

THE INTERNATIONALIZATION OF CLIMATE DAMAGES LITIGATION

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ABSTRACT: The annual global costs of climate change in 2010 were estimated at nearly \$700 billion. As the costs continue to escalate, discussion is necessarily shifting to who should pay for mitigation and adaptation. Many scholars argue that policy considerations and principles of tort law support holding greenhouse gas producers responsible for the costs of climate change. However, legal claims against greenhouse gas producers in the United States have thus far proven unsuccessful. This Article explores two previously overlooked potentialities that could significantly and rapidly alter the landscape for climate change litigation: (1) the emergence of transnational climate change litigation coupled with the possible enforcement of foreign judgments in U.S. courts; and (2) the enactment of legislation altering the rules around climate change liability. This Article then quantifies the contribution of major U.S. fossil fuel companies to the costs and damages of climate change to illustrate the potential financial impacts of successful litigation or legislative change.

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I. INTRODUCTION

In a speech given on September 29, 2015 at Lloyd’s of London, Bank of England Governor Mark Carney described climate change as a “Tragedy of the Horizon” that is bound to become a “defining issue for [global] financial stability.”¹ He described broad channels through which climate change will impact financial stability in the coming decades, two of which are worth repeating in full:

First, physical risks: the impacts today on insurance liabilities and the value of financial assets that arise from climate—and weather-related events, such as floods and storms that damage property or disrupt trade;

1. Mark Carney, Governor of the Bank of England, Speech Given at Lloyd’s of London: Breaking the Tragedy of the Horizon—Climate Change and Financial Stability at 4 (Sept. 29, 2015), www.bankofengland.co.uk/publications/Documents/speeches/2015/speech844.pdf.

Second, liability risks: the impacts that could arise tomorrow if parties who have suffered loss or damage from the effects of climate change seek compensation from those they hold responsible. Such claims could come decades in the future, but have the potential to hit carbon extractors and emitters—and, if they have liability cover, their insurers—the hardest.²

The physical risks of climate change are well understood.³ In 2010, the global costs of climate change, including private and public property damage, were estimated at nearly \$700 billion. That number is projected to rise dramatically in the coming years.⁴ The United States incurred an estimated \$45 billion of that nearly \$700 billion,⁵ and is expected to incur hundreds of billions more in climate change-related damages by the end of the century.⁶

With over 95 percent of peer-reviewed scientific papers that take a position on anthropogenic global warming endorsing the view that human activity is causing climate change,⁷ the

2. *Id.* at 5–6.

3. Numerous articles, reports, and studies have summarized the harm to people, property, and the natural environment caused by climate change. *See, e.g.*, CLIMATE VULNERABLE FORUM & DARA, CLIMATE VULNERABILITY MONITOR: A GUIDE TO THE COLD CALCULUS OF A HOT PLANET (2d ed. 2012); Matthew F. Pawa, *Global Warming: The Ultimate Public Nuisance*, in CREATIVE COMMON LAW STRATEGIES FOR PROTECTING THE ENVIRONMENT 107, 113–19 (Clifford Rechtschaffen ed., 2007); Gary C. Bryner, *Carbon Markets: Reducing Greenhouse Gas Emissions Through Emissions Trading*, 17 TUL. ENVTL. L.J. 267, 268 (2004) (explaining that the consequences of global warming include heat waves, droughts, storms, harm to biodiversity and agriculture, stimulation of infectious diseases, and rises in sea levels).

4. *See* CLIMATE VULNERABLE FORUM & DARA, *supra* note 3, at 17.

5. *See id.* at 48.

6. *See id.* (estimating the cost of climate change-related damage in the United States will exceed \$100 billion annually by 2030); Michael Greenstone, *Paying the Cost of Climate Change*, BROOKINGS (Sept. 19, 2014), <http://www.brookings.edu/blogs/planetpolicy/posts/2014/09/19-paying-cost-of-climate-change-greenstone> (citing <http://riskybusiness.org/report/national>).

7. *See* John Cook et al., *Quantifying the Consensus on Anthropogenic Global Warming in the Scientific Literature*, ENVTL. RES. LETTERS 8 (May 15, 2013), <http://stacks.iop.org/ERL/8/>. The most respected of these peer-reviewed scientific papers are the Intergovernmental Panel on Climate Change reports, produced and reviewed by thousands of scientists from the UN's 195 member states. *See* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2014: SYNTHESIS REPORT SUMMARY FOR POLICYMAKERS 4 (2014) (“[a]nthropogenic greenhouse gas emissions have increased since the pre-industrial era, driven largely by economic and population growth, and are now higher than ever. This has led to atmospheric concentrations of carbon dioxide, methane, and nitrous oxide that are unprecedented in at least the last 800,000 years. Their effects, together with those of other

discussion is shifting to the second channel identified by Carney and the focus of this Article: the liability risks presented by climate litigation. The question of who should pay for the costs and damages of climate change will only become more salient as public awareness of the costs increase, and the science connecting greenhouse gases with specific climate events improves.⁸

Some scholars have argued that policy considerations and the principles of tort law support holding greenhouse gas producers responsible for the costs of climate change.⁹ In the

anthropogenic drivers, have been detected throughout the climate system and are *extremely likely* to have been the dominant cause of the observed warming since the mid-20th century.”). According to a study conducted in 2004, of 928 article abstracts listed in the Institute of Scientific Information database, 75 percent of the papers either explicitly or implicitly accepted the consensus view of the IPCC Reports, and 25 percent took no position on the current anthropogenic climate change. Notably, none of the papers opposed the consensus view. See Naomi Oreskes, *Beyond the Ivory Tower: The Scientific Consensus on Climate Change*, 306 SCI. 1686 (2004).

8. Recent efforts to use legal channels to hold fossil fuel companies accountable for climate costs have included public campaigns. See, e.g., *Climate Suit against RWE: Peruvian Mountain Guide Will Appeal*, GERMANWATCH (Jan. 26, 2017), <http://germanwatch.org/en/13438> (demonstrating their support for Peruvian farmer Saul Luciano Lliuya in litigation against the German coal company, RWE, with extensive media and other public outreach). See also WEST COAST ENVIRONMENTAL LAW, CLIMATE LAW IN OUR HANDS, <http://www.climatelawinourhands.org> (note that author Andrew Gage is involved in this campaign); Daniel A. Farber, *Adapting to Climate Change: Who Should Pay*, 23 J. LAND USE 1, 4 (2007) (“[W]e should start thinking about cost allocation now because very soon the world is going to start doing so. As the realization sinks in that climate change will cause billions of dollars of harm even if we do everything feasible to cut back on emissions, the people who are directly harmed are going to start wondering whether they alone should bear the costs.”).

9. See, e.g., Farber, *supra* note 8 at 29–33 (“In addition to just deserts, ‘Emitters Pay’ could serve other social goals. As discussed earlier, the prospect of financial responsibility could serve as a valuable incentive for reducing emissions. . . . Finally, emitters may be in a good position to spread costs to shareholders or consumers, thus serving the loss-spreading function.”); David A. Grossman, *Warming Up to a Not-So-Radical Idea: Tort-Based Climate Change Litigation*, 28 COLUM. J. ENVTL. L. 1, 3–5 (2003); Jonathan Zasloff, *The Judicial Carbon Tax: Reconstructing Public Nuisance and Climate Change*, 55 UCLA L. REV. 1827, 1861–63 (2008); Eduardo M. Penalver, *Acts of God or Toxic Torts? Applying Tort Principles to the Problem of Climate Change*, 38 NAT. RESOURCES J. 563, 591 (1998) (“The cost-reducing goal of tort law indicates that courts should seek to hold liable those parties who are in the best position to make the price of products that lead to global climate change reflect their true cost (that is, to include the costs of accidents produced by global climate change within the prices of products whose manufacture and use contributes to the problem of climate change). The second, justice-based, goal of tort law indicates that the parties held liable should be those who have negligently failed to address the threat of climate change and who have taken actions to prevent other people from dealing appropriately with this threat. Given these goals, it is justifiable to hold liable the companies located at the earliest stages in the process of producing and marketing the fossil fuels

absence of a comprehensive international or domestic regulatory scheme, using litigation to recover such costs has become increasingly appealing.

In the United States alone, over 500 cases have raised climate change issues in state and federal courts.¹⁰ However, only a handful of these cases have involved a plaintiff suing a non-governmental defendant for damages caused by climate change. These notably include *Connecticut v. American Electric Company*,¹¹ *Comer v. Murphy Oil USA, Inc.*,¹² and *Native Village of Kivalina v. ExxonMobil Corporation*.¹³

While these 'climate damages' claims have been unsuccessful thus far,¹⁴ it is not unusual for new types of litigation to encounter problems as procedural obstacles are navigated and legal theories are tested.¹⁵ This has prompted numerous scholars to analyze the potential for climate damages litigation—most often at the domestic level and on the basis of current legal frameworks related to liability.¹⁶

This Article discusses two previously overlooked potentialities that could change the climate damages litigation landscape significantly and rapidly: specifically, the emergence

resulting in greenhouse gas emissions.”).

10. See *Climate Change Litigation in the U.S.*, ARNOLD & PORTER, <http://www.climatecasechart.com> (last visited June 24, 2016).

11. *Connecticut v. American Electric Power Co.*, 406 F. Supp. 2d 265, 274 (S.D.N.Y. 2005), *partially rev'd*, 582 F.3d 309 (2d Cir. 2009), *partially rev'd*, 564 U.S. 410, 415 (2011).

12. *Comer v. Murphy Oil USA*, 1:05-CV-436-LG-RHW, 2007 WL 6942285, at *1 (S.D. Miss. Aug. 30, 2007), *partially rev'd*, 585 F.3d 855 (5th Cir. 2009), *vacated and reh'g en banc granted*, 598 F.3d 208 (5th Cir. 2010), *appeal dismissed*, 607 F.3d 1049 (5th Cir. 2010) (en banc).

13. *Native Village of Kivalina v. ExxonMobil Corp.*, 663 F. Supp. 2d 863 (N.D. Cal. 2009), *aff'd*, 696 F.3d 849 (9th Cir. 2012).

14. See, e.g., *American Electric Power Co.*, 406 F. Supp. at 274, *vacated*, 582 F.3d 309 (U.S. App. 2009), *rev'd in part*, 564 U.S. 410, 415 (2011); *Comer*, 2007 WL at *1, *rev'd in part*, 585 F.3d 855 (5th Cir. 2009), *vacated and reh'g en banc granted*, 598 F.3d 208 (5th Cir. 2010), *appeal dismissed*, 607 F.3d 1049 (5th Cir. 2010) (en banc); *Native Village of Kivalina*, 663 F. Supp., *aff'd*, 696 F.3d 849 (9th Cir. 2012).

15. See J. Randolph Evans et al., *Past Prologue to Climate Change Liability*, LAW360 (May 31, 2011), <http://www.dentons.com/en/~media/d967a09488eb4fc69037f35c193007cd.ashx>.

16. Evans, *supra* note 15; see, e.g., Michael B. Gerrard & Gregory E. Wannier, *United States of America*, in CLIMATE CHANGE LIABILITY: TRANSNATIONAL LAW AND PRACTICE (Richard Lord et al. eds., 2012) (examining the potential for climate damages litigation in 18 countries). See also articles by Grossman, Zasloff, and Penalver, *supra* note 9.

of transnational climate damages litigation, including the possible enforcement of foreign judgments in U.S. courts; and the enactment of legislation altering the rules around climate damages liability or “climate compensation acts.” These potentialities could occur individually or together.

Section II of this Article provides an overview of the current state of climate damages litigation in the United States, drawing on jurisprudence and doctrine to outline the threshold issues currently facing potential domestic plaintiffs seeking to have their claim heard in U.S. courts. In addition, it describes the causation challenges that would likely emerge should a claim be considered on the merits.¹⁷

Section III then introduces the first potentiality that could change the current climate damages litigation landscape significantly: the emergence of transnational litigation involving foreign plaintiffs bringing a claim against non-government U.S. defendants—notably, U.S. greenhouse gas producers—in U.S. or foreign courts, and then seeking to have the resulting judgments enforced in countries where the defendants have assets.¹⁸

The climate damages litigation landscape would also be significantly altered if countries enact legislation changing or clarifying the rules around climate damages liability. Section IV considers this possibility, drawing on the lessons learned from tobacco compensation acts to show how governments might be prompted to alter the rules around liability in response to new developments or situations of perceived unfairness.¹⁹

Based on research quantifying the respective contribution of investor-owned greenhouse gas producers to carbon emissions, Section V calculates the respective contribution of major U.S. fossil fuel companies (as examples of major greenhouse gas producers) to the costs and damages of climate change. These calculations suggest the significant financial impact that the two previously identified potentialities could have if one or both become legal realities.²⁰

17. See *infra* Section II, “State of Climate Damages Litigation in the United States.”

18. See *infra* Section III, “Transnational Climate Damages Litigation.”

19. See *infra* Section IV, “Climate Compensation Legislation.”

20. See *infra* Section V, “Quantifying the Liability Risk of U.S. Greenhouse Gas Producers.”

II. STATE OF CLIMATE DAMAGES LITIGATION IN THE UNITED STATES

Broadly speaking, climate litigation refers to “any litigation motivated by a concern about climate change or climate change policy,” although narrower definitions are sometimes proposed.²¹ The term can encompass a wide range of litigation involving a variety of: actors, including governmental and non-governmental plaintiffs and defendants; types of claims, including those based on statutory, common, and public international law; and purposes, including forcing, prohibiting, and recovering for governmental and non-governmental action or inaction on climate change.²²

This Article uses the expression ‘climate damages’ litigation to refer to a specific subset of climate litigation, namely, claims involving a plaintiff suing one or more non-governmental defendants for damages caused by climate change (such as those arising from a rise in sea level, and the exacerbation of climate events including hurricanes) and the costs of preparing for such impacts. The nature of this subset of climate litigation makes torts based on negligence, nuisance, and conspiracy well suited as potential bases for liability.²³

Academic articles on the prospects of climate damages litigation generally sit along a spectrum between two opposing positions. At one end of the spectrum, commentators who are optimistic about the prospects for climate damages litigation argue that climate damages are not fundamentally different from other types of common law damages that already give rise to liability,²⁴ and that climate damages claims are very

21. David Markell & J. B. Ruhl, *An Empirical Assessment of Climate Change in the Courts: A New Jurisprudence or Business as Usual?*, 64 FLA. L. REV. 15, 26 (2012). The authors adopt a narrow definition for the purposes of their review: “any piece of federal, state, tribal, or local administrative or judicial litigation in which the party filings or tribunal decisions directly and expressly raise an issue of fact or law regarding the substance or policy of climate change causes and impacts.” *Id.* at 27.

22. See Markell, *supra* note 21, at 30–38 (discussing generally the major types of climate litigation); ARNOLD & PORTER, *supra* note 10 (a table of current U.S. climate litigation, maintained by the Sabin Center for Climate Change Law and the law firm Arnold & Porter LLP).

23. See ARNOLD & PORTER, *supra* note 10 (a table of current U.S. climate litigation, which includes the ‘principle law’ used and core object of cases). The climate damages claims filed to date in the United States have been centered on these bases for liability.

24. Such articles discuss how torts of nuisance, negligence, and conspiracy could be

much in keeping with the purposes of tort law.²⁵

Many commentators sit mid-way along the spectrum. While they accept that existing legal concepts could form a basis to recover climate damages, they caution that such cases face a series of challenges often centered around causation—specifically, which defendants can legitimately be said to have “caused” climate damages.²⁶ Articles in this range of the spectrum typically accept the possibility of climate damages litigation, but vary on the likelihood of success.²⁷

At the other end of the spectrum, some commentators argue that climate damages claims face threshold issues that will likely prevent them from ever being argued on their merits.²⁸ In essence, these articles suggest that although climate change is affecting existing legal rights protected through tort law, climate damages claims raise issues that are too complicated

applied to climate damages claims, and respond to the many defenses that are likely to be raised in such litigation. *See, e.g.*, Grossman, *supra* note 9 at 60–61 (assessing the various tort principles that could provide a basis for claims against GHG producers, such as product liability and public nuisances, and concluding that “some tort-based climate change suits have strong legal merits and may be capable of succeeding”).

25. *See, e.g.*, Grossman, *supra* note 9, at 5 (discussing how shifting the costs and damages of climate change onto fossil fuel producers is in line with the principle of corrective justice and equality); Zasloff, *supra* note 9 (discussing the various theoretical bases for tort litigation, and the policy reasons for targeting ‘upstream’ greenhouse gas producers); Penalver, *supra* note 9.

26. *See, e.g.*, Shi-Ling Hsu, *A Realistic Evaluation of Climate Change Litigation Through the Lens of a Hypothetical Lawsuit*, 79 U. COL. L. REV. 701, 703 (2008).

27. *See, e.g.*, David Hunter & James Salzman, *Negligence in the Air: The Duty of Care in Climate Change Litigation*, 155 U. PA. ST. L. REV. 1742, 1794 (2007) (arguing that changes in our understanding of climate change are increasingly the “foreseeable costs of GHG emissions,” thereby shifting the “relative risk-utility balance of climate changing activities,” thus increasing the likelihood a court will find that a GHG producers’ activities present an unreasonable risk of foreseeable injury); Evans, *supra* note 15 at 3 (arguing that climate change litigation is likely to follow the same pattern as other historical mega-recoveries, where initially unsuccessful claims will transition into large, successful class-actions); Louis Charles Chambers, *Tort Law, Climate Change and Private Nuisance* at 17–21, (Oct. 2012) (unpublished LL.B. thesis, University of Otago), <http://www.otago.ac.nz/law/research/journals/otago041734.pdf> (arguing that a climate lawsuit against a hypothetical “super emitter,” responsible for all or substantially all emissions of greenhouse gases, would likely be successful under ordinary common law principles of liability, but concluding that the number of real-world emitters involved creates potentially unmanageable challenges for would-be litigants in the absence of judicial innovations).

