

**PROFILE AND STATEMENT OF  
CARROLL MUFFETT  
(PRESIDENT AND CEO  
OF THE CENTER FOR INTERNATIONAL  
ENVIRONMENTAL LAW [CIEL])**

**Preliminary Matters<sup>1</sup>**

Carroll Muffett is the President and Chief Executive Officer of the Center for International Environmental Law (CIEL), a nonprofit organization that uses the power of law to protect the environment, promote human rights, and ensure a just and sustainable society.

Prior to joining CIEL, Carroll served as Executive Director of the Climate Law & Policy Project and Deputy Campaigns Director at Greenpeace USA, where he was instrumental in the organization's campaigns on global warming, forests, and other issues. From 2000 to 2006, he was international counsel and Senior Director for International Conservation at Defenders of Wildlife. Before joining Defenders, he was an attorney with Covington & Burling, and served as a legal fellow at CIEL.

Carroll has authored numerous articles and textbook chapters on national and international environmental policy. He is a recognized expert on international environmental law and a leader in the emerging field of international legal responses to climate change. He is co-editor, with Carl Bruch and Sandra Nichols, of *Governance, Natural Resources and Post-Conflict Peacebuilding* (Routledge 2016) for the Environmental Law Institute and the United Nations Environment Programme.

Carroll is a member of the Commission on Environmental Law of the International Union for Conservation of Nature (IUCN), a founding member of the Environmental Peacebuilding Association, and a member of the Board of Trustees of the Climate Accountability Institute.

Carroll is executing this Statement upon the invitation of Greenpeace Southeast Asia (Philippines), one of the petitioners in the human rights and climate change case filed before the Commission on Human Rights, to be a witness and resource person for the petitioners. This testimony will provide additional detail on CIEL's recent report released on 16 November 2017, entitled "***Smoke and Fumes: The Legal and Evidentiary Basis for Holding Big Oil Accountable for Climate Crisis***"<sup>2</sup> and to discuss the liability or accountability of the Carbon Majors beginning in 1957 up to the present and CIEL's opinion on ***Oil Industry Conduct and***

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<sup>1</sup> Available at <https://www.ciel.org/about-us/ciel-staff/carroll-muffett-president-and-ceo/>; last accessed on 13 July 2018.

<sup>2</sup> A copy of which was attached to petitioners' *Manifestation* dated 06 December 2017 and marked as **Exhibit "K"** during the preliminary conference held on 11 December 2017. This is also available at: <http://www.ciel.org/reports/smoke-and-fumes/>, last accessed on 13 July 2018.

*International Norms and Standards*<sup>3</sup> in the third public hearing of the case on 29-30 August 2018 at the Commission on Human Rights in Quezon City, Philippines. This Statement confirms and builds on the presentation and documents Carroll prepared for the second public hearing last 23 May 2018. Carroll will also explain the findings in a new CIEL briefing, “*A Crack in the Shell: New Documents Expose a Hidden Climate History*,”<sup>4</sup> published in April 2018.

Carroll agreed to be a witness and resource person for the petitioners and answer in writing questions to be asked of him. On 12 July 2018, one of the legal representatives for the petitioners, Attorney Hasminah Paudac, talked with Carroll via Skype and explained to him the process of statement-taking. Attorney Kristin Casper, Greenpeace Canada’s litigation counsel and international legal coordinator, and Carroll’s colleagues from CIEL were also in that call. On 13 July 2018, Ms. Anna Dominique Esmeralda, legal liaison of the petitioners, sent questions to Carroll, which he personally answered. Carroll submits this Statement, along with his *Curriculum Vitae* and PowerPoint presentation, to the Commission on Human Rights. He commits to elaborate and clarify this in the scheduled public hearing.

### Questions and Answers

**Q1:** *Can you please give us a background about your organization, the Center for International Environmental Law (CIEL)?*

A1: Center for International Environmental Law (CIEL) is a not-for-profit, charitable legal organization that uses the power of law to protect the environment, promote human rights and ensure a just and sustainable society. From offices in Washington, DC, and Geneva, Switzerland, CIEL’s team of lawyers, experts and support staff works to address an array of issues affecting human health, human rights and the environment. CIEL has been active in efforts to address the threat of climate change since the organization’s founding in 1989.

**Q2:** *How long have you been with CIEL?*

A2: I have been with CIEL in my current role since September 2010. Previously, I served with CIEL as a legal intern from June through August 1996 and as a law fellow from June 1997 through January 1998.

**Q3:** *From CIEL’s website, it appears that you are the President and Chief Executive Officer. How long have you held said position?*

A3: I have been with CIEL for approximately eight years.

**Q4:** *As President and CEO of CIEL, what are your key roles and responsibilities?*

A4: I am responsible for the leadership and oversight of all aspects of CIEL’s programmatic work and operations, including strategic direction, legal

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<sup>3</sup> A copy of which was attached to petitioners’ *Consolidated Reply* dated 10 February 2017 and marked as **Exhibit “G”** during the preliminary conference held on 11 December 2017. This is also available at: <http://www.ciel.org/reports/smoke-and-fumes/>, last accessed on 13 July 2018.

<sup>4</sup> Available at [https://www.ciel.org/wp-content/uploads/2018/04/A-Crack-in-the-Shell\\_April-2018.pdf](https://www.ciel.org/wp-content/uploads/2018/04/A-Crack-in-the-Shell_April-2018.pdf); last accessed on 13 July 2018.

compliance, and ensuring CIEL's work adheres to high standards of ethics and professionalism.

**Q5:** *In November 2017, CIEL published “Smoke and Fumes: The Legal and Evidentiary Basis for Holding Big Oil Accountable for Climate Crisis” (hereinafter, “Smoke and Fumes”; Petitioners’ Exhibit “K”), what is your involvement in this research effort, if any?*

A5: I conceived the project that ultimately became Smoke & Fumes and have served as the lead researcher and editor on the project since its inception. I am a co-author of the CIEL website *SmokeandFumes.org*, the report *Smoke and Fumes: The Legal and Evidentiary Basis for Holding Oil Companies Accountable for the Climate Crisis*, and most recently *A Crack in the Shell*.

**Q6:** *Briefly, what is this Smoke and Fumes research all about?*

A6: CIEL's Smoke and Fumes project examines the deep history of oil industry awareness of and responses to climate change with specific attention to industry notice or knowledge of climate risks, and how industry responses comported with applicable standards of legal and ethical responsibility.

**Q7:** *What are the key findings in this Smoke and Fumes research?*

A7: On the basis of the evidence compiled and analysis undertaken through Smoke and Fumes, CIEL reached the following key conclusions with regard to the notice, awareness, opportunity to act, and documented conduct of leading investor-owned oil companies with regard to climate science and climate risks. These conclusions are drawn verbatim from our Synthesis report.

- Theories regarding the potential link between fossil fuel combustion and atmospheric temperature increase were widely reported in scientific literature and academic texts relevant to the oil industry from the early decades of the twentieth century.
- The oil industry had incentives, opportunity, and relevant expertise to investigate and understand climate science.
- Documentary evidence demonstrates the oil industry was on notice of potential climate risks by 1957-1958.
- Humble Oil, at the time a wholly-owned subsidiary of Esso (now ExxonMobil), published research acknowledging the link between fossil fuels and atmospheric CO<sub>2</sub> in 1957.
- Industry records document that industry research into air pollution issues was highly coordinated and shared widely within the industry, and included research into fossil carbon in the atmosphere by no later than 1958.
- Industry records and other sources indicate that this coordinated industry research program was used to mobilize public opposition to the regulation of air pollutants by sowing doubt regarding air pollution science.

- The oil industry was expressly warned of the potential severity of climate risks by its own consulting scientists in 1968 and repeatedly thereafter.
- Numerous industry documents demonstrate these risks were communicated by industry scientists to executives at the highest levels of the industry over the ensuing decades.
- The oil industry held early patents on numerous technologies that might have reduced climate change risk.
- Even while blocking public action to address climate change, oil companies took steps to protect their own assets from climate risks. This divergence between industry communications to the public and industry action to safeguard their own investments began as early as the 1970s and is well established by the 1980s.
- Notwithstanding their own best information, leading oil companies and industry associations actively participated in or funded climate misinformation efforts for decades through media intended to reach wide audiences of consumers, investors, and the general public.

In the nine months since the Smoke and Fumes synthesis report was released, these findings have been extended and buttressed through additional research by CIEL and others, including through the report *A Crack in the Shell*, which is discussed more fully herein.

**Q8:** *Are you familiar with the Petition filed by Greenpeace, along with thirteen (13) non-profit organizations and eighteen (18) individuals, before the Philippine Commission on Human Rights requesting for an investigation of the Carbon Majors for human rights violations or threats thereof resulting from the impacts of climate change?*

A8: Yes.

**Q9:** *How did you become familiar with said Petition?*

A9: CIEL was one of several expert organizations approached to provide advice and support to the petitioners in conjunction with the filing of the original petition in 2015. CIEL submitted an opinion and annex in support of the Petitioners in February 2017. CIEL also collaborated with other amici expert organizations in the submission of a Joint Summary of the Amicus Curiae briefs, which summarizes the key findings of messages of the individual submissions.

**Q10:** *Given your background and extensive experience in climate, energy, human rights, and civil litigation matters as mentioned in your brief bio and Curriculum Vitae (Annex "A" hereof), what can you say about the Petition, if any?*

A10: The Commission's inquiry is of critical importance first and foremost to the people of the Philippines, who have suffered devastating impacts from anthropogenic climate change and who will continue to suffer new impacts for decades or centuries to come. Those whose lives have been affected most directly and most acutely by climate change have both an urgent need and a fundamental right to access to information and access to justice. That right

requires a detailed inquiry into whether and how corporate actors contributed to their harms and whether, in doing so, these actors acted consistently with relevant codes of conduct and applicable standards of care.

But the implications of the Commission's inquiry have relevance far beyond the Philippines. When it was filed, the present petition was the first of its kind in a field that, as has been borne out, will and must grow rapidly. As the consequences of climate change grow increasingly evident, widespread, frequent and grave, individuals, communities, vulnerable populations and public authorities at every level of government are being confronted with these same questions. The information, analysis and testimonies presented in this inquiry to date are already proving of value in inquiries, investigations and litigation in other countries and fora. Because the Commission is the first national human rights organization to examine the questions of corporate accountability in the climate context, the findings from this inquiry could make a profound contribution to the development of law and practice in this field.

***Q11: Could you please explain why climate litigation and investigations, such as this, are important in addressing climate change?***

**A11:** The climate crisis is not a single challenge but a complex web of challenges that must be addressed at an array of levels—from the individual to the global. The present inquiry, and similar investigations and litigation emerging around the world, help address those challenges in several ways.

