congratulate you on the process you're going through here. It's a difficult one... complicated. I have a very dense presentation of a lot of information and if there's anything at any point at which you want me to clarify something, please interrupt me because it's a lot of information that I'm trying to present. Some of it you may have seen from other presenters but I have a different angle from it. I will go slowly and try to get through this but we have... a lot that we've learned about what the fossil fuel companies knew and how they process the scientific information internally, how they exerted their influence on the policy arena both in the United States and globally, and also even at the State level here in the United States trying to suppress action on climate change, and how they funded third parties who would say things that they couldn't be caught saying to insert doubt into the policy arena.

So I need to be able to see my presentation, so I'm going to swivel this way to look at the presentation because it's not over there. How do I advance this? Just like this? So these are the suggested themes that I should cover. Again, what they knew, their efforts to stall the climate policy process, including climate science denial. They knew always that the science was key; that the science was the engine that drives the policy train. If we don't have science, we don't have any action. And then they exerted a lot of effort in the UNFCCC process over the years. They also knew that the United States was key to that process; so they knew if they could slow down the United States participation it would stall action. And then they attacked individual actions here in the United States like Obama Clean Power Plan, earlier the McCain Lieberman Climate Stewardship Act. And then I will again, present information on specific funding.

So I worked at Greenpeace for thirteen (13) years and began working on climate change in 1998, in this project that I launched in 2004 called "Exxon Secrets" where we built a catalogue of Exxon's funding of various think tanks who are operating in the U.S. and worldwide, injecting themselves into the policy process. The funding was basically invisible to the world because Exxon funded annual giving reports, but the organizations would not say they were being funded by Exxon when they went out and spoke. So we thought this illustration's interactive database contains thousands of records. I now run the Climate Investigations Center and one of our major projects is called "Climate Files" where we have a storehouse of hundreds of documents. Many of these documents are being used in the lawsuits that are being filed across

the United States and around the world as evidence. We now have over two hundred (200) documents, thousands of pages, indexed in our database. And as I stated, I submitted a full index of those documents. They are also available electronically.

I put this in here just to... we have to always think about the global political backdrop. What was happening, how the corporations were responding to the pressure from the global arena? And we know a lot about what they knew in the eighties, what they knew in the early years. It turns out they really got upset, the fossil fuel companies, in the nineties when it became more urgent, and at the Rio, which called for voluntary action. We marched towards Kyoto, towards a more mandatory treaty, and they exerted much more pressure, millions of dollars were poured into efforts specifically to stop the U.S. from signing Kyoto. And then of course Bush was elected, withdrew from Kyoto, but they increased the funding then, even more to think tanks, to try to make Bush do even less on climate change so that... it's not widely known. And then by the mid-2000s the fossil fuel companies will say "we changed and we don't do this anymore," but I will show evidence that they continue.

Starting with this, what fossil fuel companies knew. You've heard from several witnesses so far, several resource people about this but I'll just drop a few details in here. Again, here's our climate files resource. It has detailed annotations of each of the documents, each of the various documents that have been turned up by journalists, academic researchers and advocates over the past few years... really the majority. Some of them we've been curating for twenty (20) years.

One of the documents that came out exactly three years ago with the Inside Climate News revelations and the work by the Columbia journalism school, with the L.A. Times, was about a gas field right in your neighborhood, Natuna, which Exxon got rights to but... from the Indonesian government. In 1980, they began to explore this gas field, a vast reserve of gas, and discovered that it was over seventy percent (70%) carbon dioxide by volumes. So it's essentially natural gas polluted by carbon dioxide. They knew, at that time, their own scientists assessed that if they vented that carbon dioxide into the atmosphere, which is normally what they do if there's a little bit of carbon dioxide, that gas field would become the largest single point source of CO₂ on earth. Remember this is 1980, there was no regulation of carbon dioxide anywhere foreseeable on Earth and they knew. The document show that they knew that would be a bad thing that they should not be responsible for being the largest single point source of direct emissions of carbon dioxide. They also estimated that effectively burning that gas with the added carbon dioxide would have twice the impact of coal. So this is a strong showing of their internal awareness of the importance of carbon dioxide pollution.

Here's further evidence in an internal, several internal memos in the early eighties. Their own scientists are doing modelling, very detailed modelling like what's presented earlier to their own assessments of the arch of greenhouse gasses and the accompanying temperature increase. And they had, you know, they presented this to, it says, to the highest levels... widely distributed to Exxon management. So it wasn't just a scientist in the lab. This was known throughout the company.

Here's a graph of one of their models, and they almost exactly matched what has happened today in their modelling; so they were good at it. And they showed that a doubling would occur over a given period of time. They did several different iterations of this, you know, if the world decides to cap emissions at seven hundred (700) ppm, at five hundred fifty (550) ppm, what it would take? They determined that coal would have to go immediately by the 1990s and that renewables would have to be phased in very rapidly. So this shows a high level of awareness as to how it will impact their own business, and how they would impact the world. They also expressed, both Exxon and Shell, how much they felt the oil industry should be involved in discussing this. They should be heavily invested in figuring out solutions in fact. But they didn't.

Here's another key document now, 1988, or thirty (30) years ago, an internal Exxon document that was revealed only three years ago showing that they were focused on emphasizing uncertainty, that they were focused on resisting the overstatement or sensationalization of the issue which they thought could lead to the development of non-fossil fuels. So they were being defensive about... and recognizing that the science was putting pressure on them. Likewise, they were not doing anything to change their own operations because of that uncertainty.

Next is, a bunch of underlines. Next is a document that we helped reveal this year, recovered by a journalist in Holland that was marked confidential - Shell Oil confidential report. The date on the one document that we have, which is clearly the tip of the iceberg because there are many other internal documents that came before this that are referenced, details a study that they did inside Shell between 1981 and 86 where they were assessing climate change as a problem. They talked explicitly about how this is a problem that has to be dealt with before certainty is complete. They knew that if we waited, it would be too late. In fact it says, the top quote there where it says, "By the time the global warming becomes detectable, it could be too late to take effect of countermeasures to reduce the effects or even to stabilize the situation." So they knew, by the time we felt it now, it would be too late to really effectively cut off the worst of it. So this is, you know, again thirty (30) years ago, Shell internally was saying this. They were not saying this to their shareholders, they were not saying this to the public, they were not apparently talking to the governments in this language, but inside the company that's how they go.

This document we recovered recently and I have not previously shown this or publish it, but this is the oil companies in the early nineties funding Lamont-Doherty, who will be here tomorrow, sending well over one hundred thousand dollars (\$100,000) per year to the laboratory to fund modelling, to fund the exact kind of modelling that Brenda Ekwurzel is talking about the forecasting. Why were they doing this and how? We don't know much more than this. We know from this funding proposal that they... that Mobil itself was proposing to send another twenty-five thousand dollars (\$25,000) for another year. Inside the proposal, it talks about how the American Petroleum Institute, and we're acting as a lead on this for the oil industry, talks about how this is valuable for Mobil because they say, "Global warming is likely to be the key international environmental issue of the 1990s." This is 1993, they're well aware that climate is rising as a key issue and that they are well aware that they say it is more helpful to Mobil scientists to see this data before it is published, before it gets into the journals. So they want the front row seat with the academic scientists as well as their own scientists studying this.

So when did it turn? Suddenly they become more belligerent, become more obstructive, and it really happens around the period towards Kyoto after the Second Assessment Report of the IPCC. Here's a case study of a report on COP Two where they're detailing back to their colleagues all of the efforts that they took at the COP to monitor the science, to participate in it, and that members of multiple oil companies listed there Exxon, Mobil, Chevron, Texaco, which is now Chevron, and BP were on delegations at the COP. They talk about how their science was being used in the process, how they were acknowledged by the IPCC Chair as participating in the process. So it's a window into how actively they were getting in the room trying to be involved. Not necessarily as a positive force but just monitoring it for the industry.

Next case study is in 1995. We have a draft document that was about the IPCC Second Assessment Report again, to give guidance to the industry on how to talk about the science at that time. It was authored by a Mobil Oil scientist, Leonard Bernstein, 1995. They acknowledged that you can't deny climate change completely at that point. The role... the potential impact of human emissions cannot be denied they say here but they go on to say that they're upset at the language of the IPCC that there's a discernible human influence. Now you saw earlier that that language has become more and more certain over time. They were upset at the word discernible, even in the notion that there's a human impact... become part of this global document. They go on to say that we can still say it's uncertain because the computers aren't strong enough to do really good modelling. So while they're funding the modelling, the best modelling in the world at MIT and at Lamont-Doherty. They know that computers aren't fast enough to really do high resolution modelling that could predict in a fine-grain way what was going on and what would happen. So it was okay for them in their opinions to keep saying it was uncertain.

The key part of this document is that in the back, the words that were not included in the final version of this, they take apart all of the contrarian theories, all of the theories of some other cause that would discount greenhouse gasses and they go through, one by one, solar variability, the role of water vapor, Richard Lindzen who is still involved on the denial side of things. And Patrick Michaels who is still involved on the denial side of the things, on his theory, his continuing discussion of how the models don't line up with the temperature record.

And, one by one, they knocked this down and they say they do not offer convincing arguments against the conventional models, so they're all interesting but they do not offset what's happening, what's being observed, and what could happen in the future. So it's effectively... the industry is saying to itself we can't use those arguments, and we will seem out of touch with reality if we do and yet they keep funding those same scientists to profit those arguments outside their walls. At the same time, they are putting a lot of pressure on the Bush administration in the early 2000. There are series of documents that we got through freedom of information, detailed meetings early in the Bush years between the State department and members of the Global Climate Coalition, which was the industry block. And they acknowledged that the President of the United States rejected Kyoto in part based on input from industry so it shows that interlock between the two. There are also meetings with Exxon in these files.

At the same time we have extensive documents showing what Exxon was putting out in public. You heard about Geoffrey Supran and the editorial advertisements they were putting in the papers, year after year, doubting the science, questioning policy, pushing back against any action on climate change. They also published their own reports "Global Warming Who's Right? Facts About It, Don't Ignore the Facts," all injecting doubt, and these were published things that were handed out. I think the key evidence is what they were handling out versus what they knew internally and we only have some of that.

Next is a presentation that was revealed showing a 1996 internal presentation on health impacts by an Exxon scientist named Devlin and he is presenting to the Global Climate Coalition to the entire industrial team, and he is sort of saying there's increasing attention to, you know, mega storms, global epidemics, emerging infectious disease that is being written about in medical journals by the IPCC, by the National Academy of Sciences. It shows all these arguments as the hypothesis, that there will be direct and indirect impacts to people across the world from climate change. And then at the end of this document after detailing what was the existing science at that time, he writes, "The impact of climate change on human health will remain speculative and provides potentially emotional issue." So they're worried about its emotional

value and that we should instead promote the concept of relative risk, that the significance of climate change is not as big as other factors like malnutrition, or poverty, or other things... And in fact there are elements that they have executed their strategy in subsequent years.

Again, at the same time we know Mobil was putting a doubt, sowing out doubt through these advertisements. A very important case study, the 1998 API Global Climate Science Communications Plan, was leaked to an environmental group who gave it to The New York Times. It was at the front page, revealing this extensive multi-million dollar campaign to undermine science after Kyoto was passed. They knew the science is what lifted countries up to pass Kyoto... to sign Kyoto, and they wanted to back off. Other presenters have put this forward to the Commission in previous hearings but I wanted to pull out a few things. Exxon and Chevron were both implicated here, here in this room, also Southern company, the largest utility in the United States at that time. There were two members in the team in the room who were on the Trump transition team for the E.P.A. And another group I want you to remember is the Committee for Constructive Tomorrow or CFACT. I'll come back to that.

They say... their victory will be achieved when citizens recognize uncertainties in climate science, that the media will be uncertain, that the regulators and legislators will be uncertain. They had an action plan with goals. They assess the current battlefield. It's a very extensive plan. They talk about metrics to measure their success including how many talk show appearances, alternative sciences, contrarian or denial scientists were on, media articles, number of members of congress reached with their message, they detail multi-million dollar campaign over several years for media work and outreach.

This takes us to the funding question, which is a key question. In the same memo they talk about how to fund this. They laid out a plan, multi-million dollar plan. Where they get the money? They talk about the funding sources being American Petroleum Institute, Business Roundtable, Edison Electric Institute, to the Independent Petroleum Association of America and the National Mining Association and their members, so all of the companies that are members of these trade associations. The trade associations are set up to lobby for specific industry and they were drawing on all that base of funding and that the people to give the funding to who would deploy the plan were the think tanks. American Legislative Exchange Council, CFACT, I mentioned earlier, Competitive Enterprise Institute, Frontiers of Freedom, and Marshall Institute. So this again was in the front page of The New York Times, everybody saw it, and yet we think they did it anyway.

Here's a diagram of all the entities that are mentioned in this memo. Exxon funded the groups, the very groups that were in that memo for subsequent

years upwards of six million dollars (\$6,000,000), that we can track, that we know of, just Exxon. We don't know about many of the other funding sources to these same groups. That's how far we've collected records of Exxon and ExxonMobil grants to these denial organizations, that top thirty-eight (38) million dollars (\$38,000,000) from 2017 down to 1992, with five million dollars (\$5,000,000) of those grants specifically earmarked for climate change, that are titled climate change in some way. We know this is an underestimate because we don't have all the Mobil foundation records.

This is a graph showing that the funding went up in the 2000s... until 2005, the peak. At that point, they were receiving a lot of pressure from the World Society of London, the largest, the oldest scientific society on earth, and Senators, shareholders, and advocacy organizations who had revealed this to the world that they were funding all these organizations, and they had to cut it out over subsequent years. They said they had changed their mind.

This slide that I'll show you, we have only the tip of the iceberg on the funding flows. We've recently found older foundation documents from several other oil companies, Amoco, which is again BP, Chevron, Shell, Texaco, and they show funding early on to the same exact organizations that I've been talking about. Competitive Enterprise, Heartland, Citizens for a Sound Economy, which is heavily funded by Koch brothers, Heritage Foundation, and so on and so forth. Another effort that they deployed was something called the Cooler Heads Coalition. They grabbed the web address GlobalWarming.Org in the mid-nineties, and they held seminars on Capitol Hill. They pushed out literature saying it's not happening, it's not that bad, don't worry about it. That was founded we believe with a grant from Exxon of ninety-five thousand dollars (\$95,000) in 1997.

And we just found this document very recently, the 1997 data. We've tracked eleven million dollars (\$11,000,000) from Exxon, you know the numbers are dizzying here, but we know a lot. We have so much detail on these grants. I can answer any questions on that. And the grants have specific title like "Climate Change Issues, Global Climate Change Outreach, Climate Change Science," you name it. Here's the list of the organizations involved in the Cooler Heads Coalition, many of them today are still involved in denying climate change, and trying to stop the government from acting. They don't believe it's a risk.

Over eleven... these are the key funders, you can study that later. Key funded groups. Three of the coalition members got over one million dollars (\$1,000,000) from Exxon after 1997, so that it heavily funded them. We also have documents from Exxon, again these are ExxonMobil documents, their tax documents don't line up with public reports for several years. There are discrepancies between what they have submitted to the internal revenue services and what they publish in their giving report that they publish for shareholders where they omit Climate Change from the description in the

public report, but in the I.R.S. report it says Climate Change. Here's one case where they detail a Project (Climate Change), eighty thousand dollars (\$80,000), but on the public report it just says sustainability project. Another key group, Frontiers of Freedom, in the public report it says general operating support ninety thousand dollars (\$90,000), in the tax form, it says Climate Change Efforts under the same amount. So we don't know why they were being deceptive or why they were not including this in their public reports but it was clearly omitted.

This is a television ad from a Competitive Enterprise Institute where they went over the line and they said for carbon dioxide, they said "Some people call it pollution, we call it life." And they had a little girl blowing a dandelion and talked about the benefits of carbon dioxide. That very year, Exxon dropped them from their funding. They decided that was enough. Exxon even then made a statement saying, "We don't tell these groups what they say. We're not telling them what to say," but what we don't have is the reporting back from the organizations to Exxon. What did we do with your money?

Competitive Enterprise, that group was getting upwards of four hundred thousand dollars (\$400,000) a year from Exxon. And I guarantee you they had a report. Here's how we spent your money. And we'll get those documents someday maybe.

The next year, more pressure was applied and they finally had to submit a statement in their annual report saying, "We are no longer to... we will discontinue contributions to groups whose position on climate change could 'divert attention' from the discussion of the world on climate change." What you know is they were diverting attention...

This study takes a step back to 1991. The first efforts to block climate change policy were actually by the coal industry and the utilities because they knew they were gonna get hit first. Patrick Michaels was also involved in this campaign. It was called the Information Council on the Environment and the goal of this campaign was to reposition global warming as a theory not a fact; a very blatant goal. They talk about a radio tour and they ran ads just flat out denying that there was any problem at all. They talk about targeting older, less educated males who might be susceptible to their messaging because they also did polling showing that eighty percent (80%) of the public believed it was a serious problem in 1991. The opinion had gotten ahead of them, and they wanted to back it off.

This was an investigation we conducted for five years, we released in 2015, on Dr. Willie Soon at the Harvard-Smithsonian Center for Astrophysics. Actually it has less to do with Harvard University and more to do with the government Smithsonian. We got documents from Smithsonian showing that Dr. Soon had received over one million dollars (\$1,000,000) from fossil fuel

interest over a decade, and meanwhile was submitting papers to journals about how polar bears were just fine and the ice was not really melting and everything was okay. He acknowledged it in this paper. One of the first clues we had is the acknowledgement in his paper that he was funded by the Koch Foundation, American Petroleum Institute, and ExxonMobil for this work. We then found out that he was not acknowledging funding to many journals while he was reporting to the corporations, "I submitted peer-reviewed papers with the grant money you gave me, I'm contributing to the peer reviewed literature." But he breached ethics codes with journals by not revealing that funding. And a lot of his funding was cut. This was in The New York Times three years ago.

And again, back to that 1995 document, the Mobil Oil scientist talked about this exact theory. Soon's theory is that sunspots are what's causing everything, not greenhouse gasses at all. The Mobil scientist said this does not hold water. Jastrow, the scientist named here, was Soon's mentor. And he says the counter-argument, "This could account for a little bit of variation in the temperature but no way it's going to account for the trend." So in spite of being briefed by their own scientist, that this theory was not that valid, they fund the very scientist saying the contrary—in millions of dollars in subsequent years. The American Petroleum Institute published a report by Soon and colleague Baliunas attacking the hockey stick study by Michael Mann. So they had to reckon with that. How did they know this internally and still fund scientists who were saying the opposite? Here's some details on the funding.

Now these last couple of case studies specifically are about, you know, what they've done more recently. The group CFACT that I've mentioned earlier after Haiyan, remember this was the group that was participating in the API memo, they are talked about as a fundee... Exxon funded them heavily.

At the COP that was happening during Haiyan, if you remember, it was simultaneous when the Philippine negotiator declared a hunger strike and broke down giving a presentation. You know, this was five (5) days after the storm hit and the group CFACT publishes a blog saying typhoon activity in the Philippines is normal, the Philippines enjoys tropical weather, and with tropical splendor comes tropical storms. Fairly cynical, in retrospect, and that there is no worthwhile science or historical records to support the notion that extreme storms have worsened in the Philippines or elsewhere, as a result of our warming planet; entirely discounting the science.

We don't actually know who's funding CFACT at this point in time because it's all hidden. But this is the same group that was nurtured with fossil fuel money for many years, their voice was raised by fossil fuel money, and here they are basically saying everything is normal. Don't believe it. Don't believe what scientists are saying about these super typhoons.

And, finally, this case study was a document that we revealed this year with the help of a journalist inside Shell, doing future studies of how Shell should react to the world. Again 1998, twenty (20) years ago, they predicted there will be lawsuits. They say they layout a scenario of an intense storm hitting the East Coast of the United States, Sandy maybe, and in response, following the storms, I'll read the quote, "A coalition of environmental NGOs brings a class action lawsuit against the U.S. Government and fossil fuel companies on the grounds of neglecting what scientists including their own have been saying for years that something must be done." So they actually predicted that there will be legal action. The very legal action that's been happening in the past few years. They knew... in this report, detail how much their role in the problem was, what they knew about their role...

So, to recap, we know an awful lot about what they knew. We know they studied the threat excessively internally, we know they funded academics, they funded these third party deniers, these spokespeople. We know they interacted with the government at some level, we know they participated in government assessments and at the U.N. level, and that they worked also to stall government action very heavily especially in the 1990s. We know they attacked the science, they targeted individual scientists, they targeted scientific institutions, often individual scientific studies like the Hockey Stick Study that raised media awareness, and that they paid these third parties a lot of money to say things they couldn't be caught saying.

But we also know very little. We have two hundred (200) documents and it's the tip of the... it's a glimpse... often a little window into their internal thinking. We don't know much about communications within companies about these things. We have the memo, but we don't know what the meeting looked like. We don't know how they discussed it between themselves, between companies. We don't know what their communications were with trade associations, how they were putting the trade associations out as a buffer, or how they worked with many P.R. companies that are still involved to put out these messages, and then the work with non-profits.

So that's the end of my presentation and I would welcome any questions.

PANEL CHAIR CADIZ:

Thank you very much. Commissioner Leah will be fielding questions for you.

COMM. TANODRA-ARMAMENTO:

Good afternoon, Mr. Kert Davies. I would like to ask a question because your presentation appears to be adverse and very damaging to the oil companies

like Chevron, Shell, Exxon. So as I see these documents are internal documents, short of saying how were you able to obtain this? I just want to be assured that these documents, if ever presented to the court, can withstand scrutiny because it is authentic and that it is properly obtained. Thank you.

MR. DAVIES:

Fantastic question. So all the documents I presented were uncovered by journalists, were reported in the news, except for the one that I said was brand new which we retrieved from an archive. The companies have never rejected these documents in public. They have rejected the notion of the articles that have come out saying, "Here's what, you know, that you were engaged in denial, but they have not ever said these are fake documents or fabricated in any way." In many cases, the documents came from their own archives, or their own scientists or retired scientists, or some other source, academic source. In one case, it was a letter written by a retired scientist to his son in the academe that was then published in a syllabus at the university. So these are all documents that have not been stolen or recovered in any unethical way. They have been revealed by investigative journalists and advocates and academic researchers.

COMM. TANODRA-ARMAMENTO:

Thank you very much for that assurance.

PANEL CHAIR CADIZ:

Commissioner Pimentel.

COMM. PIMENTEL-GANA:

Are you saying therefore that in all these pronouncements of these major fuel companies that they have actually been misleading the public, making us believe that everything is okay, but they have been conscious of the fact, ever since, that this has been destroying our environment?

MR. DAVIES:

I think the evidence is very clear that they had a deep knowledge of how serious it was a very long time ago starting in the early 50s. I mean we know, and you've heard from other people testifying that they knew about it back to

the 50s. But when they started doing their own science, and we now have a record of their own scientist doing an internal assessment, and they knew that it would get warmer at the poles. They knew it would start the ice melting. They knew it would affect sea level rise. They detail it in their own reports, how this would change the ecology of the world and impact people. They also were finding a way out for themselves. They were figuring out how they can survive, how maybe coal has to go... but not natural gas... or some other pathway. They also were inventing at that time, they were inventing solutions.

There's an evidence that Exxon was trying to develop better solar panels but they didn't deploy it. They didn't actually push that out into the world. They just had some genius developing a better way to produce solar power. They actually created their own electric car, out of an old car, way back in the eighties. But they never deployed it. They never helped the world make that transition. Yet their own scientists, in these documents, say we have to be part of the transition. At that time they may have wanted to help, and then they backed off when the pressure got more heavy in after the real Earth Summit, towards Kyoto. And they turn into exactly what you've said... they start to reverse and say, not so fast, ... you know we can't change energy sources of the world too quickly. They start to hit tones about the role of energy in solving poverty around the world and how at one point the head of Exxon goes to China and says, "You don't want this Kyoto protocol because it's the West trying to keep you down, to stop you from developing. Meanwhile in the United States, the same organizations are saying, why is the U.S. doing this alone? Why is the U.S. obliged to cut its emissions and not China? So they're playing it very cleverly politically to stall action while they knew that things were breaking and that quote from Shell where they say, "By the time we know it, by the time we feel it, which Exxon also predicted would be around 2010 or now, it would be too late to really head it off."

They knew emissions have to start being cut in the early nineties to really head off the worst.

COMM. PIMENTEL-GANA:

What have you done actually with the results of your investigation? Have you influenced in any way policies in the United States or anywhere in the world?

MR. DAVIES:

Individually?

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COMM. PIMENTEL-GANA:

Yes.

MR. DAVIES:

I hope we had done a bit. Our objective is to spread this information, to curate this information, to analyze it, contextualize it, give it new life and preserve it. And we know, as I've said, these very documents are being cited by lawyers in cases like the New York City case that you're gonna hear about. The cases in Baltimore, in Rhode Island, in California are all using these exact documents and many more in their evidence, in their cases. On our site we have annotations of those cases showing the exact documents that are foot noted in the cases. So it's having an impact that way. It's allowing lawyers to use evidence to show that the companies knew better, that they were heavily invested in science and knew what the impacts would be and yet kept us on a path of using their products and not reducing emissions.

COMM. PIMENTEL-GANA:

Can you give us a list of these cases that actually cited... that have used your investigation in their defense? For their Petition...

MR. DAVIES:

Yes. Absolutely. I will. And again these are not my investigations. These are documents that have been revealed through many sources. What we're trying to do is to keep a library. A very exact library of all the documents, so I am not taking credit for finding all of these documents; I am just keeping them and hopefully preserving them for folks like you to use.

COMM. PIMENTEL-GANA:

Okay, thank you.

MR. DAVIES:

Yeah.

PANEL CHAIR CADIZ:

Dr. Walpole?

FR. WALPOLE:

Sorry, I find this very hard to put into question and you remind me of several things in the past because the Manila Observatory for many decades observed the sun spots so I remember that particular report when it came out and it did appear as a hoax. I feel I'm living on a very small island in the ocean and we're here in New York discussing these matters. I'm challenged to understand how, as it were, the battle of giants, that's causing so much of our increasing vulnerability as you would have it, can actually be addressed. So I'm struggling with the evidence that you were presenting, how we can hear this in a responsible society. We cannot, in the legal sense, address such companies from a legal position in the Philippines. But how? The struggle for me is how can we understand what you are presenting without sowing more and more doubt? How are we to understand the level of accountability? Earlier on we were trying to understand how carbon accountability, if you like, can be measured. But how we measure accountability in this context is grave. So when you present these documents in other contexts, what is the response to them? How can it be gauged? How can it be measured?

MR. DAVIES:

It's a good question. And I'd give you a couple of points of reference first. You know, we have a sort of aberration of our president right now, who got really lucky to be president, I believe, and suddenly he is parroting these exact words that you see from the Exxon-funded think tanks, that have been propagated by these think tanks for the past two decades. So his words are, you know, the same as the Competitive Enterprise Institute and Heartland Institutes, "It's a hoax. It's not happening. It's not real. That's an outlier voice. That's not actually a majority opinion or definitely not a scientific opinion." But that's how much power this negative energy, this denial energy has had. We now have the president saying the same thing, and so the United States is going backwards all of a sudden again.

The other point of reference is these companies, they definitely studied the exact things that you're concerned about. They were very concerned about hurricanes for example because they have their own facilities out in the ocean. We don't know yet what they know, what they knew then about the strengths of storms; their own internal studies, who they were contracting. We know they were fortifying their own facilities against bigger waves and, you know, higher impacts. So that's worth considering. And then on the impact... on the

specific impact in the public, the best reference is three years ago when the first journalistic exploration of this came out in September 2015. The reaction from most people that had not ever heard about it that I spoke to, you know, walking my dog for example was, "Wow, how did Exxon knew about this in 1980? Exxon knew about climate change?" They were just dumbstruck that Exxon would have known because they didn't know.

Individually, you know, it didn't really rise into consciousness until the late eighties. You know the famous hot summer here and James Hansen will be here tomorrow with his testimony. That's when we woke up to climate change, but the fact that Exxon was studying it earlier. For some people that I spoke to at that time, some raised all doubt for them, that the company knew better and was studying this and was acknowledging it, doubts that have been generated by the doubt, by the denial machine, by the campaign that Exxon ran to increase doubt. Suddenly they said the light bulb went off. They understood it for the first time. So, in a way, it has a very curative effect of giving people a baseline of saying, "Oh well, if major corporations knew and the government knew what was going on, and scientists knew, it's a fact, there's no doubt." And yet they began to sow doubt and finally, you know, in reaction to the lawsuits that are happening now... one of the public relations tactics being thrown out by the fossil fuel industry is, "It's not our fault, it's everyone. We just make a product. It's everyone using the product, it's not our fault that you use our fuel, we're just providing." They almost act as if they were charity providing a service to society and not making billions of dollars of profit every year on it.

So this evidence to me says they knew that their product was causing harm. They knew full well that continued use and growth in use of fossil fuels would cause increasing harm. They also knew there was a path out of that. They diagramed it in detail, the curve of emissions to go down, how to keep the temperature down. They have their own scientist mapping the temperature increase and how to stem it. So those are some random answers to your question but there's a lot to talk about.

FR. WALPOLE:

Yeah. Thank you.

PANEL CHAIR CADIZ:

When you speak of climate change denial, is the denial in regard to the climate change itself or is the denial in regard to the anthropogenic attribution.