28. *See, e.g.*, Donald G. Gifford, *Climate Change and the Public Law Model of Torts: Reinvigorating Judicial Restraint Doctrines*, 62 S. C. L. REV. 201, 224–25 (2010); Douglas A. Kysar, *What Climate Change Can Do About Tort Law*, 41 ENVTL. L. 1, 3–4 (2011).

or political to be considered by the courts.²⁹

As this Section demonstrates, these latter predictions are premature as threshold and causation issues have yet to be navigated in the U.S. court system. While the challenges facing climate litigation are formidable, legal tools exist that could be used as a basis for finding U.S. greenhouse gas producers liable for climate change-related damages—given the right case, combination of parties, judge, and forum.

A. *Threshold Issues*

In the United States, a series of barriers—notably the political question doctrine, standing, pre-emption, and displacement—have thus far prevented any climate damages claim from being argued on its merits. However, as other scholars have pointed out, these separation-of-powers doctrines³⁰ and their application in previous climate litigation have not barred future climate damages claims altogether.³¹

1. *Political Question Doctrine*

The political question doctrine prevents U.S. courts from considering cases that raise policy decisions best addressed by the legislative or executive branch of the government.³² While attempts have been made to define what constitutes a ‘political question,’³³ the doctrine remains shrouded in ambiguity.³⁴

29. See, e.g., Gifford, *supra* note 28, at 224–25 (arguing “These are not the kinds of decisions that a common law court, without guidance from previously enacted statutory or regulatory standards, is capable of making. No appropriate judicial standard exists enabling a court to determine whether the contributions of any particular defendant emitter constitute the ‘unreasonable interference’ required by most definitions of public nuisance Such decisions are not usually suitable for adjudication . . . because of the numerous variables to be taken into account and the impossibility of developing generally applicable premises of reasoning with reference to which the variables can be judged.”) (internal citations omitted).

30. See JACQUELINE PEEL & HARI M. OSOFSKY, CLIMATE CHANGE LITIGATION: REGULATORY PATHWAYS TO CLEANER ENERGY 270–71 (2015) (quoting a U.S. interviewee, the “separation-of-powers issue . . . comes up in different guises whether you call it a political question doctrine or displacement or standing It all comes down to the same issue of what branch or what government has what power.”).

31. See *id.* at 274 (arguing “these doctrines have mostly acted to constrain certain types of petitioners and claims, rather than serving as a blanket barrier to climate litigation.”).

32. See Gerrard, *supra* note 16, at 590; PEEL, *supra* note 30, at 273.

33. According to Justice Brennan in *Baker v. Carr*, there are six situations “that if

In the context of climate litigation, some lower courts in the United States have dismissed climate change-related claims on the basis that they present non-justiciable political questions.³⁵ However, higher courts, including the Supreme Court in *American Electric Power Co. v. Connecticut*, have not accepted the political question doctrine as a bar to climate claims.³⁶

'inextricable' from the case, make dismissal on the basis of the political question doctrine appropriate." See Amelia Thorpe, *Tort-Based Climate Change Litigation and the Political Question Doctrine*, 24 J. LAND USE & ENVTL. L. 79 (2008) (quoting *Baker v. Carr*, 369 U.S. 186, 210 (1962)). Justice Brennan notes it is appropriate to avoid judicial resolution where there is "(1) a textually demonstrable constitutional commitment of the issue to a coordinate political department; (2) a lack of judicially discoverable and manageable standards for resolving it; (3) the impossibility of deciding without an initial policy determination of a kind clearly for non-judicial discretion; (4) the impossibility of a court's undertaking independent resolution without expressing lack of the respect due coordinate branches of the government; (5) an unusual need for unquestioning adherence to a political decision already made; or (6) the potentiality of embarrassment from multifarious pronouncements by various departments on one question." *Id.* (quoting *Baker*, 369 U.S. at 217)

34. See Thorpe, *supra* note 33, at 81.

35. See *Connecticut v. American Electric Power Co.*, 406 F.2d 265, 274 (S.D.N.Y. 2005) (ruling that the third *Baker* factor, i.e. "the impossibility of deciding without an initial policy determination of a kind clearly for non-judicial discretion" applies to the case. Accordingly, the court rejected the plaintiff's request for an injunction, ruling that it was impossible to "strike a balance 'between interests seeking strict schemes to reduce pollution rapidly to eliminate its social costs and interests advancing the economic concern'" without an "initial policy decision" by another branch of government); *Comer v. Murphy Oil USA*, 1:05-CV-436-LG-RHW, 2007 WL 6942285, at *1 (S.D. Miss. Aug. 30, 2007) (dismissing claims on basis of non-justiciability under the political question doctrine); *Native Village of Kivalina v. ExxonMobil Corp.*, 663 F. Supp. 2d 863, 868 (N.D. Cal. 2009) (finding that both the second and third *Baker* factors "[militate] in favor of dismissal."). For criticisms of the application of the political question doctrine to these cases, see Thorpe, *supra* note 33, at 79.

36. *American Electric Power Co. v. Connecticut*, 564 U.S. 410, 420 (2011) ("[t]he petitioners [A.E.P.] contend that the federal courts lack authority to adjudicate this case. Four members of the Court would hold that at least some plaintiffs have Article III standing under *Massachusetts*, which permitted a State to challenge EPA's refusal to regulate greenhouse gas emissions; and further, that *no other threshold obstacle bars review*. Four members of the Court, adhering to a dissenting opinion in *Massachusetts*, or regarding that decision as distinguishable, would hold that none of the plaintiffs have Article III standing. We therefore affirm, by an equally divided Court, the Second Court's exercise of jurisdiction and proceed to the merits.") (emphasis added) (citing *Massachusetts v. EPA*, 549 U.S. 497, 520-26 (2007)). This decision was reflected in the Court of Appeals judgment in *Comer v. Murphy Oil USA*, 585 F.3d 855 (5th Cir. 2009), which concluded that the political question doctrine does not apply. While the decision in *Comer* was later vacated due to an unusual procedural rule, no higher court has questioned the court's reasoning in concluding that the political question doctrine does not apply in a climate damages case involving a private company as a defendant. In *Native Village of Kivalina v. ExxonMobil Corp.*, the Court of Appeals for the Ninth Circuit upheld the dismissal of the trial judgment, but based its decision on displacement, without discussing the political question doctrine. 663 F.

Some scholars have argued this ruling will likely limit the use of the political question doctrine in future U.S. cases.³⁷

2. *Standing*

According to Article III of the U.S. Constitution, a plaintiff must have standing or locus standi to bring suit in a U.S. court.³⁸ To establish standing, a plaintiff must demonstrate: (1) injury-in-fact;³⁹ (2) causation;⁴⁰ and (3) redressability.⁴¹ While straightforward in appearance, this three-part requirement has been widely criticized for being “uncertain in application and unpredictable in result.”⁴²

Supp. 2d 863, 868 (N.D. Cal. 2009).

37. See, e.g., PEEL, *supra* note 30, at 273. Other scholars are slightly less optimistic, as the decision in *Connecticut* “did not set precedent in the technical sense,” but recognized that “it may give an indication of how the Supreme Court as presently constituted would rule in another case where states sued on public nuisance grounds about GHGs” See also Gerrard, *supra* note 16, at 584.

38. Article III of the U.S. Constitution does not use the term “standing”, but rather requires that a claim involve a “case or controversy”. Courts have interpreted this as the “standing” requirement. See *Lujan v. Defenders of Wildlife*, 504 U.S. 555, 574 (1992).

39. See *id.* at 560 (the “injury-in-fact” must be (1) “concrete and particularized”; and (2) “actual or imminent, not conjectural or hypothetical”).

40. See *id.* at 560–61 (the plaintiff must show “there [is] a causal connection between the injury and the conduct complained of—the injury has to be fairly . . . trace[able] to the challenged action of the defendant, and not . . . th[e] result [of] the independent action of some third party not before the court”). In general, the degree of inquiry into causation at the standing phase is less than the degree of inquiry into causation at the merit stage. Courts will generally find causation at the standing phase when the injury is “fairly traceable” to the defendant’s conduct in cases involving toxic torts, or environmental cases, where the defendant’s conduct has made a “meaningful contribution” to the pollution. See *Causation in Environmental Law: Lessons from Toxic Torts*, 128 HARV. L. REV. 2256, 2265 (2015). This contrasts the rigorous criteria that a plaintiff must satisfy to demonstrate both factual and legal causation at the merits stage. See *infra* Section II.B. Causation.

41. See *Lujan*, 504 U.S. at 560–61 (a plaintiff must show that “it [is] likely, as opposed to merely speculative, that the injury will be redressed by a favorable decision.”) (internal citations omitted). Note also that the burden is on the plaintiff to demonstrate that all three prongs of standing test are satisfied. See *DaimlerChrysler Corp. v. Cuno*, 547 U.S. 332, 342 (2006) (parties asserting jurisdiction must “carry the burden of establishing their standing under Article III”).

42. See Scott Dodson, *The Complexity of Jurisdictional Clarity*, 97 VA. L. REV. 1, 23 (2011). This is particularly the case with environmental claims. See e.g., Daniel A. Farber, *Standing on Hot Air: American Electric Power and the Bankruptcy of Standing Doctrine*, 121 YALE L.J. ONLINE 121 (2011), <http://yalelawjournal.org/forum/standing-on-hot-air-american-electric-power-and-the-bankruptcy-of-standing-doctrine> (“The unpredictability and ideological nature of standing law seems inherent in the three-part test, whose terms seem to serve as a kind of Rorschach inkblot allowing each

Thus far, standing has not barred climate litigation for governmental petitioners.⁴³ Some scholars have argued that it may pose a challenge for non-governmental plaintiffs,⁴⁴ given that at least one lower court has rejected a climate claim by a non-governmental petitioner for failure to satisfy the causation portion of the standing requirement⁴⁵ (although that case did not involve a claim for climate damages). However, in *Connecticut*, the Court of Appeals for the Second Circuit ruled that the three plaintiff land trusts, which feared their land holdings would be impacted by climate change, had standing to seek an injunction, suggesting that at least some non-governmental plaintiffs will be able to demonstrate standing.⁴⁶ In addition, other scholars have pointed out that plaintiffs may avoid standing barriers simply by avoiding the jurisdictions issuing such denials.⁴⁷ However, whether a plaintiff can

Justice to project her own worldview onto each case. The Court has never defined what constitutes an ‘injury’ for purposes of standing, leaving it to each Justice to decide what kinds of grievances should be considered cognizable injuries. The second element is a mirror in which the judge can perceive her own preferences—when an injury is ‘fairly traceable’ is simply a question of what a judge regards as fair. The third element replicates the problems of the first one, since the Court must decide whether the benefits sought by the plaintiff through the remedy should count for constitutional purposes. One need only look at *Massachusetts*, where the conservatives were certain that the case failed all three prongs of the test whereas the liberals were equally certain that it passed the hurdles.”). See also William A. Fletcher, *The Structure of Standing*, 98 YALE L.J. 221, 221 (1988); *Causation in Environmental Law*, *supra* note 40 (in the past, courts have used standing—particularly the causation requirement, discussed in more detail below—“to avoid reaching the merits on [environmental law] cases they are unwilling or unable to decide.”).

43. See, e.g., *American Electric Power Co. v. Connecticut*, 564 U.S. 410, 420 (2011); *Massachusetts v. Environmental Protection Agency*, 549 U.S. 497, 518–20 (2007); PEEL, *supra* note 30, at 271–73.

44. See PEEL, *supra* note 30, at 271 (“Despite the fact that the Supreme Court has twice found standing in the context of climate change, those cases—with their state government petitioners—did not resolve broader issues about who can bring which kinds of climate change-related claims.”).

45. See, e.g., *Washington Environmental Council v. Bellon*, 732 F.3d 1131 (9th Cir. 2013). However, note that this case does not constitute “climate damages litigation” according to the criteria set out in this Article, as it involved a non-governmental plaintiff seeking to compel a governmental agency to regulate greenhouse gas emissions. Note also that the Court of Appeals for the Second Circuit decision in *American Electric Power Co. v. Connecticut* found that land trusts had standing to bring an application for injunction, which lends support to the proposition that at least some non-governmental plaintiffs may have standing. 582 F.3d 309 (2d Cir. 2009).

46. *American Electric Power Co.*, 582 F.3d, *rev’d on other grounds*, 564 U.S. 410 (2011).

47. See PEEL, *supra* note 30, at 274 (“standing likely will only be a barrier for

demonstrate standing will depend largely on the facts of the case and the rights the plaintiffs allege have been harmed.

3. *Displacement*

According to the displacement doctrine, U.S. courts cannot consider cases involving issues of national concern that are statutorily regulated by the other branches of government. In situations where a “statute speaks directly to the question at issue,” federal common law (of public nuisance, etc.) is displaced.⁴⁸ The most relevant federal statute in climate change litigation is the Clean Air Act.⁴⁹

Displacement may pose the greatest barrier for climate damages litigation in the United States.⁵⁰ In *Connecticut*, a case concerning a claim seeking injunctive relief rather than damages *per se*, the Supreme Court ruled that the Clean Air Act displaced the federal common law in relation to an action for “curtailment of greenhouse gas emissions.”⁵¹ The Court did not rule on whether the Act also displaced state common law.⁵²

In *Kivalina*—one of only two U.S. cases that have involved a plaintiff claiming compensation for climate change-related damages from a non-governmental defendant—the court interpreted *Connecticut* as meaning that a claim for damages under the federal common law was similarly displaced by the Clean Air Act,⁵³ despite the fact that the Clean Air Act does

nongovernmental petitioners in jurisdictions that are issuing such denials; pairing with governmental petitioners will help address the issue even in those places.”).

48. Mark Belleville & Katherine Kennedy, *Cool Lawsuits: Is Climate Change Litigation Dead After Kivalina v. ExxonMobil?*, 7 APPALACHIAN NAT. RESOURCES L.J. 51, 58, 80 (2012–2013).

49. 42 U.S.C. §§ 7401–7671 (2016).

50. See Belleville, *supra* note 48, at 74 (arguing that of the four ‘jurisdictional bars’ to climate damages litigation, the current state of the law suggests that displacement is the most significant issue).

51. *American Electric Power Co.*, 564 U.S. at 423.

52. *Id.* at 429 (“In light of our holding that the Clean Air Act displaces federal common law, the availability *vel non* of a state lawsuit depends, *inter alia*, on the preemptive effect of the federal Act. . . . None of the parties have briefed preemption or otherwise addressed the availability of a claim under state nuisance law. We therefore leave the matter open for consideration on remand.”) (citing *International Paper Co. v. Ouellette*, 479 U.S. 481, 488 (1987)).

53. *Native Village of Kivalina v. ExxonMobil Corp.*, 696 F.3d 849, 858 (9th Cir. 2012) (“Our conclusion obviously does not aid *Kivalina*, which itself is being displaced by the rising sea. But the solution to *Kivalina*’s dire circumstance must rest in the hands of the legislative and executive branches of our government, not the federal common

not directly address liability or apportionment of responsibility for damages. The extent to which this decision is adopted as “the law of the land” will determine the success of future claims for damages under federal common law.⁵⁴

It is worth noting, however, that the type of climate compensation act discussed in Section IV would avoid issues of displacement (and the political questions doctrine) by allowing the legislative branch to explicitly authorize an appropriate role for the judiciary in climate damages litigation.⁵⁵

4. *Pre-emption*

Some scholars have also discussed pre-emption as a barrier to litigation.⁵⁶ The pre-emption doctrine, often conflated with displacement, is derived from Article VI of the U.S. Constitution and provides that, in cases of conflict, federal common law and statutory law pre-empt state law.⁵⁷

Given the uncertainty regarding whether non-governmental petitioners have standing to pursue a federal public nuisance claim, climate change plaintiffs often invoke state law (generally nuisance, negligence, and trespass) either in addition to or in place of federal common law.⁵⁸ While defendants would likely argue that state law claims are pre-empted by the Clean Air Act,⁵⁹ the statute includes provisions that explicitly state that they are not.⁶⁰

law.”). See Belleville, *supra* note 48, at 59, 74–84 for a critique of the application of the displacement doctrine in this case.

54. Belleville, *supra* note 48, at 74.

55. See *infra* Section IV, “Climate Damages Litigation.”

56. See, e.g., Belleville, *supra* note 48, at 73–74 (explaining that federal legislation ‘displaces’ federal common law, while state law is ‘preempted’ by federal law, both common and legislated). Notably, other comprehensive overviews of barriers to climate litigation have not included preemption. See, e.g., PEEL, *supra* note 30, at 271.

57. U.S. CONST. art. VI, cl. 2 (“The Constitution, and the Laws of the United States . . . shall be the supreme Law of the Land . . .”).