First, climate litigation is important to addressing and redressing the impacts of climate change. In the Philippines and around the world, climate change is having profound impacts on human lives, human rights and the environment. Litigation can provide relief, access to justice and access to remedy for the growing numbers of people affected by the climate crisis.

Just as significantly, climate litigation is an important pathway for recouping or properly allocating the massive costs that must be borne by individuals and by governments at all levels not only to respond to unnatural climate disasters but to implement adaptive measures to reduce the risks of future disasters—whether by building sea walls, rebuilding critical infrastructure, changing agricultural technologies and practices, or relocating entire communities. The Carbon Majors have contributed and continue to substantially contribute to the climate crisis despite knowing the consequences of their action. Ensuring that those who played a disproportionate role in creating the climate crisis pay their share of the cost can help provide both access to remedy and the equitable allocation of costs for both present harms and future adaptation.

The science is clear that until the world transitions away from fossil fuels, the impacts and associated costs of the climate crisis will continue to grow. To date, the major carbon producers have continued to profit from the production and sale of their products while wholly avoiding these costs. By compelling major carbon producers to internalize risks and costs of their products that

they have historically externalized, climate litigation can ensure that the companies' business decisions and corporate strategies take those costs into account. In so doing, it can help accelerate the transition to cleaner sources of energy.

Climate investigations and litigation are also vital to developing a fuller, more informed public understanding of the causes of the climate crisis. This awareness will enable the public to make fully informed social and political decisions. While work by CIEL and others has revealed a great deal about what these companies knew about climate change, when they knew it, and what they did with that information, much of this history lies hidden in corporate records and will remain so until official inquiries and judicial processes force its disclosure. Ensuring both that the facts are found and that compensation is paid to those affected accords with the Polluter Pays principle and contributes to more democratic processes for countries determining how best to respond to the climate crisis.

Finally, and fundamentally, by investigating the conduct of the Carbon Majors and other corporate actors in the context of climate change, and holding them accountable where malfeasance is found, climate litigation can set an example for those companies and for others that follow. It may demonstrate that the costs of deceiving consumers, investors and the public ultimately outweigh the benefits. In so doing, it may reduce the risk of the next, still hidden, environmental crisis.

**Q12: *Could you please explain what are the “links in the chain of climate litigation,” as described in your 23 May 2018 presentation?***

A12: While the specific requirements of litigation depend upon the jurisdiction, venue and underlying laws, the core links in the climate litigation chain are the same as those for any litigation arising from a non-contractual harm. Climate litigation requires an identifiable plaintiff or group or class of plaintiffs. This may be an individual already harmed by climate change or at increased risk of future harm; it may be an entire community; a vulnerable population; or, as evidenced by recent cases in the United States, a government. The harms suffered by the plaintiffs must be discrete and particularized. The harms must be fairly traceable to the actions of an identifiable defendant or group of defendants. And those defendants must either have violated a relevant standard of care or be subject to strict liability.

**Q13: *How do advances in science make it easier to identify climate impacts and those being harmed?***

A13: In recent years, we have seen significant advances in the science of climate attribution that allow climate impacts to be identified and quantified at ever greater levels of precision. These advances in climate science are helping identify climate-related harms and plaintiffs in at least four distinct ways.

Improvements in satellite data and geospatial mapping are making it possible to identify gradual, slow-onset climate impacts with ever greater precision. This equips more individuals and communities to understand (and prove)

how they are being affected by climate change. Improvements of this kind, for example, enabled Peruvian farmer Saul Luciano Lliuya to document how glacial melting driven by climate change threatened to flood his farm and his community—and to demonstrate the likely impacts of that flooding with high resolution maps. Using this data, Mr. Luciano has brought suit against German Carbon Major RWE, in German courts, to abate the nuisance created by climate change.<sup>5</sup> This finer resolution also enabled cities like San Francisco and Oakland to more precisely assess how sea level rise would affect their municipalities, and to identify the types and scale of infrastructure investments required to respond.<sup>6</sup>

From a litigation perspective, advances in attribution science are even more significant in the context of extreme events and climate-fueled disasters, of which Typhoon Haiyan is a prime example.<sup>7</sup> Heat waves, droughts, wildfires, severe storms, floods and typhoons are all natural phenomena subject to significant natural variability. For decades, scientists have predicted that all of these events could become more frequent or more severe in the face of climate change, with massive consequences for property, communities and human lives. Until recently, however, it was difficult to distinguish the climate signal from the natural variation in a way that would allow scientists to say with confidence that *this* flood or *that* storm was a result of climate change. As expert testimony in the present inquiry demonstrates, however, it is increasingly possible to distinguish and quantify the impact of climate change on such events—whether it’s the increased number of wildfire days in the US west<sup>8</sup> or the increased energy fueling cyclones from climate-warmed seas. In light of this emerging science, the degree to which once natural disasters are ever more unnatural is becoming increasingly clear, and with it the legally significant distinction between random acts of nature and foreseeable consequences of human actions.

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<sup>5</sup> Lliuya v. RWE A.G., Case No. 2 O 285/15 Essen Regional Court (2015).

<sup>6</sup> San Francisco v. BP, Chevron Corp., Exxon Mobil Corp., Royal Dutch Shell PLC and ConocoPhillips, CGC-17-561-370, Superior Court of the State of California, Counties of San Francisco and Alameda (Filed 09/19/17), removed to U.S. District Court for the Northern District of California (No. C 17-06012 WHA); Oakland v. BP, Chevron Corp., Exxon Mobil Corp., Royal Dutch Shell PLC and ConocoPhillips, RG-17-875-889, Superior Court of the State of California, Counties of San Francisco and Alameda (Filed 09/19/17) removed to U.S. District Court for the Northern District of California (No. C 17-06011 WHA). Both cases dismissed 06/25/18, pending appeal.

<sup>7</sup> Amicus Curiae Brief submitted by Kevin E. Trenberth, 4, <https://business-humanrights.org/sites/default/files/documents/Kevin%20E%20Trenberth.pdf>; Joint Summary of Amicus Curiae, at 36-38, available online at <https://www.ciel.org/wp-content/uploads/2018/03/Joint-Summary-Amicus-submitted.pdf>.

<sup>8</sup> See, e.g., John T. Abatzoglou, A. Park Williams, Impact of anthropogenic climate change on wildfire across western US forests. Proceedings of the National Academy of Sciences Oct 2016, 113 (42) 11770-11775; DOI: 10.1073/pnas.1607171113, available online at <http://www.pnas.org/content/113/42/11770>; Brian J. Harvey, Human-caused climate change drives forest fires, Proceedings of the National Academy of Sciences Oct 2016, 113 (42) 11649-11650; DOI: 10.1073/pnas.1612926113, available online at <http://www.pnas.org/content/113/42/11649.short>.

As discussed more fully in Answer 14 below, the landmark research by Richard Heede into the Carbon Majors has identified a discrete group of corporate actors whose contributions to climate change are both globally and historically significant.<sup>9</sup> By demonstrating that a small collection of actors has contributed disproportionately to the climate crisis and its resulting harms, Heede's research has dispelled the myth that everyone everywhere is equally responsible for climate change and that, accordingly, no one is responsible. In so doing, his work demonstrates that climate impacts once perceived as broad societal harms may in fact be actionable legal wrongs.

Finally, and most recently, an emerging branch of attribution science is integrating the breakthroughs in impact attribution with the causal attribution work of Richard Heede to quantify the Carbon Majors' contributions to specific climate impacts—from atmospheric temperature increases and sea level rise to individual extreme weather events. The work of Brenda Ekwurzel et al., is particularly noteworthy.<sup>10</sup> By demonstrating that these contributions can be credibly traced and quantified not only for the Carbon Majors as a whole but to individual Carbon Majors companies, this research will further accelerate the identification of legally cognizable climate-related harms.

For the foreseeable future, the scale, scope and severity of climate impacts will continue to grow. As advances in attribution science allow climate-related harms to be more precisely identified, quantified and traced to potentially culpable actors, the need for remedy and redress, and demand for access to justice will increase accordingly—and dramatically. The Commission's present inquiry into corporate contributions to climate harms in the context of human rights is not only timely, but urgently needed.

**Q14:** *In your Smoke and Fumes research, you mentioned Richard Heede's Carbon Majors study. How do Richard Heede's Carbon Majors study and corporate attribution science make it easier to identify those responsible for contributing to harm?*

**A14:** Richard Heede's Carbon Majors study traces nearly two-thirds of all carbon dioxide and methane emitted from industrial sources since the industrial revolution began to a discrete list of only 90 entities. While some of the identified entities are states or state-owned enterprises, the majority are investor owned corporations, including major producers of oil, gas and coal. These companies sit at a unique and vital point in the supply chain for fossil fuels and--because the burning of those fuels is the most important source of

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<sup>9</sup> Richard Heede, Tracing Anthropogenic Carbon Dioxide and Methane Emissions to Fossil Fuel and Cement Producers, 1854 – 2010, 122(1-2) CLIMATIC CHANGE 229 (2014), available at <https://link.springer.com/article/10.1007/s10584-013-0986-y>. As noted in the Preliminary Matters section, I serve in an unpaid, volunteer capacity as a member of the Board of Trustees of the Climate Accountability Institute, of which Richard Heede is the Director.

<sup>10</sup> B. Ekwurzel et al., The Rise in Global Atmospheric CO<sub>2</sub>, Surface Temperature, and Sea Level From Emissions Traced to Major Carbon Producers, 144(4) CLIMATIC CHANGE 579 (2017), available at <https://link.springer.com/article/10.1007/s10584-017-1978-0>.



CO2 emissions--in the causal chain for climate harms. By producing fossil fuels and putting them into the stream of commerce, the Carbon Majors played an indispensable role in the causation of anthropogenic global warming. But for the production and marketing of fossil fuels, the majority of anthropogenic carbon dioxide and methane from industrial sources would not have been emitted into the atmosphere. Accordingly, Heede's research provides a coherent, methodologically sound means for identifying a discrete, identifiable group of potential responsible parties whose contributions to the climate crisis are quantifiable and significant both at the global scale and on a historical basis. As noted in the preceding response, moreover, subsequent research has demonstrated how specific proportions of carbon dioxide concentrations in the atmosphere, the increase in average global surface temperatures, and increases in sea level can be traced to individual Carbon Majors, allowing for greater precision in quantifying and allocating responsibility for the climate harms arising the Carbon Majors' products and operations.

