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STATE OF RHODE ISLAND
PROVIDENCE, SC.

SUPERIOR COURT

STATE OF RHODE ISLAND

Plaintiff,

vs.

Case Number:

CHEVRON CORP.;
CHEVRON U.S.A. INC.;
EXXONMOBIL CORP.;
BP P.L.C.;
BP AMERICA, INC.;
BP PRODUCTS NORTH AMERICA, INC.;
ROYAL DUTCH SHELL PLC;
MOTIVA ENTERPRISES, LLC;
SHELL OIL PRODUCTS COMPANY LLC;
CITGO PETROLEUM CORP.;
CONOCOPHILLIPS;
CONOCOPHILLIPS COMPANY;
PHILLIPS 66;
MARATHON OIL COMPANY;
MARATHON OIL CORPORATION;
MARATHON PETROLEUM CORP.;
MARATHON PETROLEUM COMPANY LP;
SPEEDWAY LLC;
HESS CORP.;
LUKOIL PAN AMERICAS, LLC;
GETTY PETROLEUM MARKETING, INC.; AND
DOES 1 through 100, inclusive,

JURY TRIAL DEMANDED

Defendants.

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PLAINTIFF'S COMPLAINT

I. INTRODUCTION

1. Defendants, major corporate members of the fossil fuel industry, have known for nearly a half century that unrestricted production and use of their fossil fuel products create greenhouse gas pollution that warms the planet and changes our climate. They have known for decades that those impacts could be catastrophic and that only a narrow window existed to take action before the consequences would be irreversible. They have nevertheless engaged in a coordinated, multi-front effort to conceal and deny their own knowledge of those threats, discredit the growing body of publicly available scientific evidence, and persistently create doubt in the minds of customers, consumers, regulators, the media, journalists, teachers, and the public about the reality and consequences of the impacts of their fossil fuel pollution. At the same time, Defendants have promoted and profited from a massive increase in the extraction and consumption of oil, coal, and natural gas, which has in turn caused an enormous, foreseeable, and avoidable increase in global greenhouse gas pollution and a concordant increase in the concentration of greenhouse gases,[1] particularly carbon dioxide ("CO_2") and methane, in the Earth's atmosphere. Those disruptions of the Earth's otherwise balanced carbon cycle have substantially contributed to a wide range of dire climate-related effects, including, but not limited to, global warming, rising atmospheric and ocean temperatures, ocean acidification, melting polar ice caps and glaciers, more extreme and volatile weather, drought, and sea level rise. Plaintiff, the State of Rhode Island,[2] along with the State's citizens, infrastructure, and natural resources, suffer the consequences.

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[1] As used in this Complaint, "greenhouse gases" refers collectively to carbon dioxide, methane, and nitrous oxide. Where a source refers to a specific gas or gases, or when a process relates only to a specific gas or gases, this Complaint refers to them by name.

[2] As used in this Complaint when referring to geographic locations, "Rhode Island" and "State" refer to all non-federal lands within the geographic boundaries of the State of Rhode Island.

2. Defendants are vertically integrated extractors, producers, refiners, manufacturers, distributors, promoters, marketers, and sellers of fossil fuel products. Decades of scientific research show that pollution from the production and use of Defendants' fossil fuel products plays a direct and substantial role in the unprecedented rise in emissions of greenhouse gas pollution and increased atmospheric CO_2 concentrations since the mid-20th century. This dramatic increase in atmospheric CO_2 and other greenhouse gases is the main driver of the gravely dangerous changes occurring to the global climate.

3. Anthropogenic (human-caused) greenhouse gas pollution, primarily in the form of CO_2, is far and away the dominant cause of global warming, and results in severe impacts including, but not limited to, sea level rise, disruption to the hydrologic cycle, more frequent and more intense drought, more frequent and more extreme precipitation, more frequent and more intense heatwaves, and associated consequences of those physical and environmental changes.[3] The primary source of this pollution is the extraction, production, and consumption of coal, oil, and natural gas, referred to collectively in this Complaint as "fossil fuel products."[4]

4. The rate at which Defendants have extracted and sold fossil fuel products has exploded since the Second World War, as have emissions from those products. The substantial majority of all greenhouse gas emissions in history has occurred since the 1950s, a period known

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[3] *See* IPCC, *Climate Change 2014: Synthesis Report*, Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland (2014), 6, Figure SMP.3, https://www.ipcc.ch/report/ar5/syr.

[4] *See* C. Le Quéré et al., *Global Carbon Budget 2016*, EARTH SYST. SCI. DATA 8, 632 (2016), http://www.earth-syst-sci-data.net/8/605/2016. Cumulative emissions since the beginning of the industrial revolution to 2015 were 413 gigatons of carbon ("GtC") attributable to fossil fuels, and 190 GtC attributable to land use change. *Id.* Global CO_2 emissions from fossil fuels and industry remained nearly constant at 9.9 GtC in 2015, distributed among coal (41 %), oil (34 %), gas (19 %), cement (5.6 %), and gas flaring (0.7 %). *Id.* at 629.

as the "Great Acceleration."[5] About three quarters of all industrial CO_2 emissions in history have occurred since the 1960s,[6] and more than half have occurred since the late 1980s.[7] The annual rate of CO_2 emissions from extraction, production, and consumption of fossil fuels has increased by more than 60% since 1990.[8]

5. Defendants have known for nearly 50 years that greenhouse gas pollution from their fossil fuel products has a significant impact on the Earth's climate and sea levels. Defendants' awareness of the negative implications of their own behavior corresponds almost exactly with the Great Acceleration, and with skyrocketing greenhouse gas emissions. With that knowledge, Defendants took steps to protect their own assets from these threats through immense internal investment in research, infrastructure improvements, and plans to exploit new opportunities in a warming world.

6. Instead of working to reduce the use and combustion of fossil fuel products, lower the rate of greenhouse gas emissions, minimize the damage associated with continued high use and combustion of such products, and ease the transition to a lower carbon economy, Defendants concealed the dangers, sought to undermine public support for greenhouse gas regulation, and engaged in massive campaigns to promote the ever-increasing use of their products at ever greater volumes. Thus, each Defendant's conduct has contributed substantially to the buildup of CO_2 in the environment that drives global warming and its physical, environmental, and socioeconomic consequences.

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[5] Will Steffen et al., *The Trajectory of the Anthropocene: The Great Acceleration*, 2 THE ANTHROPOCENE REVIEW 81, 81 (Jan. 2015), http://journals.sagepub.com/doi/abs/10.1177/2053019614564785.

[6] R. J. Andres et al., *A Synthesis of Carbon Dioxide Emissions from Fossil-Fuel Combustion*, 9 BIOGEOSCIENCES 1845, 1851 (May 2012), http://www.biogeosciences.net/9/1845/2012.

[7] *Id.* at 1848.

[8] C. Le Quéré et al., *supra* note 4, at 630.

7. Defendants are directly responsible for 182.9 gigatons of CO_2 emissions between 1965 and 2015, representing 14.81% of total emissions of that potent greenhouse gas during that period. Accordingly, Defendants are directly responsible for a substantial portion of past and committed sea level rise (sea level rise that will occur even in the absence of any future emissions), as well as for a substantial portion of changes to the hydrologic cycle, because of the consumption of their fossil fuel products.

8. As a direct and proximate consequence of Defendants' wrongful conduct described in this Complaint, average sea level will rise substantially along Rhode Island's coast; average temperatures and extreme heat days will increase; flooding, extreme precipitation events such as tropical storms and hurricanes, and drought will become more frequent and more severe; and the ocean will warm and become more acidic. The State, situated on the coast of Southern New England boasting over 400 miles of coastline is particularly vulnerable to sea level rise, cyclones, and flooding, and already has spent significant funds to study, mitigate, and adapt to the effects of global warming. Climate change impacts already adversely affect Rhode Island and jeopardize State-owned or operated facilities critical for operations, utility services, and risk management, as well as real property and other assets that are essential to community health, safety, and well-being.

9. The State of Rhode Island has engaged in several planning processes to prepare for the multitude of impacts from climatic shifts and has recognized increasingly severe consequences.

10. Defendants' production, promotion, and marketing of fossil fuel products, simultaneous concealment of the known hazards of those products, and their championing of anti-science campaigns, actually and proximately caused Rhode Island's injuries.

11. Accordingly, the State brings claims against Defendants for Public Nuisance, and Strict Liability for Failure to Warn, Strict Liability for Design Defect, Negligent Design Defect,

Negligent Failure to Warn, Trespass, Impairment of Public Trust Resources, and violations of the State Environmental Rights Act.

12. By this action, Rhode Island seeks to ensure that the parties who have profited from externalizing the responsibility for sea level rise, drought, extreme precipitation events, heatwaves, other results of the changing hydrologic and meteorological regime caused by global warming, and associated consequences of those physical and environmental changes, bear the costs of those impacts on Rhode Island, rather than the State, local taxpayers, residents, or broader segments of the public. Rhode Island does not seek to impose liability on Defendants for harms other than those to the State, including in its parens patriae capacity, nor for their direct emissions of greenhouse gases, and does not seek to restrain Defendants from engaging in their business operations.

II. PARTIES

A. Plaintiff

13. Plaintiff, the State of Rhode Island, by and through the Attorney General of the State of Rhode Island ("Rhode Island" or the "State"), brings this action as an exercise of its authority to protect public trust resources and its police power, which includes, but is not limited to, its power to prevent pollution of the State's property and waters, to prevent and abate nuisances, and to prevent and abate hazards to public health, safety, welfare, and the environment.

14. The State also brings this action in its *parens patriae* capacity for the benefit of the citizens of the State.

15. Rhode Island is already experiencing sea level rise and associated impacts. The State will experience significant additional sea level rise over the coming decades through at least the end of the century.[9]

16. The sea level rise impacts to the State associated with an increase in average mean sea level height include, but are not limited to, permanent increased inundation and temporary flooding in natural and built environments because of higher tides and intensified wave and storm surge events; aggravated wave impacts, including erosion, damage, and destruction of built structures and infrastructure, as well as natural features such as cliffs, beaches, and dunes, with consequent landslides; changes in sediment supply that could alter or destroy natural coastal habitats such as beaches and wetlands, which otherwise would have naturally mitigated sea level rise impacts; and saltwater intrusion on groundwater and built infrastructure.

17. In addition, Rhode Island is and will continue to be impacted by increased temperatures and disruptions to the hydrologic cycle. The State is already experiencing a climatic and meteorological shift toward winters and springs with more extreme precipitation events contrasted by hotter, drier, and longer summers. These changes have led to increased property damage, economic injuries, and impacts to public health. The State must spend substantial funds to plan for and respond to these phenomena, and to mitigate their secondary and tertiary impacts.

18. Compounding these environmental impacts are cascading social and economic impacts that cause injuries to the State and that arise out of localized climate change-related conditions.

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[9] Erika Spanger-Siegfried et al., *When Rising Seas Hit Home: Hard Choices Ahead for Hundreds of US Coastal Communities*, Union of Concerned Scientists, 10–11 (Apr. 2017), https://www.ucsusa.org/sites/default/files/attach/2017/07/when-rising-seas-hit-home-full-report.pdf.

B. Defendants

19. Defendants are responsible for a substantial portion of the total greenhouse gases emitted since 1965. Defendants, individually and collectively, are responsible for extracting, refining, processing, producing, promoting, and marketing fossil fuel products, the normal and intended use of which has led to the emission of a substantial percentage of the total volume of greenhouse gases released into the atmosphere since 1965. Indeed, between 1965 and 2015, the named Defendants extracted from the earth enough fossil fuel materials (i.e. crude oil, coal, and natural gas) to account for more than one in every seven tons of CO_2 and methane emitted worldwide. Accounting for their wrongful promotion and marketing activities, Defendants bear a dominant responsibility for global warming generally, and for Plaintiff's injuries in particular.

20. When this Complaint references an act or omission of the Defendants, unless specifically attributed or otherwise stated, such references should be interpreted to mean that the officers, directors, agents, employees, or representatives of the Defendants committed or authorized such an act or omission, or failed to adequately supervise or properly control or direct their employees while engaged in the management, direction, operation or control of the affairs of Defendants, and did so while acting within the scope of their employment or agency.

21. **Chevron Entities**

a. Chevron Corporation is a multinational, vertically integrated energy and chemicals company incorporated in the State of Delaware, with its global headquarters and principal place of business in San Ramon, California.

b. Chevron Corporation operates through a web of United States and international subsidiaries at all levels of the fossil fuel supply chain. Chevron Corporation's and its subsidiaries' operations consist of exploring for, developing, and producing crude oil and natural gas; processing, liquefaction, transportation, and regasification associated with liquefied

natural gas; transporting crude oil by major international oil export pipelines; transporting, storage, and marketing of natural gas; refining crude oil into petroleum products; marketing of crude oil and refined products; transporting crude and refined oil products by pipeline, marine vessel, motor equipment, and rail car; basic and applied research in multiple scientific fields including of chemistry, geology, and engineering; and manufacturing and marketing of commodity petrochemicals, plastics for industrial uses, and fuel and lubricant additives.

c. Chevron Corporation controls and has controlled companywide decisions about the quantity and extent of fossil fuel production and sales, including those of its subsidiaries.

d. Chevron Corporation controls and has controlled companywide decisions related to climate change and greenhouse gas emissions from its fossil fuel products, including those of its subsidiaries.

e. Chevron U.S.A. Inc. is a Pennsylvania corporation with its principal place of business located in San Ramon, California. Chevron U.S.A. Inc. is qualified to do business in Rhode Island. Chevron U.S.A. Inc. is a wholly owned subsidiary of Chevron Corporation that acts on Chevron Corporation's behalf and subject to Chevron Corporation's control. Chevron U.S.A. Inc. was formerly known as, and did or does business as, and/or is the successor in liability to Gulf Oil Corporation, Gulf Oil Corporation of Pennsylvania, Chevron Products Company, Chevron Chemical Company, Chevron Energy Solutions Company, ChevronTexaco Products Company, Chevron U.S.A. Production Company, and Chevron U.S.A. Products Company.

f. "Chevron" as used hereafter, means collectively, Defendants Chevron Corporation and Chevron U.S.A. Inc., and their predecessors, successors, parents, subsidiaries, affiliates, and divisions.

g. Chevron directs and has directed substantial fossil fuel-related business to Rhode Island. A substantial portion of Chevron's fossil fuel products are or have been extracted, refined, transported, traded, distributed, marketed, promoted, manufactured, sold, and/or consumed in Rhode Island, from which Chevron derives and has derived substantial revenue. For instance, Chevron formerly owned and operated a petroleum products terminal on Veteran's Memorial Parkway in East Providence that was used for oil storage and fossil fuel product distribution, marketing, and/or sales. Additionally, Chevron markets and/or has marketed gasoline and other fossil fuel products to consumers, including through Chevron- and Gulf-branded petroleum service stations in Rhode Island.

22. **ExxonMobil**

a. Exxon Mobil Corporation, doing business as ExxonMobil, is a multinational, vertically integrated energy and chemicals company incorporated in the State of New Jersey with its headquarters and principal place of business in Irving, Texas. Exxon is among the largest publicly traded international oil and gas companies in the world. Exxon Mobil Corporation was formerly known as, did or does business as, and/or is the successor in liability to ExxonMobil Refining and Supply Company, Exxon Chemical U.S.A., ExxonMobil Chemical Corporation, ExxonMobil Chemical U.S.A., ExxonMobil Refining & Supply Corporation, Exxon Company, U.S.A., Exxon Corporation, and Mobil Corporation.

b. Exxon Mobil Corporation controls and has controlled companywide decisions about the quantity and extent of fossil fuel production and sales, including those of its subsidiaries. Exxon Mobil Corporation recently represented that its success, including its "ability to mitigate risk and provide attractive returns to shareholders, depends on [its] ability to

successfully manage [its] overall portfolio, including diversification among types and locations of our projects."

c. Exxon Mobil Corporation controls and has controlled companywide decisions related to climate change and greenhouse gas emissions from its fossil fuel products, including those of its subsidiaries. Exxon Mobil Corporation's Board, or an individual/sub-set of the Board, or another committee appointed by the Board, holds the highest level of direct responsibility for climate change policy within the company. Exxon Mobil Corporation's Chairman of the Board and Chief Executive Officer, its President and the other members of its Management Committee are actively engaged in discussions relating to greenhouse gas emissions and the risks of climate change on an ongoing basis. Exxon Mobil Corporation require its subsidiaries to provide an estimate of greenhouse gas-related emissions costs in their economic projections when seeking funding for capital investments.

d. ExxonMobil Oil Corporation is wholly-owned subsidiary of Exxon Mobil Corporation that acts on Exxon Mobil Corporation's behalf and subject to Exxon Mobil Corporation's control. ExxonMobil Oil Corporation is incorporated in the State of New York with its principal place of business in Irving, Texas. ExxonMobil Oil Corporation is qualified to do business in Rhode Island. ExxonMobil Oil Corporation was formerly known as, did or does business as, and/or is the successor in liability to Mobil Oil Corporation.

e. "Exxon" as used hereafter, means collectively defendants Exxon Mobil Corporation and ExxonMobil Oil Corporation, and their predecessors, successors, parents, subsidiaries, affiliates, and divisions.

f. Exxon consists of numerous divisions and affiliates in all areas of the fossil fuel industry, including exploration for and production of crude oil and natural gas; manufacture

of petroleum products; and transportation, marketing, promotion, and sale of crude oil, natural gas, and petroleum products. Exxon is also a major manufacturer and marketer of commodity petrochemical products.

g. Exxon directs and has directed substantial fossil fuel-related business to Rhode Island. A substantial portion of Exxon's fossil fuel products are or have been extracted, refined, transported, traded, distributed, marketed, promoted, manufactured, sold, and/or consumed in Rhode Island, from which Exxon derives and has derived substantial revenue. For example, Exxon markets and/or has marketed gasoline and other fossil fuel products to consumers, including through Mobil-branded petroleum service stations in Rhode Island. Additionally, Exxon has owned and operated a fossil fuel product terminal in East Providence that was used for petroleum product storage, formulation, repackaging, and marketing, among other uses.

23. **BP Entities**

a. BP P.L.C. is a multinational, vertically integrated energy and petrochemical public limited company, registered in England and Wales with its principal place of business in London, England. BP P.L.C. consists of three main operating segments: (1) exploration and production, (2) refining and marketing, and (3) gas power and renewables. BP P.L.C. is the ultimate parent company for numerous subsidiaries that find and produce oil and gas worldwide, that refine oil into fossil fuel products such as gasoline, and that market and sell oil, fuel, other refined petroleum products, and natural gas worldwide. BP P.L.C.'s subsidiaries explore for oil and natural gas under a wide range of licensing, joint arrangement, and other contractual agreements.

b. BP P.L.C. controls and has controlled companywide decisions about the quantity and extent of fossil fuel production and sales, including those of its subsidiaries. BP P.L.C.

is the ultimate decisionmaker on fundamental decisions about the company's core business, *i.e.*, the level of companywide fossil fuels to produce, including production among BP P.L.C.'s subsidiaries. For instance, BP P.L.C. reported that in 2016–2017 it brought online thirteen major exploration and production projects. These contributed to a 12% increase in the BP group's overall fossil fuel product production. These projects were carried out by BP P.L.C.'s subsidiaries. Based on these projects, BP P.L.C. expects the company to deliver to customers 900,000 barrels of new product per day by 2021. BP P.L.C. further reported that in 2017 it sanctioned three new exploration projects in Trinidad, India, and the Gulf of Mexico and added 143% reserves replacement for the group.

c. BP P.L.C. controls and has controlled companywide decisions about the quantity and extent of fossil fuel production, including those of its subsidiaries. BP P.L.C. makes fossil fuel production decisions for the entire BP group based on a number of factors, including climate change. BP P.L.C.'s Board, an individual/subset of the Board, or a committee appointed by the Board, is the highest level within the company with direct responsibility for climate change policy. BP P.L.C.'s chief executive is responsible for maintaining the BP group's system of internal control that governs the BP group's business conduct. BP P.L.C. reviews climate change risks facing the BP group through two executive committees chaired by the group chief executive and one working group chaired by the executive vice president and group chief of staff, as part of BP group's established management structure.

d. BP America Inc. is a wholly-owned subsidiary of BP P.L.C. that acts on BP P.L.C.'s behalf and subject to BP P.L.C.'s control. BP America Inc. is a vertically integrated energy and petrochemical company incorporated in the State of Delaware with its headquarters and principal place of business in Houston, Texas. BP America Inc., consists of numerous

divisions and affiliates in all aspects of the fossil fuel industry, including exploration for and production of crude oil and natural gas; manufacture of petroleum products; and transportation, marketing, and sale of crude oil, natural gas, and petroleum products. BP America Inc. has been qualified to do business in Rhode Island. BP America Inc. was formerly known as, did or does business as, and/or is the successor in liability to BP Products North America Inc., Atlantic Richfield Company, BP Amoco Corporation, Amoco Corporation, Amoco Oil Company, The American Oil Company, BP Exploration & Oil Inc., Sohio Oil Company, Standard Oil of Ohio (SOHIO), Standard Oil (Indiana), BP Amoco Plc, BP Oil Inc., BP Oil Company, Atlantic Richfield Delaware Corporation, Atlantic Richfield Company (a Pennsylvania corporation), ARCO Products Company, and Arco Chemical Company, a division of Atlantic Richfield Company.

e. BP Products North America Inc. is a subsidiary of BP P.L.C. that acts on BP P.L.C.'s behalf and subject to BP P.L.C.'s control. BP Products North America Inc. is engaged in fossil fuel exploration, production, refining, and marketing. BP Products North America Inc. is incorporated in Maryland and has its principal office in Naperville, Illinois. BP Products North America Inc. qualified to do business in Rhode Island.

f. Defendants BP P.L.C., BP America, Inc., BP Products North America, Inc., and their predecessors, successors, parents, subsidiaries, affiliates, and divisions are collectively referred to herein as "BP."

g. BP directs and has directed substantial fossil fuel-related business to Rhode Island. A substantial portion of BP's fossil fuel products are or have been extracted, refined, transported, traded, distributed, marketed, promoted, manufactured, sold, and/or consumed in Rhode Island, from which BP derives and has derived substantial revenue. For example, BP predecessors-in-interest Arco and Amoco owned and operated a petroleum terminal at Kettle Point

in East Providence that began operating in the early 20th century. The terminal was used for fossil fuel product storage and marketing. BP is the current owner of the terminal property. Additionally, BP markets and/or has marketed gasoline and other fossil fuel products to consumers through BP- and Amoco-branded petroleum service stations in Rhode Island. BP owns and operates an interactive webpage that allow consumers to locate BP-branded gas stations in the state.

24. **Shell Entities**

a. Royal Dutch Shell PLC is a vertically integrated, multinational energy and petrochemical company. Royal Dutch Shell PLC is incorporated in England and Wales, with its headquarters and principle place of business in the Hague, Netherlands. Royal Dutch Shell PLC consists of over a thousand divisions, subsidiaries, and affiliates engaged in all aspects of the fossil fuel industry, including exploration, development, extraction, manufacturing, and energy production, transport, trading, marketing, and sales.

b. Royal Dutch Shell PLC controls and has controlled companywide decisions about the quantity and extent of fossil fuel production and sales, including those of its subsidiaries. Royal Dutch Shell PLC's Board of Directors in the Hague determines whether and to what extent Shell subsidiary holdings around the globe produce Shell-branded fossil fuel products. For instance, Royal Dutch Shell PLC's Board of Directors makes individual decisions on whether and when to initiate drilling in particular oil reserves.

c. Royal Dutch Shell PLC controls and has controlled companywide decisions related to climate change and greenhouse gas emissions from its fossil fuel products, including those of its subsidiaries. Overall accountability for climate change within the Shell group of companies lies with Royal Dutch Shell PLC's Chief Executive Officer and Executive Committee. Additionally, Royal Dutch Shell PLC has directed its subsidiaries to reduce the carbon footprint

of all fossil fuel products produced under the Shell brand, including those of its subsidiaries, and across all upstream and downstream segments of its operations.

d. Shell Oil Company is a wholly owned subsidiary of Royal Dutch Shell PLC that acts on Royal Dutch Shell PLC's behalf and subject to Royal Dutch Shell PLC's control. Shell Oil Company is incorporated in Delaware and with its principal place of business in Houston, Texas. Shell Oil Company is qualified to do business in Rhode Island. Shell Oil Company was formerly known as, did or does business as, and/or is the successor in liability to Deer Park Refining LP, Shell Oil, Shell Oil Products, Shell Chemical, Shell Trading US, Shell Trading (US) Company, Shell Energy Services, Texaco Inc., The Pennzoil Company, Shell Oil Products Company LLC, Shell Oil Products Company, Star Enterprise, LLC, Star Enterprise LLC, Pennzoil-Quaker State Company, and Motiva Enterprises LLC.

e. Motiva Enterprises LLC has refined and marketed and continues to refine and market Shell-branded products through approximately 8,300 Shell-branded petroleum service stations in the eastern and southern United States. Motiva Enterprises LLC is incorporated in Delaware with its principal place of business in Houston, Texas. Motiva Enterprises LLC is qualified to do business and is registered in Rhode Island as a petroleum product merchant. At times relevant to this Complaint, Motiva Enterprises LLC has been a wholly owned subsidiary of Royal Dutch Shell PLC that acts on Royal Dutch Shell PLC's behalf and subject to Royal Dutch Shell PLC's control.

f. Defendants Royal Dutch Shell PLC, Shell Oil Company, Motiva Enterprises LLC, and their predecessors, successors, parents, subsidiaries, affiliates, and divisions are collectively referred to as "Shell."

g. Shell directs and has directed substantial fossil fuel-related business to Rhode Island. A substantial portion of Shell's fossil fuel products are or have been extracted, refined, transported, traded, distributed, marketed, promoted, manufacturer, sold, and/or consumed in Rhode Island, from which Shell derives and has derived substantial revenue. For example, Shell until 2017 operated the largest capacity fossil fuel terminal in Rhode Island, at 520 Allens Avenue in Providence. The terminal was used for fossil fuel product storage, distribution, and sales. Additionally, Shell markets and/or has marketed gasoline and other fossil fuel products to consumers through Shell-branded petroleum service stations in Rhode Island. Shell owns and operates an interactive webpage that allows consumers to locate Shell-branded gas stations in the state.

25. **ConocoPhillips Entities**

a. ConocoPhillips is a multinational energy company incorporated in the State of Delaware and with its principal place of business in Houston, Texas. ConocoPhillips consists of numerous divisions, subsidiaries, and affiliates that carry out ConocoPhillips's fundamental decisions related to all aspects of the fossil fuel industry, including exploration, extraction, production, manufacture, transport, and marketing.

b. ConocoPhillips controls and has controlled companywide decisions about the quantity and extent of fossil fuel production and sales, including those of its subsidiaries. ConocoPhillips' most recent annual report subsumes the operations of the entire ConocoPhillips group of subsidiaries under its name. Therein, ConocoPhillips represents that its value—for which ConocoPhillips maintains ultimate responsibility—is a function of its decisions to direct subsidiaries to explore for and produce fossil fuels: "Unless we successfully add to our existing proved reserves, our future crude oil, bitumen, natural gas and natural gas liquids production will

decline, resulting in an adverse impact to our business." ConocoPhillips optimizes the ConocoPhillips group's oil and gas portfolio to fit ConocoPhillips' strategic plan. For example, in November 2016, ConocoPhillips announced a plan to generate $5 billion to $8 billion of proceeds over two years by optimizing its business portfolio, including its fossil fuel product business, to focus on low cost-of-supply fossil fuel production projects that strategically fit its development plans.

c. ConocoPhillips controls and has controlled companywide decisions related to global warming and greenhouse gas emissions from its fossil fuel products, including those of its subsidiaries. For instance, ConocoPhillips' Board has the highest level of direct responsibility for climate change policy within the company. ConocoPhillips has developed and implements a corporate Climate Change Action Plan to govern climate change decision-making across all entities in the ConocoPhillips group.

d. ConocoPhillips Company is a wholly owned subsidiary of ConocoPhillips that acts on ConocoPhillips' behalf and subject to ConocoPhillips' control. ConocoPhillips Company is incorporated in Delaware and has its principal office in Bartlesville, Oklahoma. ConocoPhillips Company is qualified to do business in Rhode Island and has a registered agent for service of process in Rhode Island.

e. Phillips 66 is a multinational energy and petrochemical company incorporated in Delaware and with its principal place of business in Houston, Texas. It encompasses downstream fossil fuel processing, refining, transport, and marketing segments that were formerly owned and/or controlled by ConocoPhillips.

f. Phillips 66 Company is a subsidiary of Phillips 66 that acts on Phillips 66's behalf and subject to Phillips 66's control. Phillips 66 Company is incorporated in Delaware and

has its principal office in Houston, Texas. Phillips 66 Company is qualified to do business in Rhode Island and has a registered agent for service of process in Rhode Island. Phillips 66 Company was formerly known as, did or does business as, and/or is the successor in liability to Phillips Petroleum Company, Conoco, Inc., Tosco Corporation, and Tosco Refining Co.

g. Defendants ConocoPhillips, ConocoPhillips Company, Phillips 66, Phillips 66 Company, and their predecessors, successors, parents, subsidiaries, affiliates, and divisions are collectively referred to herein as "ConocoPhillips."

h. ConocoPhillips transacts and has transacted substantial fossil fuel-related business in Rhode Island. A substantial portion of ConocoPhillips's fossil fuel products are or have been extracted, refined, transported, traded, distributed, promoted, marketed, manufactured, sold, and/or consumed in Rhode Island, from which ConocoPhillips derives and has derived substantial revenue. For instance, ConocoPhillips shipped gasoline manufactured at their refineries via common carrier pipelines intended to deliver gasoline to Petroleum Administration for Defense District 1, including Rhode Island.

