ARTICLES

Climate Prevention

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ABSTRACT

Climate change is rightfully perceived as today's leading global policy challenge. The obligation to prevent transboundary environmental harm has taken center stage in the legal fight to curb climate change. In this Article, I argue that the traditional understanding of prevention premised in a tort-based idea of wrongfulness faces an insurmountable impasse in addressing climate change. States do not have a tort-based duty to prevent climate change because it is not wrongful to emit greenhouse gases. A tort-based duty to the contrary would fly in the face of settled climate law. Such a tort-based duty also cannot otherwise be created out of general environmental law principles. If prevention is to be relevant to climate change at all, we must switch perspectives.

I argue that it is possible to re-theorize climate prevention on the basis of neighborliness, or holding correlative rights in a shared climate community. I argue that such a correlative rights approach to climate prevention is both more ambitious and more pragmatic than the traditional tort-based understanding of prevention. This conception of climate prevention is more ambitious because it requires the affirmative joint conservation of climate systems as opposed to imposing a negative duty to only prevent doing harm individually. At the same time, this conception of climate prevention is more pragmatic by eschewing a categorical ban on fossil fuels and allowing states to rely on a hybrid approach to energy transition that combines all available means to decarbonize energy systems in light of national circumstances (for example, increasing non-fossil fuel penetration and supporting carbon capture). I submit that climate prevention so conceived can guide decision-making around four reasonable-use factors (substantive, procedural, functional, and financial). These reasonable-use factors give pride of place to the concept of sustainable development as it is applied to the global climate and energy community.

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INTRODUCTION

Climate change is no longer a theoretical concern for future generations. July 2023 jumped "to 1.12˚C above the twentieth century average."[1] States and people around the world are experiencing the first symptoms of life under a changing climate. Sea-level rise and coastal erosion threaten the existence of states and deprive indigenous communities of their homes from Vanuatu to Louisiana.[2] Droughts shake the foundations of energy planning in such different places as nuclear-reliant France, and hydro-reliant Brazil, Ecuador, and Norway.[3] Extreme

1. Jeff Masters, *July 2023: Earth's Hottest Month on Record*, YALE CLIMATE CONNECTIONS (Aug. 14, 2023), https://perma.cc/Z4MJ-RQ7K.

2. Press Release, United Nations, Climate Change-induced Sea-Level Rise Direct Threat to Millions around World, Secretary-General Tells Security Council, U.N. Press Release UNSC/15199 (Feb. 14, 2023), https://perma.cc/F4XS-UJGS.

3. Tom Wheeldon, *How France's Prized Nuclear Sector Stalled in Europe's Hour of Need*, FRANCE24 (Jan. 5, 2023), https://perma.cc/JR5W-RBEX; *Norway Boosts Hydropower, Challenging Effort to Fill Reservoirs*, REUTERS (Aug. 17, 2022), https://perma.cc/LSD6-335U; *Ecuador Has Continued to Expand Use of Hydroelectric Power*, ENERGY INFO. ADMIN. (Sept. 21, 2023), https://perma.cc/EX5E-Y8JN; *Hydropower Made Up 66% of Brazil's Electricity Generation in 2020*, ENERGY INFO. ADMIN. (Sept. 7, 2021), https://perma.cc/6SSC-B4LH.

temperatures have made major metropolitan areas nearly unlivable.[4]

It is thus unsurprising that the international environmental principle of harm prevention has a near Pavlovian ring for every lawyer seriously dealing with energy transition.[5] Climate change is manmade: We emit greenhouse gases by burning fossil fuels.[6] Intuitively, if we cause something, we should also be able to prevent it.[7] Given the catastrophic loss of life and livelihoods around the world that climate change will cause, the moral pull is clear: it appears wrong to burn fossil fuels. We must stop.[8] This, situation on its face looks tailormade for the principle of "prevention" in international environmental law.[9]

The leap from the alleged wrongfulness of emissions to an obligation to prevent emissions is inviting because the dominant approach to harm prevention in international environmental law treats transboundary harm as a kind of tort.[10] One of the paradigmatic international environmental law prevention cases is the *Trail Smelter* arbitration.[11] In *Trail Smelter*, the U.S. brought a claim against Canada due to the noxious effects of sulfur dioxide gases emitted in Canada that crossed the border into Washington state, though the smokestacks were raised to direct emissions away from the population in the immediate vicinity. *Trail Smelter* stands for the proposition that a state must not harm its neighbor by allowing gases emitted on its territory to cause pollution abroad; depending on one's perspective, such emissions would work as a trespass or be the result of actionable negligence.[12]

The problem is that greenhouse gas emissions are not like sulfur dioxide emissions: I do not "dump" greenhouse gases and cause a problem for you rather than for me.[13] Instead, I harm everyone with my emissions no matter where they end

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4. Somini Sengupta, *An Extraordinary Heat Wave Exposes the Limits of Protecting People*, N.Y. TIMES (May 27, 2022), https://perma.cc/XU7M-VZMW.

5. Maria Liana Vodita, *The Growing Relevance of the Paris Agreement's 1.5˚C Temperature Goal in the Light of International Human Rights Law and Climate Change Litigation*, OPINIO JURIS (Nov. 23, 2023), https://perma.cc/WN95-Y3PJ; Malgosia Fitzmaurice, *A Few Reflections on State Responsibility or Liability for Environmental Harm*, EUR. J. INT'L L: TALK! (Mar. 8, 2023), https://perma.cc/7ZZB-7PDM; *see also* Rosemary Mwanza, *The Right to a Healthy Environment as a Catalyst for the Codification of the Crime of Ecocide*, 117 AM. J. INT'L L. UNBOUND 189, 189 (2023).

6. INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2023 SYNTHESIS REPORT 43 (H. Lee & J. Romero eds., 2023) [hereinafter IPCC 2023], https://perma.cc/T5BD-H3KT.

7. *See* Damian Gayle, *Greta Thunberg Arrested at London Oil Summit Protest*, THE GUARDIAN (Oct. 17, 2023), https://perma.cc/7Z7J-E8DJ (reporting on the moralistic tone of the protests).

8. *See generally* STEPHEN M. GARDINER, A PERFECT MORAL STORM: THE ETHICAL TRAGEDY OF CLIMATE CHANGE (2011).

9. *See* PHILIPPE SANDS & JACQUELINE PEEL, PRINCIPLES OF INTERNATIONAL ENVIRONMENTAL LAW 211–13 (4th ed. 2018); U.N. Conference of the Parties Serving as the Meeting of the Parties to the Paris Agreement, Outcome of the First Global Stocktake, U.N. Doc. FCCC/PA/CMA/2023/L.17 ¶¶ 4, 9 (2023) [hereinafter Stocktake], https://perma.cc/DG5K-NFA6.

10. EDITH BROWN WEISS, ESTABLISHING NORMS IN A KALEIDOSCOPIC WORLD 212–13 (2020).

11. *See* Trail Smelter (U.S. v. Can.), III U.N. Rep. Int'l Arb. Awards 1905, 1920 (1938).

12. *See id*.

13. *See id*.

up accumulating.[14] This means that it is the act of emitting rather than the place where the emissions physically end up that would be wrongful. This creates a "property line" problem because states are sovereign equals with the right to determine their own economic system and use of natural resources.[15] That climate change is not like transferring harmful substances across international boundaries creates significant—and, I argue, insurmountable—problems, for a tort-based understanding of international climate wrongs in a world that also prizes sovereign equality and permanent sovereignty over natural resources.

Greenhouse gases are different from sulfur dioxide in yet another way: Sulfur dioxide has immediate noxious effects.[16] Greenhouse gases, on the other hand, are only dangerous because there are already more of them in the atmosphere than the climate can bear.[17] This creates a "water glass" problem: Greenhouse gas emissions are like filling a water glass with a pipette, where the last drop of water will cause the glass to overflow. But dropping the last drop is not inherently more wrongful than dropping the first drop. Adding to the water glass is only problematic because others have already added to it before. As we will see, the initial "drop of water"—the first CO_2 emissions—were not wrongful in any appreciable way.[18] Further, the reason for the first emissions and for current emissions are exactly the same: to jumpstart and drive development.[19] This creates similarly insurmountable difficulties for characterizing greenhouse gas emissions today as "wrongful" in a delictual sense.

My argument is that we need to be both more ambitious and more pragmatic in developing international legal climate prevention obligations. That a tort-based understanding of prevention in international law leads to insurmountable problems in the climate context does not mean that prevention obligations are inapposite to climate change.[20] Such a conclusion would have international lawyers argue that frogs should enjoy their bath when they find themselves about to be cooked in a pot with gradually heated water.

I develop a more ambitious understanding of climate prevention by reinvigorating an alternative account of how the idea of prevention came to be in international environmental law. This alternative account is rooted in neighborliness,

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14. *See* IPCC 2023, *supra* note 6, at 43.

15. G.A. Res. 2625 (XXV), Declaration on Principles of International Law Concerning Friendly Relations and Co-operation Among States in Accordance with the Charter of the United Nations (Oct. 24, 1970) [hereinafter Friendly Relations Declaration]; G.A. Res. 3171 (XXVIII), Permanent Sovereignty Over Natural Resources (Dec. 17, 1973) [hereinafter Permanent Sovereignty Declaration).

16. *Trail Smelter*, III U.N. Rep. Int'l Arb. Awards at 1920.

17. *See* IPCC 2023, *supra* note 6, at 43.

18. *See* T.O. Elias, *The Doctrine of Inter-Temporal Law,* 74 AM. J. INT'L L. 285, 286 (1980).

19. *See* PHILIPPE AGHION ET AL., THE POWER OF CREATIVE DESTRUCTION, ECONOMIC UPHEAVAL AND THE WEALTH OF NATIONS 20–38 (2021) (discussing the factors that led to global economic takeoff during the industrial revolution); HAROLD JAMES, SEVEN CRASHES: THE ECONOMIC CRISES THAT SHAPED GLOBALIZATION 37, 53 (2023).

20. *See* Alexander Zahar, *The Nature of Climate Law*, 35 J. ENV'T L. 295, 297–98 (2023).

correlative rights, and property law rather than tort law.[21] It has since been dismissed as insufficiently attuned to environmental concerns.[22] As I will argue, it was dismissed too easily, as a correlative rights perspective can facilitate climate conservation results that a torts perspective could not achieve.

The correlative rights perspective submits that when property holders (including sovereigns) find themselves in a property community, they have correlative rights in the resource community.[23] These correlative rights limit property holders to make reasonable use of their property entitlement.[24] Reasonable use *substantively* requires correlative rightsholders to protect and conserve the resource community as a whole against waste and collapse.[25] It *procedurally* requires that each rightsholder act diligently to prevent waste.[26] The *purpose* of reasonable use is to support sustainable property development that supports human wellbeing and human flourishing.[27] Finally, reasonable use requires all community members to make *fair contributions* to the costs of resource maintenance so that each resource community member has a fair opportunity to participate in the benefits of shared resource development.[28]

This perspective helps to overcome the problems we encounter when we see climate prevention purely through the lens of wrongfulness. We have to act to conserve the climate not because greenhouse gas emissions are wrongful, but because climate collapse would deprive us all of a shared resource we each need to thrive.[29] When we each do our part to this end, we have to be mindful of our remaining carbon budget.[30] We have to plan for how we are going to support development as we address the climate emergency.[31] Finally, we have to take a close look at who is in the best position to shoulder the initial costs of change and to ascertain that a new climate regime is in fact one in which all have a fair opportunity to participate in the new shared economic and energy regime sustaining the climate.[32]

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21. Günther Handl, *Territorial Sovereignty and the Problem of Transnational Pollution*, 69 AM. J. INT'L L. 50, 56 (1975). This approach has recently gained currency in the U.S. property law literature. *See* Rashmi Dyal-Chand, *Sharing the Climate*, 122 COLUM. L. REV. 581, 585 (2022).

22. JUTTA BRUNNÉE, PROCEDURE AND SUBSTANCE IN INTERNATIONAL ENVIRONMENTAL LAW 55 (2020).

23. CAROL ROSE, PROPERTY & PERSUASION: ESSAYS ON THE HISTORY, THEORY, AND RHETORIC OF OWNERSHIP 165–89 (1994).

24. Joseph Schremmer, *Pore Space Property*, 2021 UTAH L. REV. 1, 38–42 (2021).

25. Bruce M. Kramer & Owen L. Anderson, *The Rule of Capture - an Oil and Gas Perspective*, 35 ENV'T L. 899, 913–14 (2005).

26. Tara K. Righetti & Joseph A. Schremmer, *Waste and the Governance of Private and Public Property*, 93 U. COLO. L. REV. 609, 631 (2022).

27. Dyal-Chand, *supra* note 21, at 608.

28. Spur Indus., Inc. v. Del E. Webb Dev. Co., 494 P.2d 700, 705–08 (Ariz. 1972); David Gilo et al., *Negligence, Strict Liability, and Collective Action*, 42 J. LEGAL STUD. 69, 78–79 (2013).

29. *See* DAVID WALLACE-WELLS, THE UNINHABITABLE EARTH: LIFE AFTER WARMING (2020).

30. IPCC 2023, *supra* note 6, at 82.

31. ALESSIO TERZI, GROWTH FOR GOOD: RESHAPING CAPITALISM TO SAVE HUMANITY FROM CLIMATE CATASTROPHE 214–25 (2022).

32. WILLIAM D. NORDHAUS, THE SPIRIT OF GREEN 281–93 (2021). The proposals made by Nordhaus address distribution though they are somewhat blind to historical factors. *See* TIMOTHY MITCHELL, CARBON DEMOCRACY: POLITICAL POWER IN THE AGE OF OIL (2013).

As I will argue, this is precisely the perspective that underlies the Paris Agreement and the climate agreements reached at Glasgow and Dubai in the last three years.[33] The focus of the international community in Paris, Glasgow, and Dubai has been on supporting a just transition to a world that comes into balance at approximately 1.5˚C of warming above pre-industrial levels.[34] Climate prevention supports these efforts—not by forcing one-size-fits-all deeper decarbonization steps that states cannot feasibly take without sacrificing economic and social development,[35] but by aligning decarbonization steps with the shared obligation to support the right to development globally and making resources available through climate finance and investment in a globally fair low-greenhouse-gas-emissions and climate-resilient economy.[36] This approach is pragmatic and flexible rather than rigidly dogmatic.

This approach does not look to ban fossil fuels.[37] Such a move would be developmentally disastrous.[38] Instead, it looks to a hybrid path that combines increased reliance on fossil-fuel-free energy systems like renewable electricity and nuclear energy with decarbonization through carbon removal.[39] From a climate perspective, these hybrid pathways all achieve the same desired result: limiting greenhouse gases in the atmosphere.[40] But from a developmental perspective, it allows all states to take the steps that best fit their own national circumstances.[41]

It is also more pragmatic because it admits that a developmentally-conscious approach to decarbonization is likely to lead to overshoot scenarios that see global average temperatures exceed the 1.5˚C warming ceiling.[42] I will argue that such overshoots are permissible in principle so long as they are temporary. They are permissible only to the extent that the world community invests fully to allow

33. Paris Agreement Under the United Nations Framework Convention on Climate Change, U.N. Doc. FCCC/CP/2015/L.9/Rev.1 (Dec. 12, 2015) [hereinafter Paris Agreement]; Glasgow Climate Pact, Intergovernmental Panel on Climate Change, Nov. 13, 2021, https://perma.cc/S6G6-G4E9 [hereinafter Glasgow Climate Pact]; Stocktake, *supra* note 9.

34. *See* sources cited *supra* note 33.

35. *Id.*

36. *Id.*

37. Jochen von Bernstorff, *A Fossil Fuel Ban Treaty: Corrective Treaty-Making Beyond Consensus*, EUR. J. INT'L L.: TALK! (Dec. 15, 2023), https://perma.cc/R22B-KARW.

38. *See* Rudolf Bems et al., *Economic Consequences of Large Extraction Declines: Lessons for the Green Transition* 4 (Int'l Monetary Fund, Working Paper No. 2023/097, 2023), https://perma.cc/39PR-V9KC ("The main implication for policy makers is that the transition towards clean energy might be a challenge, especially for countries that rely on fossil fuel exports and are low to middle income."). This analysis does not account for the significant impacts all along the energy value chain. *See* MARGARITA BALMACEDA, RUSSIAN ENERGY CHAINS: THE REMAKING OF TECHNOPOLITICS FROM SIBERIA TO UKRAINE TO THE EUROPEAN UNION 5 (2021) (highlighting the deep interconnection between international energy value chains and the real economy).

39. FRÉDÉRIC G. SOURGENS & LEONARDO SEMPERTEGUI, PRINCIPLES OF INTERNATIONAL ENERGY TRANSITION LAW 15–18 (1st ed. 2023).

40. INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2023 SYNTHESIS REPORT SUMMARY FOR POLICYMAKERS 21 (H. Lee & J. Romero eds. 2023), https://perma.cc/7VEK-X9DL.

41. Stocktake, *supra* note 9, ¶¶ 6–7.

42. IPCC 2023, *supra* note 6, at 23.

the most vulnerable people and states to adapt to these climate conditions. This means protecting low-lying islands against the consequences of sea level rise. It also means providing adequate air conditioning to schools to allow children to learn even in difficult circumstances.[43] It requires a global hardening of infrastructure against increased climate risks from extreme weather.[44]

Climate prevention in international law thus provides a toolkit that can help decisionmakers make better climate and energy policy.[45] It does so only to the extent that we return to the original idea of prevention as a matter of neighborliness rather than as a matter of compliance or avoidance of wrongfulness. In this new frame, climate prevention becomes a tool for the fulfillment of basic human rights. It thus becomes more than just a means to reduce emissions. It becomes a means of understanding how we share environmental resources in an increasingly connected, innovative—and strained—world.

I have organized this Article in four parts. Part I introduces the idea of prevention of transboundary harm and its traditional link to ideas of wrongfulness and tort liability. Part II then explains how climate change differs from traditional transboundary harm problems in terms of the "property line" and the "water glass" problems. Part III argues that the tort-based understanding of prevention cannot solve either problem because there is no cognizable tort duty not to emit greenhouse gases. Part III will highlight that such a tort-based duty would fly in the face of all international climate agreements concluded to date, making an argument for such a duty fanciful in the extreme.

Part IV then develops the alternative approach to climate prevention premised on neighborliness. I begin by introducing the idea of correlative rights and neighborliness as a communitarian alternative to a torts-based understanding of international environmental prevention obligations. I then theorize that a correlative rights-based understanding of prevention proceeds according to four reasonable-use factors, each of which is consistent with international environmental jurisprudence. These four factors are (1) a substantive requirement that reasonable use proactively conserves the shared resource, (2) a procedural requirement to take diligent steps towards the fulfillment of the conservation goal, (3) a functional link between reasonable use and sustainable development, and (4) a finance or cost-sharing requirement that ensures that the benefits and burdens of reasonable use are fairly distributed. I argue that each of these four factors speaks directly to the current climate law problems. I show how our understanding of prevention must shift to accommodate the needs of the climate context. I argue that climate negotiations following the Paris Agreement in fact have followed this approach. I

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43. MATTHEW E. KAHN, ADAPTING TO CLIMATE CHANGE: MARKETS AND THE MANAGEMENT OF AN UNCERTAIN FUTURE 7–8 (2021).

44. *Id.* at 77–93.