***Q15: Based on your legal research, when can a company be held accountable for human rights harms?***

A15: As noted in my previous testimony to the Commission, the foundations for corporate accountability for human rights violations are similar to the principles of responsibility under the laws of tort and non-contractual civil liability. A company can be properly held accountability for violations of human rights when the company's conduct contributes to such violations; the company was aware or should have been aware of the risks associated with its operations; and, notwithstanding this awareness, failed to take measures to avoid or ameliorate the risk. The International Commission of Jurists distilled these common elements into a series of questions:

- Was harm inflicted to an interest of the victim that is protected by law?
- Did the company's conduct contribute to the infliction of the harm?
- Did the company know or would a prudent company in the same circumstances have known that its conduct posed a risk of harm to the victim?
- Considering this risk, did the company take the precautionary measures a prudent company would have taken in order to prevent the risk from materializing?<sup>11</sup>

The United Nations Guiding Principles on Business and Human Rights apply a similar framework. Significantly, the Guiding Principles recognize that corporations have an affirmative obligation to investigate and monitor the

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<sup>11</sup> INTERNATIONAL COMMISSION OF JURISTS, 3 CORPORATE COMPLICITY & LEGAL ACCOUNTABILITY: CIVIL REMEDIES 7 (2008), available at <http://www.icj.org/wp-content/uploads/2009/07/Corporate-complicity-legal-accountability-vol3-publication-2009-eng.pdf>.

circumstances of their operations, and therefore should be on notice of human rights violations arising from those operations.<sup>12</sup>

In examining the Carbon Majors' role in climate-related human rights violations in the Philippines, the Commission should consider fundamental principles of legal and moral responsibility, including respondents' knowledge or notice of potential harms, the opportunity to avoid or reduce those harms, and the Carbon Majors' conduct in light of the risk.

***Q16: Based on your knowledge and experience, how have courts determined foreseeable risks regarding a company's products?***

A16: The question of foreseeability is central to the law of torts. As Meiring de Villiers observes, “[t]he degree to which a defendant could foresee the consequences of a wrongful act is a factor in assigning blameworthiness and moral responsibility for any harmful consequences.”<sup>13</sup> Accordingly, and with significant exceptions discussed more fully below, a defendant will generally be held liable under tort only when the harm the defendant caused was “foreseeable at the time of wrongdoing.”<sup>14</sup> The law does not require, however, that the precise harm befalling a particular plaintiff have been foreseeable by the defendant; it is sufficient that the harm be similar to a foreseeable risk or category of risk.<sup>15</sup>

Moreover, the degree and type of foreseeability analysis can vary widely in cases involving harmful products. Such harms can give rise to claims based on negligence, products liability, or both. Certain portions of the analysis, including the requirement to demonstrate that the company's product actually caused or contributed to the harm suffered, are common to both types of claims. By contrast, the extent to which the hazard associated with a product must have been foreseen or foreseeable depends to a considerable extent on whether the claim is based on negligence or on strict liability, whether the jurisdiction follows the Second or Third Restatement of Torts, and how the standard has been incorporated into the law and interpreted by the domestic courts.

In a negligence analysis, the default standard of care is the care that a “reasonable person” would exercise under the circumstances of the case, taking into account not only what that reasonable person knows but also what they should be expected to know. The standard of care, and particularly the presumption of knowledge, is higher in cases involving a company whose products are the cause of a harm. In determining what risks are foreseeable,

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<sup>12</sup> U.N. Special Rep. on Business & Human Rights, Guiding Principles on Business and Human Rights: Implementing the United Nations “Protect, Respect and Remedy” Framework, U.N. Doc. A/HRC/17/31 (Mar. 21, 2011) at 17, available at <https://business-humanrights.org/sites/default/files/media/documents/ruggie/ruggie-guiding-principles-21-mar-2011.pdf>

<sup>13</sup> Meiring de Villiers, *Foreseeability Decoded*, 16 Minn. J.L. Sci. & Tech. 343, 355 (2015). Available at <https://scholarship.law.umn.edu/mjlst/vol16/iss1/8>.

<sup>14</sup> *Id.* at 356.

<sup>15</sup> *Id.* at 375.

courts hold such companies to an expert standard of care. That is to say, a company that produces a product or places it into the stream of commerce is presumed to be fully informed of the data and science regarding its products and processes, including any hazards they may pose. As discussed in greater detail below, abundant evidence demonstrates that, in the case of major fossil fuel producers, this presumption of expertise is borne out by the evidence.

Moreover, where a company or an industry was demonstrably on notice of potential hazards associated with its products, the question of whether those risks were foreseen or foreseeable is redundant. As detailed below, there is now abundant and compelling evidence that major fossil fuel producers received early and repeated warnings not only regarding the role of fossil fuels in climate change, but of many categories of potential harm that have now materialized for the Filipino petitioners and for growing classes of petitioners and plaintiffs around the world.

Significantly, where the harm results from defects in the design, manufacture or construction of the product, and these defects rendered the product unreasonably dangerous to use, a majority of countries now apply a strict liability standard—meaning that the company or companies that produced the product or put it into the stream of commerce can be held legally responsible for harms caused by the product, regardless of fault. This standard is reflected in §402A of the Restatement (Third) of Torts.

The basic approach set forth in the Restatements has now been followed in most jurisdictions worldwide, either through jurisprudence or legislation.<sup>16</sup>

For example, Article 97 of the Consumer Act of the Philippines (Republic Act No. 7394) provides that "(a)ny Filipino or foreign manufacturer, producer and any importer shall be liable for redress, *independently of fault*, for damages caused to consumers by defects resulting from design, manufacture, construction, assembly and erection formulas and handling and making up, presentation or packing of their products, as well as for the insufficient or inadequate information on the use and hazards thereof" (italics supplied).

As Justice Edgardo P. Cruz has observed, this rule on strict liability “is based on the premise that as between the consumer and the manufacturer, producer or importer, the latter is in a better position to prevent any danger or risk that the product may reasonably pose to end-users.” Accordingly, the injured consumer “needs only establish that the product is defective or unreasonably

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<sup>16</sup> For a discussion of the evolution of the standard, see Richard W. Wright, *The Principles of Product Liability*, in *Symposium, Products Liability: Litigation Trends on the 10<sup>th</sup> Anniversary of the Third Restatement*, 26 Rev. Litig. 1067 (2007), available online at: [http://scholarship.kentlaw.iit.edu/fac\\_schol/719](http://scholarship.kentlaw.iit.edu/fac_schol/719).

dangerous and that he suffered damage as a result of the defect or danger posed by the product.”<sup>17</sup>

Even if a product does not contain design or manufacturing defects, however, it may nonetheless be defective if the producer fails to provide adequate warnings about the dangers the product may pose or adequate instructions on how and to what extent the product may be used safely.<sup>18</sup> Accordingly, the Restatement (Second) of Torts originally published in 1965 extended strict liability to cases involving failure to warn. The Third Restatement also agrees that inadequate warnings render a product defective “when the foreseeable risks of harm posed by the product could have been reduced or avoided by the provision of reasonable instructions or warnings...and the omission of the instructions or warnings renders the product not reasonably safe.”

This is particularly important in cases where a product involves intrinsic hazards which cannot be avoided even when it is used as intended. The theory, as Professor Richard Wright explains, is that providing adequate warnings regarding inherent, irreducible risks enables users to make an informed choice about whether and to what extent to make use of the product, and to understand the potential hazards to which that choice may expose them and others. These “informed choice” warnings cannot reduce the risk involved in using the product, but can enable a person to avoid or minimize those risks by not using the product or by using less of it.<sup>19</sup>

Because warning users of the intrinsic hazards of a product is so important to making informed choices, many jurisdictions, including the Philippines, recognize the failure to disclose these risks as a form of false advertising. Under Article 110 of the Consumer Act, for example, whether an advertisement is “false, deceptive or misleading” must take into account “the extent to which the advertisement fails to reveal material facts in the light of [its representations about the product], or material facts with respects to consequences which may result” from using the product in the customary manner. Similarly, §6.8 (Prohibited Acts) of Department Administrative Order Number 2, which defines the manufacturer responsibilities and liabilities with respect to products subject to mandatory certification, expressly prohibits the “[g]iving of false or misleading data/information, misrepresenting a material and substantial fact; or willfully concealing a material data or fact” about a product.<sup>20</sup>

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<sup>17</sup> J. Edgardo P. Cruz, *Consumer Protection: Beyond Lip Service*, available on the Court of Appeals website at [http://ca.judiciary.gov.ph/index.php?action=mnuactual\\_contents&ap=j7080](http://ca.judiciary.gov.ph/index.php?action=mnuactual_contents&ap=j7080) (last accessed August 16, 2018).

<sup>18</sup> BRUCE L. OTTLEY ET AL., *UNDERSTANDING PRODUCTS LIABILITY LAW* §7.01 [A] (Lexis-Nexis/Matthew Bender, 2013).

<sup>19</sup> Richard W. Wright, *The Principles of Product Liability*, in *Symposium, Products Liability: Litigation Trends on the 10<sup>th</sup> Anniversary of the Third Restatement*, 26 Rev. Litig. 1067, (2007), available online at: [http://scholarship.kentlaw.iit.edu/fac\\_schol/719](http://scholarship.kentlaw.iit.edu/fac_schol/719).

<sup>20</sup> Department Administrative Order No. 2, Series of 2002, *Defining the Responsibilities and Liabilities of Manufacturers, Importers, Traders, Wholesalers, Distributors, Retailers and or their*

The foregoing is a simplified discussion of a complex topic; and I am not licensed or qualified to assess how the specific legal provisions referenced have been applied or interpreted by the courts of the Philippines. They nonetheless reflect the general trend and underlying rationale of law and jurisprudence on company's responsibilities to properly warn users regarding the potential risks associated with their products.

***Q17: How would this apply to the fossil fuel companies that produce, manufacture, market, and sell carbon products?***

**A17:** At all relevant times, fossil fuel companies can and should be presumed to be experts in all aspects of the products they produced, manufactured, marketed or otherwise put into the stream of commerce. From the early twentieth century onward, oil companies routinely recruited scientists and engineers representing an array of scientific and technical disciplines from top tier universities. They maintained large, well-funded and well-staffed scientific operations. In addition to conducting their own research programs, oil companies routinely commissioned research from outside institutions, both as individual companies and through joint research programs funded and coordinated through WOGA, API and other industry groups. New developments in relevant scientific fields were routinely tracked, systematically archived, and regularly communicated, both within individual companies and within the industry. Industry records further demonstrate that the oil companies, in particular, were early pioneers in a wide array of fields and scientific techniques ranging from radiocarbon dating, paleoclimates and hurricane research to the early research and deployment of supercomputers, public opinion research and consumer psychology.