26. **Citgo Petroleum Corporation**

a. Citgo Petroleum Corporation ("Citgo") is a direct, wholly owned subsidiary of PDV America, Incorporated, which is a wholly owned subsidiary of PDV Holding, Incorporated. These organizations' ultimate parent is Petróleos de Venezuela, S.A. ("PDVSA"), an entity wholly owned by the Republic of Venezuela that plans, coordinates, supervises, and controls activities carried out by its subsidiaries. Citgo is incorporated in the State of Delaware and maintains its headquarters in Houston, Texas. Citgo is qualified to do business in Rhode Island.

b. Citgo controls and has controlled companywide decisions about the quantity and extent of fossil fuel production and sales, including those of its subsidiaries.

c. Citgo controls and has controlled companywide decisions related to climate change and greenhouse gas emissions from its fossil fuel products, including those of its subsidiaries.

d. Citgo and its subsidiaries are engaged in refining, marketing, and transporting petroleum products, including gasoline, diesel fuel, jet fuel, petrochemicals, lubricants, asphalt, and refined waxes.

e. Citgo directs and has directed substantial fossil fuel-related business to Rhode Island. A substantial portion of Citgo's fossil fuel products are or have been extracted, refined, transported, traded, distributed, marketed, promoted, manufactured, sold, and/or consumed in Rhode Island, from which Citgo derives and has derived substantial revenue. For instance, Citgo has marketed, sold, and/or distributed heating oil in Rhode Island including through the CITGO – Venezuela Heating Oil program, a heating oil assistance program. Additionally, Citgo markets and/or has marketed gasoline and other fossil fuel products to consumers, including through Citgo-branded petroleum service stations in Rhode Island. Citgo owns and operates an interactive webpage that allows consumers to locate Citgo-branded gas stations in the state. Citgo also supplied gasoline to 7-Eleven gas stations located in Rhode Island.

27. **Marathon Entities**

a. Marathon Oil Company is an energy company incorporated in the State of Ohio with its principal place of business in Houston, Texas. Marathon Oil Company is a corporate ancestor of Marathon Oil Corporation and Marathon Petroleum Company.

b. Marathon Oil Corporation is a multinational energy company incorporated in the State of Delaware and with its principal place of business in Houston, Texas. Marathon Oil Corporation consists of multiple subsidiaries and affiliates involved in the exploration for, extraction, production, and marketing of fossil fuel products.

c. Marathon Petroleum Corporation is a multinational energy company incorporated in Delaware and with its principal place of business in Findlay, Ohio. Marathon Petroleum Corporation was spun off from the operations of Marathon Oil Corporation in 2011. It consists of multiple subsidiaries and affiliates involved in fossil fuel product refining, marketing, retail, and transport, including both petroleum and natural gas products.

d. Marathon Oil Corporation and Marathon Petroleum Corporation control and have controlled their companywide decisions about the quantity and extent of fossil fuel production and sales, including those of their subsidiaries.

e. Marathon Oil Corporation and Marathon Petroleum Corporation control and have controlled their companywide decisions about the quantity and extent of fossil fuel production, including those of their subsidiaries.

f. Marathon Petroleum Company LP is a wholly owned subsidiary of Marathon Petroleum Corporation that acts on Marathon Petroleum Corporation's behalf and subject to Marathon Petroleum Corporation's control. Marathon Petroleum Company LP is incorporated in Delaware with its principal place of business in Findlay, Ohio. Marathon Petroleum Company LP is qualified to do business in Rhode Island. Marathon Petroleum Company LP is engaged in the marketing of motor fuels and other refined products.

g. Speedway LLC is a wholly owned subsidiary of Marathon Petroleum Corporation that acts on Marathon Petroleum Corporation's behalf and subject to Marathon

Petroleum Corporation's control. Speedway LLC is incorporated in the State of Delaware with its principal place of business in Enon, Ohio. Speedway LLC is qualified to do business in Rhode Island and has a registered agent for service of process in Rhode Island.

h. Defendants Marathon Oil Company, Marathon Oil Corporation, Marathon Petroleum Corporation, Marathon Petroleum Company LP, Speedway LLC, and their predecessors, successors, parents, subsidiaries, affiliates, and divisions, are collectively referred to as "Marathon."

i. Marathon directs and has directed substantial fossil fuel-related business to Rhode Island. A substantial portion of Marathon's fossil fuel products are or have been extracted, refined, transported, traded, distributed, marketed, promoted, manufactured, sold, and/or consumed in Rhode Island, from which Marathon derives and has derived substantial revenue. For example, Marathon markets and/or has marketed gasoline and other fossil fuel products to consumers, including through Speedway-branded petroleum service stations in Rhode Island. Marathon owns and operates an interactive webpage that allow consumers to locate Speedway-branded gas stations in the state.

28. **Hess Corporation**

a. Hess Corporation ("Hess") is a global, vertically integrated petroleum exploration and extraction company incorporated in the State of Delaware with its headquarters and principal place of business in New York, New York. Hess is qualified to do business in Rhode Island and has a registered agent for service of process in Rhode Island. Hess was formerly known as, did or does business as, and/or is the successor in liability to Amerada Hess Corporation,

WilcoHess LLC, Hess Oil Virgin Islands Corporation, Hess Energy Trading Company, LLC, and Hartree Partners, LP.

b. Hess is engaged in the exploration, development, production, transportation, purchase, marketing, and sale of crude oil and natural gas. Its oil and gas production operations are located primarily in the United States, Denmark, Equatorial Guinea, Malaysia, Thailand, and Norway. Prior to 2014, Hess also conducted extensive retail operations in its own name and through its subsidiaries.

c. Hess controls and has controlled companywide decisions about the quantity and extent of fossil fuel production and sales, including those of its subsidiaries.

d. Hess controls and has controlled companywide decisions related to climate change and greenhouse gas emissions from its fossil fuel products, including those of its subsidiaries.

e. Hess directs and has directed substantial fossil fuel-related business to Rhode Island. A substantial portion of Hess's fossil fuel products are or have been extracted, refined, transported, traded, distributed, marketed, promoted, manufactured, sold, and/or consumed in Rhode Island, from which Hess derives and has derived substantial revenue. For example, Hess markets and/or has marketed gasoline and other fossil fuel products to consumers, including through Hess-branded petroleum service stations in Rhode Island.

29. **Lukoil Pan Americas, LLC**

a. Lukoil Pan Americas, LLC ("Lukoil") is a global, vertically integrated petroleum exploration and extraction company incorporated in the State of Delaware with its

headquarters and principal place of business in New York, New York. Lukoil is qualified to do business in Rhode Island and has a registered agent for service of process in Rhode Island.

b. Lukoil is engaged in the exploration, development, production, transportation, purchase, marketing, and sale of crude oil and natural gas; gas processing; oil refining; generation, transmission and distribution of heat and power; and manufacturing and marketing of commodity petrochemicals. Lukoil is the ultimate parent company for numerous subsidiaries.

c. Lukoil controls and has controlled companywide decisions about the quantity and extent of fossil fuel production and sales, including those of its subsidiaries.

d. Lukoil controls and has controlled companywide decisions related to climate change and greenhouse gas emissions from its fossil fuel products, including those of its subsidiaries.

e. Lukoil directs and has directed substantial fossil fuel-related business to Rhode Island. A substantial portion of Lukoil's fossil fuel products are or have been extracted, refined, transported, traded, distributed, marketed, promoted, manufactured, sold, and/or consumed in Rhode Island, from which Lukoil derives and has derived substantial revenue. For example, Lukoil markets and/or has marketed gasoline and other fossil fuel products to consumers, including through Lukoil-branded petroleum service stations in Rhode Island.

f. Getty Petroleum Marketing, Inc. markets and/or marketed gasoline and petroleum products. Getty Petroleum Marketing Inc. is registered in Rhode Island as a non-resident landlord, as the owner of at least one gas station located at 7780 Post Road, North Kingstown, Rhode Island. At times relevant to this Complaint, Getty Petroleum Marketing, Inc. has been a wholly owned subsidiary of Lukoil that acted on Lukoil's behalf and subject to Lukoil's control.

During that time, Getty Petroleum Marketing leased a pipeline at the East Providence Terminal in Rhode Island.

30. **Doe Defendants:** The true names and capacities, whether individual, corporate, associate, or otherwise of Defendants Does 1 through 100, inclusive, are unknown to Plaintiff, who therefore sues said Defendants by such fictitious names pursuant to R.I. Gen. Laws § 9-5-20. Plaintiff is informed and believes, and on that basis alleges, that each of the fictitiously named Defendants is responsible in some manner for the acts and occurrences herein alleged, and that Plaintiff's damages were caused by such Defendants.

31. **Relevant Non-Parties: Fossil Fuel Industry Associations:** As set forth in greater detail below, each Defendant had actual knowledge that its fossil fuel products were hazardous. Defendants obtained knowledge of the hazards of their products independently and through their membership and involvement in trade associations.

32. Each Defendant's fossil fuel promotion and marketing efforts were assisted by the trade associations described below. Acting on behalf of the Defendants, the industry associations engaged in a long-term course of conduct to misrepresent, omit, and conceal the dangers of Defendants' fossil fuel products.

a. **The American Petroleum Institute (API)**: API is a national trade association representing the oil and gas industry, formed in 1919. The following Defendants and/or their predecessors in interest are and/or have been API members at times relevant to this litigation: Chevron, ExxonMobil, BP, Shell, Total, Marathon, and Hess.[10]

[10] American Petroleum Institute, *Members* (webpage) (accessed June 18, 2018), http://www.api.org/membership/members.

b. **The Western States Petroleum Association (WSPA)**: WSPA is a trade association representing oil producers in Arizona, California, Nevada, Oregon, and Washington.[11] Membership has included, among other entities: BP, Chevron, Shell, and ExxonMobil.[12]

c. **The American Fuel and Petrochemical Manufacturers (AFPM)** is a national association of petroleum and petrochemical companies, formerly known as the National Petroleum Refiners Association. At relevant times, its members included, but were not limited to, Chevron, Exxon, BP, Shell, Citgo, Total, and Marathon.[13]

d. **U.S. Oil & Gas Association (USOGA)** is a national trade association representing oil and gas producers, formerly known as the Mid-Continent Oil & Gas Association. USOGA's membership has included BP, Chevron, Citgo, Exxon, Shell, Marathon, and Hess.[14]

e. **Western Oil & Gas Association (WOGA)** was a California nonprofit trade association representing the oil and gas industries, consisting of over 75 member companies. Its members included companies and individual responsible for more than 65% of petroleum production and 90% of petroleum refining and marketing

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[11] Western States Petroleum Association, *About* (webpage) (accessed June 18, 2018), https://www.wspa.org/about.

[12] Western States Petroleum Association, *Member Companies* (webpage) (accessed June 27, 2018), https://www.wspa.org/about.

[13] American Fuel and Petrochemical Manufacturers, *Membership Directory* (webpage) (accessed June 18, 2018), https://www.afpm.org/membership-directory.

[14] *See, e.g.*, Louisiana Mid-Continent Oil & Gas Association, *Member Companies* (webpage) (accessed June 18, 2018), http://www.lmoga.com/members/member-companies. USOGA's membership is divided among its four subsidiary divisions.

in the Western United States.[15] WOGA membership likely included, but was not limited to, defendants Chevron, Exxon, and Shell.[16] Other fossil fuel company members of WOGA may have included, but were not limited to ConocoPhillips, Champlin Petroleum Company (Anadarko)[17] and Reserve Oil & Gas Company.[18]

f. **The Information Council for the Environment (ICE)**: ICE was formed by coal companies and their allies, including Western Fuels Association and the National Coal Association. Associated companies included Pittsburg and Midway Coal Mining (Chevron).

g. **The Global Climate Coalition (GCC)**: GCC was an industry group formed to oppose greenhouse gas emission reduction policies and the Kyoto Protocol. It was founded in 1989 shortly after the first Intergovernmental Panel on Climate Change meeting was held, and disbanded in 2001. Founding members included the National Association of Manufacturers, the National Coal Association, the Edison Electric Institute, and the United States Chamber of Commerce. The GCC's early individual corporate members included Amoco (BP), API, Chevron, Exxon, Ford, Shell, and Texaco (Chevron). Over its existence other members and funders included ARCO (BP), and the Western Fuels Association. The coalition also operated for several years out of the National Association of Manufacturers' offices.

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[15] *Am. Petroleum Inst. v. Knecht*, 456 F. Supp. 889, 894 n.2 (C.D. Cal. 1978), *aff'd*, 609 F.2d 1306 (9th Cir. 1979).

[16] *See id.* at 894 n.3.

[17] Hereinafter, parenthetical references to Defendants indicate corporate ancestry and/or affiliation.

[18] *See Am. Petroleum Inst.*, *supra* note 15, 456 F. Supp. at 894 n.3.

III. AGENCY

33. At all times herein mentioned, each of the Defendants was the agent, servant, partner, aider and abettor, co-conspirator, and/or joint venturer of each of the remaining Defendants herein and was at all times operating and acting within the purpose and scope of said agency, service, employment, partnership, conspiracy, and joint venture and rendered substantial assistance and encouragement to the other Defendants, knowing that their conduct was wrongful and/or constituted a breach of duty.

IV. JURISDICTION AND VENUE

34. Each Defendant named here maintains sufficient minimum contacts with Rhode Island, as described above, such that this Court's exercise of jurisdiction over it is not contrary to the provisions of the constitution or laws of the United States, and this Court therefore has jurisdiction pursuant to R.I. Gen. Laws § 9-5-33.

35. The Providence County Superior Court is a court of general jurisdiction and therefore has subject matter jurisdiction over this action. Because the amount in controversy exceeds $10,000, this Court has exclusive original jurisdiction pursuant to R.I. Gen. Laws §8-2-14(a).

36. Venue is proper in Providence County pursuant to R.I. Gen. Laws § 9-4-2 because this matter concerns rights and interests in real property lying within this County; and pursuant to R.I. Gen. Laws § 9-4-5 because some of the Defendants maintain operations and may be found in this County.

V. FACTUAL BACKGROUND

A. Global Warming—Observed Effects and Known Cause

37. Warming of the climate system is unequivocal, and since the 1950s, many of the observed changes to the climate system are unprecedented over decades to millennia. Globally,

the atmosphere and ocean have warmed, sea level has risen, and the amounts of snow and ice have diminished, thereby altering hydrologic systems.[19] As a result, extreme weather events have increased, including, but not limited to, heat waves, droughts, and extreme precipitation events.[20]

38. Ocean and land surface temperatures have increased at a rapid pace during the late 20th and early 21st centuries:

a. 2016 was the hottest year on record by globally averaged surface temperatures, exceeding mid-20th century mean ocean and land surface temperatures by approximately 1.69°F.[21] Eight of the twelve months in 2016 were hotter by globally averaged surface temperatures than those respective months in any previous year. October, November, and December 2016 showed the second hottest average surface temperatures for those months, second only to temperatures recorded in 2015.[22]

b. The Earth's hottest month ever recorded was February 2016, followed immediately by the second hottest month on record, March 2016.[23]

c. The second hottest year on record by globally averaged surface temperatures was 2015, and the third hottest was 2017.[24]

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[19] IPCC, *Climate Change 2014: Synthesis Report*, *supra* note 3, at 40.

[20] *Id.* at 8.

[21] NOAA, *Global Climate Report – Annual 2017*, https://www.ncdc.noaa.gov/sotc/global/201713; NASA, "NASA, NOAA Data Show 2016 Warmest Year on Record Globally" (press release) (Jan. 18, 2017), https://www.nasa.gov/press-release/nasa-noaa-data-show-2016-warmest-year-on-record-globally.

[22] *Id.*

[23] Jugal K. Patel, "How 2016 Became Earth's Hottest Year on Record," N.Y. TIMES (Jan. 18, 2017), https://www.nytimes.com/interactive/2017/01/18/science/earth/2016-hottest-year-on-record.html.

[24] NOAA, *Global Climate Report – Annual 2017*, *supra* note 21.

d. The ten hottest years on record by globally averaged surface temperature have all occurred since 1998,[25] and sixteen of the seventeen hottest years have occurred since 2001.[26]

e. Each of the past three decades has been warmer by average surface temperature than any preceding decade on record.[27]

f. The period between 1983 and 2012 was likely the warmest 30-year period in the Northern Hemisphere since approximately 700 AD.[28]

39. The average global surface and ocean temperature in 2016 was approximately 1.7°F warmer than the 20th century baseline, which is the greatest positive anomaly observed since at least 1880.[29] The increase in hotter temperatures and more frequent positive anomalies during the Great Acceleration is occurring both globally and locally, including in Rhode Island. The graph below shows the increase in global land and ocean temperature anomalies since 1880, as measured against the 1910–2000 global average temperature.[30]

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[25] *Id.*

[26] NASA, "NASA, NOAA Data Show 2016 Warmest Year on Record Globally" (press release) (Jan. 18, 2017), https://www.nasa.gov/press-release/nasa-noaa-data-show-2016-warmest-year-on-record-globally.

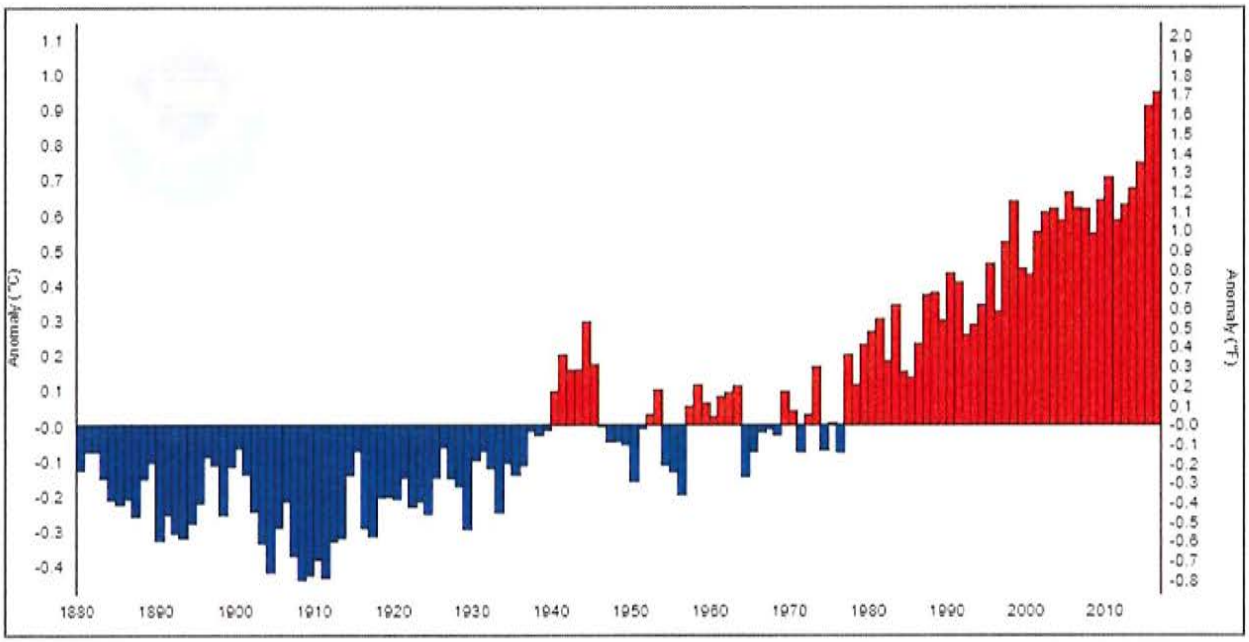
[27] *IPCC Climate Change 2014: Synthesis Report*, *supra* note 3, 2.

[28] *Id.*

[29] NOAA, National Centers for Environmental Information, *Climate at a Glance (Global Time Series)* (June 2017), https://www.ncdc.noaa.gov/cag/time-series/global/globe/land_ocean/ytd/12/1880-2016.

[30] *Id.*

Fig. 1: Global Land and Ocean Temperature Anomalies, January – December



40. The mechanism by which human activity causes global warming and climate change is well established: ocean and atmospheric warming is overwhelmingly caused by anthropogenic greenhouse gas emissions.[31]

41. When emitted, greenhouse gases trap heat within the Earth's atmosphere that would otherwise radiate into space.

42. Greenhouse gases are largely byproducts of humans combusting fossil fuels to produce energy and using fossil fuels to create petrochemical products.

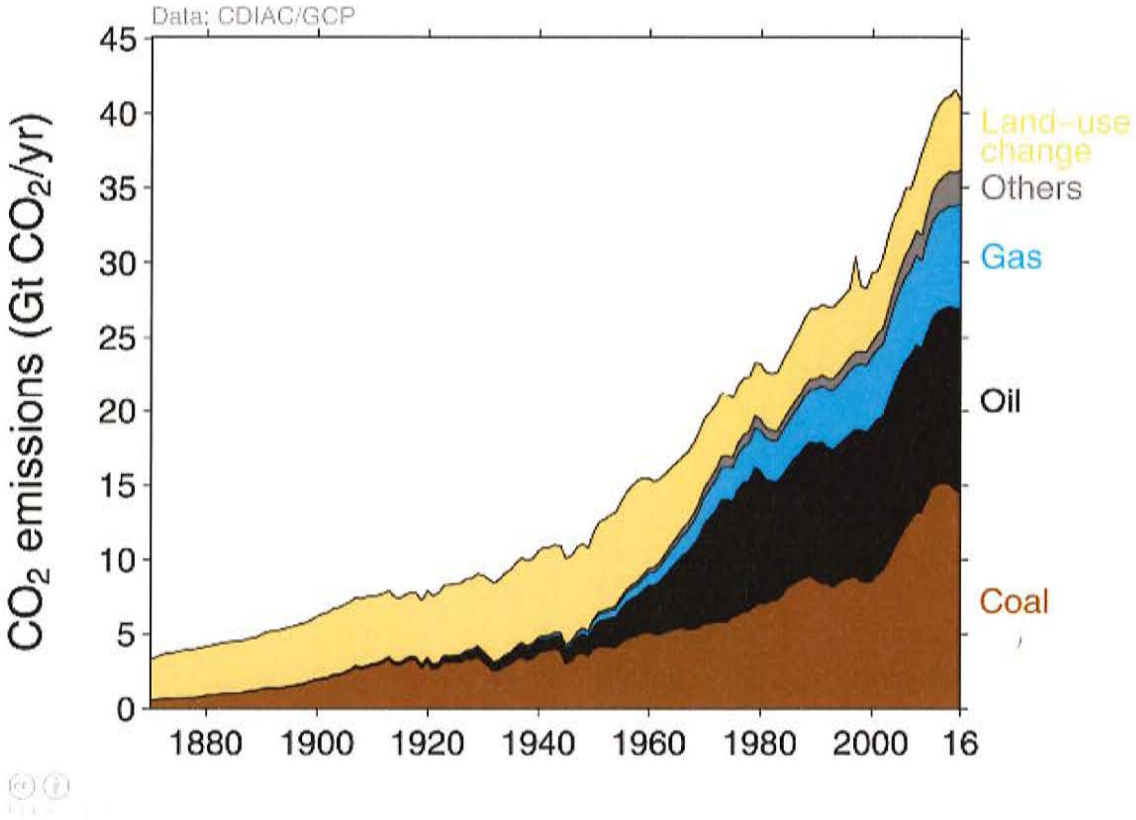
43. Human activity, particularly greenhouse gas emissions, is the primary cause of global warming and its associated effects on Earth's climate.

44. Prior to World War II, most anthropogenic CO_2 emissions were caused by land-use practices, such as forestry and agriculture, which altered the ability of the land and global biosphere

[31] IPCC, *Climate Change 2014: Synthesis Report*, supra note 3, at 4.

to absorb CO_2 from the atmosphere; the impacts of such activities on Earth's climate were relatively minor. Since the beginning of the Great Acceleration, however, both the annual rate and total volume of anthropogenic CO_2 emissions have increased enormously following the advent of major uses of oil, gas, and coal. The graph below shows that while CO_2 emissions attributable to forestry and other land-use change have remained relatively constant, total emissions attributable to fossil fuels have increased dramatically since the 1950s.[32]

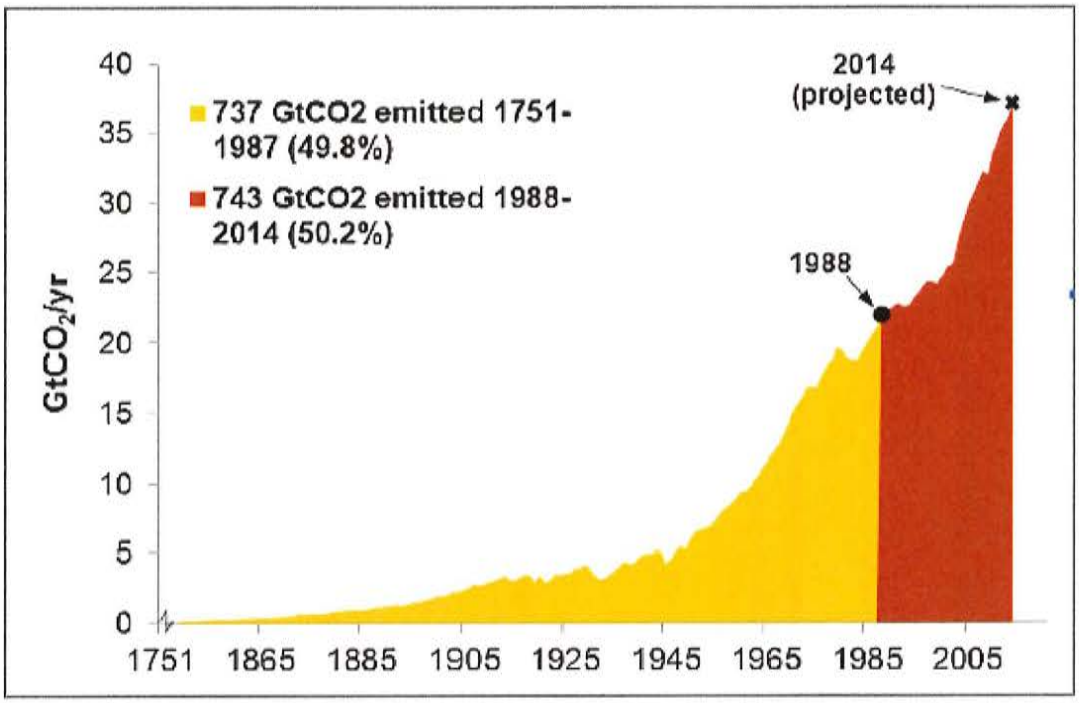
Fig. 2: Total Annual Carbon Dioxide Emissions by Source, 1860–2016



[32] Global Carbon Project, Global Carbon Budget 2017 (Nov. 13, 2017), http://www.globalcarbonproject.org/carbonbudget/17/files/GCP_CarbonBudget_2017.pdf (*citing* CDIAC; R.A. Houghton & Alexander A. Nassikas, *Global and Regional Fluxes of Carbon from Land Use and Land Cover Change 1850–2015*, 31 GLOBAL BIOCHEMICAL CYCLES 3, 456 (Feb. 2017)).

45. As human reliance on fossil fuels for industrial and mechanical processes has increased, so too have greenhouse gas emissions, especially of CO_2. The Great Acceleration is marked by a massive increase in the annual rate of fossil fuel emissions: more than half of all cumulative CO_2 emissions have occurred since 1988.[33] The rate of CO_2 emissions from fossil fuels and industry, moreover, has increased threefold since the 1960s, and by more than 60% since 1990.[34] The graph below illustrates the increasing rate of global CO_2 emissions since the industrial era began.[35]

Fig. 3: Cumulative Annual Anthropogenic Carbon Dioxide Emissions, 1751–2014



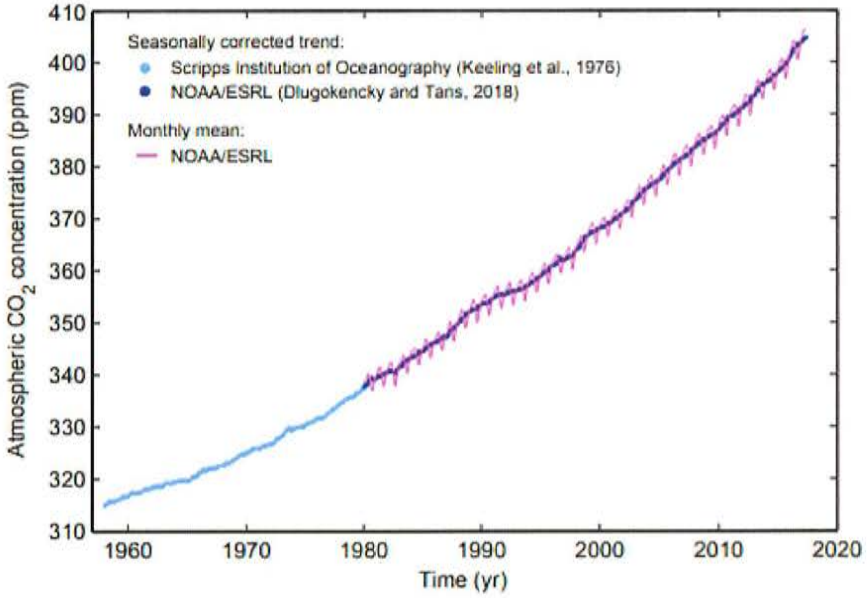
[33] R. J. Andres et al., *supra* note 6, at 1851.