MR. DAVIES:

All of them... there are so many flavors. I mean the coal industry took the tactic that carbon dioxide is good for us and there should be more in the atmosphere and that warming would benefit mankind. They ran a campaign called the Greening Earth Society where they pictured Adam and Eve and how we would return to Eden if we just burn more coal. That it would be good for us. The oil industry took a different tactic of saying it may be an issue but it's not as bad as James Hansen says or as Al Gore says or Senator McCain says. They would downplay or decrease the urgency and then there are many different shades of gray there where they will say, you know, it's happening but it may not happen so quickly. It may be the warming only occurs a little bit of the time and we can adapt. Famously, the head of Exxon, Tillerson, years ago who became our Secretary of State, said, "Well yeah, it's happening but it's just an engineering problem, we'll figure it out. We'll figure out a way to adapt." So they shift. They shift the dialogue from this is a crisis to this is just a simple engineering problem.

And we can, we can get out of it with, I don't know, some defenses. But think about how you're gonna arm the Philippines against super typhoons. What that would take on engineering level? It's ludicrous and who would pay for it? So that's part of the answer to that question.

PANEL CHAIR CADIZ:

Do you have questions for your expert witness?

ATTY. PAUDAC:

Just some questions, Commissioner. Thank you for the presentation, Mr. Davies. Given that there are current exposes made everywhere, how did these Carbon Majors or fossil fuel companies respond publicly? For example, if any, against a person like you, the Climate Investigation Center, against journalists, did they do anything, and did they continue with the same messaging that they have currently? I believe these internal documents were from before, but now, did they continue with the same messaging? Those are two questions, unrelated actually.

MR. DAVIES:

Really good questions. The initial response when the older documents emerged three (3) years ago from Inside Climate News and the Columbia Journalism School Team was to deny the entire thing. To say, you know, or

actually first to brag, “Yes, we had brilliant scientists. Of course we’ve been responsibly studying this for many years, and we have been participating in the scientific dialogue, and here are all the published studies by our scientists... And they expressed pride in their own scientific prowess on it. But then when contrasted with the denial phase, they denied everything, “That never happened, don’t believe it.” So what they’re very ashamed of publicly or want to erase is the period from say 1989 to 2007, that twenty (20) year period when they went into more than aggressive backlash stance. They’re happy about what they did in the eighties, except that Natuna was not in public knowledge. That they have abandoned that project because of the CO₂, but internally it was a story. Inside Exxon everybody knew that story. So that’s the key thing. It kinda contrast between what they were saying to the world, what they were saying to shareholders, what they were expressing outwardly versus what their internal knowledge detail. Does that answer your question?

ATTY. PAUDAC:

Yes, did they take any action against some people who exposed...

MR. DAVIES:

Yes, oh sorry. Indeed they tried to discredit the journalist. They continued today, to run campaigns through third parties to say that there’s a conspiracy on the left to attack the company. That we’re just trying to make money out of this, or there’s some grand conspiracy run by foundations and NGOs. They take it back to a meeting – so Brenda was at in 2012 – that was a public meeting, published a report about it, and called it a Secret Conspiracy, and they have this eco-chamber of blogs and spokespeople propagating this. In addition, they got a member of congress to subpoena many groups including Greenpeace to attack them for doing this work. They went after the lawyers who filed the lawsuits. They went after the Attorney General of New York who is the first to step out, the Attorney General of Massachusetts who subpoenaed Exxon for documents, they counter-turned court, and they have a whole theater of puppets who are now attacking us for revealing this and telling the truth and try to increase the investigations.

ATTY. PAUDAC:

So going back to the other question is that, after these exposes, did they continue with the messaging? With the current messaging... what is the current messaging that they publish?

MR. DAVIES:

I'll just focus on, well, Exxon and Shell for now. Exxon's messaging is we are responsibly developing energy and we are brilliant at that and we are now exploring at algae and carbon capture and everything green. While they are still in fact an oil and gas company. So they spent millions of dollars on television advertisements run during major sporting events like the Olympics and championships. Expensive television ads to show that they have a green side without ever saying carbon dioxide is a problem and causing climate change... it's a very careful nuance thing. They also are very aggressively trying to buff their own image.

There's also an initiative that was launched called the Oil and Gas Climate Initiative by major oil companies ... it was Shell, BP, Total, Pemex, Saudi Aramco, and several others. At first, the U.S. major Chevron and ExxonMobil dismissed it and said that's not what we wanna do, but they've now joined it just recently, last two weeks. And that initiative is acknowledging climate change and saying, "We want to be part of the solution. Natural gas is the solution to climate change. We need to make a transition to natural gas." And they are intervening at the U.N. level, you know, during negotiations and around negotiations very aggressively to keep their place at the table, to be involved in the dialogue. In the U.S., there's been a public push to pass a carbon tax in the government, which is completely far-fetched right now with this president and this congress. But they have publicly said, brought out this prominent Republicans leaders from the right to say, "Carbon tax is the solution and Exxon is behind it. They are quietly behind it and they have publicly acknowledged they are behind this push on a carbon tax. Cynical people say this is just an effort to sort of brainwash their image. Hidden within that proposal is a clause that would erase all lawsuits forever.

ATTY. PAUDAC:

Thank you for that, Mr. Davies. Commissioners, we would just want to make an inquiry regarding the climate files because initially Mr. Davies...

PANEL CHAIR CADIZ:

Regarding climate files...

ATTY. PAUDAC:

The climate files that... Documents, sorry. More than two hundred (200) documents that Mr. Davies volunteered to even give to the Commission. We

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would like to inquire if we're going to print it, or are we just getting it through a link, maybe to save on paper? So we just wanted to know because we are ready to... we will be having a manifestation to sending the link, or are we going to...

PANEL CHAIR CADIZ:

Have the documents been marked already?

ATTY. PAUDAC:

Not all documents of the climate file, Your Honor.

PANEL CHAIR CADIZ:

No, this particular...

ATTY. PAUDAC:

No, we are inquiring, Commissioner, if we are going to submit a manifestation. We will be submitting a manifestation including the link of the climate files document because it's available electronically. And then now we are inquiring if we are required...

PANEL CHAIR CADIZ:

Oh, yes. The link which consists of two hundred files?

MR. DAVIES:

Three thousand pages.

ATTY. PAUDAC:

Three thousand pages. Yes, are we still required...Electronically?

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PANEL CHAIR CADIZ:

Alright just...provide the link to us.

ATTY. PAUDAC:

Okay.

PANEL CHAIR CADIZ:

We won't have space in our office to store those files.

ATTY. PAUDAC:

Thank you, Commissioners.

PANEL CHAIR CADIZ:

Alright, thank you.

MR. DAVIES:

And it's growing, too.

PANEL CHAIR CADIZ:

And we will just put it on record that such has been done.

Are there further questions to Mr. Davies?

Thank you very much for that very useful information that you have provided.

MR. DAVIES:

Thank you.

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PANEL CHAIR CADIZ:

Who is... next?

Alright. I was just reminded that we are due for a fifteen-minute coffee break.

ATTY. MAYO-ANDA:

Yeah, fifteen minute break.

PANEL CHAIR CADIZ:

So we resume at...

CLERK OF THE INQUIRY:

3:15, Commissioner.

PANEL CHAIR CADIZ:

3:15... that's more than fifteen minutes. Alright. Thank you. 3:15 then.

[break]

CLERK OF THE INQUIRY:

Ladies and gentlemen we shall be resuming this Inquiry session.

PANEL CHAIR CADIZ:

Counsels, are you ready to present your next witness?

ATTY. MAYO-ANDA:

Good afternoon again, Commissioners.

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PANEL CHAIR CADIZ:

Good afternoon.

ATTY. MAYO-ANDA:

Our next resource person is Ms. Sharon Eubanks, the former Director of the U.S. Department of Justice Litigation Team and lead counsel on behalf of the United States in the largest civil “Racketeer Influenced Corrupt Organizations,” or RICO, enforcement action ever filed. That is United States versus Philip Morris U.S.A., which is a federal tobacco litigation. She’s here to give us a summary of that federal tobacco case in the U.S., explain the basis of the tobacco company’s accountability for the health impacts of smoking, and correlated it with the climate deception being undertaken by respondent Carbon Majors. In other words, she will share with us the similarities in the corporate behavior of the tobacco industry and the fossil fuel industry. And before we proceed, Commissioners, may I be allowed to manifest the pre-marked exhibits?

PANEL CHAIR CADIZ:

Please go ahead.

ATTY. MAYO-ANDA:

Ms. Sharon Eubanks submitted three (3) documents. The first is her Statement dated September 10, 2018, consisting of seven pages, pre-marked as “BBBBBBB” to “BBBBBBB-6,” and her signature as “BBBBBBB-6-A;” the second, her Curriculum Vitae, consisting of two pages, pre-marked as “CCCCCC” to “CCCCCC-1;” and the last, a printed PowerPoint presentation consisting of five pages pre-marked as “DDDDDD” to “DDDDDD-4.”

PANEL CHAIR CADIZ:

May we confirm the manifestation of the counsels for the Petitioners?

MS. ABRINA:

For the record, we confirm the pre-marking of the aforementioned documents and the sub-markings therein.

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PANEL CHAIR CADIZ:

Alright, thank you very much. We may now proceed to hearing your expert witness.

ATTY. MAYO-ANDA:

Thank you, Commissioners. So, Ms. Sharon, you may now make your presentation.

MS. SHARON EUBANKS:

Thank you. It's an honor to be asked to appear in this proceeding. I've been a practicing lawyer for about thirty-eight (38) years doing civil cases of appellate and trial work. I was chief trial council for the United States in the racketeering case against Philip Morris and eleven (11) other defendants who are all manufacturers of tobacco and sales of tobacco in the United States, as well as front groups that work with them. They similarly were defendants.

So the first thing I want to talk about is a little bit about how we built the case and I think this will invite some issues about similarities. But how we put the case together is something that I think is unique at least to my understanding of case preparation. One of the things that we did was, since it was the United States Justice Department, we engaged every division of the department, the Civil Division, the Criminal Division, the Environment and Natural Resources Division, the Antitrust Division, every single division to come together with specific laws that could be enforced, as the enforcement agent of the United States, that could be enforced in the court of law. Now we came about this effort as something that followed a failure at legislation. Legislation was considered to be a very important aspect of the resolution of the so-called tobacco problem. At this point in time, prior to our filing, forty-six (46) states had already entered into a massive settlement agreement—directly with the individual states—to make payments of around two hundred eighty billion dollars (\$280,000,000,000) annually for the rest of the time they are selling their products in the United States which continues to this day.

That agreement called the M.S.A. got the tobacco company something that they so desperately wanted.... peace. They did not want to have any more lawsuits. So, once this agreement was entered into, all of the States were no longer able to file any lawsuits. The United States of America, the Federal Government, however, didn't sign on to the agreement. So before the time when the Federal Government filed a case, there was legislation that was pending, the McCain Bill. Senator McCain had made a bi-partisan effort and had put forward legislation by working with the companies to figure out what

they would want in order to not have any more lawsuits. Now they wanted complete immunity from all lawsuits of individuals and there were hundreds, if not thousands, of cases by individual smokers blaming that they had become sick or ill or had died because of the use of tobacco and those cases preceded on a variety of different theories, most of them negligence theories. But the United States looked at the case differently. But before, the thing that killed the legislation was... again, the one thing that the government felt it couldn't give up... was that complete immunity from suit.

So once that was determined, the then president of the United States, Bill Clinton, on January 19, 1999, made an announcement in the State of the Union Address. He announced as follows, "I've decided to have my Attorney General look into the possibility of suing the tobacco industry in order to shore up the cost of treating sick smokers through our Medicare Program and through our Military Program. It's costing a lot of money and this maybe one way that we can address it." So then Attorney General Janet Reno put together a team of people which included all of the divisions as I mentioned. We put together and presented, through what we call Murder Boards, a variety of theories. Well, we also call the effort the Think Tank Effort, and individuals would come and say these are the statutes that my group is responsible for.

Ultimately, we decided on three statutes, and you can see them on the board there. One was provisions from the Medicare Secondary Payer Act or MSP, as we called it, that was a part of the Social Security Act of 1932 or 1933, I think. And we claimed that that allowed us to collect money for treating the sick smokers. The second one was the Medicare Reimbursement Act or MCRA. We similarly said that that gave rise to a cause of action by the United States to seek reimbursement from the tobacco companies for the cost of treating sick smokers. The weakest link considered by most involved was the last one, that this was a violation of the Racketeer Influenced and Corrupt Organizations Act or RICO, as it's called.

In 1971, RICO was enacted specifically with the purpose of dealing with the mobsters, mob crime, organized crime. Judge Kessler, the district court judge at first level of review with the case, ruled that only the RICO claim would be sustained, which actually, for the United States, took away a lot of problems for us. Had we had to go forward with the other theories, we would've had to research and present for fifty (50) different States the tort law, and we were already underway with the survey of the individual tort laws of the States, which then would be plugged in to say here's the causation. We started out with expert witnesses, too. We knew that there had to be a causal link between the smoking and the disease for which we were claiming the government should be reimbursed. So we hired an epidemiologist to work with the lawyers. As head of the trial team, I assigned one of my lawyers to go take epidemiology one O one (101) so that we can speak the language of science because this was a case about science and behavior and the two were

inextricably linked. So there was nothing that we could do that would inform someone especially, since many lawyers, those in the room can attest to this other than myself, too, probably went to law school because they weren't good at math. I was not good at math and not good at science, but we brought in experts to teach us so we could, you know, then have solid findings of fact. Now the funny thing about the RICO case is that it's not a damages case. We could not get damages on for civil RICO. There are two kinds of RICO, civil RICO and criminal RICO. Exactly the same elements apply for each statute... whether it's civil or criminal. But the remedies differ. With the civil RICO act, you have remedies, not damages. So what we sought under the act was the disgorgement of the ill-gotten game that the companies have made over the years, of their misrepresentation and fraudulent activities.

Now we had made the allegation, we had to prove it. So let's look back a little bit at how we got here. It wasn't just a bunch of people sitting down together after the president announces it at the State of the Union in 1999. And, by the way, we filed in September, I think, 21st of September 1999, we filed our complaint. But this goes back to the 1950s with originally there were products liability theories that were floated to try to beat the tobacco industry. The tobacco industry for many years won one hundred percent (100%) of the cases that were presented before it. So the moral of the story really was you just really have to try and try and try again. Because sooner or later the defenses are more defined, you know the defenses to the claims are more defined, and you're better able to present the next case.

So in the 1980s the case called Cipollone came forward and there was a chip in a chink of the armor there of the companies because, in that case, the failure to warn regarding addiction was a tie that seem to turn things. There were some internal documents that had crept out that showed that the companies knew that the substance nicotine was addictive, and that the companies were just designing their cigarettes in such a way as to increase their profits by having more people buy the addictive product. Later on, the next group of suits that I mentioned a little bit about were the State suits. And the State lawsuits were cost reimbursement claims that the Federal Government wasn't able to keep in its case. But that's what the State's cases were. Several of those went to trial.

The trial in Minnesota was the one that was most fruitful in terms of information that was gathered. As a result of that trial, or towards the end of that trial, the companies settled the case for more than what the government and the insurance companies were seeking. The evidence was quite compelling and a lot of it came out of that process. This was evidence that the public had never seen before. This was evidence of fraud. This was evidence of improper actions by the companies in order to, again, increase their profits. So that led to the suit that we did file, the Federal Government filed in 1999. And in the moments relating up to the suit the actions of the industry were

quite interesting. They went on an all-out campaign by television mostly to convince you that they were great corporate citizens. That they were just, you know, just responsible as anybody and that they did all kinds of charitable work and contributed to many efforts. They didn't talk about their product because in the United States it was illegal to have tobacco advertising on television by that point sometime in the seventies, I think. That was banned, but actually it wasn't banned. It was agreed that they wouldn't do it because we have this thing that we called the first amendment and the industry itself had any chance of litigation on the first amendment ground it would do. But when it found itself to be in a losing position, it oftentimes would agree to voluntary efforts. Voluntary efforts are not enforceable. They're just voluntary, but sometimes, I guess, you take what you can get.

So, finally, the conclusions of our lawsuit have been the most useful things that ever came out of any lawsuit I've ever worked on. Judge Gladys Kessler in an opinion that was over one thousand seven hundred (1,700) pages long, following a nine-month trial, following two or three years of civil discovery, came out with findings and legal conclusions that were supported by the record in the case, all of the documents that we had used, and found the defendants jointly engaged in a massive public relations campaign to fraudulently deny and distort the health consequences of smoking and second-hand smoke. Now many people criticize the United States or joked about the United States case saying, "What new did you bring? You just brought at the Federal level the same thing that have been brought at the state level. Not so much." We actually brought a case that challenged the smoking effects of second-hand smoke, which gave rise to something that was harder for the industry to combat because they couldn't say, "You smoked and you knew it." Involuntary smoking or second-hand smoke isn't the same as the type of consent that they would've argued. Number one, that's actually number two, but number one is this was not an individual case. This was a case on behalf of the people of the United States, all of them in the form of the justice department and I couldn't point to an individual and say, "This is what happened." It was a fraud upon the public that we were bringing. All of them.

So the court also found that the defendants fraudulently concealed the addictive properties of nicotine. Now that goes back to an effort that had also been undertaken before we got to this piece of litigation and that was an attempt to regulate tobacco which was undertaken by David Kessler, then the Commissioner of the Food and Drug Administration. David Kessler had served under both Democrat and Republican presidents and he was considered someone... he had both medical degree and the law degree. He read the particular statute, and he invoked his right, his belief that he had the right to regulate tobacco, and went forward and regulated tobacco. That's what he did.

Well of course that effort was met with a lawsuit which found its way to the U.S. Supreme Court, and in that lawsuit – and we will see that slide a little bit

later – the United States lost in a five-four decision. And this is the language from the court, which we also came across in our case, when the lower court case struck the MCRA case and the Medicare Secondary Payor Provisions. It goes something like this, the United States has never used the statute in this manner before cigarettes have been manufactured and sold since the dawn of this country, you know, and the fact that the you're now trying to do this indicates to us that you never had such authority to regulate tobacco, therefore we, the Supreme Court say that, "If you want to regulate it, go to the legislative branch and get the authority to do so. See you later." Basically, that was the approach that was given and that's why that didn't happen. Well you can see that the rest of the David Kessler case was not down. We actually called him as first witness to trial to put things in the context of tobacco litigation over the years, on what happened and how we got there. It was a bench trial so we didn't have to worry so much about managing a jury which can be very difficult but these other elements that we had, that we moved forward on and actually won on, was the claim that the companies had, that if you smoked filtered cigarettes they were better for you. Well, actually, their internal document show that they could be more addictive because of the designs on the cigarettes.

They, the defendants, gave the Federal Government the machines to test the amount of tar and nicotine, and the Federal Government used the machines that the industries gave them for the reading on the packages for the amount of tar and nicotine. The actual delivery, however, was different because of the way the cigarettes were designed. All of these came out in trial but have never been proven before. We argued and won on the fact that they marketed their products to youth. They called them, in their documents, the youth were called replacement smokers because so many people who smoked died. Defendants also, on top of all of that, engaged in spoliation of evidence, such as destruction of documents to conceal their tracks. They used lawyers very carefully and straightforwardly to cloak in privilege all of the things that they did that they thought were a little bit on the, let's say, shady side.

The Brown and Williamson case that I spoke on – in the screen now – which, incidentally, I apologize for the timing of these documents, because they're not actually lined up the way I should have, but let me explain. So when the Supreme Court ruled in 2009 that the FDCA, the Food, Drug and Cosmetic Act, the statute under which the Commissioner of the FDA had preceded as a whole, it was playing that the Congress did not give the FDA the authority to regulate tobacco products as customarily marketed. What Dr. Kessler said that was interesting is that the cigarette itself was a drug delivery device. And based on the fact that it was a drug delivery device, he had the right to regulate it under this particular statute.

Now, nine (9) years later, the Family Smoking Prevention and Tobacco Control Act was passed in June of 2009. It was one of the first, if not the first,

laws signed by President Obama. That act gave the FDA the power to regulate the tobacco industry. I could assure you this would not have come about had we not had litigation that pressed on these points. Meanwhile, at the same time, the litigation was continuing through the courts. It didn't go anywhere because the appeals process dropped... the appeals process of a number of orders dealing with remedies, the fact that the disgorgement of proceeds that we sought for our remedy under civil RICO was challenged by the industry and in the middle of the trial, went up to... no, just before the trial started, went up to the DC Circuit, the appellate court, to decide the issue of whether we could pursue it that way or not. There was a split in our Circuit Courts of Appeal. The DC Circuit had one rule on disgorgement of proceeds and the second circuit which includes New York had a different rule on it.

And so we both asked the Supreme Court to decide that, but they, both sides actually, did ask for that. We lost on the disgorgement of proceeds. We had to reformulate a remedies request for the judge, which included one of smoking cessation. If we won, the industry will pay for a smoking cessation. And here's how we proposed that it be done wherein they pay for, they don't operate it, or move with it. We didn't win on any of that either.

So the interesting thing is that these actions, to my mind, are not about the money that you get from the actions. It's great if you can negotiate something where the industry who has caused the grave harm can pay for a method to fix it. That's wonderful to happen, but it's also very rare. What we did get out of this process was these undeniable factual findings which, all the way through the appellate process, were never taken away. We also included in those findings that the industry would say what it did was wrong. We called them the corrective statements and that they would publish these corrective statements so that all could see. These are all those things that we did were wrong. Basically we acted based on the racketeers act, these are the actions. Well, just to keep in mind, that case was finally decided and finished this year. So that was from September of 1999 to the present, just a few months ago.

Now let's reflect a little bit on climate change litigation. I've been sitting here in the room all day and I've heard all the other witnesses speak about things, and it's fairly clear to me that there are some real parallels between the activity that the tobacco industry engaged in and the activity that the fossil fuel industry is engaging in to this day, or at least up until 2017, based on what we just heard from Mr. Davies. Now, if that is the case ... that's fraud.

One of the things that a number of people have raised over time is, "Well we have the right to make statements don't we? We have the first amendment." And of course the first amendment applies to individuals but there's a lot of Supreme Court interpretation that applies to different standard, but it is the first amendment; a free speech standard to corporations. But there is no right to commit fraud. There is no right to lie. There is no right to lie in order to get

legislation pass that supports your position. This is what was going on all along in our case. Now it wouldn't surprise you to know that even today, after the Family Smoking Prevention and Tobacco Control Act of 2009 was passed, that the industry is also a part of its own regulation. This is not uncommon in our system, that the industry being regulated has the seat at the table. But I argued strenuously and wrote strenuously and visited offices on the hill strenuously to try to get legislation that would not let the racketeers in the room and just make decisions on what to do next.

We have their documents. We had what we needed with our experts, with scientists who would come forward with true science to help us get through the process of what needed to be done. But, notwithstanding those arguments made, compromises are often worked out in places that, we don't get to vote on exactly. And the compromise was to have a control act that involves the industry. And the industry has the result to the legislation tied up and had numerous lawsuits on every aspect of whatever it is that the FDA tries to do. Why? Because they can. They have resources to address these things. And there is... it's very difficult to write a law where they could have no effect on things. But I would urge you to keep in mind the industry that we're dealing with. Certainly on the evidence that has come in today that I've seen and the actual documents themselves.

Our case was nothing without the documents. The documents were so horrific to one member of Congress who used to be a great friend of the industry. When he got a set of the documents, when there was some issue that was raised, this was before our lawsuit was filed, Congressman Bliley from a tobacco producing state, had been very friendly to the industry that he said, "Let me see the documents that, you know, you were trying to withhold." They sent him the documents, he looked at them, and he put them up on the internet. You know, they were so horrific with the things that they said, indicating what it was that the companies were doing, what they knew, and when they knew it. How important was doubt on their product, it was most important to keep that doubt in people's mind all the time. And they constantly said, "You can't prove that smoking causes disease. You can't prove that it was only smoking; there are confounding factors that go with this." Every single thing that was brought came with a fight.

So one of the theories that I've looked at in some of the recent suits, and I don't represent myself as someone who is familiar with all of these suits, I have met with some of the country's attorneys general who were thinking about some of these suits. But I'm not working on anybody... with anyone of them. There's a State of Rhode Island's case, and it's up on the screen now. That was filed earlier this year, and there's also one in Baltimore. Both of these places, just geographically, since you guys are from the Philippines and I'm from the East Coast, ... Baltimore has waters if the Atlantic is there, and same with Rhode Island, our smaller state, it's right up there in the Atlantic.

So there's a suit that's been filed, or two suits, the Baltimore suit and the Rhode Island suit that includes issues of strict liability, which is really interesting to me because that means that that's a party, that there's no need to find fault. That the product itself was inherently dangerous, and, for that reason, you don't have to prove what you would have to, go through a negligence theory which has four parts: you have to prove there was a duty, you have to prove that it was breached, you have to prove causation, and you have to prove damages. All you have to prove, if you get past the motion to dismiss stage, is that the tort occurred and that the defendant was responsible. In other words, they produced the product and that's what made the difference.

So if you look at the fifty (50) years of fraud because the Federal Tobacco Litigation looked at fifty (50) years of fraud, and, you know, if we went back fifty (50) years and we looked at the time when the petroleum industry became aware of these issues about global warming, and their scientists were looking at things... we're looking at fifty (50) years. So that's one similarity.

The tobacco... there was a multi-front effort to conceal and to deny their own knowledge. So they concealed what they knew, they continued to massively produce doubt so that others would be skeptical about the product, what it was... But the facts really were there, and they were unwilling to accept the factual scenario of a causal link. And they frequently said, "Oh we just can't tell for sure, but we'll let you know." Similarly, the industry had done that to something we called the Frank Statement. That they had published in lots of newspapers. You know there was a big tobacco scare in the 50s. There's an article in the Reader's Digest that people said, "Is there a causal link between cancer and smoking?" And the sales of the product went down. The industry's response to that was, "We got to get them back."

So they put out a Frank Statement to smokers which contained statements like in the lines of "We are men of science," and yes they were all men at that time, "...and we would let you know if this was killing you or anything bad. But we're on it. We're out there to make sure that this is a safe product and you can trust us." And this was the promise that they made to the public which many people saw as a representation of what they were supposed to do. It wasn't legally binding but it certainly was demonstrated in our case and many others, too, at this point, that it was fraudulent information. But there was no intent to work with anybody to do anything but to cover up the science. So what they did is they hired a bunch of scientists who are very very well compensated who would find things their way and oftentimes tried to tear down other scientist who wouldn't. The annual Surgeon General's Report that comes out of the Health and Human Services, they hated that report so much because the report itself contains a lot of footnotes and materials that backs up the statements that it makes. And, each year, it settles on a particular theme. Whether it's youth smoking or second hand smoke, that was problematic for

them to overcome. So the wellbeing of humans is threatened in each instance and the Commission here has, as I understand, this morning from the remarks of the Commissioner that it has a constitutional mandate to investigate all human rights issues.

I think that there's compelling evidence, I found it compelling evidence, presented today about the human rights issues, this very real devastating problem, potentially devastating to everyone here. Because the storms, the fires, the flooding, these are not natural in any sense. These are caused by actions of man and individuals have rights. We have a right to clean air, we have a right to water, we have a right to shelter. Those are basic human rights, and they certainly seem affected by what the industry has done here.

So it seems to me, based on my limited understanding of the proceedings that go pass this particular Commission and what it does. It seems to me that the constitutional mandate can be used to gather documents, to obtain evidence that supports or fails to support the Petition as it goes forward. As I look across the empty seats, the lack of participation of the respondent is something very telling. The absence of someone to respond may raise questions of waiver somewhere down the line, but it certainly raises a question of a failure of a desire to participate in a process that is constitutionally mandated.

I'll take your questions.

Oh, wait I have one more slide, I'm sorry. It's my book. So if you wanted to read about everything that happened in the lawsuit, you can get it from the American Public Health Association or from Amazon.

ATTY. MAYO-ANDA:

Thank you, Ms. Sharon.

PANEL CHAIR CADIZ:

Dr. Walpole, do you have questions?

FR. WALPOLE:

I'm trying to see how this deals with impact, with hazards on the ground, the geomorphology if you like of the landscape and the location of people, then we have the social vulnerability because we're dealing with millions of marginalized people and then we have this extreme events that comes along and shifts the whole thing. Now what I'm saying is how to build into that...

from what you present is a maliciousness and sense of fraud... and how to put these pieces together because traditionally, I dealt with the weather and I dealt with the landscape and the poverty of people so it gives me a very different understanding as to how we are sacrificing people. This is, in one sense I think, given the number of people globally, the biggest holocaust that we are talking of. Now how was this understood in terms of the youth? What interests me is how the youth were targeted in the tobacco industry and how has that been, shall I say, addressed?

MS. EUBANKS:

Thank you. The youth were targeted, as I said before, as replacement smokers. But not only that, the manner in which they were targeted was through psychology. What appeals to younger people, for instance, "Let's tell them that smoking is an adult habit, and cigarettes, are an adult product. And so you should not use them." Knowing and having done the research to understand that, that's not something that affects youth.

Flavored cigarettes, that's another thing. So they focused on products that they knew through their research were good for youth. Now to be completely fair about this and upfront about what we did, there was a change in administration when we thought that the case would probably be dismissed, when Clinton left office and Bush came in. The reason we thought so is that there were statements made on the campaign trail.

So we all felt that our case could be made a little bit stronger if we focused our remedy on the disgorgement of proceeds, of money that the companies gained by addicting children to the products, not just children but young people, you know, college-aged people, and so forth. And so we changed the focus of it because the litigation is something that oftentimes is theater and we knew that it was factually accurate. We had the numbers with our biostatisticians, what they had put together to show you the addicted smokers, what the population was, and then to attach numbers so that that would stand up.