These records further demonstrate that, by no later than the 1930s, issues of air pollution were of common interest and shared concern within the industry. By the 1940s, oil industry groups were actively funding coordinated scientific research and public relations campaigns into high priority air pollutants. Accordingly, by no later than the late 1940s, and certainly thereafter, climate risks were at least as foreseeable to fossil fuel companies as they were to the community of climate researchers and that, at minimum, fossil fuel companies can be presumed to be aware of climate relevant information being discussed, investigated and communicated on by relevant industry associations and professional associations.

More fundamentally, a growing body of documentation demonstrates clearly that from 1957 onward, the fossil fuel industry had not only constructive notice, but actual knowledge of the potential for, likelihood of, and ultimately the certainty of anthropogenic climate change caused by fossil fuel combustion and of the array of potential human, social and environmental harms climate change might engender.

**Q18:** *In your Smoke and Fumes research, you mentioned about the American Petroleum Institute and other associations. What is the American Petroleum Institute and other associations, and which companies are or were members of these associations?*

A18: The American Petroleum Institute (API) is the largest trade group representing the US oil and gas industries. API claims a membership of more than 600 companies.<sup>21</sup> API has been active in coordinating industry information sharing on a wide array of environmental issues, and since no later than 1958 has been actively involved in coordinating oil industry research into and public communications regarding carbon pollution, climate change, and climate relevant policy measures and debates, including active engagement in climate denial campaigns. API's coordinated efforts on climate change began under its Smoke and Fumes Committee in 1951, and continued under the Air and Water Conservation Committee and other committees from 1960 onward. API's full membership lists are not publicly disclosed. However, historic membership lists disclosed during unrelated litigation evidence the membership of individual Carbon Majors companies, their predecessors, subsidiaries or affiliates from 1949 through 1990. (Representative lists were submitted as documentary annexes to slides 26, 32 and 44 of my testimony of May 23<sup>rd</sup>.) These lists are discussed in further detail below.

API is the most significant but not the only organization through which the oil industry coordinated information-sharing, research, communications and policy activities with respect to air pollution and climate change.

The Western Oil and Gas Association (WOGA), founded in 1907, and later renamed the Western States Petroleum Association (WSPA) is the oldest oil industry association in the United States and the most active industry lobbying organization in the Western U.S. It is the industry organization under which the original Smoke & Fumes Committee was established in 1947, with the goal of combining industry-funded research with active public relations campaigns to promote public skepticism of air pollution regulations. WSPA remains active in efforts to obstruct climate policies, including through deceptive or misleading public relations campaigns. An internal WSPA document from 2014, uncovered by the Union of Concerned Scientists revealed how WSPA had used at least 16 fake grassroots organizations and campaigns to create the illusion of widespread public opposition to climate and energy measures in western states.<sup>22</sup> ExxonMobil, Chevron, BP, ConocoPhillips and Shell, among other Carbon Majors, have been active in WOGA and WSPA throughout their century long history, including in 2014.

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<sup>21</sup> <https://www.api.org/membership>

<sup>22</sup> Kathy Mulvey and Seth Shulman, *Climate Deception Dossiers: Internal Fossil Fuel Industry Memos Reveal Decades of Corporate Misinformation* (Union of Concerned Scientists, 2015) at 13 and Appendix C (available online at <https://www.ucsusa.org/sites/default/files/attach/2015/07/The-Climate-Deception-Dossiers.pdf>.) Complete original document available at: <https://www.documentcloud.org/documents/3472843-Climate-Deception-Dossier-WSPA-Chart.html#document/p1>.

The National Petroleum Council is an advisory committee which represents the views of the oil and gas industry before the United States Secretary of Energy. It has 213 members, representing every segment of the oil and gas industry, together with the electric industry and other large purchasers of fossil fuels, a small number of non-profit organizations, and a handful of representatives from oil and gas producing states. The NPC was the body through which the industry submitted the 1972 report *Environmental Conservation: The Oil and Gas Industries (Volume Two)*, which dismissed the risks of climate change despite explicitly referencing industry-funded research which provided a greater warning of those risks. BP, Chevron, ConocoPhillips, Eni, ExxonMobil, Marathon Oil, Murphy Oil, Occidental Petroleum, Phillips66, Repsol, Shell Oil and Total are all current members of the NPC.

The Global Climate Coalition (GCC) was a group of approximately 40 companies and industry associations representing an array of industries responsible for substantial production or combustion of fossil fuels in various forms. From its creation in 1989 through its dissolution in 2002, the GCC campaigned actively to oppose climate action at the US and international levels, and to cast doubt on mainstream climate science among consumers, policymakers and the general public. GCC's operations coincided with the critical window during which the first global agreements were being negotiated and targets set in the UN Framework Convention on Climate Change and Kyoto Protocol. Members included API, Amoco, ARCO, BHP Billiton, BP, Chevron, Exxon, Mobil, and Shell, among others. After successfully convincing the Bush Administration to reject the Kyoto Protocol in 2002, the GCC disbanded, with Shell and BP having left the coalition a few years prior.

These are only a few of the many routes through which fossil fuel producers shared information and collaborated on issues of common concerns. Others include the American Association of Petroleum Geologists and the World Petroleum Congress, through which new scientific and technical research were shared widely and in more structured format; the American Fuel & Petrochemical Manufacturers (AFPM), which lobbies, campaigns and vigorously litigates on behalf of industry interests; the US Chamber of Commerce, whose positions and vocal advocacy on climate change issues were long dominated by fossil fuel interests; and a wide array of industry oriented think tanks and front groups with which and through which fossil fuel companies coordinate for decades to promote industry messages and agendas on climate science and policy worldwide.

***Q19: What did the fossil fuel industry and companies know about climate change? When did they know it?***

A19: As a general matter, and as discussed in Answer 17 above, the fossil fuel industry can and should be presumed to be fully aware of the state of the science relevant to their products at all relevant times.

In view of the general character of the industry, as described in Answer 17, it is also reasonable to presume—though not yet demonstrated—that during the early decades of the 20<sup>th</sup> Century, the fossil fuel industry was or should have been aware of the *possibility* that fossil fuel combustion might alter the global climate during this period.

Building on earlier work by John Tyndall a half century earlier, Svante Arrhenius first calculated how fossil fuel combustion might affect global temperatures in 1896. He revisited the theory a few years later in a well-received and widely read book for popular audiences. While Arrhenius' idea was initially regarded with skepticism, the possibility of fossil-fuel based warming was addressed in college level geology texts in the early decades of the twentieth century, in popular works by other authors, and even by local newspapers in far flung corners of the globe. After British engineer Guy Callendar correlated a decades long temperature increase with the rise in fossil fuel combustion in 1938, the potential for climatic change became a matter of recurring discussion within the scientific and technical literature.

For most of this period, the potential for anthropogenic climate change was not viewed as a matter of concern. It is nonetheless reasonable to infer that researchers within fossil fuel industry were aware or should have been aware of the scientific discourse regarding potential global implications of their products. The oil industry's active engagement in and funding of research into closely related fields, including radiocarbon dating, paleoclimates, the relationship between climate change and sea level rise, and the causes and consequences of hurricanes, made the industry uniquely equipped not only to understand this discussion but to grasp its potential social and environmental implications.

More fundamentally, however, from 1957 onward there is a substantial and growing body of evidence demonstrating not just that the oil industry should have known about climate change and climate risks, but that it did know.

- From 1957 onward, the oil industry was clearly and demonstrably on notice of linkages between fossil fuel combustion, atmospheric CO<sub>2</sub> concentrations, and potential climate related risks.
- From 1968 onward it was warned repeatedly and in increasingly stark terms about the mounting scientific evidence of climate change, the compelling fit between that evidence and the role of fossil fuels, and the potential for changes to the global environment on an unprecedented and potentially catastrophic scale.
- By the late 1970s and early 1980s, industry scientists were acknowledging—and highlighting to executives—the growing scientific consensus about climate change and climate risks, and oil companies were taking those risks into account in their own long-term infrastructure investments. Companies were also acknowledging that they possessed technologies with the potential to slow CO<sub>2</sub> emissions.



- By the beginning of the 1990s, at least one oil company had expressly acknowledged the potential scale, scope and severity of climate related risks ranging from the inundation of coastal areas, to more intense storms and droughts, to massive impacts on ecosystems and agriculture, with the result that massive numbers of climate refugees could be forced to flee affected areas.

Despite these warnings and industry awareness of the potential hazards involved, the oil industry engaged in sustained, decades long campaigns to confuse the public about climate science and slow or stop efforts to reduce fossil fuel use and greenhouse gas emissions and develop, deploy and promote sustainable alternatives to fossil fuels.

**Q20: *What evidence, if any, do you have to support your statement?***

**A20:** Evidence in support of this statement includes several scientific studies, as well as internal memoranda and other company- or industry-produced documents.

**1957--Oil industry on notice of accumulating CO<sub>2</sub> in the atmosphere, the probable role of fossil fuel combustion, and emerging scientific discussion (October 1957) (Submitted for the record as documentary annex 20 to my testimony of May 23<sup>rd</sup>.)**

In 1957, Humble Oil – now ExxonMobil – was researching how the oceans absorbed carbon dioxide, directly engaging with and confronting a study by Roger Revelle and Hans Suess – often called the “opening shot” of the climate debate – from the same year. Inter alia, this paper:

- *Acknowledged that:* Human activity appears to be **adding carbon dioxide** to the natural carbon cycle;
- Combustion of **fossil fuels appeared to be the largest source**, by far, of carbon dioxide emissions into the atmosphere; and
- Callendar’s work indicated a “**significant increase**” in **atmospheric CO<sub>2</sub> concentrations** over a period of at least sixty years.
- *Calculated* cumulative CO<sub>2</sub> emissions from fossil fuel combustion for preceding century, including a graph that showed a **steady and very significant increase in emissions**.
- *Used* radiocarbon evidence to estimate the rate at which fossil carbon was entering the atmosphere and oceans.
- *Demonstrated conclusively* that at least one **major oil company was following and responding to cutting edge climate science** in real time.

**1958—Oil industry is funding coordinated research into atmospheric carbon from fossil fuels through API’s Smoke and Fumes Committee**

Two separate industry documents from 1958 demonstrate that, by no later than that year, the oil industry was funding coordinated research into atmospheric carbon from fossil sources.

The first of these documents, written by CA Jones of Shell Oil, touts industry research into the dilution of atmospheric carbon by carbon from fossil sources, and also acknowledges that **oil and gas producers are responsible for emissions not only from the production of their products, but from their use.** (Submitted for the record as document annex to slides 21-24 of my testimony of May 23<sup>rd</sup>).