[34] C. Le Quéré et al., *supra* note 4, at 630 ("Global CO_2 emissions from fossil fuels and industry have increased every decade from an average of 3.1±0.2 GtC/yr in the 1960s to an average of 9.3±0.5 GtC/yr during 2006–2015.").

[35] Peter Frumhoff et al., *The Climate Responsibilities of Industrial Carbon Producers*, 132 CLIMATIC CHANGE 157, 164 (2015).

46. Because of the increased use of fossil fuel products, concentrations of greenhouse gases in the atmosphere are now at a level unprecedented in at least 800,000 years.[36] The graph below illustrates the nearly 30% increase in atmospheric CO_2 concentration above pre-Industrial levels since 1960.[37]

Fig. 4: Atmospheric Carbon Dioxide Concentration in Parts Per Million, 1960–2017



B. Sea Level Rise—Known Causes and Observed Effects

47. Sea level rise is the physical consequence of (a) the thermal expansion of ocean waters as they warm; (b) increased mass loss from land-based glaciers that are melting as ambient air temperature increases; and (c) the shrinking of land-based ice sheets due to increasing ocean

[36] IPCC, *Climate Change 2014: Synthesis Report*, *supra* note 3, at 4.

[37] C. Le Quéré et al., *Global Carbon Budget 2017*, 10 EARTH SYST. SCI. DATA 405, 408 (Mar. 2018)).

and air temperature.[38]

48. Of the increase in energy that has accumulated in the Earth's atmosphere between 1971 and 2010, more than 90% is stored in the oceans.[39]

49. Anthropogenic forcing, in the form of greenhouse gas pollution largely from the production, use, and combustion of fossil fuel products, is the dominant cause of global mean sea level rise since 1970, explaining at least 70% of the sea level rise observed between 1970 and 2000.[40] Natural radiative forcing—that is, causes of climate change not related to human activity—"makes essentially zero contribution [to observed sea level rise] over the twentieth century (2% over the period 1900–2005)."[41]

50. Anthropogenic greenhouse gas pollution is the dominant factor in each of the independent causes of sea level rise, including the increase in ocean thermal expansion,[42] in glacier mass loss, and in more negative surface mass balance from the ice sheets.[43]

51. There is a well-defined relation between cumulative emissions of CO_2 and committed global mean sea level. This relation, moreover, holds proportionately for committed regional sea level rise.[44]

52. Nearly 100% of the sea level rise from any projected greenhouse gas emissions

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[38] NOAA, *Is Sea Level Rising?* (webpage) (last updated June 25, 2018), http://oceanservice.noaa.gov/facts/sealevel.html.

[39] IPCC, *Climate Change 2014: Synthesis Report*, *supra* note 3, at 4.

[40] Aimée B. A. Slangen, et al., *Anthropogenic Forcing Dominates Global Mean Sea-Level Rise Since 1970*, 6 NATURE CLIMATE CHANGE 701, 701 (2016).

[41] *Id.*

[42] *Id.*

[43] *Id.*

[44] Peter U. Clark, et al., *Consequences of Twenty-First-Century Policy for Multi-Millennial Climate and Sea-Level Change*, 6 NATURE CLIMATE CHANGE 360, 365 (2016).

scenario will persist for at least 10,000 years.[45] This owes to the long residence time of CO_2 in the atmosphere that sustains temperature increases, and inertia in the climate system.[46]

53. Anthropogenic greenhouse gas pollution caused the increased frequency and severity of extreme sea level events (temporary sea level height increases due to storm surges or extreme tides, exacerbated by elevated baseline sea level) observed during the Great Acceleration.[47] The incidence and magnitude of extreme sea level events has increased globally since 1970.[48] The impacts of such events, which generally occur with large storms, high tidal events, offshore low-pressure systems associated with high winds, or the confluence of any of these factors,[49] are exacerbated with higher average sea level, which functionally raises the baseline for the destructive impact of extreme weather and tidal events. Indeed, the magnitude and frequency of extreme sea level events can occur in the absence of increased intensity of storm events, given the increased average elevation from which flooding and inundation events begin. These effects, and others, significantly and adversely affect Rhode Island, with increased severity in the future.

54. Historical greenhouse gas emissions alone through 2000 will cause a global mean sea level rise of at least 7.4 feet.[50] Additional greenhouse gas emissions from 2001–2015 have caused approximately 10 additional feet of committed sea level rise. Even immediate and

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[45] *Id.* at 361.

[46] *Id.* at 360.

[47] IPCC, *Climate Change 2013: Summary for Policymakers*, 7 Table SPM.1 (2013), https://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WGIAR5_SPM_brochure_en.pdf.

[48] IPCC, Thomas F. Stocker et al., *Climate Change 2013: The Physical Science Basis*, Intergovernmental Panel on Climate Change, Cambridge University Press, 290 (2013), http://www.ipcc.ch/report/ar5/wg1.

[49] *Id.*

[50] Peter U. Clark et al., *supra* note 44, at 365.

permanent cessation of all additional anthropogenic greenhouse gas emissions would not prevent the eventual inundation of land at elevations between current average mean sea level and 17.4 feet of elevation in the absence of adaptive measures.

55. The relationship between anthropogenic CO_2 emissions and committed sea level rise is nearly linear and always positive. For emissions, including future emissions, from the year 2001, the relation is approximately 0.25 inches of committed sea level rise per 1 $GtCO_2$ released. For the period 1965 to 2000, the relation is approximately 0.05 inches of committed sea level rose per 1 $GtCO_2$ released. For the period 1965 to 2015, normal use of Defendants' fossil fuel products caused a substantial portion of committed sea level rise. Each and every additional unit of CO_2 emitted from the use of Defendants' fossil fuel products will add to the sea level rise already committed to the geophysical system.

56. Projected onshore impacts associated with rising sea temperature and water level include, but are not limited to, increases in flooding and erosion; increases in the occurrence, persistence, and severity of storm surges; infrastructure inundation; saltwater intrusion in groundwater; public and private property damage; and pollution associated with damaged wastewater infrastructure. All of these effects significantly and adversely affect Rhode Island.

57. Sea level rise has already taken grave tolls on inhabited coastlines. For instance, the U.S. National Oceanic and Atmospheric Administration ("NOAA") estimates that nuisance flooding occurs from 300% to 900% more frequently within U.S. coastal communities today than just 50 years ago.[51]

58. Nationwide, more than three quarters (76%) of flood days caused by high water levels from sea level rise between 2005 and 2014 (2,505 of the 3,291 flood days) would not have

[51] NOAA, *Is Sea Level Rising?*, *supra* note 38.

happened but for human-caused climate change. More than two-thirds (67%) of flood days since 1950 would not have happened without the sea level rise caused by increasing greenhouse gas emissions.[52]

59. Regional expressions of sea level rise will differ from the global mean, and are especially influenced by changes in ocean and atmospheric dynamics, as well as the gravitational, deformational, and rotational effects of the loss of glaciers and ice sheets.[53] Over the past half century, sea levels in the Northeast have been increasing 3 to 4 times faster than the global average rate.[54] Rhode Island is experiencing and will continue to experience greater sea level rise than the global average, due to several factors including changes in ocean circulation as a result of climate change and land subsistence.[55]

60. Rhode Island has experienced over 10 inches of sea level rise since 1930, averaging over an inch per decade.[56] The mean annual rate of sea level rise has increased in recent decades and will continue to rise significantly. According to NOAA, Rhode Island could experience 9 feet of sea level rise by 2100, along with substantial increase in the frequency of nuisance tidal flooding.[57]

61. Rhode Island's topography, geography, and land use patterns make it particularly susceptible to injuries from sea level rise. Rhode Island has substantial public assets in 21 coastal

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[52] Climate Central, *Sea Level Rise Upping Ante on 'Sunny Day' Floods* (Oct. 17, 2016), http://www.climatecentral.org/news/climate-change-increases-sunny-day-floods-20784.

[53] Peter U. Clark et al., *supra* note 44, at 364.

[54] Rhode Island Sea Grant et al., *Sea Level Rise in Rhode Island: Trends and Impacts,* 2 (Jan 2013) http://www.beachsamp.org/wp-content/uploads/2016/09/climate_SLR_factsheet2013.pdf

[55] Rhode Island Department of Health, *Rhode Island Climate Change and Resiliency Report*, 10 (2015), http://health.ri.gov/publications/reports/ClimateChangeAndHealthResiliency.pdf.

[56] *Resilient Rhody: Statewide Climate Resilience Action Strategy*, 12 (July 2018).

[57] *Id.*

municipalities along its 400 miles of coastline.[58] Twenty Rhode Island municipalities have acreage lying below the floodplain.[59]

62. Without Defendants' fossil fuel-related greenhouse gas pollution, current sea level rise would have been far less than the observed sea level rise to date.[60] Similarly, committed sea level rise that will occur in the future would also be far less.[61]

C. Warming Air Temperatures—Known Causes and Observed Effects

63. Carbon dioxide and other greenhouse gases are impairing the radiation of heat back into the atmosphere. This is slowly driving up temperatures, especially nighttime lows, as the concentration of greenhouse gases thickens.[62]

64. As the Earth's surface temperature warms, there is not only an overall increase in average temperature but also in frequency of extremely warm temperatures, corresponding with a decrease in frequency of extremely cold temperatures. The following graph illustrates the statistical shift in expected average and extreme temperatures due to anthropogenic global warming.[63]

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[58] Final Report: "Special House Commission to Study Economic Risk Due to Flooding and Sea Level Rise," 6, 32 (May 12, 2016), http://www.rilin.state.ri.us/commissions/fsrcomm/commdocs/20160512%20Economic%20Risk%20Due%20to%20Flooding%20and%20Sea%20Level%20Rise%20-%20final.pdf.

[59] *Id.* at 6.

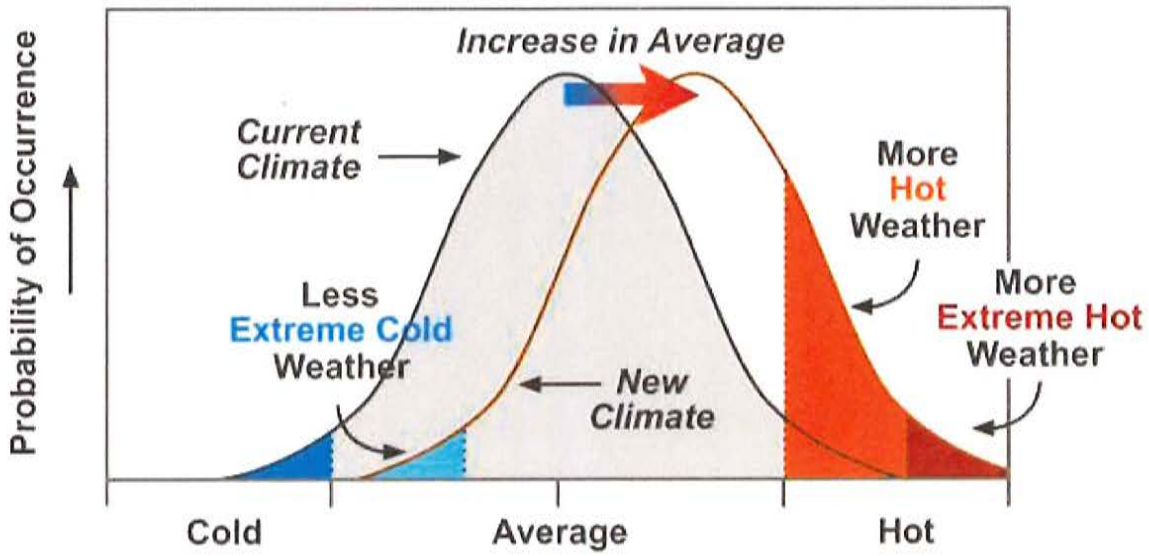
[60] Robert E. Kopp et al., *Temperature-driven Global Sea-level Variability in the Common Era*, 113 PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES, No. 11, E1434-E1441, E1438 (2016), http://www.pnas.org/content/113/11/E1434.full.

[61] Peter U. Clark et al., *supra* note 44, at 365.

[62] IPCC, Thomas F. Stocker et al., *Climate Change 2013: The Physical Science Basis*, *supra* note 48.

[63] IPCC, *Fourth Assessment Report: Climate Change 2007: Working Group I: The Physical Science*, Basis Box TS.5, Figure 1, https://www.ipcc.ch/publications_and_data/ar4/wg1/en/box-ts-5-figure-1.html.

Fig. 5: Effect of Mean Temperature on Extreme Temperature Occurrence



65. Record-breaking high temperatures are now outnumbering record lows by an average decadal ratio of 2:1 across the United States.[64] This represents an increase from approximately 1.09 high temperature records for every one low temperature record in the 1950s, and 1.36 high temperature records for every one low temperature record in the 1990s.[65]

66. Rhode Island has already begun experiencing a substantial increase in extreme heat days. As the figure below shows, 1950s and 1960s, an average summer included 54 days with a heat index above 80 degrees. By the 1990s and 2000s, that average had climbed to nearly 64 days. In 2010 through 2014, that number rose to 71 days above 80 degrees.[66]

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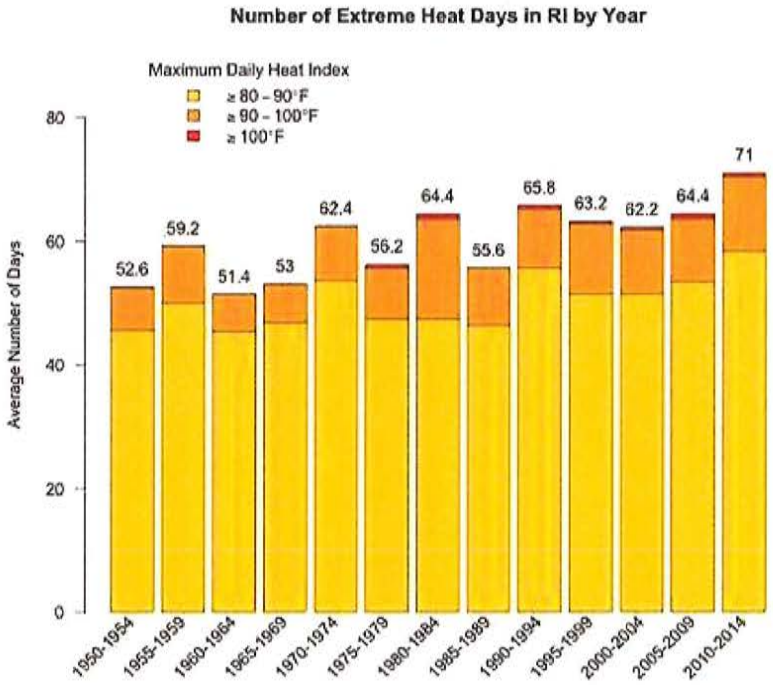
[64] Gerald A. Meehl et al., *Relative Increase of Record High Maximum Temperatures Compared to Record Low Minimum Temperatures in the U.S.*, GEOPHYSICAL RESEARCH LETTERS, L23701 at 3 (2009).

[65] *See* Climate Signals, *Record High Temps vs. Record Low Temps* (last accessed June 27, 2018), http://www.climatesignals.org/data/record-high-temps-vs-record-low-temps.

[66] "Number of 80°-plus days rising steadily in RI," BROWN UNIVERSITY NEWS (Sept. 8, 2015), https://news.brown.edu/articles/2015/09/temperature.

Fig. 6: Number of Extreme Heat Days Per Year in Rhode Island, 1950–2014



Melissa Eliot/Brown University

67. Heatwaves are prolonged periods with excessive ambient temperatures, often (but not necessarily) defined with reference to historical temperatures at a given locale. Since as early as the 1950s, increases in the duration, intensity, and especially the frequency of heatwaves have been detected over many regions,[67] including the eastern United States.[68]

68. With future emissions, the annual average number of extreme heat days and heat waves will continue to increase substantially. For instance, under a moderate rising emissions scenario, the ratio of record high maximum to record low minimum temperatures in the United

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[67] S.E. Perkins-Kirkpatrick & P.B. Gibson, *Changes in Regional Heatwave Characteristics as a Function of Increasing Global Temperature*, SCIENTIFIC REPORTS, 7:12256, 1 (2017).

[68] Noah. S. Diffenbaugh & Moestasim Ashfaq, *Intensification of Hot Extremes in the United States*, 37 GEOPHYSICAL RESEARCH LETTERS L15701 (2010).

States will continue to increase, reaching ratios of about 20:1 by 2050, and roughly 50:1 by 2100.[69] Even under a pathway of lower greenhouse gas emissions, average annual temperatures are projected to most likely exceed historical record levels by the middle of the 21st century.[70]

69. Because of Rhode Island's urban infrastructure, increased temperatures will add to the heat load of buildings and exacerbate existing urban heat islands, adding to the risks of high ambient temperatures.

D. Disruption to the Hydrologic Cycle—Known Causes and Observed Effects

70. The "hydrologic cycle" describes the temporal and spatial movement of water through oceans, land, and the atmosphere.[71] "Evapotranspiration" is the process by which water on the Earth's surface turns to vapor and is absorbed into the atmosphere. The vast majority of evapotranspiration is due to the sun's energy heating water molecules, resulting in evaporation.[72] Plants also draw water into the atmosphere from soil through transpiration. Volcanoes, sublimation (the process by which solid water changes to water vapor), and human activity also contribute to atmospheric moisture.[73] As water vapor rises through the atmosphere and reaches cooler air, it becomes more likely to condense and fall back to Earth as precipitation.

71. Upon reaching Earth's surface as precipitation, water may take several different paths. It can be reevaporated into the atmosphere; seep into the ground as soil moisture or

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[69] Gerald A. Meehl et al., *supra* note 64, at 3.

[70] NOAA, National Centers for Environmental Information, *Climate at a Glance (Global Time Series)* (June 2017), https://www.ncdc.noaa.gov/cag/time-series/global/globe/land_ocean/ytd/12/1880-2016.

[71] NASA Earth Observatory, *The Water Cycle*, (webpage) (accessed June 27, 2018), https://earthobservatory.nasa.gov/Features/Water/page1.php.

[72] See USGS, *The Water Cycle: Evaporation* (webpage) (accessed June 27, 2018), https://water.usgs.gov/edu/watercycleevaporation.html.

[73] NASA Earth Observatory, *The Water Cycle*, *supra* note 71.

groundwater; run off into rivers and streams; or stop temporarily as snowpack or ice. It is during these phases, when water is available at or near the Earth's surface, that water is captured for use by humans.

72. Anthropogenic global warming caused by Defendants' fossil fuel products is disrupting and will continue to disrupt the hydrologic cycle in Rhode Island by changing evapotranspiration patterns.[74] As the lower atmosphere becomes warmer, evaporation rates have and will continue to increase, resulting in an increase in the amount of moisture circulating throughout the lower atmosphere. As the Earth's surface temperature has increased, so has evaporation.[75] For every 1.8°F of anthropogenic global warming, the atmosphere's capacity to hold water vapor increases by 7%.[76] Thus, anthropogenic global warming has increased substantially the total volume of water vapor in the atmosphere at any given time.[77]

73. An observed consequence of higher water vapor concentrations is a shift toward increased frequency of intense precipitation events, mainly over land areas. Furthermore, because of warmer temperatures, more precipitation is falling as rain rather than snow. These changes affect both the quantity and quality of water resources available to both human and ecological systems, including in Rhode Island.

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[74] *Id.*

[75] *Id.*

[76] IPCC, Thomas F. Stocker et al., *Climate Change 2013: The Physical Science Basis*, *supra* note 48.

[77] NASA Earth Observatory, *The Water Cycle*, *supra* note 71.

74. As a result of anthropogenic climate change, Rhode Island has experienced and will experience increased precipitation extremes, leading to both increased frequency of intense precipitation events and extremely dry periods.[78]

i. Extreme Precipitation

75. Global warming has contributed and will contribute to more intense and wetter precipitation events, now and into the future. Average annual precipitation in Providence, Rhode Island, has increased by 0.4 inches per decade since 1895.[79] Intense rainfall events (heaviest 1% of all daily events from 1901 to 2012 in New England) increased 71% between 1958 and 2000.[80] Climate models project that annual precipitation will continue to increase by up to three inches per decade locally and that more precipitation will fall during intense storms.[81]

76. Over the past 80 years, Rhode Island has experienced a significant increase in both flood frequency and flood severity. Along with most of southern New England, the State has experienced a doubling of the frequency of flooding and an increase in the magnitude of flood events.[82] Rhode Island experienced more extreme precipitation events between 2005 and 2014 than any prior decade in the State's history.[83]

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[78] SafeWater RI, *Ensuring Water for Rhode Island's Future*, 11 (July 2013), http://www.health.ri.gov/publications/reports/2013EnsuringSafeWaterForRhodeIslandsFuture.pdf.

[79] Radley Horton et al., CLIMATE CHANGE IMPACTS IN THE UNITED STATES, Ch. 16: *Northeast* 373 (2014), http://s3.amazonaws.com/nca2014/low/NCA3_Full_Report_16_Northeast_LowRes.pdf.

[80] *Id.*

[81] Narragansett Bay Estuary Program, *State of Narragansett Bay and Its Watershed Summary Report*, 21 (2017), http://nbep.org/01/wp-content/uploads/2017/10/State-of-Narragansett-Bay-and-Its-Watershed-Summary-Report.pdf.

[82] *Resilient Rhody: Statewide Climate Resilience Action Strategy*, *supra* note 56, at 15.

[83] NOAA National Centers for Environmental Information, *State Summaries 149-RI, "Rhode Island,"* 1 (2017), http://climatechange.ri.gov/documents/noaa-climate-rhode-island-state-summary.pdf.

77. Due to anthropogenic climate change, seasonality of precipitation will shift so that more precipitation occurs during winter, as rain, and less during summer.[84]

78. Tropical cyclone rainfall rates will increase in the future due to anthropogenic warming and accompanying increase in atmospheric moisture content. Models project an increase on the order of 10–15% for rainfall rates averaged within about 100 km of the storm for a 2°C global warming scenario. The intensity of tropical cyclones will also increase by 1 to 10% according to model projections for a 2°C global warming.[85] Increased intensity of storms means that the destructive potential per storm increases.[86]

79. Heavy precipitation events (defined as rainfall equal to or greater than the historical 95th percentile) will significantly increase in frequency at least through the year 2100.[87]

ii. Drought

80. Drought is a period of moisture deficit defined either by a deficiency in the amount or timing of precipitation relative to a reference period ("meteorological drought"), or by a shortage of water supply for specific human, ecological, or other uses ("hydrologic drought"). Drought originates from a deficiency in precipitation and/or an elevation of temperature (and

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[84] Narragansett Bay Estuary Program, *supra* note 81, at 21.

[85] Princeton University Geophysical Fluid Dynamics Laboratory, "Global Warming and Hurricanes" (website) (last revised June 6, 2018), https://www.gfdl.noaa.gov/global-warming-and-hurricanes.

[86] *Id.*

[87] Xiang Gao et al., *21st Century Changes in U.S. Heavy Precipitation Frequency Based on Resolved Atmospheric Patterns*, MIT Joint Program on the Science and Policy of Global Change: Report 302, 15 (2016).

therefore evaporation) relative to normal conditions, resulting in a water shortage for an activity, group, or ecological use.[88]

81. As rising temperatures lead to greater rainfall variability, Rhode Island will begin to experience more frequent seasonal droughts in the summer and fall.[89]

82. As annual rainfall concentrates into a shorter time span, the annual dry period is growing longer, resulting in conditions of moisture deficiency over longer periods. Even in the absence of substantial changes in average precipitation in the State, precipitation will fall in a shorter time span and therefore be less susceptible to retention and use.

83. Thus, future droughts in the State will be more severe than historical droughts, with an attendant exacerbation of drought impacts.

E. Ocean Warming and Acidification—Known Causes and Observed Effects

84. The ocean has played an unparalleled role in response to climate change, storing approximately 93% of the excess heat energy over the last 50 years.[90]

85. As the atmospheric greenhouse gas concentrations increase, the water in Narragansett Bay is getting warmer and more acidic. Over the past 50 years, the average surface temperature of the Bay has increased 1.4° to 1.6°C (2.5° to 2.9°F). Winter water temperatures in the Bay have increased even more, from 1.6° to 2.0°C (2.9° to 3.6°F).[91]

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[88] *See, e.g.*, Donald A. Wilhite & Michael H. Glantz, *Understanding the Drought Phenomenon: The Role of Definitions*, Drought Mitigation Center Faculty Publications 20 (1985)

[89] Rhode Island Department of Health, *Rhode Island Climate Change and Resiliency Report*, *supra* note 55, at 10.

[90] IPCC, *Observations: Oceans*, Ch. 3 260, https://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5_Chapter03_FINAL.pdf.

[91] R.W. Fulweiler et al., *Whole truths vs. half truths – And a search for clarity in long-term water temperature records*, 157 ESTUARINE, COASTAL AND SHELF SCIENCE A1–A6 (May 2015), https://www.sciencedirect.com/science/article/pii/S0272771415000426.

86. Due to increased water temperatures among other factors, iconic cold-water fishery species such as cod, red hake, and winter flounder are being increasingly displaced by scup and black sea bass. Overtime, Narragansett Bay is expected to increasingly resemble that of a more southerly, mid-Atlantic estuary with associated shifts in species that are iconic in southern New England's culture.[92]

87. Uptake of carbon dioxide is also causing changes to ocean chemistry, including in Narragansett Bay, by changing the pH to be more acidic.[93] Ocean acidification, is expected to continue as global warming progresses.[94] Increased ocean acidity makes the formation and maintenance of shells and other calcareous structure by bivalves and other shellfish more energetically expensive or even impossible.[95]

F. Public Health Impacts of Anthropogenic Global Warming

88. Sea level rise, increased air temperatures and changes to the hydrologic cycle associated with anthropogenic climate change have resulted and will result in public health impacts for the state of Rhode Island.

89. Extreme weather events, such as hurricanes and inland flooding, have immediate health consequences, including danger to personal safety and longer-term consequences, including social and economic disruption, population displacement, and mental trauma.[96]

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[92] Narragansett Bay Estuary Program, *supra* note 81, at 24.
[93] *Id.* at 45.
[94] *Id.*
[95] *Id.* at 46.
[96] *Resilient Rhody: Statewide Climate Resilience Action Strategy*, *supra* note 56, at 63.

90. Extreme heat-induced public health impacts in the State will result in increased risk of heat-related illnesses such as heat exhaustion and dehydration, increased hospitalizations, and death.[97]

91. Increased heat also intensifies the photochemical reactions that produce smog, ground level ozone, and fine particulate matter (PM2.5), which contribute to and exacerbate respiratory disease in children and adults. Increased heat and CO_2 enhance the growth of plants that produce pollen, which are associated with allergies.[98]

92. In addition, the warming climate system will create disease-related public health impacts in the State, including but not limited to, increased incidence of cyanobacteria blooms (toxic alga) in aquatic systems and vector-borne disease with migration of animal and insect disease vectors.[99]

93. Public health impacts of these climatological changes are likely to be disproportionately borne by communities made vulnerable by geographic, racial, or income disparities.

G. Attribution

94. "Carbon factors" analysis, devised by the International Panel on Climate Change (IPCC), the United Nations International Energy Agency, and the U.S. Environmental Protection Agency, quantifies the amount of CO_2 emissions attributable to a unit of raw fossil fuel extracted from the Earth.[100] Emissions factors for oil, coal, liquid natural gas, and natural gas are different

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[97] Rhode Island Department of Health, *Rhode Island Climate Change and Resiliency Report*, *supra* note 55, at 14.

[98] *Id.* at 25–26.

[99] *Resilient Rhody: Statewide Climate Resilience Action Strategy*, *supra* note 56, at 15.

[100] *See* Richard Heede, *Tracing Anthropogenic Carbon Dioxide and Methane Emissions to Fossil Fuel and Cement Producers, 1854-2010*, 122 CLIMATIC CHANGE 229, 232–33 (2014).

for each material but are nevertheless known and quantifiable for each.[101] This analysis accounts for the use of Defendants' fossil fuel products, including non-combustion purposes that sequester CO_2 rather than emit it (e.g., asphalt production).

95. Defendants' historical and current fossil fuel extraction and production records are publicly available in various fora. These include university and public library collections, company websites, company reports filed with the U.S. Securities and Exchange Commission, company histories, and other sources. The cumulative CO_2 and methane emissions attributable to Defendants' fossil fuel products were calculated by reference to such publicly available documents.

96. Cumulative carbon analysis allows an accurate calculation of net annual CO_2 and methane emissions attributable to each Defendant by quantifying the amount and type of fossil fuels products each Defendant extracted and placed into the stream of commerce, and multiplying those quantities by each fossil fuel product's carbon factor.