45. W. MICHAEL REISMAN, THE QUEST FOR WORLD ORDER AND HUMAN DIGNITY IN THE TWENTY-FIRST CENTURY: CONSTITUTIVE PROCESS AND INDIVIDUAL COMMITMENT 183–90 (2012).

conclude that the key gaps in the respect and fulfillment of climate prevention obligations are not in decarbonization efforts as such. Rather, I argue that our critical failures are not fully internalizing (1) the demands of development and (2) our shared responsibility to shoulder the burdens of climate change mitigation and adaptation. Here, climate prevention can meaningfully help close the achievement gap pragmatically to help achieve a long-term 1.5˚C world.

I. THE TRADITIONAL DELICTUAL PREVENTION PARADIGM

International environmental law traditionally treats the principle that states must act to prevent transboundary environmental harm through the lens of an internationally wrongful act.[46] Three paradigmatic cases in particular inspired this delictual understanding (section I.A). Some scholars have made sense of this jurisprudence by analogy to negligence (section I.B): A state must not cause foreseeable transboundary harm directly or indirectly by failing to diligently regulate private actors in its territory.[47] Alternatively, a delictual prevention paradigm could look to strict liability, which would be even more ambitious than a negligence paradigm (section I.C). In this scenario, the deployment of greenhouse-gas-intensive energy systems creates an unreasonable risk of harm compared to its utility and thus gives rise to liability without negligence (in practice, though, the question of what constitutes such an unreasonable risk links up with the idea of the diligent judgment of a like-situated state.) As I will argue, these paradigms are ill-fit to address climate change, nor is it necessary to understand the principle of prevention announced in international jurisprudence.

A. THREE PARADIGMATIC PREVENTION CASES

Three canonical cases have been crucial to the development of the prevention principle in international environmental law. The first is the *Trail Smelter* arbitration. The International Law Commission identifies the *Trail Smelter* arbitration as the first case to have recognized the principle of prevention in its 2001 draft articles on the prevention of transboundary harm.[48]

In *Trail Smelter*, sulfur dioxide fumes crossed from Canada to Washington where they caused environmental damage.[49] The tribunal concluded that "no State has the right to use or permit the use of its territory in such a manner as to

46. *See* Benoit Mayer, *Climate Change Mitigation as an Obligation Under Customary International Law*, 48 YALE J. INT'L L. 105, 128 (2023).

47. Int'l L. Comm., Draft Articles on Prevention of Transboundary Harm from Hazardous Activity, with Commentaries, art. 3, cmts. 6–9 (2001) [hereinafter ILC Prevention]. Notably, the draft articles do not adopt a delictual perspective wholesale but rather seek to find a middle ground between a delictual and a correlative rights perspective. *See id.* at art. 1, cmt. 6. As I will argue, the ILC's work steps conceptually short in important respects when it wants to expand beyond a delictual paradigm for prevention.

48. *See id.* at General cmt. 4.

49. Trail Smelter (U.S. v. Can.), III U.N. Rep. Int'l Arb. Awards 1905, 1920 (1938).

cause injury by fumes in or to the territory of another or the properties or persons therein, when the case is of serious consequence and the injury is established by clear and convincing evidence."[50] The tribunal limited liability to damage directly caused by the emissions in question.[51] What amounts to a wrongful act in this traditional interpretation is that a state failed to diligently consider potential transboundary harm.[52]

The second is the *Pulp Mills* case between Argentina and Uruguay before the International Court of Justice.[53] This case, too, is treated as canonical in the legal literature.[54] It established that prevention is a principle of customary international law and defines what that principle means.[55] In *Pulp Mills*, Argentina alleged that Uruguay impermissibly caused it transboundary environmental harm by permitting two pulp mills on the Uruguayan side of the Uruguay River.[56] Argentina and Uruguay had agreed on the process to be followed for the environmental impact assessment of such projects in a 1975 treaty.[57] Argentina proved that Uruguay failed to act consistently with the procedure set out in the 1975 treaty.[58] The Court nevertheless ruled that Argentina had failed to prove any actual transboundary harm.[59] Consequently, it dismissed Argentina's claims.[60]

Pulp Mills follows *Trail Smelter* in key respects. *Pulp Mills* splits the analysis of prevention of transboundary environmental harm into two elements: (a) procedure and diligence, and (b) substance and actual harm.[61] Both elements must be present to prove a violation of the principle.[62]

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50. *Id.* at 1965.

51. *Id.* at 1940.

52. *See* Heike Krieger & Anne Peters, *Due Diligence and Structural Change in the International Legal Order*, *in* DUE DILIGENCE IN THE INTERNATIONAL LEGAL ORDER 351, 356 (Heike Krieger et al. eds., 2020); ALAN BOYLE & CATHERINE REDGWELL, BIRNIE, BOYLE & REDGWELL'S INTERNATIONAL LAW AND THE ENVIRONMENT 163 (4th ed. 2021).

53. Pulp Mills on the River Uruguay (Arg. v. Urug.), Judgment, 2010 I.C.J. 14 (Apr. 20). For earlier jurisprudence, *see* Corfu Channel (U.K. v. Alb.), Judgment, 1949 I.C.J. 4 (Apr. 9); Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, 1996 I.C.J. 226 (July 8); Gabčíkovo-Nagymaros Project (Hung. v. Slovk.), Judgment, 1997 I.C.J. 7 (Sept. 25).

54. BOYLE & REDGWELL, *supra* note 52, at 143–47.

55. *Pulp Mills*, 2010 I.C.J. at 55–56.

56. *Id.* at 15.

57. *Id.* at 51–60.

58. *Id.* at 77–80.

59. *See, e.g.*, *id.* at 94–95, 97–101.

60. *Id.* at 106.

61. *Id.*

62. *Id.*; Jutta Brunée, *Harm Prevention*, *in* THE OXFORD HANDBOOK OF INTERNATIONAL ENVIRONMENTAL LAW 269, 273 (2d ed., Lavanya Rajamani & Jacqueline Peel eds., 2021). For an earlier consistent view, *see* Edith Brown Weiss et al., *New Developments in International Environmental Law*, 85 AM. SOC'Y INT'L L. PROC. 401, 423 (1991) (remarks of Alexandre Kriss). *See also* Construction of a Road (Nicar. v. Costa Rica), Judgment, 2015 I.C.J. 665, 722–26, 731, 736–37, 743 (Dec. 16) (confirming the same).

The third is the recent International Tribunal for the Law of the Sea ("ITLOS") advisory opinion on climate change.[63] The advisory opinion opened with an interpretation of Article 194 of the U.N. Convention on the Law of the Sea, noting that the "key provision in this regard is article 194 of the Convention, which requires States, inter alia, to take all necessary measures to prevent, reduce and control pollution of the marine environment from 'any source.'"[64] ITLOS explained that the obligation was one of conduct rather than result and required due diligence, relying on *Pulp Mills*.[65] It added that given the "severe consequences for the maritime environment" from a temperature overshoot above the 1.5˚C target, "the standard of due diligence States must exercise in relation to marine pollution from anthropogenic GHG emissions needs to be stringent."[66] Relevantly, ITLOS clarified that "its [due diligence] implementation may vary according to States' capabilities and available resources."[67] In addition, there must also be actual harm (for example, pollution). Here, ITLOS relied on the work of the Intergovernmental Panel on Climate Change ("IPCC") to conclude that a temperature overshoot would indeed cause harm.[68]

B. PREVENTION AS NEGLIGENCE

International environmental law scholarship today thinks about prevention jurisprudence in one of two ways.[69] Either it analogizes prevention to negligence,[70] or it suggests a strict liability analogy.[71]

Thinking of prevention as negligence is straightforward: There is a duty to act with reasonable environmental care. A failure to act with appropriate diligence breaches this duty.[72] Diligence is inappropriate if the underlying conduct creates an intolerable environmental risk in light of foreseeable harm to third parties.[73]

At first blush, this appears to track the rationale expressed by ITLOS. Climate change above the 1.5˚C target creates an intolerably high risk of harm to the marine environment.[74] Consequently, states have a duty to reduce greenhouse gas

63. Climate Change and International Law (No. 31), Case. No. 31, Advisory Opinion of May 21, 2024, ITLOS [hereinafter ITLOS Advisory Opinion], https://perma.cc/8G8X-SA5C.

64. *Id.* ¶ 189.

65. *Id.* ¶¶ 233–35.

66. *Id.* ¶ 241.

67. *Id.*

68. *Id.* ITLOS confirmed that the same approach governs pollution prevention under article 194(1) and 194(2) of ITLOS. *Id.* ¶¶ 253–54. The only differentiation made by ITLOS is that "[t]he standard of due diligence under article 194, paragraph 2, can be even more stringent than that under article 194, paragraph 1, because of the nature of the transboundary pollution." *Id*. ¶ 258.

69. WEISS, *supra* note 10, at 212–13.

70. *Id*.

71. *Id*.

72. *See* Pulp Mills on the River Uruguay (Arg. v. Urug.), Judgment, 2010 I.C.J. 14, 106 (Apr. 20); Construction of a Road (Nicar. v. Costa Rica), Judgment, 2015 I.C.J. 665, 722–26 (Dec. 16).

73. *Construction of a Road*, 2015 I.C.J. at 722–26.

74. ITLOS Advisory Opinion, *supra* note 63, ¶¶ 241–44.

emissions. A failure to appropriately reduce greenhouse gas emissions is thus a breach of duty.

In keeping with the negligence analogy, proof of breach is not enough to establish negligence: We still need causation and harm.[75] This explains why there must be both a substantive violation of the prevention principle in addition to a proof of insufficient diligence.[76] Further, as a matter of causation, the link between breach and harm must be substantial and direct.[77]

C. PREVENTION AS STRICT LIABILITY

Alternatively, prevention can look like strict liability.[78] The ITLOS advisory opinion adds to the diligence requirements, particularly, stringent diligence.[79] This standard of stringent liability is not explained in the decision.[80] It may, on its face, suggest a higher duty than imposed by an ordinary negligence analysis.

One could analogize such "stringent" due diligence to strict liability for abnormally dangerous activity.[81] Such activity "creates a foreseeable and highly significant risk of physical harm even when reasonable care is exercised by all actors," and (2) "is not one of common usage."[82] Alternatively, one could look to strict liability for design defects. Such strict liability would impose liability in cases where designs create an undue risk of harm in light of their social utility.

Both strict liability conceptions are problematic. Greenhouse gas emissions are common, meaning that they are not *abnormally* dangerous.[83] Further, international jurisprudence always calls for significant balancing even in the context of "stringent" diligence in the ITLOS climate advisory opinion.[84] The same conduct (greenhouse gas emissions) is not wrongful when undertaken by some actors versus others.[85] This defeats a strict liability rationale.

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75. DAN B. DOBBS ET AL., THE LAW OF TORTS § 120 (2d ed. 2023).

76. *See Pulp Mills*, 2010 I.C.J. at 94–95, 97–101; *Construction of a Road*, 2015 I.C.J. at 731, 734, 736–37.

77. Trail Smelter (U.S. v. Can.), III U.N. Rep. Int'l Arb. Awards 1905, 1940 (1938); *see also Pulp Mills*, 2010 I.C.J. at 89; DOBBS, *supra* note 75. This is one way of understanding why mere lack of diligence does not run afoul of the prevention principle.

78. WEISS, *supra* note 10, at 213.

79. ITLOS Advisory Opinion, *supra* note 63, ¶¶ 241, 258. Per the *Pulp Mills* judgment, a state is required "'to use all means at its disposal' to avoid the harm" in question. WEISS, *supra* note 10, at 213 (quoting *Pulp Mills*, 2010 I.C.J. at 56).

80. Diane Desierto, *"Stringent Due Diligence", Duties of Cooperation and Assistance to Climate Vulnerable States, and the Selective Integration of External Rules in the ITLOS Advisory Opinion on Climate Change and International Law*, EUR. J. INT'L L.: TALK! (June 3, 2024), https://perma.cc/F2VF-E73K.

81. RESTATEMENT (THIRD) OF TORTS § 20(a) (AM. L. INST 2010); DOBBS, *supra* note 75, § 442.

82. RESTATEMENT (THIRD) OF TORTS, *supra* note 81, § 20(b)(1)–(2).

83. SARAH CONNORS ET AL., CLIMATE CHANGE 2021: A SUMMARY FOR ALL 7 (3d ed. 2022), https://perma.cc/43YJ-RKDJ.

84. ITLOS Advisory Opinion, *supra* note 63, ¶ 241.

85. *Id.* In any event, there are significant design benefits of incumbent energy systems further complicating a strict liability analysis. *See* VACLAV SMIL, ENERGY AND CIVILIZATION: A HISTORY 297 (2018).

II. TWO CLIMATE PREVENTION PROBLEMS

Climate change creates two fundamental problems for the application of a delictual prevention logic. The first is a "property line problem" (section II.A): Greenhouse gas emissions are not problematic because they cross boundaries; they are problematic no matter where they are located. The second is the "water glass" problem (section II.B): Greenhouse gas emissions do not immediately cause climate change as such; their historical accumulation does. The emission of each greenhouse gas molecule (or of each annual flow of greenhouse gases emitted by any specific country) viewed alone is not harmful—or, for that matter, wrongful—on its own.

A. THE 'PROPERTY LINE' PROBLEM

Climate change is fundamentally different from the classical transboundary pollution cases.[86] Harmful pollutants there were alleged to move from one state to another.[87] In *Trail Smelter*, sulfur dioxide crossed the border from Canada into the U.S., and did so after the smelter increased the height of its smokestack to avoid local fumigations.[88] In *Pulp Mills*, Argentina alleged that the construction of a pulp mill by Uruguay on the Uruguay River would pollute the river and thus negatively affect Argentina's riparian rights.[89]

Anthropogenic climate change is not similarly localized.[90] Burning fossil fuels (and engaging in greenhouse-intensive industrial processes and agriculture) is not like dumping toxic waste. Global climate systems are intimately connected.[91] The location of emissions is therefore less important.[92] It is the total stock of greenhouse gases in the atmosphere that is problematic, and not principally where these gases are located.[93] That is why it makes sense to speak of a "remaining global carbon budget."[94]

This difference between greenhouse gas emissions and traditional environmental prevention jurisprudence matters. The rationale that fits the classic cases does

86. *See supra* Part I.

87. Trail Smelter (U.S. v. Can.), III U.N. Rep. Int'l Arb. Awards 1905, 1920 (1938); Pulp Mills on the River Uruguay (Arg. v. Urug.), Judgment, 2010 I.C.J. 14, 15 (Apr. 20); Construction of a Road (Nicar. v. Costa Rica), Judgment, 2015 I.C.J. 665, 722–26 (Dec. 16).

88. *Trail Smelter*, III U.N. Rep. Int'l Arb. Awards at 1920.

89. *Pulp Mills*, 2010 I.C.J. at 15.

90. CONNORS ET AL., *supra* note 83, at 6.

91. *See id.* at 4–6.

92. *See id.*

93. WORKING GROUP III TO THE SECOND ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL FOR CLIMATE CHANGE, CLIMATE CHANGE 1995: ECONOMIC AND SOCIAL DIMENSIONS OF CLIMATE CHANGE 42 (James P. Bruce et al. eds., 1996), https://perma.cc/5MLW-DCEY.

94. IPCC 2023, *supra* note 6, at 82.

not fit climate change. As we will see, this distinction in fact makes a difference in why and how we should think about prevention.[95]

B. THE WATER GLASS PROBLEM

Climate change is fundamentally different from traditional transboundary pollution jurisprudence in yet another way. In cases like *Trail Smelter*, the transboundary pollution at issue—sulfur dioxide emissions—could be linked reasonably directly to the emissions of a neighboring state.[96] The sulfur dioxide emissions in question cause harm more or less immediately.[97]

This is not the case in the context of climate change. For example, once a molecule of CO_2 is emitted, it can stay in the atmosphere for 300 to 1,000 years.[98] A molecule of CO_2 also does not reach its full warming potential immediately but rather does so only after approximately ten years.[99] That is why it makes sense to think of a shrinking "remaining global carbon budget."[100]

Climate change, in other words, has a "water glass" problem: The greenhouse gases one emits are only dangerous because there already are more of them in the atmosphere than the climate can bear.[101] Greenhouse gas emissions are like filling a water glass with a pipette. The last drop of water will cause the glass to overflow, or a certain temperature threshold to be crossed.

The problem is that the first drop of water did not pose any greater risk of overfilling a then-empty glass. That means that the first drop (or first greenhouse gas molecule beyond what atmospheric sinks could absorb) is only problematic with the benefit of hindsight. We know now that many more drops (or greenhouse gas molecules) would follow it.[102] Still, it is facially difficult to charge generations gone by with that hindsight when assessing their historical conduct.[103]

This difficulty of assigning wrongfulness to historical conduct is all the greater in international law. International law follows a principle of inter-temporality.[104] Classically, "a juridical fact must be appreciated in the light of the law contemporary

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95. The ITLOS Advisory Opinion solved the problem by adopting a neighborliness approach rather than a delictual approach as discussed below. *See* ITLOS Advisory Opinion, *supra* note 63, ¶¶ 159–75.

96. Trail Smelter (U.S. v. Can.), III U.N. Rep. Int'l Arb. Awards 1905, 1923–25 (1938).

97. *See id*.

98. Alan Buis, *The Atmosphere: Getting a Handle on Carbon Dioxide*, NASA (Oct. 9, 2019), https://perma.cc/N7D4-PK2G.

99. *See* Kirsten Zickfeld & Tyler Herrington, *The Time Lag Between a Carbon Dioxide Emission and Maximum Warming Increases with the Size of the Emission*, ENV'T RSCH. LETTERS (Mar. 10, 2015), https://iopscience.iop.org/article/10.1088/1748-9326/10/3/031001.

100. IPCC 2023, *supra* note 6, at 82.

101. *Id*.

102. *Id.*

103. *See* DAVID H. DONALD, LINCOLN 13 (1996) (discussing the danger of hindsight bias in historical research).

104. *See* T.O. Elias, *The Doctrine of Inter-Temporal Law*, 74 AM. J. INT'L L. 285, 286 (1980). Perhaps more problematically, the underlying conduct (emission of greenhouse gases) is not of the kind as to easily permit reframing by introducing ethical principles in inter-temporal law, as some have

with it, and not of the law in force at the time when a dispute in regard to it arises or falls to be settled."[105]

International law began to address climate change—and create duties to prevent it—in 1992 after groundwork was laid in the 1980s.[106] At the time in question, global average temperatures had not yet overtopped the 1.5˚C target. Before that time, *then-existing* greenhouse gas emissions could not have been wrongful even judged by today's standards. They did not yet foreseeably cause an injury. Nor could there have been a duty of care. A risk must be known to the reasonable person (that is, like-situated actors) for tort liability to attach.[107] Given that prevention at the time required proof of environmental harm by clear and convincing evidence, proof of negligence would have failed on two grounds before that time.[108]

The same is also true for the last drop (or greenhouse gas molecule) that causes the glass to overflow. This pivotal CO_2 molecule is not chemically different from those earlier CO_2 emissions. It is only problematic because we know how many molecules preceded it. Just as much as it is facially difficult to charge prior generations with hindsight, it is also unfair to blame the current generation for emissions caused by prior generations.[109] This is particularly the case when emissions are the result of economic development intended to improve human development in industrializing economies.[110] Because of the slow build-up of climate change, everyone can point out that the problem was caused by someone else. Climate change ultimately is a problem of *collective action*, not *individual responsibility*.

III. DELICTUAL PREVENTION CANNOT ADDRESS EITHER CLIMATE PROBLEM

The delictual prevention paradigm outlined in Part I struggles mightily with the climate problems outlined in Part II. As I will argue below, these problems show why there can be no tort-based duty to address climate change (section III.