A second document, presented by Jerry McAfee of Gulf Oil, is included as Annex B hereto. In this new document, dated November 1958, and submitted on behalf of API's Smoke and Fumes Committee, McAfee confirms industry **"analysis of gaseous compounds in the atmosphere to determine the sources of atmospheric carbon"**. (Fig. 1)

### Figure 1.

Other research activities sponsored by the Smoke and Fumes Committee have included an air analysis program in several United States cities showing that the oxidant level of Los Angeles is abnormally high by comparison; analysis of gaseous compounds in the atmosphere to determine the sources of atmospheric carbon; the development of gas chromatographic methods of analysis for the determination of the composition of exhaust gases; the demonstration of a successful technique to trace air pollution from a single source; and the development of a method of detection of ozone suitable for use in continuous, portable instruments.

That the oil industry funded this through API's Smoke and Fumes Committee indicates that it was viewed as air pollution research.

In 1957-58, when API first acknowledged coordinated research into atmospheric carbon from fossil fuels, the following Carbon Majors companies were API members directly, or through their predecessors, subsidiaries or affiliates: Ashland Oil, British Petroleum, Chevron, Conoco Phillips, ExxonMobil, Petroleos de Venezuela, and Shell Oil. (Submitted for the record as document annex to slide 26 to my testimony of May 23<sup>rd</sup>.)

**1959—Industry document shows carbon dioxide is by far the largest component of vehicle exhaust other than water vapor; industry leaders receive a stark warning of potential climate risks from Nobel physicist.**

In 1959, a report issued as part of the Smoke & Fumes Committee's research program into air pollutants quantified the proportion of automotive tailpipe emissions of various pollutants and demonstrated that carbon dioxide was by far the largest component of emissions other than water vapor. With the exception of carbon monoxide, carbon dioxide exceeded every other component of auto exhaust by at least an order of magnitude, and generally by many orders of magnitude. This would not have come as a surprise to fossil fuel producers, who had long known that water vapor and carbon dioxide are the principal byproducts of fossil fuel combustion. While the industry as a whole continued to view carbon dioxide as a harmless byproduct at this time, the sheer scale of CO<sub>2</sub> emissions relative to other

pollutants should have put reasonable experts on notice that any indication that CO<sub>2</sub> might be hazardous would demand immediate and serious investigation. (The relevant table is included as Figure 2 below. The full document can be provided at the request of the Commission.)

Figure 2.

### **Auto Exhaust: COMPOSITION and PHOTOLYSIS PRODUCTS\***

E. R. STEPHENS, P. L. HANST, R. C. DOERR, and W. E. SCOTT  
The Franklin Institute Laboratories, Philadelphia 3, Pennsylvania

**Table 1—Composition of Auto Exhaust**  
(Concentration in Parts per Million for the Indicated Components in the Various Phases of Vehicle Operation)

Component	Idling	Accelerating	Cruising	Decelerating
Nitrogen <sup>a</sup> Dioxide	20 ± 10	1000 ± 100	310 ± 30	430 ± 50
Carbon monoxide	20,000 ± 1000	20,000 ± 1000	8800 ± 400	18,000 ± 1000
Methane	3400 ± 300	5100 ± 500	430 <sup>b</sup>	6100 ± 600
Ethylene	400 ± 50	500 ± 50	400 ± 50	800 ± 100
Acetylene	330 ± 50	330 ± 50	280 ± 40	620 ± 100
1-olefins (calc. as propylene excluding ethylene)	75 ± 25	40 ± 20	75 ± 25	850 ± 100
2-substituted 1-olefins (calc. as isobutylene)	40 ± 20	10 ± 10	10 ± 10	300 ± 50
2-olefins (calc. as trans-2-butene)	10 ± 10	10 ± 10	10 ± 10	800 ± 100
Total hydrocarbons (calc. as butane, excluding methane ethylene, acetylene)	800 ± 50	470 ± 30	1030 ± 50	17,000 ± 1000
<b>Carbon dioxide</b>	<b>64,000 ± 3000</b>	<b>59,000 ± 3000</b>	<b>64,000 ± 3000</b>	<b>33,000 ± 1500</b>
Formaldehyde	None	None	None	None
Formic acid	None	None	None	None
Other carbonyl compounds	None	None	None	None

<sup>a</sup> Much of the NO<sub>2</sub> reported here was present in the exhaust as NO and was oxidized to NO<sub>2</sub> when diluted.

<sup>b</sup> This value may be low. The oxygen used to dilute the sample contains methane which may not have been properly allowed for in this sample.

As reported by Benjamin Franta in The Guardian, industry leaders received precisely such an indication that same year, when physicist and Nobel Laureate warned participants in a high-level API symposium that as little as a 10% increase in the atmospheric could raise global temperatures enough to

melt the polar ice caps and submerge heavily populated coastal areas—including New York City, where the symposium was convened.<sup>23</sup>

**1962—Shell’s chief geologist reports growing concern among other eminent scientists and acknowledges the link between carbon dioxide risk and the need to seek alternative energy sources.**

In 1962, Shell’s Chief Consulting Geologist, Marion King Hubbert, authored a book length report on the world’s energy resources. (Submitted for the record as document annex to slide 28 of my presentation of May 23<sup>rd</sup>.) The report demonstrates the industry’s profound and sophisticated understanding of the Earth’s energy balance, including how solar energy flows into the earth as solar radiation before much of it is reflected back into space through long-wave radiation, how a smaller portion of that solar energy is converted into carbon by plant and animal life, how that a portion of that energy is converted to fossil fuels over vast spans of geologic time, and how the rise of the fossil economy was releasing the vast stores of energy and carbon in these fuels back into society and into the world, at scale hitherto unknown in human history. In its sophistication, projections and systematic approach to the flow of energy into and through the earth’s physical and biological systems, King’s work bears striking similarities to global climate models released even many years later.

Hubbert does not incorporate fossil related climate risk into his models, but a discussion late in his book demonstrates that Shell Oil—like Exxon—had been informed of those risks and their potential significance. (Fig. 3) Recounting a presentation by Professor Evelyn Hutchinson of Yale in 1961, Hubbert reports that “[t]here is evidence that the greatly increasing use of the fossil fuels...is seriously contaminating the earth’s atmosphere with CO<sub>2</sub>.” He notes that increases in CO<sub>2</sub> may already be producing “climatic change in the direction of higher average temperatures. This could have profound effects both on the weather and on the ecological balance.”

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<sup>23</sup> Benjamin Franta, *On its 100th birthday in 1959, Edward Teller warned the oil industry about global warming*, THE GUARDIAN, January 1, 2018. Available at: <https://www.theguardian.com/environment/climate-consensus-97-per-cent/2018/jan/01/on-its-hundredth-birthday-in-1959-edward-teller-warned-the-oil-industry-about-global-warming>.

Fig. 3.

There is evidence that the greatly increasing use of the fossil fuels, whose material contents after combustion are principally H<sub>2</sub>O and CO<sub>2</sub>, is seriously contaminating the earth's atmosphere with CO<sub>2</sub>. Analyses indicate that the CO<sub>2</sub> content of the atmosphere since 1900 has increased 10 per cent. Since CO<sub>2</sub> absorbs long-wavelength radiation, it is possible that this is already producing a secular climatic change in the direction of higher average temperatures. This could have profound effects both on the weather and on the ecological balances.

In view of the dangers of atmospheric contamination by both the waste gases of the fossil fuels and the radioactive contaminants from nuclear power plants, Professor Hutchinson urges serious consideration of the maximum utilization of solar energy.

In light of the dangers posed by this contamination, Hubbert noted, Professor Hutchinson urged conference participants to seriously consider making the maximum use of solar energy. Neither Hubbert himself nor, presumably, Shell Oil, were persuaded by these warnings. **But the passage demonstrates that Shell and the broader oil industry were receiving increasingly explicit warnings of climate risks from outside scientists by the beginning of the 1960s. Before the end of that decade, the same warnings were being presented, and in far greater detail, by scientists working for the oil industry itself.**

**1968-1969—API receives express, detailed and serious warnings from its own consulting scientists that carbon dioxide emissions from fossil fuel combustion could lead to dramatic changes in climate leading to widespread and potentially grave damage to society and the environment**

In 1968, the Stanford Research Institute delivered to API its final report on a multi-year investigation into the *Sources, Abundance, and Fate of Gaseous Atmospheric Pollutants*. (Submitted for the record as a document annex to slides 29-31 of my testimony of May 23<sup>rd</sup>). The report, written by SRI scientists Elmer Robinson and R.C. Robbins, explicitly addressed the state of the science with respect to carbon dioxide and its potential impacts on the global climate. While the researchers could not yet confirm a scientific consensus on climate questions, the report:

- *Observed* that CO<sub>2</sub> emissions were “the only air pollutant which has been **proven to be of global importance of man’s environment on the basis of a long period of scientific investigation.**”
- Recognized that “Past and present studies of CO<sub>2</sub> are detailed and seem to explain adequately the present state of CO<sub>2</sub> in the atmosphere.”

- *Expressly acknowledged* that burning fossil fuels provided the best explanation for the rise in atmospheric CO<sub>2</sub>.
- *Identified as the Basic Problem* that, through fossil fuel combustion, humankind was, in a short period of time, reinserting a significant portion of the carbon that had been removed from the global environment over the course of “half a billion years”.
- *Cautioned* that increases in CO<sub>2</sub> would likely result in higher global temperatures; and *Concluded* that “[s]ignificant temperature changes are almost certain to occur by the year 2000 and these could bring about climatic changes.”
- *Warned* that these increased temperatures could result in melting ice caps, rising sea levels, warming oceans, changes in the distribution of fish stocks, and environmental damage on a global scale.
- The authors highlighted the irony that air pollution efforts were focused almost exclusively on local pollutants, while ignoring abundant pollutants that “may be the source of serious worldwide environmental changes”. (Fig. 4)
- And emphasized the need for research to apply atmospheric CO<sub>2</sub> data to air pollution technology and work toward systems in which CO<sub>2</sub> emissions could be brought under control. (Fig. 5)

**Fig. 4.**

It seems ironic that in our view of air pollution technology we take such a serious concern with small-scale events such as the photochemical reactions of trace concentrations of hydrocarbons, the effect on vegetation of a fraction of a part per million of SO<sub>2</sub>, when the abundant pollutants which we generally ignore because they have little local effect, CO<sub>2</sub> and submicron particles, may be the cause of serious world-wide environmental changes.

**Fig. 5**

Past and present studies of CO<sub>2</sub> are detailed and seem to explain adequately the present state of CO<sub>2</sub> in the atmosphere. What is lacking, however, is an application of these atmospheric CO<sub>2</sub> data to air pollution technology and work toward systems in which CO<sub>2</sub> emissions would be brought under control.