58. Specifically, this uncertainty concerns whether nongovernmental petitions can pursue federal public nuisance claims, and whether other federal common law theories can adequately address the damage suffered. See Belleville, *supra* note 48, at 72–73; see also *Comer v. Murphy Oil USA, Inc.*, 839 F. Supp. 2d 849, 854; *Kivalina*, 663 F. Supp. 2d at 869.

59. See Belleville, *supra* note 48, at 77; Gerrard, *supra* note 16, at 574 (“[T]he defendants would certainly argue that the CAA [Clean Air Act] displaces [preempts] state common law nuisance claims as well.”).

60. See 42 U.S.C § 7604(e) (2012).

In any event, it is certainly possible that, at some point, a climate damages claim with the correct combination of parties, judge, and forum will be able to succeed on the threshold issues and proceed to the merits stage of examination. In such a case, causation issues will come under greater judicial scrutiny.⁶¹

B. Causation

In order to recover damages in tort litigation, a plaintiff must demonstrate a causal relationship between the defendant's action or behavior and the injury suffered. This entails meeting the requirements set out for both factual causation and proximate (legal) causation at the merits stage.⁶²

Both factual and proximate causation present challenges for climate damages litigation; many scholars consider these requirements as the most significant barriers to liability.⁶³ As

61. There has been substantial disagreement in the courts and among commentators about when factual causation should be analyzed: during the standing phase or afterwards on the merits. *See, e.g.*, Farber, *supra* note 42, at 122. In most cases, during the standing phase, courts find causation when the damage is 'fairly traceable' to the defendant's action or behavior—however, "the standard for what is considered fairly traceable is unclear. In some cases, a but-for causal connection has been considered sufficient for standing purposes." *Causation in Environmental Law, supra* note 40, at 2264–65. Should courts choose to incorporate more rigorous factual causation inquiries in the standing phase, as suggested by the concurring judgment in *Kivalina*, it may result in climate damage claims being thrown out prematurely. *See id.* at 2272 (arguing "[s]hifting some of the factual analysis for establishing causation out of standing analysis would help reduce the bias against finding standing in environmental suits"). *See also* *Native Village of Kivalina v. ExxonMobil Corp.*, 696 F.3d 849, 867 (9th Cir. 2012) (concurring opinion).

62. Note that the Restatement (Third) of Torts replaces the term 'proximate cause' with 'scope of liability', while the Restatement (Second) of Torts rejects the term in favor of 'legal cause'. *Compare* RESTATEMENT (THIRD) OF TORTS: LIABILITY OF PHYSICAL HARM § 29 (AM. LAW INST., 2012); *and* RESTATEMENT (SECOND) OF TORTS § 431 (AM. LAW INST. (1965)). Note also that both factual and proximate causation are requirements in all forms of tort claims. *See* Kysar, *supra* note 28, at 17 ("[N]or will it necessarily matter whether plaintiffs' case is styled as a negligence, strict liability, private nuisance, public nuisance, or products liability action, given the availability of proximate causation and other liability-curtailling devices under each theory.") At least one scholar, however, has argued that proximate causation was not required in the public nuisance case *Allegheny Gen. Hosp. v. Philip Morris, Inc.*, 228 F.3d 429, 446 (3d Cir. 2000), although he notes that this does not appear to be the majority approach. *See* Grossman, *supra* note 9, at 27 n.130.

63. *See, e.g.*, Vincent S. Oleszkiewicz & Douglas B. Sanders, *The Advent of Climate Change Litigation Against Corporate Defendants*, 35 BNA ENV'T REP. 2365, 2369 (2004) ("Causation is the crucial issue for defendants because it will be the most

a U.S. court has yet to consider a climate damages claim on the merits, this Section draws on the approaches adopted by courts to address similar causation challenges in other types of claims, such as environmental, toxic, and mass torts.⁶⁴

1. *Factual Causation*

Factual causation is primarily concerned with the scientific relationship between the defendant's action or behavior and the alleged injury, and is often broken down further into general causation and specific causation.⁶⁵ General causation refers to whether the action in question *could have* caused the alleged injury, while specific causation refers to whether the action in question "more likely than not" *actually caused* the alleged injury.⁶⁶

a. *General Causation*

General causation is considered an *objective* inquiry, and is often established through statistical, probabilistic, and epidemiological studies.⁶⁷ For example, in toxic tort cases such as those involving Agent Orange, plaintiffs relied upon scientific data demonstrating the association between exposure to the substance and health problems as evidence of general causation.⁶⁸

In the context of a climate damages case, for example,

difficult for a plaintiff to demonstrate . . . "); Kysar, *supra* note 28, at 29 ("The most significant challenge for climate change tort suits lies in proving causation."); Penalver, *supra* note 9, at 564, 579 ("[S]ome of the obstacles to a tort approach to climate change [include] establishing causation, calculating the proper remedies, and choosing a structure for implementing a tort-based approach. The greatest of these problems is that of causation.").

64. Others have noted the parallels between toxic tort cases and climate change cases. *See, e.g.*, Grossman, *supra* note 9, at 22; Penalver, *supra* note 9, at 579.

65. *Causation in Environmental Law*, *supra* note 40 at 2262; Penalver, *supra* note 9, at 579. Note that general causation has also been referred to as "generic causation" and specific causation has also been referred to as "individual causation."

66. *Heller v. Shaw Indus., Inc.*, No. Civ.A. 95-7657, 1997 WL 535163, at *6 (E.D. Pa. Aug. 18, 1997); *Siharath v. Sandoz Pharms. Corp.*, 131 F. Supp. 2d 1347, 1352 (N.D. Ga. 2001) (citing *Wheat v. Sofamor, S.N.C.*, 46 F. Supp. 2d 1351, 1357 (N.D. Ga. 1999)) (defining general causation as "the capacity of a product to cause injury," and specific causation as "proof that the product in question caused the injury of which the plaintiff complains.").

67. *See* Grossman, *supra* note 9, at 22.

68. *Id.*

statistical models found in studies such as those released by the United Nations' Intergovernmental Panel on Climate Change (IPCC) could be used to demonstrate that greenhouse gas emissions *could have* caused a rise in sea-levels and consequent property damage.⁶⁹ The U.S. Supreme Court confirmed the scientific consensus regarding climate change in *Massachusetts v. EPA*,⁷⁰ further supporting the argument for general causation.

b. Specific Causation

In contrast, courts have not considered studies such as those undertaken by the IPCC as adequate evidence of specific causation.⁷¹ Most often, specific causation is established through the “but for” test, which requires proof that a defendant's actions or behavior were “a necessary element” in bringing about the injury before liability can apply.⁷²

As others have pointed out,⁷³ the “but for” causal inquiry presents unique problems for climate damages plaintiffs: it may be difficult to demonstrate that damage suffered by a plaintiff was the result of climate change.⁷⁴ Furthermore, even

69. INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *supra* note 7 at 4. Note that in toxic torts cases, there are also challenges associated with determining which experts and studies to allow. See, e.g., Paul S. Miller & Bert W. Rein, *Whither Daubert? Reliable Resolution of Scientifically-Based Causality Issues in Toxic Tort Cases*, 50 RUTGERS L. REV. 563, 565–67 (1998).

70. *Massachusetts v. Environmental Protection Agency*, 549 U.S. 497, 504 (2007) (“A well-documented rise in global temperatures has coincided with a significant increase in the concentration of carbon dioxide in the atmosphere. Respected scientists believe the two trends are related. For when carbon dioxide is released into the atmosphere, it acts like the ceiling of a greenhouse, trapping solar energy and retarding the escape of reflected heat. It is therefore a species—the most important species—of a ‘greenhouse gas.’”). See also Jennifer Kilinski, *International Climate Change Liability*, 18 J. TRANSNATIONAL L. & POL. 377, 400–01 (2009).

71. Grossman, *supra* note 9, at 23.

72. See Jane Stapleton, *The Two Explosive Proof-of-Causation Doctrines Central to Asbestos Claims*, 74 BROOK. L. REV. 1011, 1012 (2009) (“under orthodox common law rules concerning causation, a tortfeasor is liable for an indivisible injury that would not have happened absent that party's breach.”); Richard W. Wring, *Causation, Responsibility, Risk, Probability, Naked Statistics, and Proof*, 73 IOWA L. REV. 1001, 1019 (1988) (defining specific cause as a “necessary element in a set of antecedent actual conditions that were sufficient for the occurrence of the result.”).

73. See, e.g., Michael Duffy, *Climate Change Causation: Harmonizing Tort Law and Scientific Probability*, 28 TEMP. J. SCI. TECH & ENVTL. L. 185 (2009); Kysar, *supra* note 28.

74. The ability of a plaintiff to demonstrate, on a preponderance of evidence, that

where a plaintiff can establish such a link, the actions of a single defendant, or even a group of defendants, would not have caused climate change alone. In other words, the emissions of a single greenhouse gas producer cannot be singled out as a “necessary element” for the damage caused by climate change.

Toxic tort claims are plagued by similar issues of identifying a “but for” cause. As a result, courts have developed a series of alternative approaches for determining specific causation in cases where “it is either impossible or overwhelmingly burdensome to isolate causation among defendants.”⁷⁵ These approaches, some of which are outlined below, suggest that a court could find specific causation in a climate damages case given the right facts, combination of parties, judge, and forum.

i. Material Contribution Approach

Sometimes referred to as the “substantial-factor test,” the material contribution approach to causation is useful where “two forces are actively operating, one because of the defendant’s [activity], the other not because of any misconduct on his part, and each of itself is sufficient to bring about harm

climate change caused the damages complained of will depend on the type of damages claimed and the available scientific evidence. Damages that arise from ongoing shifts in climate, such as the costs of adapting infrastructure to changing regional conditions or the spread of new pests or weeds beyond their historic range, may be more easily linked to climate change than, for instance, damages from a single weather event. For example, the *Kivalina* case—concerning the relocation of a village due to a pattern of storms and early melting of sea ice—falls within this category of damages claims. 663 F. Supp. 2d 863 (N.D. Cal. 2009). However, even in relation to single weather events, there are new scientific methodologies that can provide a statistical link between climate change and particular events, particularly in the case of heat waves, drought and extreme precipitation. See generally NATIONAL ACADEMIES OF SCIENCES, ENGINEERING, AND MEDICINE, *ATTRIBUTION OF EXTREME WEATHER EVENTS IN THE CONTEXT OF CLIMATE CHANGE* (2016), <https://www.nap.edu/catalog/21852/attribution-of-extreme-weather-events-in-the-context-of-climate-change>; Stephanie C. Herring et al., *Explaining Extreme Events of 2014 from a Climate Perspective*, 96 BULL. AMER. METEOR. SOC. S1 (2015), <http://journals.ametsoc.org/doi/pdf/10.1175/BAMS-ExplainingExtremeEvents2014.1>.

75. Daniel J. Grimm, *Global Warming and Market Share Liability: A Proposed Model for Allocating Tort Damages among CO₂ Producers*, 32 COLUM. J. ENVTL. L. 209, 216 (2007) (citing James A. Henderson, Jr. & Aaron D. Twerski, *Intuition and Technology in Product Design Litigation: An Essay on Proximate Causation*, 88 GEO. L.J. 659, 659 (2000) (“plaintiffs have been permitted to recover under market share liability ‘without proof of individual causation.’”)). Grimm argues that market share liability is one such approach, and would provide “an ideal platform for developing a liability regime capable of managing climate change-based torts.” *Id.* at 211.

to another.”⁷⁶ In such cases, the court may find liability where a defendant’s conduct was a substantial factor in bringing about or a material contribution to the plaintiff’s injury.⁷⁷

Courts in the United States have favored the material contribution approach in environmental and toxic torts cases where a chemical or environmental factor could have independently caused the injury at issue.⁷⁸ As Smith and Shearman explain, “[a] test based on a material increase in risk would clearly improve the prospects of success for climate change plaintiffs.”⁷⁹

ii. Co-Mingled Product Approach

Courts in the United States developed the co-mingled product approach in response to cases involving groundwater contamination from the gasoline additive methyl tertiary butyl ether (MTBE). According to one U.S. district court, “[w]hen a plaintiff can prove that certain gaseous or liquid products . . . of many suppliers were present in a completely commingled or blended state at the time and place that the risk of harm occurred, and the commingled product caused a single indivisible injury, then each of the products should be deemed to have caused the harm.”⁸⁰

Some commentators have identified the co-mingled product approach as potentially applicable to climate damages litigation.⁸¹ Indeed, greenhouse gas emissions resemble MTBE in significant ways; emissions have no “chemical signature”

76. Shelly Brinker, *Opening the Door to the Indeterminate Plaintiff: An Analysis of the Causation Barriers Facing Environmental Toxic Tort Plaintiffs*, 46 UCLA L. REV. 1289, 1297 (1999) (quoting RESTATEMENT (SECOND) OF TORTS § 432(2) (AM. LAW INST. 1965)).

77. *See, e.g.*, *Shetterly v. Raymark Indus.*, 117 F.3d 776, 780 (4th Cir. 1997) (“In order to sustain an action against Raymark for asbestos related injuries, Plaintiffs must prove that Raymark products were a substantial causative factor in their injuries.”) (internal citations omitted).

78. *Id.* at 1303–04.

79. JOSEPH SMITH & DAVID SHEARMAN, *CLIMATE CHANGE LITIGATION: ANALYSING THE LAW, SCIENTIFIC EVIDENCE AND IMPACTS ON THE ENVIRONMENT, HEALTH AND PROPERTY* 110 (2006).

80. *In re Methyl Tertiary Butyl Ether (MTBE)*, 379 F. Supp. 2d 348, 377–78 (S.D.N.Y. 2005).

81. *See, e.g.*, Lauren Case, *Climate Change: A New Realm of Tort Litigation and How to Recover When the Litigation Heats Up*, 51 SANTA CLARA L. REV. 265, 286–88 (2011).

which would allow them to be traced to particular emitters, and they co-mingle in the global atmosphere.⁸²

iii. Market Share Approach

Courts in the United States developed the market share approach in the context of litigation brought by women who claimed to have suffered injuries due to ingestion of diethylstilbestrol (DES) by their mothers during pregnancy, allowing courts to assign liability for harm caused by a product based on a defendant's respective "share" in the manufacture and sale of the product.⁸³

As one scholar has suggested, "a market share-based liability regime may actually approximate specific causation better when applied to global warming than when applied to chemically fungible products like DES."⁸⁴ Greenhouse gas producers could be held liable for climate damages according to their share of global CO₂ emissions.⁸⁵ Recent studies quantifying the relative contribution of major fossil fuel companies to global greenhouse gas emissions would facilitate the use of such an approach in the climate damages context. Importantly, a recent study by Richard Heede—elaborated in Section V—found ninety entities responsible for 63 percent of total greenhouse gas emissions to date, and determined the percentages attached to each individual entity.⁸⁶

2. Proximate Causation

Proximate causation incorporates a policy dimension absent in factual causation inquiries, asking whether the defendant's action or behavior is sufficiently related to the injury to hold them liable for the resulting damages.⁸⁷ In other words,

82. See Case, *supra* note 81, at 286–88, 295–97.

83. See *Hymowitz v. Eli Lilly & Co.*, 73 N.Y.2d 487 (N.Y. 1989); *Enright v. Eli Lilly & Co.*, 77 N.Y.2d 377 (N.Y. 1991) (affirming the use of a market share approach).

84. Grimm, *supra* note 75, at 221. See also Case, *supra* note 81, at 293 (explaining "[m]arket share liability theory is perhaps the best collective liability theory for plaintiffs in climate change cases.>").

85. See Grimm, *supra* note 75, at 221; Penalver, *supra* note 9, at 564, 579.

86. See generally Richard Heede, *Tracing Anthropogenic Carbon Dioxide and Methane Emissions to Fossil Fuel and Cement Producers, 1854–2010*, 122 CLIMATIC CHANGE 229 (2014).

87. See Brinker, *supra* note 76, at 1297; Nancy Lee Firak, *Alternative Forms of Liability: Developing Policy Aspects of the Cause-in-Fact Requirement of Tort Law*, 20

proximate causation is used to limit liability in cases where the requirements of factual causation are satisfied, yet notions of reasonableness suggest a defendant should not be held responsible.⁸⁸

As one scholar has stated, “[t]he touchstone of proximate causation is ‘foreseeability.’”⁸⁹ That is, a defendant can only be held liable for the damages that are the foreseeable result of their action or behavior, regardless of the strength of the factual causal relationship.⁹⁰ Other factors considered in the context of proximate causation include the geographic and temporal distance between the action or behavior and the damage, and the defendant’s degree of involvement in or control over the plaintiff’s injury.⁹¹

In the context of climate damages claims, scholars have generally argued that proximate causation will present fewer

ARIZ. ST. L.J. 1041, 1042 (1988).

88. See Grimm, *supra* note 75, at 227.

89. Benjamin Reese, *Too Many Cooks in the Climate Change Kitchen: The Case for an Administrative Remedy for Damages Caused by Increased Greenhouse Gas Concentrations*, 4 MICH. J. ENVTL. & ADMIN. L. 355, 367 (2015). As Reese points out, “foreseeability” has been considered part of both the duty and causation of negligence claims. *Id.* at 367 n. 72. See, e.g., Kysar, *supra* note 28, at 10–20 (arguing that “for purposes of limning [sic] greenhouse gas tort responsibilities, it may not matter whether plaintiffs’ claims hit a road block at the duty stage *à* [sic] *la* Cardozo, or only later at the proximate causation stage *à* [sic] *la* Andrews, given the analytical challenges facing plaintiffs will be similar in either case.”). See also Young v. Bryco Arms, 765 N.E.2d 1, 18 (Ill. App. Ct. 2001) (“Legal causation is essentially a question of foreseeability.”).