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argued to do to make justiciable past injustices. Andreas von Arnauld, *How to Illegalize Past Injustice: Reinterpreting the Rules of Intertemporality*, 32 EUR. J. INT'L L. 401, 401 (2021).

105. Island of Palmas (Neth. v. U.S.), II UN Rep. Int'l Arb. Awards 831, 845 (Apr. 4, 1928).

106. U.N. Framework Convention on Climate Change arts. 2, 3(1), May 9, 1992, S. Treaty Doc. No. 102-38, 1771 U.N.T.S. 165, 166, 170 [hereinafter UNFCCC]; DANIEL BODANSKY ET AL., INTERNATIONAL CLIMATE CHANGE LAW 96 (2017).

107. One of the few early secondhand smoke cases involved exposure after 1978. Patrick Luff, *Regulating Tobacco Through Litigation*, 47 ARIZ. ST. L.J. 125, 153 (2015); French v. Philip Morris, Inc., No. 00-01706CA22, 2002 WL 32153635, at *4 (Fla. Cir. Ct. Sept. 2002). At that time, cancer risk from smoke inhalation was known. Luff, *supra*, at 138.

108. Trail Smelter (U.S. v. Can.), III U.N. Rep. Int'l Arb. Awards 1905, 1965 (1938).

109. *See* JOHN RAWLS, A THEORY OF JUSTICE 7, 102 (1971) ("In this way the institutions of society favor certain starting places over others. These are especially deep inequalities. Not only are they pervasive, but they affect men's initial chances in life; yet, they cannot possibly be justified by an appeal to notions of merit or desert." [. . .] "No one deserves his greater natural capacity nor merits a more favorable starting place in society.")

110. *See* U.N. Conference on the Human Environment, *Report of the United Nations Conference on the Human Environment*, princs. 9–10, U.N. Doc. A/CONF.48/14/Rev.1, (June 16, 1972) [hereinafter Stockholm Declaration].

A). Further, any such duty would fly in the face of both the U.N. Framework Convention on Climate Change ("UNFCCC") and the Paris Agreement (section III.B). The traditional approach to international environmental law prevention thus hits a dead end in the climate context.

A. SOVEREIGN EQUALITY AS CONCEPTUAL PROBLEM FOR TRADITIONAL CLIMATE PREVENTION

The argument that prevention can be applied only with difficulty to the climate context is certainly not new.[111] Such arguments tend to focus on causation.[112] They ask: How do we attribute certain emissions to certain countries in order to establish wrongfulness? This is an area of live debate.[113] It is a debate that facially tracks the delictual paradigm; without causation, one cannot prove liability.[114]

Still, the causation issue is a problem of proof rather than a conceptual problem.[115] The two problems we encountered in Part II go deeper than causation. Both problems suggest in a slightly different way that it is difficult to conceive of a tort or negligence-inspired *duty* to prevent climate change in the first place. Obviously, if there is no duty to prevent climate change, then there can be no breach of duty.[116] The tort analogy crumples from the start.[117]

Before engaging in the duty discussion, a quick word of caution. The statement that there is no (tort-based) duty to prevent climate change should strike us as ethically outrageous.[118] My point is decidedly not there is no applicable legal standard of prevention that might apply to climate change; the next section seeks to provide a baseline to argue for just such a standard. It is just to argue that the tort and negligence analogy underlying the classical understanding of prevention cannot establish such a duty, if it can indeed conceive of such a duty at all.[119]

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111. *See* Christopher Campbell Duruflé, *The Significant Transboundary Harm Prevention Rule and Climate Change: One-Size-Fits-All or One-Size-Fits-None?*, *in* DEBATING CLIMATE LAW 29, 30–32 (Benoit Mayer & Alexander Zahar eds., 2021).

112. *See id*.

113. *See generally, e.g.*, Michael Burger et al., *The Law and Science of Climate Change Attribution*, 45 COLUM. J. ENV'T L. 57 (2020) (discussing the issue from the point of view of attribution science); Benoit Mayer, *Climate Change Mitigation as an Obligation Under Customary International Law*, 48 YALE J. INT'L L. 105, 132–33 (2023) (discussing the issue from a point of view of customary international law); Aisha I. Saad, *Attribution for Climate Torts*, 64 B.C. L. REV. 867, 868–69 (2023) (discussing the issue from a domestic U.S. climate litigation point of view).

114. *See* Saad, *supra* note 113, at 896 ("Causation presents the most significant obstacle to successful climate tort claims.")

115. *See* Burger et al., *supra* note 113.

116. *See* Thomas C. Galligan, Jr., *The Structure of Torts*, 46 FLA. ST. U. L. REV. 485, 496 (2019) ("[O]ft times things that are categorized questions of breach, causation, or damages are really questions about the existence or extent of the defendant's legal obligation or duty.").

117. *Id*.

118. For a moral case for an obligation to prevent climate change, see STEPHEN M. GARDINER, A PERFECT MORAL STORM: THE ETHICAL TRAGEDY OF CLIMATE CHANGE (2011).

119. For this understanding of prevention, see *id*.

The outrage we are likely to experience at the suggestion that there is no legal duty to prevent climate change itself is a helpful clue. It suggests that we need to ask two questions. First, are there situations in which the law of negligence imposes no duty to act in a manner that strikes us as ethically outrageous? Second, if the answer to the first question is yes, do those situations share common features with the property line and water glass problems?

There are situations in which the law of torts does not impose a duty even though our moral sensibilities are plainly outraged by such a result. Those situations invariably involve the distinction between misfeasance and nonfeasance.[120] This distinction is fundamental to the common law of torts.[121]

Negligence is the territory of misfeasance.[122] A person is under a duty to act with ordinary care when engaging in an activity that could cause another harm (for example, driving a car on public roadways).[123] When a person breaches that duty and causes another harm, that person is liable in negligence.[124] For instance, a person is negligent in this sense if they get in an accident while watching a viral video.[125]

Nonfeasance is another matter. Canonically, a bystander can stand aside and let the most vile and horrible events befall another, even if the bystander could have stopped them at little personal cost or risk.[126] The key is that the bystander had nothing to do with the impetus for the vile and horrible events. The bystander therefore owed no duty to the injured.[127]

The distinction between misfeasance and nonfeasance illustrates that the law of negligence reflects the principle of "do no harm."[128] The law of negligence does not include an affirmative obligation to prevent harm from befalling another. So long as my conduct is not wrongful, that it can cause harm is beside the point: I, as a bystander, owed no duty to prevent it.[129]

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120. Arthur Ripstein, *Private Order and Public Justice: Kant and Rawls*, 92 VA. L. REV. 1391, 1393–94 (2006) ("Private law draws a sharp distinction between nonfeasance and misfeasance: unless you owe a duty to another person, the effects of your conduct on that person are irrelevant.")

121. *Id*.

122. Marin Roger Scordato, *Understanding the Absence of a Duty to Reasonably Rescue in American Tort Law*, 82 TUL. L. REV. 1447, 1459–60 (2008).

123. *Id.* at 1455.

124. DOBBS, *supra* note 75, § 127.

125. *See* Alpizar v. John Christner Trucking, LLC, No. SA-17-CV-00712-FB, 2019 WL 1643743, at *4–5 (W.D. Tex. Apr. 16, 2019) (discussing whether similar facts in the cell phone use context constitute gross negligence).

126. DOBBS, *supra* note 75, § 405. There is, of course, a large literature that wishes to alter this basic premise of the common law of Torts—and in doing so confirms how deeply entrenched the distinction remains. *See* Ernest Weinrib, *The Case for a Duty to Rescue*, 90 YALE L.J. 247 (1980); Francis H. Bohlen, *The Moral Duty to Aid Others as a Basis of Tort Liability*, 56 U. PA. L. REV. 217, 220 (1908).

127. Scordato, *supra* note 122, at 1459–60.

128. Richard S. Whitt, *Old School Goes Online: Exploring Fiduciary Obligations of Loyalty and Care in the Digital Platforms Era*, 36 SANTA CLARA HIGH TECH. L.J. 75, 105 (2019).

129. Scordato, *supra* note 122, at 1459–60; *see also* Patricia Grande Montana, *Watch or Report? Livestream or Help? Good Samaritan Laws Revisited*, 66 CLEV. ST. L. REV. 533, 534–35 (2018).

Needless to say, this is not the result the prevention principle in the international environmental and climate context intends to work. To the contrary, the literature is emphatic that prevention is precisely proactive and protective in a manner that the "no harm" principle is not.[130] The harm prevention principle intends to exhort me towards affirmative stewardship through cooperation.[131] A view of prevention through the lens of negligence or wrongful conduct will have difficulty in achieving this result. Tort law therefore does not capture what it hopes to achieve.

The reason for the nonfeasance/misfeasance distinction (and the corresponding distinction between a no-harm principle and a harm prevention principle) is that tort law on this point follows a deep-seated individualism.[132] I have personal autonomy to do as I please without constraint from those around me.[133] It is only when my actions affirmatively harm my neighbor that I am called upon to compensate them. My hand's freedom proverbially stops at the tip of my neighbor's nose.[134] Yet, if my neighbor comes to harm simply in my presence, I have no legal duty to act.[135] I must be active as an agent of harm rather than merely passive.[136]

The analogy to tort law is particularly dangerous in the international environmental and climate contexts because international law is partially rooted in a similar deep-seated individualism.[137] This deep-seated individualism is frequently put in terms of sovereign equality.[138] The word "sovereign" quite literally refers to a state's supreme power or authority.[139] There is no one above the sovereign.[140] When such sovereigns are equal, it means that none can impose on the other against their will.[141] A tort-based understanding of international environmental law would therefore risk eviscerating the prevention principle and insist that no such duty to prevent climate change could exist due to the nonfeasance/malfeasance distinction.

International lawyers frequently refer to this understanding of sovereignty as the *Lotus* principle.[142] The *Lotus* principle is named after a 1927 case before the

130. BRUNNÉE, *supra* note 22, at 13.

131. *See id.*

132. Bohlen, *supra* note 126, at 220.

133. Isaiah Berlin categorizes this idea as negative freedom or "freedom from." Isaiah Berlin, *Two Concepts of Liberty*, *in* ISAIAH BERLIN, FOUR ESSAYS ON LIBERTY 118, 122 (1969).

134. Zechariah Chafee, Jr., *Freedom of Speech in War Time*, 32 HARV. L. REV. 932, 957 (1919).

135. For a discussion of the current jurisprudence and its stated justification, *see* Sarah L. Swan, *Bystander Interventions*, 2015 WIS. L. REV. 975, 999 (2015).

136. Bohlen, *supra* note 126, at 220.

137. On this "anthropomorphizing" of states in international law, *see* Eliav Lieblich, *Wars of Recovery*, 34 EUR. J. INT'L L. 349, 371 (2023).

138. *Id*.

139. *See* Patrick McKinley Brennan, *The Individual Mandate, Sovereignty, and the Ends of Good Government*, 159 U. PA. L. REV. 1623, 1638–1639 (2011) (discussing the history of the idea of sovereignty).

140. *Id.* at 1639.

141. The question then arises whether "law" is above the sovereign and, if so, how this could be. *Id.* This particular dynamic famously has led to arguments that positive international law is over and underdetermined. *See* MARTTI KOSKENNIEMI, FROM APOLOGY TO UTOPIA: THE STRUCTURE OF INTERNATIONAL LEGAL ARGUMENT (2d ed. 2005).

142. JAMES CRAWFORD, BROWNLIE'S PRINCIPLES OF PUBLIC INTERNATIONAL LAW 462 (9th ed. 2019).

Permanent Court of International Justice.[143] The holding of *S.S. Lotus* is frequently exaggerated to reflect points beyond what the Court narrowly held.[144] What *S.S. Lotus* stood for at that time is that absent a permissive rule to the contrary, a state may not exercise its jurisdiction on the territory of another state.[145] This holding expressed the same thought as the customary international law of sovereign equality as codified by the U.N. General Assembly in its 1970 *Friendly Relations Declaration*: "[e]ach State has the right freely to choose and develop its political, social, economic and cultural systems."[146] To this extent at least, the *S.S. Lotus* principle remains constitutive of international law.

This narrower reading of *S.S. Lotus* appears to speak directly to the right of each state to determine its own energy policy, central to the energy transition context. A sister declaration adds that part of the sovereign right to choose its "political, social, economic and cultural systems" is a state's energy sovereignty.[147] In the first place, peoples and states hold permanent sovereignty over their natural resources, particularly resources critical to energy value chains.[148] This sovereignty "must be exercised in the interest of their national development and of the well-being of the people of the State concerned."[149] Further, the exploration of natural resources (as well as their broader use in energy systems) is intimately connected to the right to self-determination.[150] Prescribing how a state should employ its natural resources or provide energy to its people infringes on the heart of sovereign power.

This means that the property-line problem truly presents difficult questions. The issue is the choice of a specific energy system by a state (that is, one premised on a hydrocarbons paradigm).[151] Facially, this choice remains for each state to make according to its equal sovereign prerogative and its permanent sovereignty over its natural resources.[152] The energy systems in question do not meaningfully

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143. S.S. Lotus (Fr. v. Turk.), Judgment, 1927 P.C.I.J. (Ser. A) No. 10, at 19 (Sept. 7).

144. *See* Anthea Roberts, *Traditional and Modern Approaches to Customary International Law: A Reconciliation*, 95 AM. J. INT'L L. 757, 776 (2001); *see also* Hugh Handeyside, *The* Lotus *Principle in ICJ Jurisprudence*, 29 MICH. J. INT'L L. 71 (2007).

145. Louis Henkin, *International Law: Politics, Values, and Functions*, *in* RECUEIL DES COURS 9, 278–79 (1989 IV); August Reinisch, *Human Rights Extraterrioriality: Controlling Companies Abroad*, *in* COMMUNITY INTERESTS ACROSS INTERNATIONAL LAW 396, 407 (Eyal Benvenisti & Georg Nolte eds., 2018).

146. Friendly Relations Declaration, *supra* note 15; Marko Milanovic, *Revisiting Coercion as an Element of Prohibited Intervention in International Law*, 117 AM. J. INT'L L. 601, 606–07 (2023).

147. Permanent Sovereignty Declaration, *supra* note 15; Guillermo J. Garcia Sanchez, *In the Name of Energy Sovereignty*, 63 B.C. L. REV. 2475, 2487 (2022); Alexandra B. Klass & Rebecca Wilton, *Local Power*, 75 VAND. L. REV. 93, 141 (2022).

148. Permanent Sovereignty Declaration, *supra* note 15; *See* Luis E. Cuervo, *OPEC from Myth to Reality*, 30 HOUS. J. INT'L L. 433, 474, 477 (2008); GIULIANO GARAVINI, THE RISE AND FALL OF OPEC IN THE TWENTIETH CENTURY 361 (2019).

149. *See* Permanent Sovereignty Declaration, *supra* note 15.

150. *Id*.

151. *See* discussion *supra* section II.A.

152. *See* Permanent Sovereignty Declaration, *supra* note 15.

"dump" pollutants in the territory of a neighbor as was the case in *Trail Smelter*; the problem is the emission of greenhouse gases *per se*, no matter where they come to be located. For a state to compel another to depart from its chosen energy system would thus appear to look like an exercise of its prescriptive jurisdiction on the territory of another state contrary to the principle of sovereign equality.[153]

This line of reasoning suggests that it cannot be wrongful for a state to exercise its own rights to benefit its own people on a purely domestic basis.[154] The state does not cause any harmful substance to leave its territory to burden its neighbor instead.[155] The state simply chooses a means to provide a basic good (here, energy) to its population. To impose a duty on a state to do otherwise would begin to hollow out the moral individualism underlying sovereign equality.[156] Tort law is a poor analogy to impose such a duty as the nonfeasance/misfeasance distinction vividly illustrates.[157] Yet, as we will see, the point is precisely that climate change is a collective action problem rather than an individual problem. It requires collective affirmative action (energy transition) rather than individual restraint from wrongdoing (greenhouse gas emissions). A tort analogy cannot get us there.

The water glass problem further compounds the difficulty of relying on a tort analogy.[158] First, it is at this point a truism to say that climate change requires energy transition, that is, it requires us to change incumbent energy systems.[159] What is hidden in this truism is that climate change is a consequence of historical choices. As we noted, many of these historical choices were not wrongful when made.[160] Still, the choice, say, to rely on locally mined coal to feed coal-fired power plants made some thirty years ago still affects us today as the coal-fired power plant continues to emit CO_2.[161] The problem is that states collectively continue to rely on incumbent energy value chains.

The water glass problem has the practical consequence that the greatest part of the world population relies on hydrocarbons in one way or another because of the way energy value chains and economic supply chains have grown over time. By way of example, the food that feeds much of the world is grown using industrial agriculture and transported by ship and truck to feed populations around the world.[162] Our jobs—our ability to make a living—similarly depend on this

153. *See* Friendly Relations Declaration, *supra* note 15.
154. *See id*.
155. *See* discussion *supra* section II.A.
156. *See* Lieblich, *supra* note 137, at 371.
157. Bohlen, *supra* note 126, at 220–21.
158. *See* discussion *supra* section II.B.
159. Stocktake, *supra* note 9, ¶¶ 6–7.
160. *See* discussion *supra* section II.B.
161. On the policy problem of coal transition in South Africa, *see, e.g.*, WORLD BANK GROUP, SOUTH AFRICA: COUNTRY CLIMATE AND DEVELOPMENT REPORT 4–5 (2022) [hereinafter WORLD BANK REPORT], https://openknowledge.worldbank.org/server/api/core/bitstreams/52409ffd-96f7-58d4-be7f-c8114abbd4c5/content.
162. FOOD & AGRIC. ORG. OF THE UNITED NATIONS, THE SHARE OF AGRI-FOOD SYSTEMS IN TOTAL GREENHOUSE GAS EMISSIONS 31 (2021) [hereinafter FAOSTAT Brief], https://openknowledge.

historical hydrocarbon infrastructure, whether one is mining cobalt in the Democratic Republic of Congo for use in EV batteries in the U.S. and Europe,[163] or making textiles in a factory in Vietnam,[164] or selling them in a mall in Minnesota.[165] No one state can break with the paradigm alone, and certainly not immediately. The power of path dependence in a globalized world economy is simply too great.[166]

That is why continuing with the *status quo* appears more analogous to a non-feasance rather than an affirmative action (a misfeasance) to which a tort duty might attach. One would need affirmatively to *retire* energy assets early to mitigate climate change.[167] This includes energy assets that materially support the global food supply.[168] Retiring such assets does not replace them and thus risks bringing national economies and supply chains to a halt.[169] Tort law does not provide a ready analogy to require such affirmative action to rescue a third state or a "stranger."[170]

Second, the water glass problem also showcases that climate change presents a distributive problem: How should we assign shares from the remaining carbon budget?[171] Individualism does poorly in such distributive contexts. Individualism can handle situations in which it is reasonably clear that everyone is better protected by a liability rule forcing a person to compensate another for harm.[172] Preventing transboundary pollution is one such scenario: I benefit from a rule that prevents any state from negligently allowing pollutants to escape its territory. I am spared from unanticipated environmental catastrophes I could not have prevented no matter how diligent my domestic environmental legislation might have been. Of course, this means I need to abide by that rule as well. Yet, as the classic "Hand formula" drills into us, negligence means that the benefit of acting more carefully would have outweighed the cost of greater care.[173] So I am, in principle, always better off in a world in which such a rule applies to me. The procedural

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fao.org/server/api/core/bitstreams/ffb21ed0-05dd-46b1-b16c-50c9d47a6676/content (31% of global greenhouse gas emissions came from agri-food systems in 2019).

