Forthcoming 29 NYU Environmental Law Journal (2021) (conference issue)
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Whatever Works: The Long and Winding Road Toward Climate Action

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This article examines the international climate change regime, its development and future prospects, particularly considering Dick Stewart's evolving view of the climate problem and my own earlier experience as a practitioner (at the Environmental Defense Fund (EDF)). Although I have no formal education in international law or politics, I learned a tremendous amount about these subjects during collaborations with Dick, Bryce Rudyk, Bob Keohane, Annie Petsonk, Scott Barrett, and others. In explaining why progress at the international level to reduce greenhouse-gas emissions has been slow or even retrograde, combining my perspective as a scientist and erstwhile professional environmental activist with that of an administrative law scholar (Dick) leads to a somewhat different emphasis than does international relations theory, with its focus on the problem of free-riding. Hence, I focus on a different range of solutions. I begin with an appraisal of the climate regime based on a thumbnail history that makes no attempt at comprehensiveness.[1]

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[1] Earth has warmed by about one-degree Celsius since the late 19th Century and most of that warming is attributed to the accumulation of human-generated greenhouse gases in the atmosphere, primarily carbon dioxide from fossil fuel combustion and deforestation. Carbon dioxide has a very long lifetime once emitted as it is only slowly removed by natural processes, primarily dissolving in the ocean. A significant portion of emissions already in the atmosphere will remain for a millennium or more regardless of emissions mitigation policy. Artificial means to remove it are theoretically possible but are not yet to be demonstrated as commercially feasible and where to store the removed carbon (underground reservoirs or absorption by minerals on Earth's surface) is contested. Impacts of climate change such as increases in extreme heat, sea level rise, and intensification of precipitation with resulting flooding are already attributable to greenhouse gas emissions and damaging to individuals, ecosystems, and society. Other observed impacts associated with warming include a shift to category 4 and 5 hurricanes, severe drying in some

The Climate Regime[2]

Attempts to develop a mode of international cooperation over climate change began with scientific exchanges dominated by developed countries and grew into a global negotiation in 1991 leading to adoption of the United Nations Framework Convention on Climate Change (UNFCCC) the following year, eventually ratified by nearly every country but which embodies no enforceable obligations. In 1997, the UNFCCC spawned the Kyoto Protocol (KP) which included specific and stringent emissions reduction obligations on developed (but notably, not developing) countries. Subsequently, the tension between countries with and without binding obligations coupled with the ascendancy of China and later India as economic powers in competition with the Organization for Economic Co-operation and Development (OECD) countries as well as rapidly increasing emissions, disrupted the expectation of optimists that the KP would be the first step along a path lined with agreements progressing toward lower global emissions.[3] The KP will provide value, however, as an important experiment in design of various institutional arrangements, including emissions markets.

The US' withdrawal from the KP in 2001 led to reconsideration of the means to obtain international climate cooperation.[4] Stewart and Jonathan Wiener averred that

> It's time for a new, more pragmatic approach. Smart climate policy does not have to choose between extremes. A pragmatic climate policy would balance benefits and costs, heed warnings without being panicked, recognize uncertainty without

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regions with increased risk of wildfire, loss of Arctic sea ice and disintegration of the large ice sheets in Greenland and Antarctica, adding to sea level rise. An acceleration of both warming and these impacts over this century is projected in high-emission scenarios. With an additional warming of as much as 5 degrees expected in this century (dependent on future emissions and other uncertainties), worsening of impact will doubtless occur regardless of policy but much more manageable impacts are foreseen under low-emission than high-emission pathways.

[2] For a history of the international climate regime, see *International climate change law* / Daniel Bodansky, Jutta Brunnée, Lavanya Rajamani. Oxford University Press, Oxford, UK. 2017, chapter 4.

[3] The Collapse of the Kyoto Protocol and the Struggle to Slow Global Warming / David G. Victor. Princeton, NJ : Princeton University Press, [2011] ©2001

[4] The Regime Complex for Climate Change, Robert O. Keohane and David G. Victor *Perspectives on Politics* Vol. 9, No. 1 (March 2011), pp. 7-23

> being paralyzed, employ economic incentives to accomplish results cost-effectively, and learn from experience with regulatory design. It would engage key countries in a new regime parallel to the Kyoto Protocol (or an adaptation of Kyoto led by the EU) that would allow us to test and evaluate international climate regulation over time instead of making an all-or-nothing choice today.[5]

There are echoes here of the authors' 1992 paper that argued for a comprehensive approach with respect to both sources and sectors of greenhouse-gas emissions, and included several perceptive and prophetic insights, e.g., that methane ought to be regulated along with carbon dioxide (CO2) due to the potential for fuel switching (e.g., coal to natural gas) which would increase methane emissions due to leaks in the production, transmission, and distribution system, a very grave concern today.[6] The 2004 article also noted

> The United States and China will not join a serious climate regime without each other. Joint accession by the United States, China, and other developing countries would provide leverage to persuade Europe to fix the flaws in Kyoto as well as establishing greater price stability in the allowance trading market.