**By no later than 1968, therefore, API and its industry members were being warned by their own scientific consultants that the links between fossil fuel combustion and rising atmospheric CO<sub>2</sub> were credible; that temperature rise was almost certain to result; and that the most pressing research need was into technologies to address and control the release of carbon dioxide into the atmosphere from the burning of fossil fuels.**

*Despite embracing* other aspects of *the* report, API asked SRI to review *its* findings on CO<sub>2</sub> in a Supplemental Report, which was submitted in 1969. (Submitted for the record as documentary annex for slides 29-31 of my testimony of May 23<sup>rd</sup>.) The Supplement:

- *Repeated* and further substantiated most of the core conclusions of the 1968 report, including its recognition that: atmospheric concentrations of carbon dioxide were steadily increasing; 90% of this increase could be attributed to fossil fuel combustion; and continued use of fossil fuels would inevitably and inexorably result in greater CO<sub>2</sub> levels in the atmosphere.
- *Found* it unlikely that natural changes in the biosphere could be responsible for rising CO<sub>2</sub> levels
- *Further concluded* that natural sinks could *not* keep pace with the excess emissions created by burning fossil fuels.
- Estimated that the projected growth in fossil fuel use would push atmospheric CO<sub>2</sub> to 370 ppm by the year 2000.
- Estimated (accurately) that an increase in CO<sub>2</sub> to 370ppm would increase global temperatures by 0.5 C (0.9 F) by the year 2000.
- Estimated that *using all then* recoverable fossil fuels would raise atmospheric CO<sub>2</sub> to 850 ppm, driving global temperatures still higher.
- *Acknowledged* that the melting of polar ice caps, if it occurred, “would obviously result in inundation of coastal areas.”
- *Repeated that* “there seems to be no doubt that the potential damage to our environment could be severe ...[and that] the prospect for the future must be of serious concern.”

On balance, therefore, the great majority of the evidence and analysis in the Supplement reinforces and further extends the core conclusions of the original. Despite this, there are striking differences between the two reports that cannot be explained by the analysis itself.

In contrast to their earlier warnings about the risks and potential impacts of CO<sub>2</sub>—warnings borne out by the evidence in the Supplement--the authors declared that “with our present knowledge we are not justified in predicting future effects of CO<sub>2</sub> based on these correlations.” Similarly, they omitted several paragraphs from the 1968 report that summarized the potential environmental and human impacts of climate change. Finally, and notably, the Supplemental Report included two paragraphs of “Summary and Conclusions” with respect to CO<sub>2</sub>. While the first of these paragraphs briefly and accurately summarized the report’s findings, the second paragraph downplayed the potential implications of rising CO<sub>2</sub> for global temperatures, sea levels, and the environment—focusing exclusively on the uncertainties that made it impossible to draw any conclusions.

In 1969, the following Carbon Majors companies were API members directly, or through their predecessors, subsidiaries or affiliates: Ashland Oil, Aramco, Atlantic Richfield Company, British Petroleum, Chevron, Conoco Phillips, ExxonMobil, Husky Energy, Marathon Oil, Murphy Oil, Petroleos de Venezuela,

Shell Oil, Suncor and Total. (See document annex to slide 32 of my testimony of May 23<sup>rd</sup>). Membership in 1968 was likely similar.

**1972-Industry documents show the 1968 and 1969 reports were circulated within the industry and that industry executives claimed to have read them, confirming that the findings, conclusions and warnings from Robinson and Robbins were seen.**

- We know that the reports were circulated within API and other industry groups at the time, and that many industry scientists and executives either read the reports or claimed to have done so. Most significantly, the work of Robinson and Robbins was referenced, praised and extensively discussed in a report submitted by National Petroleum Council (NPC) to the Department of Interior in 1972. (Submitted as document annex to slides 33-34 of my testimony at the May 23<sup>rd</sup> hearing.)

**1970s-1980s—Internal industry documents repeatedly and increasingly acknowledge the growing scientific consensus on climate change.**

**1978—Internal Exxon presentation recognizes “general scientific agreement” that fossil fuels are most likely source on human influence on climate and that “man has a window of five to ten years before the need for hard decisions regarding energy strategies might become critical”.**

In a cover memo and internal presentation shared with an Exxon executive, Exxon scientist James Black provided an extensive overview of then current science on climate change. (Annex C hereto.) Black focused on areas of continued debate and uncertainty, but concluded by acknowledging a growing scientific consensus on the most likely sources and scale of global temperature change, and the short time-frame in which tough decisions on energy might become critical. (Fig. 6)

## Fig. 6

### V. Summary

A summary of my talk is presented in Vugraph 18. In the first place, there is general scientific agreement that the most likely manner in which mankind is influencing the global climate is through carbon dioxide release from the burning of fossil fuels. A doubling of carbon dioxide is estimated to be capable of increasing the average global temperature by from 1° to 3°C, with a 10°C rise predicted at the poles. More research is needed, however, to establish the validity and significance of predictions with respect to the Greenhouse Effect. It is currently estimated that mankind has a 5-10 yr. time window to obtain the necessary information. A major research effort in this area is being considered by the U.S. Department of Energy.

Notably, Jack's cover letter to F.G. Turpin, Vice President of Exxon Research & Engineering states that he had delivered a version of this presentation to Exxon's Corporation Management Committee the previous. This demonstrates Exxon was being briefed on climate change at the highest levels of management by 1977 at the latest.



**1981—Internal Exxon Correspondence from May 1981 acknowledges rising CO<sub>2</sub> levels, likely global temperature increases, and potentially significant impacts, but proposes that Exxon's public position be that action is not yet needed because the problem won't be detectable until the year 2000.**

In an internal Exxon memo communicating Exxon's public position on climate change and also providing relevant background, Exxon scientist Henry Shaw expressly acknowledged that atmospheric CO<sub>2</sub> had increased to 338 ppm since 1957 and would reach 380 ppm by the year 2000. (Annex D hereto.) He recognized that a doubling of CO<sub>2</sub> would raise global temperatures by 3 degrees Celsius and 10 degrees at the poles, resulting in major shifts in rainfall patterns and agriculture and the melting of polar ice. (Fig.7.)

**Fig. 7.**

Background:

- Average atmospheric CO<sub>2</sub> increased 7% since 1957 (315 to 338 ppm). We project CO<sub>2</sub> will reach about 380 ppm by 2000.
- Atmospheric CO<sub>2</sub> will double in 100 years if fossil fuels grow at 1.4%/a.
- 3°C global average temperature rise and 10°C at poles if CO<sub>2</sub> doubles.
  - Major shifts in rainfall/agriculture
  - Polar ice may melt

Nonetheless he communicated that Exxon's public position on the matter was that it was too early to take action on climate change and that potential concerns about climate change should not slow the growth of carbon intensive synthetic fuels, including shale oil. (Fig. 8)

**Fig. 8.**

PRELIMINARY STATEMENT OF EXXON'S POSITION ON  
THE GROWTH OF ATMOSPHERIC CARBON DIOXIDE

Position:

There is sufficient time to study the problem before corrective action is required.

- An indication of the average global temperature increase due to CO<sub>2</sub> will not be measurable above normal climatic fluctuations (noise) until about 2000.
- Effective energy conservation and high price for fossil fuels over the last few years have now delayed the projected doubling time of CO<sub>2</sub>. We estimate now that the doubling time is about 100 years.
- This permits time for an orderly transition to non-fossil fuel technologies should restrictions on fossil fuel use be deemed necessary.

**1982—Internal Exxon Memo acknowledges the scientific consensus around climate impacts of rising CO<sub>2</sub> and states that Exxon’s own research agrees with this consensus.**

In an internal company memorandum dated September, 1982, Roger Cohen, Director of Exxon’s Theoretical and Mathematical Sciences Laboratory acknowledges the “clear scientific consensus” that a doubling of atmospheric CO<sub>2</sub> from pre-industrial levels would raise global temperatures by approximately 3 degrees Celsius. (Annex E hereto.) He further acknowledges the “unanimous agreement in the scientific community” that an increase of this size would cause significant changes to the climate, to rainfall patterns and to the biosphere. (Fig. 9)

**Fig. 9.**

over the past several years a clear scientific consensus has emerged regarding the expected climatic effects of increased atmospheric CO<sub>2</sub>. The consensus<sup>†</sup> is that a doubling of atmospheric CO<sub>2</sub> from its pre-industrial revolution value would result in an average global temperature rise of  $(3.0 \pm 1.5)^{\circ}\text{C}$ . The uncertainty in this figure is a result of the inability of even the most elaborate models to simulate climate in a totally realistic manner. The temperature rise is predicted to be distributed nonuniformly over the earth, with above-average temperature elevations in the polar regions and relatively small increases near the equator. There is unanimous agreement in the scientific community that a temperature increase of this magnitude would bring about significant changes in the earth's climate, including rainfall distribution and alterations in the biosphere. The time

Significantly, Cohen further acknowledges that Exxon’s own research is in accord with this scientific consensus on the climate effects of increased CO<sub>2</sub>. (Fig. 10)

**Fig. 10**

In summary, the results of our research are in accord with the scientific consensus on the effect of increased atmospheric CO<sub>2</sub> on climate. Our research appears to reconcile Newell's observations and proposed mechanism with the consensus opinion.

**1986-1988—Documents from Both Exxon and Shell demonstrate that by the mid-1980s, oil companies considered climate risks sufficiently serious to take them into account in their own infrastructure investments.**

In a document reported on by the Los Angeles Times in 2015, Ken Croasdale, the lead ice researcher for Imperial Oil, ExxonMobil’s Canadian Subsidiary, acknowledged that the company needed to consider the potential impacts of climate change on any new long-lived infrastructure investments, particularly in the far north and offshore environments. Significantly, in undertaking their planning and modeling work for Exxon, Croasdale and his team employed the

same global circulation models that Exxon would continue to publicly attack as unreliable for another two decades.<sup>24</sup>

A Shell Oil researcher made the same admission in an internal report *The Greenhouse Effect* initially developed in 1986, then formatted for internal publication in 1988 and not unearthed until April of this year. Like Exxon before it, but with greater specificity, Shell recognized that rising sea levels would have “direct operational consequences” for the company’s offshore and coastal facilities, and (implicitly) for others who might be responsible for infrastructure in the same areas. Shell acknowledged that there would be increased but uncertain costs from defending against sea level rise, with the uncertainties compounded by factors like “extreme ocean storms.” (Fig. 11)

**Fig. 11.**

Direct operational consequences can be expected from a rising sea level, impacting offshore installations, coastal facilities and operations (e.g. platforms, harbours, refineries, depots) with an uncertain magnitude. Costs of defending against a sea level rise will depend on the local situation (levels of security demanded for contingencies like extreme ocean storms, flooding, etc.) and national policies to compensate industry for the extra costs incurred.