So we were able to demonstrate... we had several psychologist to testify, people who were familiar with youth behavior... take the documents from the companies and analyze them and testify as to how this would cause a young person to want to smoke. The coolness aspect of the cigarettes, where they advertise cigarettes, how they tried to demonstrate all people having a great time while smoking cigarettes, their particular products. They spent billions of dollars over the years on advertising and yet say, "The reason we only advertise is for people who are going to switch brands." That didn't seem right, didn't ring through... All that money would be spent because people wanted to switch brands?

Our case has seven different prongs... and youth marketing... I want to be clear about this, since it was a fraud case. Not that they were charged with marketing to youth, they were charged with lying about marketing to youth. So it was the lying out that later got them into more trouble under the RICO statute. I know that's kind of difficult to wrap your head around but it was the line.

FR. WALPOLE:

Yeah. I think this is what I am trying to grapple with. On the ground, we cannot – in most of the countries I work with in Southeast Asia – actually manage at this stage to care socially for these people in terms of relocation and livelihood. And livelihood is the biggest issue... by just taking them out. We have to struggle enough with reality, if there's a lie behind all these. The burden seems even more unjust. We've been here this morning wrapping up our mind around the attribution dynamics of carbon and people? We're understanding the science of that. Understanding the experience of the tobacco industry may help?

MS. EUBANKS:

One of the things that we did that I have great interest in is the attribution issues. I was pleased to see the direction of where we're going because I understand that that's a problem. The way it became a non-problem in the tobacco case, remember I said there were multiple defendants, was that under RICO, they were jointly and severally liable. In for penny, in for pound. So it didn't matter if we have come up and if we have obtained a judgment for the disgorgement of proceeds of Philip Morris, even though Philip Morris was the largest company. We didn't have to figure out now this many sales were for Philip Morris, this many diseases were caused by them, and have this legate or whomever one of the defendants... That also created a number of ways to ease things. That might have been more problematic had the other two causes of action been made.

So that joint several liability issue was something that was good for our ability to get where we needed to be without having to attribute a certain amount to each one, but you know, that was how it worked, in our case at least.

PANEL CHAIR CADIZ:

My question might be rhetorical. So it has been proven, established, well-known... there's no dispute that tobacco smoke is harmful. Why is it still in the market?

MS. EUBANKS:

Because those who have the will to take it off the market won't do it.

PANEL CHAIR CADIZ:

Why has not the State banned it from the market? Does not the state have a duty to prevent the manufacture and selling of essentially poisonous or cancer-producing products?

MS. EUBANKS:

I would agree with you and it's not really a rhetorical point. It's very difficult once a product has been manufactured and put in the market to take it off. In fact in Dr. Kessler's book, he advocated for the ban of the product when Rich Carmona, who was the Surgeon General during the trial of the case. The trial was nine months, by the way, I think I said that. Rich Carmona at his testimony was asked whether he was just trying to ban tobacco. Here is a medical doctor who knows that tobacco smoking is harmful to health. He sees them in patients who come to his doors and he, no doubt, tells them, "Stop smoking, that's one of the first good things you can do for yourself." But he testified that it was not his mission to ban the product because he knew if he got into office and tried to ban the product, he would be out of the office. So the will is not there by the people who have the power to institute such a ban on behalf of people.

Now some other countries look into the issue of criminal liability for tobacco smoking, and charging the CEOs and others in the company with manslaughter and other charges. There's a project by an organization called Action on Smoking and Health, and they have a webpage, ash.org, where they explain their criminal liability project. And they have actually got some pretty good citations to support the fact that maybe that is the way this should be looked at. You know because people are definitely dying from the use of the product. It's being put on the market and it cannot be made safe. I mean, tobacco is the only product when used as directed that kills you that's on the market – the only one that you can go and buy, and if used as directed, can make you sick or kill you.

PANEL CHAIR CADIZ:

Can you not make an argument that States can be held liable in a class suit for allowing the production of tobacco?

MS. EUBANKS:

I don't see how the States would be held liable. That would be a preemption issue at least I would think, because the Federal Government has legislated in the field with the FDA regulation and that case would likely be dismissed because it's been preempted by Federal Law. I don't see that kind of suit as surviving.

PANEL CHAIR CADIZ:

But is this not a failure on the part of the State to protect its citizens from harmful products?

MS. EUBANKS:

You'll get no argument from me. I think so.

PANEL CHAIR CADIZ:

So you've made a very clear and logical parallelism between the tobacco industry and the carbon fuel industry. If the tobacco industry can be aggressively regulated in the way that it's been regulated now by the State, why cannot the fossil fuel industry be as aggressively regulated, given the parallelism that you have elucidated on?

MS. EUBANKS:

I think the premise is there, and I think they could. Again, and it's the will of our representatives that's the issue here. They put a lot of money into the system to lobby, which they are allowed to do. And they get lobbyist who... and this is one of the pieces of fraud that you actually see. It seems to me that both tobacco litigation and in climate litigation where they are lying to representatives about the product and what it's doing, and responsibilities that

they may have in order to keep down the regulatory effect that would likely come their way and should come their way.

We've seen a rollback of regulations, you know, at the time when we need more regulations we've seen voluntary acts by places like in California where they decided to say, "Hey listen, we are a state, we are a sovereign state, and we're going to raise certain issues that will protect our people. So you do find a smattering of efforts throughout there but it comes down, to my mind, money that is involved in getting laws passed. Money and politics, and they have an awful lot of money.

PANEL CHAIR CADIZ:

And if the State's action against the tobacco industry is to allow it to continue producing its product with the warning, "Smoking causes cancer; smoking is bad for your health," can you not make an analogy also? This is where the rhetoric comes in: Can the Carbon Majors say, "Just make us put in our gas stations, 'carbon fuels are bad for your health?'"

MS. EUBANKS:

You know I thought about that, and in a short answer, no. Here's why, the tobacco industry argued that we gave you a warning and everybody knew and you knew when you smoked that it was bad for you and so it's quite natural for the petroleum industry to say, "Oh yeah, we warned you and we've made any duty to warn you about the harms of the use of these products." But it is the production of the product and the placing it out there on the market.

You don't just warn someone, as I talked about different types of remedies, that if it's an inherently dangerous product, you don't even have a duty to warn. These were some of the arguments in the early tobacco litigation that came up through the pike. But for the companies to say that they're absolved of any responsibility simply by putting a warning... that didn't work for the tobacco industry, and it can't work for the petroleum industry either. I don't see that just warning someone about the product is bad, you have to go back to the time when they were creating doubt, don't you? You still have a reasonable basis for how we got here and before you put that warning on there the things that happened. If you want to go with the warning, I mean, I know that that's just an argument that you're making, but I have heard other lawyers who were representing the industry make a statement that, "You guys out there, you all use the product, what responsibility do you have?"

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It's the same thing with tobacco smoking. You use the product, how can you now claim that we're responsible for your bad health, as warned you? Fraud overcomes all that.

PANEL CHAIR CADIZ:

I'm not arguing on behalf of the Carbon Majors, by the way.

MS. EUBANKS:

I understand.

PANEL CHAIR CADIZ:

I'm just engaging you in a hypothetical discussion.

MS. EUBANKS:

I understand.

PANEL CHAIR CADIZ:

...especially concerning attribution and liabilities, because I wanted a clear nuancing between the two industries. Going back to the last point that you made in your presentation... yes, the Respondents are not here and, yes, we do have a mandate to inquire on human rights violations. Unfortunately, we do not have the power to compel parties to come before us, especially not here in New York.

So are there other questions for Ms. Eubanks?

(To Atty. Mayo-Anda) Please go ahead.

ATTY. MAYO-ANDA:

Commissioner Cadiz, can I?

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PANEL CHAIR CADIZ:

Please go ahead.

ATTY. MAYO-ANDA:

My question is what can we learn from the successful tobacco litigation experiences that you shared in relation to this national inquiry?

MS. EUBANKS:

The short answer is that the documents will tell you what efforts were undertaken at that time, and that will assist you in getting to the truth of a matter more than anything else. The importance in our case of the documents and just watching Mr. Davies go through what he had discovered in the documents is really compelling evidence that puts to the lie certain statements that are made to the contrary of what's in the internal company documents. So to the extent that those those documents will come to life one day, the sooner we get those, I think the better position people are in to hold the companies liable or at least to receive an explanation from them for what is the meaning of this document that you've written there. You can interpret it on this side differently from what the respondent might say, but they should have that opportunity to bring forward the documents so that they could then advance their position and, you know, see when the truth comes out.

ATTY. MAYO-ANDA:

Thank you, Ms. Sharon.

PANEL CHAIR CADIZ:

We have no further questions.

MS. EUBANKS:

Thank you.

PANEL CHAIR CADIZ:

Ms. Sharon, thank you very much.

Do we have our last resource person, or two more?

CLERK OF THE INQUIRY:

Commissioner, the Inquiry Panel has invited Mr. John Knox to share his insights. He has submitted a PowerPoint presentation and a Curriculum Vitae marked as Exhibit "PRP-1" and Exhibit "PRP-2," respectively.

PANEL CHAIR CADIZ:

Yes, the markings are a bit different because John Knox is a resource person invited by the Panel. He is not being presented by the Petitioners.

Thank you very much, John, for coming here. We last met in Glasgow where we negotiated your appearance before the Panel and we are very happy that you have agreed to come here to share your expertise and your experience on this issue, especially on your experience as former Rapporteur on the Environment.

MR. JOHN KNOX:

Thank you very much.

PANEL CHAIR CADIZ:

So when you're ready, please start.

MR. KNOX:

Thank you very much, Commissioner Cadiz and all of the members of the Commission. It's my honor and pleasure to be with you today. I want to thank you for the work you're doing in this historic series of hearings on this path-breaking decision. Where is my... there is my PowerPoint presentation. As you said, I was for six (6) years or until the end of July of 2018 the first United Nation's Independent Expert on Human Rights and the Environment and then the first United Nation's Special Rapporteur on Human Rights and the Environment.

So I will, in my presentation today, focus on the International Human Rights Law Obligations relating to the environment, to climate change in particular.

I'm quite aware that I'm speaking to Human Rights Experts yourselves and so I apologize in advance for telling you things that you may already well know, but there it is.

So Human Rights Council decided in March 2012 to appoint for the first time a special mandate holder, an independent expert to study the applications of human rights norms to environmental issues. There have never been such a position before. However, there have been an increasing number of decisions by regional bodies and national courts, as well as U.N. experts applying the entire spectrum of human right including the right to life, health, food, water, housing and then the others to environmental issues.

So there was a kind of body of human rights law that was being applied to environmental issues. So, the Human Rights Council appointed me as the first independent expert to study these human rights obligations relating to the enjoyment of a safe, clean, healthy, and sustainable environment. I issued a series of reports over my first three-year mandate and in 2015, the Human Rights Council renewed my mandate for another three years and changed my title from Independent Expert to Special Rapporteur; and that position had asked me to focus more on promoting compliance and implementation.

In that position, in my last report to the Human Rights Council in March of this year, I presented "Framework Principles on Human Rights and the Environment" which I would be happy to share with you now if I can. Unfortunately, I only brought three copies. I apologize for that. The framework principles are not intended to create new human rights obligations relating to the environment. Instead, the existing human rights obligations based on human rights treaties that have been widely accepted by the entire international community.

There are sixteen (16) principles, and I'll briefly describe them. The first two simply express the basic interdependent relationship between human rights and the environment. That is, the States have obligations to ensure a safe, clean, healthy, and sustainable environment in order to respect, protect, and fulfill human rights, and vice-versa; that is, not only must we have a safe, clean, healthy, and sustainable environment in order to enjoy our human rights, but we also must be able to exercise our human rights in order to be able to safeguard the safe, clean, healthy, and sustainable environment.

Within that broad framework, the framework principle set out a number of specific obligations including procedural obligations. States have obligation to protect environmental defenders, for example to provide for and respect freedom of expression and association, to provide for education and public awareness, to provide public access to environmental information, to assess environmental and human rights impacts, for public participation in

environmental decision-making, and to provide for access to effective remedies.

States also have obligations that are substantive to nature. States have obligations to set environmental standards that are non-discriminatory and non-retrogressive and it strike a reasonable balance between environmental and other societal goals such as economic development. They also have an obligation to enforce these environmental standards once adapted.

A fundamental principle of human rights law is non-discrimination and that applies to the environmental context as well. So States must prohibit and take measures to address instances of discrimination in the environmental context, but they must also take additional steps to protect those who are most at risk, who may include women, children, the disabled, older persons, persons living in poverty, perhaps most notably in the environmental context indigenous peoples and traditional communities because of their close relationship with the environment.

Finally, these obligations... they apply even when States are taking steps to try and promote sustainable development or to address environmental problems. It's no excuse to ignore or overlook human rights concern simply because the State says it is taking steps to try and promote sustainable development.

Now these general provisions address the problem of global environmental threats to human rights, such as climate change specifically. And it's quite clear that states have an obligation to cooperate with each other to address these global threats. And that could include States taking action in the mechanics of climate change that go beyond simply their concerns over its effects in their own territory. So that is the description of the general human rights laws that applies to environmental issues. Now let me focus more specifically on human rights and climate change.

I want to address three (3) specific issues. First, it is absolutely clear beyond doubt now that climate change not only threatens but already undermines the enjoyment of a vast range of human rights. Second, it is clear that States have obligations to protect against the effects of climate change on human rights, and third it is also clear that corporations have responsibilities to protect against these effects of climate change as well. So I may say a few words about each of these three points.

First, this is a quote from Mary Robinson, who has been a leader in this area. She of course was the former president of Ireland and also one of the first High Commissioners for Human Rights for the U.N. She is currently the U.N. envoy on climate change. She has described climate change as the greatest threat to human rights in the twenty-first century. I think that it's now clear

that climate change is not only a great threat but it's a threat already being actualized. We already see its evidence in many different contexts.

I know you've seen a lot of evidence to this effect. It's part of your hearings. To me this chart actually sums up the risks that we're going through here. This chart indicates that for the twelve thousand (12,000) years, human civilization as a whole has developed in a context of a very narrow range of temperature; only about one degree Celsius (1°C). We've been very fortunate to be living in a period of unusually stable climate. We are now breaking out of that range. We are now leaving that safe range and going into literally uncharted territory and we're already seeing the effects.

This is a quote from William Gibson that novelist and science fiction writer that is saying, "The future is already here. It is just unevenly distributed." That is, some places are already experiencing what would be the future effects that others have yet to feel. So for example the Arctic is warming nearly twice as fast as the globe as a whole. That means that Alaskan villages for example, have already had to evacuate their homes because of melting thermal frost and ice.

I don't need to tell you that the Philippines has already experienced the future in this respect through Typhoon Haiyan and other extreme weather events. You are experiencing weather that normally arises once every so often, once every several decades, once every century but now it's coming more and more often. In my own personal life, I experienced this as well. Hurricane Harvey struck Houston last year. Houston is a town I used to live in. I went to college there. Scientists have estimated that its total water fall was about twenty percent (20%) more than it would've been in the absence of climate change. I now live in North Carolina.

North Carolina was struck just two (2) weeks ago by Hurricane Florence. Hurricane Florence has been estimated by scientists already, it's a preliminary estimate because it just happened. But they estimated that the total amount of water that fell there was fifty percent (50%) more than it would've been in the absence of climate change. The winds that struck North Carolina and South Carolina were not unusually heavy, we were lucky that way, but the water that fell broke all records in those states by an enormous margin and so many cities and towns inland are still flooded to degrees they have never been before.

Of course, other areas will experience climate change in different ways. Africa experienced one of the worst droughts in living memory last year. California has experienced wildfires. Perhaps the most vulnerable of all are people living in small island states who are literally facing extinction of their islands, of their states. How does all this translate into human rights? It's absolutely clear that it threatens and undermines the enjoyment of human rights to life, to health, to food, to water, to housing, and in some cases such as these small

islands states even the very right to self-determination and the right to existence as a people.

I am not the only person to come to this conclusion, obviously. I would just note that my colleagues, the other special rapporteurs, have issued a series of joint statements over the last several years drawing attention into the effects of climate change on the enjoyment of human rights. I would also note that the Human Rights Council, the Principal United Nations Intergovernmental Body for Human Rights, has issued a series of resolutions, all of them drawing attention to the effects of climate change to human rights and has held a series of panel discussions focusing on the effects of particular rights or particularly vulnerable groups of people, including for example a panel on the right to food and a panel on the effect of climate change on migrants.

With respect to migrants in particular, I would note as well that climate change will have so-called downstream effects on human rights. That is, as the number of migrants increases, the number of people who were subjected to human rights abuses will also increase. Migrants are particularly vulnerable to certain human rights abuses, climate change will cause these numbers to go up, therefore those abuses will go up as well.

So states have duties to try and protect people from threats to enjoyment of human rights generally. Those duties certainly apply in the context of climate change. In particular, I have written a report to the Human Rights Council, which I also like to provide you with copies, which I submitted after the Paris agreement was entered. This was the report I submitted to the next council in March of 2016, in which I essentially applied these human rights principles to climate change, and I point out that in order to avoid widespread interference with the enjoyment of human rights, in order to safeguard human rights from these violations, it's necessary scientists tell us to keep the increase in temperature well below two degrees (2°).

I and other special rapporteurs, at the request of the Climate Vulnerable Forum, then chaired by the Philippines in 2015, actually prepared a report on the effects of climate change resulting from a two degrees (2°) increase in human... I'm sorry, we prepared a report on the effect on human rights of a two degrees (2°) average temperature increase as opposed to a one point five degree (1.5°) average temperature global increase. We found again that the differences are remarkable.

Therefore, states have obligations to protect against the effect against the most vulnerable and also to adapt effective adaptation measures as well as mitigation measures to try and protect against those effects.

Every State has a duty to adapt to climate change, to help its population, to help its people adapt to climate change. This is a picture of the Island of Male the capital of Maldives which has about one hundred thousand (100,000)

residents. As you can see, it's a very low lying island. The Maldives is the lowest lying State in the world. The Maldives contributes virtually nothing to the problem of climate change but even the Maldives would recognize that it has a duty to help its citizens adapt to and protect them from the effects of climate change. It has, for example, built a sea-wall, around the entire island of Male with the help of the government of Japan. It has also built several artificial islands trying to anticipate a day in which the natural islands, the coral atolls which it is based may no longer be sufficient.

Mitigation is harder because as I said many countries such as the Maldives, even if they cut their greenhouse gas emission to nothing, they could do nothing to influence climate change. In fact, greenhouse gas emissions are predominantly from just a handful of countries. As this chart shows, China, the United States, and the EU together have made about one-half of all the greenhouse gas emissions, the next seven largest emitters make up about one additional quarter. Therefore, it's necessary for there to be international cooperation to address this international threat. That duty of cooperation is based on very firm sources. The United Nations Charter, the International Covenant on Economic, Social, and Cultural Rights.

So States, you might say, have answered this threat through the Paris Agreement. The Paris Agreement does include good language including a recognition of human rights for the first time in the preamble. It also includes a strong target: well below two degrees Celsius (2°C) above pre-industrial levels, and a commitment of States to pursue its efforts to limit the increase to one point five degrees Celsius (1.5°C) by the industrial levels. They also set out some provisions on how to get there through adaptation planning, assistance, internationally determined contributions. The problem, of course, is that it has been clear from the beginning, "Even if all of States meet all of their commitments, they would fail to meet the target they have set for themselves" and, I would add, the targeted human rights that the law says they should be trying to meet.

The United Nations Environment Programs says that even if they meet their commitments, they will only be able to keep temperatures from rising to about three degrees Celsius (3°C) or two point two degrees Celsius 2.2°C. The gap between what's necessary and what's promised then is quite large. It really needs an additional commitment on the part of States. As I said in my report, the Human Rights Council in March 2016, even if they meet their current commitment, the States will not be able to satisfy their human rights obligations. It's therefore necessary not only to implement their intended contributions as they are now but to also strengthen those contributions to meet the targets that they set out themselves in Article Two.

I want to just briefly say human rights also has implications for other aspects of this problem, for example, the response actions that States take to address

climate change must also meet their human rights obligations and that is something States are not always committed to doing. The climate finance mechanisms, for example, all includes safeguards. But those safeguards vary enormously on how much protection they provide for human rights. Some are pretty good such as the Adaptation Fund. Some are quite bad such as the Claim Development Mechanism. The current mechanism under development, the jury is still out. We just have to see how strong these mechanisms will end up being.

Finally, in one of the last things I did before my term ended, I joined with some colleagues to call attention to the importance of freedom of expression and participation at the climate talks themselves. We call on the Government which is hosting the next round of talks to be sure that it provides enough space for civil society to be able to participate freely.

So that's it, a brief overview of the obligations on States. What about corporations? I think the best guide to this remains the guiding principles on business and human rights that were presented to the Human Rights Council in 2011 by Professor John Ruggie who was the representative, the special representative of the Secretary General on Business and Human Rights. I know that you're already familiar with these guiding principles but I think it's still important to put them in the center of what human rights law has to say about climate change even though they don't specifically address climate change or environmental issues. It's clear that they applied to all threats to human rights including those that come in the environmental and the climate context. In fact, John Ruggie's reports themselves make that clear. Ruggie was quite clear that environmental problems can give rise to human rights abuses. In fact, an issue in that report demonstrate that, that was one of the chief sources of human rights abuses from corporations.

So let me just highlight a few of these guiding principles that I think are particularly relevant. Now, perhaps before I do that, I should say another word about their legal status. The guiding principles are not in themselves binding human rights laws. However, Ruggie was quite clear that he was not trying to develop new principles of human rights law. He was trying to explain how existing human rights law applied in the context of business and human rights. He was so successful doing that in a way that governments accepted that, for one of the few times in history. The Human Rights Council actually endorsed the guiding principles in 2011. It did not, in other words, just take note of them or welcomed them. It actually endorsed them. I say there were some envy because they did not endorse my framework principles on human rights and the environment, although they should have. But in any event that's not really the point here. The point here is that governments accepted these guiding principles as Ruggie put them forward.

Guiding Principle One restates the basic obligation of States in this area, that States must protect against human rights abuse within their territorial jurisdiction and this includes taking appropriate steps to prevent, investigate, punish, and redress such abuse. This I think is absolutely indisputable. But what may be more relevant to your current work is that Ruggies' guiding principles also set out responsibilities of corporations themselves. Guiding Principle Eleven (11) in particular says the business enterprises should respect human rights. This means that they should avoid infringing on the human rights of others and should address adverse human rights impacts with which they are involved. In the commentary, Ruggie said, addressing adverse human rights impacts requires taking adequate measures for their prevention, mitigation, and more appropriate remediation. It also says business enterprises should not undermine State's abilities to meet their own human rights obligations.

You have already heard, and so I will not repeat all of the ways in which corporations have failed to address the adverse human rights impacts of climate change. It's not just that they have failed to take steps in advance to avoid those average impacts, it's also that they are still failing to take measures to address those impacts and provide for remediation of them which again is part of their overall responsibility to respect. In particular, I think this last sentence in the commentary is particularly relevant, "States have obligations, to try to address climate change." Business enterprises should not undermine the State's abilities to meet those obligations through helping their communities and people to adapt, for example, through taking steps to mitigate the effects of climate change. To the extent that they are doing that, they violate their responsibility to respect.

I also want to make clear that this applies not only to business enterprises' own activities, Guiding Principle Thirteen here makes clear that it also applies to impacts that are directly linked to their operations by their business relationships. So this includes the supply chains, subsidiaries, other businesses with which they have direct connections. Guiding Principle Twenty-Two also makes clear that they should address remediation even with respect to human rights impacts that they have not foreseen or been able to prevent. So even if corporations come forward and say, "Well we didn't realize what was happening at the time," now that you've heard evidence that calls that into question, at least for some corporations, but even with respect of corporations say, "We didn't know at the time the problems that we were causing for human rights through contributing to climate change," they still have an obligation to respect human rights by actively engaging in remediation by themselves in cooperation with other actors.

I want to close the discussion of the Guiding Principles by also pointing out that Ruggie made clear that States have obligations to ensure through traditional administrative or other means that when abuses occur within their

jurisdiction, people have access to effective remedies. Again, this is what corporations have a responsibility to try to cooperate with, not to try to undermine. They have an obligation to try and work with States as they work for these effective remedies.

That concludes my presentation, and again I thank you for your time and I'm very happy to answer any questions you might have. Or if you want to leave you can... You've had a long day, I know.

PANEL CHAIR CADIZ:

Dr. Walpole?

DR. WALPOLE:

(indicates that he has no question)

PANEL CHAIR CADIZ:

Just one question... in regard to the obligation of businesses to cooperate with States in addressing the issue of climate change and also in relation to the mandate of NHRIs to promote and protect human rights. Our Commission, being a state-based, non-judicial mechanism for providing remedies... would you say that, in a sense, the carbon major companies have an obligation to participate in this dialogue?

MR. KNOX:

Yes. I would say their responsibility to cooperate does extend to National Human Rights Institutions, absolutely. I think the guiding principles and other discussions around corporate responsibility relating to human rights made clear that remediation procedures and investigatory procedures generally can include a wide variety of possibilities beyond just litigation or legislative hearings. And so, this is an extremely important opportunity, I would say for corporations to show their good faith and concern about these human rights issues by cooperating with you.

PANEL CHAIR CADIZ:

Thank you very much, Mr. Knox.

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Are there other questions?

ATTY. MAYO-ANDA:

Can we ask?

PANEL CHAIR CADIZ:

Please do.

ATTY. MAYO-ANDA:

Thank you, Sir John. Thank you for the presentation. Do you think that these activities of the respondent companies here maybe in a sense undermining the Philippine Government's efforts to meet its obligations, its human rights obligations?

MR. KNOX:

Honestly, that's a factual question that I don't feel kind of ready to answer. I guess I would like to see the rest of the evidence come in and then kind of draw a conclusion based on that. But I do think that if it is a case where they have withheld information, for example about the effects that they knew that were happening, if they withheld information from governments including the Philippine government then that would absolutely be the evidence that they have undermined the ability of the Philippine government and other governments to adequately address the effects of climate change.

ATTY. PAUDAC:

Can I have another question? Thank you for that presentation, Mr. Knox. Were there instances after releasing this report, the special report that you had and you circulated here with us, were there instances that these fossil fuel companies or these Carbon Majors reached out to you? Did they take any action publicly regarding this special report?

MR. KNOX:

None that I'm aware of. I should make clear that the report was primarily directed at states and government, and so I think corporations, I don't want to

speculate about what they were thinking, but I think they... one possibility is that they simply thought, well, this is all about states and it really has no relation to us. I'm not saying that would be the correct interpretation but that might be what they were... that might be why they reacted... or that's why they might not have reacted very strongly to the report.

ATTY. MAYO-ANDA:

Related to that, Mr. Knox, do you think that the corporations have a role to play to complement the efforts of the governments to meet their human rights obligations?

MR. KNOX:

Yes, absolutely. I think that that's absolutely clear and I think the effort could be cooperative and actually quite productive. I think, in general, corporations – and this is one of the messages of all of Ruggies work to them which was very widely accepted by the corporations as well as the government – have a responsibility to work with governments and not simply to defer all human rights issue to government. They have a responsibility to work with governments and to be pro-active in working with governments to ensure that the people who are most directly affected by the corporations' actions are not adversely affected. That their ability to enjoy their human rights is not undermined or abused.

ATTY. MAYO-ANDA:

Thank you.

MR. KNOX:

Thank you.

COMM. TANODRA-ARMAMENTO:

Hi, Mr. Knox. So does it mean therefore that these Carbon Majors can actually be held accountable in terms of their responsibilities under the guiding principles of business and human rights?

MR. KNOX:

Well the message of holding them accountable as so often in international law lag behind the standards themselves, I think. I mean, the institutional methods of holding them accountable are not as strong as our agreement standards, but I certainly think that the standards are clear enough that businesses, corporations, including the Carbon Majors can be assessed for their compliance with those standards or not.

COMM. TANODRA-ARMAMENTO:

And the National Human Rights Institutions are actually recognized in the Guiding Principles as part of mechanism whereby remedies can actually be followed or taken advantaged of, but they who are actually being affected by the...

MR. KNOX:

Absolutely. And I would say that in my experience as the Independent Expert and then the Special Rapporteur, I found over and over again that National Human Rights Institutions around the world were increasingly receiving complaints arising from environment to all related human rights abuses. While many of those complaints were directed at government behavior, there are increasing numbers directed against corporate behavior as well. So while this case is particularly high profile, it is certainly not unique in that National Human Rights Institutions in other countries as well are also facing cases involving environmental human rights abuses committed by corporations. Thank you.

PANEL CHAIR CADIZ:

Just to read into the records of the Commission's Inquiry, we are marking the two (2) documents that you just distributed to us. "The Framework Principles on Human Rights and the Environment"... is being marked as "PRP-3," and the other document, entitled "Report of the Special Rapporteur on the Issue of Human Rights Obligations Relating to the Enjoyment of a Safe, Clean, Healthy, and Sustainable Environment," as Exhibit "PRP-4," both as parts of your testimony.

So we are really honored, Mr. Knox, that you have come here to share your knowledge and expertise with us. We really appreciate it.

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MR. KNOX:

Thank you. Thank you very much.

PANEL CHAIR CADIZ:

We have no more witnesses for today or resource persons?

CLERK OF THE INQUIRY:

There are no other business matters for the day.

PANEL CHAIR CADIZ:

Alright. We wish to thank again the very generous support provided to us by the New York City Bar Association. We are adjourning and we will be having our hearing tomorrow starting at nine o'clock.

CLERK OF THE INQUIRY:

We will have a picture taking, and then the...