163. *CO_2 Emissions from Cobalt Production Expected to Soar*, MINING.COM (Apr. 19, 2019), https://perma.cc/JL23-LBDK.

164. *The Textile Industry Emits About 5 Million Tons of CO2 Every Year*, VIET. NEWSPAPER OF NAT'L RES. & ENV'T (Nov. 8, 2023), https://perma.cc/DH6S-TW7G.

165. DIEGO FERNÁNDEZ BRISEÑO ET AL., MIT, RETAIL CARBON FOOTPRINTS 11–12 (2020), https://perma.cc/A92F-BFRU.

166. *See* JAMES, *supra* note 19, at 312–13.

167. *See* WORLD BANK REPORT, *supra* note 161, at 4–5.

168. *See* FAOSTAT Brief, *supra* note 162.

169. *See* David McHugh, *Germany Went from Envy of the World to the Worst-Performing Major Developed Economy. What Happened?*, ASSOCIATED PRESS (Sept. 19, 2023), https://perma.cc/W3NM-RJF2 ("[T]he loss of cheap Russian natural gas needed to power factories 'painfully damaged the business model of the German economy.'").

170. *See* Galligan, *supra* note 116, at 496.

171. *See* IPCC 2023, *supra* note 6, at 82.

172. *See* Guido Calabresi, *Torts—The Law of a Mixed Society*, 56 TEX L. REV. 519, 524 n.10 (1978).

173. *See* Ronen Perry, *Harmful Precautions*, 99 NOTRE DAME L. REV. 153, 154 (2023).

obligations of the classic prevention principle could easily act in terms of such a formula.[174]

This classical liability situation differs markedly from our remaining carbon budget.[175] Our current situation precisely does not treat like action alike (emitting a ton of CO_2, be it in 1890, and emitting a ton of CO_2, be it in 2025) due to the lingering effect, particularly of CO_2 emissions (the ton of CO_2 emitted in 1890 still has roughly the same effect as a ton of CO_2 emitted in 2025).[176] Some states (like the United Kingdom) have "escaped" a duty not to rely on a hydrocarbons paradigm for their economic and social development in the past (and likely will continue to "escape" given the nature of inter-temporal legal obligations); a critical share of the U.K.'s emissions, which propelled its empire and economy, happened before climate harm was meaningfully foreseeable.[177] Others, like the United Kingdom's former colonies (for example, India), now would appear to carry a disproportionate cost for similar economic policies simply because their development is later in time. This differentiation defies the intuitive authority for liability rules; people are treated differently because of who they are and their status, not what they did.

Worse still, in the climate context, each of my actions, viewed on its own, does not in fact cause harm. It is the impact of collective action that does.[178] That is why we frequently treat climate change as a tragedy of the commons.[179] Classically, it is the collective overgrazing of a commons that leads to its collapse.[180] It is not the singular action of one particular shepherd.[181] To say that a shepherd acted wrongfully in responding to the incentive set created by a commons is to say that the shepherd should have had a duty to act differently (in fact, the apparent rationality of the action of each shepherd is what is so tragic in the first place).[182] Individualism tells us that it is rational for the shepherds to get theirs while the getting is good. When distributive problems encounter the economic individualism at the heart of tort law, they engender competition rather than collaboration.[183]

The individualism at the heart of the tort paradigm creates competitive pressures that bring out the worst in states.[184] Tort law does little if anything to tame them. It is in this sense—the worst of the individualism that underlies the tort

174. DANIELLA DAM-DE JONG, INTERNATIONAL LAW AND GOVERNANCE OF NATURAL RESOURCES IN CONFLICT AND POST-CONFLICT SITUATIONS 137 (James Crawford & John S. Bell eds., 2015). In the NEPA context, *see* Samantha Caravello & William Mumby, *Back to Basics: An Overview of NEPA's Requirements*, 2 FOUND. FOR NAT. RES. & ENERGY L. 1, 2–7 (2023).

175. IPCC 2023, *supra* note 6, at 82.

176. Buis, *supra* note 98.

177. *See* discussion *supra* section II.B.

178. *See* discussion *supra* section II.B.

179. *See* Goran Dominioni & Daniel C. Esty, *Designing Effective Border Carbon Adjustment Mechanisms: Aligning the Global Trade and Climate Change Regimes*, 65 ARIZ. L. REV. 1, 21 (2023).

180. Garrett Hardin, *The Tragedy of the Commons*, 162 SCI. 1243, 1244 (1968).

181. *Id.*

182. *Id.*

183. JAMES, *supra* note 19, at 18.

184. *Id*.

paradigm—that one would say that there is no duty to prevent climate change. That is why tort law is a poor guide for how to escape the competition, shore up interconnected networks, and avoid blame when what we need to do is precisely those three things. It is better to look for an alternative paradigm for climate prevention.

B. CLIMATE AGREEMENTS AS A PRACTICAL PROBLEM FOR TRADITIONAL CLIMATE PREVENTION

International climate treaties and decisions do not create a free-standing delictual duty to mitigate climate change. This is so for the UNFCCC.[185] It is so for the Paris Agreement.[186] It is similarly the case for the *Glasgow Climate Pact* and the *First Global Stocktake* under the Paris Agreement enacted in December 2023.[187] The absence in these treaties of a support for a duty of ordinary climate care tends to suggest that a tort-based approach to climate prevention fundamentally misses the mark.

The 1992 UNFCCC codifies five "principles" of international climate law: prevention, differentiated responsibility, precaution, sustainable development, and cooperation.[188] None of these principles are formulated as a duty of care. Rather, they exhort that the parties "should" follow the relevant principle in their decision-making.[189] The "commitments" made in the UNFCCC also do not textually ground a duty to prevent climate change. To the contrary, all the UNFCCC requires is that parties "[t]ake climate change considerations into account, to the extent feasible, in their relevant social, economic and environmental policies and actions."[190] The qualifier "to the extent feasible" undoes any mandate to the contrary.[191]

The 2015 Paris Agreement follows a similar approach. The Paris Agreement sets out that "[e]ach Party shall prepare, communicate and maintain successive nationally determined contributions that it intends to achieve. Parties shall pursue domestic mitigation measures, with the aim of achieving the objectives of such contributions."[192] It adds that "[e]ach Party's successive nationally determined contribution will represent a progression beyond the Party's then current nationally determined contribution and reflect its highest possible ambition."[193] Again, the Paris Agreement imposes no substantive duty—it imposes procedural requirements only. These procedural requirements are not consistent with a duty to prevent greenhouse gas emissions outright. To the contrary, the Paris Agreement

185. UNFCCC, *supra* note 106, at art. 7.
186. Paris Agreement, *supra* note 33.
187. Glasgow Climate Pact, *supra* note 33; Stocktake, *supra* note 9.
188. UNFCCC, *supra* note 106, at art. 3.
189. *Id.*
190. *Id.* at art. 4(1)(f).
191. *Id.*
192. Paris Agreement, *supra* note 33, at art. 4(2).
193. *Id.* at art. 4(3).

codifies that the "Parties aim to reach global peaking of greenhouse gas emissions as soon as possible," so even new emissions increases are not wrongful as such.[194]

Neither the UNFCCC nor the Paris Agreement provide any basis whatsoever to ground a delictual duty to prevent climate change. To the contrary, they both appear consistent with the opposite position, that greenhouse gas emissions are within the sovereign purview of each state to manage as the state deems appropriate so long as the state in question considers climate change as a factor for policy-making.[195] In other words, the UNFCCC and the Paris Agreement fully confirm that concerns of sovereign equality and permanent sovereignty over natural resources undercut any delictual duty to assist third states to avoid the consequences of climate change.

The *Glasgow Climate Pact* on its face goes further than the Paris Agreement in key respects. It urges a transition to net zero emissions by or around mid-century.[196] Still, this exhortation is precisely not framed as a duty.[197] Rather, the *Glasgow Climate Pact* "[w]elcomes efforts by Parties to communicate new or updated nationally determined contributions, long-term low greenhouse gas emission development strategies and other actions that demonstrate progress towards achievement of the Paris Agreement temperature goal."[198] The verb "welcomes" highlights the facially voluntary (and thus non-compelled) nature of such efforts.[199]

The December 2023 *First Global Stocktake* under the Paris Agreement also appears to go further still than the *Glasgow Climate Pact*. Thus, it is the first such climate decision to be express in its goal of "[t]ransitioning away from fossil fuels in energy systems, in a just, orderly and equitable manner, accelerating action in this critical decade, so as to achieve net zero by 2050 in keeping with the science."[200] Yet again, the operative language of the decision does not recognize a duty to prevent climate change. Rather, it "calls on Parties to contribute to the following global efforts, in a nationally determined manner, taking into account the Paris Agreement and their different national circumstances, pathways and approaches."[201] The formulation "calls on" is again hortatory and does not indicate a pre-existing duty of climate prevention.

Construing the prevention principle as a traditional delictual principle applicable to climate change simply does not work. It is conceptually flawed (section III. A). It is contrary to the language of the UNFCCC and the Paris Agreement as well as agreements like the *Glasgow Climate Pact* and the *First Global Stocktake*

194. *Id.* at art. 4(1).
195. UNFCCC, *supra* note 106, at art. 4(1)(f); Paris Agreement, *supra* note 33, at art. 4(1)–(3).
196. Glasgow Climate Pact, *supra* note 33, ¶ 22.
197. *Id.*
198. *Id.* ¶ 24.
199. *Id.*
200. Stocktake, *supra* note 9, ¶ 28(d).
201. *Id.* ¶ 28.

adopted by global consensus. The delictual approach to prevention does not fit the climate problem at any level in any manner. Consequently, looking to the alternative correlative rights understanding of prevention developed in section I.B appears the last best hope for meaningful climate prevention in international law. In the remainder of this Article, I will argue that this is precisely the path international law requires us to take.

IV. CORRELATIVE PREVENTION AS CLIMATE PREVENTION

Given the challenges faced by the traditional delictual prevention paradigm, we should try to find an alternative. I argue that the principle of neighborliness and correlative rights at the heart of early international environmental law provides a ready alternative. I will introduce this understanding of neighborliness, explain why it fell into disuse in international environmental law, and argue that it should be re-invigorated: It is uniquely well-positioned to overcome objections to climate prevention premised in sovereign equality, that is, the property line problem (section IV.A). I develop in detail how such a correlative rights approach can tackle climate change despite the water glass problem and introduce a four-factor reasonable use approach (section IV.B). I argue that a correlative rights approach is both consistent with the current Paris Agreement approach to climate law and able to diagnose and correct why it currently falls short. It further provides a better means for understanding the recent ITLOS advisory opinion on climate change. It thus provides a cogent, coherent, and constructive conception for climate prevention in light of developing jurisprudence and treaty practice.

A. THE CORRELATIVE RIGHTS SOLUTION TO THE CLIMATE PREVENTION PROBLEM

There is an alternative understanding of prevention. It grounds prevention not in a tort (negligence) but rather in the idea of neighborliness.[202] The International Law Commission articulated the reason for this alternative understanding: Prevention must apply even when "the activity itself [causing harm] is not prohibited."[203] The point of prevention is not wrongfulness of conduct (that is, its violation of a prohibition). Rather, "[t]he ecological unity of the planet does not correspond to political boundaries. In carrying out lawful activities within their own territories, States have impacts on each other."[204]

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202. Trail Smelter (U.S. v. Can.), III U.N. Rep. Int'l Arb. Awards 1905, 1963–65 (1938); Construction of a Road (Nicar. v. Costa Rica), Judgment, 2015 I.C.J. 665, 706 (Dec. 16); BRUNNÉE, *supra* note 22, at 62; Stockholm Declaration, *supra* note 110, at princ. 21; U.N. Conference on Environment and Development, *Rio Declaration on Environment and Development*, U.N. Doc. A/CONF.151/26/Rev.1 (Vol. I), princ. 2. (Aug. 12, 1992) [hereinafter *Rio Declaration*]; Laurence Boisson de Chazournes & Danio Campanelli, *Neighbour States*, *in* MAX PLANCK ENCYCLOPEDIA OF PUBLIC INTERNATIONAL LAW (Rüdiger Wolfrum ed., 2006), https://perma.cc/X5D5-YYEU.

203. ILC Prevention, *supra* note 47, at art. 1, cmt. 6.

204. *Id.* at art. 2, cmt. 5.

This approach is consistent with the approach taken by the ITLOS advisory opinion on climate change.[205] ITLOS began its advisory opinion with a detailed interpretation of the "marine environment" to which the protections of the United Nations Convention on the Law of the Sea apply.[206] Its analysis focused on the "general sense" of the word "marine environment."[207] It covers ecosystems. Ecosystems, in turn, refer to "a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit."[208] ITLOS's discussion of the maritime environment thus focuses on the "functional unit" of an ecosystem—their "ecological unity" rather than political boundaries.[209] It situates the environmental obligations in the context of this shared marine resource. This firmly places the starting point of ITLOS's analysis in a neighborliness frame.

Neighborliness looks to the correlative nature of rights in a resource community.[210] Correlative rights require property holders collectively to act for the common good in a shared resource community even when they do not have an individual duty to other property holders.[211] Correlative rights require each property holder in a shared resource community to make reasonable use of their property.[212] For example, two neighboring homeowners, Amy and Bob, live in such a resource community. Amy has installed solar panels on her roof and Bob wishes

205. ITLOS Advisory Opinion, *supra* note 63.

206. *Id.* ¶¶ 159–73.

207. *Id.* ¶ 167.

208. *Id.* ¶ 169.

209. *Compare id.*, *with* ILC Prevention, *supra* note 47, at art. 2, cmt. 5.

210. *See* ROSE, *supra* note 23, at 165–89; Carol M. Rose, *Given-Ness and Gift: Property and the Quest for Environmental Ethics*, 24 ENV'T L. 1, 28 (1994); Carol M. Rose, *The Several Futures of Property: Of Cyberspace and Folk Tales, Emission Trades and Ecosystems*, 83 MINN. L. REV. 129, 179 (1998); Monika U. Ehrman, *Hidden Resources*, 13 U.C. IRVINE L. REV. 563, 609 (2023); Schremmer, *supra* note 24, at 38–42; David E. Pierce, *Carol Rose Comes to the Oil Patch: Modern Property Analysis Applied to Modern Reservoir Problems*, 19 PENN. ST. ENV'T L. REV. 241, 243–45 (2011); Dyal-Chand, *supra* note 21, at 612–17; *see also* Frédéric G. Sourgens, *Cyber-Nuisance,* 42 U. PA. J. INT'L L. 1005 (2021). The idea of correlative rights is common to many legal systems around the world and not just the common law. Importantly, there remain remnants of a torts view of neighborliness in the work of the International Law Commission. ILC Prevention, *supra* note 47, at art. 10, cmt. 10. For example, the International Law Commission considers that prevention as neighborliness is an extension of the "polluter pays" principle. *Id.* at General cmt. 3, art. 3, cmt. 15. Rather than paying for pollution, an operator must pay to prevent it. As an ounce of prevention is worth a pound of cure, both states are ostensibly better off for it. *Id*. at General cmt. 2. Still, a close reading of the draft articles suggests that prevention as neighborliness remains a matter of responsibility and wrongfulness. *Id*. at art. 1, cmt. 6 ("Equally, it is to be understood that non-fulfilment of the duty of prevention at any event of the minimization of risk under the articles would not give rise to the implication that the activity itself is prohibited. However, in such a case *State responsibility could be engaged* to implement the obligations, including any civil responsibility or duty of the operator." (emphasis added)). The International Law Commission therefore here appears to reintroduce rather than resolve the problem. As outlined in this section, there is a better conceptual path available that is in fact capable of resolving the conceptual problem in question.

211. For a theoretical appraisal of correlative rights, *see* Frédéric Sourgens, *Bundles of Freedom*, 76 RUTGERS L. REV. (forthcoming 2025).

212. *See* sources cited *supra* note 210.

to build a second-floor additional dwelling unit that would block Amy's sunlight. Both Amy and Bob have a facial ownership right to add to their home (solar panels and a second-floor additional dwelling unit). They just cannot both effectively do it.[213] Once Amy has installed and registered her solar panels, it would be unreasonable for Bob to use his property to deprive Amy of her existing investment.[214] If a critical mass of the neighborhood has already installed solar panels, and a critical mass of houses are single-story buildings, it may be unreasonable for Bob to deprive Amy of the ability to install solar panels by building up even if she has not installed them yet.[215]

In the international context, neighborliness as correlative rights posits that when states act in an environmental resource community, in which other states hold "similar rights of an equal rank," each state may not exercise its respective rights unreasonably.[216] Neighborliness here "merely represents an expression of the principle of abuse of rights."[217] It does not create a new tort duty or create a new kind of fault-based responsibility.[218] Correlative rights as respected and fulfilled through the reasonable use of shared resources are thus a viable foundation for prevention.

This leaves the question of why this understanding of neighborliness has fallen dormant. The reason is likely the skepticism expressed by international environmental lawyers that this property-law-based understanding of neighborliness can appropriately address environmental concerns.[219] This criticism asks most trenchantly "[w]hat if the concern to be addressed is actually an *environmental* concern, such that it requires a tailored response, rather than one focused on defending coincidentally affected rights?"[220]

As we will see, this question in many ways leads us into a trap in the climate context. In the climate context, environmental concerns cannot outright trump developmental concerns without undoing core parts of our understanding of energy sovereignty and sovereign equality.[221] This does not in any way mean that climate conservation cannot be a neighborliness imperative. To the contrary, the conservation of the human environment is critical to the fulfillment of human rights and

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213. *See* Kelvin Henry, *Solana Beach Neighbors Upset Over Second-Story ADU that Would Block Ocean View*, NBC SAN DIEGO (Aug. 31, 2023), https://perma.cc/DS7X-R6PG; Felicity Barrenger, *Trees Block Solar Panels, and Feud Ends in Court*, N.Y. TIMES (Apr. 7, 2008), https://perma.cc/V2AE-HSTT.

214. Hannah J. Wiseman, *Localizing the Green Energy Revolution*, 70 EMORY L.J. ONLINE 59, 100 (2021) ("California prohibits trees or other structures from shading solar panels that existed prior to the growth of trees or the building of new structures.").

215. *See* Christopher Serkin, *What Property Does*, 75 VAND. L. REV. 891, 930 (2022) ("Focusing on evolutionary reliance interests, however, suggests a different analysis. A relevant consideration–perhaps the relevant consideration–should be the pace of change in the area.").

216. Handl, *supra* note 21, at 56.

217. *Id*.

218. *Id*.

219. BRUNNÉE, *supra* note 22, at 54–55.

220. *Id.* at 55 (emphasis in original).

221. Friendly Relations Declaration, *supra* note 15; Permanent Sovereignty Declaration, *supra* note 15.

the right to development.[222] Given how critical the climate is for human development, climate conservation is a cross-cutting concern that is strengthened rather than weakened when seen in this holistic context.[223]

The ITLOS advisory opinion on climate change makes more sense when it is seen through this frame. ITLOS rejected that the climate regime (consisting of the UNFCCC, the Kyoto Protocol, the Paris Agreement, and related agreements) constitutes a special authority displacing general international law with more specific legal principles and rules.[224] Rather, different international legal principles must be integrated together to come up with a coherent idea of prevention informed by the whole of international law.[225] It is for this reason that ITLOS can speak both of stringent due diligence obligations concerning climate and allow that "its implementation may vary according to States' capabilities and available resources."[226] This limitation only makes sense when one considers the developmental constraints and imperatives under which states find themselves. Sadly, here the decision did not elaborate further by looking to the human rights regime as a source to understand how a state should deploy its limited capabilities and available resources.[227] Still, ITLOS's logic plainly suggests that such an approach would be fully consistent with its reasoning.