**1988—Internal Shell Report *The Greenhouse Effect* acknowledges unequivocally the rise of global CO<sub>2</sub> levels, the primary role of fossil fuel combustion, the ability of oil companies to calculate their own (globally significant) contributions, and clear industry notice of the foreseeable and significant harms from climate change.**

Unearthed in April by Dutch journalist Jelmer Mommers of De Correspondent, and analyzed in the CIEL report *A Crack in the Shell*, Shell’s internal study *The Greenhouse Effect* demonstrates conclusively that sophisticated understanding of climate science and climate risks wasn’t limited to Exxon. More importantly, *The Greenhouse Effect* provides a detailed snapshot of oil industry knowledge of those risks at a moment when cumulative global CO<sub>2</sub> emissions were less than half their current levels.

In *The Greenhouse Effect*, Shell:

- *Acknowledged* unequivocally that atmospheric CO<sub>2</sub> levels were increasing;
- that fossil fuel combustion was the primary cause: and
- that there was “reasonable scientific agreement that increased levels of greenhouse gases would cause a global warming.”
- *Recognized* the potential consequences arising from this warming, including:
  - Increased water temperatures;
  - Rising sea levels;
  - Ocean acidification, with negative impacts on shellfish and corals;
  - Regional increases in both drought and flood events;

<sup>24</sup> Sarah Jerving, et al., *What Exxon Knew about Earth’s Melting Arctic*, Los Angeles Times, (October 9, 2016). Available online at [https:// http://graphics.latimes.com/exxon-arctic/](https://graphics.latimes.com/exxon-arctic/).

- And major shifts in the distribution of species.
- *Recognized* that these impacts could materialize during the lifetimes of people then living or their children or family members, with an array of negative social impacts, including:
  - Particularly harmful effects for the 30% of the world's population living within 50 Km of a coastline or in other low-lying areas, who would face risks of inundation;
  - Loss of coastal and estuarine habitats that provide nurseries vital for food production, resulting in turn in losses of resources and income for people dependent on those nurseries;
  - Additional losses in income and resources from shifts in species population and from ocean acidification;
  - Changes to agriculture, with poorer countries being at greatest risk;
  - Changes in air temperature requiring investments in adaptation and potentially costly changes in the ways people live and work;
  - Changes in hydrological cycles and to water supply.

**The recognition of these impacts is legally significant in the context of this inquiry because it demonstrates that the climate harms now being inflicted upon a growing number of victims and potential plaintiffs were not only wholly foreseeable to the oil companies—they were, in fact, foreseen.**

In a final and equally significant development, *The Greenhouse Effect* not only acknowledged the scale of Shell's own contributions to CO<sub>2</sub> emissions, but calculated them. Moreover, it made this calculation based on the sales of the entire Shell Group of companies, rather than a single entity, and it took into account not only Shell's own operations, but the greenhouse emissions resulting from use of the fuels it produced and marketed. (Fig. 12)

**Fig. 12**

Table 8. Contribution to global CO<sub>2</sub> emissions from fuels sold by the Shell Group in 1984 (source: Shell Coal)

fuel	carbon emissions (gigatonnes of carbon)	
	total world	Group share
oil	2.56 ( 40%)	0.20 (3.1%)
gas	0.80 ( 12%)	0.03 (0.5%)
coal	2.46 ( 38%)	0.02 (0.4%)
NCE*	0.63 ( 10%)	0 (0.0%)
<b>total</b>	<b>6.45 (100%)</b>	<b>0.25 ( 4% )</b>

\* NCE = Non-Commercial Energy (biomass)

Shell calculated that fossil fuels which are marketed and used by the Group in 1984 account for the production of 4% of the CO<sub>2</sub> emitted worldwide from combustion. In so doing, it not only demonstrated the ability of fossil fuel producers to measure their own impact, it provided implicit support for similar approaches applied in the Carbon Majors analysis nearly 3 decades later.

**1991- Shell's *Climate of Concern* film demonstrates that risks of extreme weather events, super-powered storms and potential widescale human displacement were not only foreseeable but foreseen.**

- Acknowledged that the climate might “change too fast, perhaps, for life to adapt without severe dislocation.”
- Discussed the scale and scope of risks, including
  - changes to weather patterns;
  - “the increasing frequency of abnormal weather;”
  - saltwater intrusion in coastal ecosystems and freshwaters;
  - sea level rise;
  - increasingly destructive storm surges, noting “warmer seas could make such destructive surges more frequent and even more ferocious;”
  - pollution of groundwater;
  - impacts on agriculture;
  - displacement of people living on low-lying islands;
  - potential for “greenhouse refugees” displaced by shifting climates.
- Acknowledged and warned that “If the weather machine were to be wound up to such new levels of energy, no country would remain unaffected.”

*Climate of Concern* demonstrates that more than a quarter century before Typhoon Haiyan, the potential for increasingly powerful and increasingly destructive climate-fueled storms, and the unique vulnerability to those impacts for people in coastal and low-lying areas, was explicitly recognized by major producers of fossil fuels.

**Q21: *What did they do with that information, if you know?***

A21: **In 1965**—At a time when the oil industry was demonstrably on notice that CO<sub>2</sub>, the most abundant waste product from the burning of fossil, was of significant and growing concern as a possible global pollutant, the American Petroleum Institute actively and successfully opposed governmental funding for research into pollution free electric vehicles. In testimony before the United States Senate, the President of the American Petroleum Institute urged Congress that targeted funding for electric vehicle research was unnecessary, because by the time electric cars became viable, internal combustion engines would be pollution free. (Annex F)

Even as climate warnings from its own scientists became more frequent and more serious, the oil industry actively opposed early efforts to increase fuel economy in passenger cars to save resources and reduce emissions from automobiles. After federal Corporate Average Fuel Economy (CAFÉ) standards were adopted in 1975, the oil industry continued to actively oppose

the standards, including working to stop efforts. It has lobbied and litigated against the reauthorization, implementation and enforcement of new fuel efficiency standards for decades, up to and including under the Trump Administration.

In addition to opposing stronger standards to make gas-powered engines cleaner and more fuel efficient, the oil industry has continued its efforts to slow the adoption of electric vehicles and other clean transport technologies. In 1994, for example, a previously unheard of group, Californians Against Utility Company Abuse, launched a major, well-funded campaign seeking to block state investments in electric vehicle charging stations. After the group sent letters to more than 200,000 electricity customers in California, an investigation by the Los Angeles Times exposed CAUCA as a front group funded and operated by the Western States Petroleum Association.<sup>25</sup>

In 2006, the documentary *Who Killed the Electric Car* investigated the efforts of car makers, oil companies and others to limit the development and marketing electric vehicle technologies. The filmmakers documented that, after small battery maker Ovonic developed a new and promising new technology for large Nickel Metal Hydride batteries for use in vehicles, first General Motors then Chevron bought control of the patent. The filmmakers pointed out that Chevron's arrangement gave the oil company exclusive control of the licensing and use of the NiMH battery patent, and alleged that Chevron was using patent entanglement to prevent the further development or use of the technology. As of this writing, Chevron continues to control the patent. (Annex G).

**In 1972**, three years after the API received the final and Supplemental Reports from Robbins and Robinson of SRI addressing in detail the state of climate science and the risk of ignoring global risks from carbon dioxide, the National Petroleum Council submitted a two volume, book-length report to the Department of Interior on the petroleum industry's environmental conservation efforts. High-level executives from across the oil and gas industry were identified as authors and editors of the 1972 report and of its component chapters, including an extensive chapter on "Air Pollution." The relevant committees included representatives from all of the following companies: Gulf Oil Corp. (Chevron); Humble Oil (ExxonMobil; Mobil Oil Corp. (ExxonMobil); Phillips Petroleum (ConocoPhillips); Shell Oil; Standard Oil of Indiana (BP); and Texaco (Chevron)

In that Air Pollution chapter, the NPC draws extensively on the Robbins and Robinson report, and refers to the researchers themselves as eminent scientists. Despite this, however, and notwithstanding the extensive and

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<sup>25</sup> Michael Parrish, *Trying to Pull the Plug : Big Oil Companies Sponsor Efforts to Curtail Electric, Natural Gas Cars*, Los Angeles Times (August 14, 1994), Available at [http://articles.latimes.com/1994-04-14/business/fi-46003\\_1\\_natural-gas-cars](http://articles.latimes.com/1994-04-14/business/fi-46003_1_natural-gas-cars).

detailed discussions of climate science and climate risk in the Robbins and Robinson reports, NPC omits any reference to the analysis or warnings of the oil industry's own consultants with respect to climate change. Instead, NPC cited only an external report from several years earlier that took a much more critical view of climate science. In a particular irony, NPC's discussion of climate dismissed outright the possibility that air pollutants could have any impact on the global environment, arguing that air pollution is a purely local phenomenon. In so doing, it directly contradicted a core conclusion and essential warning from scientists the oil industry itself had contracted for advice. (Fig. 13)

**Fig. 13**

***18. Based on scientific studies, on a global aggregate basis air pollution is not a serious problem, although in many urban industrialized areas it has reached serious proportions. Studies involving international cooperation are needed to define any global effects of air pollution, particularly from man-made sources.***

**While man's contribution produces localized problems of varying degrees, depending on population density and natural ventilation, there is a question as to the effect of man's pollution on a global basis in view of nature's contribution and absorptive capability.**

Answer 20 above provides extensive documentary evidence to demonstrate that, by the 1980s, major fossil fuel producers were well aware of the growing consensus within the scientific community on the accumulation of anthropogenic greenhouse gases in the atmosphere, the primary role of fossil fuel combustion in that accumulation, and the probability that this would lead to higher global temperatures with potentially severe consequences for society and global environment.

In 1989, the year after both Exxon and Shell expressly acknowledged these realities internally, the Global Climate Coalition was created. During the ensuing 13 years, and during a critical window of opportunity for avoiding or minimizing catastrophic climate change, the members of the Global Climate Coalition carried on a sustained campaign to sow misinformation, uncertainty and doubt regarding climate science and the need for climate action. In 1995, an internal primer on climate science and climate denial by a Mobil Oil scientist, presented several leading arguments by climate denialists together with a detailed rebuttal of those arguments. Despite this, the members continued to fund and orchestrate climate denial operations

through the GCC itself. In a document from 1996, for example, the GCC argued that:

- Most observed warming of the atmosphere was caused by natural forces;
- Any human contribution to this observed warming was very small and overwhelmed by natural forces; and that
- “[T]here is no convincing evidence that future increases in greenhouse gas concentrations will produce significant climatic effects.”