PANEL CHAIR CADIZ:

We're having a picture taking?

CLERK OF THE INQUIRY:

Yes.

PANEL CHAIR CADIZ:

With whom?

CLERK OF THE INQUIRY:

Everyone.

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PANEL CHAIR CADIZ:

Why don't we have it now? Because some of the people here will not be here tomorrow.

CLERK OF THE INQUIRY:

We can have picture taking now.

PANEL CHAIR CADIZ:

Sorry... that would be an informal part of this. But, before that, we are officially adjourning today's session. Those who want to stay for the picture-taking can do so.

ATTY. TRISHA ISABEL FERNANDEZ (CLERK OF THE INQUIRY PANEL):

Good morning, everyone. I am Trisha Isabel Fernandez, Clerk of the Philippine Panel. Thank you very much for being here with us today. We are requesting that cellphones be put on silent mode while the sessions are ongoing. The Inquiry Panel members present here today are Philippine Human Rights Commissioner Leah C. Tanodra-Armamento, Commissioner Gwendolyn Ll. Pimentel-Gana and Inquiry Panel Chairman Roberto Eugenio T. Cadiz. Dr. Pedro Walpole, S.J. assists the Commission on Human Rights of the Philippines in this inquiry.

The Panel has sent notices to all the parties regarding today's inquiry inviting them to participate therein. The Panel has invited notable resource persons to share their knowledge and expertise to this ongoing discussion. The Panel has not received any response from the Respondents.

PANEL CHAIR CADIZ:

Thank you very much, Ms. Fernandez. So far, since we opened the Inquiry and until yesterday, we have only heard the presentation of the resource persons of the Petitioners. Perhaps the Inquiry Panel's knowledge and information might still be supplemented by resource persons from other sources. Today, we have invited six (6) other experts on their respective fields.

They are the resource persons of the Panel itself... and they are not the resource persons of any parties in this case. Ms. Fernandez, please introduce our first two resource persons.

CLERK OF THE INQUIRY:

David Estrin is a distinguished Adjunct Professor of Osgoode Hall Law School, York University and is recognized as Canada's senior environmental law specialist. He co-chaired the International Bar Association President's Task Force on Climate Change Justice and Human Rights that produced the groundbreaking book "Achieving Justice and Human Rights in an Era of Climate Disruption." He chaired the International Bar Association Environment Committee and has been a senior scholar with the International Law Research Program at the Center of International Governance Innovation where he focused on new approaches to climate change laws and damage and the role of domestic climate change litigation... despite the Paris Agreement. He is the author of the leading "Business Guide to Environmental Law" and has been a partner with one of Canada's largest law firms where he continues as counsel. He is also Academic Co-Director of the Osgoode Hall Environmental Justice and Sustainability Clinical Program.

We also have with us today Prof. Cynthia A. Williams, Osgoode's Chair in Business Law and Co-Director of Jay and Barbara Hennick Centre for Business and Law at Osgoode's Hall Law, York University. She is an expert in corporate responsibility, securities, disclosure and new governance initiatives. She is principal co-investigator of the Commonwealth Climate and Law Initiative in Canada, a project of the Smith's School of Enterprise and the Environment, Oxford University to evaluate directors' and trustees' obligation to consider climate change in their strategies, disclosure and project planning in Australia, Canada, South Africa and the UK. She also co-founded and is on the board of the London-based Climate Bound Initiative, which is working to establish a new asset class, climate-bounds to fund the transition to a low carbon economy. She received her law degree with honors from the New York University and practiced at Cravath, Swaine & Moore in New York City before joining the faculty at the University of Illinois College of Law.

MS. ABRINA:

The presentation of Mr. David Estrin has been marked as "PRP-5," and his CV as "PRP-6." The summary of recommended measures co-authored by Estrin and Williams has been pre-marked as "PRP-7." The presentation of Ms. Cynthia Williams has been pre-marked as "PRP-8," and her CV as "PRP-9."

PANEL CHAIR CADIZ:

Thank you very much, Ms. Abrina. Dave and Professor Williams, we are ready now to hear your presentation.

MR. ESTRIN:

Thank you very much Commissioner. It's really an honor for us to be here and we hope our remarks will provide some insights. We think we have some specific background and expertise that complement each other; that's why we suggested a sort of an "unusual" approach, or a "tag-team" approach to the presentation. To begin with, I hand over a document already marked as an exhibit. It is a summary of our recommended measures. Some copies are made available in the room for anyone who wants them.

We thought it would be helpful to let you understand what our recommendations are and then we will explain how we got there.

The title of our presentation overall is the wording at the top of that document: "Unique Legal Obligations of Officers and Directors of Carbon Major Enterprises and Their Investors to Reduce Enterprise Carbon Emissions and Avoid Climate-Change-Related Human Rights Impacts to Vulnerable Communities and Measures," and this is the other thing: "Measures that These Enterprises and Directors Should Implement to Act on or Comply with These Obligations." That is the scope of what we are doing. We explain why there are some unique obligations of corporate and securities law, and Prof. Williams will be doing that because that is her area of expertise. We both worked together to develop measures that we think might be helpful for directors of corporations to implement and to comply with.

Some of the recommended measures have two (2) parts. The first part addresses those that we think should be accomplished by those Carbon Majors voluntarily. The second part is – in the event that they don't – the government's role in making sure that they actually do these things. We think there's actually a useful interaction to have both. That's why we said government measures should be implemented to backstop what we recommend should apply to the Carbon Majors.

So the first thing is that the Carbon Major should acknowledge the need to commit a higher percentage of funds in their business plans and future corporate activity towards actually decarbonizing and diversifying their primary energy supply and product mix. The National Energy Agency has said clearly (and I will come to that in our PowerPoint) that unless these companies actually and swiftly get off fossil fuels as their primary stock for energy use, we will never get to accomplish the Paris objectives.

We say that the acknowledgment of the need to do this shall be confirmed by corporate policy commitments of the board. To be more specific, we think it will be appropriate for these corporations (under Roman No. two-a) to commit to corporate policies and actions to achieve reduction of carbon emissions and decarbonization as primary energy supply, basically to reduce their overall carbon footprint, minimize related human rights impacts, and to ensure that each corporation has made its appropriate contribution in keeping global warming as much as possible below two degrees Celsius (2°C).

And now we get even more specific (under Roman No. two-b). We think it would be helpful if, within one year of the passing of a board resolution, the board would require that all the things we're gonna talk about should happen within one year of that resolution. The corporation should develop specific business plans, including time horizons and approved investment allocations and specific steps that it will take to implement the plan to achieve a peaking of carbon emissions by 2020, concordant with the emission reductions identified by the International Energy Agency, within that time frame 2020 to peak from their 2017 report that I'll talk about later. We say we have to do more, and do it sooner in order to keep below two degrees Celsius (2°C). And after peaking in 2020, they must continue reducing their emissions by moving to a substantially decarbonized primary energy supply and more substantial investments and commitments to renewable energy.

And then we come to the next aspect of this. We think there should be issues about disclosure. If these plans are going to be credible and useful, people outside experts have to be able to understand that they are actually not based on bad assumptions or mere hopes. And there has to be transparency.

A recent study called "Transition Pathway Initiatives," done by an organization which works in the aegis of the LSE and the Grantham Institute in London, developed what they call "minimum disclosure expectations for oil and gas producers." I am going to show a PowerPoint about that later. There's a real problem faced by anybody really determining the scenarios that these companies are publishing—as they do not provide information outside peer reviewers—to determine whether or not they are actually getting to the goal they say they are going to get. And so also it should include some other things like an objective analysis of potential emissions from yet untapped corporate reserves, including Scope Three emissions, corporate analysis and disclosure of extent of the possible fuel reserves it's currently developing, and the emissions that could be released based on those reserves, and then identify new possible fuel projects that the company may be pursuing, and projections regarding emissions that will be caused by those approved projects.

So let's say they actually got the right data in their plan, they should then produce a draft plan that gets us to item C on the second page. They now have

a draft plan with proposed action steps (including the data and assumptions on which the actions are based), which should now be circulated to people outside the company. They should be circulated to peer reviewers comprised of independent scientists, energy and environment experts, environmental and non-governmental organizations (ENGOs) with experience in these issues, like Carbon Tracker, Inc. etc. and government agencies with expertise in climate change, emission reductions and carbonization pathways. After that, they should revise their commitments according to the comments they get from these peer reviews, and thereafter adopt and publicly publish the plan.

So the plan should not just be kept for themselves. It has to be made public. We suggest that the corporation direct the officers to provide the board with an analysis of the extent to which the activities of the corporation are on track to achieve the goals and timing of the plan, at least on an annual basis, including a report on any implementation issues and recommendations for action that the corporation should take to ensure that the plan's intent and objectives are met within the time periods set in the plan. It is important that they get a report from an officer of the corporation designated to do that.

We now go to Roman number three (3) under Government backstopping of carbon major emissions CO₂ reduction. These corporate policies should be backstopped by national and sub-national governments to ensure that they are carried out. By sub-national, we mean, in the United States, the States; in Canada, the provinces. National and sub-national governments with regulatory authority over things like the exploration of natural resources for industrial enterprises, together with state agencies that have regulatory and oversight functions over the environment, as well as human rights, should routinely require carbon enterprises to prepare these plans, etc. They should also provide the designated government official to impose and enforce requirements to better ensure the objectives and timing of such actions are achieved. We also add that such requirements are not to include unreliable provisions on carbon capture methods that promise more than five percent (5%) of carbon emission reductions. So far, the carbon capture technologies are nice on paper but have never been developed to actually be operable at the scale needed.

They should all legally require carbon enterprises to prepare these plans, et cetera. And it's buried in the middle of paragraph, upon paragraph at the top of the page. And, also there's a, says provided that if a designated government official, this is in the fourth line of small... later on... I provided a bit of a designated government officials. The other plans of actions are not appropriate for the purposes described above. The state is to impose legally, enforceable requirements on any such enterprise to better assure that objectives and timing for such plans and actions are achieved. And then we also add this, such requirements are not our to include a provision that the plans are not to be relearned on carbon capture methods for more than five

percent (5%) of carbon emission reductions. And the rationale for that, is simply that for some people, it is generally, the reason is pie in the sky. But so far the carbon capture technologies are a nice on paper but had never been developed to actually be seen to be operable at the scale that are needed.

Shell has said that their emissions projections for the future will comply with the Paris Agreement. They say they will rely on carbon capture. I think they would need eighty thousand (80,000) carbon capture facilities to realize it. I will come to that.

The other thing that government should do is to monitor the stipulated legal duty of personnel officers of these corporations to prepare and review the program, identify the issues, and ensure that the plans are carried out. It is not unusual in environmental legislation for governments to say it is not just the corporations that have a legal duty. The directors have the duty to take the necessary steps to require and ensure that the corporation abides by and complies with the law. So this is something I think that is quite normal these days.

Number three-three (No. 3-iii) legally require, and this I think is quite important, the precondition of international research environmental agency for licenses or other forms of approval for private sector energy exploration development or supply as a precondition for any government funding or promise of funding. What we are saying is that before they can get a license to explore or develop or get initial assistance, the government should make sure that (a) the legally required plans for decarbonization and other actions necessary for the Carbon Majors to meet the Paris objectives have been prepared and updated; (b) that their commitments and other actions have been fulfilled or are on track to be fulfilled in accordance with the plan and corporate commitments; and (c) that any other license and other forms of government approval for funding, etc., contribute to the successful implementation of the corporation's commitments to implement measures set out in the plan, and also to reach a conclusion that a particular permit or other application does not likely – by itself or as part of other steps – result in a derogation and failure to achieve the corporation's commitments. So when they make a specific application, the government official must determine whether the application itself would result in the corporation's failure to meet its commitments in the plan, as filed. Before issuing licenses, the government official should look at the plan dutifully and carefully and make an impact analysis that they can be honest. That's the overview of our specific recommendations.

It is not likely itself by itself or as part of other steps the corporation is taking to result in the corporation derogating from or failing to achieve its commitment. So they'd look at a specific application and say, well, if you do this, company X seems to us you're going to violate your, or not be able to

meet your plan to reduce that you've already bought. So I think we think there ought to be a duty to our government officials before they issue these licenses. To look at the plan carefully and make, makes sure on an independent analysis that, they can be accomplished. So that's the overview of our specific recommendations.

There is another one about disclosure. We will come to that more carefully in a minute. At this point, I would like to turn you over to my colleague, Cynthia Williams. She is going to explain why, from a corporate perspective, this should be done.

PANEL CHAIR CADIZ:

Please go ahead Professor Williams.

PROF. WILLIAMS:

Thank you very much for this opportunity. One might argue that everything that David and I have set out in the recommendations for officers and directors is already part of the corporation's fiduciary obligations under state and federal securities laws.

I'm going to concentrate on law as it applies in the United States because I am a US-trained lawyer and because twenty (20) of the forty-seven (47) Respondents in this proceeding are incorporated in states within the United States.

Now I have an overview of what I'm going to talk about. Is climate change a human rights problem? Why do officers, directors, and trustees need to consider it? What kinds of cases have been brought to date? What are the specific fiduciary duty and obligation in some claims that could be brought before our recommendations, and why?

I am going to race through the first three (3) points. I know the Commission has got testimonies on these. I will argue that the guiding principles on business and human rights are important predicates for their fiduciary obligations.

Yes, as we all can recognize. A recent article written by a team of global scientists from Sweden and Australia, published in August this year by the National Academy of Sciences, said that we are—on an Earth System pathway—headed for Hothouse Earth temperatures, with devastating effects on ecosystems, societies and economies. That does not leave very much out. The authors concluded that we do still have a door open to a stabilized earth,

but the door is closing and we must do more, we must do it at scale. Sorry. It's a tragedy. And I think it's a tragedy of failure of world governments and states to take seriously what they need to do. And so that's one reason that's so important that this Commission is listening to the evidence. So, as we know, the current effects of climate change—hurricanes have increased in intensity, droughts, floods, fires, increased severity of storms, sea level rise, shrinking glaciers—all these things we are already seeing. They are no longer projected future effects. They are impairing fundamental human rights, such as the right to life, health, clean water and sanitation, food, adequate housing, self-determination and development, equally, our children are going to suffer the most. And all of us here and the poor who do not have the resources to adapt and protect themselves. So it is a human rights problem.

Why must officers and directors need to consider climate risk? First is the Paris Agreement. Although the Paris Agreement obligates states, directors and trustees of investment funds need to be sensitive to the transition pathways that the states are adapting and need to adapt their own strategies to those transition pathways. I'll speak more about that in a moment.

Second, the science of attribution is improving. I have some sources here from Steffen and Rockström, the greenhouse gas emissions contributions of the oil and gas majors, the coal and cement majors proceedings since 1988. David will talk more about the alarming increases since 1988.

Specific attribution then leads to the ability of the individual officers and directors of individual companies to know what their contribution is and to consider that foreseeable risk both for their strategies and for potential litigation risks. And lawyers in this room know, litigation risk is a separate risk from liability risk because litigation is time-consuming and expensive.

The other reason, the third reason, is the global consensus that has been articulated in the UN Guiding Principles, the responsibility of companies and states to protect, respect, and remedy human rights violations. I know you have received extensive testimony on this. I would just like to point out that business enterprises have and should avoid infringing on the human rights of others and should address adverse human rights impacts with which they are involved. This also has been articulated in Principle Thirteen as an obligation to avoid causing adverse human rights impacts through their own activities and through their own networks and relationships.

And finally there is now a global consensus that companies need to make policy commitments to respect human rights and that these policy commitments need to be publicly articulated and made available to affected parties.

So these are just the preconditions and the predicates for my discussion.

I would say as part of the Commonwealth Climate Law Initiative, we are looking at comparable fiduciary obligations in Australia and in the UK, and in South Africa and Canada. Many of these obligations arise from the same legal source, that is, obligations as agents to their principle: duties of care, loyalty and disclosure. So some of the details may be different at the margins, but in general these are the same core fiduciary obligations across Commonwealth countries and across Common Law countries.

We would argue that each of these duties provides the scope and grounding for the recommendations that we've identified for the Commission. I will be more specific.

Directors and officers and investment trustees have duties to make lawful decisions and in a careful way. So here we would say that companies that are potentially contributing to human rights violations are clearly contributing to climate change and must turn their minds to climate change risks and opportunities in their business strategy, development and decision-making. And so what does this require? It requires evaluating the risks and opportunities based on the scientific evidence and reasonable evaluation of specifics depending on the industry, geographical location and the project being considered. Now, directors are required by the standards of the duty of care to make reasonable decisions. We do not expect perfection from any human being, and I think we can all see lots of evidence on that. But, as many lawyers in the room may know, there is a powerful defense against any liability for failing to make careful decisions. And that's the business judgement rule. However, the business judgement rule protects judgements. It protects decisions that are made. It does not protect unconsidered inaction.

There are also other powerful defenses for companies incorporated in Delaware which is a major state where most companies are incorporated. These are called exculpation clauses. These are clauses in the article of corporation that say a company may limit or eliminate duty of care liability. Not every company will have done so but there are limits to those limitations. You cannot exculpate actions not in good faith, you cannot exculpate violations of the duty of loyalty. To my mind the duty of loyalty and the duties to act in good faith provide a broader route to liability but it should really be emphasized that corporate law and the American Bar Association understand that there is a difference between the standards that are required of directors and the standards for liability. We do give strong protection against liability for good reasons. We want directors to take well-considered risks and not personal liability of the risk to turn out to cause some financial damage. But that does not mean that directors have no duty to act carefully. They do.

Let us look at the duty of loyalty. The fiduciary duty of loyalty requires actions in good faith in the best interest of the corporation, in good faith and avoiding

financial conflicts of interest. The financial conflict of interest is not really the core of this particular duty of loyalty argument. Now this particular duty of loyalty arguments suggest that the Delaware Supreme Court had stated conscious disregard of a known duty to act is a violation of the duty of loyalty.

It is also action not in good faith. So, duty of loyalty violations are not given the benefits of judgement rule; they are not exculpated, they can't be ensured against; you can't ensure that your directors are going to act in bad faith. It's just a moral problem. So what are some of these sources that are known duty to act that could ground such a claim? Under the Guiding Principles, there is a global consensus that directors and companies are not to violate human rights, and need to have procedures in place to know if they are likely to be at risk of violating human rights. I should step back and say that officers' and directors' serious obligations here is to know that companies have in place systems to report its compliance, to communicate to its employees what such law compliance requires, and to have a system to get information about potential risks of violating the law. The Delaware courts have rejected claims – after the financial crisis, a lot of claims were brought against big global banks claiming that the banks' directors had not properly evaluated the business risk of excess leverage. And these claims were rejected because there was no specific legal grounding for the duty to know about excess leverage. But if there is a specific legal duty that grounds a claim, then the Delaware courts have—in rare instances, I would be the first to admit—moved claims forward. So for instance, a claim recently went forward where the company had failed to know that it had proper internal controls. Internal controls are required under federal securities laws, under general accounting principles. So the human rights obligations under the guiding principles could potentially ground this liability, this duty to act, but also federal securities law for public reporting for public companies have something like financial management analysis that is part of federal reporting. Management Discussion and Analysis (MDA) policies ask the directors to talk about the company's financial results and future risks, based on some known trends, events and occurrences that might have a negative effect on the company. In 2010, the Securities and Exchange Commission issued guidance about how officers and directors could evaluate climate risks and opportunities as part of their MD and A. Where officers and directors ignore the evaluation of climate risks and opportunities—not paying attention to valuing whether the company is complying with its obligations under the Federal Securities law—the company is at risk of this kind of conscious disregard of the duty to act.

And then, third, we, securities people, tend to think that disclosure is simply required by Federal Securities Law and that honest disclosure is required by Federal Securities Law as it is. But state security law particularly in Delaware is fierce on the idea that when companies speak to their shareholders, they have to be honest. We cannot materially mistake the facts or omit material facts under Federal Securities law, under Delaware law. There is, I would

argue, an even broader duty to be very honest. And the Delaware Supreme Court has said this duty is not just asking for corporate action in voting for a merger, or an acquisition, or voting for directors. It is a fundamental duty. I would argue that the directors and officers have a duty to know that their public statements are honest. Now, where might this hinge? The US Supreme Court, in a recent case—it's a couple of years old now but it's still a very important—was asked whether there could be securities liability for misstatements. The court said, yes, under certain circumstances, if the opinion is not honestly held by the company or if there are facts in the company's knowledge that undermine the opinions that have been stated. I wouldn't know if the Commission has received testimonies on the climate deception campaign, and I would just point out one type of fact, which is publicly alleged in some documents that after some time that Exxon Mobil was disputing the reality of climate projections and climate science it was using the best projections it could find, the best climate projections it could find when it was making decisions about forward planning. So it was reinforcing its offshore oil rigs against sea level rise and it was placing its pipelines deeper underground in Canada because it knew that at some point the permafrost was going to become unstable. So at the exact same time—actually at one point in daily full-page ads in the New York Times—that it was publicly disputing climate change, it was using the best climate projections possible in its planning.

So I've just heard that I have three (3) minutes left. So that's possibly enough.

I would just race forward. We can just talk about these things in the question and answer, how have these claims started to bubble up?

I would end by talking about the Task Force on Climate Related Financial Disclosures, which many people may know about. This is a global initiative of the Financial Stability Board, the FSB, and it is currently chaired by the former mayor of New York Michael Bloomberg. This is a voluntary initiative but it's really being taken up very seriously around the world because it was developed by business, by accounting firms and by major investors. Now, in terms of protecting the world against human rights violations, TCFD may not be sufficient. I think David and I might slightly disagree about how valuable TCFD is and his views will run the frame of environmental and human rights lens.

From a security and corporate law perspective, I actually like the core elements of recommended disclosure. Why? Because they ask about things that the company knows. They ask the company what is your governance of climate risks and opportunities. What is your strategy? What is your risk management approach to the risks and opportunities? And moreover, what are the targets for reducing emissions and what are the metrics that you are using to determine if you are meeting those targets? So the recommendations that

we've made are to track this kind of approach. It is not asking for speculative future information. It asks the company to talk about what they are doing now.

And I will conclude with this, from what I understand from a number of consultants who have been asked to come in and write TCFD disclosure. The best consultants will say we cannot write about your disclosure without talking about your strategy. We cannot write any decent disclosure without having a serious discussion about what you were doing and what you are going to do better. So it's a way in to talk at the highest levels about these issues. Thank you very much.

MR. ESTRIN:

Thank you, Cynthia. Could you please put up the other PowerPoint presentation?

Just to segue from what Cynthia was talking in terms of the recommendations of the TCFD. They are important for the organization to do self-analysis, all in the context of protecting the corporation. It's all about making sure that the self-analysis protects the resilience of the organization. It does not directly require the organization to focus on how inaction would impact the environment and human rights. And that is why we recommend what we think are complementary objectives in corporate planning and strategies that say you can take some of the steps in your resiliency strengthening, but you need to actually look at the implications of inaction?

Well, if we don't do certain things, how will that impact the environment and human rights? And that is why we have in our recommendations tried to provide what I think are complimentary objectives and corporate planning and strategies that say you can take some of the stuff you're doing for your internal resilience strengthening.

But you need to actually look at the implications of that. If you don't do this, what are the implications? Well, how will that fail in terms of the climate agreement in Paris agreement? How will that fail in terms of protecting human rights? How will that? How will you fail or are not in terms of peaking at a certain required time? And so I think that's the advantage of having a corporate policy directed as we have articulated it. It compliments, as Cynthia says, something that those principles are not specifically aimed to require. And I think it's important to say that. Thank you. So there's the title. You go to the right, go for it. Yep. Okay. So, we've already seen the title and as a majority. And so today's presentation is really to pick these recommendations on the slide here are ones that Client Earth left with you I think at some point earlier in the summer.

And what I'm saying, what we're saying is today's presentation identify key practical measures needed to enhance these recommendation made to the C.S.R., to the C.H.R. by others. So I'm just picking them up and saying we don't disagree with those. We think those are right, but you need, I think, much more specific, neat to actually think about in terms of possible recommendations. For what you consider to be more specific obligations if you're looking for that to identify for the Carbon Majors.

PROF. WILLIAMS:

And can I just interject that Climate Earth is part of the Commonwealth Climate and Law Initiative and we are working together with Minter Ellison Law Firm in Australia. We have full copyright permissions to include this.

MR. ESTRIN:

So the other thing that I would like to say by way of our rationale for our recommendations about this corporate strategy and putting duties on directors and officers to come up with specific big action plans to decarbonize – this is not strange news, this is consistent with long-accepted principles of environmental impact assessments. In the United States, since 1969, when President Nixon approved the National Environmental Policy Act (NEPA), environmental assessments have become a fundamental – almost international – law principle. It's a principle that says look to know what you're doing before you do it, and if you find that maybe you shouldn't be doing it, then you better either come up with mitigation measures to stop those bad things that are happening or don't do it at all. Do something else like transform to some other forms of energy primary requirements as opposed to fossil fuel. So that's a basic rationale. It's also consistent with the precautionary principle, of course. And these recommendations, as Cynthia said, are consistent with the UN Guiding Principles.

As she said, we are linking our recommendations to the UN Guiding Principles and concepts like the environmental assessments and precautionary principles that all provide specific and general support to the recommendations because they are all rooted and directed to the best interests of the corporation. This is not something that the corporation should do just to protect human rights. It is also in the mutual interest of the corporation and their directors.

What I'd like to do at this point is to stand over here and look at the screen. I'll probably finish in ten (10) minutes. And so, let me come to this slide. You have probably heard this already in the summary, in the handout, and I'll flash through this at the bottom of this slide. We are saying: More specifically, these

corporations should, for example, commit to corporate policies and actions to achieve a reduction. A “transition pathway analysis” should be a key part of the plan. That phrase comes from the recent report by the Grantham Institute in LSE which has headed Transition Pathways Analysis. And why do we need that?

Well, here’s a PowerPoint that may not be that easy to read. Basically, there are three temperature scenarios. Those at the top, one of them, in the possible temperature scenarios, would result in the business as usual two point seventy five degrees Celsius (2.75°C). If you want the sustainable development scenario today we should go two degrees Celsius (2°C). If you want a more rigorous one that has been recently enunciated by the International Energy Agency, you’re going to have a good chance of getting below two degrees Celsius (2°C). The button chart at the bottom tries to map out and illustrate the amount of reduction with each scenario. What we are basically saying is that corporations that emit these amounts of carbon should be specifically gearing their strategies and actions to bring down those amounts in the time that is necessary.

And you know what? This is something that the Transition Pathways report says is possible, that there is a need and a value for Carbon Majors to prepare a transition pathway plan, in their report it says, “It is possible to define a transition pathway for primary energy production, both against the Paris Agreement NDCs or pledges, and against a two degrees Celsius (2°C) scenario.” These are the people who have the expertise to say this. And they’ve looked at the data from some of the big Carbon Majors.

The second conclusion is: It is possible to assess primary energy producers, particularly oil and gas, against these transition pathways using data on their current production and their future ambitions, objectives and targets.

Thirdly: It is possible to differentiate between companies on the basis of their current and future emissions, although some care is required as the data reported may not be sufficiently granular to establish whether small differences between companies’ performance are genuine, or are within the margin for error.

So basically, if we go to the next slide. We see in their report, they produced a chart looking at carbon intensity pathways for Shell, Total and Petrobras versus low-carbon benchmarks. And the Paris pledges are at the bottom of the line, at the bottom... sorry that’s two degrees Celsius (2°C).

And look at the charts. The gap between Shell and Petrobras are pretty marked. I mean they’re not even getting close in that scenario. And even Paris is not close. And it’s possible to do this kind of analysis. These companies

should be doing this kind of analysis in their corporate plans and they should be saying how are we going to bring that line down.

That's why we want to see more details and analysis in their plans. It's not good enough to say, oh yeah, we know about the Paris Agreement; we're working toward that. Well, they are not working toward that if we take that graph, for example. And that leads to issues of minimum disclosure.

I mentioned that their plan must be developed using data analysis that complies with the "minimum disclosure of oil and gas producers," and that is set up in a box in the same Transition Pathways Report.

It's hard to read but it's headed Minimum Disclosure Expectations to oil and gas producers. It's very specific to the type of data that they know needs to be obtained so that anybody who is interested can actually do this assessment as they have done it. I think that's very important, you know, expert opinion about what these companies should be doing to enhance and improve their disclosure, otherwise you can't do these kind of analyses that they did for other companies.

So this schematic might help in terms of a diagram. Ultimately, we want to have the companies arrive at a plan at the top that's got these very specific steps and acknowledges that they're going to do what they need to do to get below, that is, to do their share to get below two degrees Celsius (2°C). What does that involve? It needs research and development for production and supply of alternative sources of energy, actual development of those alternative sources, which means plans for diversification of their portfolio. And so, that's why we say they should be committing in their corporate plans to develop these alternative energy sources. The map that Shell talks about in their recent corporate documents shows less than five percent (5%) of its total investment budget. That's miniscule in the scheme of things. It's almost like small change for a company like Shell. If they have these obligations, they should actually be up to it. We suggest a much higher percentage. And there should be, in a box to the right, a specific date when they're going to end their capital expenditures for new energy resource development if they actually commit to a net zero emission by 2050 or peak their emissions by 2020.

The next PowerPoint repeats what I said about the details on how a draft plan with all the analysis should be circulated for comments.

And the next one you have ... To actually get an updated annual report, the board has to give a specific mandate to the officers: you tell us honestly and fully what is happening to our plan, actually complying or failing? And if we are failing, what should we be doing?

Then the next slide, basically says the board should annually consider need for changes in company operations and financial commitments to alternative

energy sources and implement changes. They should really consider this on an annual basis and implement changes in operations and activities of the enterprise, including funding commitments, to ensure that the plan objectives are achieved.