Far from being a weakness, the holistic focus of correlative rights helps us to resolve the property line problem in a way that is both more environmentally ambitious and economically pragmatic than a torts-based understanding of prevention. The property line problem stated that one state could not exercise jurisdiction over the energy policy choices of another when those policy choices do not directly transfer noxious substances from one to the other.[228] Sovereign equality and permanent sovereignty over natural resources stood in the way because a state's pursuit of its own energy policy to support the economic development of its people was at the heart of a state's sovereign prerogative.[229]

A correlative rights-based understanding shifts the pieces of sovereign equality, energy sovereignty, development, and environmental conservation into a different picture. This picture allows a more ambitious understanding of prevention as

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222. *See* International Covenant on Economic, Social and Cultural Rights, Dec. 16, 1966, 993 U.N.T. S. 3, art. 12(2)(b) [hereinafter ICESCR].

223. Scholars like Jutta Brunée have expressed skepticism that such a view of prevention would make environmental prevention merely a coincidence of non-environmental rules. BRUNNÉE, *supra* note 22, at 55. I disagree on this point. Environmental prevention instead is embedded in a broader framework of different legal rules working in tandem with each other. This approach appears at the heart of the ITLOS decision on prevention, given its integration of multiple international legal regimes including international environmental law, climate law, and law of the sea regimes. *See* ITLOS Advisory Opinion, *supra* note 63, ¶¶ 197–258.

224. ITLOS Advisory Opinion, *supra* note 63, ¶ 224.

225. *Id.*

226. *Id.* ¶ 241.

227. Desierto, *supra* note 80.

228. *See* discussion *supra* section II.B.

229. *Id.*

conservation of a shared resource as opposed to simply the narrow prevention of transboundary harm. Thus, "[t]he ecological unity of the planet does not correspond to political boundaries. In carrying out lawful activities within their own territories, States have impacts on each other."[230] These impacts, when aggregated, can threaten a regional or even a planetary ecosystem as a whole, as climate change does now.

When impacts threaten a shared ecosystem as a whole, the point is not that the activities lead to an unfair distribution of benefits of economic activity to some (economic activity from a smelter) and environmental burdens on others (sulfur dioxide fumigations).[231] The point is rather that economic development premised on the use of the shared ecosystem will come to a cataclysmic halt for all when the ecosystem collapses due to overuse. It is thus not an impermissible exercise of jurisdiction by any state to insist that its neighbors use the shared environment in a manner that does not completely destroy it. Such use by a neighbor is unreasonable because it destroys the future realization of the right to development for each and all members of the resource community, including its own.[232]

Here, the neighborliness frame demands significantly more than the delictual frame: States can, and have a right to, expect a reasonable use of resources and capabilities by all other states towards the protection and maintenance of a resource they share even if an unreasonable use of that resource is not wrongful.[233] The long-term conservation of developmentally critically shared ecosystems like the climate *as such* is an overriding imperative of a correlative rights-based understanding of prevention.

Basic correlative property law relationships illustrate this point. Assume I own property on the foot of a hill. I may not use my property to deprive my uphill neighbors of subjacent support and bring the hill crashing down on my property.[234] Such a use of property would constitute an impermissible complete waste of the resource community.[235] It is impermissible not because denying subjacent support to my neighbor is negligent. It is impermissible because it unreasonably uses a shared resource (the hill itself).

At the same time, correlative rights-based prevention is also more economically pragmatic than a wrongfulness-based perspective because it is respectful of the energy system choices made by states. As we will see in detail in the next section, how prevention is fulfilled and respected depends on community standards and the actions of each state.[236] It does not impose external constraints on these choices or pre-determine what path a state must take.

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230. ILC Prevention, *supra* note 47, at art. 2, cmt. 5.
231. Trail Smelter (U.S. v. Can.), III U.N. Rep. Int'l Arb. Awards 1905, 1963–65 (1938).
232. It is thus also domestically impermissible. *See* ICESCR, *supra* note 222, at arts. 2(1), 12(2)(b).
233. *See* ITLOS Advisory Opinion, *supra* note 63, ¶ 241.
234. John G. Sprankling, *Property Law for the Anthropocene Era*, 59 ARIZ. L. REV. 737, 746 (2017).
235. Righetti & Schremmer, *supra* note 26, at 623.
236. *See* discussion *infra* section IV.B.

In the energy context, community standards create value chains (energy solutions and supply chains to put them into wide application) and value chains reflect community standards.[237] As these value chains strengthen, they gain new participants due to price competitiveness and resilience of energy outcomes.[238] These value chains are themselves a direct reflection of global community standards.[239] We can add to these value chains, for example, by insisting they incorporate smokestack technology to support the environmental sustainability of existing energy systems.[240] We can subsidize value chain functions to provide a critical mass of users to launch value chains.[241] What we cannot do in a correlative rights perspective is deem any one value chain impermissible, as such.[242] We can only demand that it be adjusted to meet ecological ends and create additional energy value chains to compete for market share with it.

This means that prevention is not a wrecker of economic systems to save ecological ones. It does not demand shock therapy.[243] Rather, it pragmatically works within existing community standards and helps to shape them. As these community standards respond to environmental demands, they will provide opportunities that themselves will lead to shifts in conduct. Prevention thus trusts in a bottom-up, joint governance of shared resources rather than the imposition of a top-down mandate as to how ecosystems are to be conserved. It does so through the concept of reasonable use developed in the next section.

B. REASONABLE USE OF THE CLIMATE SYSTEM

The fundamental idea of correlative rights is reasonable use.[244] As I will outline in this section, reasonable use can be broken down into four factors: a substantive

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237. *See* SOURGENS & SEMPERTEGUI, *supra* note 39, at 27–30 (summarizing the idea of energy value chains in the energy transition context).

238. *See* NICOLA DE BLASIO & DEREK ZHENG, HARV. KENNEDY SCH. BELFER CTR., THE FUTURE OF ENERGY VALUE CHAINS IN THE TRANSITION TO A LOW-CARBON ECONOMY 33–34 (2023), https://perma.cc/U78P-867T.

239. *See* STATHIA BAMPINIOTI ET AL., MCKINSEY & CO., BUILDING RESILIENT SUPPLY CHAINS FOR THE EUROPEAN ENERGY TRANSITION (Oct. 2022), https://perma.cc/2E83-TT34 (discussing how community standards create business opportunities). These business opportunities once realized become "sticky" because they cause path dependencies thus informing community standards in turn.

240. This is the approach taken by the Biden administration in the power sector with its proposed rule to replace the Clean Power Plan following West Virginia v. EPA, 597 U.S. 697 (2022). *See* Ethan G. Shenkman et al., *EPA Unveils Sweeping New Power Plant Emissions Rule Relying on Carbon Capture and Storage and Hydrogen Technologies*, ARNOLD & PORTER (May 18, 2023), https://perma.cc/5ANC-KPJF.

241. Renewable portfolio standards and feed in tariffs did just that for wind and solar electricity generation. Shelley Welton, *The Bounds of Energy Law*, 62 B.C. L. REV. 2339, 2361–66 (2021).

242. For a cogent critique of such calls, *see* Monika U. Ehrman, *A Call for Energy Realism: When Immanuel Kant Met the Keep It in the Ground Movement*, 2019 UTAH L. REV. 435 (2019).

243. *See* STÉPHANIE BOUCKAERT ET AL., INT'L ENERGY AGENCY, NET ZERO BY 2050: A ROADMAP FOR THE GLOBAL ENERGY SECTOR PATHWAY TO KEEP THE 1.5˚C GOAL IN REACH 102 (2021), https://perma.cc/2G7A-XF5X.

244. *See* Righetti & Schremmer, *supra* note 26, at 631.

factor, a procedural factor, a functional factor, and a financial factor. Together, these factors require immediate and sustained action to conserve the climate system, no matter whether any greenhouse gas emissions by any state at any point in time were internationally wrongful. A correlative rights perspective therefore can also address the water glass problem posed by climate change.[245]

1. The Substantive Meaning of Reasonable Climate Use

Reasonable use requires affirmative cooperation between members of a resource community to protect the shared resource, and thus the resource community, as a whole.[246] Members of a resource community must take affirmative steps to protect and conserve the shared resource for reasonable future use.[247] This substantive obligation is proactive rather than reactive.[248] It requires affirmative upkeep rather than merely desisting from doing harm.[249]

This, again, is consistent with the approach laid out in the ITLOS advisory opinion on climate change. ITLOS noted that "the duty to cooperate is reflected in and permeates the entirety of Part XII of the Convention."[250] Quoting the IPCC, ITLOS continued that "[e]ffective mitigation will not be achieved if individual agents advance their own interests independently. Collective responses, including international cooperation, are therefore required to effectively mitigate GHG emissions and address other climate change issues."[251] When ITLOS "requires a State with greater capabilities and sufficient resources to do more than a State not so well placed," this must include the duty to cooperate.[252] The obligation to protect the marine environment is proactive rather than reactive, consistent with the understanding of correlative rights I advance here.

Such cooperative conservation of the shared resource is not premised on an idea of rectifying or even avoiding wrongful conduct.[253] It is premised on an idea of sharing benefits and burdens within the resource community.[254] Each co-sovereign or property owner must do their part to protect the resource community as such going forward.[255]

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245. *See* discussion *supra* section II.B.

246. Mfrs.' Gas & Oil Co. v. Ind. Nat. Gas & Oil Co., 57 N.E. 912, 915 (Ind. 1900); Palmer v. Mulligan, 3 Cai. 307, 313–14 (N.Y. Sup. Ct. 1805); ROSE, *supra* note 23, at 179, 186; Kramer & Anderson, *supra* note 25, at 913–14; JAMES KENT, COMMENTARIES ON AMERICAN LAW 571 (George F. Comstock ed., 11th ed. 1867); ELINOR OSTROM, GOVERNING THE COMMONS: THE EVOLUTION OF INSTITUTIONS FOR COLLECTIVE ACTION 82–86 (1990). For further discussion of this aspect of reasonable use in property law, *see* Sourgens, *supra* note 211.

247. *See* sources cited *supra* note 213.

248. *Id.*

249. *Id.*

250. ITLOS Advisory Opinion, *supra* note 63, ¶ 297.

251. *Id.* (quoting Intergovernmental Panel on Climate Change, Climate Change 2014: Synthesis Report 17 (2014)).

252. *Id.* ¶ 241.

253. *See* sources cited *supra* note 213.

254. *Id.*

255. *Id.*

Understood, the first reasonable-use factor provides a different way of understanding the substantive element of prevention. In a slight shift in focus from the traditional understanding of prevention, it does not merely aim to "prevent significant transboundary harm or at any event to minimize the risk thereof" as codified in the *ILC Draft Articles on Transboundary Harm*.[256] Rather, it affirmatively seeks to respect, conserve, and support a shared environmental or resource community. The correlative version of prevention becomes fully proactive (conserve the resource community) compared to the more reactive formulation of the *Draft Articles*.[257] In doing so, it better fulfills the object of prevention as distinguished from a duty not to do harm at the heart of the *Draft Articles* themselves.[258]

The shift in focus from reactive prevention to proactive conservation is consistent with the principle of neighborliness. States must be mindful of the consequences of seemingly purely domestic policies because they each inhabit a shared resource community that can only be maintained through mutual cooperation.[259]

As will become clear in the context of the next three reasonable-use factors, the obligation to conserve a shared environmental or resource community is not an inflexible *a priori* obligation. It rather involves two steps, both familiar from human rights law, that will be fleshed out more fully in the remaining three reasonable-use factors.

First, states have an obligation to respect the environment they share with other states.[260] "Respect," given the context of how most emissions come to be made, broadly means that states must "guarantee conformity of their laws and policies regarding corporate activities with" the environmental rights of their neighbors.[261] This conformity requires that the relevant laws in their application must "ensure that companies demonstrate due diligence" with regard to potential negative impacts.[262] The classic international environmental law cases involved

256. ILC Prevention, *supra* note 47, at art. 3; Stockholm Declaration, *supra* note 110, at princ. 21.

257. *See* sources cited *supra* note 213.

258. *See* ILC Prevention, *supra* note 47, at art. 1, cmt. 6; *see also* Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, 1996 I.C.J. 226, 242 (July 8) (noting "[T]he general obligation of States to ensure that activities within their jurisdiction and control respect the environment of other States or of areas beyond national control is now part of the corpus of international law relating to the environment.").

259. Handl, *supra* note 21, at 56; *see also* de Chazournes & Campanelli, *supra* note 202; ILC Prevention, *supra* note 47, at art. 4; Stockholm Declaration, *supra* note 110, at princ. 24; *Rio Declaration*, *supra* note 202, at princs. 7, 17, 18, 27; Trail Smelter (U.S. v. Can.), III U.N. Rep. Int'l Arb. Awards 1905, 1963–65, 1977–80 (1938); Pulp Mills on the River Uruguay (Arg. v. Urug.), Judgment, 2010 I.C.J. 14, 56, 91–101 (Apr. 20); Construction of a Road (Nicar. v. Costa Rica), Judgment, 2015 I.C.J. 665, 706–07 (Dec. 16).

260. *Nuclear Weapons*, 1996 I.C.J. at 242.

261. U.N. Committee on Economic, Social, and Cultural Rights, Statement on the Obligations of States Parties regarding the Corporate Sector and Economic, Social, and Cultural Rights, ¶ 4, U.N. Doc. E/C.12/2011/1 (2011). For a discussion, *see* DIANE A. DESIERTO, PUBLIC POLICY IN INTERNATIONAL ECONOMIC LAW: THE ICESCR IN TRADE, FINANCE, AND INVESTMENT 287 n.104 (2015).

262. *See* Statement on the Obligations of States Parties regarding the Corporate Sector and Economic, Social, and Cultural Rights, *supra* note 261.

allegations that the respondent state had failed in one way or another to meet the obligation to respect.[263]

The first reasonable-use factor insists that this "respect" does not exhaust prevention. Second, states have an additional obligation to *fulfill* the continued sustainability of the shared resource community as also recognized in *Pulp Mills*.[264] As an obligation to fulfill, the state has some discretion as to how to prioritize its achievement; the state only has an obligation to progressively fulfill multiple rights, each of which can create inconsistent resource strains on states in the short term.[265] How that discretion should be exercised in the context of actions that by their very nature affect an entire resource community is subject to the next three reasonable-use factors.

Applying the first factor to the climate context is reasonably straightforward. All states live in a climate community connected through a global climate system.[266] As noted by the IPCC, "[r]isks and projected adverse impacts and related losses and damages from climate change will escalate with every increment of global warming (*very high confidence*). They are higher for global warming of 1.5˚C than at present, and even higher at 2˚C (*high confidence*)."[267]

We can now preliminarily conclude what a correlative understanding of climate prevention requires in substance. The obligation to fulfill climate prevention means that states must affirmatively facilitate the progressive achievement of at least a 1.5˚C world.[268] The obligation of states to respect the shared environment, in turn, requires states to act diligently towards this goal (as discussed in the next section in the procedural reasonable-use factor).[269] As the ITLOS advisory opinion clarifies, states have a substantive obligation to act diligently towards a shared objective (prevention). How that diligence occurs is a procedural obligation; that it must be attempted is a substantive obligation of result in its own right.[270] This understanding of the substance of prevention is widely consistent with constitutional jurisprudence like that of the German constitutional court in *Neubauer* and the development of the climate regime itself.[271] Critically, there is no preference for any one approach to energy governance. Rather, the policy space for decisionmakers

263. *Trail Smelter*, III U.N. Rep. Int'l Arb. Awards at 1963–65; *Pulp Mills*, 2010 I.C.J. at 31; *Construction of a Road*, 2015 I.C.J. at 680.

264. *Pulp Mills*, 2010 ICJ at 49, 54, 56.

265. CHRISTIAN TOMUSCHAT, HUMAN RIGHTS: BETWEEN IDEALISM AND REALISM 142 (3d ed. 2014).

266. IPCC 2023, *supra* note 6, at 46.

267. *Id.* at 15.

268. *Compare Pulp Mills*, 2010 I.C.J. at 56, *with* IPCC 2023, *supra* note 6, at 15.

269. *Compare* Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, 1996 I.C.J. 226, 242 (July 8), 1996 I.C.J. at 242, *with* IPCC 2023, *supra* note 6, at 15.

270. ITLOS Advisory Opinion, *supra* note 63, ¶ 238.

271. Bundesverfassungsgericht [BVerfG] [Federal Constitutional Court] Mar. 24, 2021, 157 Entscheidungen des Bundesverfassungsgerichts [BVerfGE] 270 (2021) (Ger.); Paris Agreement, *supra* note 33, at art. 4(2); Glasgow Climate Pact, *supra* note 33, ¶¶ 21–22; Stocktake, *supra* note 9, ¶ 27.

allows them to draw on any combination of energy solutions so long as their choice remains consistent with the obligation to fulfill climate prevention.

2. The Procedural Meaning of Reasonable Climate Use

Reasonable use requires members of a resource community to diligently exploit the shared community without waste.[272] Diligence is guided by community standards.[273] It is cognizant of relevant shifts in community standards.[274] Its result itself creates community practice in the course of conduct adopted by a diligent state that must be taken into account in future diligence by third states.[275] Reasonable use develops and supports the formation of standards from within the resource community that facilitate such shared, waste-minimizing resource use.[276]

Such reasonable use necessarily requires coordination.[277] Coordinated use, in turn, is reasonable if it allows the maximum *joint* enjoyment of the resource by correlative rightsholders, as opposed to enjoyment that allocates access to only some and burdens to only others.[278] Certainly, actual benefits and burdens eventually will be unevenly distributed. What matters is that all are afforded a meaningfully fair opportunity to enjoy the shared resource.[279]

The second reasonable-use factor provides a different way of understanding the procedural element of prevention compared to how it has traditionally been articulated. The correlative rights perspective focuses more directly on the proposed use of the shared resource and its impact on the environmental community. The resource must be diligently employed to avoid waste and ascertain a fair opportunity for all to participate in their employment.[280] The correlative rights perspective

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272. *See* Coastal Oil & Gas Corp. v. Garza Energy Tr., 268 S.W.3d 1, 6 (Tex. 2008); Lightning Oil Co. v. Anadarko E&P Onshore, LLC, 520 S.W.3d 39, 43–53 (Tex. 2017); Righetti & Schremmer, *supra* note 26, at 627 ("The waste principle requires a tenant to act reasonably to maintain property to the extent that the value it realizes through neglect is outweighed by the utility it could pre-serve through diligence."). I disagree with the position advanced by Righetti & Schremmer when they submit that "[m]oreover, waste doctrine only prevents subtractive harms; it does not impose a duty to improve property. As a result, waste alone may not keep up with disruptive and rapidly compounding challenges like climate change." *Id.* at 676. The obligation to preserve the climate system already flows from the logic of "subtractive harms"—be it in the inverse, that is, climate systems are harmed not by subtraction of a resource but by the addition of greenhouse gases. Yet, the deterioration of the climate system as a whole is a subtractive harm to that system. When viewed holistically, correlative rights (the preservation of which the doctrine of waste performs a weightbearing function) therefore precisely can deal with challenges such as climate change.