97. Defendants, through their extraction, promotion, marketing, and sale of their fossil fuel products, caused over 14.5% of global fossil fuel product-related CO_2 between 1965 and 2015, with contributions currently continuing unabated. This constitutes a substantial portion of all such emissions in history, and the attendant historical, projected, and committed sea level rise and disruptions to the hydrologic cycle associated therewith.

98. By quantifying CO_2 and methane pollution attributable to Defendants by and through their fossil fuel products, ambient air and ocean temperature, sea level, and hydrologic cycle responses to those emissions are also calculable, and can be attributed to Defendants on an individual and aggregate basis. Individually and collectively, Defendants' through their control of

[101] *See, e.g., id.*

the extraction, sale, and promotion of their fossil fuel products are responsible for substantial increases in ambient (surface) temperature, ocean temperature, sea level, droughts, extreme precipitation events, heat waves, and other adverse impacts on Rhode Island described herein.

99. Anthropogenic CO_2 emissions have caused a substantial portion of both observed and committed mean global sea level rise.[102]

100. Anthropogenic CO_2 emissions have caused and will continue to cause increased maximum temperature extremes relative to the historical baseline.[103]

101. Anthropogenic CO_2 emissions have caused and will continue to cause increases in daily precipitation extremes over land.[104]

102. Anthropogenic CO_2 emissions have caused and will continue to cause increased frequency and severity of droughts. [105]

103. Defendants, through their extraction, promotion, marketing, and sale of their fossil fuel products, caused a substantial portion of both those emissions and the attendant historical, projected, and committed sea level rise and other consequences of the resulting climatic changes described herein, including increased incidences of extreme temperatures and extreme weather events.

104. As explained above, this analysis considers only the volume of raw material actually extracted from the Earth by these Defendants. Many of these Defendants actually are responsible for far greater volumes of emissions because they also refine, manufacture, produce,

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[102] Peter U. Clark et al., *supra* note 44, at 365.

[103] *Id.*

[104] *See, e.g.*, E.M. Fischer & R. Knutti, *Anthropogenic Contribution to Global Occurrence of Heavy-Precipitation and High-Temperature Extremes*, 5 NATURE CLIMATE CHANGE 560–64 (2015).

[105] Rhode Island Department of Health, *Rhode Island Climate Change and Resiliency Report*, *supra* note 55, at 10.

market, promote, and sell more fossil fuel derivatives than they extract themselves by purchasing fossil fuel products extracted by independent third parties.

105. In addition, considering the Defendants' lead role in promoting, marketing, and selling their fossil fuels products between 1965 and 2015; their efforts to conceal the hazards of those products from consumers; their promotion of their fossil fuel products despite knowing the dangers associate with those products; their dogged campaign against regulation of those products based on falsehoods, omissions, and deceptions; and their failure to pursue less hazardous alternatives available to them, Defendants, individually and together, have substantially and measurably contributed to the State's climate change-related injuries.

H. Defendants Went to Great Lengths to Understand the Hazards Associated with, and Knew or Should Have Known of the Dangers Associated with the Extraction, Promotion, and Sale of Their Fossil Fuel Products.

106. By 1965, concern about the risks of anthropogenic greenhouse gas emissions reached the highest level of the United States' scientific community. In that year, President Lyndon B. Johnson's Science Advisory Committee Panel on Environmental Pollution reported that by the year 2000, anthropogenic CO_2 emissions would "modify the heat balance of the atmosphere to such an extent that marked changes in climate . . . could occur."[106] President Johnson announced in a special message to Congress that "[t]his generation has altered the composition of the atmosphere on a global scale through . . . a steady increase in carbon dioxide from the burning of fossil fuels."[107]

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[106] President's Science Advisory Committee, *Restoring the Quality of Our Environment: Report of the Environmental Pollution Panel*, 9 (Nov. 1965), https://hdl.handle.net/2027/uc1.b4315678.

[107] President Lyndon B. Johnson, *Special Message to Congress on Conservation and Restoration of Natural Beauty* (Feb. 8, 1965), http://acsc.lib.udel.edu/items/show/292.

107. These statements from the Johnson Administration, at a minimum, put Defendants on notice of the potentially substantial dangers to people, communities, and the planet associated with unabated use of their fossil fuel products. Moreover, Defendants had amassed a considerable body of knowledge on the subject through their own independent efforts.

108. A 1963 Conservation Foundation report on a conference of scientists referenced in the 1966 World Book Encyclopedia, as well as in presidential panel reports and other sources around that time, described many specific consequences of rising levels of greenhouse gas pollution in the atmosphere. It warned that a doubling of carbon dioxide "could be enough to bring about immense flooding of lower portions of the world's land surface, resulting from increased melting of glaciers." The publication also asserted that "a continuing rise in the amount of atmospheric carbon dioxide is likely to be accompanied by a significant warming of the surface of the earth which by melting the polar ice caps would raise sea level and by warming the oceans would change considerably the distributions of marine species including commercial fisheries." It warned of the potential inundation of "many densely settled coastal areas, including the cities of New York and London" and the possibility of "wiping out the world's present commercial fisheries." The report, in fact, noted that "the changes in marine life in the North Atlantic which accompanied the temperature change have been very noticeable".[108]

109. But industry interest in carbon accumulation goes back at least to 1958. A review in that year of the American Petroleum Institute ("API") Smoke and Fumes Committee's Air Pollution Research Program by Charles Jones (the committee secretary and Shell executive),

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[108] The Conservation Foundation, *Implications of Rising Carbon Dioxide Content of the Atmosphere: A statement of trends and implications of carbon dioxide research reviewed at a conference of scientists* (Mar. 1963), https://babel.hathitrust.org/cgi/pt?id=mdp.39015004619030.

mentions a project focused on analyzing gaseous carbon data to determine the amount of carbon of fossil origin compared to the total amount.[109]

110. At that point in time API's stance was that "the petroleum industry supplies the fuel used by the automobile, and thus has a sincere interest in the solution to the problem of pollution from automobile exhaust," according to an API presentation at the 1958 National Conference on Air Pollution. API acknowledged the industry's responsibility in mitigating some of the negative impacts of its products, stating that the objective of its Smoke and Fumes committee was to "determine the causes and methods of control of objectional atmospheric pollution resulting from the production, manufacture, transportation, sale, and use of petroleum and its products."[110]

111. In 1968, a Stanford Research Institute ("SRI") report commissioned by the API and made available to all its members, concluded, among other things:

> If the Earth's temperature increases significantly, a number of events might be expected to occur including the melting of the Antarctic ice cap, a rise in sea levels, warming of the oceans and an increase in photosynthesis. . . .
>
> It is clear that we are unsure as to what our long-lived pollutants are doing to our environment; however, there seems to be no doubt that the potential damage to our environment could be severe. . . . [T]he prospect for the future must be of serious concern.[111]

112. In a supplement to the 1968 report prepared for API in 1969, authors Robinson and Robbins projected that based on current fuel usage, atmospheric CO_2 concentrations would reach

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[109] Charles A. Jones, *A Review of the Air Pollution Research Program of the Smoke and Fumes Committee of the American Petroleum Institute*, JOURNAL OF THE AIR POLLUTION CONTROL ASSOCIATION (1958), https://www.tandfonline.com/doi/pdf/10.1080/00966665.1958.10467854.

[110] C.A. Jones, *Sources of Air Pollution – Transportation (Petroleum)* (Nov. 19, 1958), https://www.industrydocumentslibrary.ucsf.edu/tobacco/docs/#id=xrcm0047.

[111] Elmer Robinson & R.C. Robbins, *Sources, Abundance, and Fate of Gaseous Atmospheric Pollutants*, Stanford Research Institute (Feb. 1968), https://www.smokeandfumes.org/documents/document16.

370 ppm by 2000[112]—almost exactly what it turned out to be (369.34 ppm, according to data from NASA).[113] The report also draws the connection between the rising concentration and the use of fossil fuels stating that "balance between environmental sources and sinks has been disturbed by the emission to the atmosphere of additional CO_2 from the increased combustion of carbonaceous fuels" and that it seemed "unlikely that the observed rise in atmospheric CO_2 has been due to changes in the biosphere." The authors warn repeatedly of the temptations and consequences of ignoring CO_2 as a problem and pollutant:

> CO_2 is so common and such an integral part of all our activities that air pollution regulations typically state that CO_2 emissions are not to be considered as pollutants. This is perhaps fortunate for our present mode of living, centered as it is around carbon combustion. However, this seeming necessity, the CO_2 emission, is the only air pollutant, as we shall see, that has been shown to be of global importance as a factor that could change man's environment on the basis of a long period of scientific investigation.[114]

113. In 1969, Shell memorialized an on-going 18-month project to collect ocean data from oil platforms to develop and calibrate environmental forecasting theories related to predicting wave, wind, storm, sea level, and current changes and trends.[115] Several Defendants and/or their predecessors in interest participated in the project, including Esso Production Research Company (ExxonMobil), Mobil Research and Development Company (ExxonMobil), Pan American Petroleum Corporation (BP), Gulf Oil Corporation (Chevron), Texaco Inc. (Chevron), and the Chevron Oil Field Research Company (Chevron).

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[112] Elmer Robinson & R.C. Robbins, *Sources, Abundance, and Fate of Gaseous Atmospheric Pollutants Supplement*, Stanford Research Institute (June 1969).

[113] "Global Mean CO_2 Mixing Ratios (ppm): Observations," NASA Goddard Institute for Space Studies, https://data.giss.nasa.gov/modelforce/ghgases/Fig1A.ext.txt (webpage) (accessed June 16, 2018).

[114] Elmer Robinson & R.C. Robbins, *supra* note 112.

[115] M.M. Patterson, *An Ocean Data Gathering Program for the Gulf of Mexico*, Society of Petroleum Engineers (1969), https://www.onepetro.org/conference-paper/SPE-2638-MS.

114. In a 1970 report by H.R. Holland from the Engineering Division of Imperial Oil (Exxon), he stated: "Since pollution means disaster to the affected species, the only satisfactory course of action is to prevent it – to maintain the addition of foreign matter at such levels that it can be diluted, assimilated or destroyed by natural processes – to protect man's environment from man." He also noted that "a problem of such size, complexity and importance cannot be dealt with on a voluntary basis." CO_2 was listed as an air pollutant in the document.[116]

115. In 1972, API members, including Defendants, received a status report on all environmental research projects funded by API. The report summarized the 1968 SRI report describing the impact of fossil fuel products, including Defendants', on the environment, including global warming and attendant consequences. Defendants and/or their predecessors in interest that received this report include, but were not limited to: American Standard of Indiana (BP), Asiatic (Shell), Ashland (Marathon), Atlantic Richfield (BP), British Petroleum (BP), Chevron Standard of California (Chevron), Cities Service (Citgo), Esso Research (ExxonMobil), Ethyl (formerly affiliated with Esso, which was subsumed by ExxonMobil), Getty (ExxonMobil), Gulf (Chevron, among others), Humble Standard of New Jersey (ExxonMobil/Chevron/BP), Marathon, Mobil (ExxonMobil), Pan American (BP), Shell, Standard of Ohio (BP), Texaco (Chevron), Union (Chevron), Skelly (ExxonMobil), Colonial Pipeline (ownership has included BP, Citgo, ExxonMobil, and Chevron entities, among others) and Caltex (Chevron).[117] Other members of the fossil fuel industry that received the report include, but were not limited to, Continental (ConocoPhillips), Dupont (former owner of Conoco), Phillips (ConocoPhillips), Sun (Sunoco),

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[116] H.R. Holland, *Pollution is Everybody's Business*, Imperial Oil (1970), https://www.desmogblog.com/sites/beta.desmogblog.com/files/DeSmogBlog-Imperial%20Oil%20Archive-Pollution-Everyone-Business-1970.pdf.

[117] American Petroleum Institute, *Environmental Research, A Status Report*, Committee for Air and Water Conservation (January 1972), http://files.eric.ed.gov/fulltext/ED066339.pdf.

Rock Island (Koch Industries), Signal (Honeywell), Great Northern, Edison Electric Institute (representing electric utilities), Bituminous Coal Research (coal industry research group), Mid-Continent Oil & Gas Association (presently the U.S. Oil & Gas Association, a national trade association), Western Oil & Gas Association, National Petroleum Refiners Association (presently the American Fuel and Petrochemical Manufacturers Association, a national trade association), and Champlin (Anadarko), among others.[118]

116. In a 1977 presentation and again in a 1978 briefing, Exxon scientists warned the Exxon Corporation Management Committee that CO_2 concentrations were building in the Earth's atmosphere at an increasing rate, that CO_2 emissions attributable to fossil fuels were retained in the atmosphere, and that CO_2 was contributing to global warming.[119] The report stated:

> 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 . . . [and that] Man has a time window of five to ten years before the need for hard decisions regarding changes in energy strategies might become critical.[120]

117. One presentation slide read: "Current scientific opinion overwhelmingly favors attributing atmospheric carbon dioxide increase to fossil fuel combustion."[121] The report also warned that "a study of past climates suggests that if the earth does become warmer, more rainfall should result. But an increase as large as 2°C would probably also affect the distribution of the rainfall." Moreover, the report concluded that "doubling in CO_2 could increase average global

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[118] *Id.*

[119] Memo from J.F. Black to F.G. Turpin, *The Greenhouse Effect*, Exxon Research and Engineering Company (June 6, 1978), http://www.climatefiles.com/exxonmobil/1978-exxon-memo-on-greenhouse-effect-for-exxon-corporation-management-committee.

[120] *Id.*

[121] *Id.*

temperature 1°C to 3°C by 2050 A.D. (10°C predicted at poles)."[122]

118. Thereafter, Exxon engaged in a research program to study the environmental fate of fossil fuel-derived greenhouse gases and their impacts, which included publication of peer-reviewed research by Exxon staff scientists and the conversion of a supertanker into a research vessel to study the greenhouse effect and the role of the oceans in absorbing anthropogenic CO_2. Much of this research was shared in a variety of fora, symposia, and shared papers through trade associations and directly with other Defendants.

119. Exxon scientists made the case internally for using company resources to build corporate knowledge about the impacts of the promotion, marketing, and consumption of Defendants' fossil fuel products. Exxon climate researcher Henry Shaw wrote in 1978: "The rationale for Exxon's involvement and commitment of funds and personnel is based on our need to assess the possible impact of the greenhouse effect on Exxon business. Exxon must develop a credible scientific team that can critically evaluate the information generated on the subject and be able to carry bad news, if any, to the corporation."[123] Moreover, Shaw emphasized the need to collaborate with universities and government to more completely understand what he called the "CO_2 problem."[124]

120. In 1979, API and its members, including Defendants, convened a Task Force to monitor and share cutting edge climate research among the oil industry. The group was initially called the CO_2 and Climate Task Force, but changed its name to the Climate and Energy Task

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[122] *Id.*

[123] Henry Shaw, *Memo to Edward David Jr. on the "Greenhouse Effect*, Exxon Research and Engineering Company (Dec. 7, 1978), http://insideclimatenews.org/sites/default/files/documents/Credible%20Scientific%20Team%201978%20Letter.pdf.

[124] *Id.*

Force in 1980 (hereinafter referred to as "API CO_2 Task Force"). Membership included senior scientists and engineers from nearly every major U.S. and multinational oil and gas company, including Exxon, Mobil (ExxonMobil), Amoco (BP), Phillips (ConocoPhillips), Texaco (Chevron), Shell, Sunoco, Sohio (BP) as well as Standard Oil of California (BP) and Gulf Oil (Chevron), among others. The Task Force was charged with assessing the implications of emerging science on the petroleum and gas industries and identifying where reductions in greenhouse gas emissions from Defendants' fossil fuel products could be made.[125]

121. In 1979, API sent its members a background memo related to the API CO_2 and Climate Task Force's efforts, stating that CO_2 concentrations were rising steadily in the atmosphere, and predicting when the first clear effects of climate change might be felt.[126]

122. Also in 1979, Exxon scientists advocated internally for additional fossil fuel industry-generated atmospheric research in light of the growing consensus that consumption of fossil fuel products was changing the Earth's climate:

> We should determine how Exxon can best participate in all these [atmospheric science research] areas and influence possible legislation on environmental controls. It is important to begin to anticipate the strong intervention of environmental groups and be prepared to respond with reliable and credible data. It behooves [Exxon] to start a very aggressive defensive program in the indicated areas of atmospheric science and climate because there is a good probability that legislation affecting our business will be passed. Clearly, it is in our interest for such legislation to be based on hard scientific data. The data obtained from research

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[125] American Petroleum Institute, *AQ-9 Task Force Meeting Minutes* (March 18, 1980), http://insideclimatenews.org/sites/default/files/documents/AQ-9%20Task%20Force%20Meeting%20%281980%29.pdf (AQ-9 refers to the "CO_2 and Climate" Task Force).

[126] Neela Banerjee, *Exxon's Oil Industry Peers Knew About Climate Dangers in the 1970s, Too*, INSIDE CLIMATE NEWS (Dec. 22, 2015), https://insideclimatenews.org/news/22122015/exxon-mobil-oil-industry-peers-knew-about-climate-change-dangers-1970s-american-petroleum-institute-api-shell-chevron-texaco.

> on the global damage from pollution, e.g., from coal combustion, will give us the needed focus for further research to avoid or control such pollutants.[127]

123. That same year, Exxon Research and Engineering reported that: "The most widely held theory [about increasing CO_2 concentration] is that the increase is due to fossil fuel combustion, increasing CO_2 concentration will cause a warming of the earth's surface, and the present trend of fossil fuel consumption will cause dramatic environmental effects before the year 2050."[128] According to the report, "ecological consequences of increased CO_2" to 500 ppm (1.7 times 1850 levels) could mean: "a global temperature increase of 3°F;" "the southwest states would be hotter, probably by more than 3°F, and drier;" "most of the glaciers in the North Cascades and Glacier National Park would be melted;" "there would be less of a winter snow pack in the Cascades, Sierras, and Rockies, necessitating a major increase in storage reservoirs;" "marine life would be markedly changed;" and "maintaining runs of salmon and steelhead and other subarctic species in the Columbia River system would become increasingly difficult."[129] With a doubling of the 1860 CO_2 concentration, "ocean levels would rise four feet" and "the Arctic Ocean would be ice free for at least six months each year, causing major shifts in weather patterns in the northern hemisphere."[130]

124. Further, the report stated that unless fossil fuel use was constrained, there would be "noticeable temperature changes" associated with an increase in atmospheric CO_2 from about 280

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[127] Henry Shaw, *Exxon Memo to H.N. Weinberg about "Research in Atmospheric Science"*, Exxon Inter-Office Correspondence (Nov. 19, 1979), https://insideclimatenews.org/sites/default/files/documents/Probable%20Legislation%20Memo%20(1979).pdf.

[128] W.L. Ferrall, *Exxon Memo to R.L. Hirsch about "Controlling Atmospheric CO_2"*, Exxon Research and Engineering Company (Oct. 16, 1979), http://insideclimatenews.org/sites/default/files/documents/CO2%20and%20Fuel%20Use%20Projections.pdf.

[129] *Id.*

[130] *Id.*

parts per million before the Industrial Revolution to 400 parts per million by the year 2010.[131] Those projections proved remarkably accurate—atmospheric CO_2 concentrations surpassed 400 parts per million in May 2013, for the first time in millions of years.[132] In 2015, the annual average CO_2 concentration rose above 400 parts per million, and in 2016 the annual low surpassed 400 parts per million, meaning atmospheric CO_2 concentration remained above that threshold all year.[133]

125. In 1980, API's CO_2 Task Force members discussed the oil industry's responsibility to reduce CO_2 emissions by changing refining processes and developing fuels that emit less CO_2. The minutes from the Task Force's February 29, 1980, meeting included a summary of a presentation on "The CO_2 Problem" given by Dr. John Laurmann, which identified the "scientific consensus on the potential for large future climatic response to increased CO_2 levels" as a reason for API members to have concern with the "CO_2 problem" and informed attendees that there was "strong empirical evidence that rise [in CO_2 concentration was] caused by anthropogenic release of CO_2, mainly from fossil fuel combustion."[134] Moreover, Dr. Laurmann warned that the amount of CO_2 in the atmosphere could double by 2038, which he said would likely lead to a 2.5°C (4.5°F) rise in global average temperatures with "major economic consequences." He then told the Task Force that models showed a 5°C (9°F) rise by 2067, with "globally catastrophic effects."[135] A

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[131] *Id.*

[132] Nicola Jones, *How the World Passed a Carbon Threshold and Why it Matters*, YALE ENVIRONMENT 360 (Jan. 26, 2017), http://e360.yale.edu/features/how-the-world-passed-a-carbon-threshold-400ppm-and-why-it-matters.

[133] *Id.*

[134] American Petroleum Institute, *AQ-9 Task Force Meeting Minutes* (Mar. 18, 1980), http://insideclimatenews.org/sites/default/files/documents/AQ-9%20Task%20Force%20Meeting%20%281980%29.pdf (AQ-9 refers to the "CO_2 and Climate" Task Force).

[135] *Id.*

taskforce member and representative of Texaco (Chevron) leadership present at the meeting posited that the API CO_2 Task Force should develop ground rules for energy release of fuels and the cleanup of fuels as they relate to CO_2 creation.

126. In 1980, the API CO_2 Task Force also discussed a potential area for investigation: alternative energy sources as a means of mitigating CO_2 emissions from Defendants' fossil fuel products. These efforts called for research and development to "Investigate the Market Penetration Requirements of Introducing a New Energy Source into World Wide Use." Such investigation was to include the technical implications of energy source changeover, research timing, and requirements.[136]

127. By 1980, Exxon's senior leadership had become intimately familiar with the greenhouse effect and the role of CO_2 in the atmosphere. In that year, Exxon Senior Vice President and Board member George Piercy questioned Exxon researchers on the minutiae of the ocean's role in absorbing atmospheric CO_2, including whether there was a net CO_2 flux out of the ocean into the atmosphere in certain zones where upwelling of cold water to the surface occurs, because Piercy evidently believed that the oceans could absorb and retain higher concentrations of CO_2 than the atmosphere.[137] This inquiry aligns with Exxon supertanker research into whether the ocean would act as a significant CO_2 sink that would sequester atmospheric CO_2 long enough to allow unabated emissions without triggering dire climatic consequences. As described below,

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[136] *Id.*

[137] Neela Banerjee, *More Exxon Documents Show How Much It Knew About Climate 35 Years Ago*, INSIDE CLIMATE NEWS (Dec. 1, 2015), https://insideclimatenews.org/news/01122015/documents-exxons-early-co2-position-senior-executives-engage-and-warming-forecast.

Exxon eventually discontinued this research before it produced enough data from which to derive a conclusion.[138]

128. Also in 1980, Imperial Oil (ExxonMobil) reported to Esso and Exxon managers and environmental staff that increases in fossil fuel usage aggravates CO_2 in the atmosphere. Noting that the United Nations was encouraging research into the carbon cycle, Imperial reported that "[t]echnology exists to remove CO_2 from [fossil fuel power plant] stack gases but removal of only 50% of the CO_2 would double the cost of power generation."

129. Exxon scientist Roger Cohen warned his colleagues in a 1981 internal memorandum that "future developments in global data gathering and analysis, along with advances in climate modeling, may provide strong evidence for a delayed CO_2 effect of a truly substantial magnitude," and that under certain circumstances it would be "very likely that we will unambiguously recognize the threat by the year 2000."[139] Cohen had expressed concern that the memorandum mischaracterized potential effects of unabated CO_2 emissions from Defendants' fossil fuel products: ". . . it is distinctly possible that the . . . [Exxon Planning Division's] scenario will produce effects which will indeed be catastrophic (at least for a substantial fraction of the world's population)."[140]

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[138] Neela Banerjee et al., *Exxon Believed Deep Dive into Climate Research Would Protect Its Business*, INSIDE CLIMATE NEWS (Sept. 17, 2015), https://insideclimatenews.org/news/16092015/exxon-believed-deep-dive-into-climate-research-would-protect-its-business.

[139] Roger W. Cohen, *Exxon Memo to W. Glass about possible "catastrophic" effect of CO_2*, Exxon Inter-Office Correspondence (Aug. 18, 1981), http://www.climatefiles.com/exxonmobil/1981-exxon-memo-on-possible-emission-consequences-of-fossil-fuel-consumption.

[140] *Id.*

130. In 1981, Exxon's Henry Shaw, the company's lead climate researcher at the time, prepared a summary of Exxon's current position on the greenhouse effect for Edward David Jr., president of Exxon Research and Engineering, stating in relevant part:

- "Atmospheric CO_2 will double in 100 years if fossil fuels grow at 1.4%/a[2].
- 3°C global average temperature rise and 10°C at poles if CO_2 doubles.
  - Major shifts in rainfall/agriculture
  - Polar ice may melt"[141]

131. In 1982, another report prepared for API by scientists at the Lamont-Doherty Geological Observatory at Columbia University recognized that atmospheric CO_2 concentration had risen significantly compared to the beginning of the industrial revolution from about 290 parts per million to about 340 parts per million in 1981 and acknowledged that despite differences in climate modelers' predictions, all models indicated a temperature increase caused by anthropogenic CO_2 within a global mean range of 4°C (7.2°F). The report advised that there was scientific consensus that "a doubling of atmospheric CO_2 from [] pre-industrial revolution value would result in an average global temperature rise of (3.0 ± 1.5)°C [5.4 ± 2.7°F]." It went further, warning that "[s]uch a warming can have serious consequences for man's comfort and survival since patterns of aridity and rainfall can change, the height of the sea level can increase considerably and the world food supply can be affected."[142] Exxon's own modeling research confirmed this, and the company's results were later published in at least three peer-reviewed

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[141] Henry Shaw, *Exxon Memo to E. E. David, Jr. about "CO_2Position Statement"*, Exxon Inter-Office Correspondence (May 15, 1981), https://insideclimatenews.org/sites/default/files/documents/Exxon%20Position%20on%20CO2%20%281981%29.pdf.

[142] American Petroleum Institute, *Climate Models and CO_2 Warming: A Selective Review and Summary*, Lamont-Doherty Geological Observatory (Columbia University) (Mar. 1982), https://assets.documentcloud.org/documents/2805626/1982-API-Climate-Models-and-CO2-Warming-a.pdf.

scientific papers.[143]

132. Also in 1982, Exxon's Environmental Affairs Manager distributed a primer on climate change to a "wide circulation [of] Exxon management . . . intended to familiarize Exxon personnel with the subject."[144] The primer also was "restricted to Exxon personnel and not to be distributed externally."[145] The primer compiled science on climate change available at the time, and confirmed fossil fuel combustion as a primary anthropogenic contributor to global warming. The report estimated a CO_2 doubling around 2090 based on Exxon's long-range modeled outlook. The author warned that "uneven global distribution of increased rainfall and increased evaporation" were expected to occur, and that "disturbances in the existing global water distribution balance would have dramatic impact on soil moisture, and in turn, on agriculture."[146]

133. Moreover, the melting of the Antarctic ice sheet could result in global sea level rise of five feet which would "cause flooding on much of the U.S. East Coast, including the State of Florida and Washington, D.C."[147] Exxon's primer warned that "there are some potentially catastrophic events that must be considered," including sea level rise from melting polar ice sheets. It noted that some scientific groups were concerned "that once the effects are measurable, they might not be reversible."[148]

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[143] *See* Roger W. Cohen, *Exxon Memo summarizing findings of research in climate modeling*, Exxon Research and Engineering Company (Sept. 2, 1982), https://insideclimatenews.org/sites/default/files/documents/%2522Consensus%2522%20on%20CO2%20Impacts%20(1982).pdf (discussing research articles).

[144] M. B. Glaser, *Exxon Memo to Management about "CO_2 'Greenhouse' Effect"*, Exxon Research and Engineering Company (Nov. 12, 1982), http://insideclimatenews.org/sites/default/files/documents/1982%20Exxon%20Primer%20on%20CO2%20Greenhouse%20Effect.pdf.

[145] *Id.*

[146] *Id.*

[147] *Id.*

[148] *Id.*

134. In a summary of Exxon's climate modeling research from 1982, Director of Exxon's Theoretical and Mathematical Sciences Laboratory Roger Cohen wrote that "the time required for doubling of atmospheric CO_2 depends on future world consumption of fossil fuels." Cohen concluded that Exxon's own results were "consistent with the published predictions of more complex climate models" and "in accord with the scientific consensus on the effect of increased atmospheric CO_2 on climate."[149]

135. At the fourth biennial Maurice Ewing Symposium at the Lamont-Doherty Geophysical Observatory in October 1982, attended by members of API, Exxon Research and Engineering Company president E.E. David delivered a speech titled: "Inventing the Future: Energy and the CO_2 'Greenhouse Effect.'"[150] His remarks included the following statement: "[F]ew people doubt that the world has entered an energy transition away from dependence upon fossil fuels and toward some mix of renewable resources that will not pose problems of CO_2 accumulation." He went on, discussing the human opportunity to address anthropogenic climate change before the point of no return:

> It is ironic that the biggest uncertainties about the CO_2 buildup are not in predicting what the climate will do, but in predicting what people will do. . . .[It] appears we still have time to generate the wealth and knowledge we will need to invent the transition to a stable energy system.