90. See James A. Henderson, Jr. & Aaron D. Twerski, *Intuition and Technology in Product Design Litigation: An Essay on Proximate Causation*, 88 GEO. L.J. 659, 664 (2000) (foreseeability is necessary to determine if “the type of harm suffered by the plaintiff was, qualitatively and quantitatively, of such a nature that a reasonable person would have taken it into account in performing the risk-utility calculus relevant to deeming the defendant’s conduct negligent.”); Gerrard, *supra* note 16, at 592 (“A party is only liable for expected harms from their bad conduct. Where the action is intentional or reckless, this liability extends even to harms that were unlikely.”).

91. See Grossman, *supra* note 9, at 25–27; *City of Bloomington, Ind. v. Westinghouse Elec. Corp.*, 891 F.2d 611, 614 (7th Cir. 1989) (holding that Monsanto was not liable for nuisance because “Westinghouse was in control of the product purchased and was solely responsible for the nuisance it created.”); *In re Methyl Tertiary Butyl Ether (“MTBE”)*, 175 F. Supp. 2d 593, 629 (S.D.N.Y. 2001) (suggesting that a defendant can be held liable for damages, even if others outside of the defendant’s control contributed to the injury). On the relevance of temporal and geographic distance in causation, see Shannon Roesler, *Responding to Climate-Related Harms: A Role for the Courts?*, in CONTEMPORARY ISSUES IN CLIMATE CHANGE LAW AND POLICY: ESSAYS INSPIRED BY THE IPCC 181, 185–91 (Robin Craig & Stephen Miller eds., 2016).

challenges than factual causation.⁹² It is reasonable to argue that climate damages were foreseeable by greenhouse gas producers since at least the first IPCC study was released in 1990.⁹³ As our understanding of climate science and its impacts continues to improve the foreseeability of damages will only increase.⁹⁴

Similarly, a plaintiff could reasonably argue that the defendants exercised sufficient control over climate damages. Unlike in handgun cases, where damages were found to have been caused by individuals misusing the product in a manner outside the control of the manufacturer,⁹⁵ no misuse is involved with fossil fuels. Individuals use emission-producing products in the manner intended by the manufacturer, making the resulting damage both foreseeable and controllable.⁹⁶

As this Section outlines, while the threshold issues and causation challenges facing climate litigation are formidable, legal tools exist that plaintiffs could potentially use as a basis for finding U.S. greenhouse gas producers liable for climate change-related damages given the right facts, combination of parties, judge, and forum.

III. TRANSNATIONAL CLIMATE DAMAGES LITIGATION

Most scholars have focused on the potential success of climate damages litigation involving U.S. plaintiffs seeking to have their claims against U.S. defendants heard in U.S. courts.⁹⁷ U.S. emissions, however, cause climate change in conjunction with emissions produced by a large number of

92. See, e.g., Reese, *supra* note 89, at 368; Grossman, *supra* note 9, at 25–27.

93. See Grossman, *supra* note 9, at 27. Note also recent reports suggesting that the largest U.S. greenhouse gas producer, ExxonMobil, knew about climate change as early as 1981. See Suzanne Goldberg, *Exxon Knew of Climate Change in 1981, Email Says – But It Funded Deniers for 27 More Years*, GUARDIAN (July 8, 2015), <http://www.theguardian.com/environment/2015/jul/08/exxon-climate-change-1981-climate-denier-funding>.

94. See David Hunter & James Salzman, *Negligence in the Air: The Duty of Care in Climate Change Litigation*, 155 U. PA. ST. L. REV. 1742, 1780–81 (2007).

95. See Grossman, *supra* note 9, at 26–27 (discussing municipal claims against handgun manufacturer, particularly Camden County Bd. of Chosen Freeholders v. Beretta, U.S.A. Corp., 273 F.3d. 536 (3d Cir. 2001)).

96. See Grossman, *supra* note 9, at 27.

97. See, e.g., Grossman, *supra* note 9; Case, *supra* note 81; Hunter & Salzman, *supra* note 27; Penalver, *supra* note 9; Gifford, *supra* note 28; Kysar, *supra* note 28.

producers around the world.⁹⁸ The effects of these emissions are felt in different ways by the people of different countries.⁹⁹

This Section introduces the first of two potentialities that could change the climate damages litigation landscape significantly and rapidly: transnational litigation. Specifically, it discusses the possibility of a foreign plaintiff bringing a climate damages claim against a U.S. non-governmental defendant, such as a greenhouse gas producer, in a U.S. court. This Section also examines the perhaps more significant possibility of a foreign plaintiff suing a U.S. greenhouse gas producer in a foreign country, and then seeking to have that judgment recognized in the United States or in other countries in which the U.S. defendant has assets. These scenarios present complex questions of jurisdiction, choice of law, and recognition and enforcement of foreign judgments.

A. *Jurisdiction*

In the United States, a court must possess both subject matter jurisdiction and in personam or personal jurisdiction in order to consider a case.¹⁰⁰ Subject matter jurisdiction refers to a court's ability to hear and decide a particular type of case, whereas personal jurisdiction refers to a court's ability to exercise jurisdiction over the actors involved.¹⁰¹ As legal scholar Richard Lord writes, "a right is of little use unless a tribunal can be found to uphold and enforce it."¹⁰²

98. Hunter, *supra* note 27, at 1745.

99. See generally CLIMATE VULNERABILITY FORUM & DARA, *supra* note 3.

100. Subject matter jurisdiction is also referred to as "jurisdiction to prescribe," while in personam or personal jurisdiction is also referred to as "jurisdiction to adjudicate" according to the Restatement (Third) of Foreign Relations LAW pt. IV, introductory n. (AM. LAW INST. 1987). Jurisdictional issues are generally analyzed in this order. See DAVID EPSTEIN & CHARLES S BALDWIN, INTERNATIONAL LITIGATION: A GUIDE TO JURISDICTION, PRACTICE, AND STRATEGY 95 (4th ed. 2010). Note that for the sake of clarity, this Article will use the terms subject matter jurisdiction and personal or in personam jurisdiction as opposed to the terms used in the Restatement.

101. See EPSTEIN, *supra* note 100, at 95; Zasloff, *supra* note 9, at 1875–80, for a discussion of whether a U.S. court might assert jurisdiction against an Indian car company, Tata, for climate-related damage caused in the United States, the reverse of the scenario being discussed here.

102. Lord, *supra* note 16, at 44.

1. *Subject Matter Jurisdiction*

Both state and federal courts can exercise subject matter jurisdiction over cases involving multiple jurisdictions,¹⁰³ although much transnational litigation occurs at a federal level.¹⁰⁴ Notably, Article III of the U.S. Constitution, along with federal statutes, authorizes federal courts to exercise subject matter jurisdiction over diversity actions between U.S. and foreign citizens,¹⁰⁵ actions based on the Alien Tort Claims Act,¹⁰⁶ and actions against foreign states under the Foreign Sovereign Immunities Act.¹⁰⁷

However, federal courts may decline to exercise subject matter jurisdiction on the basis of *forum non conveniens*.¹⁰⁸

103. Most state courts are courts of “general jurisdiction,” meaning they are assumed to have subject matter jurisdiction over any case falling under state or federal law. Federal courts, on the other hand, are courts of “specific jurisdiction,” meaning they can only exercise subject matter jurisdiction explicitly granted by U.S. CONST. art. III, § 2 and federal statute. *See, e.g.,* *Verlinden BV v. Central Bank of Nigeria*, 461 U.S. 480, 491 (1983) (“Congress may not expand the jurisdiction of the federal courts beyond the bounds established by the Constitution.”); *Insurance Corp. of Ireland v. Compagnie des Bauxites de Guinee*, 456 U.S. 694, 701 (1982) (explaining that federal subject matter jurisdiction is “limited to those subjects encompassed within a statutory grant of jurisdiction.”) Notably, the types of cases enumerated under Article III are not the exclusive jurisdiction of federal courts, and state courts can exercise concurrent jurisdiction unless expressly forbidden by Congress. *See* EPSTEIN, *supra* note 100, at 96–97 (quoting Graham C. Lilly, *Jurisdiction Over Domestic and Alien Defendants*, 69 VA L. REV. 85, 123 n.142 (1983)).

104. U.S. federal courts and federal law have generally been perceived as being hospitable to transnational litigation. *See* Donald Earl Childress III, *Escaping Federal Law in Transnational Cases: The Brave New World of Transnational Litigation*, 93 N.C. L. Rev. 995, 998 (2015). Additionally, foreign defendants have a right to remove the case from a state court to federal district court under 28 U.S.C. § 1441(a) & (b) (2012). The most common types of transnational litigation in state courts include torts, family law, and employment law. *See* EPSTEIN, *supra* note 100, at 96–99; GARY BORN & PETER B. RUTLEDGE, *INTERNATIONAL CIVIL LITIGATION IN UNITED STATES COURTS* 10 (5th ed. 2011).

105. U.S. CONST. art. III; 28 U.S.C. § 1332(a)(2)–(3) (2012). Note that the amount in controversy must exceed \$75,000 to be considered by a court under diversity of citizenship. *Id.* § 1332.

106. *Id.* § 1350 (2012).

107. *Id.* § 1330(a) (2012). Note that federal courts also exercise subject matter jurisdiction over: (1) “cases involving federal questions arising under the U.S. Constitution, statutes, and regulations,” *id.* § 1331, and (2) “diversity of citizenship cases, between citizens of different U.S. states,” *id.* § 1332, although these grants of jurisdiction are less applicable in international litigation. *See* BORN, *supra* note 104, at 11.

108. BORN, *supra* note 104, at 384. Courts may also decline to exercise jurisdiction on the basis of international comity and unreasonableness. EPSTEIN, *supra* note 100,

While weight is given to the plaintiff's choice of forum,¹⁰⁹ the forum non conveniens doctrine allows courts to dismiss a case after examining the various private and public interests involved, if a foreign court would be "adequate" and substantially more convenient or appropriate.¹¹⁰

Therefore, if a foreign plaintiff sues a U.S. non-governmental defendant for transnational climate damages, a U.S. court could foreseeably find subject matter jurisdiction. This jurisdiction could be based on the "diverse citizenship" of the parties involved, the headquarters of the defendants, or the quantity of greenhouse gas emissions occurring within the United States.¹¹¹ However, a U.S. defendant may seek to have

at 128. According to EPSTEIN, the comity and unreasonableness rules emerge from the Restatement (Third) of Foreign Relations Law § 403 (AM. LAW INST. 1987). *See, e.g.*, *Timberland Lumber Co. v. Bank of America Nat'l Sav. & Tr. Ass'n*, 549 F.2d 597 (9th Cir. 1976); *Mannington Mills v. Congoleum Corp.*, 595 F.2d 1287, 1297-98 (3d Cir. 1979). Under the doctrine of comity, a court may decline to exercise jurisdiction in cases where there is concurrent jurisdiction, and a substantial conflict between U.S. laws and the laws of a foreign jurisdiction, whereas the unreasonableness rule provides that a court may decline to exercise jurisdiction where it appears to be unreasonable. *See, e.g.*, *In re Maxwell Communications Corp.*, 93 F.3d 1036, 1046-49 (2d Cir. 1996). *See also* EPSTEIN, *supra* note 100, at 121-30, for a more in-depth discussion of these two limitations of subject matter jurisdiction.

109. *See, e.g.*, *Gulf Oil Co. v. Gilbert*, 330 U.S. 501, 508 (1947). *See generally* Margaret G. Stewart, *Forum Non Conveniens: A Doctrine in Search of a Role*, 74 CAL. L. REV. 1259 (1986). The U.S. Supreme Court has recognized that the selection of a U.S. court by a foreign plaintiff "will likely make a forum less convenient than will the presence of a local plaintiff." RONALD A. BRAND & SCOTT R. JABLONSKI ET AL., *FORUM NON CONVENIENS: HISTORY, GLOBAL PRACTICE, AND FUTURE UNDER THE HAGUE CONVENTION ON CHOICE OF COURT AGREEMENTS* 116 (2007). As a result, in transnational litigation, "a foreign plaintiff's choice [of forum] deserves less deference [than a local plaintiff's choice]." *Piper Aircraft Co. v. Reyno*, 454 U.S. 235, 255-56 (1981).

110. *See* EPSTEIN, *supra* note 100, at 119 (summarizing the forum non conveniens test articulated in *Pain v. United Technologies Corp.*, 637 F.2d 775 (D.C. Cir. 1980)). The test is as follows (footnotes omitted) (emphasis in original):

- First, determine whether there is an adequate alternative forum that can try the entire case;
- Second, "consider all relevant factors of private interests, *weighing in the balance a strong presumption against disturbing plaintiffs' initial form choice*;"
- Third, if the balance of interest is in or near "equipoise," consider whether the public interest favors a foreign forum;
- Fourth, if the balance favors a foreign forum, ensure that plaintiffs can reinstate their suit in the alternative forum without "undue inconvenience or prejudice." For an overview of the forum non conveniens doctrine, *see also* BORN, *supra* note 104, at 365-459.

111. Note that it is unlikely that a foreign plaintiff could bring a climate action against a U.S. defendant on the basis of the Alien Tort Claims Act (ATCA), as the Act

the case dismissed based on forum non conveniens, arguing that an adequate alternative forum for litigation exists, and that private and public interest favour this alternative forum.¹¹² The success of such an argument would depend on whether the defendant would be amenable to being sued in an adequate alternative forum, likely a court in the plaintiff's home state.¹¹³

2. *Personal Jurisdiction*

Both state and federal courts can exercise personal jurisdiction over transnational litigation where authorized by statute¹¹⁴ and consistent with the constitutional principles of due process.¹¹⁵ According to the test outlined in *International Shoe Co. v. Washington*, due process requires that a defendant have minimum contacts with the forum such that the exercise of jurisdiction accords with the notions of “fair play and

only applies to torts “committed in violation of the law of nations or a treaty of the United States.” 28 U.S.C. § 1350 (2012). As of yet, the United States is not party to any treaty that forbids—or even limits—the emissions of greenhouse gases. See Gerrard, *supra* note 16, at 44. Perhaps even more importantly, in its modern revival (post-1980), the ATCA has only been applied to conduct committed outside the United States.

112. This was the argument made in Texaco Inc.'s Memorandum of Law in Support of Its Renewed Motions to Dismiss Based on Forum Non Conveniens and International Comity at 22–51, *Aguinda v. Texaco, Inc.*, No-93 Civi. 7527 (S.D.N.Y. Jan. 11, 1999). See also Howard Erichson, *The Chevron-Ecuador Dispute, Forum Non Conveniens, and the Problem of Ex Ante Inadequacy*, 1 STAN. J. COMPLEX LITIG. 417, 425 (2013).

113. *Piper Aircraft Co. v. Reyno*, 454 U.S. 235, at 254 n.22 (1981) (“At the outset of any forum non conveniens inquiry, the court must determine whether there exists an alternative forum.”). Based on this case, “an alternative forum is normally considered adequate if the defendant is subject to jurisdiction in the alternative forum even if the alternative forum has [different] laws.” Michael T. Lii, *An Empirical Examination of the Adequate Alternative Forum in the Doctrine of Forum Non Conveniens*, 8 RICH J. GLOBAL L. & BUS. 513, 517 (2009).

114. See BORN, *supra* note 104, at 82 (“All the states of the Union have enacted statutes (or rules of court) defining the personal jurisdiction of state courts over non-resident defendants.”) See generally ROBERT C. CASAD, JURISDICTION IN CIVIL ACTIONS § 4.01 (2d ed. 1991) (describing and reproducing state long-arm statutes). Statutory authorization for federal courts to exercise personal jurisdiction over foreign defendants is derived from Federal Rule of Civil Procedure 4, which allows federal courts to (1) “borrow” the long arm statute of the state in which they sit; (2) exercise personal jurisdiction according to applicable federal statute; or (3) exercise personal jurisdiction within the limits of the Constitutional principles of due process in certain federal question cases. Fed. R. Civ. P. (4)(k). See also BORN, *supra* note 104, at 74.

115. Note also that unlike with subject matter jurisdiction, the defendant can, either explicitly or implicitly, waive personal jurisdiction. EPSTEIN, *supra* note 100, at 173.

substantial justice.”¹¹⁶

While there is a lack of consensus regarding what actions satisfy the minimum contacts requirement,¹¹⁷ courts will generally consider: (1) the quantity of contacts with the forum state; (2) the nature and quality of contacts; (3) the source and connection of the cause of action with these contacts; (4) the interest of the state in providing a forum; and (5) the convenience of the parties, when determining whether to exercise personal jurisdiction.¹¹⁸

The factors relevant to determining whether the exercise of personal jurisdiction accords with the notions of fair play and substantial justice include: “(1) [the] burden on the defendant in litigation in the forum state; (2) the interests of the forum state; (3) the plaintiff’s interest in obtaining relief; (4) the interstate judicial system’s interest in obtaining the most efficient resolution of controversies; and (5) the shared interest of the several states in further fundamental substantive social policies.”¹¹⁹

In the context of a transnational climate damages claim involving a foreign plaintiff suing a U.S. greenhouse gas producer, a U.S. court would likely find that exercising personal jurisdiction accords with the notions of fair play and substantial justice.¹²⁰ A court would reach this decision by applying the factors relevant to determining whether the exercise of personal jurisdiction accords with the notions of fair play and substantial justice stated above to this scenario. In reference to the first factor, a U.S. greenhouse gas producer

116. *Int’l Shoe Co. v. Washington*, 326 U.S. 310, 316, 320 (1945).