273. ROSE, *supra* note 23, at 181; *see* Tyler v. Wilkinson, 24 F. Cas. 472, 474 (C.C.D.R.I. 1827) (No. 14,312).

274. Serkin, *supra* note 215, at 930.

275. *See* Dyal-Chand, *supra* note 21, at 628.

276. ROSE, *supra* note 23, at 181; *see Tyler*, 24 F. Cas. at 474; OSTROM, *supra* note 246, at 42–45.

277. *See* ROSE, *supra* note 23, at 180.

278. For a slightly different catalogue, *see* ROSE, *supra* note 23, at 180.

279. Schremmer, *supra* note 24, at 34.

280. *See* ROSE, *supra* note 23, at 180–81; Righetti & Schremmer, *supra* note 26, at 627; Schremmer, *supra* note 24, at 34; Stockholm Declaration, *supra* note 110, at princ. 5; *Rio Declaration*, *supra* note 202, at princ. 4.

requires coordination (and thus communication) from the outset, no matter whether there is possible harm caused by the activity.[281] Correlative rights holders coordinate their efforts to stabilize resource use consistent with evolving community standards.[282] A correlative rights approach requires more than notification and exchange—it requires coordination of use.[283]

The second reasonable-use factor also provides a yardstick from past resource use to determine the sufficiency of current diligence.[284] It therefore provides a dynamic and self-correcting measure for environmental protection.[285] *Pulp Mills* required states to take all available means at the disposal of the relevant state.[286] The ITLOS advisory opinion provides a similar definition of "stringent diligence."[287] To determine what means are at the disposal of states, we look to community standards within the relevant resource community and coordinate the improvement of resource use through bottom-up governance and exchange.[288] Rather than providing an abstract duty to use "all available means" or to act with "stringent diligence," a correlative rights understanding explains what reference point to use to establish the sufficiency of diligent conduct. Importantly, if we take such a path, the functional, the developmental reasonable-use factor interacts with this procedural reasonable-use factor as discussed below.[289]

The procedural reasonable-use factor also can be applied straightforwardly to the climate context. Both the obligations of states to respect their shared climate and to fulfill the conservation of the climate systems established in the substantive reasonable-use factor require states to address atmospheric greenhouse gases.[290] This creates a problem akin to the exploitation of an exhaustible resource like a carbon budget.[291] Present and future greenhouse gas emissions, when added to the existing stock of emissions already in the atmosphere, threaten the collapse of our shared climate system.[292] States therefore must coordinate and cooperate with each other to protect the climate system as a whole going forward, irrespective of whether the

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281. *See* sources cited *supra* note 280.

282. *Id.*

283. ILC Prevention, *supra* note 47, at arts. 7, 8(1); *Rio Declaration*, *supra* note 202, at princ. 17.

284. *See Serkin, supra* note 215, at 930.

285. *See id.*

286. Pulp Mills on the River Uruguay (Arg. v. Urug.), Judgment, 2010 I.C.J. 14, 56, (Apr. 20); Construction of a Road (Nicar. v. Costa Rica), Judgment, 2015 I.C.J. 665, 706–07 (Dec. 16).

287. ITLOS Advisory Opinion, *supra* note 63, ¶ 241.

288. Trail Smelter (U.S. v. Can.), III U.N. Rep. Int'l Arb. Awards 1905, 1964 (1938) (The U.S. Supreme Court "found that the practice complained of was general along the shores of the Mississippi River at that time, that *it was followed by Missouri itself* and that thus a standard was set up by the defendant which the claimant was entitled to invoke." (citing Missouri v. Illinois, 200 U.S. 496, 521 (1906) (emphasis added)).

289. *See* discussion *infra* section IV.B.3.

290. *See* discussion *supra* section IV.B.1.

291. *Compare* Stockholm Declaration, *supra* note 110, at princ. 5, *with* IPCC 2023, *supra* note 6, at 82.

292. IPCC 2023, *supra* note 6, at 15.

past use of the climate system by states was in any meaningful sense wrongful, by burdening the climate system with only their fair share of the remaining carbon budget.[293]

To do so, states must both communicate about their respective use of the climate system and coordinate improvement of their use of the climate system. They must coordinate how to achieve a net reduction of emissions.[294] Ideally, they further should coordinate how to reduce the existing stock of greenhouse gases.[295]

Such a reduction of greenhouse gas emissions can be achieved in three ways. States can change greenhouse gas *inputs* into the climate system.[296] The replacement of coal-fired plants with nuclear and renewable generation is one means to achieve this end.[297] Further, the electrification of transportation, or in the alternative, hydrogen-based transportation, has been held out as yet another means of reducing the hydrocarbon reliance of economic value chains.[298]

Similarly, states can reduce net emissions by limiting the *output* of greenhouse gases from existing energy, industrial, and transportation systems.[299] It is possible to remove CO_2 from high concentration points (like power plant smokestacks) with a technology called carbon-capture-utilization-and-storage (CCUS).[300] It is also in principle possible to remove CO_2 present in low concentrations from ambient air.[301] Further, there is research exploring the removal of CO_2 from the tailpipes of vehicles.[302] If CO_2 can be removed, no change to existing energy systems would be needed to meet climate goals.[303]

Finally, emissions can be reduced by combining both methods in a hybrid approach.[304] This approach combines all available technologies where it makes sense, for example, increasing the penetration of renewable energy in energy systems and capturing CO_2 at the source of existing coal-fired power plants.[305]

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293. *See* sources cited *supra* note 246.

294. *See* IPCC 2023, *supra* note 6, at 46.

295. *Id*. at 23.

296. *Id.* at 21.

297. MICHAEL E. WEBBER, POWER TRIP: THE STORY OF ENERGY 246 (2019).

298. DANIEL YERGIN, THE NEW MAP: ENERGY, CLIMATE AND THE CLASH OF NATIONS 327–346 (2020); MARCO ALVERA, THE HYDROGEN REVOLUTION, A BLUEPRINT FOR THE FUTURE OF CLEAN ENERGY 160–88 (2021).

299. IPCC 2023, *supra* note 6, at 21.

300. Eli Kintisch, *Technologies*, *in* CLIMATE ENGINEERING AND THE LAW 28, 41–45 (Michael Gerrard and Tracy Hester eds., 2018).

301. *Id*.

302. Abdullah Al-Dossary, *Taking Carbon Capture on the Road*, ARAMCO (Mar. 29, 2022), https://perma.cc/JR5Q-8Y4S.

303. Damian Carrington & Ben Stockton, *COP28 President Says There Is 'No Science' Behind Demands for Phase-Out Of Fossil Fuels*, THE GUARDIAN (Dec. 3, 2023), https://perma.cc/D3E3-ZAJ4. The Guardian's headline places the comments by Sultan Al Jaber in a decidedly unfair light. He noted that an output model could, in principle, meet climate goals, something that is at least as true as the suggestion that a hydrocarbon-free world can meet energy, transportation, industrial and agricultural needs. *See* IPCC 2023, *supra* note 6, at 21.

304. *See* SOURGENS & SEMPERTEGUI, *supra* note 39, at 27–30.

305. *Id.*

In the climate system, there is no difference between the three approaches. The IPCC noted in its 2023 synthesis report, "[g]lobal modelled mitigation pathways reaching net zero CO_2 and GHG emissions include transitioning from fossil fuels without carbon capture and storage (CC[U]S) to low- or zero-carbon energy sources, such as renewables or fossil fuels with CC[U]S, demand-side measures and improving efficiency, reducing non-CO_2 GHG emissions, and CDR."[306] As noted by the IPCC, renewables are essentially equivalent to fossil fuels with CCUS for purposes of meeting climate goals.[307]

This means that states are free to follow any hybrid approach. They may combine net emission reductions by any means they can realistically achieve: CCUS, greater reliance on non-fossil fuel systems, etc.[308] Such an approach allows the greatest short-term emission reduction gains while holding energy supply at least constant, as it does not need to replace global energy value chains wholesale or all at once.[309]

As states diligently consider and coordinate their own respective use of the climate system, and which hybrid pathway to choose, they must establish a fair share of their continued use consistent with their obligation to respect the shared climate system and fulfill the ultimate climate conservation goal.[310] This fair share is informed by community standards, for example, the reductions and commitments made by other participants in the shared climate system. It is further informed by other applicable environmental law principles like the principle of "common but differentiated responsibility." If a state did not act diligently to establish and meet its fair share of emissions reductions, its conduct would create a waste.[311] It would be this waste—as opposed to the emission of greenhouse gases in its own right—that could potentially violate the climate prevention obligation.[312]

The procedural reasonable-use factor is firmly embedded in the architecture of climate consensus-building following the Paris Agreement. The Paris Agreement itself is premised upon achieving the substantive well-below-2˚C goal by means of setting community standards through nationally determined contributions.[313] These contributions indicate how much each state is willing to reduce its use of the shared climate system by reducing greenhouse gas emissions.[314] These contributions expressly may follow a hybrid approach.[315] Nationally-determined contributions are publicly reported and intended to create a community standard

306. IPCC 2023, *supra* note 6, at 21.
307. *Id*.
308. *Id*.
309. For a discussion, *see* Frédéric G. Sourgens, *Diligent Zero*, 75 SMU L. REV. 417 (2022).
310. *See* discussion *supra* section IV.B.1.
311. *See* sources cited *supra* note 272.
312. *Id.*
313. Paris Agreement, *supra* note 33, at art. 4(2).
314. *Id.* at art. 4(1).
315. *See id*. ("a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases").

through mutual reliance.[316] This community standard is further intended to increase in ambition over time.[317]

The *Glasgow Climate Pact* increased the ambition and community standards to support it. As noted, the *Glasgow Climate Pact* moved the object of climate prevention fulfillment from well-below 2˚C to 1.5˚C and recognized that this goal required the achievement of net zero CO_2 emissions around mid-century.[318] The *Glasgow Climate Pact* continued to endorse a hybrid approach to emissions reductions, leaving the choice of specific pathways to each state according to its respective position.[319] The *Glasgow Climate Pact* also made progress in meeting the substantive climate prevention goals. Before the conclusion of the *Glasgow Climate Pact*, "approximately 150 countries submitted new or updated nationally determined contributions" with the majority of them "reduc[ing] emissions further than the initial NDCs they replaced."[320] The *Glasgow Climate Pact* invited states to further update their nationally-determined contributions to close the achievement gap that remained.[321] This received some uptake, if not sufficient uptake, to secure fulfillment of the 1.5˚C climate prevention goal outright.[322]

The *Stocktake* expresses the significant progress that the Paris architecture has been able to achieve.[323] It moved the world "from an expected global temperature increase of 4˚C according to some projections prior to the adoption of the Agreement to an increase in the range of 2.1–2.8˚C with the full implementation of the latest nationally determined contributions."[324] It noted in this regard "that 87 per cent of the global economy in terms of share of gross domestic product is covered by targets for climate neutrality, carbon neutrality, greenhouse gas neutrality or net zero emissions, which provides the possibility of achieving a temperature increase below 2˚C when taking into account the full implementation of those strategies."[325]

Still, as the *Stocktake* notes, this progress is insufficient to fulfill climate prevention and achieve a close-to-1.5˚C world.[326] It therefore called for further mitigation efforts including "[t]ransitioning away from fossil fuels in energy systems,

316. *Id.* at arts. 4(9), (12); Frédéric G. Sourgens, *Climate Commons Law, The Transformative Force of the Paris Agreement*, 50 N.Y.U. J. INT'L L. & POL. 885, 915–44 (2018).

317. Paris Agreement, *supra* note 33, at art. 4(3).

318. Glasgow Climate Pact, *supra* note 33, ¶¶ 21–22.

319. *Id.* ¶ 36.

320. Taryn Fransen et al., *5 Ways the Glasgow Climate Pact Aims to Reduce Greenhouse Gas Emissions*, WORLD RES. INST. (Mar. 10, 2022), https://perma.cc/5XY8-JXRH.

321. *Id.*; Glasgow Climate Pact, *supra* note 33, ¶ 24.

322. India is the main party to have been moved towards submission of an NDC by this call though its NDC was already announced (though not formally submitted) at Glasgow. *See* Fransen, *supra* note 320; CLIMATE ACTION TRACKER, MID-YEAR UPDATE: DESPITE GLASGOW CLIMATE PACT, 2030 CLIMATE TARGET UPDATES HAVE STALLED (June 2022), https://perma.cc/RWS9-TTX4.

323. Stocktake, *supra* note 9, ¶ 18.

324. *Id*.

325. *Id*. ¶ 20.

326. *Id*. ¶¶ 24–25.

in a just, orderly and equitable manner."[327] The *Stocktake* thus shows that the procedural reasonable-use factor is capable of driving real prevention outcomes.[328] The outcomes thus far suggest that states as a general rule have met their climate prevention obligations to respect their shared climate community.[329] It also highlights the remaining challenges ahead—challenges that require a deeper engagement with the relationship between climate prevention and development.

3. The Functional, Developmental Dimension of Reasonable Climate Use

Reasonable use requires that members of a resource community must at all times strive to secure resource uses that support basic human capabilities over uses that displace them.[330] The function of reasonable use is to realize human development through the coordinated use of shared resources.[331] Two global, canonical correlative rights cases illustrate this reasonable-use factor: *Spur Industries* (Arizona) and *Ata Textile Co.* (Israel).[332] In *Spur Industries*, a developer of residential properties sued a pre-existing feedlot owner for creating a smell nuisance.[333] In *Ata Textile Co.*, a resident of a residential neighborhood sued a nearby textile factory in an industrial neighborhood for creating a noise nuisance through its nighttime operations.[334] Both plaintiffs won.[335] What both cases have in common is the understanding that basic human needs, such as shelter, are more important than economic production when economic production can be moved so as not to interfere with those basic human needs.[336]

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327. *Id.* ¶ 28.

328. *Id.* ¶ 18.

329. *Id.* The 2.1°C figure would suggest a potential approximate of the original fulfillment goal. It thus suggests an honest engagement by states in passing laws that cause significant emission reductions.

330. Basic human capabilities refer, for example, to life, bodily health, bodily integrity (including shelter), thought, imagination and reason, be part of a community, play, and environmental agency. MARTHA C. NUSSBAUM, CREATING CAPABILITIES: THE HUMAN DEVELOPMENT APPROACH 33–34 (2011). The U.N. Development Programme has adopted a version of Nussbaum's capabilities theory in its work. S. R. OSMANI, UNITED NATIONS DEVELOPMENT PROGRAMME HUMAN DEVELOPMENT REPORT, THE CAPABILITY APPROACH AND HUMAN DEVELOPMENT 3, 16 (2017), https://perma.cc/7GYE-5S9C.

331. Sourgens, *supra* note 211.

332. Spur Indus., Inc. v. Del E. Webb Dev. Co., 494 P.2d 700 (Ariz. 1972); CivA 44/76 Ata Textile Co. v. Schwartz, 30(iii) P.D. 785 (1976) (Isr.). *Spur Industries* is often a core part of the 1L property law curriculum. *See* JESSE DUKEMINIER ET AL., PROPERTY 747 (10th ed. 2022); THOMAS MERRILL ET AL., PROPERTY: PRINCIPLES AND POLICIES 970 (4th ed. 2022); JOHN CRIBBET ET AL., PROPERTY: CASES AND MATERIALS 685 (9th ed. 2007). On the canonical status of *Ata Textile Company*, as well as the history of Israeli law and its relationship to the common law of nuisance, *see* Aharon Barak, *The Codification of the Civil Law and the Law of Torts*, 24 ISR. L. REV. 628, 642 n.86 (1990) (discussing the paradigmatic nature of the case); Ronen Perry, *Law of Torts*, *in* THE ISRAELI LEGAL SYSTEM 87, 109 (Christian Walter et al. eds., 2019).

333. *Spur Industries,* 494 P.2d at 705.

334. David Kretzmer, *Judicial Conservativism v. Economic Liberalism: Anatomy of a Nuisance Case*, 3 ISR. L. REV. 298, 304 (1978).

335. *Id.*; *Spur Industries*, 494 P.2d at 705–08.

336. *See* sources cited *supra* note 335.

The third reasonable-use factor explains how international environmental law prevention fulfills the right to development. It again provides a shift of focus to the traditional balancing of interests associated with the harm prevention principle. For example, the *ILC Draft Articles on Transboundary Harm* provide for balancing of risk when states consult on preventative measures to be taken in case an activity gives rise to a significant risk of transboundary environmental harm.[337] Development is one factor in such balancing and includes "the importance of the activity, taking into account its overall advantages of a social, economic and technical character for the State of origin in relation to the potential harm for the State likely to be affected."[338] Otherwise, developmental concerns are pointedly demoted beneath environmental ones throughout the official commentary to the draft articles.[339]

Here, the third reasonable-use factor provides a much-needed adjustment to the other factors: A corrective that is much more in line with the jurisprudence of the International Court of Justice. *Pulp Mills* in particular links prevention to an overall objective of using shared natural resources to achieve sustainable development.[340] So understood, prevention embodies the "interconnectedness between equitable and reasonable utilization of a shared resource and the balance between economic development and environmental protection that is the essence of sustainable development."[341] In other words, neither environmental nor economic concerns may trump the other in the name of prevention.[342] They must be *integrated* with each other.[343]

As noted above, the ITLOS advisory opinion on climate change is broadly consistent with such an approach. However, it falls short by failing to carry its approach through to its logical conclusion. Despite noting the importance of integration of different areas of law in the climate context, the ITLOS advisory

337. ILC Prevention, *supra* note 47, at art. 9(2).

338. *Id.* at art. 10(b).

339. *See, e.g.*, *id.* at art. 3, cmts. 11–18. Centrally, Comment 13 to Article 3 notes that "The economic level of States is one of the factors to be taken into account in determining whether a State has complied with its obligation of due diligence. But a State's economic level cannot be used to dispense the State from its obligation under the present articles." *Id*. at art. 3, cmt. 13. This comment directly concerns references to sustainable development in the Stockholm and Rio Declarations. Most directly, it quotes Principle 11 of the Rio Declaration that "Environmental standards, management objectives and priorities should reflect the environmental and developmental context to which they apply." *Id.* at art. 3, cmt. 10. What is missing completely from the draft articles is an understanding that development may change priorities reflecting the developmental context of a state. This elision—and the prioritizing of environmental concerns as if they should always be prioritized no matter developmental context—is perhaps one of the unfortunate side-effects of cognitive bias in the context of international legal fragmentation.

340. Pulp Mills on the River Uruguay (Arg. v. Urug.), Judgment, 2010 I.C.J. 14, 74 (Apr. 20); Nicholas S. Bryner, *Never Look Back: Non-Regression in Environmental Law*, 43 U. PA. J. INT'L L. 555, 564 (2022).

341. *Pulp Mills*, 2010 I.C.J. at 75; *see also* Stockholm Declaration, *supra* note 110, at princs. 8, 11; *Rio Declaration*, *supra* note 202, at princs. 4, 8, 12.

342. *Pulp Mills*, 2010 I.C.J. at 74–75.

343. *Id.*

opinion excludes human rights from its scope of prevention.[344] A fuller view integrates human rights. Such a fuller view restores needed policy space to states while holding them to achieving external, measurable benchmarks: human rights outcomes. The third reasonable-use factor therefore is meaningfully additive to understanding the requirements of "stringent" diligence in the climate context.[345] Particularly, it explains how we should think about the deployment of available resources to address climate change.