136. Throughout the early 1980s, at Exxon's direction, Exxon climate scientist Henry Shaw forecasted emissions of CO_2 from fossil fuel use. Those estimates were incorporated into Exxon's 21st century energy projections and were distributed among Exxon's various divisions.

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[149] Roger W. Cohen, *Exxon Memo summarizing findings of research in climate modeling*, *supra* note 143.

[150] E. E. David, Jr., *Inventing the Future: Energy and the CO_2 Greenhouse Effect: Remarks at the Fourth Annual Ewing Symposium, Tenafly, NJ* (1982), http://sites.agu.org/publications/files/2015/09/ch1.pdf.

Shaw's conclusions included an expectation that atmospheric CO_2 concentrations would double in 2090 per the Exxon model, with an attendant 2.3–5.6°F average global temperature increase. Shaw compared his model results to those of the U.S. EPA, the National Academy of Sciences, and the Massachusetts Institute of Technology, indicating that the Exxon model predicted a longer delay than any of the other models, although its temperature increase prediction was in the mid-range of the four projections.[151]

137. During the 1980s, many Defendants formed their own research units focused on climate modeling. The API, including the API CO_2 Task Force, provided a forum for Defendants to share their research efforts and corroborate their findings related to anthropogenic greenhouse gas emissions.[152]

138. During this time, Defendants' statements express an understanding of their obligation to consider and mitigate the externalities of unabated promotion, marketing, and sale of their fossil fuel products. For example, in 1988, Richard Tucker, the president of Mobil Oil, presented at the American Institute of Chemical Engineers National Meeting, the premier educational forum for chemical engineers, where he stated:

> [H]umanity, which has created the industrial system that has transformed civilities, is also responsible for the environment, which sometimes is at risk because of unintended consequences of industrialization. . . . Maintaining the health of this life-support system is emerging as one of the highest priorities. . . . [W]e must all be environmentalists.
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> The environmental covenant requires action on many fronts . . . the low-atmosphere ozone problem, the upper-atmosphere ozone problem and the

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[151] Neela Banerjee, *More Exxon Documents Show How Much It Knew About Climate 35 Years Ago*, INSIDE CLIMATE NEWS (Dec. 1, 2015), https://insideclimatenews.org/news/01122015/documents-exxons-early-co2-position-senior-executives-engage-and-warming-forecast.

[152] Neela Banerjee, *Exxon's Oil Industry Peers Knew About Climate Dangers in the 1970s, Too*, *supra* note 126.

> greenhouse effect, to name a few. . . . Our strategy must be to reduce pollution before it is ever generated—to prevent problems at the source.
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> Prevention means engineering a new generation of fuels, lubricants and chemical products. . . . Prevention means designing catalysts and processes that minimize or eliminate the production of unwanted byproducts. . . . Prevention on a global scale may even require a dramatic reduction in our dependence on fossil fuels—and a shift towards solar, hydrogen, and safe nuclear power. It may be possible that—just possible—that the energy industry will transform itself so completely that observers will declare it a new industry. . . . Brute force, low-tech responses and money alone won't meet the challenges we face in the energy industry.[153]

139. Also in 1988, the Shell Greenhouse Effect Working Group issued a confidential internal report, "The Greenhouse Effect," which acknowledged global warming's anthropogenic nature: "Man-made carbon dioxide released into and accumulated in the atmosphere is believed to warm the earth through the so-called greenhouse effect." The authors also noted the burning of fossil fuels as a primary driver of CO_2 buildup and warned that warming could "create significant changes in sea level, ocean currents, precipitation patterns, regional temperature and weather." Taking it a step further, they pointed to the potential for "direct operational consequences" of sea level rise on "offshore installations, coastal facilities and operations (e.g. platforms, harbours, refineries, depots)."[154]

140. Similar to early warnings by Exxon scientists, the Shell report notes that "by the time the global warming becomes detectable it could be too late to take effective countermeasures to reduce the effects or even to stabilize the situation." The authors mention the need to consider policy changes on multiple occasions, noting that "the potential implications for the world are…so

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[153] Richard E. Tucker, *High Tech Frontiers in the Energy Industry: The Challenge Ahead*, AIChE National Meeting (Nov. 30, 1988), https://hdl.handle.net/2027/pur1.32754074119482?urlappend=%3Bseq=522.

[154] Greenhouse Effect Working Group, *The Greenhouse Effect*, Shell Internationale Petroleum, 30 (May 1988), https://www.documentcloud.org/documents/4411090-Document3.html#document/p9/a411239.

large that policy options need to be considered much earlier" and that research should be "directed more to the analysis of policy and energy options than to studies of what we will be facing exactly."

141. In 1989, Esso Resources Canada (ExxonMobil) commissioned a report on the impacts of climate change on existing and proposed natural gas facilities in the Mackenzie River Valley and Delta, including extraction facilities on the Beaufort Sea and a pipeline crossing Canada's Northwest Territory.[155] It reported that "large zones of the Mackenzie Valley could be affected dramatically by climatic change" and that "the greatest concern in Norman Wells [oil town in North West Territories, Canada] should be the changes in permafrost that are likely to occur under conditions of climate warming." The report concluded that, in light of climate models showing a "general tendency towards warmer and wetter climate," operation of those facilities would be compromised by increased precipitation, increase in air temperature, changes in permafrost conditions, and significantly, sea level rise and erosion damage. The authors recommended factoring these eventualities into future development planning and also warned that "a rise in sea level could cause increased flooding and erosion damage on Richards Island."[156]

142. In 1991, Shell produced a film called "Climate of Concern." The film advises that while "no two [climate change projection] scenarios fully agree, . . . [they] have each prompted the same serious warning. A warning endorsed by a uniquely broad consensus of scientists in their report to the UN at the end of 1990." The warning was of an increasing frequency of abnormal weather and of sea level rise of about one meter over the coming century. Shell specifically described the impacts of anthropogenic sea level rise on tropical islands, "barely afloat even now,

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[155] Stephen Lonergan & Kathy Young, *An Assessment of the Effects of Climate Warming on Energy Developments in the Mackenzie River Valley and Delta, Canadian Arctic*, 7 ENERGY EXPLORATION & EXPLOITATION 359–81 (Oct. 1, 1989), http://journals.sagepub.com/doi/abs/10.1177/014459878900700508.

[156] *Id.*

. . . [f]irst made uninhabitable and then obliterated beneath the waves. Wetland habitats destroyed by intruding salt. Coastal lowlands suffering pollution of precious groundwater." It warned of "greenhouse refugees," people who abandoned homelands inundated by the sea, or displaced because of catastrophic changes to the environment. The video concludes with a stark admonition: "Global warming is not yet certain, but many think that the wait for final proof would be irresponsible. Action now is seen as the only safe insurance."[157]

143. The fossil fuel industry, including Defendants, was at the forefront of carbon dioxide research for much of the latter half of the 20th century. They developed cutting edge and innovative technology and worked with many of the field's top researchers to produce exceptionally sophisticated studies and models. For instance, in the mid-nineties Shell began using scenarios to plan how the company could respond to various global forces in the future. In one scenario published in a 1998 internal report, Shell paints an eerily prescient scene:

> In 2010, a series of violent storms causes extensive damage to the eastern coast of the U.S. Although it is not clear whether the storms are caused by climate change, people are not willing to take further chances. The insurance industry refuses to accept liability, setting off a fierce debate over who is liable: the insurance industry or the government. After all, two successive IPCC reports since 1993 have reinforced the human connection to climate change"… "Following the storms, a coalition of environmental NGOs brings a class-action suit against the US government and fossil-fuel companies on the grounds of neglecting what scientists (including their own) have been saying for years: that something must be done. A social reaction to the use of fossil fuels grows, and individuals become 'vigilante environmentalists' in the same way, a generation earlier, they had become fiercely anti-tobacco. Direct-action campaigns against companies escalate. Young consumers, especially, demand action[158]

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[157] Jelmer Mommers, *Shell Made a Film About Climate Change in 1991 (Then Neglected To Heed Its Own Warning)*, DE CORRESPONDENT (Feb. 27, 2017), https://thecorrespondent.com/6285/shell-made-a-film-about-climate-change-in-1991-then-neglected-to-heed-its-own-warning/692663565-875331f6.

[158] Royal Dutch/Shell Group, *Group Scenarios 1998–2020*, 115 (1998), http://www.documentcloud.org/documents/4430277-27-1-Compiled.html.

144. Fossil fuel companies did not just consider climate change impacts in scenarios. In the mid-1990s, ExxonMobil, Shell, and Imperial Oil (ExxonMobil) jointly undertook the Sable Offshore Energy Project in Nova Scotia. The project's own Environmental Impact Statement declared: "The impact of a global warming sea-level rise may be particularly significant in Nova Scotia. The long-term tide gauge records at a number of locations along the N.S. coast have shown sea level has been rising over the past century. . . . For the design of coastal and offshore structures, an estimated rise in water level, due to global warming, of 0.5 m [1.64 feet] may be assumed for the proposed project life (25 years)."[159]

145. Climate change research conducted by Defendants and their industry associations frequently acknowledged uncertainties in their climate modeling—those uncertainties, however, were merely with respect to the magnitude and timing of climate impacts resulting from fossil fuel consumption, not that significant changes would eventually occur. The Defendants' researchers and the researchers at their industry associations harbored little doubt that climate change was occurring and that fossil fuel products were, and are, the primary cause.

146. Despite the overwhelming information about the threats to people and the planet posed by continued unabated use of their fossil fuel products, Defendants failed to act as they reasonably should have to mitigate or avoid those dire adverse impacts. Defendants instead adopted the position, as described below, that the absence of meaningful regulations on the consumption of their fossil fuel products was the equivalent of a license to continue the pursuit of profits from those products. This position was an abdication of Defendants' responsibility to

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[159] ExxonMobil, Sable Project, Development Plan, *Volume 3 – Environmental Impact Statement* Ch 4: Environmental Setting, 4-77, http://soep.com/about-the-project/development-plan-application.

consumers and the public, including the State, to act on their superior knowledge of the reasonably foreseeable hazards of unabated production and consumption of their fossil fuel products.

I. Defendants Did Not Disclose Known Harms Associated with the Extraction, Promotion, and Consumption of Their Fossil Fuel Products, and Instead Affirmatively Acted to Obscure Those Harms and Engaged in a Concerted Campaign to Evade Regulation.

147. By 1988, Defendants had amassed a compelling body of knowledge, unavailable to the general public and the broader scientific community, about the role of anthropogenic greenhouse gases and specifically those emitted from the normal use of Defendants' fossil fuel products, in causing global warming, disruptions to the hydrologic cycle, extreme precipitation and drought, heatwaves, and associated consequences for human communities and the environment. On notice that their products were causing global climate change and dire effects on the planet, Defendants were faced with the decision and were in control of whether to take steps to limit the damages their fossil fuel products were causing and would continue to cause for virtually every one of Earth's inhabitants, including the State of Rhode Island and its citizens.

148. Defendants at any time before or thereafter could and reasonably should have taken any of a number of steps to mitigate the damages caused by their fossil fuel products, and their own comments reveal an awareness of what some of these steps may have been. Defendants should have made reasonable warnings to consumers, the public, and regulators of the dangers known to Defendants of the unabated consumption of their fossil fuel products, and they should have taken reasonable steps to limit the potential greenhouse gas emissions arising out of their fossil fuel products.

149. But several key events during the period 1988–1992 appear to have prompted Defendants to change their course of action from general research and internal discussion on

climate change to a public campaign aimed at evading regulation of their fossil fuel products and/or emissions therefrom. These include:

a. In 1988, National Aeronautics and Space Administration ("NASA") scientists confirmed that human activities were actually contributing to global warming.[160] On June 23 of that year, NASA scientist James Hansen's presentation of this information to Congress engendered significant news coverage and publicity for the announcement, including coverage on the front page of the New York Times.

b. On July 28, 1988, Senator Robert Stafford and four bipartisan co-sponsors introduced S. 2666, "The Global Environmental Protection Act," to regulate CO_2 and other greenhouse gases. Four more bipartisan bills to significantly reduce CO_2 pollution were introduced over the following ten weeks, and in August, U.S. Presidential candidate George H.W. Bush pledged that his presidency would "combat the greenhouse effect with the White House effect."[161] Political will in the United States to reduce anthropogenic greenhouse gas emissions and mitigate the harms associated with Defendants' fossil fuel products was gaining momentum.

c. In December 1988, the United Nations formed the Intergovernmental Panel on Climate Change ("IPCC"), a scientific panel dedicated to providing the

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[160] *See* Peter C. Frumhoff et al., *The Climate Responsibilities of Industrial Carbon Producers*, 132 CLIMATIC CHANGE 161 (2015).

[161] N.Y. TIMES, *The White House and the Greenhouse* (May 9, 1998), http://www.nytimes.com/1989/05/09/opinion/the-white-house-and-the-greenhouse.html.

world's governments with an objective, scientific analysis of climate change and its environmental, political, and economic impacts.

d. In 1990, the IPCC published its First Assessment Report on anthropogenic climate change,[162] in which it concluded that (1) "there is a natural greenhouse effect which already keeps the Earth warmer than it would otherwise be," and (2) that

> emissions resulting from human activities are substantially increasing the atmospheric concentrations of the greenhouse gases carbon dioxide, methane, chlorofluorocarbons (CFCs) and nitrous oxide. These increases will enhance the greenhouse effect, resulting on average in an additional warming of the Earth's surface. The main greenhouse gas, water vapour, will increase in response to global warming and further enhance it.[163]

The IPCC reconfirmed these conclusions in a 1992 supplement to the First Assessment report.[164]

e. The United Nations began preparation for the 1992 Earth Summit in Rio de Janeiro, Brazil, a major, newsworthy gathering of 172 world governments, of which 116 sent their heads of state. The Summit resulted in the United Nations Framework Convention on Climate Change ("UNFCCC"), an international environmental treaty providing protocols for future negotiations aimed at "stabiliz[ing] greenhouse gas concentrations in the atmosphere at a level that

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[162] *See* IPCC, *Reports*, http://www.ipcc.ch/publications_and_data/publications_and_data_reports.shtml.

[163] IPCC, *Climate Change: The IPCC Scientific Assessment*, Policymakers Summary (1990), http://www.ipcc.ch/ipccreports/far/wg_I/ipcc_far_wg_I_spm.pdf.

[164] IPCC, *1992 IPCC Supplement to the First Assessment Report* (1992), http://www.ipcc.ch/publications_and_data/publications_ipcc_90_92_assessments_far.shtml.

would prevent dangerous anthropogenic interference with the climate system."[165]

150. These world events marked a shift in public discussion of climate change, and the initiation of international efforts to curb anthropogenic greenhouse emissions – developments that had stark implications for, and would have diminished the profitability of, Defendants' fossil fuel products.

151. But rather than collaborating with the international community by acting to forestall, or at least decrease, their fossil fuel products' contributions to global warming, sea level rise, disruptions to the hydrologic cycle, and associated consequences to Rhode Island and other communities, Defendants embarked on a decades-long campaign designed to maximize continued dependence on their products and undermine national and international efforts like the Kyoto Protocol to rein in greenhouse gas emissions.

152. Defendants' campaign, which focused on concealing, discrediting, and/or misrepresenting information that tended to support restricting consumption of (and thereby decreasing demand for) Defendants' fossil fuel products, took several forms. The campaign enabled Defendants to accelerate their business practice of exploiting fossil fuel reserves, and concurrently externalize the social and environmental costs of their fossil fuel products. These activities stood in direct contradiction to Defendants' own prior recognition that the science of anthropogenic climate change was clear and that the greatest uncertainties involved responsive human behavior, not scientific understanding of the issue.

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[165] United Nations, *United Nations Framework Convention on Climate Change*, Article 2 (1992), https://unfccc.int/resource/docs/convkp/conveng.pdf.

153. Defendants took affirmative steps to conceal, from the State and the general public, the foreseeable impacts of the use of their fossil fuel products on the Earth's climate and associated harms to people and communities. Defendants embarked on a concerted public relations campaign to cast doubt on the science connecting global climate change to fossil fuel products and greenhouse gas emissions, in order to influence public perception of the existence of anthropogenic global warming and sea level rise, disruptions to weather cycles, extreme precipitation and drought, and associated consequences. The effort included promoting their hazardous products through advertising campaigns and the initiation and funding of climate change denialist organizations, designed to influence consumers to continue using Defendants' fossil fuel products irrespective of those products' damage to communities and the environment.

154. For example, in 1988, Joseph Carlson, an Exxon public affairs manager, described the "Exxon Position," which included among others, two important messaging tenets: (1) "[e]mphasize the uncertainty in scientific conclusions regarding the potential enhanced Greenhouse Effect;" and (2) "[r]esist the overstatement and sensationalization [sic] of potential greenhouse effect which could lead to noneconomic development of non-fossil fuel resources."[166]

155. A 1994 Shell report entitled "The Enhanced Greenhouse Effect: A Review of the Scientific Aspects" by Royal Dutch Shell environmental advisor Peter Langcake stands in stark contrast to the company's 1988 report on the same topic. Whereas before, the authors recommended consideration of policy solutions early on, Langcake warned of the potentially dramatic "economic effects of ill-advised policy measures." While the report recognized the IPCC conclusions as the mainstream view, Langcake still emphasized scientific uncertainty, noting, for

[166] Joseph M. Carlson, *Exxon Memo on "The Greenhouse Effect"* (Aug. 3, 1988), https://assets.documentcloud.org/documents/3024180/1998-Exxon-Memo-on-the-Greenhouse-Effect.pdf.

example, that "the postulated link between any observed temperature rise and human activities has to be seen in relation to natural variability, which is still largely unpredictable." The Group position is stated clearly in the report: "Scientific uncertainty and the evolution of energy systems indicate that policies to curb greenhouse gas emissions beyond 'no regrets' measures could be premature, divert resources from more pressing needs and further distort markets."[167]

156. In 1991, for example, the Information Council for the Environment ("ICE"), whose members included affiliates, predecessors and/or subsidiaries of Defendants, including Pittsburg and Midway Coal Mining (Chevron) and Island Creek Coal Company (Occidental), launched a national climate change science denial campaign with full-page newspaper ads, radio commercials, a public relations tour schedule, "mailers," and research tools to measure campaign success. Included among the campaign strategies was to "reposition global warming as theory (not fact)." Its target audience included older less-educated males who are "predisposed to favor the ICE agenda, and likely to be even more supportive of that agenda following exposure to new info."[168]

157. An implicit goal of ICE's advertising campaign was to change public opinion and avoid regulation. A memo from Richard Lawson, president of the National Coal Association asked members to contribute to the ICE campaign with the justification that "policymakers are prepared to act [on global warming]. Public opinion polls reveal that 60% of the American people already

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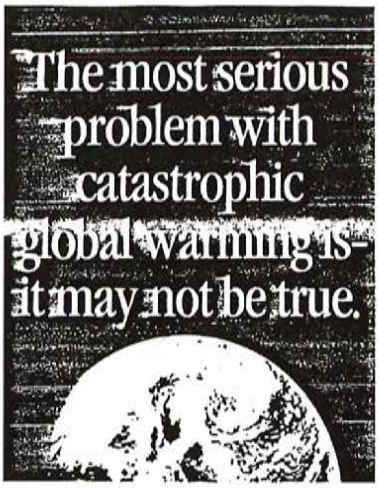
[167] P. Langcake, *The Enhanced Greenhouse Effect: A review of the Scientific Aspects*, (Dec. 1994), https://www.documentcloud.org/documents/4411099-Document11.html#document/p15/a411511.

[168] Union of Concerned Scientists, *Deception Dossier #5: Coal's "Information Council on the Environment" Sham* (1991), http://www.ucsusa.org/sites/default/files/attach/2015/07/Climate-Deception-Dossier-5_ICE.pdf.

believe global warming is a serious environmental problem. Our industry cannot sit on the sidelines in this debate."[169]

158. The following images are examples of ICE-funded print advertisements challenging the validity of climate science and intended to obscure the scientific consensus on anthropogenic climate change and induce political inertia to address it.[170]

Fig. 7: Information Council for the Environment Advertisements



159. In 1996, Exxon released a publication called "Global Warming: Who's Right? Facts about a debate that's turned up more questions than answers." In the publication's preface, Exxon CEO Lee Raymond stated that "taking drastic action immediately is unnecessary since many scientists agree there's ample time to better understand the climate system." The subsequent article described the greenhouse effect as "unquestionably real and definitely a good thing," while ignoring the severe consequences that would result from the influence of the increased CO_2 concentration on the Earth's climate. Instead, it characterized the greenhouse effect as simply

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[169] Naomi Oreskes, *My Facts Are Better Than Your Facts: Spreading Good News about Global Warming* (2010), in Peter Howlett et al., *How Well Do Facts Travel?: The Dissemination of Reliable Knowledge*, 136–66, Cambridge University Press (2011).

[170] Union of Concerned Scientists, *Deception Dossier #5: Coal's "Information Council on the Environment" Sham*, *supra* note 168, at 47–49.

"what makes the earth's atmosphere livable." Directly contradicting their own internal reports and peer-reviewed science, the article ascribed the rise in temperature since the late 19th century to "natural fluctuations that occur over long periods of time" rather than to the anthropogenic emissions that Exxon and other scientists had confirmed were responsible. The article also falsely challenged the computer models that projected the future impacts of unabated fossil fuel product consumption, including those developed by Exxon's own employees, as having been "proved to be inaccurate." The article contradicted the numerous reports circulated among Exxon's staff, and by the API, by stating that "the indications are that a warmer world would be far more benign than many imagine . . . moderate warming would reduce mortality rates in the US, so a slightly warmer climate would be more healthful." Raymond concluded his preface by attacking advocates for limiting the use of his company's fossil fuel products as "drawing on bad science, faulty logic, or unrealistic assumptions" – despite the important role that Exxon's own scientists had played in compiling those same scientific underpinnings.[171]

160. API published an extensive report in the same year warning against concern over CO_2 buildup and any need to curb consumption or regulate the industry. The introduction states that "there is no persuasive basis for forcing Americans to dramatically change their lifestyles to use less oil." The authors discourage the further development of certain alternative energy sources, writing that "government agencies have advocated the increased use of ethanol and the electric car, without the facts to support the assertion that either is superior to existing fuels and technologies" and that "policies that mandate replacing oil with specific alternative fuel technologies freeze progress at the current level of technology, and reduce the chance that

[171] Exxon Corp., *Global Warming: Who's Right?*, (1996), https://www.documentcloud.org/documents/2805542-Exxon-Global-Warming-Whos-Right.html.

innovation will develop better solutions." The paper also denies the human connection to climate change, saying that no "scientific evidence exists that human activities are significantly affecting sea levels, rainfall, surface temperatures or the intensity and frequency of storms." The message the report repeatedly sends is clear: "Facts don't support the arguments for restraining oil use."[172]

161. In a speech presented at the World Petroleum Congress in Beijing in 1997 at which many of the Defendants were present, Exxon CEO Lee Raymond reiterated these views. This time, he presented a false dichotomy between stable energy markets and abatement of the marketing, promotion, and sale of fossil fuel products known to Defendants to be hazardous. He stated:

> Some people who argue that we should drastically curtail our use of fossil fuels for environmental reasons . . . my belief [is] that such proposals are neither prudent nor practical. With no readily available economic alternatives on the horizon, fossil fuels will continue to supply most of the world's and this region's energy for the foreseeable future.
>
> Governments also need to provide a stable investment climate . . . They should avoid the temptation to intervene in energy markets in ways that give advantage to one competitor over another or one fuel over another.
>
> We also have to keep in mind that most of the greenhouse effects comes from natural sources . . . Leaping to radically cut this tiny sliver of the greenhouse pie on the premise that it will affect climate defies common sense and lacks foundation in our current understanding of the climate system.
>
> Let's agree there's a lot we really don't know about how climate will change in the 21st century and beyond . . . It is highly unlikely that the temperature in the middle of the next century will be significantly affected whether policies are enacted now or 20 years from now. It's bad public policy to impose very costly regulations and restrictions when their need has yet to be proven.[173]

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[172] Sally Brain Gentille et al., *Reinventing Energy: Making the Right Choices, American Petroleum Institute*, (1996), http://www.climatefiles.com/trade-group/american-petroleum-institute/1996-reinventing-energy.

[173] Lee R. Raymond, *Energy – Key to growth and a better environment for Asia-Pacific nations,* World Petroleum Congress (Oct. 13, 1997), https://assets.documentcloud.org/documents/2840902/1997-Lee-Raymond-Speech-at-China-World-Petroleum.pdf.

162. Imperial Oil (ExxonMobil) CEO Robert Peterson falsely denied the established connection between Defendants' fossil fuel products and anthropogenic climate change in the Summer 1998 Imperial Oil Review, "A Cleaner Canada:"

> [T]his issue [referring to climate change] has absolutely nothing to do with pollution and air quality. Carbon dioxide is not a pollutant but an essential ingredient of life on this planet . . . .[T]he question of whether or not the trapping of 'greenhouse gases will result in the planet's getting warmer . . . has no connection whatsoever with our day-to-day weather.
>
> There is absolutely no agreement among climatologists on whether or not the planet is getting warmer, or, if it is, on whether the warming is the result of man-made factors or natural variations in the climate. . . . I feel very safe in saying that the view that burning fossil fuels will result in global climate change remains an unproved hypothesis.[174]

163. Mobil (ExxonMobil) paid for a series of "advertorials," advertisements located in the editorial section of the New York Times and meant to look like editorials rather than paid ads. These ads discussed various aspects of the public discussion of climate change and sought to undermine the justifications for tackling greenhouse gas emissions as unsettled science. The 1997 advertorial below[175] argued that economic analysis of emissions restrictions was faulty and inconclusive and therefore a justification for delaying action on climate change.

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[174] Robert Peterson, *A Cleaner Canada in Imperial Oil Review* (1998), http://www.documentcloud.org/documents/2827818-1998-Imperial-Oil-Robert-Peterson-A-Cleaner-Canada.html.

[175] Mobil, *When Facts Don't Square with the Theory, Throw Out the Facts*, N.Y. TIMES, A31 (Aug. 14, 1997), https://www.documentcloud.org/documents/705550-mob-nyt-1997-aug-14-whenfactsdontsquare.html.

like race,

But when we no longer allow those choices, both civility and common sense will have been diminished. □

who was dragged from his sister's car by police officers and shot in the face at point-blank range. The cops who have the power to do something about those officers, but choose not to. □

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164. In 1998, API, on behalf of Defendants, among other fossil fuel companies and organizations supported by fossil fuel corporate grants, developed a Global Climate Science Communications Plan that stated that unless "climate change becomes a non-issue . . . there may be no moment when we can declare victory for our efforts." Rather, API proclaimed that "[v]ictory will be achieved when . . . average citizens 'understand' (recognize) uncertainties in climate science; [and when] recognition of uncertainties becomes part of the 'conventional wisdom.'"[176] The multi-million-dollar, multi-year proposed budget included public outreach and the dissemination of educational materials to schools to "begin to erect a barrier against further efforts to impose Kyoto-like measures in the future"[177] – a blatant attempt to disrupt international efforts, pursuant to the UNFCCC, to negotiate a treaty that curbed greenhouse gas emissions.

165. Soon after, API distributed a memo to its members identifying public agreement on fossil fuel products' role in climate change as its highest priority issue.[178] The memorandum illuminates API's and Defendants' concern over the potential regulation of Defendants' fossil fuel products: "Climate is at the center of the industry's business interests. Policies limiting carbon emissions reduce petroleum product use. That is why it is API's highest priority issue and defined as 'strategic.'"[179] Further, the API memo stresses many of the strategies that Defendants individually and collectively utilized to combat the perception of their fossil fuel products as hazardous. These included:

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[176] Joe Walker, *E-mail to Global Climate Science Team, attaching the Draft Global Science Communications Plan* (Apr. 3, 1998), https://assets.documentcloud.org/documents/784572/api-global-climate-science-communications-plan.pdf.

[177] *Id.*

[178] Committee on Oversight and Government Reform, *Allegations of Political Interference with Government Climate Change Science*, 51 (Mar. 19, 2007), https://ia601904.us.archive.org/25/items/gov.gpo.fdsys.CHRG-110hhrg37415/CHRG-110hhrg37415.pdf.

[179] *Id.*

a. Influencing the tenor of the climate change "debate" as a means to establish that greenhouse gas reduction policies like the Kyoto Protocol were not necessary to address climate change responsibly;

b. Maintaining strong working relationships between government regulators and communications-oriented organizations like the Global Climate Coalition, the Heartland Institute, and other groups carrying Defendants' message minimizing the hazards of the unabated use of their fossil fuel products and opposing regulation thereof;

c. Building the case for (and falsely dichotomizing) Defendants' positive contributions to a "long-term approach" (ostensibly for regulation of their products) as a reason for society to reject short term fossil fuel emissions regulations, and engaging in climate change science uncertainty research; and

d. Presenting Defendants' positions on climate change in domestic and international forums, including by preparing rebuttals to IPCC reports.

166. Additionally, Defendants mounted a campaign against regulation of their business practices in order to continue placing their fossil fuel products into the stream of commerce, despite their own knowledge and the growing national and international scientific consensus about the hazards of doing so. These efforts came despite Defendants' recent recognition that "risks to nearly every facet of life on Earth . . . could be avoided only if timely steps were taken to address climate change."[180]

[180] Neela Banerjee, *Exxon's Oil Industry Peers Knew About Climate Dangers in the 1970s, Too*, *supra* note 126.