117. Various standards have been adopted in state and federal courts. In *Asahi Metal Indus. Co., Ltd. v. Superior Court*, the Supreme Court outlines two of the predominant standards used in courts: the “stream of commerce” theory, which allows courts to exercise jurisdiction where a consumer uses the defendant’s product in the forum, and a stricter “purposeful direction” standard, which allows courts to exercise jurisdiction only where a defendant has taken purposeful action towards the forum, such as advertising in the forum state or marketing a product through a regular channel. 480 U.S. 102, 110–12 (1987). See generally EPSTEIN, *supra* note 100, at 158–66.

118. *World-Wide Volkswagen Corp. v. Woodson*, 444 U.S. 286, 292 (1980).

119. EPSTEIN, *supra* note 100, at 164 (citations omitted). Courts generally agree that the stronger the connection between the defendant and the forum, the greater the burden on the defendant to show that such an exercise of jurisdiction is unreasonable. *Id.*

120. See *Int’l Shoe*, 326 U.S. at 320 (discussing the test to determine whether the exercise of personal jurisdiction is appropriate).

would be unlikely to suffer any burden in litigating in the United States. The United States would also have an interest as the forum state to consider the liability of U.S. greenhouse gas producers. The foreign plaintiff may have an interest in holding litigation in the United States in order to obtain relief in the jurisdiction where the defendant's assets are located.

A U.S. court would almost certainly find that minimum contacts exist between a U.S. defendant and the United States. Extensive or "general" contact, which can be established by domicile or incorporation, satisfies this minimum contacts requirement. This would allow a court to exercise personal jurisdiction over the defendant "with respect to all claims arising from any of the defendant's activities, including activities unrelated to the forum state."¹²¹

If the defendant's interactions with the United States are less extensive than general contact, a U.S. court could still exercise personal jurisdiction based on "specific contacts." This would limit the claims heard by a court to those "that are related to or arise out of a defendant's contacts with the forum."¹²² As one commentator noted, "[t]he line between general and specific [contacts] is obviously not a bright one, and the question will require a case-by-case analysis of the particular statutory grant of jurisdiction and the facts of each case."¹²³ A U.S. court could likely find personal jurisdiction based on a greenhouse gas producer's either general or specific contacts with the United States, given the close relationship that exists between the nature of a foreign plaintiff's claim and the activities of that producer.

It is beyond the scope of this Article to consider the many diverse legal approaches in other countries related to personal jurisdiction. Yet, it is important to note that in many countries, personal jurisdiction can be exercised over defendants that are not connected with the jurisdiction, with leave of the court or otherwise, where the case involves harm to real property located within the jurisdiction.¹²⁴ It is possible that U.S.

121. BORN, *supra* note 104, at 83–84. Other factors considered when determining whether there is general jurisdiction include: nationality, residence, registration to do business, consent, waiver, and continuous and systemic activity. *Id.* at 109.

122. BORN, *supra* note 104, at 90.

123. EPSTEIN, *supra* note 100, at 167 (citations omitted).

124. AUSTRALIAN PRIVATE INTERNATIONAL LAW FOR THE 21ST CENTURY, STUDIES IN INTERNATIONAL PRIVATE LAW 17 (Andrew Dickinson et al. eds., (2014) ("In most

defendants could find plaintiffs asserting personal jurisdiction over them notwithstanding that they have little or no presence in the jurisdiction.

B. Choice of Law

Once a court has established subject matter and personal jurisdiction over a case involving parties from multiple jurisdictions, it may be necessary for it to consider whether to apply domestic forum law or the foreign law of another country. While courts will select forum law most often,¹²⁵ it is possible for courts, including those in the United States, to apply foreign law instead. Choice of law analysis describes the processes and rules used by courts to make this determination.

Numerous scholars have described choice of law as a “dismal swamp, filled with quaking quagmires” due to its complex and changing nature.¹²⁶ In the United States, choice of law regimes vary between states largely based on the First Restatement Conflict of Laws¹²⁷ and Second Restatement Conflict of Laws.¹²⁸ Some states, however, have adopted hybrid

international cases, personal jurisdiction is established by service out of the jurisdiction pursuant to the rules of court, a form of delegated legislation which is made by Rules Committees of the courts.”). *See, e.g.*, United Kingdom Practice Direction 6B, s. 3.1 (9) and (11); New Zealand High Court Rules, r. 9.27. *See* Andrew Gage & Margaretha Wewerinke, *Taking Climate Justice into Our Own Hands: A Model Climate Compensation Act*, WEST COAST ENVTL LAW 14–15 (2015), <https://ssrn.com/abstract=2906252> (discussing examples of national rules regarding jurisdiction).

125. Empirical studies have found that modern choice-of-law systems, such as that found in the Second Restatement Conflict of Laws, tend to favor the application of forum law. *See* Ralph U. Whitten, *U.S. Conflict-of-Laws Doctrine and Forum Shopping, International and Domestic (Revisited)*, 37 TEX. INT'L L.J. 559, 560–66 (2002); Michael E. Solimine, *An Economic and Empirical Analysis of Choice of Law*, 24 Ga. L. Rev. 49, 86 (1992). *See also* Patrick J. Borchers, *The Choice of Law Revolution: An Empirical Study*, 49 WASH. & LEE L. REV. 357, 377–78 (1992).

126. *See* William L. Prosser, *Interstate Publication*, 51 MICH. L. REV. 959, 971 (1953). Many scholars have since taken up this analogy, including JOSEPH W. GLANNON, CIVIL PROCEDURE: EXAMPLES AND EXPLANATIONS 231–32 (Aspen Publishers eds., 6th ed. 2008).

127. RESTATEMENT (FIRST) CONFLICT OF LAWS (AM. LAW INST. 1934). States that follow the traditional choice of law approach as articulated in the First Restatement Conflict of Laws include, Alabama, Georgia, Kansas, Maryland, New Mexico, North Carolina, South Carolina, and Virginia. *See In re Yasmin & Yaz (Drospirenone) Mktg., Sales Practices & Prods. Liab. Litig.*, No. 3:09-md-02100-DRH-PMF, MDL No. 2100, 2011 WL 1375011, at *14 (S.D. Ill. Apr. 12, 2011).

128. RESTATEMENT (SECOND) CONFLICT OF LAWS (AM. LAW INST. 1971). States that follow the significant relationship choice of law approach as articulated in the Second

regimes.¹²⁹

In U.S. states that follow the First Restatement Conflict of Laws, courts take a traditional territorial approach to the choice of law.¹³⁰ They will generally apply the law of the place of wrong, defined as the place “where the last event necessary to make an actor liable for an alleged tort” occurred.¹³¹ This is usually, but not necessarily, the place of injury or damage.¹³²

In U.S. states that follow the more modern choice of law approach, set out in the Second Restatement Conflict of Laws, courts will consider factors other than the place of injury or damage. These include the place where the event giving rise to the damage occurred; the domicile, residence, nationality, place of incorporation and place of business of the parties, and the place where their relationship, if any, is centred.¹³³ With these factors in mind, a court will determine and apply the law of the state with the “most significant relationship to the occurrence and the parties.”¹³⁴

Restatement Conflict of Laws include: Alaska, Arizona, Colorado, Connecticut, Delaware, Florida, Idaho, Illinois, Iowa, Kentucky, Maine, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New York, Nevada, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Dakota, Tennessee, Texas, Utah, Vermont, Washington, West Virginia, Wisconsin, and Wyoming. See *In re Yasmin & Yaz (Drospirenone) Mktg., Sales Practices & Prods. Liab. Litig.*, No. 3:09-md-02100-DRH-PMF, MDL No. 2100, 2011 WL 1375011, at *10–13 (S.D. Ill. Apr. 12, 2011).

129. California and the District of Columbia have explicitly adopted the “government interest analysis” test to determine choice of law. See Herma Hill Kay, *Currie’s Interest Analysis in the 21st Century: Losing the Battle, but Winning the War*, 31 WILLAMETTE L. REV. 123, 126 (2001). The government interest analysis is a three-step test related to the Second Restatement’s significant relationship test, which involves determining (1) whether the laws in the two jurisdictions differ as applied to the facts of the case; (2) if they differ, whether a “true conflict” exists where each state has an interest in applying its laws; and (3) which state’s interest would be more impaired if its laws were not applied. See *C.K. Liew v. Official Receiver & Liquidator*, 685 F.2d 1192, 1196 (9th Cir. 1982).

130. See BORN, *supra* note 104, at 766.

131. RESTATEMENT (FIRST) CONFLICT OF LAWS, *supra* note 127, at § 377.

132. See David Riley, *The First Restatement of Conflict of Laws on the Twenty-Fifth Anniversary of its Successor: Contemporary Practice in Traditional Courts*, 56 MD. L. REV. 1196, 1196–97 (1997).

133. RESTATEMENT (SECOND) CONFLICT OF LAWS, *supra* note 128, at § 145.

134. RESTATEMENT (SECOND) CONFLICT OF LAWS, *supra* note 128, at § 145. Courts will also consider: the needs of the interstate and international systems; the relevant policies of the state of the forum; the relevant policies of other interested states; the protection of justified expectations; the basic policies underlying the particular field of law; certainty, predictability and uniformity of result; and the ease in the determination and application of the law to be applied. See RESTATEMENT (SECOND)

Under these principal choice-of-law regimes, a U.S. court could conceivably choose to apply foreign law to transnational climate litigation involving a foreign plaintiff and U.S. defendant. This scenario is more likely under the traditional choice-of-law approach in the First Restatement, which dictates that the law of the place of injury applies in transnational tort litigation.¹³⁵

As outlined above, the Second Restatement takes a broader approach when determining choice of law. Whether a court applies forum law or the law of the country where climate damages occurred will largely depend upon which country is deemed to have the “most significant relationship” with the parties and the dispute.¹³⁶

The relative benefits for foreign plaintiffs of either choice—forum or foreign law—will depend largely upon the specifics of the case. Foreign plaintiffs are often drawn to U.S. courts for transnational litigation due to the (sometimes inaccurate) perception that U.S. tort law is more favorable than the law of the country where the injury or damage occurred.¹³⁷

However, the application of foreign law may be particularly attractive to foreign plaintiffs pursuing climate damages litigation in U.S. courts because of the different approaches and bases for liability in other countries. Lawyers from several countries and affiliated with the Environmental Law Alliance Worldwide have identified several countries with laws that are well suited for climate damages claims:

We found that civil law jurisdictions are more likely to have a particular statute under which a case seeking compensation for climate damages could be filed. In particular, Brazil, Colombia, and Mexico all have laws under which a climate-related claim could be filed. One exception is the common law country of Kenya, which

CONFLICT OF LAWS, *supra* note 128, at § 6(2).

135. RESTATEMENT (FIRST) CONFLICT OF LAWS, *supra* note 127, at § 377. *See also* BORN, *supra* note 104 at 766–67.

136. RESTATEMENT (SECOND) CONFLICT OF LAWS, *supra* note 128, at § 145.

137. The United States has long been a “magnet” forum for transnational litigation due to its pro-plaintiff legal environment, cultivated by “trial by jury, liberal pretrial discovery, representation by experienced litigators for a [contingency] fee [...] substantially higher damage awards, and relatively prompt trial settings.” Walter W. Heiser, *Forum Non Conveniens and Choice of Law: The Impact of Applying Foreign Law in Transnational Tort Actions*, 51 WAYNE L. REV. 1161, 1177 (2005).

also has a relevant law that opens the door to climate litigation as well as a specialized environmental court. . . .

Constitutions in some countries contain provisions that would support a climate damages case filed against a private corporation. Our research found clear indications that courts in Brazil and Colombia will hold private corporations liable for violating fundamental rights; and very likely that courts in Ecuador, India, Kenya and Mexico would do so, too. Because constitutional provisions can be coupled with strong laws in Brazil, Colombia, Kenya and Mexico, filing a case in one of these four countries gains even more appeal.¹³⁸

Given that the emissions that are alleged to be tortious do not occur in any one country, it might be argued that the tort, if it occurs anywhere, must occur in the jurisdiction where the harm occurs. That country may have a more significant relationship than a country where only some of the potential defendants reside and a small fraction of the emissions occurred. Regardless of the benefits of forum or foreign law, the forum court decides which law to apply.¹³⁹

138. ENVTL. LAW ALL. WORLDWIDE, *Holding Corporations Accountable for Damaging the Climate* 3 (2014), <https://www.elaw.org/system/files/elaw.climate.litigation.report.pdf>. See also CONSTITUTION OF THE REPUBLIC OF BRAZIL, Oct. 5, 1988, art. 225 § 3 (“[T]he conduct and activities considered harmful to the environment shall subject the offender, individuals or legal entities, to criminal and administrative sanctions, regardless of the obligation to repair the damage caused.”); *M.C. Mehta v. Union of India*, A.I.R. 1987 S.C. 1086, 1089–90 (expanding the ambit of Article 32 to allow Indian courts to compensate private party victims for Constitutional rights violations, including those breached by other private citizens, corporations, and legal persons); ENVIRONMENTAL LAW INSTITUTE, CONSTITUTIONAL ENVIRONMENTAL LAW: GIVING FORCE TO FUNDAMENTAL PRINCIPLES IN AFRICA 28 (2007). See generally Lord, *supra* note 16; Andrew Gage & Michael Byers, *Payback Time: What the Internationalization of Climate Change Litigation Could Mean for Canadian Oil Companies* 13, 18 (2014) (reviewing options available to climate damages plaintiffs under different legal systems).

139. Note that some other countries have adopted more flexible rules relating to choice of law for transnational environmental litigation. According to the Rome II regulation, which is intended to apply across the European Union, the plaintiff has the choice whether to sue based on the laws of the “country where the damage occurred” or the country where “the event giving rise to the damage occurred.” Commission Regulation 864/2007 of July 11, 2007, On the Law Applicable to Non-Contractual Obligations (Rome II), 2007 O.J. (L 199) 40–49 (EC), <http://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX:32007R0864>. As a result, if a court in an EU country

C. *Recognition and Enforcement of Foreign Judgments*

Given the threshold issues currently facing climate litigation in the United States, it is possible—perhaps even likely—that foreign plaintiffs will instead opt to sue U.S. defendants in their own courts.¹⁴⁰ Alternatively, as mentioned above, a defendant may argue that a case should not be heard in the United States under the doctrine of *forum non conveniens*.¹⁴¹ In either case, foreign plaintiffs may first obtain a judgment for climate change-related damages in a foreign court. Afterwards, they may seek to have that judgment recognized and enforced in other countries where the defendant's assets are located, including the United States.¹⁴²

found jurisdiction over a climate change litigation case, perhaps on the basis of the particularly broad jurisdiction asserted in some of those countries, a U.S. greenhouse gas producer could be held to the law of the plaintiff's choosing. The possibility that a U.S. court might then recognize and enforce the foreign judgment is discussed in the following Section. *See also* Lord, *supra* note 16, at 484 (“The Rome II regime is of potentially great significance in climate change litigation, where nationals in developing countries may allege damage suffered in those countries as a result of actions by corporations domiciled in the EU. Such corporations may be sued in their State of domicile, with the claimant able to rely on the law of his/her own State.”).

140. Traditionally, foreign litigants have been drawn to the United States, “as a moth is drawn to the light.” Marcus S. Quintanilla & Christopher A. Whytock, *Transnational Litigation: Foreign Courts, Foreign Judgments, and Foreign Law*, 18 SW. J. INT'L L. 31, 32 (2012) (quoting Lord Denning in *Smith Kline & French Labs Ltd. v. Bloch*, 1 W.L.R. 730, 711 (C.A. 1982)). However, according to some scholars, this unipolar era in transnational litigation has given way to greater multi-polarity. As the relative popularity of non-U.S. forums grows, it is likely there will be a proliferation of foreign judgments brought to the United States for recognition and enforcement—along with the consequent challenges of determining foreign law. *Id.* at 37–38. *See also* Christopher A. Whytock, *The Evolving Forum Shopping System*, 96 CORNELL L. REV. 481 (2011) (discussing and analyzing the data underpinning the assertion that U.S. transnational litigation is decreasing in popularity).

141. *See supra* note 108 and accompanying text.

142. *See* John B. Bellinger, III & R. Reeves Anderson, *Tort Tourism: The Case for a Federal Law on Foreign Judgment Recognition*, 54 VA. J. INT'L L. 501, 521 (2014). It may also be possible for a foreign plaintiff to seek to have a judgment recognized and enforced in a jurisdiction where the defendant itself does not have assets, but a subsidiary of the defendant does. For example, a recent Ontario Court of Appeal decision in *Yaiguaje v. Chevron Corporation* indicated that Ontario courts have jurisdiction to recognize and enforce judgments against the assets of an uninvolved subsidiary of a corporate defendant, providing that Ontario has jurisdiction over the subsidiary, and that there is an “economically significant relationship” between the subsidiary and the defendant. 2013 CanLII 758, para. 38 (Can. O.N.) *appeal dismissed* 3 S.C.R. 69, 72 (2015). In the U.S., according to the ALI, a judgment can be enforced where the judgment debtor has assets *or* where they are subject to personal jurisdiction. *See* AMERICAN LAW INST., RECOGNITION AND ENFORCEMENT OF FOREIGN JUDGMENTS: ANALYSIS AND PROPOSED FEDERAL STATUTE § 9(b) (2006).