The recently adopted *U.N. Convention on the Right to Development* sheds additional light on how sustainable development can integrate a human rights lens into a climate prevention principle. The Convention defines the right to development in Article 4(1).[346] It provides that every person is "entitled to participate in, contribute to, and enjoy civil, cultural, economic, political and social development that is indivisible from and interdependent and interrelated with all other human rights and fundamental freedoms."[347] Article 4(2) adds that "[e]very human person and all peoples have the right to active, free and meaningful participation in development and in the fair distribution of benefits resulting therefrom."[348]

The Convention specifies that "development must be achieved in its three dimensions, namely, economic, social and environmental, in a balanced and integrated manner and in harmony with nature."[349] Policies must always be capable of, and work towards, the full progressive realization of the right to development along all three dimensions (even if they may not fully realize the right to development along all three dimensions immediately).[350] Logically, this means that "the right to development cannot be realized if development is unsustainable."[351]

Under the Convention, states must realize the right to development "in a balanced and integrated manner," meaning the right to development does not prioritize any of its dimensions.[352] To be consistent with the principle of development, prevention similarly may not prioritize any dimension of development.[353] The Court in *Pulp Mills* agreed with this proposition.[354]

The Convention gives the authority as to how the right to development is to be fulfilled, and how its different dimensions are to be balanced, to each state as a matter of its self-determination.[355] In choosing its own path, each state may not

344. Desierto, *supra* note 80.

345. ITLOS Advisory Opinion, *supra* note 63, ¶ 241.

346. Human Rights Council, Revised Draft Convention on the Right to Development with Commentaries, art. 4(1), cmt. 1, U.N. Doc. A/HRC/WG/2/23/2/Add.1 (2022) [hereinafter UN Development Convention], https://perma.cc/8VMZ-J4DV.

347. *Id*. at art. 4(1).

348. *Id*. at art. 4(2).

349. *Id*. at art. 3(g).

350. *Id*.

351. *Id*.

352. *Id*.

353. *Id*.

354. Pulp Mills on the River Uruguay (Arg. v. Urug.), Judgment, 2010 I.C.J. 14, 75 (Apr. 20).

355. UN Development Convention, *supra* note 346, at art. 5(1), art. 5(1), cmt. 1.

undermine the rights of others (including extraterritorially).[356] Rather, states have an obligation to "cooperate with each other in ensuring development and eliminating obstacles to development, encouraging full observance and realization of all human rights."[357]

The functional reasonable-use factor can also be applied straightforwardly to the climate context. At this stage, it is reasonably likely that the world will overshoot the 1.5˚C climate goal.[358] This overshoot is particularly likely because departing abruptly from existing energy systems would likely have catastrophic developmental repercussions.[359] Prevention therefore needs to be able to handle such an overshoot scenario. And if a state burdens the climate system with more than its share of the remaining climate budget in the short term, this is likely to lead to an overshoot scenario beyond a 1.5˚C world.[360] Given obligations to communicate about climate use, information about whether such an overshoot scenario becomes likely should become available in near-real time.[361]

There are two consequences from such an overshoot scenario for this understanding of prevention. First, it may be that the state nevertheless has acted consistently with its obligation to respect the shared climate system. It would do so if it acted consistent with community standards; that is, if it acted diligently and consistently with the efforts of other peer and non-peer states in reducing emissions. Yet, even in such a scenario, the obligation to fulfill a return to a 1.5˚C world remains unaffected.[362] It instead "require[s] additional deployment of carbon dioxide removal, compared to pathways without overshoot, leading to greater feasibility and sustainability concerns."[363]

Still, reference to community standards to assert that one has respected the shared climate through one's emissions efforts is not endlessly flexible. As the *U.N. Convention on the Right to Development* makes clear, one state's development policy may not come at the expense of undermining the development in a different state.[364] As each state considers its own ability to reduce its net impact on climate systems, it must take into account that unabated catastrophic losses,

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356. *Id.*

357. *Id.* at art. 8(2); *see also* G.A. Res. 51/229, art. 5(1), Convention on the Law of the Non-Navigational Uses of International Watercourses (July 8, 1997). For a discussion, *see* Salman M.A. Salman, *Equitable and Reasonable Utilization and the Obligation Against Causing Significant Harm-Are They Reconcilable?*, 115 AM. J. INT'L L. UNBOUND 183 (2021).

358. *The Evidence is Clear: The Time for Action is Now. We Can Halve Emissions by 2030*, IPCC (Apr. 4, 2022), https://perma.cc/2QEG-3T6T ("It is almost inevitable that we will temporarily exceed this temperature threshold but could return to below it by the end of the century.").

359. *See* VACLAV SMIL, POWER DENSITY: A KEY TO UNDERSTANDING ENERGY SOURCES AND USES 244–45, 254–55 (2015).

360. IPCC 2023, *supra* note 6, at 23.

361. MAHMOUD ABU ZEID ET AL., CLIMATE KNOWLEDGE FOR ACTION 68 (2011), https://perma.cc/QY5Q-738U.

362. *See* discussion *supra* section IV.B.1.

363. IPCC 2023 SUMMARY FOR POLICYMAKERS, *supra* note 40, at 23.

364. UN Development Convention, *supra* note 346, at art. 5(1), cmt. 1.

such as the complete loss of territory by some states due to climate change, are not an acceptable outcome from the perspective of sustainable development and the right to development.[365] The victims of such catastrophic losses would be deprived of a meaningfully fair opportunity to enjoy the shared climate resource.[366] Such a result is fundamentally inconsistent with an obligation to respect mandated by the second reasonable-use factor, and the obligation to choose pathways consistent with the right to development mandated by the third reasonable-use factor.[367]

This means that, second, overshoot scenarios can be consistent with both the obligation to respect the shared climate and the obligation to fulfill climate conversation in limited circumstances only. When states submit that their own development policies require emissions that will result in a global overshoot, this has a facially impermissible negative impact on the development of third parties.[368] These third parties (people and states) now stand to suffer catastrophic consequences from climate change due to the overshoot.[369]

This engages the duties to cooperate to protect the very people and states in question against these catastrophic losses in two ways. Cooperation requires all states to assist as much as possible to avoid overshoot scenarios through climate finance and contribution to mitigation efforts, as discussed in the next section. Even such full cooperation is nevertheless highly likely to lead to overshoots given the time needed to build energy systems and energy value chains.[370]

To the extent that cooperation cannot realistically avoid an overshoot, the duty to cooperate additionally (and just as importantly) requires all states to protect people and states against catastrophic losses from climate change through adaptation.[371] There are many technologically-available means to address many of the most catastrophic impacts of climate change.[372] They require resources, technology transfer, and capacity building to deploy.[373] At a minimum, this requires a solid climate finance regime aimed at achieving adaptation outcomes.[374]

The world community as a whole shares in this primary responsibility of cooperation.[375] It is grounded not in culpability, but in neighborliness and shared

365. For a discussion of the very real threats to statehood and peoples, *see* Michael B. Gerrard, *Statehood and Sea-Level Rise: Scenarios and Options*, 17 CHARLESTON L. REV. 579 (2023).

366. *See* Schremmer, supra note 24, at 34.

367. *Id.*

368. UN Development Convention, *supra* note 346, at art. 5(1), cmt. 1.

369. *See* IPCC 2023, *supra* note 6, at 23.

370. *See* Sourgens, *supra* note 309.

371. UN Development Convention, *supra* note 346, at art. 13(2).

372. MATTHEW E. KAHN, ADAPTING TO CLIMATE CHANGE, MARKETS AND MANAGEMENT OF AN UNCERTAIN FUTURE 60–94 (2021).

373. *Id*.

374. UN Development Convention, *supra* note 346, at art. 13, cmt. 5. As I discuss elsewhere, such financial contributions are insufficient. Cooperation requires a deeper economic, social, and cultural cooperation beyond climate finance. *See* FRÉDÉRIC G. SOURGENS, GOVERNING THE GLOBAL ENERGY COMMONS (forthcoming 2025).

375. UN Development Convention, *supra* note 346, at art. 13(2).

resource use.[376] At the same time, states that have disproportionately burdened the carbon budget have an additional obligation in this regard given their contribution to the climate overshoot.[377] Again, even this additional obligation is not a matter of wrongfulness. Rather, it is a matter of abating the consequences of shared use. Even with such adaptation measures in place, states must still endeavor to correct the overshoot scenario. Adaptation alone is not enough. Additional corrective measures to remedy the overshoot are similarly required. These corrective measures must abate the overshoot itself and fulfill the conservation of climate systems at a 1.5˚C increase.[378] These corrective measures necessitate further investment in, and development of, carbon capture technology as the reduction of global temperatures will require a net reduction of CO_2 in the atmosphere.[379]

Climate prevention therefore does not prohibit overshoot scenarios so long as states act to protect vulnerable states and people. This makes sense considering the effort that energy transition entails. As states grapple with their obligation to fulfill climate conservation, they are also subject to the significant consequences of the energy transition itself. Decarbonization does not occur in a vacuum. Rather, it occurs in the context of shared energy systems in which states are similarly correlative rightsholders.[380] These shared energy systems, in turn, feed the real economy and economic growth potential around the world.[381]

As the *U.N. Convention on the Right to Development* makes clear, sustainable development must integrate and balance the "three dimensions, namely, economic, social and environmental" development.[382] Given the stickiness of energy systems, this means that states must have a safety valve to focus on economic and social development to finance environmental development.[383] *Pulp Mills* reminds us that environmental concerns must be balanced against economic ones.[384] Neither set of environmental or economic rights locks us into a suicide pact that prevents the progressive realization of both.[385] Overshoot scenarios are the likely consequence of this reality.[386] So long as they are corrected and vulnerable states and people are protected by those capable of protecting, this result does not contravene the obligation of climate prevention.

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376. Handl, *supra* note 21, at 56; *see also* de Chazournes & Campanelli, supra note 202.

377. UN Development Convention, *supra* note 346, at art. 5(1), cmt. 1.

378. *See supra* section IV.B.1.

379. Frédéric G. Sourgens, *Geo-Markets*, 38 VA. ENV'T L.J. 58, 61–62 (2020).

380. Frédéric Gilles Sourgens, *A Parisian Consensus*, 60 COLUM. J. TRANSNAT'L L. 657, 703–14 (2022).

381. *Id*.

382. UN Development Convention, *supra* note 346, at art. 3(g).

383. Sourgens, *supra* note 380.

384. Pulp Mills on the River Uruguay (Arg. v. Urug.), Judgment, 2010 I.C.J. 14, 75 (Apr. 20).

385. UN Development Convention, *supra* note 346, at art. 3(g).

386. *See The Evidence is Clear*, IPCC, *supra* note 358, https://perma.cc/75KC-K6XK ("Even if we do this, it is almost inevitable that we will temporarily exceed this temperature threshold but could return to below it by the end of the century.").

The development-centered reasonable-use factor is firmly embedded in the architecture of climate consensus-building following the Paris Agreement. The Paris Agreement itself confirms that the purpose of climate action—the function of reasonable climate use—is the right to development. Its preamble expressly recognizes that climate action should "respect promote and consider . . . the right to development" as an organizing principle.[387] This principle is carried forward throughout the entire structure of the Paris Agreement. The climate goals agreed to in Article 2(1) of the Paris Agreement are agreed to "in the context of sustainable development."[388] The operative mitigation measures under Article 4 of the Paris Agreement must be undertaken by Paris Agreement parties "on the basis of equity, and in the context of sustainable development and efforts to eradicate poverty."[389] Sustainable development further is made expressly part of the adaptation response codified in Article 7.[390] The Paris Agreement, in other words, adopts a climate prevention approach that is consistent not with a delictual understanding of prevention but with a correlative rights understanding of climate prevention.

The *First Global Stocktake* links climate action even more closely to its developmental purpose. It endorses a fully participatory approach to climate action that echoes the definition of the right to development in the *U.N. Convention on the Right to Development*.[391] It further notes that "time frames for peaking [of greenhouse gas emissions] may be shaped by sustainable development, poverty eradication needs and equity and be in line with different national circumstances."[392] The *First Global Stocktake* is therefore inconsistent with a one-size-fits-all approach to decarbonization because of the different developmental needs of Paris Agreement parties.

The developmental purpose thus sheds additional light on the decarbonization approach embraced by the *First Global Stocktake*. Thus, as noted above, the *First Global Stocktake* calls on the Paris Agreement parties to "[t]ransition[] away from fossil fuels in energy systems, in a just, orderly and equitable manner."[393] This call should not be misunderstood as a call for a complete global phase-out of fossil fuels (and thus a one-size-fits-all input solution to climate change mitigation). Instead, the *Stocktake* also calls for "accelerating . . . abatement and removal technologies such as carbon capture and utilization and storage, particularly in hard-to-abate sectors."[394] The choice of which approach to take

387. Paris Agreement, *supra* note 33, at art. 1 Clause 11.
388. *Id.* at art. 2(1).
389. *Id.* at art. 4(1).
390. *Id*. at art. 7(1).
391. *Compare* UN Development Convention, *supra* note 346, at art. 4(1), *with* Stocktake, *supra* note 9, ¶ 9.
392. Stocktake, *supra* note 9, ¶ 26.
393. *Id.* ¶ 28(d).
394. *Id.* ¶ 28(e).

emains sensitive to the "different national circumstances, pathways and approaches" of Paris Agreement parties.[395]

All told, the first three reasonable-use factors of climate prevention endorse a hybrid approach to decarbonization. This hybrid approach looks to build multiple carbon-neutral energy systems with a far greater market share for non-fossil-fuel energy systems (nuclear, renewables, and industrial use of nuclear power instead of coking coal) alongside fully abated fossil fuel systems. The fulfillment of climate prevention ultimately leads to a net zero world within a 1.5˚C warming goal after a likely overshoot.[396] Respect for the climate system requires states to choose their own pathway consistent with their specific economic, social, and environmental developmental context.[397] When this approach leads to the fulfillment of the 1.5˚C goal after an overshoot scenario, all states must jointly protect vulnerable people and states against the consequences of an overshoot through robust adaptation support.[398] Any solution that demands even more ambitious climate mitigation is not consistent with the correlative rights understanding of climate prevention. Neither is an approach that mandates a particular technological solution to meet energy demand. Both fail to satisfy such an approach because it would constitute an unintended abuse of rights by privileging climate rights over other, equal, and developmentally dispositive entitlements.

4. The Financial Dimension of Reasonable Climate Use

Reasonable use requires resource community members to consider sharing the financial burdens from the radical change in community standards equitably, particularly when some community members receive an apparently disproportionate economic benefit and others an apparently disproportionate economic burden from change. *Spur Industries* again is the canonical U.S. case for this reasonable-use factor.[399] The *Spur Industries* court accepted that the displacement of agricultural use (a feedlot) for the benefit of residential use improved the property community.[400] The court nevertheless required the residential developer to pay for the move of the feedlot.[401] Ordering the feedlot to move imposed an economic burden on the feedlot owner. In turn, the real estate developer received an economic benefit due to the higher prices they could achieve for selling residential properties in the area.[402] The feedlot owner would have carried the entire burden except that it incurred

395. *Id*. ¶ 28.

396. *Id*. ("deep, rapid and sustained reductions in greenhouse gas emissions in line with 1.5˚C pathways"). Such an overshoot is expressly linked to "sustainable development, poverty eradication needs and equity." *Id*. ¶ 26.

397. UN Development Convention, *supra* note 346, at art. 3(g).

398. *Id.* at art. 5, cmt. 1.

399. Spur Indus., Inc. v. Del E. Webb Dev. Co., 494 P.2d 700, 707 (Ariz. 1972).

400. *Id*. at 708.

401. *Id*.

402. *See id.* at 705–08.

significant costs in developing the feedlot that was reasonable when it was made.[403] The real estate developer would have received an economic benefit precisely because the feedlot owner could not recover their costs. Here, the economic benefits and burdens of changing community standards were disproportionate.

In the energy context, the feedlot owner is analogous to the use of traditional energy systems in the developing world. Under the UNFCCC regime, the developing world has no climate mitigation obligation and therefore is entitled to continue using existing energy systems to further its own economic development.[404] The developer is analogous to states with a mitigation obligation seeking to displace existing energy uses globally.

The fourth reasonable-use factor is closely connected to the third and explains how international environmental law prevention distributes the financial benefits and burdens of prevention. It again provides a shift of focus to the traditional contribution to costs associated with the harm prevention principle. For example, as noted in the context of the third reasonable-use factor above, the traditional approach in the *ILC Draft Articles on Transboundary Harm* in Article 10 provides for balancing of risk when states consult on preventative measures to be taken in case an activity gives rise to a significant risk of transboundary environmental harm.[405] Sharing of costs is one factor in such balancing and includes "the degree to which the State of origin and, as appropriate, the State likely to be affected are prepared to contribute to the costs of prevention."[406] The focus of the *ILC Draft Articles on Transboundary Harm* on this point remains steadfastly delictual. As the comments to the provision explain, "if the States likely to be affected are prepared to contribute to the expense of preventive measures, it may be reasonable, taking into account other factors, to expect the State of origin to take more costly but more effective preventive measures."[407] The comments go on to caution that, "this, however, should not underplay the measures the State of origin is obliged to take under these articles" given "the basic policy of the so-called polluter-pays principle."[408] In other words, contribution is a minor factor given that the person who does wrong must bear the remedial consequences of such wrongful conduct.[409]

The correlative-rights perspective takes a fundamentally different and cooperative approach. It does not look purely to the environmental outcomes to be achieved (like the removal of "pollution" in our feedlot example).[410] Rather, it integrates the appreciation of environmental outcomes in a broader balance of the

403. *See id*.
404. BODANSKY, *supra* note 106, at 127.
405. ILC Prevention, *supra* note 47, at art. 9(2).
406. *Id.* at art. 10(d).
407. *Id.* at art. 10, cmt. 9.
408. *Id.* at art. 10, cmts. 9-10.
409. *Id.*
410. *See* Spur Indus., Inc. v. Del E. Webb Dev. Co., 494 P.2d 700, 705–08 (Ariz. 1972).

economic, social, and environmental dimensions of development: it sees that environmental outcomes create a dislocation and impose undue financial burdens on some (the feedlot owner) while allowing others to reap financial windfalls (the real estate developer) and corrects for this distributive outcome.[411] In doing so, it follows the principle of sustainable development codified in the *U.N. Convention on the Right to Development*.[412]

This perspective is particularly important because a purely environmental perspective risks undermining the right to development on this point. Article 4(2) of the *U.N. Convention on the Right to Development* requires that "[e]very human person and all peoples have the right to active, free and meaningful participation in development and in the fair distribution of benefits resulting therefrom."[413] The "fair distribution of benefits" from development requires one to bear in mind dislocations from development policies along all three dimensions of development (economic, social, and environmental).[414] When environmental policies create economic dislocation that distributes benefits and burdens of the dislocation unfairly, the right to development requires community members to contribute equitably to the cost of environmental improvement that ultimately benefits all.