The idea of joint action by the two dominant emitters came to fruition in the 2014 bilateral declaration by the US and China, which opened the possibility of success in shaping the Paris Agreement (PA).[7] As it turned out, the idea of leverage on fixing flaws in the KP was superfluous and the PA pathway nudged the Kyoto pathway aside.

As Stewart and Wiener suggested it would, the bilateral declaration stimulated the development of a new type of climate agreement that the US in particular had *not* envisioned as the future of the climate regime when it signed (but did not ratify) the KP - a considerable irony since the emissions allowance system envisioned by the US in the negotiations at Kyoto and opposed by the EU became a primary mode of EU implementation of its KP obligation, as a

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[5] Practical Climate Change Policy,RICHARD B. STEWART and JONATHAN WIENER *Issues in Science and Technology,* Vol. 20, No. 2 (WINTER 2004), pp. 71-78 (8 pages)

[6] RB Stewart and JB Wiener, The Comprehensive Approach to Global Climate Policy: Issues of Design and Practicality, 9 Ariz. J. Int'l & Comp. L. 83 (1992).

[7] see https://obamawhitehouse.archives.gov/the-press-office/2014/11/11/us-china-joint-announcement-climate-change for US-China bilateral and https://obamawhitehouse.archives.gov/the-press-office/2014/11/11/fact-sheet-us-china-joint-announcement-climate-change-and-clean-energy-c for related fact sheet.

means to mitigate the cost of implementation of the EU's relatively aggressive target. However, emissions markets play a decidedly subsidiary role in the PA. Instead, the KP, with its negotiated binding targets for developed countries and exclusion of binding obligations for developing countries provided a model of what parties should seek to avoid as they moved toward a new framework for agreement. The latter began to emerge at the COP-15 held at Copenhagen in 2009[8] and was finalized at COP-21 at Paris in 2015.[9]

The PA embodies key elements that the US and China could agree on, as foreshadowed both by Stewart and Wiener's political analysis and some of their proposed elements of a post-KP accord: the comprehensive approach to regulation encompassing all significant, long-lived greenhouse gases rather than carbon dioxide alone, developing country obligations that each could match to its self-perceived capacity to reduce emissions, and, while no longer a central element, a nod to emissions trading. Notably, Stewart and Wiener's ideal system involved national targets determined by balancing cost and benefits, as opposed to Kyoto's politically-negotiated national targets. The PA rejected both approaches in favor of nationally-determined contributions (targets), the latter a key element of the PA the authors did not anticipate. This approach had the effect of letting Parties do their own cost-benefit calculus, where costs are more broadly defined to include the domestic political calculus of those in power.

Carrots and Sticks

Notably, the Stewart-Wiener proposal makes no mention of either compliance or enforcement of targets and here we arrive at a core element of Stewart's beliefs that arises from the distinction between domestic and international law, providing an opportunity to digress into

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[8] D Bodansky, The Copenhagen Climate Change Conference: A Postmortem. *The American Journal of International Law,* Vol. 104, No. 2 (April 2010), pp. 230-240

[9] D. Bodansky The Paris Climate Change Agreement: A New Hope? *The American Journal of International Law,* Vol. 110, No. 2 (April 2016), pp. 288-319

Stewart's deeper philosophical beliefs.[10] We cannot here do justice to these but other papers in this symposium surely will do so. A very brief summary (with thanks to conversations with Bryce Rudyk) especially relevant to the climate problem is this: government operates best if its role is seen as mediating between interests of individuals, the private sector, and the larger society (which government represents), with obligations spelled out for each. In Dick's primary bailiwick, the domain of domestic administrative law, government has clear powers to compel compliance with regulations and thus government has the potential to be both supreme and effective (if not always cost effective). The Stewart-Wiener vision was based on cost-effectiveness through flexibility, cost-benefit analysis, and an overall set of non-enforced obligations that might satisfy most players who were interested in reining in climate change.