Traditionally, the United States has been perceived as “relatively friendly to recognizing and enforcing foreign judgments.”¹⁴³ However, there is no uniform federal law governing this area. Instead, the recognition and enforcement of foreign judgments is primarily governed by state law in both state and federal courts.¹⁴⁴ Courts recognize and enforce foreign judgments on the following three bases: the 1962 Uniform Foreign Money Judgment Recognition Act,¹⁴⁵ the 2005 Uniform Foreign-Country Money Judgments Recognition Act,¹⁴⁶ and common law principles if neither of the previous statutes have been adopted.¹⁴⁷

All three bases for recognition and enforcement of foreign judgments stem from the comity doctrine,¹⁴⁸ best defined in *Hilton v. Guyot* as “the recognition which one nation allows within its territory to the legislative, executive, or judicial acts

143. See Gerrard, *supra* note 16, at 596 (citations omitted); Ronald A. Brand, *Recognition and Enforcement of Foreign Judgments*, FED. JUD. CTR. 2 (2012).

144. The U.S. Supreme Court has never directly addressed the question of whether state or federal law governs the recognition and enforcement of foreign judgments. However, the consensus among state courts and lower federal courts is that state law governs the recognition and enforcement of foreign judgments and federal courts will apply the law of the state in which they sit. As an exception to this rule, federal law will be applied in federal question cases. See RESTATEMENT (SECOND) CONFLICT OF LAWS, *supra* note 128, at § 98 cmt. c.

145. At its height, the 1962 Uniform Foreign Money Judgment Recognition Act was in force in over thirty states and the District of Columbia. Many of these states have since repealed the Act in favor of more recent legislation. For the full text, see UNIFORM FOREIGN MONEY JUDGMENT RECOGNITION ACT (NAT'L CONFERENCE OF COMM'RS ON UNIF. STATE LAWS 1962) [hereinafter 1962 Act], <https://lettersblogatory.com/wp-content/uploads/2011/01/UFMJRA.pdf>. For a list of states that at one point adopted this statute, see BRAND, *supra* note 109 at app. D.

146. The 2005 Uniform Foreign-Country Money Judgments Recognition Act is largely based on the 1962 Act, but clarifies procedural and substantive issues, and includes provisions relating to the burden of proof and statute of limitations. See UNIFORM FOREIGN-COUNTRY MONEY JUDGMENTS RECOGNITION ACT, § 2; 9 (NAT'L CONFERENCE OF COMM'RS ON UNIF. STATE LAWS 2005), [hereinafter 2005 Act], http://www.uniformlaws.org/shared/docs/foreign%20country%20money%20judgments%20recognition/ufcmjra_final_05.pdf. At the time of writing, the 2005 Act was the most widely recognized base for the recognition and enforcement of foreign judgments, with eighteen states and the District of Columbia having adopted the statute in full or in part. See S. I. Strong, *Recognition and Enforcement of Foreign Judgments in U.S. Courts: Problems and Possibilities*, 33:1 REV. LITIG. 45, 67 (2014).

147. The primary source of common law principles for the recognition and enforcement of foreign judgments is the Restatement (Third) of Foreign Relations Law (Am. Law Inst. 1987).

148. BRAND, *supra* note 143, at 3.

of another nation.”¹⁴⁹ Given the common origin of these bases for recognition and enforcement of foreign judgments, it is unsurprising that they apply to a similar subset of foreign judgments. That is, judgments that are “final, conclusive, and enforceable” and “grant or deny a sum of money.”¹⁵⁰

All three bases for recognition and enforcement of foreign judgments outline a series of mandatory and discretionary grounds for non-recognition with slight variances.¹⁵¹ In general, mandatory grounds for non-recognition apply, where:

- (1) the judgment was rendered under a system which does not provide impartial tribunals or procedures compatible with the requirements of due process of law;
- (2) the foreign court did not have personal jurisdiction over the defendant; or
- (3) the foreign court did not have jurisdiction over the subject matter.¹⁵²

While a court *must* deny recognition if any of these three (or in the case of the Restatement, two) grounds exist, a court *may* deny recognition on other grounds as a matter of discretion.¹⁵³ Notably, there are a number of discretionary grounds for non-

149. See *Hilton v. Guyot*, 159 U.S. 113, 158 (1895). According to *Hilton v. Guyot*, comity requires the recognition and enforcement of foreign judgments “where there has been opportunity for a full and fair trial abroad before a court of competent jurisdiction, conducting the trial upon regular proceedings, after due citation or voluntary appearance of the defendant, and under a system of jurisprudence likely to secure an impartial administration of justice between the citizens of its own country and those of other countries, and there is nothing to show either prejudice in the court, or in the system of laws under which it was sitting, or fraud in procuring the judgment, or any other special reason why the comity of this nation should not allow it full effect”

150. 2005 Act, *supra* note 146, at § 3 (a)(1)–(2); 1962 Act, *supra* note 145, at §§ 2–3; RESTATEMENT (THIRD) OF FOREIGN RELATIONS LAW, *supra* note 147, at § 481 (1).

151. Mandatory grounds for non-recognition render the judgment *necessarily* non-recognizable and non-enforceable, while discretionary grounds allow courts to interpret whether the circumstances of the specific case should make the judgment non-recognizable and non-enforceable. See BRAND, *supra* note 143, at 13–20; 20–24.

152. See 2005 Act, *supra* note 146, at § 4(b)(1)–(3); 1962 Act *supra* note 145, at § 4(a)(1)–(3); RESTATEMENT (THIRD) OF FOREIGN RELATIONS LAW, *supra* note 147, at § 482 (1)(a)–(b). The 2005 Act states that these grounds render the judgment “non-recognizable,” while the 1962 Act states that these grounds render the judgment “non-conclusive”—which in effect makes them non-recognizable. Note also, in the Third Restatement Foreign Relations Law, no “jurisdiction over the subject matter” is a discretionary ground as opposed to a mandatory one for non-recognition.

153. See Strong, *supra* note 146, at 70.

recognition, including where:

- (1) the defendant in the proceedings in the foreign court did not receive notice of the proceedings in sufficient time to enable him to defend;
- (2) the judgment was obtained by fraud;
- (3) the claim for relief on which the judgment is based is repugnant to the public policy of this state;
- (4) the judgment conflicts with another final and conclusive judgment;
- (5) the proceeding in the foreign court was contrary to an agreement between the parties to otherwise settle the dispute; or
- (6) in the case of jurisdiction based only on personal service, the foreign court was an inconvenient forum for the trial of the action.¹⁵⁴

Where mandatory grounds for non-recognition do not apply, and where a discretionary basis for non-recognition does not exist or is not invoked, a judgment is “enforceable in the same manner as the judgment of a court of a sister state which is entitled to full faith and credit.”¹⁵⁵

The most common ground for non-recognition is lack of

154. See 2005 Act, *supra* note 146, at § 4(c)(1)–(6); 1962 Act, *supra* note 145, at § 4(b)(1)–(6); RESTATEMENT (THIRD) OF FOREIGN RELATIONS LAW, *supra* note 147, at § 482 (2)(a)–(f). The 2005 Act adds two additional discretionary grounds for non-recognition to this list, where:

[T]he judgment was rendered in circumstances that raise substantial doubt about the integrity of the court with respect to the judgment; or the specific proceeding in the foreign court leading to the judgment was not compatible with the requirements of due process of law.

155. 1962 Act, *supra* note 145, in Prefatory Note. According to the 2005 Act, a judgment is “enforceable in the same manner and to the same extent as a judgment rendered in this state.” *Supra* note 146, at § 7(2). The Restatement (Third) of Foreign Relations Law also uses slightly different language, stating “a judgment entitled to recognition . . . may be enforced by any party . . . in accordance with the procedure for enforcement of judgments applicable where enforcement is sought.” *supra* note 147, at § 481(2). In addition (though not included in either Act or according to common law principles), some states have passed legislation that makes ‘reciprocity’ an additional requirement for enforcement. In other words, the foreign court must likewise recognize and enforce judgments originating in the respective U.S. state or federal court. Florida, Idaho, Maine, and North Carolina have made reciprocity a statutory discretionary ground for recognition (no reciprocity a discretionary ground for non-recognition), while Georgia and Massachusetts have made reciprocity a mandatory ground for recognition (no reciprocity a mandatory ground for non-recognition). See *also* Strong, *supra* 146, at 72.

personal jurisdiction.¹⁵⁶ According to the 1962 Act, the 2005 Act, and common law principles, a foreign issuing court must have personal jurisdiction over the defendant for the judgment in question to be recognized and enforced in the United States.¹⁵⁷ While this requirement “appear[s] to consider the issue solely from the perspective of the court rendering the judgment in question,” U.S. courts often interpret this requirement using the U.S. standard for due process, including personal jurisdiction.¹⁵⁸

In the context of a judgment for climate change-related damages, the U.S. standards for personal jurisdiction can only be met if the defendant has “minimum contacts” with the foreign jurisdiction over which the issuing court presides.¹⁵⁹ These contacts must be such that a U.S. based greenhouse gas producer “could reasonably expect to be hauled into court”¹⁶⁰ without offending “traditional notions of fair play and justice.”¹⁶¹

In a scenario where a U.S. court is considering whether a U.S. defendant has general or specific contacts with the foreign forum sufficient to give rise to personal jurisdiction, it is unclear whether the production of greenhouse gas emissions that cause climate damages only in combination with emissions originating elsewhere would be sufficient to meet the threshold test for “minimum contacts” established in *International Shoe* and *World Wide Volkswagen*. In the case of major U.S.-based greenhouse gas producers, it is reasonable to

156. See BRAND, *supra* note 143, at 17.

157. Strong, *supra* note 146, at 71. According to the 1962 Act and 2005 Act, there is personal jurisdiction “in cases of personal service, voluntary appearance, prior consent to jurisdiction of the foreign court, domicile, and commercial conduct.” *Id.* at 72; *see also id.* at 17. The common law principles of personal jurisdiction are largely the same, albeit slightly more complicated. *Id.* at 72; 1962 Act, *supra* note 145, at § 5(a); 2005 Act, *supra* note 146, at § 5(a).

158. Strong, *supra* note 146, at 72. This is particularly the case in states that adhere to common law principles rather than the 1962 Act or 2005 Act. According to the Restatement (Third) of Foreign Relations Law, “even if the rendering court had jurisdiction under the laws of its own state, a court in the United States asked to recognize a foreign judgment should scrutinize the basis for asserting jurisdiction . . .” *Supra* note 147, at § 482 cmt. c; *see, e.g., Koster v. Automark Indus. Inc.*, 640 F.2d 77 (7th Cir. 1981); *Mercandino v. Devoe & Reynolds Inc.*, 436 A.2d 942 (N.J. Super. Ct. App. Div. 1981).

159. *Int'l Shoe Co. v. Washington*, 326 U.S. 310, 316 (1945).

160. *World Wide Volkswagen Corp. v. Woodson*, 444 U.S. 286, 287 (1980).

161. *Int'l Shoe Co.*, 326 U.S. at 316.

assume they have operations and other connections worldwide, strengthening the ties between the defendant and the foreign jurisdiction, and the case for general or specific contacts.¹⁶²

Even if a U.S. court does not ultimately recognize and enforce a foreign judgment, many large greenhouse gas producers operate in multiple countries. This means that the judgment could conceivably be enforced in countries other than the United States,¹⁶³ including countries which have a more relaxed approach to the requirements of personal jurisdiction.¹⁶⁴

As this Section demonstrates, transnational litigation involves complex and inter-related questions about which country's courts should hear a climate damages case (jurisdiction), which country's laws should apply (choice of law), and which countries could recognize and enforce a judgment obtained in a foreign forum (recognition and enforcement).

Based on an analysis of the United States' current approach to these questions, transnational climate damages litigation could increase the likelihood of climate damages liability for a U.S. greenhouse gas producer, simply by increasing the number of jurisdictions where such claims could be brought,

162. The annual reports pursuant to section 13 or 15(d) of the Securities Exchange Act of 1934, completed by U.S. greenhouse gas producers as discussed in Section V, demonstrate the significant overseas holdings and operations of these companies. *See* Securities Exchange Act of 1934, 15 U.S.C. § 78 (2012). *See, e.g.*, CHEVRON CORP., ANNUAL REPORT (FORM 10-K) 3–30, <https://www.sec.gov/Archives/edgar/data/93410/000009341013000003/cvx-123112x10kdoc.htm>.

163. For example, in *Ecuador v. ChevronTexaco*, an Ecuadorian court found Chevron liable for environmental damages totaling \$9.5 billion. *See Chevron Corp. v. Yaiguaje*, 2015 S.C.C. 42 at para 6, [2015] 3 S.C.R. 69. Since the judgment was issued in 2011, the plaintiffs seek to have the judgment recognized and enforced in foreign courts, including in the U.S. and in Canada. *See Ecuador v. ChevronTexaco*, 376 F. Supp. 2d 334 (S.D.N.Y. 2005). While the U.S. refused to recognize the judgment on the basis of fraud, Canada's Supreme Court recently found jurisdiction to hear the case, allowing the plaintiffs to once again seek recognition and enforcement of the Ecuadorian judgment. *See Nicola Hong & Kim Mackrael, Canada's Top Court Rules in Favor of Ecuador Villagers in Chevron Case*, WALL ST. J. (Sept. 4, 2015), <http://www.wsj.com/articles/canadas-top-court-rules-in-favor-of-ecuador-villagers-in-chevron-case-1441384265>.

164. GAGE, *supra* note 124, at 17–18 (outlining the more relaxed approaches to personal jurisdiction found in other commonwealth countries, including the UK, Australia, New Zealand and Canada). For information on how Australia addresses personal jurisdiction in a more flexible manner, *see Dickinson, supra* note 124.

the laws that could be applied, and countries where a judgement could be recognized.

As Section V of this Article illustrates, transnational litigation and, in particular, the possibility of the enforcement of climate damages judgments in U.S. courts, could have severe financial consequences for large U.S. greenhouse gas producers.¹⁶⁵ However, first, it is necessary to consider the possibility that governments—either in the U.S. or abroad—will introduce legislation facilitating climate damages litigation.

IV. CLIMATE COMPENSATION LEGISLATION

To date, most attempts to assess the potential for climate damages litigation have also assumed that liability will be determined on the basis of current legal frameworks related to liability, whether common law or statutory in nature.¹⁶⁶ However, as this Section shows, governments often alter the rules related to liability in response to new developments or situations of perceived unfairness.

Many countries that are suffering from climate-related impacts arguably have significant financial incentives for reform that will only grow as these impacts, especially on public expenditure, worsen.¹⁶⁷ As public debate increasingly focuses on damages and responsibility, public opinion may also demand new climate compensation legislation to impose liability on those responsible for large-scale greenhouse gas emissions.

A. *Tobacco Damages Recovery Legislation and Other Laws*

As noted above, links are often made between climate damages litigation and tobacco damages litigation. Such commentary generally emphasizes the ways in which common law rules related to civil liability for tobacco have evolved. In some jurisdictions, the introduction of legislation altering

165. See *infra* Section V, “Quantifying the Liability Risk of U.S. Greenhouse Gas Producers.”

166. See, e.g., Grossman, *supra* note 9; Zasloff, *supra* note 9; Penalver, *supra* note 9; PEEL, *supra* note 30.

167. LYNDA COLLINS & HEATHER MCLEOD-KILMURRAY, THE CANADIAN LAW OF TOXIC TORTS 291 (2014).

common law bases for liability around tobacco claims was central in clarifying or establishing the rules for civil liability and clarifying approaches to causation.¹⁶⁸

Notably, in 1995, Florida enacted the Medicaid Third Party Liability Act,¹⁶⁹ with British Columbia following suit in 1997, and other Canadian provinces following suit shortly thereafter.¹⁷⁰ As Jacob Shelley explained, the Medicaid Act allowed the government to recover smoking-related costs covered by Medicaid, and changed the rules for liability in lawsuits against tobacco companies:

The Medicaid Third Party Liability Act represented a significant development as it allowed the state to introduce epidemiological evidence to prove causation, created a new cause of action, removed affirmative defences, and permitted the allocation of responsibility on the basis of market share.¹⁷¹

Climate damages litigation appears ripe for this type of development. Just as the tobacco compensation acts were enacted in response to mounting scientific consensus that tobacco was a cause of cancer¹⁷² and the increasing burden of tobacco-related costs, the scientific consensus regarding climate change is improving,¹⁷³ costs are increasing,¹⁷⁴ and

168. See Martin Olszynski et al., *From Smokes to Smokestacks: Lessons from Tobacco for the Future of Climate Change Liability*, GEO. ENVTL. L. REV. (April 24, 2017), <https://ssrn.com/abstract=2957921> (discussing the parallels between climate and tobacco litigation, including the potential for climate compensation legislation modeled on tobacco legislation).

169. Medicaid Third Party Liability Act, FLA. STAT. ANN. § 409.910 (West 1995).

170. Jacob J. Shelley, *The Crown's Right of Recovery Act*, 18 HEALTH L. REV. 15, 16 (2010).

171. *Id.* at 17.