So that's the end of the aspect of what the corporation should do. The next phase is the government legal requirements. I earlier talked about that in general terms in the summary, but I'd say the key legal requirements are to impose a duty on carbon major directors to require that the planning elements are included in the final corporate plan, to impose a duty on directors and officers and not allow plans to be reliant on carbon capture methods for more than five percent (5%) of carbon emission reductions.

And that these plans may precondition for government issuing approvals for further fossil fuel development or funding for these things. As I have said, as part of that they have to make sure that the plan commitments are being met.

Let me just go back. And then this next slide, I mentioned why doing these kinds of things, carbon reduction policy and action plans is mutually beneficial. This slide headed "Good Corporate Carbon Reduction Policy and Action Plans" mutually benefit Carbon Majors and protect human rights. Because these procedures and guidelines are in the self-interest of enterprises and their shareholders, directors and investors. This tells us why directors need to be concerned. We are trying to help them. We are trying to assist these enterprises and their directors to actually demonstrate their respect and abiding loyalty to their corporate, securities and common law principles and obligations. We help them convince anybody looking at the scenarios in an objective way that they will be consistent with the responsibility of their sectors to achieve the goals of the Paris Agreement and commitments made by the state, that they will be consistent with the obligations for business enterprises, and that they are consistent with what many of the Carbon Majors are now realizing they must do and are informing shareholders they are doing or will achieve (even though, in fact, many of or perhaps most of them, are not doing it), that is, to design businesses that comply with the objectives of the Paris Agreement.

And it's also good corporate policy to do this because they should avoid climate litigation. Many of the Carbon Majors have recently been sued by the City of New York for the trauma and suffering. Other municipalities in the West Coast of the United States have done the same. And there's going to be suits by investors against oil and gas companies for overstating the value of these "unburnable assets," etc.

Now, why must carbon enterprise directors ensure that new specific policies and actions are taken? Well, you know about the contribution of fossil of the Carbon Majors on global warming. I'm not going to go over that. But these

carbon energy enterprises are not significantly decarbonizing their business plans, despite the Paris Agreement nor are they taking actions to stringently cut back their carbon emissions consistent with the extent and timing of needed reductions articulated by say the IEA and the IPCC.

Now, here's something new that's coming up. Some recent examinations of the proposed oil gas sectors have found that while there have been some improvements in companies' carbon policies and management processes, there remains a fundamental problem. "Most are yet to adopt business strategies in line with the goals of the Paris Agreement." And despite shareholder resolutions requiring disclosure by these companies, one of these reports concluded that: "Many of the US oil and gas companies have adopted plans or targets to limit their full life cycle contribution of greenhouse gas emissions, and that instead, the vast majority are continuing business as usual planning that includes expanded future production." And so there are specific critically important concerns that are at the bottom of that slide; that their projections are far beyond what can be burned while keeping temperatures well below two degrees Celsius (2°C), there's an over-reliance on carbon capture technologies that are not improving and that are not yet feasible on an industrial scale to rationalize increased emissions to continue, and business plans that ignore the clear findings of IEA in keeping to get below two degrees Celsius (2°C).

Here's some excerpts, Carbon Action Tracker reviewed the climate scenario analyses of the eighteen (18) largest listed oil and gas companies. Seven of them are named Respondents in this proceeding. After reviewing the climate related scenarios of these companies, this report stated in its executive summary "the state of play suggests that a minority of companies plan for two degrees Celsius (2°C). Almost universally, the largest oil and gas companies are not planning for a world consistent with well-below two degrees Celsius (2°C). Such optimism among the industry for the increasing consumption of fossil fuels beyond the levels required under a Paris-compliant scenario is not surprising given their past attitudes towards these matters."

Some specific Carbon Action Tracker findings are interesting. What do they say about BP? "BP dodges the question of whether it plans for a two degrees Celsius (2°C) world. It provides a figure that compares emission pathways between its scenario in the IEA scenarios, and they say in their report that, in Figure Three, BP is not planning for a two degrees Celsius (2°C) world. It's two degrees Celsius (2°C) disclosure is poor, and lacks transparency and detail. Moreover, despite the overwhelming support of its shareholders for the company to assess its long term resilience, BP offers little or no evidence that it has seriously considered the implications of a carbon constrained scenario."

Let's go on. Chevron. Carbon Tracker report finds: "A key takeaway is that Chevron's strategic planning is based on global warming of more than two

degrees Celsius (2°C) and the company views a near term peak in oil demand as unlikely.”

What about Shell? “One key takeaway in Shell’s Sky scenario, its latest projection, provides its first view of what is ostensibly below two degrees Celsius (2°C) scenario. That’s good. However, it differs little with many business-as-usual forecasts and assumes still higher demand for oil and gas in 2035 than today. It also relies on enormous deployment of carbon capture and storage in the long-term to rein in emissions.”

And the next slide gets in detail, “Shell’s scenario burns through the carbon budget and leans heavily on CCS.” The report says “Having assumed that oil and gas demand is barely impacted for the next twelve years, squaring the circle to a one point seventy-five degree Celsius (1.75°C) outcome requires some challenging assumptions in other aspects of the modeling.”

I don’t think anybody is an expert in this scenario to get this easily, but they say that the “implications are enormous. Shell’s Sky scenario requires some ten thousand (10,000) large scale carbon capture and storage facilities to be built over the time frame, more than one every other day for the next fifteen (15) years and capturing over five hundred fifty (550) gigatons (GT) CO₂ equivalent to fifteen (15) years of current global emissions from the energy sector.” They say that “CCS has not proven to be an economic or scalable technology.”

If the “Carbon Majors are going to be seen to be acting with objective determination to meet the requirements to decarbonize as specified by the IEA and IREA,” then they must show that they are doing more. And, that is, deal with “the carbon density of coal, oil and gas because it’s significantly higher than the benchmarks of the Paris Agreement. So, just to show you what they mean they say, this graph looks at the carbon intensity of coal, oil and gas and oil is the red dot way up on the left-hand margin, coal is even higher, and gas is just below oil. And so those are the carbon intensities of these fuels. And yet what does the Paris Pledges require? What does two degrees centigrade (2°C) below require? A lot further down. So, they’re saying, you know, this helps, put into perspective the need for these enterprises to adopt and pursue specific policies.

Another concern in the report is expanding investments in oil and gas exploration. This chart shows on the left what was happening at the last decade up to 2016 with a recession then. But look at the right-hand side – North America is driving growth in capital expenditures for expansion of production. So this is a concern.

What has the IEA said about this issue? The IEA and the IREA (the International Renewable Energy Association) jointly issued this 2017 report

entitled “Perspectives on the Energy Transition.” They focused on what must be required to achieve the Paris Agreement objectives with more rigor and certainty. And you know that seems prudent since there are experienced climate experts who are concluding that the Paris targets are insufficient and that to prevent climate chaos and impacts from climate change that affect human rights, we must limit the global temperature rise to as close as possible to one degree centigrade (1°C). The IEA said, on that issue for purposes of the Paris Agreement, they talk about the Paris targets and underline “For the purpose of this report, it was chosen to focus on a scenario with a sixty six percent (66%) probability of keeping the average global temperature rise throughout the twenty first century to below two degrees centigrade (2°C) without any temporary offshoot. Understanding that budget consistent with this definition is a critical consideration for modeling the pace and extent of the energy transition.”

And here’s what they found. “Limiting the global mean temperature rise to below two degrees (2°) with a probability of sixty six percent (66%) would require an energy transition of exceptional scope, depth and speed.” And that’s their own emphasis and headline. And then the next quote is “Energy-related CO₂ emissions would need to peak before 2020 and fall by more than seventy percent (70%) from today’s levels by 2050. The share of fossil fuels in primary energy demand would halve between 2014 and 2050, while the share of low-carbon sources, including renewables would more than triple worldwide to comprise seventy percent (70%) of energy demand in 2050.” So they’re basically saying to those companies, “you should understand what you need to do.”

The International Renewable Energy Association findings in the same report said: “The share of renewable energy needs, to meet this assurance, to get to below two degrees (2°) with a sixty six percent (66%) assurance probability, the renewable energy needs to increase from around fifteen percent (15%) of the primary energy supply as it is in 2015 to sixty five percent (65%) in 2050.” They also say the energy supply mix in 2050 would be significantly different. Right now, the total fossil fuel use in 2050 would stand at a third of today’s level. The use of coal would decline the most, while oil demand would be at forty five percent (45%) of today’s level. Early action is critical in order to limit the planet’s temperature rise to two degrees centigrade (2°C) and to maximize the benefits of this energy transition.” And this is the last point, “Taking action early is also critical for the feasibility of maintaining the option of limiting the global temperature rise to one point five (1.5°C). Delaying decarbonization of the energy sector would cause the investments to rise and would double standard assets. In addition, delaying action would require the use of costly technologies to remove carbon from the atmosphere.” I would say, parenthetically, if they would work at all.

So that's our presentation. I hope that we've provided some useful information. Thank you.

PANEL CHAIR CADIZ:

Thank you very much, Professors Estrin and Dr. Williams. I would now invite my fellow (panel) members to field-in questions.

COMM. TANODRA-ARMAMENTO:

Good morning to both of you. My first question is you have presented very good convincing arguments towards decarbonizing. And in fact you have presented a plan. But do you think this is enough to convince Carbon Majors to have a diversification of their business portfolio, as you have suggested, considering that there is a continuous demand for fossil fuel; and there is not enough incentive or reward, in dollar terms, if ever they diversify or transition from fossil fuel to the more renewable energy investments?

MR. ESTRIN:

Well, two responses. First of all, the IEA in its report recognizes there will still be use of fossil fuel up to 2050, to some extent. So, it's not like they're going to say you'll have to shut down all your oils or anything like that. Secondly, though I think most importantly, unless the directors of these companies really understand why they have legal obligations to achieve decarbonization, they're not going to easily do it. They'd be almost kicking and screaming to that result. Some of them will probably get it. Some of them will obviously be wanting to think ahead. And they're actually claiming in their documents that well we are thinking ahead, we are thinking about Paris, we're gonna get there, look at our stocks. But in reality they're not. So that's why we think it's important to put forward rigorous requirements and guideposts on what directors should be doing. That's why, in our summary, we said, if you do this, do it transparently with peer review, you will be accountable; and that's what you should be doing; it will help you, and it will help everybody else. Unless they are required to do that, to do this rigorous self-analysis on where they are, transparently, it won't happen.

PROF. WILLIAMS:

I would quickly add that, in a way, who better to lead the transition than these large companies, right? They have the expertise, they have excellent scientists, engineers; they have global reach. They need policy clarity but we

don't have that. But maybe to fill in the gap, some personal liability of directors and officers may create a change in their incentives. Secure these liabilities to be paid by the company. Breach of fiduciary duty of liability is personal liability of the directors. We just need one or two big cases and those incentives might shift.

MR. ESTRIN:

And on that point, in the process, in Ontario, it was only when the government of Ontario, back in late eighties and early nineties, actually imposed specific duty on all officers and directors to ensure that the corporation will take measures to avoid and to make sure they didn't violate the act. That's what caught the attention of the corporate and there's been good behavior, proper behavior since that time. So I agree with that comment.

COMM. TANODRA-ARMAMENTO:

I agree with you that maybe there will be an urgent push for these companies to act. But in case of human rights violations caused by these corporate activities, if you attribute responsibility, if you attribute it to the company on a civil aspect and also to its officers, what are the proofs that you need to present before the court so that you can pin down personal liability on these persons?

PROF. WILLIAMS:

The proof will be a reporting system meant to address these underlying legal obligations that is absolutely insufficient, or that the members of the board of directors are ignoring a reporting and monitoring system that is in place. It is an aspect of Delaware law that is potentially useful that the first step in litigation can be a book of records request. And the book of records request can allow greater access to board minutes and to reviews of board agenda, that sort of thing. It's possible that a review of two or three board agenda which shows nothing, no attention to some of the underlying legal causes of inaction that could be useful. It's all in the facts.

COMM. PIMENTEL-GANA:

Most of your recommendations are very specific and actually addressed to Carbon Majors' officers, trustees, and board of directors. I would just like to

find out if you have actually given these to Carbon Majors and what are their response?

MR. ESTRIN:

The answer is you are the first one to see it.

COMM. PIMENTEL-GANA:

Ohh, ok.

MR. ESTRIN:

We thought about what useful information and advice we could try to give you – that was what we were focusing on. What are the kinds of steps that they would take. We believe it is important to bring to your attention measures that you might want to take to the corporate sector, to those involved in the carbon emissions in a major way. You could identify these procedures as something that could be used as an example of what is required. And you would be at the forefront if you put it in your report and make that public.

COMM. PIMENTEL-GANA:

Thank you very much for that. You made our lives easier. I was listening to what was discussed by Cynthia earlier about the fiduciary responsibilities of officers, directors of companies. Would you consider the pronouncements made by Carbon Majors malicious and false given the evidence presented by scientists and all the other findings of evidence and attribution? Can the directors and officers of such corporations be held accountable under the fiduciary principle you mentioned?

PROF. WILLIAMS:

That's an interesting idea. That seems to me comparable to the legal action that underlie the Urgenda litigation in the Netherlands, right? Because in the Urgenda litigation, the plaintiffs used the Netherlands statements about the importance of the transition, and then showed the gap in the actions of the government, this is what their statements have consistently been for many years. So that's a very interesting idea – to look at some of the public statements of the companies now, when they are finally acknowledging the reality of climate change, and then pointing to the gaps between their public

statements and what they're actually doing, and using that not only for securities litigations but for potential fiduciary litigations. I like that idea. Thank you.

COMM. PIMENTEL-GANA:

Well, okay, cool.

PANEL CHAIR CADIZ:

Thank you very much, Commissioner Pimentel.

Cynthia, your recommendations are very useful and we are almost certain to adopt most of them, among the other recommendations that have been presented by the other resource persons. But, specifically, have you developed a template or model law complaint that we can bring to different governments, different policy makers, incorporating all these ideas that, you know, push governments towards certain directions... push businesses towards decarbonization?

PROF. WILLIAMS:

That's another good idea. The Commonwealth Climate Initiative in Canada, at the University of British Columbia, is into its second year of work, and one strand of work is with policy makers in Canada, saying we should use this as a basis for model law. And we've also see that in the UK and Australia, South Africa. Canada could then take that model law promoted in different Commonwealth jurisdictions. It's a great idea.

COMM. PIMENTEL-GANA:

And actually it can be part of the implementation of the Guiding Principles on Business and Human Rights.

PANEL CHAIR CADIZ:

I would imagine it would not only use the carrot and stick principle, but also...I lost my train (of thought)... But anyway...

PROF. WILLIAMS:

To think about incentives as well... because governments do provide enormous financial incentives to the Carbon Majors. One could look at subsidies and other positive incentives as well to consider as part of such a model law.

PANEL CHAIR CADIZ:

Okay. The other one that I wanted to inquire about is on the practical aspect... You mentioned it was a good idea, from an economic point of view, for the Carbon Majors, to de-carbonize, essentially, and follow the recommendations under the Paris Agreement, as well, so as to avoid possible litigious processes. So, if these are the given facts, if you say that, even from an economic point of view, it is advantageous for them to decarbonize, how come they're not doing it?

MR. ESTRIN:

I think they got the idea that they have to. The problem is that they don't want to do, or avoid thinking how fast they need to do it in order to achieve something they think they don't have the responsibility for, which is the temperature decline. So they see it themselves, I would think, to diversify their energy because they see it coming in that, you know, the highest people, like Bloomberg and the Task Force, have all said you're gonna have stranded assets unless you actually decarbonize. So they know that that is their future, they just have to, they need to. But what they don't seem to have on top of mind is the need to do it at a time to stop the earth from being uninhabitable. And that, I think, that's the difference.

PROF. WILLIAMS:

Right. The Bank of England has described this as the tragedy of the horizons. Politicians have a short time frame, officers and directors of companies have a short time frame, and some industrialists have a short time frame... not all. We have a hundred largest investors in the world and now the largest companies in the world understanding that they need to make a transition. It's a short-term tragedy versus longer-term transition issue. The incentives today are not aligned with Paris.

MR. ESTRIN:

And that's why, in our mind, it is important to tie the granting of government approvals to a plan that already shows particular steps to get the objectives accomplished in a timely way. So they have to develop that plan. We can make it a case that government should make it a requirement that they meet those, and not approve certain other things if it's going to violate that plan.

PANEL CHAIR CADIZ:

Thank you very much, Professor Williams and Dave Estrin.

MR. ESTRIN:

Thank you very much.

PANEL CHAIR CADIZ:

Atty. Fernandez, are we going to our next resource person or are we going to have a break?

CLERK OF THE INQUIRY:

Next resource person, Commissioner.

PANEL CHAIR CADIZ:

Alright, thank you very much again, Doctors Williams and Estrin.

Ms. Fernandez, can you...

CLERK OF THE INQUIRY:

We welcome, Dr. James Hansen to share his insights with us today.

PANEL CHAIR CADIZ:

Can you turn on your microphone?

DR. JAMES HANSEN:

Thank you very much. I think it's better if I stand up. Let me summarize the status of our understanding of climate change and the consequences. You can see, we have a pointer here? Yeah.

So you know, through the last few years, discussions on global warming seems to have stopped because for decades or so the temperature was not as much warmer as it was during the super El Niño in 1998. Now with more recent El Niño, you can see there's no slowdown in the global warming. In fact, if you compare the peak temperatures of that El Niño and this one and if you realize that this current temperature is actually a minimum, we're about to have temperature rising. So, if anything, the rate of temperature is actually beginning to accelerate and there are reasons to think that that is actually the case.

We're certain that global temperature is going to go up because the planet is out of energy balance. The reason being that we are adding greenhouse gases to the atmosphere which we produce from thermal radiation to space. And if there's more energy coming in than going out, then the planet is going to go warmer.

We can now measure the planet's energy imbalance very accurately by measuring the heat content of the heat reservoirs, the biggest reservoir being the ocean. And we now sample that with these argo floats distributed around the world's oceans. And what we find is that the upper ocean is gaining heat at a substantial rate, the deeper ocean is also gaining heat, and energy is going to be melting ice all around the planet. So the total energy imbalance (Slide: Total Solar Irradiance) during this period of study 2005-2011, the planet was out of balance by as much as six-tenths (6/10) of a watt per meter squared (W/m^2). That doesn't sound like a lot of energy but is in fact equivalent to four hundred thousand (400,000) Hiroshima atomic bombs per day, every day of the year. That much more energy is coming into the climate system than going out. And now, the climate deniers were saying the climate varies naturally specially because of the solar variation. But that imbalance was during the deepest solar minimum in the period of accurate measurements, and yet there was more energy coming in than going out. Now average over the solar cycle, we find that the imbalance is about three-quarters (3/4) of a watt per meter squared (W/m^2). So there's still substantial warming in the pipeline even without any further increase of greenhouse gases.

The Earth's history is a very useful source of knowledge about the expected effects of the fossil fuel generated changes in the atmospheric composition. This is a record of the last eight hundred thousand (800,000) years for global

temperature, CO₂ amount, and sea level. You can see there's a very high correlation of global temperature with the CO₂ amount.

In fact, if we look at that carefully from the Antarctic ice core, you see a spectacular rise of the CO₂ and the temperature. This is the temperature in Antarctica. A more relevant data for global temperature - we can estimate the global temperature during the last eight hundred thousand (800,000) years from ocean cores. You see again there's a very high correlation of CO₂ with the global temperature. So those temperature changes over the eight hundred thousand (800,000) year-period are driven primarily by (Slide: Atmospheric CO₂ and Global Surface Temperature) two slow feedback mechanisms. The instigation of those climate changes on those long-time scales are perturbations of the earth's orbit and the tilt of the earth's spin axis which changes the seasonal and geographical distribution of sunlight. And that's a very weak forcing but it spurs two strong amplifying feedbacks: the amount of CO₂ in the atmosphere and the area covered by the ice sheets. And those two mechanisms cause these very large climate changes of several degrees Celsius on these long-time scales. Well, now on this graph, I've added the last one hundred fifty (150) years, expanding the time scale, so you can see the change. And CO₂ is now shooting off the chart. And in response, global temperature is rising, but it's only reached a fraction of its natural response. The physics doesn't change and the eventual global temperature change in response to this CO₂ amount is going to be a much larger warming. It takes time for the slow feedbacks to come into play. As the planet warms, the size of the ice sheets decreases. Ice and snow melts as the planet gets warmer. And as the ocean gets warmer and as the tundra melts, it gives up CO₂ and its companions methane and nitrous oxide, and those slow feedbacks will amplify the temperature change. So if we do not decrease the amount of CO₂ in the atmosphere, we're going to get a larger climate change on a time scale which is hard to say. Or if you look at the sea level, you know the sea level is a measure of how big the ice sheets are, if you look at the temperature and sea level record in eight hundred thousand (800,000) year record, you see that the sea level lags the temperature by a few centuries, by three to four centuries.

So the slow feedbacks do take time. However, the human-made forcing is being added so much faster than any of those natural changes that the lag may not be as long. We estimate, in our paper published two years ago, "Ice Melts, Sea Level Rises, Super Storms," that the lag of sea level of ice sheet is probably only fifty (50) to one hundred fifty (150) years to get to multi-meter sea level rise. If we stay on business-as-usual, rapid growth of fossil fuel emission while the sea level has actually stabilized over the last few thousand years, sea level change by less than a meter. Well now, this range of sea level is already beginning to rise at a rate that is accelerating. The present, the rate of the last few decades, is about three millimeters (3 mm) over a year, that is three meters (3 m) a millennium. So it's already much, in the order of magnitude, faster than any changes during the past several thousand years.

And if that rate will continue to increase if we don't rapidly reduce emissions...

And, of course, more than half of the large cities in the world are located on coastlines. This is one of the huge impacts. We now can measure the mass of the Greenland and Antarctic ice sheets very accurately from gravity satellite, and they have been beginning to lose mass which is the reason sea level is rising. And the consequences will occur all around the world.

Now, in addition, there are regional climate changes that are beginning to be apparent. If you look at the temperature variability in the last century, it formed a nice bell curve, above the average seasonal temperature fluctuation from one year to another due to natural variability. But that bell curve is now shifting because of the global warming. So the extreme events, the extreme warming events, the extreme warm seasons that occurred very infrequently last century are now becoming more common. In the United States and Europe, the shifts are measurable but only have the one standard deviation. If you look at the sub-tropics and the tropics, the shift is larger. Summer warming in the sub-tropics are now more than two standard deviations. So that means every summer is now warmer than the average climate fifty (50) years ago. And the same is true in all seasons in the tropics. So these lead to substantial impacts on regional climate. It's well understood that, in the extremes, as the planet gets warmer, the times that are dry, the places that are dry, in the extremes of heat, drought and fire increase. And wet regions tend to get wetter and have greater rainfall and more extreme floods and storms. This is already showing up as we saw in the fires in Greece this year which had major impacts. The other end of the hydrologic cycle, the one hundred (100) year flood is now occurring more often than once a century. The floods in Japan this year were really extreme, more extreme than we've seen in the last century. The winds of Super Typhoon Haiyan had the strongest winds ever recorded on land.

So the climate situation is that we have a crisis. But it's not well recognized by the public partly because part of the warming is still in the pipeline. And then these amplifying feedbacks mean that we are handing young people a situation which may be out of their control. And what this means is we burn only a small fraction of the total fossil fuels in the ground. We have to live on what remains on the ground, if we're going to leave young people a situation that's not out of their control. That's well understood.

But in fact, what's happening? The global energy consumption is continuing to rise and the fossil fuel use is continuing to increase even if we know, we talk about. We have the Paris Agreement, everybody agrees we have to reduce emissions or young people will inherit something out of their control. Yet we just stay right on this path, which is an injustice to young people. It's an injustice of the North to the South because the United States and Europe, the

developed the world, burned most of the allowable carbon budget and the impacts are going to be largest at lower latitudes, and, of course, to humans and to all other species on the planet.

The climate change is proportional to cumulative impacts, the integrated impacts over time. If you look at these, you see that the United States, Germany, United Kingdom are much more responsible for the emissions, for the climate change, than the developing nations. Even China, which now emits twice as much as the United States, on a per capita basis, they're on a much lower magnitude, less responsible. And India's barely visible on this chart. So, the crucial requirement, much of the world needs energy to raise the standard of living. But we're gonna have to do that with carbon free energy.

That's only going to happen if we have alternatives that are competitive in price. But the fossil fuel price needs to include the costs to society, to human health, costs of air pollution, water pollution, and the costs of climate change. And so fossil fuel companies will continue to ignore this until we make fossil fuels include their costs to society. So we need to have a carbon fee or carbon tax.

Now I also want to... I noticed that you have Pat Michaels on the agenda, but I don't see him. I don't know if he's still on the agenda.

Okay, well, I want to point out that the scientific method says that you have to use all of the data, and that you must be very skeptical of your own interpretation, and you must reassess from scratch as soon as any new data becomes available. Pat is actually is a very affable guy, but he's a master of the fine art of cherry-picking, which is exactly the opposite of the scientific method, in the sense that he's not using all the data. And he, in fact, wrote an article, published by the Wall Street Journal this year, in which he again looked back in my 1988 testimony. He's famous for looking at that, and looking only at 1988, when I testified in Congress, we attached our article in the Journal Geological Research in which we looked at scenarios, three scenarios for the future, scenarios A, B and C. And Pat looked only at scenario A, erased the other two scenarios, and compared scenario A to the real world. But we actually know very well what the real world has done. And it has followed closely, slightly below, what we called scenario B for the greenhouse gas growth rate. And in that case, the model actually did a pretty good job simulating what has actually happened. The model that we used in that 1988 paper was the first model, first GCM used for transient climate simulation, in which you put in growth-changing greenhouse gases. And that model had a sensitivity of four degrees (4°) for double CO₂. It was our first run of that model, we had to take what it gave us; it actually took us three (3) years to run the model. We had used computer; so we had to take what the model gave, even though we believed, the attorneys at the National Science Studies believed that the best estimates for climate sensitivities was three degrees (3°)

double CO₂. So the model came out... temperature slightly larger than actually occurred, but if you adjust a bit for the fact that sensitivity was four degrees (4°) rather than three, then actually it was very accurate as to what actually happened in the real world. But the reason that it didn't follow scenario A was the world actually did a good job of addressing the ozone problem. The Montreal Protocol was actually followed and so the growth of trace gases, the red part on this diagram, it decreased rapidly. And methane growth decreased. So the scenario has been more or less constant. But, in the last few years, the growth of the trace of greenhouse gases has begun to accelerate again, and it's much higher than the scenario needed to stay less than two degrees (2°). We're actually exceeding what is necessary, so you would have to suck CO₂ out of the atmosphere if you want to get back on this track. And as someone has already, the skepticism discussed in the last hour, it's very unlikely that we're actually going to suck CO₂ out of the atmosphere. It's going to be very difficult and very expensive to do that. What we actually have to do is to reduce emissions. That's the only way that we can have the chance to stabilize the climate. Government is saying there's a problem, we should do something. But they're not doing it, and fossil fuel companies are basically ignoring that because the governments are pretending the companies understand. So we got a problem. And that's why we're gonna sue somebody.

And in case, you know, to deal with the kind of cherry-picking that Pat Michaels does, the last time I spoke with him was six (6) years ago before Grover Norquist in Washington, it took me a week to write a document to address each of the cherries that Michaels wrote and I don't have time to do that now because next month, I'm fully-booked. Our law suit, "Our Children's Trust" law suit, I have a deposition next week and I have to prepare for that, and another trial of some people who shut off a pipeline, and I have to go to China. I don't have the time to deal with Michaels again. But I brought ten (10) copies of the nice document I wrote addressing his cherry-picking. So I brought ten (10) copies of that in case you do listen to him. But I guess he hasn't shown up today. So I went through that pretty quickly, but do you want to have a discussion on that?

PANEL CHAIR CADIZ:

Thank you very much, Dr. Hansen.

CLERK OF THE INQUIRY:

We just heard from Dr. James Hansen. He is formerly the director of the NASA Goddard Institute for Space Studies and is Adjunct Professor at Columbia University's Earth Institute where he directs the Program Climate Science Awareness and Climate Solutions. He is best known for his testimony

on climate change in the 1980s that helped raise awareness of global warming. He is a member of the US National Academy of Sciences and has received numerous awards including the Sophie and Blue Planet Prizes. Dr. Hansen is recognized for speaking truth to power and for outlining actions needed to protect the future of young people and all species on the planet. For purposes of documentation, the presentation of Dr. James Hansen has been marked as PRP-10 and his curriculum vitae as PRP-11.

PANEL CHAIR CADIZ:

Thank you very much. We shall now be fielding questions to Dr. Hansen.

COMM. TANODRA-ARMAMENTO:

Dr. Hansen, good morning. I'm just curious. In your personal opinion, do you think Patrick Michaels' criticism on your study affects your credibility?

DR. HANSEN:

No, I think he's pretty much disappeared from the scene. The Wall Street Journal, that like Donald Trump believes that climate change is a hoax, is about the only place he can publish. So I don't think this is a serious issue. We have IPCC documents. Nobody takes him seriously.

PANEL CHAIR CADIZ:

Dr. Walpole?