In the real world, two key problems arose. First and foremost, at the time the KP was negotiated, and even seventeen years later when the US and China stepped up to announce their bilateral accord, it was abundantly clear that state-to-state prioritization of the climate problem varied tremendously. It is one thing to argue that, with the 2014 accord, China and the US showed a new willingness to act against greenhouse gases and quite another to say that their commitments to steep, binding, and enforceable emissions mitigation were so strong that each was willing to pay the perceived near-term cost to their economies, face down domestic interests dependent on fossil fuels, and use diplomatic pressure at the highest level to assure that unwilling states would come along anyway. China was serious about reducing carbon dioxide emissions (committing to reach a peak in emissions by 2030) primarily for the sake of the co-benefit of reducing domestic air pollutants like sulfur dioxide and fine particles from coal combustion; slowing climate change was secondary.[11] Among other concerns, it had its own domestic fossil

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[10] *Supra* note 5.
[11] Teng Fei, A view from China, in *Towards a Workable and Effective Climate Regime*

fuel interests in mind, and over the succeeding period, partly satisfied those interests by vastly expanding its lending for construction of new coal-fired power plants elsewhere in Asia. Externally generated emissions would not be a large source of air pollution in China due to their short lifetime, but carbon dioxide emitted anywhere has a warming effect everywhere. Meanwhile, in 2014, the Obama Administration was only willing to go just so far (a 26-28% reduction in emissions by 2025) because several Congressional members of the President's own party regarded climate change as unimportant compared to the needs of their constituents, such as coal miners and others dependent on energy intensive industries. Earlier, the reality of those considerations had helped sink the House-passed Waxman-Markey bill before it came to the Senate floor.[12]

It is usually argued that the key problem of treaty-making is the lack of a central enforcer of international law, a role that neither the UN Security Council nor any state has shown the least willingness to take on in the context of environmental problems. As a result, free-riding becomes an inevitable risk. The challenge for negotiations, as laid out by Scott Barrett, is to reduce this risk through measurement of performance (such as emissions monitoring), specific compliance determinations based on that information, incentives for participation by reluctant states, and credible enforcement powers to deter both non-participation and non-compliance.[13] However, free-riding becomes the main issue only once a number of key states (which, when taken together, have the ability to solve the problem or coerce others to join in doing so) recognize that a problem exists and must be solved, and have generated a domestic political commitment to

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Scott Barrett, Carlo Carraro and Jaime de Melo, eds, A VoxEU.org eBook, 2015, Chapter 6.

[12] Eric Pooley, *The climate war : true believers, power brokers, and the fight to save the earth.* New York : Hyperion, c2010.

[13] S Barrett, Environment and statecraft: the strategy of environmental treaty-making, Oxford : Oxford University Press, 2005, chapter 3.

measures that match the scope of the problem. It is rare that an international agreement is first negotiated at a level of detail and commitment that can be argued would "solve" an important problem and only then that the issue somehow levitates to a high level of domestic concern among key parties. Weak or nonexistent domestic concern usually will not support strong agreements. As important a threat as free-riding is to the effectiveness of treaties, it becomes a crucial factor only once key states decide they can make the case to domestic constituencies that they should act decisively and attempt a cooperative solution.

This is not to say that neither China nor the US by 2014 had much interest in solving the climate problem. Both had considerable interest – China had released a report on the threat of climate change in 2006 as a sort of informal announcement of its belief in the international scientific consensus laid out by the Intergovernmental Panel on Climate Change.[14] The report contained an honest description of the threats climate changed posed to China and discussion of possible policy initiatives. In the US, climate change had been a public issue since 1988 and the public has supported action as a general proposition, but its willingness to pay has remained doubtful. That the US House of Representatives passed strong climate legislation in 2009 is some measure of the issue having gained sufficient domestic support for the US to proceed to reinvigorate international negotiations. Absent demonstration of such a credible level of domestic commitment, it is doubtful that other states would have taken the eventual US position at Paris seriously.

However, American and Chinese levels of commitment, and those of other key states like the EU countries as a whole, were insufficient for them to take the next step to avert free-riding: embed strong participation, compliance, and enforcement provisions in the Paris agreement,

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[14] China's First National Climate Change Assessment, Ministry of Science and Technology (MOST), China Meteorology Administration (CMA), and the Chinese Academy of Sciences, 26 December 2006.

which relies on a "name-and-shame" process of mutual review to encourage states to meet their self-determined commitments and then offer stronger commitments in subsequent periods (beyond the first, ending in 2025). Hence the reality of enforcement under Paris pales in comparison to what is available under domestic administration law. Stewart's skepticism runs even deeper: to paraphrase, I have often heard him ask 'how can parties come to be convinced that the threat of sanctions is credible' even under treaty arrangements that provide incentives for participation and compliance such as the strong trade sanction embodied in the Montreal Protocol on Substances that Deplete the Ozone Layer (MP).[15] 'What assures Parties, including those who may intentionally fail to comply, as well as other states considering whether to join such a compact, that sanctions will actually be implemented in the face of non-participation and non-compliance?' The answer must circle back to the question of how seriously key governments take the issue, what priority it has achieved in a state's evaluation of domestic and international policy and politics, and ultimately, whether the public will support the mutual pain that accompanies, for example, trade sanctions.