172. Notably, while the Surgeon General determined that tobacco was a cause of cancer, they never stated that it was the cause of cancer. See Bruce A. Levin, *The Liability of Tobacco Companies—Should Their Ashes be Kicked?*, 29 ARIZ. L. REV. 195, 223 (1987).

173. See Oreskes, *supra* note 7 (finding that of 928 article abstracts listed in the Institute of Scientific Information database in 2004, 75 percent of the papers either explicitly or implicitly accepted the consensus view of the IPCC Reports, and 25 percent took no position on the current anthropogenic climate change. Notably, none of the papers opposed the consensus view).

174. See, e.g., Angela Lianovich, Comment, *Smoke Before Oil: Modeling a Suit Against the Auto and Oil Industry on the Tobacco Tort Litigation is Feasible*, 35 GOLDEN GATE U.L. REV. 429, 431 (2005) (“Likewise, the petro industry has managed to pass billions of dollars in environmental costs to the public, while successfully avoiding common-law tort liability”).

attention is shifting to who should be held responsible for the resulting damages.¹⁷⁵ As Lynda Collins and Heather McLeod-Kilmurray write,

Tobacco cost recovery statutes were enacted in response to the enormous expenses caused by tobacco-related illness. At a certain point governments (and presumably citizens) realized that it was inappropriate for the public purse to bear the burden of illnesses caused by profit-centered commercial enterprise. It seems highly likely that a similar thought process will occur in the climate change context. As expenses resulting from climate change mount (e.g. loss of roads and buildings due to melting permafrost in the north, flooding and other extreme weather events, personal injury from heat waves, etc.), governments may well feel the inclination – or indeed the necessity – to compel large emitters to provide compensation. Although the public nuisance model is theoretically available without statutory reform, there is no doubt that the creation of a statutory tort along the lines of the tobacco legislation would substantially increase governments' chances of success in climate-related tort litigation.¹⁷⁶

While the possible parallels between tobacco-related litigation and climate damages litigation are well discussed, tobacco damages recovery statutes are only one of many examples of legislation that modifies the rules for liability. The ability of the legislative branch to create, clarify, modify, or limit rules of liability is well recognized, both in the United States and in countries around the world.

In the environmental context, the rules for contaminated sites liability defined by the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA, also known as the Superfund) is an example. Section 107 of CERCLA makes most current and past owners (broadly defined) of contaminated property liable to the U.S. Environmental Protection Agency for the costs of clean up, as well as defines possible defenses and limits on that liability.¹⁷⁷

175. *See id.*, for a more complete discussion of some of the notable parallels between the development of tobacco legislation, leading ultimately to recovery, and the current state of climate litigation broadly.

176. COLLINS, *supra* note 167, at 291.

177. 42 U.S.C. § 9607 (2012).

Similarly, the Oil Pollution Act of 1990 imposes strict liability on parties that are “responsible” for oil spills, but also caps that liability.¹⁷⁸

Outside of environmental law, federal and state rules governing questions that are fundamental to civil litigation and procedure are often statutory in origin—for example, legislation on limitation periods, joint and several liability, and corporate structures. A host of other statutes also create, modify, or limit rules of civil liability. Outside the United States, there are many precedents for statutes that modify civil liability rules. In civil law countries, liability regimes are entirely statutory in nature.¹⁷⁹ In common law countries, legislation often alters the judge-made rules around liability, causation, and the calculation of damages.¹⁸⁰

Far from being remarkable or unusual, the legislative branch has always played a crucial role in establishing rules of liability in most, if not all, countries. Statutes related to climate damages litigation could follow the path of contaminated sites, oil spills, tobacco recovery, and other similar statutes intended to clarify rules of liability while addressing issues of broader public importance. Like transnational litigation, development of such legislation could lead to greenhouse gas producers being held liable for climate change-related damages.

B. What Might a Climate Compensation Act Look Like?

There is a lesson from the statutes explored in Section IV.A., for countries suffering climate impacts: if climate liability is difficult or impossible to litigate under the current legal

178. 33 U.S.C. § 2704 (2012).

179. Civil law countries include much of continental Europe and their former colonies, where governments have enacted “civil codes” outlining the rules governing liability. In Germany, there are specific statutes outlining environmental liability rules. See Umwelthaftungsgesetz [UmweltHG] [Environmental Liability Act], Dec. 10, 1990, BUNDESGESETZBLATT [BGBL I] at 2634, § 1 (Ger.), http://www.utexas.edu/law/academics/centers/transnational/work_new/german/case.php?id=1396.

180. For example, and discussed above, Canadian provinces have introduced legislation altering the rules around liability for the harm caused by tobacco. In British Columbia, see Tobacco Damages Recovery Act, S.B.C. 1997, c. 41 (Can.), subsequently renamed the Tobacco Damages and Health Care Costs Recovery Act, S.B.C. 2000, c. 30 (Can.).

system, then change the law.¹⁸¹ Such legislation could vary considerably from country to country, based on the underlying approaches to liability. The following list, which includes some of the goals a climate compensation act might accomplish, is based on the ways that legislation has altered and clarified liability in the past:¹⁸²

- clarify who can sue for climate damages, and on what basis (standing);¹⁸³
- recognize or create legal rights or duties in respect of the global atmosphere, or other rights that might form alternative basis of liability;¹⁸⁴
- clarify the type of evidence that may be used to establish a causal link between particular weather events and climate change;¹⁸⁵
- adapt common law causes of action, or create new causes of action, to address climate-related liability;¹⁸⁶
- address questions about limitation periods and how they apply to greenhouse gases emitted over long periods of time;¹⁸⁷

181. See, e.g., Tyson Dyck, *Features: A Civil Action*, HAZMAT MANAGEMENT (Jun. 1, 2006), <http://www.hazmatmag.com/features/a-civil-action/> (discussing how the reasoning in the 2005 Supreme Court of Canada decision in *British Columbia v. Imperial Tobacco* could help governments recover the public costs associated with other industries, particularly those with high GHG emissions).

182. It is important to note that climate compensation acts could also have the reverse effect of preventing governmental and non-governmental petitioners from bringing claims against greenhouse gas producers. For example, legislation could be enacted which prevents claims against greenhouse gas producers, providing they abide by emission regulations.

183. See, e.g., Environmental Bill of Rights, S.O. 1993, c. 28 § 103 (Can.); Abatement of Environmental Nuisances (Civil Action) Act, 5752–1992, p. 2 (Isr.) [hereinafter AENCAA], as discussed in Lord, *supra* note 16, at 294. The AENCAA allows any person (or NGO acting on behalf of a person) to take a civil action or class action in cases of environmental pollution or nuisance.

184. See, e.g., National Environmental Management Act 107 of 1998 § 28 (S. Afr.) (creating a duty of care to prevent or remediate pollution).

185. See, e.g., Medicaid Third Party Liability Act, FLA. STAT. ANN. § 409.910 (West 1995). A fairly common form of legislation dealing with issues of proof is a “reverse onus clause,” which requires a defendant to disprove elements of a case once certain elements are proven. See, e.g., Highway Traffic Act, R.S.O. 1990, c. H-8 § 193 (Can.).

186. AENCAA, *supra* note 183, as discussed in Lord, *supra* note 16, at 294. There are statutes that create or recognize legal rights and associated causes of action in respect to environmental problems. See, e.g., UmweltHG, *supra* note 179 at 2634, § 1 (Ger.). This Act is discussed in Lord, *supra* note 16, at 413.

187. In general, limits on when court cases can be brought are statutory in nature. However, there are also examples of these statutes being adjusted in situations where

- define the remedies that a court might grant in a climate litigation case, including how damages might be apportioned between defendants;¹⁸⁸
- provide for reciprocal enforcement of climate-related judgments from countries that have similar climate compensation legislation.¹⁸⁹

In 2015, the Vanuatu Environmental Law Association and West Coast Environmental Law released a report outlining what a climate compensation act might look like.¹⁹⁰ The report provides a model act with commentary, setting out a legal basis for common law claims by a variety of actors, including individuals, against major greenhouse gas emitting companies.¹⁹¹

C. *The Potential for Climate Compensation Acts*

While there are no examples to date of a comprehensive legal scheme aimed at addressing climate change liability, there is current and proposed legislation that addresses the civil liability of private corporations for climate change-related losses.

Israel's environmental laws include an early example of a statutory regime that directly addresses civil liability and injunctive relief related to climate change. Since 2008, these laws have allowed a person who may be injured by "material whose presence in the air causes or may cause . . . climate or weather change" to apply to a court for an injunction.¹⁹² Two more recent examples—originating in California and Kenya—

the time-delay is significant. *See, e.g.*, Acts Amendment (Asbestos Related Diseases) 1983, (WA) s 4 (Austl.), amending Limitations Act 1935–1978 (WA) s 38 (Austl.).

188. *See, e.g.*, Canadian Environmental Protection Act, S.C. 1999, c. 33 §§ 39–40 (Can.).

189. Some countries or jurisdictions have legislation setting out rules for the enforcement of court orders from other countries, including designating the orders of particular jurisdictions as generally enforceable. *See, e.g.*, Foreign Judgments (Reciprocal Enforcement) Act 1933, 23 Geo. 5 c. 13 (Eng.).

190. GAGE, *supra* note 124.

191. GAGE, *supra* note 124.

192. I. Rosen-Zvi, *Israel*, in CLIMATE CHANGE LIABILITY, *supra* note 16, at 294 (describing the effect of the Abatement of Environmental Nuisances (Civil Action) Act and the Abatement of Environmental Nuisances Act, 1961 as amended by the Clean Air Act, 2008). *Id.* at 294 (suggesting that claims for damages related to such an injunction might be brought under the Class Action Act).

suggest a new interest in legislation aimed at holding large-scale industrial actors accountable for their contributions to climate change.¹⁹³

Starting in the United States, the Climate Science Truth and Accountability Act is, at the time of writing, being debated in the California Senate. The Climate Science Truth and Accountability Act arises out of revelations that Exxon and other fossil fuel companies knew, possibly as early as the 1960s, that fossil fuels were disrupting the global atmosphere, and yet the companies spread and funded misinformation campaigns, apparently to stifle public action on climate change. As a result of these revelations, several state attorneys generals have launched investigations into Exxon, with consideration of possible proceedings under anti-trust laws. In California, the Climate Science Truth and Accountability Act amends the state's limitation laws to prevent a fossil fuel giant from claiming that any such proceedings are statute barred. While not aimed at compensation for climate damages, the Act represents a precedent for amending legislation to hold fossil fuel companies accountable for climate-related activities that are now viewed as tortious.

Kenya's Climate Change Act (2014) is a comprehensive climate change statute, which became law in May 2016.¹⁹⁴ Section 23 of the Act includes an important provision setting out rules for civil liability and compensation for actions related to climate change:

- (1) A person may, pursuant to Article 70 of the Constitution, apply to the Environment and Land Court alleging that a person has acted in a manner that has or is likely to adversely affect efforts towards mitigation and adaptation to the effects of

193. Singapore's Transboundary Haze Pollution Act of 2014 is not included in this list because it tackles regional transnational impacts of air pollution; however, it still represents an important recent example of national liability rules being modified to address transnational pollution impacts. Transboundary Haze Pollution Act (Act No. 24/2014) (Sing.). The Act creates a duty of entities to avoid contributing to the "haze pollution in Singapore," and makes a breach of that duty "actionable conduct at the suit of any person in Singapore" who has suffered personal injury, property loss, or economic loss as a result of the breach. *Id.* § 6. The Act also creates various presumptions that would assist the plaintiff in such litigation. *Id.* § 8.

194. David Njagi, *At Last, Kenya Signs Bill Into Climate Change*, PAN-AFRICAN MEDIA ALLIANCE FOR CLIMATE CHANGE (May 6, 2016), <http://pamaccfrica.blogspot.ca/2016/05/finally-kenya-hassigns-bill-into.html>.

climate change.

- (2) Where an application is made under sub-section (1), the Court may make an order or give directions that it considers appropriate to—
 - (a) prevent, stop or discontinue an act or omission that is harmful to the environment;
 - (b) compel a public officer to take measures to prevent or discontinue an act or omission that is harmful to the environment; or
 - (c) provide compensation to a victim of a violation relating to climate change duties.
- (3) For the purposes of this section, an applicant does not have to demonstrate that a person has incurred loss or suffered injury.¹⁹⁵

The Kenyan Climate Change Act represents the best example of a statute addressing climate compensation since the amendments to Israeli rules for injunctive relief in 2008. It is worth noting that Kenya, even prior to this new law, had been identified by Environmental Law Alliance Worldwide as a jurisdiction in which there were legal bases for climate damages claims.¹⁹⁶ Also, Kenya's new Act is reportedly the first climate change law enacted in an African country,¹⁹⁷ suggesting that the Act could be used by other African countries as a model.

A joint agreement, "People's Declaration for Climate Justice," signed by six island nations in 2015, expresses the desire of countries suffering from climate change to hold accountable those seen as responsible for climate damages. This agreement includes a sentiment that may give rise to climate compensation statutes in the coming years:

We are from island states in shared oceans. We stand in solidarity.

We commit to holding those most responsible for climate change accountable. By doing so, we send a message of hope that the people and not the polluters are in charge of humanity's destiny.

We commit to bring a case that would investigate the

195. Climate Change Act, No. 11 (2016) THE LAWS OF KENYA, Part IV § 23 (Kenya), <http://www.kenyalaw.org/lex//actview.xql?actid=No.%2011%20of%202016>.

196. ENVTL. LAW ALL. WORLDWIDE, *supra* note 138.

197. Njagi, *supra* note 194.

human rights implications of climate change and hold the big carbon polluters accountable to appropriate international bodies or processes.¹⁹⁸

If enacted, climate compensation legislation would have the potential to significantly impact litigation among domestic parties within the enacting states, as well as the potential to significantly impact transnational litigation. In the context of transnational litigation, foreign climate compensation acts might be applied in—and greatly facilitate—cases brought in a foreign court involving a foreign plaintiff and a U.S. greenhouse gas producer. The plaintiff could then seek to have any resulting judgment recognized and enforced in the United States or any other country where the defendant has assets. As is discussed in Section V, these potential outcomes could have significant implications for U.S. greenhouse gas producers.

V. QUANTIFYING THE LIABILITY RISK OF U.S. GREENHOUSE GAS PRODUCERS

Should one or both of the potentialities regarding transnational litigation and legislation alter the rules around litigation and liability, the liability of U.S. greenhouse gas producers could be staggering. For the sake of illustration, this Section draws upon research by Richard Heede, quantifying the contribution of ninety entities to historic greenhouse gas emissions, and considers the potential liability of five oil, gas, and coal companies currently trading on the New York Stock Exchange: Chevron, ExxonMobil, Conoco Phillips, Peabody Energy, and Consol Energy.¹⁹⁹

A. *Methodology*

Heede's study quantifies the relative contribution of major fossil fuel companies to global greenhouse gas emissions and provides a starting point for estimating the potential liability of U.S. companies for the costs and damages of climate change,

198. *People's Declaration for Climate Justice*, GREENPEACE (June 8, 2015) (Phil.), <http://www.greenpeace.org/international/Global/international/briefings/climate/2015/People%E2%80%99s%20Declaration%20for%20Climate%20Justice.pdf>.

199. Fossil fuel producers, such as these companies, are attractive targets for climate change lawsuits as they are “upstream defendants”: companies responsible not only for their own emissions, but also for the emissions resulting from the proper use of their products. *See* Zasloff, *supra* note 9, at 1861–63.

both globally and in specific countries.²⁰⁰ Heede's figures include estimates of both direct emissions (those created by the company and its subsidiaries) and "downstream" emissions (those produced by the oil, gas or coal when it is burned).²⁰¹ The aforementioned U.S. oil, gas, and coal companies represent the top five U.S. greenhouse gas producing companies on Heede's list of "carbon majors" (and all five are among the top ten investor-owned greenhouse gas producers worldwide).²⁰²

To reach the liability figures below, each U.S. company's percentage of global emissions from 1751 to 2010 was multiplied by the costs and damages of climate change as provided in the 2012 Climate Vulnerability Forum/DARA Report (DARA Report) funded by UNICEF, among others.²⁰³ This report focuses on the socio-economic impact of global emissions on individual nations, differentiating between the costs and damages caused by climate change²⁰⁴ and the direct

200. Heede, *supra* note 86, at 229. See Richard Heede, *Supplementary Materials: Tracing Anthropogenic Carbon Dioxide and Methane Emissions to Fossil Fuel and Cement Producers, 1854–2010*, 6–9, <http://www.climateaccountability.org/pdf/Heede%20SupplementaryMaterials%20Nov13.pdf>. The *Supplementary Materials* to Heede's study divide the carbon majors into investor-owned companies, state-owned companies, and nation states. As this Article focuses on the potential liability of greenhouse gas producing companies, it concentrates on Heede's list of investor-owned "carbon majors," which together represent 21.7 percent of global emissions from 1751 to 2010. As examined in this Section, the top five US greenhouse gas producing companies all fall within Heede's top ten investor-owned carbon majors and cumulatively represent 9.4 percent of global emissions from 1751 to 2010. *Id.*

201. This raises questions about the relative legal responsibility of companies that extract, process, and market fossil fuels relative to the end-user. However, case law concerning MTBE fuel additives, tobacco, and other products demonstrates that courts can and will find manufacturers of products that cause harm liable for the anticipated use of their products. See *e.g.*, *R.J. Reynolds Tobacco Co. v. Engle*, 672 So. 2d 39 (Fla. Dist. Ct. App. 1996); *R.J. Reynolds Tobacco Co. v. Engle*, 122 F. Supp. 2d 1355 (S.D. Fla. 2000); *Engle v. Liggett Group, Inc.*, 945 So.2d 1246 (Fla. 2006).