FR. WALPOLE:

Thank you very much for what you have presented. In one sense, you have verified, very quickly, much of the history of global warming... It's well proven. I understand that in the sciences we've established a level of peer review that in a sense removes the denial. We also seem to have moved, listening to the earlier discussions, to a stage where I would say attribution and vulnerability... On the other hand, we have established the involvement... or, shall we say, the fraud of some companies, and we're coming to a point of inaction. So as I understand the global discussion point to the inaction. We've had some input this morning from both David Estrin and Cynthia Williams as to how that might be addressed legally. I'm wondering with the science that you are presenting here, how can that in one sense enter the mainstream. What

are the avenues outside of the Wall Street Journal for this entering into mainstream communication and being a basis for action.

DR. HANSEN:

Well, of course, the science entering the mainstream via the peer review journals per se do not seem to have any impact on the real world, and in the path of Carbon Majors in emissions. In such a situation, frankly, scientists had not been helpful in communication, and we went along with it. So we do, after the 1980s hullabaloo, and the global response was very appropriate and very popular, surprisingly. So contrary to the Time magazine article that there was no response, in 1992, remarkably, the United States and essentially the entire world agreed we should avoid dangerous human-made interference with climate. That's kinda the best you could have hoped to get that quickly. It was followed up with Kyoto Protocol and Paris Agreement which are wishful thinking agreements where you ask one hundred ninety (190) nations to please try to consider reducing your emissions. It doesn't work. Nations want to make money to raise the standard of living of their people. They need energy to do that and the cheapest energy – because it does not pay its cost to society – are fossil fuels. That's why I say you have to have a rising carbon fee, carbon tax that needs to be made global or near global which could actually happen quite easily if the United States, preferably United States and China, would agree to have a carbon fee, put a carbon duty on products... That would be a great incentive for other countries to have their own carbon fee, so that they could collect the money themselves rather than have China and the United States collect that in their borders. It's possible to do something but the politics is not leading there and that's because our legislative and executive branches are under the heavy influence of money. I've gone to more than a dozen countries and have found they're not much better than the United States. The money is... special interests have an undue sway in our governments... That's where the judiciary comes in because, hopefully, it's less subject to pressure to money, and gives us a chance... I think we're going to win the case to our Children's Trust case against this Trump government. It's a very powerful case based on the Constitution. Young people are not being given due process. They are being deprived of life, liberty and property without due process of law. They're not being given equal protection of the law. And so, the district court is already dismissing government's request to dismiss the case. The judges made pretty clear they understand the situation, so I think we're going to win it there. I think we can win even in the conservative Supreme Court because it's based so strongly on the Constitution. And the science is now so clear. I think we will win that, but this pressure on the judiciary... Otherwise, young people are screwed.

FR. WALPOLE:

How do you think the scientific community, through an inquiry like this, could contribute to the COP process, you know, to speed-up the reality presented here.

DR. HANSEN:

We have to make it clear, I think, we have been complicit. You know, when we see that the world is running off the track that will be put into the model. So let's put on some negative emissions. But those negative emissions which you assume are sucking CO₂ out of the air at an enormous rate are impossible, I think. The cost could be a hundred trillion dollars. Who's gonna pay that? It's just not realistic. This is an urgent problem. If we don't get on track to phase out emissions, then it becomes an almost unsolvable problem. If we allow the ocean to warm to the point that we're going to melt the ice shelves around Antarctica, the tons of ice shelves in the ocean, then for sure, essentially over the next century, we're gonna get lots amounts of ice into the ocean, sea level is going to go up on multi-meter. The economic consequences are almost incalculable. And together with that, we're warming the low latitudes and making them unpleasant places to live. Summers you can't work outdoors. And more than half of the jobs in agriculture, construction... it's a big migration pressure to get out of that part of the world. So, we'll end up in an ungovernable planet. Young people will be in a situation out of their control. So we have to get on a path of reducing emissions and the only way to do that is to make fossil fuel economically costly.

I once gave a talk to executives in the United Kingdom, and at the coffee break I asked them about their websites, which showed windmills and solar Panels. Are you really investing in non-fossil fuel energy? They sort of smiled and smirked. Until they are forced to do it, they're gonna make money the way that they do it most effectively, and as long as we allow them to do it. They will keep going after more fossil fuels.

PANEL CHAIR CADIZ:

Dr. Hansen, this case, "Our Children's Trust" case, can you talk a bit more about that? What exactly are you asking the government to order (the respondents), and the Court to order (the respondents)?

DR. HANSEN:

Yeah. When we first filed the case several years ago, we calculated that what we really want to do is get, if a stabilized climate this century you have to get CO₂ to about three hundred and fifty parts per million (350 ppm). That would restore energy balance, instead of more energy coming into the planet than going out. If you have to reduce the amount of greenhouse gases in the atmosphere, we can calculate very accurately how much we have to reduce them, it would be CO₂ from four hundred ten parts per million (410 ppm) to about three hundred and fifty parts per million (350 ppm). That's very hard to do. That requires reducing emissions several percent a year. And if you do that, you actually keep warming less than one and a half degrees (1.5°), the peak warming. And then it would start to decline. That's the ideal result. Now, it's getting harder and harder, probably impossible to do that. But you could stay under two degrees (2°), and you can actually get into one and a half degrees (1.5°) with reductions of two percent (2%) or three percent (3%) a year. And that is actually plausible. The economic studies show that if you have a gradually rising price on carbon, you would reduce emissions by over three percent (3%) a year up to a point over ten (10) years. The study shows you could get thirty percent (30%) reduction. But governments also need to be investing on long-term R&D. I am very skeptical that renewable energy alone is going to replace fossil fuel, and so are the Carbon Majors. They know. That's one reason they smirk when they put these solar Panels on their websites. Because they know that this intermediate energy is not going to replace fossil fuels... they are turtle jets. They probably shift to nuclear power in the next generation. But that's not going to happen without the economic incentive. Fossil fuels are inherently cheap because you just need a bulldozer to get coal out of the ground. If coal will not pay for its pollution, then it's going to continue to be the cheapest energy. That's what India will use, that's what China will use.

PANEL CHAIR CADIZ:

So, specifically, you want government to prevent and limit the operations of the Carbon Majors? Specifically, what is your main... prayer in the Petition?

DR. HANSEN:

I think the Carbon Majors, you know, they want to make money... If the rules change, they'll figure out ways to continue to make money. They've got the resources to invest. You know, in 1982, a paper we had written in 1981 for a science magazine was reported on the front page of the New York Times. We concluded you can't burn all fossil fuels, you'd create a different planet. You know, sea level's going up to tens of meter if you burn up all fossil fuels. So

we had a workshop, a symposium at the Lamont Geophysical Observatory sponsored by Exxon Research and Engineering, and the keynote speaker at the dinner was EE David, Jr., the president of Exxon Research and Engineering. And he correctly identified the fundamental nature of the problem. He said, "Oh this is a very interesting system that you're dealing with in the climate because it is characterized by a slow response, you don't get a response immediately, and its characterized by amplifying feedbacks." He said, "In such a system, I looked at the theory of feedback, loops tell you that you lose control unless you have anticipation. And the anticipation that was required was, obviously, you better develop some non-carbon energies."

But instead, what Exxon Research and Engineering did was develop fracking. It began to work on fracking. They invested in it and over a few decades, they finally perfected it. Now, they can get gas and oil, much more of it, out of the ground. So they sort of knew what they needed to do but didn't because they just thought of doing this as long as they're not required. As long as government subsidizes what they're doing; wouldn't they keep digging up more fossil fuels?

PANEL CHAIR CADIZ:

If we were to follow your recommendations to adopt a carbon tax, by how many percent on a per gallon basis would the cost of fuel increase?

DR. HANSEN:

Yeah, there is an organization in the United States, Citizens Climate Lobby, which has adopted this idea of a carbon fee and dividend. In a democracy, people don't like the idea of the price of gasoline at the pump going up rapidly. But if the money that is collected is distributed to the public, in equal amount to the residents, then actually two-thirds of them will come out ahead. Rich people have a bigger carbon footprint with their big houses, travelling and flying around the world. So they lose money but they can afford it.

But anyway, to answer your question, they've looked at with economic studies a case of ten dollars (\$10) a ton of CO₂, and going up each year, ten dollars (\$10) a ton. After ten (10) years, it's one hundred dollars (\$100) a ton, which is a dollar a gallon. So, you'll see, probably prices going up but they would be getting two thousand dollars (\$2,000) for each citizen from the dividend, if all the money were distributed to the public. So actually most people would begin to like that dividend. And it will be easy to maintain.

So, you know, those behind the scenes, a lot of industry leaders, business leaders are coming around to this idea, even some of the fossil fuel companies.

And, incidentally, relevant to your consideration, what fossil fuel companies would really like though, for them to agree to this, is for them to have immunity from lawsuits. I mean you're right. No, no we won't make such a deal. If you want to save the planet, you better... What you really need is this rising carbon fee, and for fossil fuel and industry leaders to be more concerned with the future of young people.

PANEL CHAIR CADIZ:

Thank you very much, Professor Hansen.

Excuse me... Would you Counsels for Petitioners field some questions?

Okay, go ahead. Yes, of course. We have a few more minutes. We can use this.

ATTY. MAYO-ANDA:

Good morning, Commissioners. Good morning, Dr. Hansen. You mentioned about the law and judicial pressure as critical. We would like to know your thoughts or insights on other equally critical initiatives besides seeking refuge from the judiciary. Because you mentioned a while ago about certain hopelessness when we talk about politicians and legislators, so, we'd like to have your thoughts.

DR. HANSEN:

Yes, judicial pressure is necessary but the judicial branch cannot write laws. This is very analogous to civil rights in the last century. Brown versus Board of Education was in 1954 but it took decades before what you call the "all deliberate speed" came to be. In this case, "all deliberate speed" needs to be pretty damn fast. We can't wait, we can't wait for the legislative and executive branches to fumble around for a couple of decades doing ineffectual things. So you actually have to do the only thing that will work, and that is to make the price of fossil fuel include their costs to society. The most useful thing we can do is to support Citizens Climate Lobby, and lobby the government and try to get the public and the legislators to understand that the fee on carbon can't be stolen or used for legislators' favorite special interests. They have to let the money go with the public. And this kind of lobby now actually exists in several nations.

I've just been back, midnight from last night, from Taiwan, a country which imports all of its fossil fuel energy. They pretend, the government pretends

that they're gonna have some plan to go down to zero emissions by the middle of the century, but they're getting only one percent (1%) of energy from renewable energy. That island is not a place where you're going to have room for solar Panels. So you're gonna have some plan. There's actually some physicists on a hunger strike trying to persuade the government not to close its nuclear plant... Anyway, they need a plan. You have to hold these governments accountable. They say that by the middle of the century we'll do something... But when you ask, so where's your plan? Where's your plan? They don't have one. They don't have anything realistic.

ATTY. MAYO-ANDA:

Dr. James, two (2) more questions. What do you think Dr. James if the fossil fuel majors continue their business-as-usual plans?

DR. HANSEN:

Well, I've already said a lock-in in the ocean and that lock-in on a time scale... But even when we've already seen the facts, you know, it is not certain that, when you get this, it's not now Houston, now South Carolina, North Carolina where you got these effects of the increased water vapor in the atmosphere, heavier rains going with the storms that occur... We're beginning to see coastal problems already even on our own country. But that's a small taste of what it will be if we get meter-scale and multi-meter-scale sea level rise. So that's the single biggest danger, and the cost of that becomes so great... I also mentioned, the low latitudes getting warmer, the Mediterranean region, Middle East is now uncomfortable in the summer and that's just with only one degree. If we go three degrees or something, then people won't want to live there.

ATTY. MAYO-ANDA:

Could this situation for storms and hurricanes?

DR. HANSEN:

The fuel for tropical storms as well as thunderstorms and tornadoes is both a lot of vapor in the atmosphere. And warmer ocean surface temperature provides the potential for storms to become stronger. It doesn't mean that every strong storm is going to be stronger, but the strongest storms will be stronger. And those storms which can just be so devastating that you can't recover in a year or even a decade from the most destructive storms. So that's

another consequence which is now scientifically clear that's going to happen if you stay on this path and we're beginning to see enough empirical evidence that we're there already getting some non-negligible impact.

PANEL CHAIR CADIZ:

Thank you very much, Dr. Hansen.

It's quarter to 12. We break for lunch and come back at 1:45. Thank you very much.

CLERK OF THE INQUIRY:

Good afternoon, everyone. I hope everyone had a good lunch. We welcome today Ms. Erin Daly, a professor of law and interim co-dean at Widener University, Delaware Campus. She has written extensively on comparative constitutional law and transitional justice issues throughout the world. She recently published "Dignity Rights, Courts, Constitutions and the Worth of the Human Person" with a foreword by the former president of the Israeli Supreme Court Aharon Barak. This is the first book to explore the constitutional law of dignity around the world. Erin has also written on Comparative Environmental Law and is co-authoring a book on Environmental Constitutionalism with Widener Professor James R. May. Erin is currently at work on a project investigating transitional justice in Iraq and that country's path toward democracy. We welcome Erin to share her insights today. For the purposes of documentation by the Panel, her submission has been pre-marked as exhibit "PRP-12," and her CV pre-marked as "PRP-13."

PANEL CHAIR CADIZ:

Ms. Erin, we are ready to listen to your presentation.

MS. DALY:

Thank you very much. It's a delight to be here today. I'm very honored to be able to participate in this important conversation that the Commission on Human Rights of the Philippines is holding to investigate the contributions of the Carbon Majors to climate change and to ocean acidification. I am speaking here on behalf of the Dignity Rights Project at Delaware Law School. I also would like to acknowledge my Delaware Law School student, Simone Berman-Pearlstein, who is attending the hearing today.

Dignity rights are well established in international law and in the constitutional law of most nations around the world. My intervention today will focus on ways that climate change impacts the right to dignity, both in substantive and in procedural terms. I will first address the evolution of dignity rights in international law and domestic constitutions and then talk about how the global jurisprudence of dignity rights has developed in contexts that touch on climate change.

We heard this morning about the relationship between climate change and human rights. This presentation will pick up on those themes mentioned there, with a focus in particular on the human right to dignity.

Human dignity is the foundation of human rights protection in the twenty-first [21st] century. It is central to human rights law at both international and domestic levels, and in both juridical and non-juridical forums. It joins together civil and political rights with social, economic, and cultural rights, and compels us to care about both present and future generations. It is, importantly, the motto of the Commission on Human Rights, which promises to secure the “Dignity of All.”

My goal today is to describe the pivotal importance of dignity and the legal protection of those rights that are most threatened by climate change. It is, in fact, hard to imagine anyone being concerned about the earth’s changing climate and all the tremendous ramifications that that imports – from extreme wildfires to more violent typhoons, to desertification of farmlands, to rising ocean levels that threaten most of the world’s urban population – it’s hard to think about these issues if not out of concern for the dignity of those people who are most vulnerable.

In particular, in showing the links between climate change and human rights, the Primer that was distributed earlier, does not mention dignity rights per se, but mentions seven rights that are all connected to the right to live with human dignity. And these have other implications. As climate change impacts are felt, we will see a flood of refugees, more and more wars, and the destruction of communities. And all of this will of course be felt most by the most vulnerable among us. That is what it means to be vulnerable. And this is why we need to pay attention to human dignity, and, in fact, why courts have already begun to focus their constitutional jurisprudence on dignity rights.

Human dignity is of course a philosophical concept and a spiritual concept among other things. But it is also importantly a legal concept – a right that is judicially recognized and enforced. In the international conventions, in domestic constitutions of more than one hundred sixty (160) countries, in the jurisprudence of nations in all regions of the world, it is the legal axis around which the protection of human rights revolves.

As a legal right, the concept of human dignity means, quite simply, that every person has equal worth. A simple but very profound concept. It has two elements. First, each person – every member of the human family – has value; no one can be dismissed, ignored, mistreated, abused, as if their humanity means nothing. Dignity means that each person’s humanity means something, it has worth. Each person has a right to live and to be recognized as if his or her life matters.

Second, each person’s worth is equal to every other person’s. No one’s life is more important to any other person’s. No one has the right to decide that any other person is not as valuable. Each person’s right to agency, to self-development, to choose one’s life course is the same as every other’s. Despite our differences, in our humanity, we are all equal.

What the Universal Declaration of Human Rights did in 1948, seventy (70) years ago today, was to bring this philosophical concept into law, and to make it the starting point of all human rights law.

“All human beings are born free and equal in dignity and rights,” says the UDHR in Article One. The preamble reinforces this by recognizing “the inherent dignity and the equal and inalienable rights of all members of the human family, recognizing that that is the foundation of freedom, justice, and peace in the world.”

The notion that dignity is the foundation of all other rights, and even of all other things that we as human beings hold dear like peace, justice, and freedom, that is repeated in countless human rights documents.

The two international covenants, which along with the UDHR make up the International Bill of Rights, recognize that all other rights, I am quoting, “derive from the inherent dignity of the human person.” So, too, do the Convention on the Rights of the Child and the Convention on the Elimination of All Forms of Racial Discrimination, among others.

Dignity is also the foundation or a foundation of domestic constitutions throughout the world. For instance, South Africa’s Constitution asserts that “The Republic of South Africa is one, sovereign, democratic state founded on human dignity,” among other values. And South Africa’s Constitution is not alone in establishing itself on the basis of human dignity.

But dignity is not only the starting point of human rights. It’s also the middle and the endpoint. The Constitution of the Philippines insists that it is a state policy that “The State values the dignity of every person and guarantees full respect for human rights.” Thus, it is an ongoing obligation of the State, in everything it does, to value the equal worth of every human being. This

describes not only why the state must respect human rights, but how it must act: it must act by valuing the dignity of every person.

Even more commonly, human dignity is recognized in constitutions around the world as the endpoint of human rights protection. The purpose of constitutionalism, of human rights protection, is to advance the ability of people to live with dignity, to enjoy the full measure of their dignity. The Kenyan Constitution says so explicitly: “The purpose of recognizing and protecting human rights and fundamental freedoms is to preserve the dignity of individuals and communities and to promote social justice and the realization of the potential of all human beings.” In Serbia, “Guarantees for inalienable human and minority rights in the Constitution have the purpose of preserving human dignity.” Peru’s Constitution is even more emphatic: “The defense of the human person and respect for his dignity are the supreme purpose of the society and the State.”

The Philippine Constitution, as well, asserts that the aim of government action is to promote human dignity when it says that, and again I’m quoting, “The Congress shall give highest priority to the enactment of measures that protect and enhance the right of all the people to human dignity” as well as other things.

And when this Commission takes as its motto “Dignity of All,” it means this in a purposive way. The purpose of the Commission is to assure the recognition of the dignity of all Filipinos, wherever residing.

So, dignity rights matter to all the actions of the State, and it is the function of Commissions like this one to ensure that the policies of the State and the practices that take place within the State reflect and protect the dignity – the equal worth – of all.

Let me shift now to give you some examples of jurisprudence around the world on dignity which is extremely voluminous. So, I’m just picking a few examples that touch most closely on rights that relate to the impacts of climate change.

Courts around the world have developed a very robust jurisprudence that interprets and applies the right to dignity. Cases protecting human dignity, whether as a value or as a right, arise from the full range of factual situations, most of which are relevant to the impacts of climate change. These affect shelter, access to water, health, participation and so on.

So, for example, in a case about the right to housing, the South African Constitutional Court has said: “It is fundamental to an evaluation of the reasonableness of State action that account be taken of the inherent dignity of human beings. The Constitution, the South African Constitution will be worth infinitely less than its paper if the reasonableness of State action concerned

with housing is determined without regard to the fundamental constitutional value of human dignity. The right to housing must mean that the Respondents have a right to reasonable action by the State in all circumstances and with particular regard to human dignity.” In short, the justice said: I emphasize that human beings are required to be treated as human beings.

In a Colombian case about the right to water, the Constitutional Court said: “The water that people use is indispensable to guarantee physical life and human dignity, understood as the ability to enjoy the material conditions of life that permit the development of an active role in society...” In an Israeli case about water, the State did not even deny, did not even contest that the Petitioners who were seeking access to water had a right to water as part of their basic rights to live in dignity.

Another case in Colombia links the right to health with dignity. With the fundamental right to health, the Constitutional Court has recognized that life includes respect for human dignity and, thus, a health condition that alters the dignified conditions of life must be protected by constitutional mechanisms.

In a case about access to education, the Indian Supreme Court has concisely demonstrated the connection among different sets of rights, explaining that human development connotes more than the elimination of poverty but also allows individuals to lead a life with dignity with a view to participate in the Governmental process so as to enable them to preserve their identity and their culture. Dignity reflects the indivisibility, the interdependence of all of these rights, whether classified as socio-economic or civil and political.

And in one case about prison sentences, the German Constitutional Court held that a sentence of life without parole violated human dignity by removing the prisoner’s ability to hope. This is obviously not a case that’s directly related to climate change, but I think hope is very much related to climate change. Hope itself, in this case, is an inviolable aspect of human dignity. It is essential to the unfolding of the human personality.

Focusing on human dignity helps us see the interdependence, the interrelatedness, the indivisibility of our human rights, which is in fact how deprivations of rights are experienced by people. When a typhoon hits, it is not just independently the loss of a house, the loss of a school, the loss of family, the loss of health care, the lack of water, food insecurity, or the end of hope that needs to be vindicated, but all of these churning together in combination and in turmoil that makes the experience of climate impacts so devastating and so threatening to human dignity.

This is perhaps one of the most important benefits that a dignity lens can bring. More nearly than any other human or legal right, dignity expresses the human experience as humans experience it. People don’t think in terms of what rights have been violated. But they know when their dignity has been violated, they

know when a company produces conditions that makes them feel less than human, or when a government lets that happen. By focusing on what matters most to people, which is being treated as a person of worth, the law of dignity reminds us of what is really at stake.

Because the condition of our natural environment colors how we live, courts have also recognized that protecting human dignity must mean protecting the environment. One court in Nigeria has declared that: “the constitutional guarantee of the right to life and dignity of the human person ... includes the right to a clean, poison-free and pollution-free air and a healthy environment conducive for human beings to reside in and for our development and full enjoyment of life.”

The Supreme Court of Nepal just last year said, “it cannot be imagined to live with dignity in a polluted environment.”

The impacts of climate change threaten human dignity directly not only by altering the environment in which we live, for instance by raising air temperatures, or acidifying the oceans or raising the sea level, but also by threatening people’s ability to enjoy and exercise the full range of their human rights. Once we start to think in terms of environmental and climate *justice*, the right of humans to live with dignity comes to the fore.

Earlier this year, the High Court of Lahore in Pakistan reiterated that “Climate Justice and Water Justice are rooted in the right to life and the right to dignity of that country’s Constitution and stand firmly on the preambular constitutional values of social and economic justice.” It is human dignity that brings law more nearly to justice.

Some of these cases therefore point to remedial considerations, recalling that human dignity is not only the root of rights but also their purpose. In announcing an implied right to a healthy environment, the Irish Supreme Court at the end of last year said that: “A right to environment,” excuse me, I want to get this language right, “A right to environment that is consistent with the human dignity and well-being of citizens at large is an essential condition for the fulfilment of all human rights. It is an indispensable existential right that is enjoyed universally, yet which is vested personally.”

And I just want to reread that language because I think it’s so important. This is from the Irish Supreme Court on December 2017. “A right to environment that is consistent with the human dignity and well-being of citizens at large is an essential condition for the fulfilment of all human rights. It is an indispensable existential right that is enjoyed universally, yet which is vested personally.” The last part is there to reinforce the idea that this right, even though possibly a collective right or a solidarity right is nonetheless individually, judicially enforceable.

These cases, as well as the work being done at the international level to recognize a right to a healthy environment, reflect the aim of the present case before the Commission: to secure an environment that is consistent with human dignity. That should be the polestar.

Many of the remedies sought by the Petitioners, as well as many of the avenues for amelioration that were mentioned in this morning's sessions, are related to information and increased transparency. And this brings up the relationship between human dignity or the right to dignity and not just substance of rights but procedural rights and in particular the procedural rights that are recognized at the international level and the regional level, the rights to information and participation and access to justice.

So, the remedies requested in the Petition include compelled disclosure of information, monitoring to generate ongoing information, development and submission of plans, and the development of accountability mechanisms that victims can easily access. These are ways of increasing the flow of truthful information from those who have it to those who need it and are most affected by it.

Under Principle Ten of the Rio Declaration as well as the constitution of dozens of countries, the rights to information, participation and access to justice are secured. This is true as well in the Constitution of the Philippines.

These rights are not accidental or optional. They are essential to securing the right to human dignity of all people. The central idea of human dignity is the right to agency, the right to have control over one's life. That's why a stable environment and access to all the necessities of life like food, water, shelter are essential to protecting human dignity. But agency can only be exercised when people have full information about the choices they have and when they can participate in decision-making, particularly on issues relating to their environment. These procedural remedies relating to information and participation, therefore, are essential again to securing the human dignity of all Filipinos.

In sum, focusing on dignity rights can advance the present inquiry in several ways:

It keeps the focus directly on people whose lives are most affected by changes in the earth's climate. Much of the conversation is abstract. We focus on CO₂ [Carbon Dioxide] levels, on even abstract terms like climate change, even climate justice, and even human rights. They can start to sound abstract after a while. Recognizing that every person has a right to have his or her dignity respected reinforces that this ultimately is about people. And their ability to live decent lives.

Focusing on dignity rights also remind us that every person matters. And the focus on equality reminds us that every person matters equally. We cannot have a world in which we say that there will be fifty (50) million refugees as if that's simply just some huge number of an undifferentiated mass. Each of those is a human being, who wants to have a home, to be in love, to care for a child, to have some control over his or her life.

The focus on human dignity also helps with the legal analysis. It recognizes that human rights are indivisible. While it is important to focus on each of the individual rights that are threatened by climate change, it is essential to recognize that these violations are experienced interdependently and indivisibly. When one is threatened, it threatens others.

This focus also belies the barrier of liability and accountability between public and private actors. Everyone has a dignity that must be respected, whether by government actors or by the private sector.

And finally, dignity law connects individuals to legal issues by invoking a legally recognized right that people can understand and own.

So, the conclusion that human dignity depends on a stable and healthy environment may be self-evident, but it is important to articulate it explicitly because it reminds us of what is at stake. We protect environmental and other human rights as a means of advancing the capacity of people to live with dignity. If climate change is the greatest challenge of our time, then human dignity is certainly the greatest source of resilience. Thank you.

PANEL CHAIR CADIZ:

Thank you very much, Erin. Commissioner Armamento will have some questions for you.

COMM. TANODRA-ARMAMENTO:

Good afternoon, Erin. Do you know if there's a specific case caused by climate change or climate disaster, brought before the court and became a law because a violation of human dignity was committed? Is there one that you can possibly cite or give as an example to us?

MS. DALY:

There are cases... I've mentioned some but I didn't go into the facts of the cases. There are cases that have been brought, for instance, the case from Pakistan, Ashgar Leghari from the Lahore High Court, which some of you may be familiar with. It's sort of, like others, a preemptive case. It's not in response to climate disaster, it says that the government hasn't done enough to protect people against climate disasters, and the Court again agreed with that claim, agreed with the importance of climate justice as rooted in the life and dignity clauses of the Pakistan Constitution.

Cases about climate disasters... There have certainly been cases, ultimately not successful, in the way of Katrina in the United States, alleging that actions taken by the Army Corps Engineers had changed the environment such that storms like Katrina would be more likely. And I have to think more about specific claims, the buried claims in Nigeria is not so much in response to a disaster but in response to gas flaring by private entities in Nigeria, a relatively older case; not from the last few years. We've seen a lot of cases much more recently. And that's a case also that connects, in an indirect way, climate justice with the environmental damage that gas flowering does. People have a right to live in a clean environment.

COMM. TANODRA-ARMAMENTO:

Okay, thank you. One more follow-up question. If a person is a victim of climate disaster, what are the possible legal remedies that he or she can appeal, like in your jurisdiction?

MS. DALY:

I think it depends. There's no right to protection against climate disaster per se. The way we think of those is when the climate disaster happens, it affects all these different rights – right to housing, access to water, to education, all other things. So, they tend to be sort of litigated in terms of those specific rights. What we're saying more and more though is whether in constitutions that explicitly protect dignity and also in constitutions where dignity is not justiciable, litigants can still connect that whole basket of rights affected by climate change disasters with human dignity.

PANEL CHAIR CADIZ:

Commissioner Pimentel will ask questions also.

COMM. PIMENTEL-GANA:

Thank you. Can you expound on your earliest statement about life imprisonment violating human dignity because it ended hope? Can you expound on that please?

MS. DALY:

There's a couple of cases from the German Constitutional Court that look at very long prison sentences: life imprisonment and life imprisonment without parole. The one without parole is particularly striking because what that means is that you have no hope of getting out, of rejoining community and society. And the Court said that that was a violation of the right to human dignity. Human dignity is protected in Article One of the German Constitution in a very, very emphatic and sort of general way; the right to dignity is inviolable. And so that Court has relied on that provision in a lot of different cases, in a lot of different settings. But in those cases where the court said particularly about a sentence that says you are sentenced to jail for your life and you will never get out, no matter what you do, violates the human right to hope. And that, I think, is incredibly profound. It's very moving. It really does apply in all kinds of ways. It just sort of connects how much human dignity is, about what goes on inside us and how we feel. It also actually highlights another point that I wouldn't mind sort of referencing here.

I didn't mention this in my remarks but there's an aspect of human dignity, a very strong strain in the dignity jurisprudence that connects dignity to community, to belonging. This is interesting because we think of dignity as an individual right and when we think of even hope or self-actualization, self-development, it's always very individual. My right to control my life and all that kind of way. But most of these cases, including a few that I mentioned in my presentation, say the reason that's important, the reason that you want to alleviate poverty, the reason that you want to provide education, the reason that you want a person have some right of getting out, is the dignity value of belonging, of being a part of a community. And so one of the things that poverty does, one of the things that climate change does is destroying communities... in creating huge populations of refugees, that destroys communities. Those refugees now have nothing that they can belong to except a community of other refugees. And so what the German Constitutional Court was saying was it takes away your hope and that takes away something very essential in the human psyche. The particular hope that it takes away is the hope of rejoining the community, rejoining society. And I think that's a very important point also when we think about the harms, the many multiple, multi-faceted harms of climate change. One is the destruction of community, the very difficulty of belonging to a community.