167. The Global Climate Coalition ("GCC"), on behalf of Defendants and other fossil fuel companies, funded advertising campaigns and distributed material to generate public uncertainty around the climate debate, with the specific purpose of preventing U.S. adoption of the Kyoto Protocol, despite the leading role that the U.S. had played in the Protocol negotiations.[181] Despite an internal primer stating that various "contrarian theories" [i.e., climate change skepticism] do not "offer convincing arguments against the conventional model of greenhouse gas emission-induced climate change," GCC excluded this section from the public version of the backgrounder and instead funded efforts to promote some of those same contrarian theories over subsequent years.[182]

168. A key strategy in Defendants' efforts to discredit scientific consensus on climate change and the IPCC was to bankroll scientists who, although accredited, held fringe opinions that were even more questionable given the sources of their research funding. These scientists obtained part or all of their research budget from Defendants directly or through Defendant-funded organizations like API,[183] but they frequently failed to disclose their fossil fuel industry underwriters.[184]

169. Creating a false sense of disagreement in the scientific community (despite the consensus that its own scientists, experts, and managers had previously acknowledged) has had an

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[181] *Id.*

[182] Gregory J. Dana, *Memo to AIAM Technical Committee Re: Global Climate Coalition (GCC) – Primer on Climate Change Science – Final Draft*, Association of International Automobile Manufacturers (Jan. 18, 1996), http://www.webcitation.org/6FyqHawb9.

[183] *E.g.*, Willie Soon & Sallie Baliunas, *Proxy Climatic and Environmental Changes of the Past 1000 Years*, 23 CLIMATE RESEARCH 88, 105 (Jan. 31, 2003), http://www.int-res.com/articles/cr2003/23/c023p089.pdf.

[184] *E.g.*, Newsdesk, *Smithsonian Statement: Dr. Wei-Hock (Willie) Soon*, SMITHSONIAN (Feb. 26, 2015), http://newsdesk.si.edu/releases/smithsonian-statement-dr-wei-hock-willie-soon.

evident impact on public opinion. A 2007 Yale University-Gallup poll found that while 71% of Americans personally believed global warming was happening, only 48% believed that there was a consensus among the scientific community, and 40% believed there was a lot of disagreement among scientists over whether global warming was occurring.[185]

170. 2007 was the same year the IPCC published its Fourth Assessment Report, in which it concluded that "there is *very high confidence* that the net effect of human activities since 1750 has been one of warming."[186] The IPCC defined "very high confidence" as at least a 9 out of 10 chance.[187]

171. Defendants borrowed pages out of the playbook of prior denialist campaigns. A "Global Climate Science Team" ("GCST") was created that mirrored a front group created by the tobacco industry, known as The Advancement of Sound Science Coalition, whose purpose was to sow uncertainty about the fact that cigarette smoke is carcinogenic. The GCST's membership included Steve Milloy (a key player on the tobacco industry's front group), Exxon's senior environmental lobbyist; an API public relations representative; and representatives from Chevron and Southern Company that drafted API's 1998 Communications Plan. There were no scientists on the "Global Climate Science Team." GCST developed a strategy to spend millions of dollars manufacturing climate change uncertainty. Between 2000 and 2004, Exxon donated $110,000 to Milloy's efforts and another organization, the Free Enterprise Education Institute and $50,000 to

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[185] *American Opinions on Global Warming: A Yale/Gallup/Clearvision Poll*, Yale Program on Climate Change Communication (July 31, 2007), http://climatecommunication.yale.edu/publications/american-opinions-on-global-warming.

[186] IPCC, *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (2007), https://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-spm.pdf.

[187] *Id.*

the Free Enterprise Action Institute, both registered to Milloy's home address.[188]

172. Defendants by and through their trade association memberships, worked directly, and often in a deliberately obscured manner, to evade regulation of the emissions resulting from use of their fossil fuel products.

173. Defendants have funded dozens of think tanks, front groups, and industry-controlled foundations pushing climate change denial. These include the Competitive Enterprise Institute, the Heartland Institute, Frontiers for Freedom, Committee for a Constructive Tomorrow, and Heritage Foundation. From 1998 to 2014 ExxonMobil spent almost $31 million funding numerous organizations misrepresenting the scientific consensus that Defendants' fossil fuel products were causing climate change, sea level rise, and injuries to coastal communities, including Rhode Island.[189] Several Defendants have been linked to other groups that undermine the scientific basis linking Defendants' fossil fuel products to climate change and sea level rise, including the Frontiers of Freedom Institute and the George C. Marshall Institute.

174. Exxon acknowledged its own previous success in sowing uncertainty and slowing mitigation through funding of climate denial groups. In its 2007 Corporate Citizenship Report, Exxon declared: "In 2008, we will discontinue contributions to several public policy research groups whose position on climate change could divert attention from the important discussion on how the world will secure the energy required for economic growth in an environmentally

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[188] Seth Shulman et al., *Smoke, Mirrors & Hot Air: How ExxonMobil Uses Big Tobacco's Tactics to Manufacture Uncertainty on Climate Science*, Union of Concerned Scientists, 19 (Jan. 2007), http://www.ucsusa.org/sites/default/files/legacy/assets/documents/global_warming/exxon_report.pdf.

[189] ExxonSecrets.org, *ExxonMobil Climate Denial Funding 1998–2014* (accessed June 27, 2018), http://exxonsecrets.org/html/index.php.

responsible manner."[190] Despite this pronouncement, Exxon remained financially associated with several such groups after the report's publication.

175. Today, Defendants, including Exxon, Chevron, BP, Shell, and ConocoPhillips publicly purport to accept the consensus embodied in the most recent IPCC reports, that global warming is occurring, and that human activity has been the dominant cause of global warming and related climactic changes since the beginning of the Great Acceleration. At the same time, however, Defendants continue to play up the uncertainty of future climate modeling, and the purported historic uncertainty, imprecision, and inconsistency of climate science to disguise and distract from their own knowledge and intensive research dating back to at least 1960s. While Defendants claim to accept the scientific consensus on climate change, moreover, they still continue to promote and expand their exploration, production, promotion, marketing, and sale of fossil fuels that are the dominant cause of anthropogenic global warming.

176. Defendants could have contributed to the global effort to mitigate the impacts of greenhouse gas emissions by, for example delineating practical technical strategies, policy goals, and regulatory structures that would have allowed them to continue their business ventures while reducing greenhouse gas emissions and supporting a transition to a lower carbon future. Instead, Defendants undertook a momentous effort to evade international and national regulation of greenhouse gas emissions to enable them to continue unabated fossil fuel production.

177. As a result of Defendants' tortious, misleading conduct, reasonable consumers of Defendants' fossil fuel products and policy-makers, have been deliberately and unnecessarily deceived about: the role of fossil fuel products in causing global warming, sea level rise, disruptions to the hydrologic cycle, and increased extreme precipitation, extreme temperatures,

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[190] ExxonMobil, *2007 Corporate Citizenship Report* (Dec. 31, 2007).

and drought; the acceleration of global warming since the mid-20th century and the continuation thereof; and about the fact that the continued increase in fossil fuel product consumption that creates severe environmental threats and significant economic costs for coastal communities, including Rhode Island. Reasonable consumers and policy makers have also been deceived about the depth and breadth of the state of the scientific evidence on anthropogenic climate change, and in particular, about the strength of the scientific consensus demonstrating the role of fossil fuels in causing both climate change and a wide range of potentially destructive impacts, including sea level rise, disruptions to the hydrologic cycle, extreme precipitation, heatwaves, drought, and associated consequences.

J. In Contrast to Their Public Statements, Defendants' Internal Actions Demonstrate Their Awareness of and Intent to Profit from the Unabated Use of Fossil Fuel Products.

178. In contrast to their public-facing efforts challenging the validity of the scientific consensus about anthropogenic climate change, Defendants' acts and omissions evidence their internal acknowledgement of the reality of climate change and its likely consequences. These actions include, but are not limited to, making multi-billion-dollar infrastructure investments for their own operations that acknowledge the reality of coming anthropogenic climate-related change. These investments include (among others), raising offshore oil platforms to protect against sea level rise; reinforcing offshore oil platforms to withstand increased wave strength and storm severity; and developing and patenting designs for equipment intended to extract crude oil and/or natural gas in areas previously unreachable because of the presence of polar ice sheets.[191]

[191] Amy Lieberman & Suzanne Rust, *Big Oil braced for global warming while it fought regulations*, L.A. TIMES (Dec. 31, 2015), http://graphics.latimes.com/oil-operations.

179. For example, in 1973 Exxon obtained a patent for a cargo ship capable of breaking through sea ice[192] and for an oil tanker[193] designed specifically for use in previously unreachable areas of the Arctic.

180. In 1974, Chevron obtained a patent for a mobile arctic drilling platform designed to withstand significant interference from lateral ice masses,[194] allowing for drilling in areas with increased ice floe movement due to elevated temperature.

181. That same year, Texaco (Chevron) worked toward obtaining a patent for a method and apparatus for reducing ice forces on a marine structure prone to being frozen in ice through natural weather conditions,[195] allowing for drilling in previously unreachable Arctic areas that would become seasonally accessible.

182. Shell obtained a patent similar to Texaco's (Chevron) in 1984.[196]

183. In 1989, Norske Shell, Royal Dutch Shell's Norwegian subsidiary, altered designs for a natural gas platform planned for construction in the North Sea to account for anticipated sea level rise. Those design changes were ultimately carried out by Shell's contractors, adding substantial costs to the project.[197]

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[192] Patents, *Icebreaking cargo vessel*, Exxon Research Engineering Co. (Apr. 17, 1973), https://www.google.com/patents/US3727571.

[193] Patents, *Tanker vessel*, Exxon Research Engineering Co. (July 17, 1973), https://www.google.com/patents/US3745960.

[194] Patents, *Arctic offshore platform*, Chevron Res (Aug. 27, 1974), https://www.google.com/patents/US3831385.

[195] Patents, *Mobile, arctic drilling and production platform*, Texaco Inc. (Feb. 26, 1974), https://www.google.com/patents/US3793840.

[196] Patents, *Arctic offshore platform*, Shell Oil Company (Jan. 24, 1984), https://www.google.com/patents/US4427320.

[197] *Greenhouse Effect: Shell Anticipates a Sea Change*, N.Y. TIMES (Dec. 20, 1989), http://www.nytimes.com/1989/12/20/business/greenhouse-effect-shell-anticipates-a-sea-change.html.

a. The Troll field, off the Norwegian coast in the North Sea, was proven to contain large natural oil and gas deposits in 1979, shortly after Norwegian oil and gas regulators approved Norske Shell to operate a portion of the field.

b. In 1986, the Norwegian parliament granted Norske Shell authority to complete the first development phase of the Troll field gas deposits, and Norske Shell began designing the "Troll A" gas platform, with the intent to begin operation of the platform in approximately 1995. Based on the very large size of the gas deposits in the Troll field, the Troll A platform was projected to operate for approximately 70 years.

c. The platform was originally designed to stand approximately 100 feet above sea level—the amount necessary to stay above waves in a once-in-a-century strength storm.

d. In 1989, Shell engineers revised their plans to increase the above-water height of the platform by 3–6 feet, specifically to account for higher anticipated average sea levels and increased storm intensity due to global warming over the platform's 70-year operational life.[198]

e. Shell projected that the additional 3–6 feet of above-water construction would increase the cost of the Troll A platform by as much as $40 million.

K. Defendants' Actions Prevented the Development of Alternatives That Would Have Eased the Transition to a Less Fossil Fuel Dependent Economy.

184. The harms and benefits of Defendants' conduct can be balanced in part by weighing the social benefit of extracting and burning a unit of fossil fuels against the costs that a unit of fuel

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[198] *Id.*; Amy Lieberman & Suzanne Rust, *Big Oil Braced for Global Warming While It Fought Regulations*, L.A. TIMES (Dec. 31, 2015), http://graphics.latimes.com/oil-operations.

imposes on society, known as the "social cost of carbon" or "SCC."

185. Because climatic responses to atmospheric temperature increases are non-linear, and because greenhouse gas pollution accumulates in the atmosphere, some of which does not dissipate for potentially thousands of years (namely CO_2), there is broad agreement that SCC increases as emissions rise, and as the climate warms. Relatedly, as atmospheric CO_2 levels and surface temperature increase, the costs of remediating any individual environmental injury—for example, infrastructure to mitigate sea level rise, and changes to agricultural processes—also increase. In short, each additional ton of CO_2 emitted into the atmosphere will have a greater net social cost as emissions increase, and each additional ton of CO_2 will have a greater net social cost as global warming accelerates.

186. A critical corollary of the non-linear relationship between atmospheric CO_2 concentrations and SCC is that delayed efforts to curb those emissions have increased environmental harms and increased the magnitude and cost to remediate harms that have already occurred or are locked in by previous emissions. Therefore, Defendants' campaign to obscure the science of climate change and to expand the extraction and use of fossil fuels greatly increased and continues to increase the harms and rate of harms suffered by the State and the People.

187. The consequences of delayed action on climate change, exacerbated by Defendants' actions, already have drastically increased the cost of mitigating further harm. Had concerted action begun even as late as 2005, an annual 3.5% reduction in CO_2 emissions to lower atmospheric CO_2 to 350 ppm by the year 2100 would have restored earth's energy balance[199] and halted future

[199] "Climate equilibrium" is the balance between Earth's absorption of solar energy and its own energy radiation. Earth is currently out of equilibrium due to the influence of anthropogenic greenhouse gases, which prevent radiation of energy into space. Earth therefore warms and move back toward energy balance. Reduction of global CO_2 concentrations to 350 ppm is necessary to

global warming, although such efforts would not forestall committed sea level rise already locked in.[200] If efforts do not begin until 2020, however, a 15% annual reduction will be required to restore the Earth's energy balance by the end of the century.[201] Earlier steps to reduce emissions would have led to smaller—and less disruptive—measures needed to mitigate the impacts of fossil fuel production.

188. The costs of inaction and the opportunities to confront anthropogenic climate change and sea level rise caused by normal consumption of their fossil fuel products, were not lost on Defendants. In a 1997 speech by John Browne, Group Executive for BP America, at Stanford University, Browne described Defendants' and the entire fossil fuel industry's responsibility and opportunities to reduce use of fossil fuel products, reduce global CO_2 emissions, and mitigate the harms associated with the use and consumption of such products:

> A new age demands a fresh perspective of the nature of society and responsibility.
>
> We need to go beyond analysis and to take action. It is a moment for change and for a rethinking of corporate responsibility. . . .
>
> [T]here is now an effective consensus among the world's leading scientists and serious and well informed people outside the scientific community that there is a discernible human influence on the climate, and a link between the concentration of carbon dioxide and the increase in temperature.
>
> The prediction of the IPCC is that over the next century temperatures might rise by a further 1 to 3.5 degrees centigrade [1.8° – 6.3° F], and that sea levels might rise by between 15 and 95 centimeters [5.9 and 37.4 inches]. Some of that impact is probably unavoidable, because it results from current emissions. . . .

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re-achieve energy balance, if the aim is to stabilize climate without further global warming and attendant sea level rise. *See* James Hansen et al., *Assessing "Dangerous Climate Change:" Required Reduction of Carbon Emissions to Protect Young People, Future Generations and Nature*, 8 PLOS ONE 1, 4–5 (Dec. 3, 2013), http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0081648.

[200] James Hansen et al., *Assessing "Dangerous Climate Change:" Required Reduction of Carbon Emissions to Protect Young People, Future Generations and Nature*, 8 PLOS ONE 1, 10 (Dec. 3, 2013), http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0081648.

[201] *Id.*

> [I]t would be unwise and potentially dangerous to ignore the mounting concern.
>
> The time to consider the policy dimensions of climate change is not when the link between greenhouse gases and climate change is conclusively proven … but when the possibility cannot be discounted and is taken seriously by the society of which we are part. . . .
>
> We [the fossil fuel industry] have a responsibility to act, and I hope that through our actions we can contribute to the much wider process which is desirable and necessary.
>
> BP accepts that responsibility and we're therefore taking some specific steps.
>
> To control our own emissions.
>
> To fund continuing scientific research.
>
> To take initiatives for joint implementation.
>
> To develop alternative fuels for the long term.
>
> And to contribute to the public policy debate in search of the wider global answers to the problem."[202]

189. Despite Defendants' knowledge of the foreseeable, measurable harms associated with the unabated consumption and use of their fossil fuel products, and despite the existence and Defendants' knowledge of technologies and practices that could have helped to reduce the foreseeable dangers associated with their fossil fuel products, Defendants continued to market and promote heavy fossil fuel use, dramatically increasing the cost of abatement. At all relevant times, Defendants were deeply familiar with opportunities to reduce the use of their fossil fuel products, reduce global CO_2 emissions associated therewith, and mitigate the harms associated with the use and consumption of such products. Examples of that recognition include, but are not limited to

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[202] John Browne, *BP Climate Change Speech to Stanford*, Climate Files (May 19, 1997), http://www.climatefiles.com/bp/bp-climate-change-speech-to-stanford.

the following:

a. In 1963, Esso (Exxon) obtained multiple patents on technologies for fuel cells, including on the design of a fuel cell and necessary electrodes,[203] and on a process for increasing the oxidation of a fuel, specifically methanol, to produce electricity in a fuel cell.[204]

b. In 1970, Esso (ExxonMobil) obtained a patent for a "low-polluting engine and drive system" that used an interburner and air compressor to reduce pollutant emissions, including CO_2 emissions, from gasoline combustion engines (the system also increased the efficiency of the fossil fuel products used in such engines, thereby lowering the amount of fossil fuel product necessary to operate engines equipped with this technology).[205]

190. Defendants could have made major inroads to mitigate the State's injuries through technology by developing and employing technologies to capture and sequester greenhouse gases emissions associated with conventional use of their fossil fuel products. Defendants had knowledge dating at least back to the 1960s, and indeed, internally researched and perfected many such technologies. For instance:

a. The first patent for enhanced oil recovery technology, a process by which CO_2 is captured and reinjected into oil deposits, was granted to an ARCO (BP)

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[203] Patents, *Fuel cell and fuel cell electrodes*, Exxon Research Engineering Co. (Dec. 31, 1963), https://www.google.com/patents/US3116169.

[204] Patents, *Direct production of electrical energy from liquid fuels*, Exxon Research Engineering Co. (Dec. 3, 1963), https://www.google.com/patents/US3113049.

[205] Patents, *Low-polluting engine and drive system*, Exxon Research Engineering Co. (May 16, 1970), https://www.google.com/patents/US3513929.

subsidiary in 1952.[206] This technology could have been further developed as a carbon capture and sequestration technique;

b. Phillips Petroleum Company (ConocoPhillips) obtained a patent in 1966 for a "Method for recovering a purified component from a gas" outlining a process to remove carbon from natural gas and gasoline streams;[207] and

c. In 1973, Shell was granted a patent for a process to remove acidic gases, including CO_2, from gaseous mixtures.

191. Despite this knowledge, Defendants did not commit to or follow through on later forays into the alternative energy sector. For instance, in 2001, Chevron developed and shared a sophisticated information management system to gather greenhouse gas emissions data from its explorations and production to help regulate and set reduction goals.[208] Beyond this technological breakthrough, Chevron touted "profitable renewable energy" as part of its business plan for several years and launched a 2010 advertising campaign promoting the company's move towards renewable energy. Despite all this, Chevron rolled back its renewable and alternative energy projects in 2014.[209]

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[206] James P. Meyer, *Summary of Carbon Dioxide Enhanced Oil Recovery (CO_2EOR) Injection Well Technology*, American Petroleum Institute, 1, http://www.api.org/~/media/Files/EHS/climate-change/Summary-carbon-dioxide-enhanced-oil-recovery-well-tech.pdf.

[207] Patents, *Method for recovering a purified component from a gas*, Phillips Petroleum Co (Jan. 11, 1966), https://www.google.com/patents/US3228874.

[208] Chevron, Chevron Press Release – *Chevron Introduces New System to Manage Energy Use* (Sept. 25, 2001).

[209] Benjamin Elgin, *Chevron Dims the Lights on Green Power*, BLOOMBERG (May 29, 2014), https://www.bloomberg.com/news/articles/2014-05-29/chevron-dims-the-lights-on-renewable-energy-projects.

192. Likewise, while Shell orchestrated an entire public relations campaign around energy transitions towards net zero emissions, a fine-print disclaimer in its 2016 net-zero pathways report reads: "We have no immediate plans to move to a net-zero emissions portfolio over our investment horizon of 10–20 years."[210]

193. BP, appearing to abide by the representations Lord Browne made in his speech described in paragraph 188, above, engaged in a rebranding campaign to convey an air of environmental stewardship and renewable energy to its consumers. This included renouncing its membership in the GCC in 2007, changing its name from "British Petroleum" to "BP" while adopting the slogan "Beyond Petroleum," and adopting a conspicuously green corporate logo. However, BP's self-touted "alternative energy" investments during this turnaround included investments in natural gas, a fossil fuel, and in 2007 the company reinvested in Canadian tar sands, a particularly high-carbon source of oil.[211] The company ultimately abandoned its wind and solar assets in 2011 and 2013, respectively, and even the "Beyond Petroleum" moniker in 2013.[212]

194. After posting a $10 billion quarterly profit, Exxon in 2005 stated that "We're an oil and gas company. In times past, when we tried to get into other businesses, we didn't do it well. We'd rather re-invest in what we know."[213]

195. Even if Defendants did not adopt technological or energy source alternatives that would have reduced use of fossil fuel products, reduced global greenhouse gas pollution, and/or mitigated the harms associated with the use and consumption of such products, Defendants could

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[210] *Energy Transitions Towards Net Zero Emissions* (NZE), Shell (2016).

[211] Fred Pearce, *Greenwash: BP and the Myth of a World 'Beyond Petroleum'*, THE GUARDIAN, (Nov. 20, 2008), https://www.theguardian.com/environment/2008/nov/20/fossilfuels-energy.

[212] Javier E. David, *'Beyond Petroleum' No More? BP Goes Back to Basics*, CNBC (Apr. 20, 2013), http://www.cnbc.com/id/100647034.

[213] James R. Healy, *Alternate Energy Not in Cards at ExxonMobil* (Oct. 28, 2005), https://usatoday30.usatoday.com/money/industries/energy/2005-10-27-oil-invest-usat_x.htm.

have taken other practical, cost-effective steps to reduce the use of their fossil fuel products, reduce global greenhouse gas pollution associated therewith, and mitigate the harms associated with the use and consumption of such products. These alternatives could have included, among other measures:

a. Accepting scientific evidence on the validity of anthropogenic climate change and the damages it will cause people and communities, including Plaintiff, and the environment. Mere acceptance of that information would have altered the debate from *whether* to combat climate change and sea level rise to *how* to combat it; and avoided much of the public confusion that has ensued over nearly 30 years, since at least 1988;

b. Forthrightly communicating with Defendants' shareholders, banks, insurers, the public, regulators and Plaintiff about the global warming and sea level rise hazards of Defendants' fossil fuel products that were known to Defendants, would have enabled those groups to make material, informed decisions about whether and how to address climate change and sea level rise vis-à-vis Defendants' products;

c. Refraining from affirmative efforts, whether directly, through coalitions, or through front groups, to distort public debate, and to cause many consumers and business and political leaders to think the relevant science was far less certain than it actually was;

d. Sharing their internal scientific research with the public, and with other scientists and business leaders, so as to increase public understanding of the

scientific underpinnings of climate change and its relation to Defendants' fossil fuel products;

e. Supporting and encouraging policies to avoid dangerous climate change, and demonstrating corporate leadership in addressing the challenges of transitioning to a low-carbon economy;

f. Prioritizing alternative sources of energy through sustained investment and research on renewable energy sources to replace dependence on Defendants' inherently hazardous fossil fuel products;

g. Adopting their shareholders' concerns about Defendants' need to protect their businesses from the inevitable consequences of profiting from their fossil fuel products. Over the period of 1990-2015, Defendants' shareholders proposed hundreds of resolutions to change Defendants' policies and business practices regarding climate change. These included increasing renewable energy investment, cutting emissions, and performing carbon risk assessments, among others.

196. Despite their knowledge of the foreseeable harms associated with the consumption of Defendants' fossil fuel products, and despite the existence and fossil fuel industry knowledge of opportunities that would have reduced the foreseeable dangers associated with those products, Defendants wrongfully promoted, campaigned against regulation of, and concealed the hazards of use of their fossil fuel products.

L. Defendants Caused Rhode Island's Injuries.

197. Defendants, individually and collectively, extracted a substantial percentage of all raw fossil fuels recovered globally since 1965. Defendants also individually and collectively manufactured, promoted, marketed, and sold a substantial percentage of all fossil fuel products

used and combusted during that period. Defendants further played leadership roles in campaigns to deny the link between their products and the adverse effects of global warming, to avoid regulation, and to stifle transition away from fossil fuels that would reduce the carbon footprint affecting the world climate system.

198. CO_2 emissions attributable to fossil fuels that Defendants extracted from the Earth and injected into the market are responsible for a substantial percentage of greenhouse gas pollution since 1965.

199. Defendants' individual and collective conduct, including, but not limited to, their extraction, refining, and/or formulation of fossil fuel products; their introduction of fossil fuel products into the stream of commerce; their wrongful promotion of their fossil fuel products and concealment of known hazards associated with use of those products; and their failure to pursue less hazardous alternatives available to them; is a substantial factor in causing the increase in global mean temperature and consequent increase in global mean sea surface height and disruptions to the hydrologic cycle, including, but not limited to, more frequent and extreme droughts, more frequent and extreme precipitation events, more frequent and extreme heat waves, and the associated consequences of those physical and environmental changes, since 1965.

200. Defendants have actually and proximately caused sea levels to rise, increased the destructive impacts of storm surges, increased coastal erosion, exacerbated the onshore impact of regular tidal ebb and flow, caused saltwater intrusion, disrupted the hydrologic cycle, caused increased frequency and severity of drought, caused increased frequency and severity of extreme precipitation events, caused increased frequency and severity of heat waves, and caused consequent social and economic injuries associated with the aforementioned physical and

environmental impacts, among other impacts, resulting in inundation, destruction, and/or other interference with the State's property and citizenry.

201. Rhode Island has already incurred, and will foreseeably continue to incur, injuries and harms from sea level rise; increased ambient temperatures and extreme heat days; disruptions to the hydrologic cycle including increased frequency and severity of drought; increased frequency and severity of extreme precipitation events; and social and economic harms associated with those physical and environmental changes, all of which have been caused and/or exacerbated by Defendants' conduct.

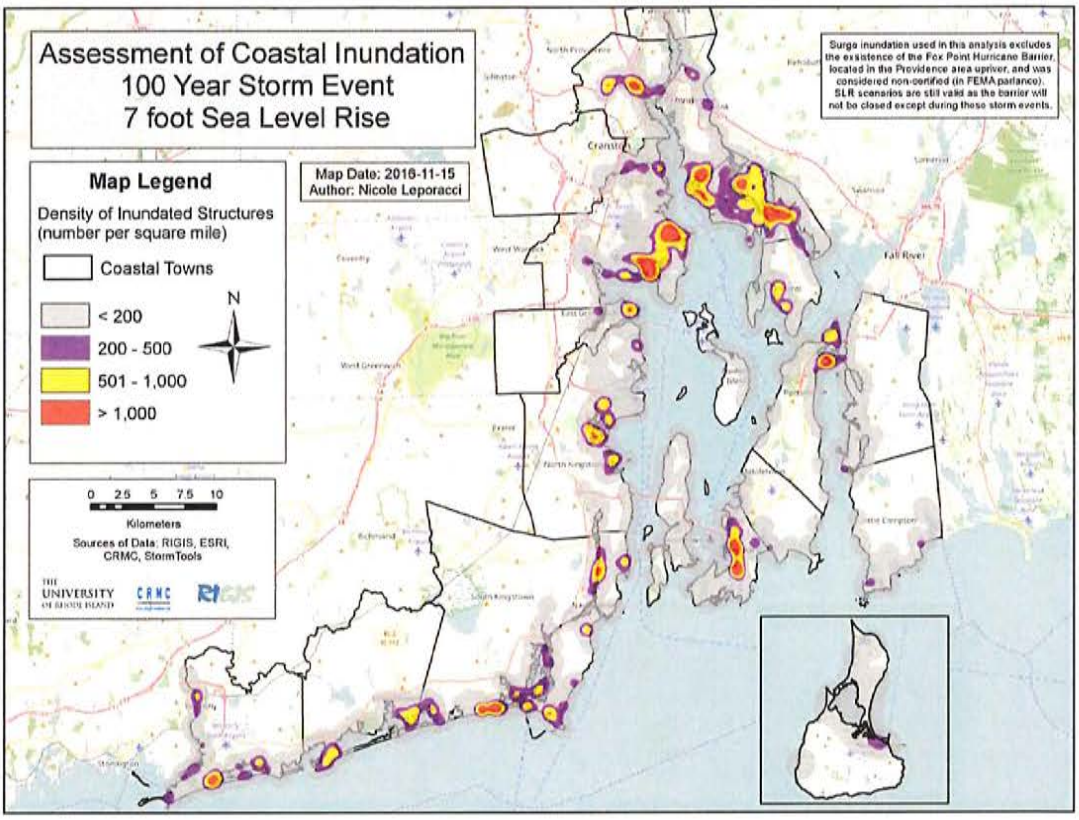
202. Sea level rise has created and will continue to create significant impacts attributable to Defendants' conduct.