During the negotiation of the Kyoto Protocol, and the transition between the administrations of Bill Clinton and George W. Bush, the GCC worked intensely to build opposition to the agreement among lawmakers and the public. After the Bush Administration withdrew the United States from the Kyoto Protocol the GCC was dissolved in 2002.

In the interim, however, the American Petroleum had expanded its own climate denial operations. In 1998, an internal API document entitled the Global Climate Communications Plan (but also called the “Roadmap Memo”) laid out API’s objectives and path to victory with respect to climate change and climate science. According to the document, the goal of API’s project was to ensure a majority of recognized that “significant uncertainties” exist in climate science, prompting them to raise questions with Congress and others responsible for influencing US progress on climate change. “Victory Will Be Achieved” declared API, “When average citizens “understand” uncertainties in climate science”, these uncertainties become part of the “conventional wisdom”, and supporters of the Kyoto Protocol are viewed as “out of touch with reality”.

During this period, the following Carbon Majors companies were API members directly, or through their predecessors, subsidiaries or affiliates: Amoco, Ashland Oil, Aramco, Atlantic Richfield Company, British Petroleum, Chevron, Conoco Phillips, ExxonMobil, Husky Energy, Marathon Oil, Murphy Oil, Petroleos de Venezuela, Shell Oil, Statoil, Suncor and Total. (See document annex to slide 44 of my testimony of May 23<sup>rd</sup>).

**Q23:** *Could you please provide one or more concrete examples, if any, of respondent Carbon Major companies’ awareness of climate risks, their products’ role in contributing and/or exacerbating climate risks, and failure to take steps to avoid and reduce climate risks?*

A23: Relevant examples are incorporated in Answers 19 and 20 above.

**Q24** *In April 2018, CIEL released a publication entitled, “A Crack in the Shell: New Documents Expose a Hidden Climate History” (hereinafter, “Shell Report”). Briefly, what is this all about?*

A24: In April 2018, the Climate Investigation Center published a new and significant trove of internal Shell documents unearthed by Dutch journalist Jelmer Mommers of *De Correspondent*. Prior to releasing the documents,



Jelmer approached CIEL for assistance in assessing the contents and significance of the documents. In the Shell Report, *A Crack in the Shell*, CIEL combined an analysis of these new documents with our own research into Shell's early awareness of and responses to climate science to present a clearer picture of what Royal Dutch Shell and its subsidiaries knew about climate risks, when they knew it, and how they acted in light of that information.

For example, the Shell Report documents the early and active role of Shell executives in API's Smoke and Fumes Committee, and documents that Shell engaged with API not only through its US subsidiary but through representatives from its British and Dutch parent companies.

The report brought to light an early and explicit discussion of climate change and climate risks by M. King Hubbert, who was Shell's chief consulting geologist at the time. It demonstrated that Shell, like Exxon, was on notice of emerging climate science and growing concerns regarding carbon dioxide more than five decades ago.

Finally, through its analysis of documents ranging from the 1980s through the present day, the Shell Report highlighted an ongoing tension between Shell's public representations and internal discussions and actual conduct in the face of climate risks.

**Q25:** *There were mention of several publications and a film made my Shell, to wit: The Greenhouse Effect; The Enhanced Greenhouse Effect; Is Climate Change Occurring Already?; Climate of Concern; Shell and the Environment; Climate Change; and What Does Shell Think and Do About It? Could you please walk us through these publications and film?*

**A25:** Please see my reply to Question 20 for a detailed discussion of the content and potential significance of *The Greenhouse Effect* and the film *Climate of Concern*. In 1994, Shell prepared a revised version of its earlier report entitled *The Enhanced Greenhouse Effect*. The most noteworthy aspect of the latter report is that it placed a far greater emphasis on scientific uncertainties even as the science itself was becoming stronger. Similarly, the 1995 document *Is Climate Change Occurring Already?* placed a heavy emphasis on the uncertainties in climate science, departed significantly from Shell's own earlier analysis, and patently disregarded relevant work by NASA Scientist Dr. James Hansen.

**Q26:** *In the said Shell Report, CIEL also mentioned about this "Roadmap Memo." Could you briefly explain what is this all about?*

**A26:** As briefly recounted in Answer 22, the "Roadmap Memo" is the shorthand name used for a document entitled "Global Climate Science Communications Action Plan", created and distributed by the American Petroleum Institute in 1998. This plan outlined a media and communications strategy designed to convince the American public, as well as industry leaders and politicians, that "significant uncertainties exist in climate science," and noted that "Victory Will Be Achieved When ... Average

citizens ‘understand’ (recognize) uncertainties in climate science; recognition of uncertainties becomes part of the ‘conventional wisdom’”. The memo also includes notes about funding sources, specific strategies and tactics, and how they will measure progress and success.

**Q27: *What are CIEL’s key findings or conclusion, if any, in this Shell Report?***

A27: Our analysis of the documents unearthed by Jelmer Mommers of De Correspondent, together with documents gathered through CIEL’s own research, revealed a contrast between Shell’s internal discussions and its public actions during a critical window for climate action.

Together, these documents prove that Shell, like ExxonMobil had early, repeated, and often urgent notice of climate risks linked to its products. Despite these warnings, and contrary to its public image, Shell maintained active membership in an array of industry trade groups and front groups that carried out a decades-long campaign of climate denial and climate obstruction.

Just as significantly, more than six decades after it was put on notice of climate risks from its products, Shell continues aggressively pushing to open new oil and gas horizons—including the rapidly melting Arctic.

- Shell’s new Sky Scenario, discussed below, epitomizes this dichotomy: Shell’s model sets out a vision to meet Paris goals, even as the company acknowledges that it has no intent to pursue that vision.
- The new revelations pose risks not only for Shell itself, but for other oil majors whose role in the climate crisis have received relatively less attention.
- Finally, our findings demonstrate that while these investigations may have begun with ExxonMobil, Exxon did not act in isolation and the conduct of other major oil producers should and likely will be further investigated.

**Q28: *In your Shell Report, there was also a mention of Shell’s “Sky Scenario.” Could you briefly explain what is this all about?***

A28: In March 2018 Shell released a scenario analysis which purports to demonstrate a potential pathway by which the global community could limit atmospheric warming in accordance with the Paris Agreement. This is one of several Shell scenarios which outline how future energy production and consumption may evolve.

**Q29: *What is CIEL’s analysis, if any, on Shell’s Sky Scenario?***

A29: While CIEL believes that all fossil fuel companies should engage in robust scenario analysis and disclose those analyses to investors and the public, Shell’s Sky Scenario serves more as justification for continuing the status quo than as a potential roadmap for de-carbonization and climate change mitigation.

While Shell claims that its Sky Scenario would hold warming to “around 1.75 degrees”, Shell’s approach is not in our view consistent with the Paris climate target. Parties agreed in Paris to keep warming well below 2 degrees Celsius and to limit the increase to no more than 1.5 degrees if possible. This is a critical difference. As the experience of the Philippines attests all too clearly, even at 1 degree of warming the world is witnessing severe impacts on communities, ecosystems and human rights. This is why many scientists and advocates argue that even 1.5°C of warming is too much, and urgent efforts are needed to keep warming as low as possible. An analysis of the scenario prepared for Shell by MIT estimates that there would be a mere 13% chance of staying below 1.5°C under the Sky Scenario. Even if one accepted that the higher 1.75°C limit proposed by Shell was acceptable, MIT says there's only a 50% chance of keeping to that target. To get a two-thirds chance of success under Sky, one must accept a temperature target of approximately 1.9 degrees Celsius. This, in our view, cannot be considered “well below” 2 degrees.

The Sky Scenario also implies wrongly and dangerously that the global community can continue its reliance on fossil fuels for several decades while somehow still meeting the goals of the Paris Agreement. In order to achieve this, the Sky Scenario must assume the deployment of unproven and risky carbon capture and storage technologies at a massive scale, with potential severe impacts on communities and ecosystems. Even with these technologies, moreover, Shell assumes the world will overshoot the Paris target, then use additional CCS, together with Bioenergy with CCS (BECCS) to bring temperatures back down.

Finally, and fundamentally, in the absence of clear plans to implement it, the Sky Scenario is meaningless unless Shell has concrete plans to pursue it. Legal disclaimers in the document make clear that it does not.

***Q30: In your professional opinion, do the Shell internal and public communications indicate that the company misled the public, the consumers, and its shareholders in ways that may have broken the law or be inconsistent with the company’s responsibilities to respect human rights?***

A30: In my opinion, and on the present evidence, I believe there is a significant dichotomy between the public image Shell seeks to convey on climate change, and the actual content of its operations.

***Q31: Do you know if Shell and other fossil fuel companies did anything to advance or derail efforts on renewable energy transition and other solutions to address climate change?***

A31: I have discussed relevant examples of this in Answer 21 above.

**Q33:** *Have your reports/publications been used as reference in any effort to pursue policy reform concerning climate change either nationally or internationally?*

A33: CIEL's research, analysis and documents unearthed by our work have been referenced in litigation before the domestic courts in several countries, subnational courts in several US states, and in submissions to national and international human rights bodies, including the commission.

**Q38:** *In light of your years of research and expertise on the subject matter, are investor-owned carbon producers aligning production and investment with science-based targets that will ensure the global temperature rise is limited to safe levels? Please explain.*

A38: They are not. Shell's recent *Sky Scenario* is emblematic of this fact.

**Q39:** *Based on your extensive research, do you have any insights on what steps respondent Carbon Majors should take to remedy, eliminate, and prevent human rights harms resulting from the fossil fuel products they extract and sell?*

A.39. I would welcome the opportunity to provide a response to this question at a later date.

**Q40:** *Is there anything else you would like to say about your research that may be relevant to this national inquiry?*

A40: One of the most important conclusions from our research is that the vast majority of the relevant history on these issues has yet to come to light. Understanding that history more fully, including the conduct of corporate actors, is a vital element of providing access to remedy, promoting informed democracy, and establishing corporate accountability where appropriate. A critical lesson from our research, including in repositories such as the Tobacco Truth Documents and other online litigation archives, is that official fact finding, whether through litigation, investigation or non-judicial inquiries, will be indispensable to protecting and promoting human rights in the context of climate change. The present inquiry is a vital step forward toward that goal.

**Q41:** *Are you ready and willing to swear this Profile and Statement under oath before the Philippine Commission on Human Rights, if required to do so?*

A41: I am.

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**CARROLL MUFFETT**

Signature and Date of Signing  
August 20, 2018