COMM. PIMENTEL-GANA:

Can it also mean that hope for the next generation?

MS. DALY:

Yes.

COMM. PIMENTEL-GANA:

When you talk about climate change, you take away the hope for the next generation.

MS. DALY:

I'm very aware of that. How we feel about our children and their children. Right.

COMM. PIMENTEL-GANA:

Thank you.

FR. WALPOLE:

I want to ask about community. It's very evident in terms of indigenous communities. Are there examples where this has been presented in court? Are there cases?

MS. DALY:

Yeah.

FR. WALPOLE:

Specifically in the sense of belonging? The sense of belonging is crucial.

MS. DALY:

Yeah. The sense of belonging is in a very large number of cases. Often, it's sort of ancillary. They're trying to reduce poverty, or reduce illiteracy, or something like that. And the cases about levels of pension, cases about socio-economic development rights, also including cases about health. And the reason that you want a person to be healthy is not just because health seems like a good idea, but because if you're not healthy, it really isolates you. Prison condition cases, about solitary confinement, there's a lot of cases that are either directly or indirectly about community, about belonging. There are other cases that are a little bit more on point about community, cases about language rights, for instance, or cultural rights and also cases about indigenous groups. So, we do see that and the interest in the dignity of the community or the human individual dignity of maintaining a community, protecting, preserving a community... So, there are a lot of cases that I haven't come across... but it doesn't mean they don't exist. I just haven't come across it in the time I had. Cases specifically about climate change and the destruction of communities that we see there. That's a place for research.

FR. WALPOLE:

One last point. How do you see, in this context, free prior informed consent?

MS. DALY:

I think that's obviously a very important aspect of procedural rights, specifically the right to participation. The right to participation is extremely relevant to human dignity, in part because they play off this need to belong, one expresses one's dignity and one's feeling toward dignity in community, towards others. One of the ways that dignity is described is the right to be respected, the right to be respected as a person and that tells you right there. It's not just something that's self-generated, it's something that we do with others. My dignity is impaired if you disrespect it. So, the right to belong is an important part of that. And people will connect the right to belong to a community in general with the right to belong to a particular community and to participate in that particular community. So, once we focus on participation rights, we get to throw in the specifics about the importance of consent, other kinds of participation and the consent has to be meaningful, free, prior, and informed. So, I think that's a very important way of defining what it means to have a dignity-based right to participation.

FR. WALPOLE:

Thank you.

PANEL CHAIR CADIZ:

Thank you very much, Erin, for reminding us that, beneath all these dialogues on climate justice and climate change, is the issue of dignity of the human person. As a matter of fact, I'm reminded that, in our Commission, that is the motto now: "Dignity of All." Thank you very much for reminding us. But I also recall in one of our dialogues, outside of this Inquiry, that you wrote a book or a paper on a particular case involving... I'm not sure if you were part of that case, but I know you studied that case... the case on children's rights, as it is also relevant to climate change. Can you tell us more about it and what exactly is the call of the Petitioners?

MS. DALY:

I think you are referring to the case known colloquially as "Our Children's Trust Case," which I think some of you are familiar with, probably far more than I do. My colleague, Prof. May, and I wrote the amicus brief on behalf of over sixty (60) law professors when the Trump administration attempted to take the case out of the District Court where it was, and asked the Ninth Circuit to issue a writ of mandamus on the grounds that the District Court's opinion that there was a cause of action was cognizable, finding that that violated separation of powers. So that was a bit convoluted backwards way into it... For those of you who aren't familiar with it, "Our Children's Trust" in the case of Dr. Hansen, others in this room I'm sure have made the claim on behalf of youths that the United States government, going back to the Obama administration, had violated their constitutional rights as well as their right under the public trust doctrine, had violated the children's, the youth's constitutional rights through their actions and inactions that contributed to changes in climate. And that those actions and inactions violated plaintiffs' substantive and due process rights under the United States Constitution. The United States Constitution as you know doesn't have a dignity right, doesn't have a right to a healthy environment, doesn't have these socio-economic rights that you might hang a climate justice action on. But we do have a due process clause that has been interpreted to have a substantive component, and the Petitioners argued that due process, right to life and liberty and property, include the right to a stable climate. The District Court had held that that was interesting, that was actionable, and they would not dismiss the case. The Trump administration said that that decision to not dismiss the case violated separation of power and asked the Ninth Circuit to issue a writ of mandamus to dismiss it. We wrote the amicus brief on behalf of the law professors asking

the Ninth Circuit not to dismiss the case both for reasons that have to do with the authority of the courts to decide cases like this and that when somebody brings the constitutional complaint, we thought the perfect place for that would be the District Court of the United States, and also because we thought that the conclusion that the District Court had reached that it was an actionable claim under the due process clause was not unreasonable. So that was sort of my involvement with it. The Ninth Circuit agreed with the Petitioners and declined to dismiss the complaint and it's now going forward with the trial scheduled for October, to begin on October 29th. Many eyes will be on that.

PANEL CHAIR CADIZ:

I'm sure to monitor the case, because that will also have an impact on our proceedings here.

MS. DALY:

Yeah.

PANEL CHAIR CADIZ:

We invite our plaintiffs... perhaps the Petitioners have some questions for our resource person?

ATTY. PAUDAC:

Thank you Professor Daly for that presentation. And thank you for bringing up earlier the dignity and hope in the context of rejoining community. Our two (2) resource persons yesterday actually spoke about it. They experienced the loss of belonging... of transferring to another community. In your expert opinion, how then would you characterize the Carbon Majors' actions – producing these products which have fueled climate change – in relation to dignity, in particular, and in human rights in general?

MS. DALY:

I don't want to give an expert opinion on the actual liability of the Respondents in this case, in this Petition. I haven't studied the specific facts in this Petition and that's your job. But, in general, I think one of the things that I mentioned at the end, perhaps too briefly, is that human dignity is a right that is cognizable, but it's not just a right against the government. The right to

housing, perhaps, a right to free speech, perhaps, those are rights that really tend to, not in all cases, be claimable against government entities. A right to dignity is claimable against anyone. You should give me dignity, I should give you dignity, and respect each other in that way. So, there shouldn't be an artificial barrier between public and private actors, that is, anybody who is having an impact on someone else's life should be respecting their equal worth. I think the way sometimes industry is managed does not necessarily take into account the equal value of all of the individuals who are affected by industrial activity. And so, again, I think it's a lens that we can sort of use to measure the impacts whether it's by Carbon Majors or by others.

ATTY. PAUDAC:

Thank you for that. That will be all, Commissioners. Sorry, just another question. Do you believe there is a community right to hope for a safe climate?

MS. DALY:

A community right to hope for a safe climate? I think there are all those rights individually. There is a right to community, there is a right to hope, and there is a right to safe climate. I mean, you know, it's a question of jurisdiction, it's a question of how the claims are made and what laws are available. But I certainly do think that if there is, if each of those is important as a separate and distinct interest, there's no reason that it wouldn't be important as a collective interest as we combine it. And that again is what's valuable about dignity – it highlights the indivisibility of these distinct rights. It's useful as a lawyer to be saying it violates these specific five (5) things but it's also useful as a lawyer, as a judge, and as a Petitioner to be able to say it's my dignity, it's all of these because it interferes with how I feel and how I interact with others.

ATTY. PAUDAC:

Thank you Professor Erin. That would be all, Commissioners.

PANEL CHAIR CADIZ:

Commissioner Pimentel will have follow-up questions.

COMM. PIMENTEL-GANA:

Just a clarification. We've been saying that rights are indivisible, so, we're talking about the framework of all rights which is human dignity. Would you then consider that human dignity is a demandable right?

MS. DALY:

Right. I think it can get a little bit confusing because we're talking about dignity in a lot of different contexts, so there's a lot to unpack. Human dignity is certainly a value, it sorts of represents all human rights, it's important in that way. Yet, it is also, and I think this is critically important, a legally enforceable right. There is, in many constitutions, an enforceable right to human dignity. So that when people make these claims about water, education, whatever else it is, they will also say just as you might attach it to a right to equality, they will attach it to the right to human dignity. And there are certainly cases where the courts have, in many of the ones that I've mentioned, ruled in favor of the Petitioners on the basis of the right to dignity. And that is essentially one way of thinking about the claim of the Juliana Petitioners in "Our Children's Trust."

COMM. PIMENTEL-GANA:

So, would you have a list of those cases aside from the Juliana case that's already been decided by certain jurisdictions?

MS. DALY:

There are many cases I can provide you, there's a list in every jurisdiction there's an active Supreme Court. There are cases about that and the one that Commissioner Cadiz referenced. It's sort of a survey of those cases that look at dignity as a right, not just as a really good idea.

PANEL CHAIR CADIZ:

Thank you very much, Erin.

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MS. DALY:

Thank you. My pleasure...

PANEL CHAIR CADIZ:

From coming all the way from... I understand you drove two to three hours.

MS. DALY:

Just a few hours. It's fine.

PANEL CHAIR CADIZ:

A few days ago, you came here, then you drove back to do your sharing here. We appreciate it very much.

MS. DALY:

Thank you, very much. I appreciate it.

PANEL CHAIR CADIZ:

Short break. Coming back at 3pm. Thank you.

[Break]

CLERK OF THE INQUIRY:

Good afternoon, everyone. We shall be resuming this Inquiry. We would like to welcome Mr. Radley Horton, an Associate Research Professor at Columbia University's Lamont-Doherty Earth Observatory. His research focuses on climate change's tail risks, climate impacts adaptation. Radley was the convening lead author for the Third National Climate Assessment. He currently coaches Columbia's adaptation initiative and is the lead principal investigator for the National Oceanic and Atmospheric Administration Regional Integrated Sciences and Assessments Funded Consortium for Climate Risk in the Urban Northeast and the WWF Columbia University Advanced Partnership. Radley is also the Columbia University lead for the

Department of Interior-funded Northeast Climate Adaptation Center. He has also served as Deputy Lead for NASA's Climate Adaptation Science and Investigator Working Group charged with linking NASA's science with NASA's institutional stewardship. Radley also teaches in Columbia University's Sustainable Development Department. He is a leading climate science communicator appearing regularly on television, radio and in print. Radley has presented to diverse groups ranging from US senators to the United Nations. His submissions will be marked for purposes of the documentation of the Inquiry Panel. Today's presentation of Mr. Radley Horton shall be marked as "PRP-14" and his curriculum vitae as "PRP-15."

PANEL CHAIR CADIZ:

Thank you very much, Prof. Horton, we are ready to listen to you.

PROF. HORTON:

Thank you very much for the chance to speak to you today on a very important topic. As a climate scientist, I am going to focus on material I feel will be very familiar, all too familiar to you. Hopefully I will bring a little bit of a unique perspective and illuminate some dimensions. So, I've spent a lot of time, talking about how small shifts in average conditions, temperature, sea level, associated with human emissions from fossil fuels have already profoundly modified the frequency and intensity of many types of extreme weather events, including the types of coastal flooding, heavy rain events and extreme high temperatures that the Philippines of course is so familiar with.

I will also talk a little bit about some of the impacts and get into a discussion of the urgency of solutions of reducing greenhouse gas emissions, advancing the adaptations in resilience strategy that you and the Philippines are at the forefront including disaster risk reductions. And then, throughout my remarks, including conversations at the end, I would like to devote a little more detail on attributable liability... in the emerging science, in better unpacking how much of the climate harm and side impact damages during extreme events can be attributed in part to fossil fuel emissions as a whole, by sectors and, potentially, even by individual companies. That's the emerging research area, certainly emerging area for me, but I do want to pop in a few remarks on that topic because it's of critical interest to you.

So, I'll advance... My apologies, if this is all familiar to all of you, and advance to move [through it] quickly. Think about the changing planet as we're thinking about global warming. Of course, there are many, many things that are changing. This isn't just global average temperatures. Here we have a new planet in many ways. Anytime an extreme weather, like when a typhoon

forms, there's this interplay of all these changing factors. The upper ocean is warming. The temperature profile in the atmosphere which influences how a storm forms and intensifies are changing. The amount of ice on land and on the ocean is changing, impacting sea level rise, changing the patterns of the ice on lands, just to give you examples. There are so many lines of evidence of how the planet is changing. And I'll show the large role of human activity.

Globally, average temperature, going back in this case about a hundred and fifty (150) years or so, we can see there's some year-to-year variability. Those black lines show the individual years. But when you look at the global average, you can see the statistics have already shifted. It's really no longer possible to get a year that's cooler than average over this one hundred (150) year period. The warming today, with the greenhouse gas emissions today, are such that they've already shifted the statistics. We need to plan for those changes as you can see in this plot of global average temperature.

What about the emission side of things? Here, too, we've seen dramatic changes. The top right plot here is showing new concentrations of various greenhouse gases. Carbon dioxide has now increased over forty percent (40%) since the Industrial Revolution, roughly two hundred and fifty (250) years ago. But even larger percentile increases by far in methane, an even more powerful greenhouse gas. And it's trivially simple to link these increases to human activity. There's actually a different isotopic signature of the stored fossil fuel, if you will, that we're burning. So, this is not a natural process. This is directly due to human activities. But, showing temperatures going up, showing these changes in greenhouse gas concentrations doesn't close the whole loop. We need to show, even if we know these changes are due to human activities, how do we know we're responsible for a large part of the climate changes we're observing?

There are many lines of evidence that link those increases in greenhouse gas concentrations to a changing climate. But basic physics is trivially simple and have been understood for hundreds of years. Essentially, greenhouse gases in the atmosphere, we're making a one-way blanket, if you will, more powerful than in the past. This blanket is not effective at blocking incoming solar radiation making its way towards the planet's surface. However, this blanket of greenhouse gases is extremely effective at blocking the Earth's long wave radiation, this radiation emitted at low temperature from the Earth back out to space is not able to penetrate as it did in the past. Some of the energy is sent back down to the surface causing warming.

Some of the physics gets more complicated later. How did the planet respond to that warming? How about the clouds? But basic physics, trivially simple, is understood for almost two hundred (200) years now.

Other lines of evidence. We built climate models to better understand these processes, mathematical simulations and those. Climate models are not just tools for predicting what's going to happen in the future, how much warming or sea level rise we're going to see a century from now. They're also incredibly powerful for testing our hypotheses and help us understand, over historical time periods, how sensitive sea level has been, for example, to the amount of carbon dioxide in the atmosphere over thousands of years or more, and understand the role of natural variability relative to these increases in greenhouse gases due to human activity. These experiments that are underway now are trying to unpack how much of the increase for example in the frequency of extreme events, how much of sea level rise we're observing is due to these fossil fuel emissions.

Climate models are incredibly powerful tools because we can use them in a historical mode where we can run different experiments, where we increase carbon dioxide but keep other natural variation in different parameters, looking at those different models so that we can tease out or untangle the strands, how much of a change for example in different type of extreme events is due to human activity. In the future, we can even see studies that attempt to tease out the role of individual countries' true emissions, individual sector emissions.

As always, climate projections have a little more detail on how this works. Climate models are really not just a forward-looking tool but something that helps us understand the past and test different theories. If you look at this figure here, you can see the black line showing you, again, the pattern over a hundred years or so, the global average temperature, what we've observed. We've removed, here on this black line, the year-to-year variability showing this longer-term averages. So, you can see temperatures over the last few years are higher than in these earlier periods. What I want you to focus on here is these two shaded bands. They're showing two different types of climate model experiments. That blue band is showing you the temperatures you get when you run a climate model not in the future but in the past. Go back and start it at one hundred fifty (150) years ago with the greenhouse gas concentrations that were in the atmosphere at that time. Start that model in the world of 1900 with greenhouse gas concentration thirty percent (30%) lower. Run that model forward a hundred (100) years keeping greenhouse concentrations at those levels they read in 1900. You've got somewhat of a range of the outcomes depicted with the blue, there's no uncertainty, there's no variability like volcanoes, El Niño events.

The other simulations, the orange band is what happens again when we run those climate models in a historical mode starting in 1900, with the greenhouse gas concentrations in 1900. But what's different in that orange band is that each year as the climate model advances, we add the additional greenhouse gas as we actually added it to the atmosphere on the real world

over that period. So by the time this orange band climate model simulation gets to 2000, they have the carbon dioxide concentrations thirty percent (30%) higher, about four hundred (400) ppm that we're observing today. So I ask, which is the better predictive of the world we've observed? If we think of a hypothesis that greenhouse gases don't contribute to warming, and test that against this model and plug in as you can see in the climate model, the greenhouse gases are able to reproduce what we've actually observed. There's uncertainty, the orange band, we don't know exactly how strong these forces are, we don't know exactly what the temperature will be for a year in the future, but from a risk-management perspective, a testing of a hypothesis risk-perspective, it's clear. Climate model analysis helps us understand the role of greenhouse gases in this process, in this warming that we're observing, for example.

So, let's go into more detail now. Instead of looking at global average temperature, let's look at a spatial map of warming trends over the past hundred years or so across the US, across the world. The purple colors on this map are showing you places that have warmed approximately two point five degrees Celsius (2.5°C) over the past century. The important thing to note here is those white colors, the white that you see on this map is the places where there's been no warming trend. That's because we don't have enough data to make a trend projection all the way back to 1900. Tropical regions with limited data sites and open ocean places... on that map where you actually see a negative trend. You see those light blue lines, small part of the Southeast US, small part of the North Atlantic Ocean, and those cooling trends in two small regions I just mentioned about an older model... on the amount of warming in the purple regions. The purple regions are two point five degrees Celsius (2.5°C) warming since 1900, those light blue areas are on something point twenty-five degrees Celsius (.25°C), point four degrees Celsius (.4°C), over point four degrees Fahrenheit (.4°F) for the past century. So, if we look at the glacier patterns, we see even more strongly this warming trend.

But what does this mean from a societal impact perspective? We think of individuals on the ground, we think of farmers, we think of people with pre-existing health conditions exposed to extreme heat. The key point here is that these small shifts in average over periods, that one degree Celsius (1°C) of warming that I showed you, even the most extreme cases here, two point five degrees Celsius (2.5°C) of warming, when you think of average numbers like that, it's hugely important.

The best way to understand that is to look at the frequency and intensity of extreme weather events. This figure here is a schematic showing you average temperatures across the whole year for example, individual days. This is the distribution. The Y axis here you'd have frequency, number of days per year at a certain temperature band. And then on the X axis, the red towards the

right is showing you the really, really hot days, and the blue is showing you the really, really cool days. So, for the Philippines, this range may really be small, but somehow, I think for a lot of parts in the Philippines maybe, especially in certain times of the year, there's gonna be certain days five degrees Celsius (5°C) that are cooler than others. But the key point really here is that as we shift average temperatures a little bit, a typical day of the year in New York, maybe a sixty degree (60°) temperature, the frequency on that day actually doesn't change very much with climate change. But out of that extreme tail for New York, those days that are thirty-eight degree Celsius (38°C). One hundred degrees Fahrenheit (100°F), the small shift on average conditions now means that an event to have a frequency occurring may be once every year, once every two years, is now happening five times per year, far more frequent occurrence of really extreme devastating temperatures. So, climate change impacts the frequency and intensity of extreme events. Something of a case in the north, far more frequent days that are getting up above thirty degrees Celsius (30°C). Ninety-five degrees Fahrenheit (95°F). And those worst days, instead of maybe being thirty-seven degrees Celsius (37°C) will be thirty-nine degrees Celsius (39°C), just a couple of extra degrees. But we think of human vulnerability, we think of demands on air conditioning, we try to provide cooling, those couple extra degrees during really extreme events are hugely important, huge impacts on mortality, energy demands, as a couple of examples.

I only have this data in the US, I apologize. Just to show the changes of frequency in another way we can suffer. For the US, if we look at recent decades across eighteen hundred (1800) weather stations across the US since the year 2000, we're seeing twice as many record-breaking hot extremes as cold extremes. One degree of warming has led to a two to one (2:1) ratio of heat extreme versus cold extreme. So extreme events are very sensitive to these small shifts and average conditions.

On this small area, well in the Philippines and other parts in the tropics, there's a lot of emerging research these days about why we need to think not just about high temperatures but humidity at the same time. The joint effects of high temperature and high humidity days. Our research and finding is that as we push out into the future, we see not small changes in the frequency of these very hot and humid days but dramatic changes in their frequencies. So, across the tropics as a whole, including the Philippines, a couple of generations from now, if we continue to emit greenhouse gases at the sort of high trajectory we have there, you could see something like an eighty (80) or one hundred (100) days per year that have a combination of high heat and humidity that historically happen only once per year. So, the transformation... These days, when it's very hot for the human body to cool itself, it's very hard for people to labor in fields, in construction, you name it. Of course, these kinds of days are particularly challenging from a human rights perspective, for children, the elderly, those with pre-existing health conditions, they are all huge concerns.

For sea level rise, you know, there is talk of the devastating impact of coastal flooding, heavy rain and wind, of more typhoons. Sea level rise turns out to be a central part of those... Just as average temperature changes frequency of heat extremes, average gradual sea level rise changes the amount of and frequency of flooding when a typhoon or hurricane does happen. And sea level rise is changing dramatically over long time periods when human activities played a relatively small role in burning fossil fuels. Some natural variations in sea level in the order of maybe five (5) inches, twelve (12) centimeters, and a more recent period of increase of sea level over the last century, something in the order of eight (8) inches, twenty (20) centimeters. But as we go out to the future, we see these really profound impacts and, as I'll describe in a little while, we can't rule out anymore the idea that sea level could rise three meters into the century. That's the worst-case scenario, not the most likely outcome but from a risk-management perspective, this is something we can't rule out as a possibility. So, we need to consider it when we're thinking about high consequence outcomes. What could be more high consequence than that?

But consistent with what I said earlier about small shifts in averages, profoundly impacting on frequency of extremes, let's first start with a couple of cases of small amount of sea level rise. What if we just get a couple of feet sea level rise? What that means is that when a turbulence happens such as a typhoon, additional areas get flooded that would not have been flooded otherwise... because sea level rise has raised, the baseline raised the floor. That also means not just more areas getting flooded but that those flood waters get deeper than they were in the past. Of course, that translates in ways of the loss of human lives and that means more damages during those events.

It also means more frequent high levels of water threshold than in the future. And this is what these non-linear reactions are painting; it's very important, but very under-appreciated. Again, I apologize I only have US data but if we look at this, we see a very similar pattern to what you see here. What you're seeing is a whole bunch of tide gauges in the US with long-term data. How, if we just had two feet of sea level rise, which would be the low-end projections that we saw before? That if storms don't change at all, just with the hurricanes of the past, but raise that baseline sea level to two feet, how often in the future will you get a high-water level of a threshold that historically happened only once every one hundred (100) years. So, the event for New York City, like the Hurricane Sandy, what you see is that with just two (2) feet of sea level rise... stronger storms... the coastline regions here will see anywhere from a triple high frequency of that high water level to roughly a hundred-fold increase. Parts of the southwest are getting roughly once every year of a high water level that historically happens once every hundred years. So, the patterns are going to be slightly different in different places. But as we think about the Philippines, as we think about that sea level rise due to human activities, due

to fossil fuel emissions and made worse by land sinking in parts of the Philippines due to various reasons including groundwater extraction cases, changes in the deltas, that risk of flooding is going to become much more severe.

We can't just talk about sea level rise. Here we have to show, going back to the second slide, all the ingredients that go into climate change. We have to ask about the nature of these storms themselves, right. We know that the Philippines suffers the fate of receiving about as many or more extreme typhoons just about anywhere else on the Earth. So how do we think the nature of those storms will change? And there's some pretty clear evidence for some dimensions, for some other parts that are more uncertain. I'll talk a little about both.

So here we talk about how sea level rises, about more frequent flooding risks when storms happen. That's a given. We're also extremely confident that when a typhoon forms, there's going to be heavy rainfall in the future, even if the wind speed is the same, just because the atmosphere is going to be warmer in the future and can't hold no more moisture, we have heavy rainfall and so if you think about the coastal city coasts like Manila... Some places farther North here, with worse probability, getting hit by these storms, getting storm surge, also getting heavier rain than in the past. All that rainfall is going to be combining with storm surge, more of a flood risk for low-lying areas. Relatively few that I know in the Philippines not along the coast. It's going to be harder for rainwater to drain off as sea level rises, and you have that surge and more rainfall. Additionally, the balance of evidence suggests that the storms themselves of central low pressure, and the winds are gonna become stronger.

The balance of evidence suggests that this devastating category five (5) storms with wind like we saw with Haiyan, for example, will become more frequent and intense. To be clear where we are about typhoons, of the total number of typhoons that will include category one weaker storms, we can't say for sure that the total number will increase. But the balance of evidence, again from the risk-management perspective, says that the real powerful ones, which dominate the death toll, which dominate the economic damages, are going to be more frequent. With more rainfall, the risks profile changes with climate change.

So, most of what I've focused on I will call, sort of, a likely scenario, even though it may sound depressing. I haven't invoked extreme sea level rise yet, I haven't involved rapid changes in global average temperature, I haven't made assumptions of huge increases in greenhouse gas emissions. Even at the scenario I just described to you, to avoid these worst-case impacts, we need to rapidly drop down greenhouse gas emissions, ultimately probably extract carbon from the atmosphere. That's not my area of expertise but given these

hazards, clearly this is the direction that we need to go. And it may be even more extreme than we would think. We have an obligation point out some lower probability on the potentially catastrophic outcomes, were they to happen.

So, let's go back to our sea level plot. What I've shown you so far is how coastal flood frequency will change into a two feet of sea level rise. But while we're talking about the possibility of it by 2100, to understand that, we have to get into the idea of tipping points, non-linear surprises in this notion of climate models ... powerful tools... the further we turn up the dial, the further we push greenhouse gas levels, outside of the range of what we've had experienced, the bigger the chance that some processes are gonna kick in that our historical experience hasn't really prepared us for, something that our models aren't really prepared to handle. (Slide) Feedbacks, for example.

Let's summarize here. Climate models incorporate important processes, but they don't include all processes, they don't include all of the possible feedbacks, so we can't rule out tail risks, worst-case scenarios beyond what our climate models can project. When we look at longer term data, climate information about sea level rise over thousands of years or more, the evidence suggests that sea level has been more, not less, sensitive to temperature, than what climate models would tell us. As a result, our projections are more likely to underestimate than overestimate some of these risks.

One example of these feedbacks that we are observing and leading our understanding is when we think about parts of Antarctica. What we're observing is... these ice cliffs and the potential of a runaway process that not so many climate models can simulate well. As we observe more and more of these changes, we cannot rule out the idea of as much as eight (8) feet sea level rise which will make more of these impacts that I've described.

Ultimately everybody's for the argument of rapidly reducing the greenhouse gas emissions. The impacts I'll just quickly cover. I think these are more than familiar (Slide: Small Islands) to all of you. Certainly, we all know about the small islands case. It tends to be in the context understandably of the existential issue of nationhood and loss of nationality. It is important to remember that the Philippines, an archipelago, has many low-lying islands at risk of loss as sea level rises.

Coastal areas come to mind immediately. Let's also think about the landslides preceded by heavy rain. Let's think about environments in a rapidly developing country, with many people having pre-existing vulnerabilities that amplify certain impacts, and with minimized adaptation options.

Surrounded by so much marine biodiversity, reliance on economic tourism, we also need to be thinking about multiple stressors – how that warming ocean

combines with acidification of the ocean as we get more carbon in the atmosphere. We don't fully understand how coral bleaches, how organisms that rely on carbon to make their shells are going to suffer as we see acidification becoming more of a problem. This could have feedbacks throughout the marine food chain.

I didn't have time to talk about agriculture. There's a growing body of research suggesting that if you push temperatures a little bit higher that we've discussed, yields of crops, including corn, can actually fall off dramatically. High temperatures have direct impacts on health, like cardio-vascular and respiratory diseases. There's also a whole gamut of health risks associated with vector borne diseases, for example. Greater impact on source of food with climate change. Livelihood and quality of life, infrastructure damage, not just loss of life in some storms but also loss of assets, home, quality of life as people face more risks, loss of traditional cultures, and livelihood in this context as well. And the broader ecosystems, not just the ocean but the forests, tropical biodiversity also hugely at risk.

Some of the key points, quickly now, to be sensitive to time here. I tried to highlight the small changes in average conditions of temperature and sea level. They're easy to attribute to human activity and fossil fuel emissions... Large changes in intensity, frequency and duration of climate extremes, heavy rain events, high water levels. As long as temperature continues to rise, we expect to see an acceleration in those changes in extreme events. But even important to note that failing to push the climate system by increasing greenhouse gases, by allowing temperatures to rise, the greater the loss for surprises. Unforeseen things that cause the climate to change more rapidly than our models would suggest. And these surprises can also be on the impact side. How well do we understand how crops respond, economic productivity, conflict among societies, as we push those temperatures higher? These impact models are very simple. In the real world this model includes multiple stressors in the ocean context.

However, as we think about tipping points, there's also the fact that solutions can be non-linear as well. Would this be in our favor? We can't wait for it to. But know that, with a push, we could also point to some ways, steps we could take to upscale greenhouse gas mitigation – ultimately sequestration – and advancing adaptation.