203. The State of Rhode Island is particularly vulnerable to the impacts of sea level rise because of its long coastline, substantial low-lying land area, and extensive coastal development.

204. Under a seven-feet sea level rise scenario, ocean water will inundate approximately seventeen square miles of land along Rhode Island's Narragansett Bay coastline, encompassing 3,765 buildings and the residences of over 10,000 people.[214] The figure below depicts inundated structures during a 100-year storm event with seven feet of sea level rise.

[214] Narragansett Bay Estuary Program, *supra* note 81, at 22; *see also* STORMTOOLS, http://www.beachsamp.org/stormtools.

Fig. 8: Rhode Island Coastal Inundation Projection



205. The impacts of sea level rise will occur unevenly across the state depending on local factors including location, natural features, and development. The lower Taunton River watershed is especially vulnerable to sea level rise, for example, because of its shallow slopes.

206. Sea level rise endangers major public and private property and infrastructure by causing coastal flooding of low-lying areas, erosion, salinity intrusion, and storm surges. Critical facilities, existing roadways, wastewater treatment facilities, residential neighborhoods, industrial areas including ports, highways, rail lines, emergency response routes and facilities, beaches, and parks have suffered and/or will suffer injuries due to sea level rise expected by the end of this century.

207. The State will experience continuing significant and dangerous sea level rise through at least the end of this century,[215] and those increases in sea level will accelerate over time. The State will suffer greater overall sea level rise than the global average,[216] and even if all carbon emissions ceased, Rhode Island would still experience greater committed sea level rise in the future due to the "locked in" greenhouse gases already emitted.[217]

208. In addition to direct damage to State property, infrastructure, and natural resources, sea level rise will require the State to expend resources to disseminate flood risk information to communities; set new policies, such as building regulations to account for increased risks; to invest in adaptive measures such as raising or relocating coastal roads and structures; and/or to invest in defensive measures such as seawalls or levees to prevent property damage.[218] By the end of the century, 6,660 Rhode Island coastal properties, worth roughly $3.6 billion, will be at risk under a high-sea level rise scenario, reducing property tax revenue by as much as $47.8 million.[219] That lost tax revenue could in turn reduce resources available to the State to prevent and mitigate further the harms suffered by Rhode Island municipalities. Even with resiliency measures in place under a low emissions scenario, coastal properties will face increased flooding risk and associated harms, and depression in property value.[220]

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[215] Erika Spanger-Siegfried et al., Union of Concerned Scientists, *supra* note 9, at 10–11.

[216] Rhode Island Department of Health, *Rhode Island Climate Change and Resiliency Report*, *supra* note 55, at 10.

[217] Peter U. Clark et al., *supra* note 44, at 363–65.

[218] Union of Concerned Scientists, *Underwater: Rising Seas, Chronic Floods, and the Implications for US Coastal Real Estate*, 16–17 (June 2018), https://www.ucsusa.org/underwater.

[219] Union of Concerned Scientists, *Underwater: Rising Seas, Chronic Floods, and the Implications for US Coastal Real Estate, "Complete data by state"* (June 2018), https://www.ucsusa.org/sites/default/files/attach/2018/06/underwater-data-by-state.xlsx.

[220] *See id.*

209. Furthermore, Rhode Island has experienced and will continue to experience injuries due to changes in the hydrologic cycle caused by Defendants' conduct. Increased intensity and frequency of storms results in flooding and erosion and impacts transportation, infrastructure, businesses, homes, and public health. Dry extremes impact water supply, infrastructure and public health.

210. More frequent and intense storms, including Nor'easters (extra-tropical storms), and "bomb cyclones" riding on top of rising seas, are contributing to coastal flooding that is as damaging as flooding typically associated with hurricanes.[221] Under a 3-foot rise in sea level, even a Nor'easter could submerge coastal areas of the state, including areas sufficient to cut off the southwestern peninsula of Newport, RI from the mainland.[222]

211. The state's coastline is highly vulnerable to flood damage from winter storms and hurricanes. In October 2012, Superstorm Sandy (a post-tropical storm) caused a storm surge 9.4 feet above normal high tide in Providence, resulting in extensive flooding.[223] One year earlier, heavy rainfall and strong southeast winds—up to 70 mph—from Hurricane Irene knocked down power lines, leaving half of Rhode Island's one million residents without power.[224]

212. Sea level rise, changes to the hydrologic cycle, and increased air and ocean temperatures resulting from anthropogenic climate change have and will result in injury to public, industrial, commercial, and residential assets within the State either directly, or through secondary and tertiary impacts that cause the State to expend resources in resiliency planning, responding to these impacts, and repairing infrastructure damage; lost revenue due to decreased economic

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[221] *Resilient Rhody: Statewide Climate Resilience Action Strategy*, *supra* note 56, at 15.

[222] Rhode Island Department of Health, *Rhode Island Climate Change and Resiliency Report*, *supra* note 55, at 10.

[223] NOAA National Centers for Environmental Information, *supra* note 83, at 2.

[224] *Id.*

activity in the State; injury to natural resources which the State holds in trust for the use and enjoyment of the people of the State; and cause the State to suffer other injuries. Among the properties and natural resources in the State that have and/or will be injured as a result of anthropogenic climate change are:

a. **Roads and Bridges:** With over 400 miles of coastline and large inland watersheds, Rhode Island's transportation and transit infrastructure (roads, bridges, intermodal facilities, culverts, etc.) is vulnerable to sea level rise and flooding.[225] Much of the State's extensive network of roads, bridges, and parking areas are state owned or maintained. Rhode Island's transportation system Federal regulations require the state to engage in asset management to weigh climate change risks (among others).[226] According to an analysis conducted in 2016 (that excluded riverine flooding), 175 miles of roadway will be exposed with seven feet of sea level rise. In a storm surge event with seven feet of sea level rise, 573 miles of roadway will be exposed, over 200 additional miles of roadway over a similar surge at today's sea level.[227] Riverine inundation will present additional challenge to the State's transportation infrastructure.[228] Ten of the most vulnerable segments of roads under state jurisdiction are projected to experience daily high tide flooding at either one or three feet of sea level rise, and all but one are hurricane evacuation routes.[229] In

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[225] *Resilient Rhody: Statewide Climate Resilience Action Strategy*, *supra* note 56, at 32.

[226] *Id.*

[227] *Id.* at 33

[228] *Id.*

[229] Rhode Island Statewide Planning Program, *Vulnerability of Transportation Assets to Sea Level Rise*, 11–12 (Jan. 2015).

addition, 90 bridges are vulnerable to sea level rise, and 148 bridges vulnerable to storm surge.[230] Increased flooding of coastal roads, evacuation routes, and bridges creates the risk of coastal populations becoming trapped with no means of accessing emergency services during high tides and storm surge events.[231] Rising temperatures and more frequent extreme weather events also contribute to degradation of roads and bridges increasing maintenance and repair costs.

b. **Other Transportation Infrastructure**. Sea level rise will also impact railroad systems. Several rail segments will be flooded under three- and five-foot sea level rise scenarios, including portions of the Newport Secondary, a state-owned track.[232] Sea level rise and increased flooding will also impact the State's statewide bus network, both disrupting service and requiring relocation of a number of stops and the Newport Gateway hub to upland locations.[233]

c. **Energy Infrastructure:** Rhode Island has experienced many severe weather-related events over the last eight years, including floods, blizzards, extended heat waves, extreme cold snaps and hurricanes. One of the most direct energy security impacts of major storm events is power outages. Power outages result in direct costs to repair damaged or flooded infrastructure or downed poles and wires and to restore service, indirect costs such as lost business and tax revenue, and health

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[230] Rhode Island Statewide Planning Program, *Vulnerability of Municipal Transportation Assets to Sea Level Rise and Storm Surge*, 21 (Sept. 28, 2016).

[231] Rhode Island Sea Grant et al., *Sea Level Rise in Rhode Island: Trends and Impacts*, 4 (Jan. 2013), http://www.beachsamp.org/wp-content/uploads/2016/09/climate_SLR_factsheet2013.pdf.

[232] Rhode Island Statewide Planning Program, *Vulnerability of Transportation Assets to Sea Level Rise*, 12 (Jan. 2015).

[233] *Resilient Rhody: Statewide Climate Resilience Action Strategy*, *supra* note 56, at 35–36.

impacts from loss of electricity and air conditioning.[234] Increased extreme heat days also put stress on the state's electricity grid, by requiring increased air conditioning. State agencies are playing key roles in overseeing energy assurance and resiliency in Rhode Island.[235]

d. **Dams:** The state has 668 inventoried dams, 96 of which are classified as "high hazard" (meaning that failure or mis-operation will result in probable loss of human life) and 81 of which are classified as "significant hazard" (meaning failure can cause major economic loss, disrupt critical facilities or infrastructure, or detriment public's health, safety or welfare).[236] The Rhode Island Department of Environmental Management (RIDEM) has the statutory duty to inspect dams and to take necessary action to make dams safe. RIDEM is in the process of studying hazardous dams to determine what actions are necessary to withstand a 500-year storm event.[237]

e. **Ports:** Maritime transportation, including through the Port of Providence and Port of Galilee, serves a critical role in the Rhode Island economy by providing access to products, raw materials, and export revenue. Numerous ancillary businesses depend on the ports' functionality. The Port of Providence alone generated more than $200 million in economic benefits for the region and over 2,400 jobs. The State's commercial fishing industry generates approximately $200 million in annual sales and supports about 7,000 jobs. Impacts of climate change on fishing

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[234] *Resilient Rhody: Statewide Climate Resilience Action Strategy*, *supra* note 56, at 28–29.
[235] *Id.* at 29.
[236] *Id.* at 23.
[237] *Id.*

resources, including flooding from major storms and associated damage and closure of fisheries and loss of profitable aquatic species, have caused and will cause both short and long-term disruptions in the Rhode Island economy, causing the State to lose revenue. The State is actively engaged in studying resilience of its ports and informing the public to encourage long-term planning.[238]

f. **Beaches:** Coastal beaches and barriers are dynamic systems that define much of Rhode Island's south-facing shore and are popular recreational destinations for both residents and out-of-state visitors. Climate change has and will subject beaches to increased storm surge, erosion, coastal flooding and sea level rise. The State owns numerous beaches open for public use and enjoyment. Beaches will migrate landward and if impeded by development will narrow or disappear altogether, reducing the area available for public recreation and tourism, and affecting habitats for plants and for birds migrating or nesting on shore.[239] Because bacteria grows more quickly in warm water, warming ocean temperatures will result in increased beach closures.[240] As a result of climate change the State will lose real property to inundation and flooding and revenue from decreased tourism and use of Rhode Island beaches. The State is expending resources to analysis coastal adaptations strategies to protect beaches and dunes.

g. **Water Supply:** Sea level rise and increased summer and fall droughts will stress Rhode Island's water supply.[241] Reduced seasonal precipitation will increase public

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[238] *Resilient Rhody: Statewide Climate Resilience Action Strategy*, *supra* note 56, at 26–27.

[239] Rhode Island Sea Grant et al., *Sea Level Rise in Rhode Island: Trends and Impacts*, 4 (Jan. 2013), http://www.beachsamp.org/wp-content/uploads/2016/09/climate_SLR_factsheet2013.pdf.

[240] Narragansett Bay Estuary Program, *supra* note 81, at 20.

[241] *Resilient Rhody: Statewide Climate Resilience Action Strategy*, *supra* note 56, at 20.

reliance on groundwater sources to provide drinking water, and simultaneously slow replenishment of groundwater aquifers. At the same time, sea level rise will result in saltwater intruding into coastal groundwater aquifers and wells, contaminating drinking water resources.[242] This is a large concern for southern Rhode Island, which relies heavily on coastal ground water supplies.[243] For example, Aquidneck Island's primary reservoir is highly vulnerable to storm surge from hurricanes and coastal storm events.[244] Sea level rise and storm events can also result in or exacerbate intrusion into drinking water systems by toxic and hazardous substances that are dangerous to human health. Many brownfield and superfund sites within the State susceptible to climate impacts are located next to water bodies which they may contaminate if disturbed.[245]

h. **Wastewater Management:** The State is home to nineteen major wastewater treatment facilities and over 250 pumping stations to transport sewage to these systems. Most of these wastewater systems are located in floodplains to take advantage of gravity fed flows.[246] Sea level rise, and increased flooding and storms associated with climate change will exceed infrastructure capacity, overwhelming and submerging infrastructure, including pipelines, wastewater pumping stations and treatment systems.[247] Treatment systems and pumping stations will require upgrades to withstand future conditions, and the State has already begun requiring

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[242] *Id.*

[243] SafeWater RI, *Ensuring Water for Rhode Island's Future*, *supra* note 78, at 11.

[244] *Resilient Rhody: Statewide Climate Resilience Action Strategy*, *supra* note 56, at 19.

[245] *Id.* at 63.

[246] *Id.* at 21.

[247] SafeWater RI, *Ensuring Water for Rhode Island's Future*, *supra* note 78, at 14.

resiliency analysis as part of major wastewater treatment facility permit reissuances. Local authorities will need to assess local conditions and take necessary steps to improve resilience of wastewater treatment infrastructure.

i. **Stormwater/Flood Management Infrastructure:** More frequent and more intense extreme weather events and flooding will damage the States' stormwater infrastructure, which was not designed to withstand the intense storms and floods that will become more common with climate change. Climate change is already challenging capacity and performance of these drainage systems.[248] As storm patterns change, they will exceed existing capacity of local stormwater infrastructure. Overburdened and inadequate stormwater infrastructure will result likely release pathogens and other pollutants during storm events, causing property damage, water quality impairments, beach closures, closure of shellfish growing areas, and other public health risks.[249] Given the extensive network of State-owned or maintained roads, bridges, and parking areas within Rhode Island, the Rhode Island Department of Transportation ("RIDOT") has significant responsibilities for stormwater management. RIDOT manages stormwater infrastructure that includes an estimated 25,000 catch basins and 3,800 outfalls. RIDOT has recently embarked on a ten-year strategic program to improve stormwater management consistent with a federal consent decree issued in 2015.[250] The State lacks adequate funding to

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[248] *Resilient Rhody: Statewide Climate Resilience Action Strategy*, *supra* note 56, at 24.

[249] *Id.*

[250] *Resilient Rhody: Statewide Climate Resilience Action Strategy*, *supra* note 56, at 25.

support necessary retrofitting and ongoing maintenance of the stormwater infrastructure, in particular under a high-emission scenario.[251]

j. **Residential and Commercial Property:** Sea level rise and extreme weather events have harmed and will harm residential and commercial property. A study evaluating the State's 21 coastal communities found that with 3 feet of sea level rise, over 300 homes will be in the inundation zone.[252] With 7 feet of sea level rise, over 4,000 occupied residential units and 800 commercial units would be within the inundation zone.[253] Indeed, over fifty percent of the State's parcels lie within or touch the flood plain.[254] These properties are particularly vulnerable to inundation and flooding due to extreme weather events and sea level rise. The city of Newport alone contains hundreds of businesses and historic properties lining its waterfront. Like many older cities in the State, Newport was built on landfill placed into large portions of Narragansett Bay, placing it only slightly above sea-level.

k. **Aquatic Resources:** Laboratory studies have already shown ocean acidification reduces the survival of larval finfish and shellfish. Ocean acidification will impact ocean food webs and economically important organisms such as shellfish in the

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[251] *Id.*

[252] Rhode Island State Planning Program, *Socioeconomics of Sea Level Rise Technical Paper 168*, 15 & 18 (Sept. 2015), http://www.planning.ri.gov/documents/sea_level/socio/Technical%20Paper%20168.pdf.

[253] *Id.*

[254] Final Report: *Special House Commission to Study Economic Risk Due to Flooding and Sea Level Rise,* 31 (May 12, 2016), http://www.rilin.state.ri.us/commissions/fsrcomm/commdocs/20160512%20Economic%20Risk%20Due%20to%20Flooding%20and%20Sea%20Level%20Rise%20-%20final.pdf.

coastal environment.[255] In addition, shellfish perform important ecological functions, such as removing nutrients and bacteria from the water. Consequently, decreased shellfish populations may result in a positive feedback loop, further decreasing marine water quality in Rhode Island. Warmer ocean temperatures associated with climate change are also harming ocean ecosystems. The fisheries of Narragansett Bay are changing from being dominated by bottom dwelling fish and invertebrates to being dominated by fish that occur throughout the water column.[256] Warmer ocean temperatures also impact the abundance and diversity of phytoplankton, resulting in changes across the food web, including reduction in seagrass that helps cycle nutrients, stabilize marine sediment and provides critical habitat to ecologically and economically valuable species.[257] Warming temperatures and acidification not only harm natural resources, but also harm the industries that rely on them, including fishing and tourism, thus injuring the State's economy and reducing tax revenue. Rhode Island is ranked seventh in the nation in economic dependence on shellfishing.

l. **Marshes and Coastal Wetlands**: Sea level rise will cause changes in coastal habitats that are important centers of biodiversity. Salt marshes provide critical habitat for fish and shellfish. Vegetated coastal wetlands perform critical ecosystem functions and have been shown to reduce storm surge duration and height by

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[255] Stephanie C. Talmage & Christopher J. Gobler, "*Effects of past, present, and future ocean carbon dioxide concentrations on the growth and survival of larval shellfish*," 107 PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES 17246–17251 (Oct. 2010), http://www.pnas.org/content/107/40/17246.

[256] *Resilient Rhody: Statewide Climate Resilience Action Strategy*, *supra* note 56, at 15.

[257] Narragansett Bay Estuary Program, *supra* note 81, at 20.

providing a storage reservoir for encroaching water. For example, areas that contained wetlands had an average of 10% reduction in damages from Hurricane Sandy when compared to those without wetlands, and coastal wetlands were predicted to have reduced wave heights during the storm across 80% of the Northeastern coastal floodplain.[258] Salt marshes will either drown or migrate landward as a consequence of sea level rise.[259] With only one foot of sea level rise in Rhode Island, 13% of the state's remaining salt marshes will be lost. At five feet, lost salt marsh ecosystems will increase to 83% resulting in substantial loss of critical ecosystem functions and increased threats from storms to coastal property.[260]

m. **Terrestrial Natural Resources**: Warmer temperatures also impact terrestrial species. In southern New England, including Rhode Island, spring is arriving sooner and leaf-out (the period when trees produce new leaves) and flowering is occurring earlier each year. Changes in the timing of leaf-out, flowering, and fruiting in plants can be very disruptive to plant pollinators and seed dispersers.[261] Warmer temperatures are also impacting the timing of migratory cycles in birds.[262]

213. The State has incurred and will continue to incur expenses in planning, preparing for, and treating the public health impacts associated with anthropogenic global warming. Rhode

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[258] *Resilient Rhody: Statewide Climate Resilience Action Strategy*, *supra* note 56, at 42.

[259] *Id.* at 15.

[260] Frank Carini ,*Rhode Island Losing Ground in Battle Against Sea-Level Rise,* Ecori News (Feb. 17, 2018), https://www.ecori.org/climate-change/2018/2/16/rhode-island-losing-ground-in-battle-against-sea-level-rise.

[261] *Resilient Rhody: Statewide Climate Resilience Action Strategy*, *supra* note 56, at 15.

[262] *Id.*

Islanders are more likely to seek emergency on hotter days. On days when the temperatures reach 90°F, hospitalizations in the State for heat and dehydration increase 60% amongst those aged between 18 and 64, compared to the hospitalization rate on 80°F days.[263] Climate models predict that ambient surface temperature will increase by an average of 1.6°F by 2022, resulting in 378 more emergency department visits due to extreme heat in the months of April through October.[264] Vulnerable populations such as the disabled, elderly, children, communities of color, and low income are more likely to suffer health effects from high air temperatures.[265] Increased prevalence of vector-borne diseases, increased pollution, and increased airborne allergens caused by increased surface temperatures will further contribute to increased hospitalizations in the State.

214. Rhode Island will shoulder a portion of the costs for increased hospitalizations to treat recipients of State-funded medical insurance.

215. To address heat-related illnesses, the State is incurring expenses planting and maintaining trees in urban centers as an adaptive strategy to provide cooling and shade.[266] Climate change complicates the care for urban forests by increasing extreme weather events and invasive plants and pests.[267]

216. Increased incidents of extreme weather have still more public health consequences, including danger to personal safety, economic disruption, and population displacement.[268] As climate change impacts and severe weather events increase, they will place greater demands on

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[263] Rhode Island Department of Health, *Rhode Island Climate Change and Resiliency Report*, *supra* note 55, at 20.
[264] *Id.* at 10.
[265] *Resilient Rhody: Statewide Climate Resilience Action Strategy*, *supra* note 56, at 13.
[266] *Resilient Rhody: Statewide Climate Resilience Action Strategy*, *supra* note 56, at 47.
[267] *Id.*
[268] *Id.* at 62–63.

emergency response and sheltering services. The Rhode Island Emergency Management Agency ("RIEMA") has already incurred costs to improve the State's resiliency to future disasters through planning and preparedness activities, trainings, and adaptation programs.[269]

217. Rhode Island is undertaking extensive planning efforts across State agencies, as well as funding independent research efforts, to assess the State's vulnerability to a broad range of anticipated climate change related impacts, and to develop adaptation and resilience strategies. For example, the State has conducted studies to ensure drinking water supplies will be adequate to meet the State's future needs.[270] RIDOT has also funded researchers to conduct a vulnerability and resilience strategy assessment of maritime infrastructure.[271] Execution of these research and planning projects have come at a substantial cost to the State, and State will continue to incur substantial costs for these and similar projects.

218. The State has incurred significant expenses educating and engaging the public to better understand climate change, and promoting community involvement in actions to reduce climate change risks. These efforts include by educating vulnerable populations about the public health impacts of extreme heat waves (such as heat stroke), drought (diminished water supply), and other climate change-related impacts. Implementation of these planning and public outreach processes represent substantial cost to the State.

219. As a direct and proximate result of Defendants' acts and omissions alleged herein, Rhode Island has incurred significant expenses related to predicting and planning for future climate change-related injuries to its real property, natural resources, and improvements thereon; State-

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[269] *Id.* at 53.

[270] *Id.* at 20.

[271] *Hurricane Resilience: Long Range Planning for the Port of Providence*, The University of Rhode Island, https://www.portofprovidenceresilience.org.

owned or operated infrastructure; citizens; and other community assets, to preemptively mitigate and/or prevent injuries to itself and the public.

220. As a direct and proximate result of Defendants' acts and omissions alleged herein, Rhode Island has incurred sea level rise-related, extreme heat-related, and hydrologic regime change-related injuries and harms. These include, but are not limited to, infrastructural repair, planning costs, and response costs to flooding and other acute incidents.

221. As a direct and proximate result of Defendants' acts and omissions alleged herein, Rhode Island has been inundated by sea water, and extreme precipitation, among other climate-change related intrusions, which has caused injury and harms to its real property and to improvements thereon, and has prevented free passage on, use of, and normal enjoyment of that real property, or permanently destroying it.

222. As a direct and proximate result of Defendants' acts and omissions alleged herein, natural resources held in trust by Rhode Island for the benefit of the people of the State, including the State's fisheries, shores, groundwater, and terrestrial plant and animal life, have been threatened and damaged to the public's detriment.

223. But for Defendants' conduct, Rhode Island would have suffered no or far less injuries and damages than they have endured, and foreseeably will endure, due to increased air and ocean temperatures, anthropogenic sea level rise, disruption of the hydrologic cycle, and associated consequences of those physical and environmental changes.

224. Defendants' conduct as described herein is therefore an actual, substantial, and proximate cause of Rhode Island's climate change-related injuries.

VI. CAUSES OF ACTION

FIRST CAUSE OF ACTION

Public Nuisance

(Against All Defendants)

225. Plaintiff State of Rhode Island realleges each and every allegation contained above, as though set forth herein in full.

226. In Rhode Island, the public is entitled by right to the protection, preservation, and enhancement of the air, water, land, and other natural resources located within the State, and it is the policy of the State to create and maintain within the State conditions under which man and nature can exist in productive harmony in order that present and future generations may enjoy clean air and water, productive land, and other natural resources with which this State has been endowed.

227. Defendants, and each of them, by their affirmative acts and omissions, have created, contributed to, and assisted in creating, conditions in the State of Rhode Island that constitute a nuisance, and has permitted those conditions to persist, by, *inter alia*, increasing local sea level, and associated flooding, inundation, erosion, and other impacts within the State; increasing the frequency and intensity of drought in the State; increasing the frequency and intensity of extreme heat days in the State; and increasing the frequency and intensity of extreme precipitation events in the State.

228. The nuisance created and contributed to by Defendants unreasonably endangers and injures the property, health, peace, comfort, safety, and welfare of the general public and the natural resources of State of Rhode Island, interfering with the comfort and convenience of communities state-wide, as well as with the State's *parens patriae* ability to protect, conserve, and

manage the water, land, and wildlife of the State, which are by law precious and invaluable public resources.

229. Defendants specifically created, contributed to, assisted in creating, and/or were a substantial contributing factor in the creation of the public nuisance by, *inter alia*:

a. Controlling every step of the fossil fuel product supply chain, including the extraction of raw fossil fuel products, including crude oil, coal, and natural gas from the Earth; the refining and marketing of those fossil fuel products, and the placement of those fossil fuel products into the stream of commerce;

b. Affirmatively and knowingly promoting the sale and use of fossil fuel products which Defendants knew to be hazardous and knew would cause or exacerbate global warming and related consequences, including, but not limited to, sea level rise, drought, extreme precipitation events, and extreme heat events;

c. Affirmatively and knowingly concealing the hazards that Defendants knew would result from the normal use of their fossil fuel products by misrepresenting and casting doubt on the integrity of scientific information related to climate change;

d. Disseminating and funding the dissemination of information intended to mislead customers, consumers, and regulators regarding known and foreseeable risk of climate change and its consequences, which follow from the normal, use of Defendants' fossil fuel products;

e. Affirmatively and knowingly campaigning against the regulation of their fossil fuel products, despite knowing the hazards associated with the normal

use of those products, in order to continue profiting from use of those products by externalizing those known costs onto the public, the environment, and communities; and failing to warn the public about the hazards associated with the use of fossil fuel products.

230. Because of their superior knowledge of fossil fuel products, and their position controlling the extraction, refining, development, marketing, and sale of fossil fuel products, Defendants were in the best position to prevent the nuisance as the harm occurred and continues to occur, but failed to do so, including by failing to warn customers, retailers, regulators, public officials, or the State of the risks posed by their fossil fuel products, and failing to take any other precautionary measures to prevent or mitigate those known harms.

231. The public nuisance caused, contributed to, maintained, and/or participated in by Defendants has caused and/or imminently threatens to cause substantial injury to the environment of the State, in which the public has interests represented by and protected by the State in its *parens patriae* capacity. The public nuisance has also caused and/or imminently threatens to cause substantial injury to property directly owned by the State. In particular, higher sea level, more frequent and extreme droughts, more frequent and extreme precipitation events, more frequent and extreme heat waves, and the associated consequences of those physical and environmental changes: (1) are harmful and dangerous to human health; (2) are indecent and offensive to the senses of the ordinary person; (3) obstruct and threaten to obstruct the free use of public property within the State so as to interfere with the comfortable enjoyment of life and property; and (4) obstruct and threaten to obstruct the free passage and use of navigable lakes, rivers, bays, streams, canals, basins, public parks, squares, streets, and/or highways within the State.

232. The seriousness of rising sea levels, higher sea level, more frequent and extreme drought, more frequent and extreme precipitation events, more frequent and extreme heat waves, and the associated consequences of those physical and environmental changes, is extremely grave and outweighs the social utility of Defendants' conduct because, *inter alia*,

a. interference with the public's rights due to sea level rise, more frequent and extreme drought, more frequent and extreme precipitation events, more frequent and extreme heat waves, and the associated consequences of those physical and environmental changes as described above, is expected to become so regular and severe that it will cause material deprivation of and/or interference with the use and enjoyment of public and private property in the State;

b. the ultimate nature of the harm is the destruction of real and personal property, and loss of natural resources, rather than mere annoyance;

c. the interference borne is the loss of property, infrastructure, and natural resources within the State, which will actually be borne by the public as loss of use of public and private property and infrastructure and diversion of tax dollars away from other public services to the mitigation of and/or adaptation to climate change impacts;

d. Rhode Island's property, which serves myriad uses including residential, infrastructural, commercial, and ecological, is not suitable for regular inundation, flooding, landslides, and/or other physical or environmental consequences of anthropogenic global warming;

e. the social benefit of placing fossil fuels into the stream of commerce is outweighed by the availability of other sources of energy that could have been placed into the stream of commerce that would not have caused anthropogenic climate change and its physical and environmental consequences as described herein; Defendants, and each of them, knew of the external costs of placing their fossil fuel products into the stream of commerce, and rather than striving to mitigate those externalities, Defendants instead acted affirmatively to obscure them from public consciousness;

f. the cost to society of each ton of greenhouse gases emitted into the atmosphere increases as total global emissions increase, so that unchecked extraction and consumption of fossil fuel products is more harmful and costly than moderated extraction and consumption; and

g. it was practical for Defendants, and each of them, considering their extensive knowledge of the hazards of placing fossil fuel products into the stream of commerce and extensive scientific engineering expertise, to develop better technologies and to pursue and adopt known, practical, and available technologies, energy sources, and business practices that would have mitigated greenhouse gas pollution and eased the transition to a lower carbon economy.