The *U.N. Convention on the Right to Development* underlines that this result does not rely upon just one state. Rather, it is an obligation of cooperation between states. States must "cooperate with each other in ensuring development and eliminating obstacles to development, encouraging full observance and realization of all human rights."[415] The unfair global distribution of benefits and burdens created by the domestic developmental policies of some states has the potential to create the very 'obstacles,' which cooperation pursuant the U.N. Convention on the Right to Development obligates states to eliminate.[416]

The focus on contribution in a correlative-rights-based understanding of prevention looks to place the obligation to contribute to climate prevention holistically. It requires that those benefited financially by the new state of affairs share their financial benefit fairly by contributing to the cost of prevention appropriately.[417] It thus does not look to who pollutes.[418] Instead, it looks to make sure that far-reaching policy interventions in fact equitably distribute the burdens of the intervention also from the perspective of who benefits financially from the very interventions in question.[419]

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411. *Id*.
412. UN Development Convention, *supra* note 346, at art. 3(g).
413. *Id.* at art. 4(2).
414. *Id*. at art. 3(g).
415. *Id*. at art. 8(2).
416. *Id.*; *see also id*. at art. 5(1), cmt. 1.
417. *See* Spur Indus., Inc. v. Del E. Webb Dev. Co., 494 P.2d 700, 705-08 (Ariz. 1972).
418. ILC Prevention, *supra* note 47, at art. 10, cmt. 10.
419. More technically, my point is that, in some circumstances, the "polluter pays" principle looks a lot like a Kaldor-Hicks approach to distributive justice. The environmental benefits of course inure to all, including the "polluter." At the same time, there are disproportionate distributions of economic

Counterintuitively, this holistic approach can better secure environmental outcomes than the traditional understanding of prevention. The traditional understanding of prevention excuses underperformance of environmental outcomes for developing states (at least to a limited extent).[420] A correlative rights understanding seeks to compensate for such underperformance through contribution by better-positioned states. It does so not just by seeking mutual assistance to build more environmentally-friendly facilities and processes (though it does that, too).[421] Rather, it seeks to construct a world economy in which states can compete on the basis of relative advantage by lifting developing states to the innovation frontier quickly rather than treating them exclusively as resource depots and sweatshops to supply economies at the innovation frontier.[422] Done right, environmental protection is a kind of "lagging indicator" of an overall fairer world economy: We no longer offload environmental burdens as an employment creation tool but rather create a broader base of participants at the global innovation frontier.[423] The holistic approach of prevention as neighborliness lifts environmental outcomes by improving cooperation on economic and social development thus shortening the "lag time" of building an overall fairer world.

The financial reasonable-use factor can also be applied straightforwardly to the climate context. Global efforts to mitigate climate change require climate finance.[424] Under the original architecture of climate treaties, only certain states, known as UNFCCC Annex I countries, had an obligation to mitigate climate change.[425] Non-Annex I countries did not have such obligations under the principle of common but differentiated responsibility.[426] Climate negotiations since 2009 have changed this dynamic.[427] Particularly, under the Paris Agreement, non-Annex I countries make

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burdens and benefits in the real economy that operate quite distinct from the fact of pollution itself. Justifying these economic distributive outcomes from the prevention principles thus again sound like a Kaldor-Hicks approach that allows distributive outcomes because greater efficiencies allow those negatively affected by a new distribution to, in principle, be compensated with room to spare. *See, e.g.*, BINYAMIN APPELBAUM, THE ECONOMISTS' HOUR: FALSE PROPHETS, FREE MARKETS, AND THE FRACTURE OF SOCIETY 189 (2019). This distributive approach does not function in a right to development informed perspective precisely because it creates benefits through legal intervention that are then not distributed fairly but are allowed to be fall where they may.

420. ILC Prevention, *supra* note 47, at art. 3, cmt. 13.

421. UN Development Convention, *supra* note 346, at art. 13, cmt. 5.

422. *See* AGHION, *supra* note 19, at 173–93 (discussing the importance of the innovation frontier in energy transition); CARLOTA PEREZ, TECHNOLOGICAL REVOLUTIONS AND FINANCIAL CAPITAL, THE DYNAMICS OF BUBBLES AND GOLDEN AGES 65, 85 (2003) (discussing the tendency of economies at the innovation frontier to export obsolete technology to developing economies to maximize end of life profits).

423. *See* Brigham Daniels et al., *Just Environmentalism*, 37 YALE L. & POL'Y REV. 1, 41 (2018) (suggesting that environmental protection done wrong imposes social justice harms).

424. Stocktake, *supra* note 9, ¶¶ 66–100.

425. BODANSKY, *supra* note 106, at 122.

426. *Id*.

427. ALEXANDER ZAHAR, CLIMATE CHANGE FINANCE AND INTERNATIONAL LAW 72 (2016).

contributions to mitigate climate change alongside Annex I countries.[428] They have done so in the expectation, and against the promise, of climate finance to support these efforts.[429] This, again, is broadly consistent with the ITLOS advisory opinion on climate change.[430]

The correlative rights perspective goes further than this now-traditional climate finance paradigm by looking not just at climate finance through an environmental lens (climate mitigation) but more broadly through a developmental lens. Through this lens, it is reasonably straightforward to see that at least all non-Annex I countries find themselves in a reasonably similar position to the Arizona feedlot owner in *Spur Industries*.[431] They have made significant investments in infrastructure that is valuable only in the context of a hydrocarbon energy paradigm.[432] Further, they have invested in participating in the energy value chains, which make up the hydrocarbon energy paradigm.[433] Finally, they have built their entire economic system on the assumption that this paradigm would have significant longevity.[434] That is, states have made investments in, and built up, value chains at a time and in a manner that—as in the context of our feedlot owner—made it prudent to do so.

Climate prevention measures now threaten to render valueless the very investments made by these states. Annex I countries continue to propose initiatives that increase the cost of use of the existing hydrocarbons paradigm, for example by increasing the cost of capital for oil, gas, and coal projects.[435] This in turn affects the supply of those basic raw materials which in turn can increase prices.[436] States that require feedstock for their traditional energy infrastructure now may need to pay more for the requisite materials even though their investment in the relevant energy infrastructure was prudent when made.[437] This is not a purely financial matter, but one with broad socio-economic consequences. South Africa, for instance, heavily relies on coal and coal-fired power.[438] If employment from

428. *See* Paris Agreement, *supra* note 33, at art. 4(2).

429. *See id.* at art. 9(3); BODANSKY, *supra* note 106, at 240–41.

430. ITLOS Advisory Opinion, *supra* note 63, ¶ 336.

431. *See* Spur Indus., Inc. v. Del E. Webb Dev. Co., 494 P.2d 700, 705–08 (Ariz. 1972).

432. For a discussion of India as a case in point on energy transition, *see* YERGIN, *supra* note 298, at 407–10.

433. *Id*.

434. *Id*.

435. *See* von Bernstorff, *supra* note 37. For a critical analysis of EU efforts on this front, *see* Jakub Bednarek, *Is the EU Realizing an Externally Just Transition?*, EUR. J. INT'L L.: TALK! (Oct. 31, 2022), https://perma.cc/VB84-YGXA.

436. *See* von Bernstorff, *supra* note 37. Diminishing supply, in principle, increases price under the laws of supply and demand.

437. *See* YERGIN, *supra* note 298, at 407–10.

438. *See Coal Production in South Africa and Major Projects*, MINING TECHNOLOGY (last updated Aug. 23, 2024), https://perma.cc/VF58-SUXU.

coal mining and coal-fired power were to disappear before being replaced by other industries, South Africa would face significant economic hardship.[439]

At the same time as incumbent energy systems are coming under strain due to ostensible climate prevention measures, there is an economic boom in other forms of energy generation like renewables.[440] This economic boom is driven by innovation and innovation rents.[441] With a few exceptions, the economic boom from this new energy paradigm and the new energy value chains takes place far away from the non-Annex I countries in question.[442] What is more, ostensible climate prevention measures aim to re-onshore industry to Annex-I countries and thus further increase the economic scissoring effect of some present climate policies.[443]

A correlative rights perspective deems such an outcome impermissible because it unfairly distributes benefits and burdens from climate prevention measures. The increasing cost of now-disfavored energy value chains is offloaded to non-Annex I countries.[444] These costs include frequently significant financing costs to support infrastructure investments and value chain transactions.[445] These financing costs continue to bring economic rents from the very energy value chains in question to Annex I countries.[446] Non-Annex-I countries thereby suffer a disproportionate burden that requires adjustment.

At the same time, there is also a potentially disproportionate benefit from climate prevention. Climate prevention itself creates a marketplace in which all states participate to meet climate goals.[447] This marketplace provides rewards in the trillions of dollars for those who can supply it.[448] The economic beneficiaries

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439. *See* Bernard Kengni, *Transition from Coal to Renewables: Is South Africa Ready?*, UNIV. CAPE TOWN (Feb. 15, 2023), https://perma.cc/7KDZ-X79Y ("Coal mining is of great economic significance to South Africa. The sector accounts for almost 100 thousand jobs as of 2021, and about 72% of the country's energy needs are directly sourced from coal. However, the potential of coal mining activities to stimulate economic growth does not always materialise, especially in areas where the communities surrounding mines tend to remain mining-dependent").

440. *Rapid Progress of Key Clean Energy Technologies Shows the New Energy Economy is Emerging Faster than Many Think*, INT'L ENERGY AGENCY (July 12, 2023), https://perma.cc/JJ5K-N8QS ("As a result, renewables now account for 30% of global electricity generation. Investment in clean energy reached a record USD 1.6 trillion in 2022, an increase of almost 15% from 2021, demonstrating continued confidence in energy transitions even in an uncertain economic climate").

441. Thought leaders from within the EU see first-mover advantages to be exploited as part of these booms. TERZI, *supra* note 31, at 214–25.

442. *See id.; see also* Raf Chomsky, *10 Renewable Energy Companies Making Alternative Energy Sources Widely Available*, SUSTAINABLE REV. (Sept. 19, 2023), https://perma.cc/3WHM-YC4F. The list provides a snapshot of leading renewables companies. It does not account for the broader supply chains.

443. *See* Bednarek, *supra* note 435.

444. Niccolò Manych et al., *Pushed to Finance? Assessing Technology Export as a Motivator for Coal Finance Abroad*, 18 ENV'T RSCH. LETTERS 084028 (2023); PEREZ, *supra* note 422, at 65, 85.

445. For a more detailed discussion, *see* SOURGENS & SEMPERTEGUI, *supra* note 39, at 65–67.

446. *Id.*

447. *See* Paris Agreement, *supra* note 33, at art. 4(2); Liisa Õunmaa, *What are the Socio-Economic Impacts of an Energy Transition?*, UNDP (Aug. 23, 2021), https://perma.cc/2NUE-P53G.

448. LAURA COZZI ET AL., INT'L ENERGY AGENCY, NET ZERO ROADMAP: A GLOBAL PATHWAY TO KEEP THE 1.5˚C GOAL IN REACH 15 (2023) ("The world is set to invest a record USD 1.8 trillion in clean

from this marketplace are not the same people as those burdened by climate prevention.[449] To the contrary, they are likely to be the same parties that benefited from the traditional energy paradigm that is now being displaced or adjusted.[450] There is thus a need to readjust outcomes precisely to make sure that benefits and burdens from climate prevention are fairly distributed.

This distributive problem is more pronounced the more aggressively states and international legal actors push energy transition pathways towards an input approach to energy transition.[451] Such an approach is purposefully destructive of existing energy value chains.[452] It is a shock therapy that provides huge rewards (and assigns huge losses) in a short period of time.[453] This destruction of the existing energy value chain—and their replacement with alternatives—creates a bonanza for some (the "heroes" of renewable energy) and a calamity for some (the supposed "villains" in the oil industry and oil exporting states). A climate prevention paradigm that is anchored in sustainable development cannot let bonanza and calamity fall where they may.[454] Rather, it must ensure that costs and rents from transition are fairly distributed to all.[455]

This distributive problem is less pronounced—though still present—in a more balanced hybrid approach to energy transition.[456] Such an approach more gradually changes energy value chains.[457] It therefore does not impose the same kind of fast and deep disruptions. Yet, it, too, creates economic benefits that are likely to be ill-distributed within states and between states.[458] Climate prevention here too can only remain developmentally conscious (as required by the jurisprudence of the Court and international human rights law) if it corrects for benefits and burdens falling where they may.[459]

The distributive reasonable-use factor is firmly embedded in the architecture of climate consensus-building following the Paris Agreement. The Paris Agreement itself codifies the bargain of climate finance for non-Annex I countries in

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energy in 2023: this needs to climb to around USD 4.5 trillion a year by the early 2030s to be in line with our pathway.").

449. *See* FELICITY HANNON & JAMES NIXON, CAN THE CLEAN ENERGY TRANSITION BOOST GLOBAL GROWTH? 15 (Apr. 2022), https://perma.cc/3HYU-M9ER ("Our scenario analysis suggests the effect of innovation on growth must be fairly punchy to offset the negative supply shock that results from higher carbon prices in a stringent mitigation scenario.").

450. *See* TERZI, *supra* note 31, at 214–25; Chomsky, *supra* note 442.

451. *See supra* section IV.B.2.

452. *See* BOUCKAERT, *supra* note 243, at 102.

453. *See* Sourgens, *supra* note 309, at 430.

454. UN Development Convention, *supra* note 346, at art. 4(2).

455. *Id*.

456. *See supra* section IV.B.2.

457. *Id.*

458. *See* Evie Liu, *Carbon Capture Is Set to Take Off. These Companies are Ahead of the Game*, BARRON'S (Apr. 23, 2023, 8:23 AM), https://perma.cc/H7HD-UJQX. For a discussion of internal disruptions from technological and trade shocks, *see* ABHIJIT V. BANERJEE & ESTHER DUFLO, GOOD ECONOMICS FOR HARD TIMES (2019).

459. UN Development Convention, *supra* note 346, at art. 4(2).

exchange for global climate mitigation efforts in Articles 2, 9, and 11.[460] The *Glasgow Climate Pact* drove home that climate finance is about more than financing energy infrastructure: "financial flows" instead are critical "to ensure just transitions that promote sustainable development and eradication of poverty, and the creation of decent work and quality jobs."[461] The *First Global Stocktake* now has further explained the complementary relationship between these different aspects of climate finance. On the one hand, direct financial support under Article 9 is critical for states to be able to achieve their nationally determined contributions and thus affects the feasibility of the hybrid path chosen by each state to decarbonize.[462] On the other hand, this path is only the first step to supporting climate-resilient global development.[463] Both depend not just on financial support, but also on a transfer of technology that can assist states in affordably and independently achieving both.[464] A just transition is possible only if financial and economic flows support both the implementation of nationally-determined contributions and the larger economic policies toward a climate-resilient development path that follows.

Reasonable use in the end remains firmly communitarian.[465] It creates incentives for a sustainable communion.[466] This means that, in case of radical realignments within a community, a critical mass of community members need to participate to keep the community intact. Such realignments are possible only if every community has a fair opportunity to participate in the upside of change and carries their fair share of the burden.[467] Further, more than just an opportunity, there must also be a broad actual distribution of benefits within the community.[468] This distribution is critical to sufficiently give many community members a reason to continue doing the work of community maintenance and, thus, stability. Short of this, trust within a community erodes—and with that trust erodes the possibility of joint governance of a resource community.[469] The reasonable-use finance factor addresses this distributive dynamic. Given the size of the climate challenge, any breakdown in the world community around a just transition is likely to doom our hope of meeting global climate goals.[470] This factor is

460. *See, e.g.*, Paris Agreement, *supra* note 33, arts. 2(1)(c), 9(2)–(4), 11(1).
461. Glasgow Climate Pact, *supra* note 33, ¶ 85.
462. Stocktake, supra note 9, ¶ 94.
463. *Id.* ¶¶ 70, 90.
464. *Id.* ¶ 101.
465. ALISDAIR MCINTYRE, AFTER VIRTUE 198–99, 260–01 (2d ed. 1984).
466. Encyclical Letter from Pope Francis, *Fratelli Tutti: On Fraternity and Social Friendship*, ¶¶ 91–92, 106 (Oct. 3, 2020), https://perma.cc/WZ4D-WFFY.
467. *See* OSTROM, *supra* note 246, at 103–41.
468. *See* VICTOR DAVIS HANSON, THE OTHER GREEKS: THE FAMILY FARM AND THE AGRARIAN ROOTS OF WESTERN CIVILIZATION 118 (1995).
469. *See* OSTROM, *supra* note 246, at 143–80.
470. Glasgow Climate Pact, *supra* note 33, ¶ 85.

therefore more critical than any in achieving an energy transition by securing a just distribution of its pains and rewards.

It is therefore critical to take seriously the admonition of the *First Global Stocktake* under the Paris Agreement.[471] It "[*h*]*ighlights* the growing gap between the needs of developing country Parties, in particular those due to the increasing impacts of climate change compounded by difficult macroeconomic circumstances, and the support provided and mobilized for their efforts to implement their nationally determined contributions."[472] It goes on to "highlight[] that such needs are currently estimated at USD 5.8–5.9 trillion for the pre-2030 period."[473] Climate prevention is best supported if states embrace the fair distribution of energy transition benefits. Such a fair distribution will "enable[e] conditions to reach the scale of investments required to achieve a global transition towards low greenhouse gas emissions and climate-resilient development."[474] As it stands, the world community is underperforming this factor of climate prevention and places existing efforts in grave peril of falling critically short.[475]

CONCLUSION

My goal in this Article is to reimagine climate prevention. To think of climate prevention as "emissions as wrongfulness" fails. Wrongfulness does not fit our scientific knowledge about how climate change works. And it does not fit the interconnected and fraught history of energy systems and economic globalization.[476] Consequently, greenhouse gas emissions do not fit the traditional understanding of international environmental jurisprudence, nor do consensus-based international climate agreements like the Paris Agreement allow any inference that to permit greenhouse gas emissions is to commit an internationally wrongful act.

I have proposed an alternative to the idea that climate prevention requires us to look at greenhouse gas emissions as wrongful. By returning to the original concept of neighborliness that underpinned early international environmental jurisprudence, I have embedded climate prevention in an understanding of correlative rights in the climate system and reasonable use of the climate system. This correlative-rights-based understanding gives us a far more robust understanding of what it means to fulfill climate prevention obligations than any wrongfulness approach could have: it demands nothing less than the proactive conservation of the global climate system by each and all states.

At the same time, this correlative-rights-based understanding of climate prevention remains pragmatic. Different starting points and different developmental

471. Stocktake, *supra* note 9, ¶ 67.
472. *Id*.
473. *Id.*
474. *Id.* ¶ 70.
475. *See id.* ¶¶ 80, 91.
476. MITCHELL, *supra* note 32; GARAVINI, *supra* note 148.

needs require different pathways to decarbonization. Fossil fuels are not the enemy of climate prevention. Climate prevention fails if we fall into a political clash between proponents for different energy system solutions to climate change problems.[477] Climate prevention succeeds if we look to achieve climate outcomes by combining all tools available to lower the flow of greenhouse gas emissions, reduce the stock of greenhouses in the atmosphere, and stabilize the heating potential of the planet. Energy transition thus means more renewable energy, more nuclear energy, and more carbon capture and other geoengineering.

The lodestar of this version of climate prevention is what it is about. It is about realizing the right to development for all through equitable participation in an innovation-led, globalized world economy. The right to development can balance climate, economic, and social development to achieve a sustainable path forward together. What it does—and what climate prevention must do—is counterbalance rather than destroy, empower rather than rival, and share rather than monopolize. The more people think of energy transition as a one-time realignment of riches and wretches around first-mover advantages, the likelier we are to fail. A development-led climate prevention resolutely seeks to avoid that trap. It is about building fair opportunity for all in a new, 1.5˚C world economy. This fair opportunity is premised on the conviction that with each additional person competing at the innovation frontier from another corner of the globe, we are one step closer to meeting the 1.5˚C mark and that, together, we can improve upon it.

477. CARL SCHMITT, DER BEGRIFF DES POLITISCHEN 8 (1933).