And here we just quickly allude to some of these emerging points in the law and policy which, unfortunately, I don't have time to get into it in more detail. But just to quickly highlight some of the things you've heard about, maybe, yesterday. There's so much going on right now in the space of assessment of historical emissions of fossil fuels to date. In other areas, major efforts are on the way now to unpack over various time periods how much of the greenhouse gas emissions to date, how much of the warming to date, how much of the sea

level rise to date can be attributed not just to human activities in general but to individual nations, sectors and companies.

And there's also a lot happening in the space for individual types of extreme events: typhoons, heat waves, heavy rain events. Unpacking how much more frequent events of a certain threshold such as ten centimetre of wave may be coming due to human activities, but also how much magnitude perspective, how much extra rain, how much extra high-water level, during an event is due to the same human activities. So, these are emerging areas. There will be uncertainties here but, from the risk-management perspective, we already know how much things have changed. We can quibble about the quality of the amounts but it's clear where things are heading. And definitely, there are some things that are different from what we've seen, temperature extremes, heavy rain events, sea level rise... It's very easy to attribute a portion of those to greenhouse gas emissions, even as we quibble about the exact numbers. We'll come up with some of these methods. For other cases, the frequency of hurricanes of different strengths for example, it's going to be far tougher I think for the foreseeable future to decouple all the role of the particular country, sector or company for reasons ranging from large natural variability from year-to-year, the strength of hurricanes are to be given at a given category, to uncertainties about historical emissions over a long period, land-use changes, how much were emitted for many of these risks... We're already in a different world. The frequency and intensity of these extreme events have already changed due to human activity. We need to plan for a different future and reduce emissions to avert the worst outcomes.

I'll leave it there. I apologize for running a little over my allotted time.

PANEL CHAIR CADIZ:

Thank you very much, Mr. Horton. Ms. Armamento will be fielding questions.

COMM. TANODRA-ARMAMENTO:

Thank you. We heard already a lot of testimony coming from scientists on attribution. May I know, have scientists agreed on a particular method of attribution to determine the liability of specific Carbon Majors on their emission of carbon fuel?

PROF. HORTON:

I think there have been a few papers that are clearly in the vanguard in this area. Publications by Heede, for example, get into a lot of detail using self-reporting by companies around the world, their production data, and then trying to determine the carbon dioxide and methane emissions associated with those activities. There's a lot of estimates. I think, there's always a lot of push-pull, you know, how much emissions is enough. Clearly, we know a lot. Science is going to continue to evolve and emerge, but leave it to the legal to weigh in on one technique specifically to attribute damage and liability. Clearly, from the West's perspective, the fossil fuel emissions have profoundly changed the planet and other extreme events.

Other studies, I heard a speaker yesterday has a paper... a little beyond that paper by Heede, et.al., by looking at not just at emissions but also at the implications specially on the eighteen (18) or nineteen (19) fuel majors, those companies, not just on greenhouse gas concentration but extending it to the impact of global average temperature, impact on sea level rise. So, getting a step closer to extreme event attribution, we've seen few papers today making particular companies, sectors, or industries... Most of those studies, instead, tended to say did this hurricane become more or likely due to an aggregate of all fossil emissions.

A paper by Federico Otto took a particular extreme level event in Argentina. For that particular extreme event, he didn't just try to say did climate, did human activities make it more frequent, more intense? He asked what role did the country and emissions sector play in proportion of that? So that really is in the frontier, I think, linking individual companies or sector to individual events. We're seeing more efforts on that space, and certainly bigger about laws and policies on this side. My point, do you have enough information to act, or maybe file a liability in the presence of uncertainties?

PANEL CHAIR CADIZ:

Commissioner Pimentel...

COMM. PIMENTEL-GANA:

You've heard what Mr. Hansen shared earlier on and I just want to get your opinion on his statement about imposing carbon tax. Do you think it would in any way make life better for us considering that this would allegedly stop Carbon Majors from, you know, imposing their products on us?

PROF. HORTON:

I apologize, I wasn't here for that particular testimony, but I am familiar with the general idea. What I would highlight here is the scope of the ambition that's required. One of the figures I showed briefly, if you wanted to unpack it, based on the point if you want to decarbonize our society, we're talking around ninety percent (90%) reduction or more of greenhouse gas emissions just to stabilize concentrations of carbon dioxide and stay at levels where they are today. We've seen a lot of sea level rise, a lot of Arctic sea ice, a lot of future change. So, I think you know my short answer would be it's gonna take a range of extremely ambitious activities at national scales, international scales. And in terms of a carbon tax specifically, getting a carbon tax alone wouldn't be in anyway a guarantee hitting the kind of targets that are required to avoid the worst impact. If the price was high enough it could be powerful, but I think one could question the probability of a really ambitious enough tax to put into place to have the kind of impact you wanna see. The importance of not discounting steps in the right direction, increased ambition to begin discussion... The carbon tax can certainly do that, but I think a carbon tax itself isn't a panacea but may be a necessary step one can argue towards a kind of dramatic emissions reduction that we're gonna need. I was making the point that to avoid a two degrees Celsius (2°C) world – we've already got a one degree Celsius (1°C) of warming – to have a fifty percent (50%) chance of that, basically in about twenty (20) years) at this point, we have to turn our emissions to zero. And that's assuming we don't pop up the emissions and stay at a level today for about twenty (20) more years. We have a two degrees Celsius (2°C) target, and the next day have no emissions. Of course, for a lot of sectors, aviation, we don't have alternatives. So to some extent we try to reduce emissions to buy ourselves time. If we do shoot through the target, so we have carbon sequestration technology... But to bank on improving technology like carbon sequestration is powerless at best. We don't really know at what point society becomes unstable, conflict to next happen. We don't even have a chance to control the narrative of what we can gather today, globally, to solve this problem.

PANEL CHAIR CADIZ:

Counsel for the Petitioners, do you have questions for our resource person? Please come to the table and go ahead and ask.

ATTY. MAYO-ANDA:

Good afternoon, Commissioners, and thank you, Dr. Radley. Do you have a simple method of demonstrating... the emissions of the field products by these companies? Is there any simple method of demonstrating this?

PROF. HORTON:

Demonstrating the emissions or the consequences?

ATTY. MAYO-ANDA:

Yes, the emissions and the consequences.

PROF. HORTON:

The first is a little outside my area of expertise. I could mention the historic period because carbon stays in the atmosphere for a hundred years or more. It's very important to know earlier emissions. Some can push back and say if you're far enough in the history, maybe the companies didn't know the full consequences. Of course, that kind of argument assumes. But, in the 1960s, companies essentially did, some actually knew what they were doing. Holding that point aside, over the historical period, I mentioned this paper by Heede that has looked at self-reporting by companies of their production and then used known relationships between that production to estimate fossil fuel emissions. In the current day, I think there are some satellite-based technologies, for example, that can detect at fine scale, for example, methane emissions. We have technologies, for example, in the context of forest burning, that show us what's happening. That, again, that's not my area of expertise... economic analysis, remote sensing to give us a sense of what's happening on the emission side. Models are really important to help us see the atmospheric impact, about how much is this fossil fuel emission versus carbon cycles in the atmosphere, as one example. Climate models are critical tools for getting emissions, and their associated impacts on society. So, sort of circling back to that slide where I showed how you run a climate model under different scenarios. You can run that same model, have two (2) identical scenarios, one of them can include the fossil fuel concentration going up, and the other simulation can keep them the same rate, and compare how often those two (2) simulations get heat waves, for example. I guess it's part of a way to estimate a change, as with any model there are going to be some uncertainties. That's the figure I was referring to. I'd be happy for a follow-up.

ATTY. MAYO-ANDA:

Since you've mentioned about Dr. Heede's work, do you think the trend of the attribution, determining the contribution of certain companies to gas emissions is getting enhanced?

PROF. HORTON:

I think it's almost indisputable... It's going up as we look at the number of studies, new paper submissions, new research initiatives. There's a way of doing it at real time, sometimes even before an event happens. Florence, for example, recently here in the Carolinas in the US, we saw attribution studies coming up before the storm actually hit. There's a wave of new research. Science is improving incrementally as it always does with time, we've better observed data, which is a key part of estimating the frequency of extreme events, and climate models with higher spatial resolutions which improve things as well. I think it's undeniable that we're seeing far more studies, we're seeing far more lawsuits, we're seeing far more media coverage... That itself may pose some reputational risks for fossil fuel emitters. The science itself will continue to advance, perhaps a little bit slower than the number of studies and the reports. But the science and any kind of future projections, any type of science, will always see the uncertainties. And the legal community may put aside the implications. But I do think, in general, that as we get more data, our models improve, and with a bigger body of papers for scientists to assess each year than the ones before, our physical understanding improves.

ATTY. MAYO-ANDA:

Thank you. The last question, there's a slide earlier showing from 1901 to 2012... I think the Philippines seems to be warming traditionally... So then do you expect ocean acidification getting more intense in the Philippines?

PROF. HORTON:

So, is the question about the amount of warming in the Philippines? Right. Yes. I would say that tropical countries in general have less year-to-year variability in temperature. There can be an exception in this region but in general the signal that you're seeing here, this long-term trend is very powerful in regions like the Philippines because compared to a place like Canada, the year-to-year round of variability is much smaller. In the Philippines, the signal has already emerged as the oceans warm, absolutely you're gonna see more frequent extremes of high temperature in the oceans and those are gonna fuel heavier rain events, and isolation due to stronger

typhoons and other factors, for instance like wind. There is also potential for those deadly heat humidity combinations that I mentioned where the upper ocean, the potential for evaporation into the air... As we push back in the average five (5) years, ten (10) years in the future, you would expect to see more damaging impacts to corals and the marine environment. That's the impact especially in the tropics.

Also, the general reason we've seen more rapid sea level rise in the Western Pacific Ocean in the past few decades is partly due to the warming in the upper ocean. This may be an example in the scientific community, we can't say for all climate change... somewhere, natural variability has to be accounted for climate change, too.

ATTY. MAYO-ANDA:

Thank you very much, Dr. Radley. Thank you, Commissioners.

PANEL CHAIR CADIZ:

Thank you very much, Professor Horton, we really learned a lot from your presentation.

Ms. Fernandez, we have our last witness?

CLERK OF THE INQUIRY:

We would like to welcome our last but definitely not the least resource speaker today, Mr. Daniel Zarrilli, the Director of One NYC, a plan which envisions the physical city of New York to address social, economic and environmental issues. Mr. Zarrilli's engagement in planning efforts include leading the Steering Committee of the first One NYC Strategy on Cities Task Force in 2013. He served on the Federal Emergency Management Agency National Council, the National Oceanic Atmospheric Administration's Federal Advisory Committee for the Sustained National Climate Assessment, and State of Louisiana Coastal Advisory Group. He is a licensed professional engineer in New York, and holds an MS in civil and environmental engineering from MIT.

PANEL CHAIR CADIZ:

Mr. Zarrilli, we are all ready to listen to you.

MR. ZARRILLI:

Thank you very much. My name is Daniel Zarrilli and I am New York City Mayor de Blasio's Chief Climate Policy Advisor and the Director of OneNYC. I'd like to thank Commissioner Cadiz and the members of the Commission on Human Rights of the Philippines and the New York City Bar Association for this opportunity to speak about our approach to climate liability and the progress the de Blasio Administration has made as a global leader in the fight against climate change, including the actions we've taken to hold the fossil fuel industry accountable for the destruction that has been unleashed by the continued burning of fossil fuels.

First, let me commend the other members of the Panel that have testified over the last two (2) days. We have certainly heard powerful voices of survivors from across the globe and we should all thank them for sharing their stories.

Today, I intend to briefly describe the history of the City's actions to address climate change, with an overview of the three (3) main themes of our current work: One, mitigation or the reduction of our own contribution to the causes of climate change; Two, adaptation, the preparations we're making for its inevitable effects; and Three, accountability, holding the fossil fuel industry directly accountable for the damage we've already seen and can reasonably expect to see in the future, before taking questions.

First, a little bit of history. In October 2012, Hurricane Sandy roared ashore and brought home the reality that climate risks could no longer be thought of as a future risk. It was here and it was now. And the risks are not limited to hurricanes. Rising seas, more extreme heat and stronger precipitation events threaten us, as well. In response, the City released its first comprehensive climate resiliency plan and set forth a detailed risk assessment and new initiatives, launching an over twenty billion dollar (\$20,000,000,000) program to prepare New York City for a future with climate change. We were a city that had been shaken to consciousness on climate change and our actions had to change along with it.

When the De Blasio administration came into office, that legacy informed our work, and we knew that we had to expand on it as well. In April 2015, Mayor de Blasio released *One New York: The Plan for a Strong and Just City* (OneNYC), a strategic plan for inclusive growth and climate action. OneNYC addressed the challenges that we face as a city with a growing population, an inequality crisis, aging infrastructure, as well as the risks of climate change.

OneNYC not only looked inward and set aggressive goals to address local, interconnected challenges around climate change, poverty and economic development, it also looked outward and recognized New York City's place

in the global landscape of sustainable development. OneNYC was the world's first urban resilience strategy and provided a compelling model of how local governments can implement the sustainable development goals and help achieve the Paris Agreement. In fact, earlier this year New York City released the world's first voluntary local review for its efforts at achieving the global goals and sustainable development goals.

OneNYC also deepened the City's commitment to increasing equity and addressing income inequality across the five boroughs of New York City. As Mayor de Blasio has said, our environmental sustainability work must walk hand-in-hand with our economic sustainability work in order to achieve a truly fair and just city for all New Yorkers.

On that point, while climate change affects everyone, its impacts are not equally shared. Simply put, the poorest and most vulnerable, who have historically contributed the least to GHG emissions, are the hardest hit by climate change. OneNYC explicitly seeks to address the disparate environmental conditions that have historically resulted in diminished health outcomes, economic opportunities, and quality-of-life in some of our city's neighborhoods. These injustices have led to public health impacts from poor air quality, disproportionate exposure to pollution, and increased risks related to chronic exposure to extreme heat and the urban heat island effect.

Across the globe, the increasing frequency of extreme weather events and natural disasters, rising sea levels, floods, heat waves, droughts, all of it will affect directly and indirectly threaten human rights. We must all recognize the urgency of this challenge and take bold actions to protect the human rights imperatives of the Paris Agreement. This is really the only way forward for us.

Today, we continue to deliver on these commitments of the Administration to address climate change, to fill the void of leadership left by Washington DC, and deliver results for New Yorkers. Our work can best be summed up in those three themes: sustainability, resiliency, and accountability. I will also walk through them, briefly.

Our climate mitigation or sustainability work is focused on reducing our contribution to climate change by cutting our greenhouse gas emissions as fast as possible. We've committed to make New York City the most sustainable big city in the world and a global leader in the fight against climate change.

To accomplish this, we are working to keep the city on track to meet our goal of reducing greenhouse gases, eighty percent (80%) by 2050, an effort we recently accelerated to align with the Paris Agreement's one point five Celsius (1.5°C) stretch goal. We have already achieved a fifteen percent (15%) reduction. But getting to eighty by fifty means making more transformative

changes in our city to buildings, our largest source of greenhouse gas emissions in the city to make them more energy efficient, expanding renewable energy options, sending zero waste to landfills, and improving our air quality.

Our climate adaptation or resiliency work focuses on adapting the city to the risks of climate change, such as rising seas, storms, heat. In OneNYC, we committed to making the city's neighborhoods better prepared to withstand and emerge stronger from these impacts.

To accomplish this, we are working with many agencies to deliver over twenty billion dollar (\$20,000,000,000) resiliency investments and institutionalizing the idea of resiliency into the city's operations more broadly. By doing so, we're working to deliver on our promise to protect all New Yorkers from the impact of climate change.

And finally, New York City is bringing this fight straight to the fossil fuel companies that caused this climate crisis in the first place.

Let's talk plainly, and I'm sure you've heard many of this during the day. The burning of fossil fuels is the single largest contributor to human-caused climate change. Period. This simple fact was denied and buried for decades by fossil fuel companies intent on misleading policymakers and the public. Now, New York City is ending a decades-long pattern of deception and denial by holding those fossil fuel companies to account for the damage they've caused while taking prudent steps to protect the financial interests of New Yorkers.

So, what does this actually look like?

First, we're working to divest our pension funds from fossil fuel reserve owners, those companies that own the oil and gas in the ground. This is a case where the prudent action to protect city pensions also lines up perfectly with good social policy to fight climate change. Fossil fuel securities have consistently underperformed the market in recent years, and the outlook for fossil fuel investment continues to be poor. According to our most recent analysis, the city's five pension funds hold roughly five billion dollars (\$5,000,000,000) in securities of over one hundred fossil fuel reserve owners.

Working hand-in-hand with our fund trustees, New York City is pursuing divestment consistent with prudent practice and in line with our fiduciary responsibilities. This will involve many steps, from additional analysis and trustee resolutions to the actual process of selling the securities. Our goal is to complete this divestment process as fast as possible by the end of 2022.

Make no mistake, this move is among the most significant divestment efforts in the world to date. While divestment is necessary to stop investing in fossil fuels, we have another tremendous opportunity to pursue investment in the future.

Earlier this month, New York City made another important announcement. Mayor de Blasio and City Comptroller Scott Stringer pledged that we will invest two percent (2%) of all our pension assets into renewable energy and climate solutions within the next three years. That means an investment of four billion dollars (\$4,000,000,000). New York City is the first U.S. city to set such a goal, and we are asking cities around the nation and around the world to join us in this effort.

Investing in climate change solutions is not only the right thing for the Earth, it's the right thing as investors and for all of the people who depend on our pension investments. Fossil fuel investments are proven to be toxic for our planet, and they're just as toxic for our portfolios as well.

Finally, we have filed suit against five (5) of the investor-owned fossil fuel companies that have contributed the most to climate change – Exxon-Mobil, BP, Conoco-Phillips, Royal Dutch Shell, and Chevron. These companies knew as far back as at least the 1980s and perhaps earlier that burning fossil fuels would have ruinous impacts on the planet's atmosphere and that it would change our climate, exposing the globe to sea level rise, increased heat, and severe storms. While they deceptively encouraged and reaped the profits from our reliance on fossil fuels, cities like New York have been left to foot the bill for the harms caused by fossil fuels. Our lawsuit seeks to change that.

The impacts of climate change are no longer theoretical. It's not just happening to someone else far away. It's here, it's now, it's hitting all of us. Seas have risen. Temperatures have increased. We are already spending billions to protect New York City, and much more will be needed this century to protect New Yorkers. That's why the City's federal lawsuit is seeking billions in damages to ensure that our city will be ready to withstand these impacts.

We know this will be a tough fight and could extend over several years, but the facts and the law are clearly on our side and we intend to vigorously pursue our claims and secure relief.

With these efforts, we are taking the largest combined actions by any city to confront the growing climate crisis, work for climate justice, and demonstrate the global leadership necessary to win this fight against fossil fuels and the damage they've caused.

These are just a few of the steps we're taking and we're just one place. Imagine what could happen if everyone followed this lead. We could truly

change the world. And that leads to my last point. All of our work not only benefits New Yorkers, it also serves as a model to other cities around the nation and around the world. Which is why we partner with other cities and through networks to scale up climate solutions, support climate accountability, and pursue climate justice. Continuing to rely on fossil fuels will have catastrophic consequences, but we know there is another way.

To conclude, I would like to again thank Commissioner Cadiz and members of the Commission on Human Rights of the Philippines and the New York City Bar Association and all of the other speakers here today who share our commitment to a better planet. We look forward to continuing the work with you as we seek to combat the impacts of climate change.

And I'm happy to take any questions you may have. Thank you very much.

PANEL CHAIR CADIZ:

Thank you very much, Mr. Zarrilli, we will be fielding questions now.

Starting with Commissioner Armamento...

COMM. TANODRA-ARMAMENTO:

I'm glad to hear that your city is taking positive steps to mitigate any effect of climate change and that you're taking steps to reduce greenhouse effect. My question is do you think all the initiatives are sufficient for you to fulfil your commitment under the Paris Agreement?

MR. ZARRILLI:

It's a great question. My general answer, speaking less of the city but as a member of the planet, we all need to do more. It's very clear to us. We chartered a course and adopted a city plan, we've adopted the goals and principles of the Paris Agreement, we've laid out a path on how we're gonna get there and we've actually accelerated our own actions in building retrofits, retro to put us on the path to get there. It's gonna require more action, it's not one thing we can do next year and we'll be down the right path, we have to do things next year, we have to continue to accelerate our action, to continue to need to invest and we've put ourselves to doing that, and we have a lot of work ahead of us.

COMM. TANODRA-ARMAMENTO:

Additional question, New York City had brought an action in court, cases to protect your citizens. May I know the status of the cases that you have filed?

MR. ZARRILLI:

Absolutely. We have been initially dismissed by the first judge. We immediately filed an appeal, and we'll be in front of an appellate judge at the appellate court quite soon.

COMM. PIMENTEL-GANA:

On the cases that you've filed, what is the nature of the cases, the damages?

MR. ZARRILLI:

I should preface I'm not a lawyer, so for me to get into the legal analysis is probably outside my field. But, yes, we are seeking relief for damages we've seen here in New York City, which will likely be to the tune of billions of dollars. We've seen damages and we know we will have more, damages we can trace back to those causing them, and that started our lawsuit.

COMM. PIMENTEL-GANA:

Okay. On behalf of the city, damages made. Yesterday, two (2) residents of Red Hook actually testified about the devastation that Typhoon Sandy brought to their community. I was just wondering about, maybe you can share your good practice because; actually, as a local government NYC has a very big part to play in terms of protecting the rights of their constituents. How did you prepare for Typhoon Sandy in terms of downloading safeguards for all your communities, like Red Hook, for example. It's known to be a community that easily floods. So how did you prepare the citizens?

MR. ZARRILLI:

Well, certainly our emergency management team have hurricane preparedness protocols. We had issued evacuation orders in our lowest-lying city, and that includes Red Hook, pre-deployed certain equipment, and made sure our emergency responders were ready. We do that as a normal business to any number of hazards that we see coming and even those that we don't see are coming. We have a robust preparation for emergencies. Now, Sandy of course

taught us a lot of things. And we haven't seen a storm like that in New York City in decades, if not longer, and so we learned a lot, a bit about our relationship with the city's two hundred fifty meter (250m) coastline. Over a number of decades, we've sort of forgotten those lessons. And I think, since now we've responded with a lot of learnings, we've upgraded our building standards, we're doing work on zoning and land-use as a tool for resiliency. We're also working with community leaders and residents in places like Red Hook, in Queens, in areas like Staten Island and low-lying areas in Manhattan on resiliency measures, on protection structures and other measures by which we are preparing for the future. So, in Red Hook in particular, there's been a really, really robust planning process and the city has allocated some of the federal funds we've received from Hurricane Sandy toward protective structures. We've been working with the residents to design the plan and also to implement those solutions.

COMM. PIMENTEL-GANA:

So, I guess what we're really seeing is very important when preparing for disasters because what was testified yesterday was that they did not get much information before they were asked to evacuate. But, as I'm hearing from you now, your practice has actually improved, and it was already in experience.

MR. ZARRILLI:

It wasn't since that time we've had evacuation maps in place, we've updated them to be scientifically more robust to storms that we see in New York City. We run education campaigns in zones, so that people are aware. You'll see ads on bus stops, and in the flood zones people are more aware of the risks. They hear about evacuation plans, they know which zone they are in and how that may affect them and how they should be preparing for those events.

PANEL CHAIR CADIZ:

Do the Petitioners have questions for our resource person?

ATTY. PAUDAC:

We would like to know, to return to the discussion, just how much did Hurricane Sandy cost New York? In terms of numbers?

MR. ZARRILLI:

It was the worst natural disaster we've ever faced in New York City. Tragically, forty-four (44) lives were lost, and nineteen billion dollars (\$19,000,000,000) in damages in economic activity. We can put dollars in it, but we can't put dollars on the lives we've lost in New York City.

ATTY. PAUDAC:

Thank you for that. I understand there are also billions of investments for adaptation and resiliency. Can they access the funds from the city? Is there a mechanism for that?

MR. ZARRILLI:

In the aftermath of the storm, different funding streams opened up. Some of them are infrastructure related, to rebuild whether it's our waste treatment plants or power grids, a number of other sensitive investment for infrastructure. There were other streams of assistance for people who had been displaced from their homes, for rebuilding and reconstructing homes in coastal areas. We've ended up serving thousands of New Yorkers whose homes were damaged and elevated hundreds and hundreds of homes along the coastal communities. So, there were different mechanisms where the city was directing federal assistance to those in need, and it came in the form of business support, in home owner support, support for renters, and a number of programs that people have lined up for. Some of the big dollar amounts into infrastructure repair, long-term coastal protection, things like that.

ATTY. PAUDAC:

Thank you for that information. You also mentioned about the lawsuit you filed against five (5) big fossil fuel companies. How have the defendants responded, if any, inside and outside the courtroom?

MR. ZARRILLI:

Negatively. They fight back with everything they have. Public relations campaign, expensive lawyers, they're going to protect their interests and they have big pockets to do so. It really gets important that we, like New York, fight back and see that we can fight back on equal footing, as we can.

ATTY. PAUDAC:

These are legal lawsuits. Are you looking into regulatory measures? Because you mentioned earlier about sustainability and adaptation and resiliency. But how about the political side of it and you're regulating these fossil fuel companies? New York City can play a really big role on that. Can New York City deliver a big blow to these fossil fuel companies?

MR. ZARRILLI:

I'm not sure if we have a direct blow to fossil fuel operations, much of which is not directly in New York City. Some of their operations are in New York City. We have regulatory authority that we are going to upgrade building standards so that less and less fossil fuel are burned for heating and cooling these buildings. We are working to phase out the use of fossil fuel in our own city fleet; we have over one thousand five hundred (1,500) electric vehicles, better servicing New Yorkers. We're investing in electric vehicles. In our public infrastructure, we're investing in our own municipal buildings for less fossil use. So we're doing things on both investment, we're working to regulate, there have been bills passed in the city council to take down the city's power plants for heating and cooling in buildings. There's a number of tools we have at our disposal and we are trying to maximize those whenever possible.

ATTY. PAUDAC:

Just one last question. New York City filed this lawsuit and we have a similar Petition in the Philippines, actually the reason why we are here today. What advice can you give to the Petitioners? New York City is in a better position and has resources. In the Philippines, Petitioners and the community we're based on, were taking all these kind of work, what advice can you give?

MR. ZARRILLI:

Well, I think it's incredibly powerful to see people stepping into this fight and at all levels and the globe. And I guess, you know, one advice is keep up the fight because we're on the right track. We're going to fight our way through a clear trajectory, like what we saw in the tobacco lawsuit decades ago. I think it provides a nice roadmap of where we're heading and we're going to break through. We're going to find the right case and it's going to open the floodgates.

ATTY. PAUDAC:

Thank you for answering my questions. That would be all, Commissioners.

PANEL CHAIR CADIZ:

Thank you. Mr. Zarrilli, I want to focus on the political dimension, on the consequences of your action, specifically on the push-back, I imagine, from the Carbon Majors. What kind of political pressure has been made to bear upon your government? Does it impact the political position of your mayor? And, in terms of campaign finance, can you give us an idea on the influence of the Carbon Majors?

MR. ZARRILLI:

Campaign finance, I don't know much how that plays out. What I've seen largely is the public campaign first. There are messages being put on social media, there are op-eds being written on newspapers. They are trying to undermine our case in the court of public opinion. And it's not dissuading us by any means. I don't think they're very persuasive to begin with at all. But those we've seen. We've also seen high-priced lawyers being brought to bear in these cases. Those are the two (2) biggest things we've seen today, and I know that the Carbon Majors have huge political sway right here in New York City. They're certainly using the court of public opinion to their advantage.

PANEL CHAIR CADIZ:

Alright, we have five minutes. Are there questions coming from the audience? We welcome you.

None? Thank you very much, Mr. Zarrilli, for that very, very good information.

CLERK OF THE INQUIRY:

There are no other business for today.

PANEL CHAIR CADIZ:

So, we shall now proceed to... do you have a closing program? I'll just deliver my closing remarks, and then we're done for the day.

Thank you very much to all. Climate change is truly a grave concern that urgently challenges us to assess our processes, to address it in a global manner. Over the past two days, we have seen the collective effort that underscores the need for global dialogue and action on this issue. The fact that we have conducted these sessions outside of our country, the Philippines, under the auspices of the New York City Bar Association, underscores, in a symbolical way, the imperative for urgent practical action for addressing this issue as one community. We have collectively shown, in what might be described as a precedent... we've placed non-judicial mechanisms, such as national human rights institutions, to complement court-directed initiatives to address this grave issue.

What we have achieved over these two days is not just symbolical. The sharing of knowledge is very rich and concrete, a sure path to... a movement towards achieving climate justice.

We'd like to thank the New York City Bar Association again, Susan Kath, and your other organization, the Cyrus Vance Center for International Justice. And, most especially, we'd like to thank the resource persons who have participated over the past two days.

We have come here, as a small Commission, to be informed on the issue of climate change, and to listen to your expertise. We are truly humbled that you have somehow lent gravitas and credence to our processes.

We look forward to our next round of hearings back in Manila and then in London.

There's a lady there in red, who has come here as part of our preparation for our hearings in London, Dr. Joana Setzer. Thank you very much also for coming here, and for helping us prepare for the conduct of our next hearing in London.

I would reiterate the invitation... we have said from the very beginning that our process would be inclusive. We continue to invite the Petitioners - and the Respondents, as well - to please join this dialogue. We are not here to side with anybody. We are here to come up with a solution, a fair solution, that would hopefully address the issue of climate change.

So, again, thank you very much and see you in Manila or London.

Thank you.