233. As a direct and proximate result of Defendants' conduct, as set forth above, the common rights enjoyed by the citizens of the State of Rhode Island have been unreasonably interfered with because Defendants knew or should have known that their conduct would create a continuing problem with long-lasting significant negative effects on the rights of the public.

234. Defendants' acts and omissions as alleged herein are an actual and legal cause of the public nuisance.

235. Defendants' acts and omissions as alleged herein are indivisible causes of Plaintiff State of Rhode Island's injuries and damage as alleged herein, because, *inter alia*, it is not possible to determine the source of any particular individual molecule of CO_2 in the atmosphere attributable to anthropogenic sources because such greenhouse gas molecules do not bear markers that permit tracing them to their source, and because greenhouse gasses quickly diffuse and comingle in the atmosphere.

236. Defendants' wrongful conduct was willful, reckless, or wicked, with conscious disregard for the probable dangerous consequences of that conduct and its foreseeable impact upon the rights of others, including the State of Rhode Island. Therefore, the State requests an award of punitive damages in an amount reasonable, appropriate, and sufficient to punish these Defendants for the good of society and deter Defendants from ever committing the same or similar acts.

237. Wherefore, the State of Rhode Island prays for relief as set forth below.

SECOND CAUSE OF ACTION

Strict Liability for Failure to Warn

(Against All Defendants)

238. Plaintiff State of Rhode Island realleges each and every allegation contained above, as though set forth herein in full.

239. Defendants, and each of them, extracted raw fossil fuel products, including crude oil, coal, and natural gas from the Earth, and placed those fossil fuel products into the stream of commerce; and at all times had a duty to issue adequate warnings to Plaintiff, the public,

consumers, and public officials of the reasonably foreseeable or knowable risks posed by their fossil fuel products.

240. Defendants, and each of them, extracted, refined, formulated, designed, packaged, distributed, tested, constructed, fabricated, analyzed, recommended, merchandised, advertised, promoted, and/or sold fossil fuel products, which were intended by Defendants, and each of them, to be combusted for energy, refined into petrochemicals, and refined and/or incorporated into petrochemical products including fuels and plastics.

241. Defendants, and each of them, heavily marketed, promoted, and advertised fossil fuel products and their derivatives, which were sold or used by their respective affiliates and subsidiaries. Defendants received direct financial benefit from their affiliates' and subsidiaries' sales of fossil fuel products. Defendants' roles as promoters and marketers were integral to their respective businesses and a necessary factor in bringing fossil fuel products and their derivatives to the consumer market, such that Defendants had control over, and a substantial ability to influence, the manufacturing and distribution processes of their affiliates and subsidiaries.

242. Throughout the times at issue, Defendants individually and collectively had actual and/or constructive knowledge, in light of the scientific knowledge generally accepted at the time, that fossil fuel products release greenhouse gases into the atmosphere that inevitably cause, *inter alia*, global warming, sea level rise, more frequent and extreme droughts, more frequent and extreme precipitation events, more frequent and extreme heat waves, and the associated consequences of those physical and environmental changes.

243. Throughout the times at issue and continuing today, fossil fuel products presented and still present a substantial risk of injury to Plaintiff and its citizens and natural resources through the climate effects described above.

244. Throughout the times at issue, the ordinary consumer would not recognize that the use of fossil fuel products causes global and localized changes in climate, including those effects described herein, and could not ordinarily discover or protect themselves against those dangers in the absence of adequate warnings.

245. Throughout the times at issue, Defendants individually and in concert widely disseminated marketing materials, refuted the scientific knowledge generally accepted at the time, advanced pseudo-scientific theories of their own, and developed public relations campaigns and materials that prevented reasonable consumers from recognizing the risk that fossil fuel products would cause grave climate changes, including those described herein.

246. Defendants, and each of them, breached their duty to warn by failing to adequately warn customers, consumers, regulators, and the general public of the known and foreseeable risks posed by their fossil fuel products, and the consequences that inevitably follow from their use.

247. As a direct and proximate result of the defects previously described, fossil fuel products, Plaintiff State of Rhode Island has sustained and will sustain other substantial expenses and damages set forth in this Complaint within the jurisdictional limits of this Court, including damage to publicly owned infrastructure and real property, and injuries to public trust resources that interfere with the rights of the State and its citizens.

248. Defendants' acts and omissions as alleged herein are indivisible causes of Plaintiff State of Rhode Island's injuries and damage as alleged herein, because, *inter alia*, it is not possible to determine the source of any particular individual molecule of CO_2 in the atmosphere attributable to anthropogenic sources because such greenhouse gas molecules do not bear markers that permit tracing them to their source, and because greenhouse gasses quickly diffuse and comingle in the atmosphere.

249. Defendants' wrongful conduct was willful, reckless, or wicked, with conscious disregard for the probable dangerous consequences of that conduct and its foreseeable impact upon the rights of others, including the State of Rhode Island. Therefore, the State requests an award of punitive damages in an amount reasonable, appropriate, and sufficient to punish these Defendants for the good of society and deter Defendants from ever committing the same or similar acts.

250. Wherefore, the State of Rhode Island prays for relief as set forth below.

THIRD CAUSE OF ACTION

Strict Liability for Design Defect

(Against All Defendants)

251. Plaintiff State of Rhode Island realleges each and every allegation contained above, as though set forth herein in full.

252. Defendants, and each of them, extracted raw fossil fuel products, including crude oil, coal, and natural gas from the Earth and placed those fossil fuel products into the stream of commerce; and owed a duty to all persons whom Defendants' fossil fuel products might foreseeably harm, including Plaintiff, not to market any product which is unreasonably dangerous for its intended use.

253. Defendants, and each of them, extracted, refined, formulated, designed, packaged, distributed, tested, constructed, fabricated, analyzed, recommended, merchandised, advertised, promoted, and/or sold fossil fuel products, which were intended by Defendants, and each of them, to be burned for energy, refined into petrochemicals, and refined and/or incorporated into petrochemical products including but not limited to fuels and plastics.

254. Defendants, and each of them, heavily marketed, promoted, and advertised fossil fuel products and their derivatives, which were sold or used by their respective affiliates and

subsidiaries. Defendants' received direct financial benefit from their affiliates' and subsidiaries' sales of fossil fuel products. Defendants' roles as promoters and marketers were integral to their respective businesses and a necessary factor in bringing fossil fuel products and their derivatives to the consumer market, such that Defendants had control over, and a substantial ability to influence, the manufacturing and distribution processes of their affiliates and subsidiaries.

255. Throughout the time at issue, fossil fuel products have not performed as safely as an ordinary consumer would expect them to, and have been unreasonably dangerous for their intended, foreseeable, and ordinary use, because greenhouse gas emissions from their use cause numerous global and local changes to Earth's climate. In particular, ordinary consumers did not expect that:

a. fossil fuel products are the primary cause of global warming since the dawn of the Industrial Revolution, and by far the primary cause of global warming acceleration in the 20th and 21st centuries;

b. fossil fuel products would cause acceleration of sea level rise since the beginning of the 20th century;

c. normal use of fossil fuel products would cause more frequent and extreme drought;

d. normal use of fossil fuel products would cause more frequent and extreme precipitation events;

e. normal use of fossil fuel products would cause more frequent and extreme heat waves;

f. normal use of fossil fuel products would cause other injurious changes to the environment as alleged herein;

g. by increasing sea level rise and increasing the severity and intensity of droughts, extreme precipitation events, heat waves, and the associated consequences of those physical and environmental changes, fossil fuel products cause damage to publicly and privately-owned infrastructure and buildings, including homes;

h. the social cost of each ton of CO_2 emitted into the atmosphere increases as total global emissions increase, so that unchecked extraction and consumption of fossil fuel products is more harmful and costly than moderated extraction and consumption; and

i. for these reasons and others, the unmitigated use of fossil fuel products present significant threats to the environment and human health and welfare.

256. Throughout the times at issue, Defendants individually and in concert widely disseminated marketing materials, refuted the scientific knowledge generally accepted at the time, advanced pseudo-scientific theories of their own, and developed public relations materials, among other public messaging efforts, that prevented reasonable consumers from forming an expectation that fossil fuel products would cause grave climate changes, including those described herein.

257. The risks posed to consumers and the general public, including and especially to Rhode Island and its citizens, by Defendants' defective fossil fuel products outweigh those products' benefits, because, *inter alia*:

a. the gravity of the potential harms caused by fossil fuel products is extreme; global warming and its attendant consequences are guaranteed to occur following the use of fossil fuel products because such use inherently releases greenhouse gases into the atmosphere; and global warming would continue to occur for decades even if all greenhouse gas emissions ceased;

b. the social benefit of the purpose of placing fossil fuels into the stream of commerce is overshadowed by the availability of other sources of energy that could have been placed into the stream of commerce that would not have caused global warming, its associated consequences including those described herein, and accordingly Plaintiff's injuries; Defendants, and each of them, knew of the external costs of placing their fossil fuel products into the stream of commerce, and rather than striving to mitigate those externalities, instead acted affirmatively to obscure them from public consciousness;

c. Defendants' campaign of disinformation regarding global warming and the climatic effects of fossil fuel products prevented customers, consumers, regulators, and the general public from taking steps to mitigate the inevitable consequences of fossil fuel consumption, and incorporating those consequences into either short-term decisions or long-term planning;

d. the cost to society of each ton of CO_2 emitted into the atmosphere increases as total global emissions increase so that unchecked extraction and consumption of fossil fuel products is more harmful and costly than moderated extraction and consumption; and

e. it was practical for Defendants, and each of them, in light of their extensive knowledge of the hazards of placing fossil fuel products into the stream of commerce, to pursue and adopt known, practical, and available technologies, energy sources, and business practices that would have mitigated their greenhouse gas pollution and eased the transition to a lower carbon economy,

reduced global CO_2 emissions, and mitigated the harms associated with the use and consumption of such products.

258. The above-described defects were beyond the knowledge of an ordinary consumer, and neither Plaintiff nor any ordinary consumer could have avoided the harm caused by Defendants' defective fossil fuel products by the exercise of reasonable care.

259. Defendants' individual and aggregate fossil fuel products reached the consumer in a condition substantially unchanged from that in which it left Defendants' control; and were used in the manner in which they were intended to be used by individual and corporate consumers; the result of which was the addition of CO_2 emissions to the global atmosphere with attendant global and local consequences.

260. As a direct and proximate result of the defects previously described, fossil fuel products, Plaintiff State of Rhode Island has sustained and will sustain other substantial expenses and damages set forth in this Complaint within the jurisdictional limits of this Court, including damage to publicly owned infrastructure and real property, and injuries to public trust resources that interfere with the rights of the State and its citizens.

261. Defendants' acts and omissions as alleged herein are indivisible causes of Plaintiff State of Rhode Island's injuries and damage as alleged herein, because, *inter alia*, it is not possible to determine the source of any particular individual molecule of CO_2 in the atmosphere attributable to anthropogenic sources because such greenhouse gas molecules do not bear markers that permit tracing them to their source, and because greenhouse gasses quickly diffuse and comingle in the atmosphere.

262. Defendants' wrongful conduct was willful, reckless, or wicked, with conscious disregard for the probable dangerous consequences of that conduct and its foreseeable impact upon

the rights of others, including the State of Rhode Island. Therefore, the State requests an award of punitive damages in an amount reasonable, appropriate, and sufficient to punish these Defendants for the good of society and deter Defendants from ever committing the same or similar acts.

263. Wherefore, the State of Rhode Island prays for relief as set forth below.

FOURTH CAUSE OF ACTION

Negligent Design Defect

(Against All Defendants)

264. Plaintiff State of Rhode Island realleges each and every allegation contained above, as though set forth herein in full.

265. Defendants knew or should have known of the climate effects inherently caused by the normal use and operation of their fossil fuel products, including the likelihood and likely severity of global and local sea level rise and its consequences, and including injuries to Plaintiff, its citizens, and its natural resources, as described herein.

266. Defendants, collectively and individually, had a duty to use due care in developing, designing, testing, inspecting, and distributing their fossil fuel products. That duty obligated Defendants collectively and individually to, *inter alia*, prevent defective products from entering the stream of commerce, and prevent reasonably foreseeable harm that could have resulted from the ordinary use of Defendants' products.

267. Defendants, and each of them, breached their duty of due care by, *inter alia*:

a. allowing fossil fuel products to enter the stream of commerce, despite knowing them to be defective due to their inevitable propensity to cause sea level rise, more frequent and extreme drought, more frequent and extreme

precipitation events, more frequent and extreme heat waves, and the associated consequences of those physical and environmental changes;

b. failing to act on the information and warnings they received from their own internal research staff, as well as from the international scientific community, that the unabated extraction, promotion, and sale of their fossil fuel products would result in material dangers to the public, including the State of Rhode Island and its citizens and natural resources;

c. failing to take actions including, but not limited to, pursuing and adopting known, practical, and available technologies, energy sources, and business practices that would have mitigated greenhouse gas pollution caused by Defendants' fossil fuel products and eased the transition to a lower carbon economy; shifting to non-fossil fuel products, and researching and/or offering technologies to mitigate CO_2 emissions in conjunction with sale and distribution of their fossil fuel products; and pursuing other available alternatives that would have prevented or mitigated the injuries to Plaintiff, its citizens, and its natural resources caused by sea level rise, more frequent and extreme drought, more frequent and extreme precipitation events, more frequent and extreme heat waves, and the associated consequences of those physical and environmental changes, that Defendants, and each of them, knew or should have foreseen would inevitably result from use of Defendants' fossil fuel products;

d. engaging in a campaign of disinformation regarding global warming and the climatic effects of fossil fuel products that prevented customers, consumers,

regulators, and the general public from staking steps to mitigate the inevitable consequences of fossil fuel consumption, and incorporating those consequences into either short-term decisions or long-term planning.

268. Defendants' individual and collective acts and omissions were actual, substantial causes of sea level rise, more frequent and extreme drought, more frequent and extreme precipitation events, more frequent and extreme heat waves, and the associated consequences of those physical and environmental changes, including injuries and damages set forth herein to Plaintiff, its citizens, and its natural resources, as sea levels would not have risen to the levels that caused those injuries, and prevailing climatic and meteorological regimes would not have been disrupted to a magnitude that caused those injuries, but for Defendants' introduction of their fossil fuel products into the stream of commerce.

269. As a direct and proximate result of Defendants' and each of their acts and omissions, Plaintiff State of Rhode Island has sustained and will sustain other substantial expenses and damages set forth in this Complaint within the jurisdictional limits of this Court, including damage to publicly owned infrastructure and real property, and injuries to public trust resources that interfere with the rights of the State and its citizens.

270. Defendants' acts and omissions as alleged herein are indivisible causes of Plaintiff State of Rhode Island's injuries and damage as alleged herein, because, *inter alia*, it is not possible to determine the source of any particular individual molecule of CO_2 in the atmosphere attributable to anthropogenic sources because such greenhouse gas molecules do not bear markers that permit tracing them to their source, and because greenhouse gasses quickly diffuse and comingle in the atmosphere.

271. Defendants' wrongful conduct was willful, reckless, or wicked, with conscious disregard for the probable dangerous consequences of that conduct and its foreseeable impact upon the rights of others, including the State of Rhode Island. Therefore, the State requests an award of punitive damages in an amount reasonable, appropriate, and sufficient to punish these Defendants for the good of society and deter Defendants from ever committing the same or similar acts.

272. Wherefore, the State of Rhode Island prays for relief as set forth below.

FIFTH CAUSE OF ACTION

Negligent Failure to Warn

(Against All Defendants)

273. Plaintiff State of Rhode Island realleges each and every allegation contained above, as though set forth herein in full.

274. Defendants, and each of them, at all times had a duty to issue adequate warnings to Plaintiff, the public, consumers, and public officials of the reasonably foreseeable or knowable risks posed by their fossil fuel products.

275. Defendants knew or should have known, based on information passed to them from their internal research divisions and affiliates and/or from the international scientific community, of the climate effects inherently caused by the normal use and operation of their fossil fuel products, including the likelihood and likely severity of global warming, global and local sea level rise, more frequent and extreme drought, more frequent and extreme precipitation events, more frequent and extreme heat waves, and the associated consequences of those physical and environmental changes, including Plaintiff's injuries and damages described herein.

276. Defendants knew or should have known, based on information passed to them from their internal research divisions and affiliates and/or from the international scientific community,

that the climate effects described herein rendered their fossil fuel products dangerous, or likely to be dangerous, when used as intended.

277. Throughout the times at issue, Defendants breached their duty of care by failing to adequately warn any consumers or any other party of the climate effects that inevitably flow from the intended use of their fossil fuel products.

278. Throughout the times at issue, Defendants individually and in concert widely disseminated marketing materials, refuted the scientific knowledge generally accepted at the time, advanced pseudo-scientific theories of their own, and developed public relations materials that prevented reasonable consumers from recognizing the risk that fossil fuel products would cause grave climate changes, undermining and rendering ineffective any warnings that Defendants may have also disseminated.

279. Given the grave dangers presented by the climate effects that inevitably flow from the normal use of fossil fuel products, a reasonable extractor, manufacturer, formulator, seller, or other participant responsible for introducing fossil fuel products into the stream of commerce, would have warned of those known, inevitable climate effects.

280. Defendants' conduct was a direct and proximate cause of Plaintiff's injuries and a substantial factor in the harms suffered by Plaintiff as alleged herein.

281. As a direct and proximate result of Defendants' and each of their acts and omissions, Plaintiff State of Rhode Island has sustained and will sustain other substantial expenses and damages set forth in this Complaint within the jurisdictional limits of this Court, including damage to publicly owned infrastructure and real property, and injuries to public trust resources that interfere with the rights of the State and its citizens.

282. Defendants' acts and omissions as alleged herein are indivisible causes of Plaintiff State of Rhode Island's injuries and damage as alleged herein, because, *inter alia*, it is not possible to determine the source of any particular individual molecule of CO_2 in the atmosphere attributable to anthropogenic sources because such greenhouse gas molecules do not bear markers that permit tracing them to their source, and because greenhouse gasses quickly diffuse and comingle in the atmosphere.

283. Defendants' wrongful conduct was willful, reckless, or wicked, with conscious disregard for the probable dangerous consequences of that conduct and its foreseeable impact upon the rights of others, including the State of Rhode Island. Therefore, the State requests an award of punitive damages in an amount reasonable, appropriate, and sufficient to punish these Defendants for the good of society and deter Defendants from ever committing the same or similar acts.

284. Wherefore, the State of Rhode Island prays for relief as set forth below.

SIXTH CAUSE OF ACTION

Trespass

(Against All Defendants)

285. Plaintiff State of Rhode Island realleges each and every allegation contained above, as though set forth herein in full.

286. Plaintiff owns, leases, occupies, and/or controls real property throughout the State.

287. Defendants, and each of them, have intentionally, recklessly, or negligently caused flood waters, extreme precipitation, landslides, saltwater, and other materials, to enter Plaintiff's property, by extracting, refining, formulating, designing, packaging, distributing, testing, constructing, fabricating, analyzing, recommending, merchandising, advertising, promoting, marketing, and/or selling fossil fuel products, knowing those products in their normal operation

and use would cause global and local sea levels to rise, more frequent and extreme droughts to occur, more frequent and extreme precipitation events to occur, more frequent and extreme heat waves to occur, and the associated consequences of those physical and environmental changes.

288. The State of Rhode Island did not give permission for Defendants, or any of them, to cause floodwaters, extreme precipitation, landslides, saltwater, and other materials to enter its property as a result of the use of Defendants' fossil fuel products.

289. The State of Rhode Island has been and continues to be actually injured and continues to suffer damages within the jurisdictional limits of this Court as a result of Defendants and each of their having caused flood waters, extreme precipitation, landslides, saltwater, and other materials, to enter its real property, by *inter alia* submerging real property owned by Rhode Island and causing flooding which has invaded and threatens to invade real property owned by Rhode Island and rendered it unusable, causing storm surges and heightened waves which have invaded and threatened to invade real property owned by Rhode Island, and causing landslides to enter the State's property, and in so doing, rendering the property unusable.

290. Defendants' and each Defendant's introduction of their fossil fuel products into the stream of commerce was a substantial factor in causing the injuries and harms to Rhode Island's public and private real property as alleged herein.

291. Defendants' acts and omissions as alleged herein are indivisible causes of Plaintiff State of Rhode Island's injuries and damage as alleged herein, because, *inter alia*, it is not possible to determine the source of any particular individual molecule of CO_2 in the atmosphere attributable to anthropogenic sources because such greenhouse gas molecules do not bear markers that permit tracing them to their source, and because greenhouse gasses quickly diffuse and comingle in the atmosphere.

292. Defendants' wrongful conduct was willful, reckless, or wicked, with conscious disregard for the probable dangerous consequences of that conduct and its foreseeable impact upon the rights of others, including the State of Rhode Island. Therefore, the State requests an award of punitive damages in an amount reasonable, appropriate, and sufficient to punish these Defendants for the good of society and deter Defendants from ever committing the same or similar acts.

293. Wherefore, the State of Rhode Island prays for relief as set forth below.

SEVENTH CAUSE OF ACTION

Impairment of Public Trust Resources

(Against All Defendants)

294. Plaintiff State of Rhode Island realleges each and every allegation contained above, as though set forth herein in full.

295. The Rhode Island Constitution has enshrined common law to provide for broad protection of the State's natural resources, and guarantees that its citizens "shall continue to enjoy and freely exercise all the rights of fishery, and the privileges of the shore, to which they have been heretofore entitled under the charter and usages of this state, including but not limited to fishing from the shore, the gathering of seaweed, leaving the shore to swim in the sea and passage along the shore; and they shall be secure in their rights to the use and enjoyment of the natural resources of the state with due regard for the preservation of their values." R.I. Const. art. I, § 17.

296. The Rhode Island Constitution provides that the "powers of the state" to "regulate and control the use of land and waters in the furtherance of the preservation, regeneration, and restoration of the natural environment . . . as those rights and duties are set forth in Section 17, shall be an exercise of the police powers of the state, [and] shall be liberally construed." R.I. Const. art. I, § 16.

297. The General Assembly has repeatedly declared that coastal resources of the State, plant and animal life within the State, and the State's watershed are critical natural resources inuring to the benefit of the public. The General Assembly has thus found and declared that "the coastal resources of Rhode Island, a rich variety of natural, commercial, industrial, recreational, and aesthetic assets, are of immediate and potential value to the present and future development of this state," and that "it shall be the policy of this state to preserve, protect, develop, and, where possible, restore the coastal resources of the state for this and succeeding generations." R.I. Gen. Laws §§ 46-6.1-2(5); 46-23-1(a)(2).

298. The General Assembly has further found and declared that "Narragansett Bay may be the greatest natural resource of the state of Rhode Island," and that failure to protect the environmental integrity of the Narragansett Bay will create "severe and detrimental ecological and economic impact upon the people of the state of Rhode Island." R.I. Gen. Laws § 46-5-2(a)(2).

299. The General Assembly has further found and declared that "the bays, rivers, and associated watersheds of Rhode Island are unique and unparalleled natural resources that provide significant cultural, ecological, and economic benefit to the state," and that "it is in the best interest of the state and its citizens to preserve, protect, and restore our bays, rivers, and associated watersheds." R.I. Gen. Laws § 46-31-.1-1(1),(3).

300. The General Assembly has further found and declared that "animal life inhabiting the lands of the state, its lakes, ponds, streams, and rivers, and the marine waters within its territorial jurisdiction, are a precious, renewable, natural resource of the state." R.I. Gen. Laws § 20-1-1(a).

301. As alleged above, Defendants, through their affirmative acts and omissions have interfered with the use and enjoyment of public trust resources within Rhode Island including the

fisheries, shores, and other coastal resources of the State; plant and animal life within the State; and the State's watershed by, *inter alia*, increasing local sea level, and associated flooding, inundation, erosion, and other impacts within the State; increasing the frequency and intensity of drought in the State; altering and harming the diversity of wildlife in the State's coastal waters and fisheries; harming salt marsh ecosystems within the State; increasing the frequency and intensity of extreme heat days in the State; and increasing the frequency and intensity of extreme precipitation events in the State.

302. As a direct and proximate result of the defects previously described, fossil fuel products, the public trust resources over which the State serves as trustee have been injured, and the use and enjoyment of those resources by Rhode Island and its citizens has been impaired. As a result, the State of Rhode Island has incurred and will continue to incur substantial expenses and damages set forth in this Complaint within the jurisdictional limits of this Court to investigate, remediate, prevent, and restore injuries to public trust resources, for which Defendants are jointly and severally liable.

303. Defendants' acts and omissions as alleged herein are indivisible causes of Plaintiff State of Rhode Island's injuries and damage as alleged herein, because, *inter alia*, it is not possible to determine the source of any particular individual molecule of CO_2 in the atmosphere attributable to anthropogenic sources because such greenhouse gas molecules do not bear markers that permit tracing them to their source, and because greenhouse gasses quickly diffuse and comingle in the atmosphere.

304. Defendants' wrongful conduct was willful, reckless, or wicked, with conscious disregard for the probable dangerous consequences of that conduct and its foreseeable impact upon the rights of others, including the State of Rhode Island. Therefore, the State requests an award of

punitive damages in an amount reasonable, appropriate, and sufficient to punish these Defendants for the good of society and deter Defendants from ever committing the same or similar acts.

305. Wherefore, the State of Rhode Island prays for relief as set forth below.

EIGHTH CAUSE OF ACTION

State Environmental Rights Act, Equitable Relief Action

(Against All Defendants)

306. Plaintiff State of Rhode Island realleges each and every allegation contained above, as though set forth herein in full.

307. The General Assembly has further found and declared that "each person is entitled by right to the protection, preservation, and enhancement of air, water, land, and other natural resources located within the state," and that "it is in the public interest to provide an adequate civil remedy to protect air, water, land and other natural resources located within the state from pollution, impairment, or destruction." R.I. Gen. Laws § 10-20-1.

308. The General Assembly has defined "pollution, impairment, or destruction" to include "any conduct which materially adversely affects or is likely to materially adversely affect the environment." R.I. Gen. Laws § 10-20-2(6).

309. The Attorney General "may maintain an action in any court of competent jurisdiction for declaratory and equitable relief against any other person for the protection of the environment, or the interest of the public therein, from pollution, impairment, or destruction," and may "take all possible action, including . . . formal legal action, to secure and insure compliance with the provisions of this chapter." R.I. Gen. Laws § 10-20-3(b), (d)(1), (d)(5).

310. In such an action maintained by the Attorney General, "[t]he court may grant declaratory relief, temporary and permanent equitable relief, or may impose such conditions upon

a party as are necessary or appropriate to protect the air, water, land, or other natural resources located within the state from pollution, impairment, or destruction, considering the health, safety, and welfare of the public, and the availability of feasible, prudent, and economically viable alternatives." R.I. Gen. Laws § 10-20-6.

311. As alleged above, Defendants, through their affirmative acts and omissions have polluted, impaired, and/or destroyed natural resources of the state by, *inter alia*, increasing local sea level, and associated flooding, inundation, erosion, and other impacts within the State; increasing the frequency and intensity of drought in the State; increasing the frequency and intensity of extreme heat days in the State; and increasing the frequency and intensity of extreme precipitation events in the State.

312. As a direct and proximate result of Defendants' fossil fuel products, Defendants have polluted, impaired, and/or destroyed natural resources of the state. Rhode Island has incurred and will continue to incur substantial expenses and damages set forth in this Complaint within the jurisdictional limits of this Court to investigate, remediate, prevent, and restore injuries to public trust resources, for which Defendants are jointly and severally liable.

313. Defendants' acts and omissions as alleged herein are indivisible causes of Plaintiff State of Rhode Island's injuries and damage as alleged herein, because, *inter alia*, it is not possible to determine the source of any particular individual molecule of CO_2 in the atmosphere attributable to anthropogenic sources because such greenhouse gas molecules do not bear markers that permit tracing them to their source, and because greenhouse gasses quickly diffuse and comingle in the atmosphere.

314. Defendants' wrongful conduct was willful, reckless, or wicked, with conscious disregard for the probable dangerous consequences of that conduct and its foreseeable impact upon

the rights of others, including the State of Rhode Island. Therefore, the State requests an award of punitive damages in an amount reasonable, appropriate, and sufficient to punish these Defendants for the good of society and deter Defendants from ever committing the same or similar acts.

315. Wherefore, the State of Rhode Island prays for relief as set forth below.

VII. PRAYER FOR RELIEF

The Plaintiff, **STATE OF RHODE ISLAND**, seeks judgment against these Defendants for:

1. Compensatory damages in an amount according to proof;
2. Equitable relief, including abatement of the nuisances complained of herein;
3. Reasonable attorneys' fees as permitted by law;
4. Punitive damages;
5. Disgorgement of profits;
6. Costs of suit; and
7. For such and other relief as the court may deem proper.

REQUEST FOR JURY TRIAL

Plaintiff hereby demands a jury trial on all causes of action for which a jury is available under the law.

Dated: July 2, 2018

STATE OF RHODE ISLAND

By Its Attorneys,

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