202. Heede, *supra* note 86. "Carbon majors" refer to the ninety entities responsible for 63 percent of total greenhouse gas emissions to date. These U.S. companies are typical of others on Heede's list of carbon majors in that their greenhouse gas production began early in the 1900s, well before the impact of greenhouse gases on climate change became well-established. This could suggest that the U.S. companies' respective share of global emissions from 1990 to present—and consequent liability—may be slightly lower than identified in Heede's study.

203. CLIMATE VULNERABLE FORUM & DARA, *supra* note 3.

204. The estimate for "climate change" encompasses the costs and damages associated with a global rise in temperature. Examples of the types of costs and damages of climate change considered in the DARA Report include, but are not limited to: hunger;

costs caused by the current “carbon economy.”²⁰⁵

The liability figures do not include the costs and damages caused by U.S. companies’ contribution to the carbon economy because these effects are largely localized. That is, unlike climate impacts, where a U.S. contribution is proportionately responsible for damage in other countries, the bulk of costs and damages caused by U.S. companies through the carbon economy will be borne in and by the United States.²⁰⁶

B. Global Liability of U.S. Greenhouse Gas Producers

The DARA Report estimates the total costs and damages of climate change *and* the carbon economy in 2010 as \$1.2 trillion, or 1.7 percent of global GDP, rising to 3.2 percent of global GDP by 2030.²⁰⁷ Using the information provided in the report, the total annual costs and damages of climate change *alone* in 2010 were nearly \$700 billion.²⁰⁸ The figures in *Table 1* below represent the annual contribution of the top five U.S. greenhouse gas emitting producers to the global costs and

melting permafrost; drought, floods and landslides; loss of biodiversity and rising sea levels; malaria and other vector borne diseases; and stresses on fishing, forestry, tourism, and other industries. See CLIMATE VULNERABLE FORUM & DARA, *supra* note 3, at 63.

205. The estimate for the “carbon economy” focuses on the localized costs and damages arising from the production and use of fossil fuels. The DARA Report considers examples of the types of costs and damages of the carbon economy, including but not limited to: costs and damages caused by oil extraction and oil spills, increased risk of health issues associated with air pollution, and stresses on industries. See *id.*

206. Excluding the costs and damages of the carbon economy may result in conservative liability estimates, as they include only one aspect of the damages and costs caused by the U.S. companies.

207. CLIMATE VULNERABLE FORUM & DARA, *supra* note 3, at 17.

208. See CLIMATE VULNERABLE FORUM & DARA, *supra* note 3, at 17. While the *Executive Summary* does not provide a number for global GDP in 2010, it is possible to estimate the global GDP as \$70.6 trillion using the numbers provided (where 1.7 percent of global GDP is \$1.2 trillion, global GDP is \$1.2 trillion divided by 1.7 percent or 0.017). *Id.* Accordingly, it is possible to estimate the 2010 costs and damages of climate change alone (*i.e.* excluding costs from the carbon economy) as \$705.8 billion (where the costs and damages of climate change are an estimated 1.0 percent of GDP, climate change costs and damages is global GDP multiplied by 0.01). *Id.* This estimate of \$705.8 billion is higher than the estimate of \$609.0 billion, reached by totaling the individual costs and damages of each climate vulnerability indicator. *Id.* at 23. Note also that the original global GDP in 2010 estimate of \$70.6 trillion, derived from the numbers presented in the *Executive Summary*, is greater than the global GDP 2010 estimate by the World Bank of \$63.0 trillion. World Development Indicators Database, *Gross Domestic Product 2010*, WORLD BANK 4 (Jul. 1, 2011), <http://siteresources.worldbank.org/DATASTATISTICS/Resources/GDP.pdf>.

damages of climate change alone in 2010 and by 2030.²⁰⁹

Table 1²¹⁰

GLOBAL LIABILITY OF U.S. COMPANIES				
Entity	Percentage of Global Emissions 1751–2010	Market Capitalization (2010 in 2010 U.S. Dollars)²¹¹	Annual contribution to the costs and damages of climate change (2010 in 2010 U.S. Dollars)	Annual contribution to the costs and damages of climate change (2030 in 2010 U.S. Dollars)
Chevron	3.52%	\$183.6 billion	\$21.4 billion	\$151.5 billion
Exxon Mobil	3.22%	\$368.7 billion	\$19.6 billion	\$138.6 billion
Conoco Phillips	1.16%	\$100.1 billion	\$7.1 billion	\$49.9 billion
Peabody Energy	0.86%	-	\$5.2 billion	\$37.0 billion
Consol Energy	0.63%	-	\$3.8 billion	\$27.1 billion

C. Liability of U.S. Greenhouse Gas Producers in Developing Countries

While the global liability of U.S. companies is significant, recovery for the costs and damages of climate change through litigation or legislation will develop in individual countries—likely by those expected to suffer most from the impacts of climate change, but receive little benefit from fossil fuels. Vietnam, Ghana, and India fall into this category, as they are

209. *I.e.*, excluding costs from the carbon economy. Each company's "Percentage of Global Emissions 1751–2010" is taken from Heede, *supra* note 86, at 229.

210. *See* Section V.A., "Methodology" (describing the methodology used to reach these calculations).

211. Note that the market capitalization of each company in 2010 is included to illustrate how significant liability is relative to capitalization. The liability estimates relative to capitalization would conceivably be even greater if growth of these companies were to slow, as it becomes clear that some of the proven reserves of the companies cannot be gainfully exploited.

historically considered to be “low emitters” in “acute” or “severe” danger of significant losses from climate change.²¹² The figures in *Table 2* below represent the contribution of the top five U.S. greenhouse gas producers to the costs and damages of climate change in these developing countries.²¹³

1. *Vietnam*

The DARA Report estimates the net costs and damages caused by climate change in Vietnam in 2010 as approximately \$14.2 billion,²¹⁴ rising to \$160.6 billion by 2030.²¹⁵ As *Table 2* illustrates, the top five U.S. greenhouse gas producers contributed approximately \$1.3 billion to these costs and damages in 2010, and are expected to contribute \$15.1 billion per year by 2030.

2. *Ghana*

The DARA Report estimates the net costs and damages caused by climate change in Ghana in 2010 as approximately \$2.7 billion,²¹⁶ rising to \$20.5 billion by 2030.²¹⁷ As indicated in

212. CLIMATE VULNERABLE FORUM & DARA, *supra* note 3, at 294–96.

213. While the DARA Report estimates the costs of climate change for each country in terms of a percentage of GDP, it does not provide a dollar value of the losses in one location. For the purposes of this report, country specific net costs are calculated by totaling the costs for the country for each indicator assessed by the DARA Report. Provided in the following footnotes are comparisons of the numbers achieved by totaling the costs for the country for each indicator, and the numbers reached by multiplying the costs of climate change as a percentage of GDP by actual GDP in 2010 and projected GDP in 2030. CLIMATE VULNERABLE FORUM & DARA, *supra* note 3, at 294–96.

214. *Supra* note 3, at 58 n.212 (discussing the formula for this calculation). According to the Climate Vulnerable Forum, the losses for Vietnam are estimated as 5.2 percent of Vietnam’s GDP in 2010. *Id.* at 296. The GDP for Vietnam in 2010 is estimated as \$280 billion 2010 PPP (purchasing power parity is an economic concept used to determine the relative value of currency across countries). *Id.* at 219. Using these numbers, the estimated costs and damages of climate change were \$14.6 billion in 2010 (which is slightly more than achieved by adding the various DARA Report indicators for Vietnam).

215. According to the Climate Vulnerable Forum, the losses for Vietnam are estimated as 10.7 percent of Vietnam’s GDP in 2030. CLIMATE VULNERABLE FORUM & DARA, *supra* note 3, at 296. The GDP for Vietnam in 2030 is estimated as \$1.5 trillion 2030 PPP. *Id.* at 219. Using these numbers, the estimated costs and damages of climate change would be \$160.5 billion in 2030 (which is significantly more than that achieved by adding the various DARA Report indicators for Vietnam).

216. *Supra* note 3, at 58 n.212 (discussing the formula for this calculation). According to the Climate Vulnerable Forum, the losses for Ghana are estimated as 4.4

Table 2, the contribution of the top five U.S. greenhouse gas producers to the costs and damages of climate change totaled \$255.5 million in 2010, with this number projected to increase to \$1.9 billion per year by 2030.

3. *India*

It is particularly relevant to examine the contribution of U.S. companies to the costs and damages of climate change in India, given the nation's potentially favorable judicial environment for climate change litigation.²¹⁸ The DARA Report estimates the net costs and damages caused by climate change in India in 2010 as approximately \$76.5 billion,²¹⁹ rising to \$613.6 billion by 2030.²²⁰ As shown in *Table 2*, the top five U.S. greenhouse gas producers contributed approximately \$7.2 billion to these costs and damages in 2010, and are expected to contribute \$57.6 billion per year by 2030.

percent of Ghana's GDP in 2010. CLIMATE VULNERABLE FORUM & DARA, *supra* note 3, at 296. The GDP for Ghana in 2010 is estimated as \$65 billion 2010 PPP. *Id.* at 207. Using these numbers, the estimated costs and damages of climate change were \$2.7 billion in 2010 (which matches the estimated loss achieved by adding the various climate vulnerability monitor indicators for Ghana).

217. *Supra* note 3, at 58 n. 212 (discussing the formula for this calculation). According to the Climate Vulnerable Forum, the losses for Ghana are estimated as 8.9 percent of Ghana's GDP in 2030. *Id.* at 296. The GDP for Ghana in 2030 is estimated as \$210 billion 2030 PPP. *Id.* at 207. Using these numbers, the estimated costs and damages of climate change would be \$18.7 billion in 2030 (which is slightly higher than that achieved by adding the various climate vulnerability monitor indicators for Ghana).

218. Some have singled out India as being a promising venue for climate damages litigation due to the "potentially potent combination of the following: (i) well developed law and activist judiciary; (ii) its status as a potentially serious 'victim' of climate change; and (iii) at the same time its large population, economic power and growth rate, and status as a 'top ten' (in cumulative terms) GHG emitter." See CLIMATE CHANGE LIABILITY, *supra* note 16, at 48.

219. *Supra* note 3, at 58 n.212 (discussing the formula for this calculation). According to the Climate Vulnerable Forum, the losses for India are estimated as 2.2 percent of India's GDP in 2010. *Id.* at 294. The DARA Report does not provide an estimated GDP for India in 2010.

220. *Supra* note 3, at 58 n.212 (discussing the formula for this calculation). According to the Climate Vulnerable Forum, the losses for India are estimated as 4.3 percent of India's GDP in 2030. *Id.* at 294. The DARA Report does not provide a projected GDP for India in 2030.

Table 2

LIABILITY OF U.S. COMPANIES IN DEVELOPING COUNTRIES			
VIETNAM			
Entity	Percentage of Global Emissions 1751-2010	Annual contribution to the costs and damages of climate change (2010 in 2010 U.S. Dollars)	Annual contribution to the costs and damages of climate change (2030 in 2010 U.S. Dollars)
Chevron	3.52%	\$501.5 million	\$5.7 billion
Exxon Mobil	3.22%	\$458.7 million	\$5.2 billion
Conoco Phillips	1.16%	\$165.3 million	\$1.9 billion
Peabody Energy	0.86%	\$122.5 million	\$1.4 billion
Consol Energy	0.63%	\$89.7 million	\$1.0 billion
GHANA			
Entity	Percentage of Global Emissions 1751-2010	Annual contribution to the costs and damages of climate change (2010 in 2010 U.S. Dollars)	Annual contribution to the costs and damages of climate change (2030 in 2010 U.S. Dollars)
Chevron	3.52%	\$95.8 million	\$720.0 million
Exxon Mobil	3.22%	\$87.6 million	\$658.7 million
Conoco Phillips	1.16%	\$31.6 million	\$237.3 million
Peabody Energy	0.86%	\$23.4 million	\$175.9 million
Consol Energy	0.63%	\$17.1 million	\$128.9 million

INDIA			
Entity	Percentage of Global Emissions 1751–2010	Annual contribution to the costs and damages of climate change (2010 in 2010 U.S. Dollars)	Annual contribution to the costs and damages of climate change (2030 in 2010 U.S. Dollars)
Chevron	3.52%	\$2.7 billion	\$21.6 billion
Exxon Mobil	3.22%	\$2.5 billion	\$19.8 billion
Conoco Phillips	1.16%	\$887.1 million	\$7.1 billion
Peabody Energy	0.86%	\$657.6 million	\$5.3 billion
Consol Energy	0.63%	\$481.8 million	\$3.9 billion

These figures represent the total contribution of U.S. companies to climate change damages, globally and in specific countries, and therefore the *risk*, not *certainty*, of liability; the actual numbers could be lower or, conceivably, higher.

Even if courts around the world become increasingly willing to award climate damages against fossil fuel companies, there may be situations that prevent full recovery.²²¹ The only way that awards based purely on damages could even approach these estimates would be if it became commonplace for governments to bring suits for all climate damages suffered by their citizens and their country (encompassing a wide range of the climate damages).²²²

221. For example, if the link between a company's greenhouse gas emissions and climate damages cannot be proven on the basis of a balance of probabilities, or where a plaintiff is not in a position to engage in large-scale tort litigation, then there may not be (full) recovery.

222. This type of litigation, known as *parens patriae* litigation, in which the government acts in the role of a parent on behalf of the public, is well established in the United States. See *Massachusetts v. Environmental Protection Agency*, 549 U.S. 497, 518–28 (2007) (recognizing the ability of states as *parens patriae* to protect natural resources or the health of citizens). The emergence of class actions for climate damages might also represent a significant percentage of the damages discussed, but would probably not include environmental and other public damages which could be better captured in a *parens patriae* case.

On the other hand, the calculations above do not reflect the possibility of punitive awards, which is in addition to damages for actual harm suffered, and intended to punish egregious behavior. Such awards might be possible where companies make little effort to move away from fossil fuels despite full knowledge of the damage they cause, or where companies actively undercut science establishing the connection between emissions and climate change.²²³

Subject to these qualifications, this Article is a first attempt at quantifying the considerable liabilities that at least five U.S. companies might be incurring. Investors may wish to note that the current stock valuations of Chevron, Exxon Mobil, Conoco Phillips, Peabody Energy, and Consol Energy Inc., as well as other companies responsible for high levels of greenhouse gas production, do not take into account this risk of climate damages litigation.

VI. CONCLUSION

This Article opened with a quotation by Bank of England Governor Mark Carney, describing climate change as a “Tragedy of the Horizon” that is bound to become a “defining issue for [global] financial stability” in the coming decades.²²⁴ While Carney identifies multiple channels through which climate change will impact financial stability, the focus of this Article has been the second: the liability risks presented by climate damages litigation.

Two previously overlooked potentialities—the emergence of

223. *The Guardian* recently reported that ExxonMobil was aware of the connection between greenhouse gas emissions and climate change as early as 1981. See Suzanne Goldenberg, *Exxon Knew of Climate Change in 1981, Email Says – but it Funded Deniers for 27 More Years*, THE GUARDIAN, (Jul. 8, 2015), <http://www.theguardian.com/environment/2015/jul/08/exxon-climate-change-1981-climate-denier-funding>. According to Greenpeace, ExxonMobil has since spent over \$30 million on think-tanks and research promoting climate change denial. *Id.* In Canada, a Quebec superior court recently ordered three major cigarette companies to pay \$15 billion to smokers, with the plaintiffs arguing that the companies were aware of the health concerns and profited from the addictive quality of cigarettes. See *Létourneau v. JTI-MacDonald Corp.*, 2015 QCCS 2382, 10 J.E. 2015-1024 (Can.). For a discussion of the parallels between potential legislation altering the liability rules around climate change and those around tobacco legislation in Canada (such as those found in Quebec), see GAGE, *supra* note 124 and see GAGE & BYERS, *supra* note 138 at 34–37. Note also that the figures do not reflect the considerable legal costs that would be incurred by companies defending themselves against such lawsuits.

224. Carney, *supra* note 1, at 1.

transnational climate damages litigation, including the possible enforcement of foreign judgments in U.S. courts; and the enactment of climate compensation legislation—have the ability to shift the current climate damages litigation landscape well within the decades forecasted by Carney.

Section V of this Article calculates the substantial “climate liabilities” held by the top five U.S. greenhouse gas producers, if and when parties who have suffered climate damages succeed in recovering compensation. The liability of the top global greenhouse gas producers would be staggering, with far reaching consequences for their corporate survival. Investors will wish to inform themselves of these risks; money managers, for their part, have a legal duty to do so.²²⁵

225. See Christina Ross, Evan Mills & Sean B. Hecht, *Limiting Liability in the Greenhouse: Insurance Risk-Management Strategies in the Context of Global Climate Change*, 26A STAN. ENVTL. L.J. & STAN. J. INT'L L. 251, 271 (2007) (“Failing to take into account climate change through fund risk management practices could be deemed a breach of fiduciary duty. Furthermore, if the investment goals of the pension plan (or foundation or charitable trust) include environmental health or sustainability criteria, the fiduciaries must make certain that their investment-related decisions further environmental health or sustainability”).