The outstanding success of the MP, whose strong trade sanctions pertain explicitly to non-participating states, is often offered as an example of the potential effectiveness of sanctions *and* their credibility when the problem at hand has high priority among key Parties. The perceived threat of sanctions apparently extends to reducing the risk of noncompliance among Parties, as occurred briefly among former Soviet states during the 1990s, but which was resolved relatively quickly. However, a new test of both the priority among key states of protecting the ozone layer and the seriousness of the threat of sanctions looms: direct observations of

[15] S Barrett, Environment and statecraft: the strategy of environmental treaty-making, Oxford : Oxford University Press, 2005, chapter 8. R Benedick, Ozone Diplomacy: new directions in safeguarding the planet. World Wildlife Fund, ©1991, 1998. Chapter (TBD).

atmospheric levels of a banned substance (CFC-11, or Freon-11) indicate illegal production at facilities in China while production of other substances that deplete ozone and are either controlled but not yet banned or not subject to control due to their very short lifetimes, are also growing unexpectedly, all of which threatens to slow the recovery of the ozone layer.[16] China claims it is cracking down on the responsible facilities, but there is as yet no evidence from atmospheric observations of any reduction in the violations. Among the various tensions between central and provincial governments over environmental enforcement, will this particular problem draw sufficient priority from Beijing that it will take steps to solve the problem? How will Beijing balance its domestic political concerns, its international reputation, the threat of sanctions (which are not strictly directed at Parties), and the precedent that its own lack of domestic enforcement might set for other Parties? How will the US government respond, given its wavering support on some aspects of the Montreal Protocol and its current lack of interest in environmental risks in general? Perhaps Stewart's skepticism about the credibility of sanctions, even those that appeared to be self-enforcing,[17] will be shown to be justified.

After Paris

A New Strategy for Global Climate Protection[18]*,* authored by Stewart, Rudyk, and me, was published two years before COP-21, but prefigures a set of solutions to the following puzzle

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[16] MP Chipperfield , R Hossaini, SA Montzka, S Reimann,D Sherry and S Tegtmeier, *Renewed and emerging concerns over the production and emission of ozone- depleting substances*. *Nature Reviews Earth & Environment* volume 1, pages251–263(2020); KM Stanley, D Say, J Mühle, CM Harth, PB Krummel, D Young, SJ O'Doherty, PK Salameh, PG Simmonds, RF Weiss, RG Prinn, PJ Fraser & M Rigby, *Increase in global emissions of HFC-23 despite near-total expected reductions*. *Nature Communications* volume 11, Article number: 397 (2020)

[17] AE Cirone and J Urpelainen,*Trade sanctions in international environmental policy: Deterring or encouraging free riding?* Conflict Management and Peace Science, Volume: 30 issue: 4, page(s): 309-334

[18] RB Stewart, M Oppenheimer, B Rudyk, A new strategy for global climate protection Richard B. Stewart & Michael Oppenheimer & Bryce Rudyk, Climatic Change (2013) 120:1–12; see also Stewart, R.B., Oppenheimer, M. & Rudyk, B. Building blocks: a strategy for near-term action within the new global climate framework. *Climatic Change* **144,** 1–13 (2017) which summarizes a special issue of *Climatic Change* containing various perspectives on this andother bottom-up strategies.

that COP-21 grappled with: increasing concern about climate change among most high-emission states without the issue having achieved top priority status for most; among the same countries, widespread disenchantment with negotiated targets; no taste for strong compliance and enforcement provisions, reflecting both the level of priority placed on the issue and the uncertainty of achieving the substantial emissions reductions that might become a political (as well as scientific) necessity; and a receding commitment to a single, global emissions market in light of the ambiguous track record of the EU phase I experiment (essentially a political failure); as well as more fundamental, longstanding critiques related to equity and transparency. Although elements of the proposal existed and were already functioning, taken as a package, the institutional arrangements in the paper amounted to a new path toward solving the climate problem. Not just states but subnational units, non-governmental organizations (NGOs), and industrial groups would be encouraged to join together, sometimes with governments, sometimes without, to develop a plethora of institutions and arrangements that would have the effect of reducing emissions.

The key aspects of this "building blocks" or "bottom-up" approach tie together the main themes woven through Stewart's philosophical stance, as discussed above, but extended them to the institutions, public and private, existing or hypothetical, that could be envisioned as governing and implementing greenhouse gas reductions. Building new institutions for this purpose was not a new idea and some such effort, like Climate and Clean Air Coalition,[19] was already underway, but the paper combined these ideas into a new pathway by focusing on three key proposals. One such idea is that co-benefits of greenhouse-gas emissions mitigation would provide the main domestic rationale for many governments to agree to international cooperative

[19] see https://www.who.int/news-room/detail/01-01-2020-the-climate-and-clean-air-coalition-(ccac)

arrangements aimed at climate change. The political and economic value of co-benefits had long been clear, as previous scholars and other commentators had forwarded a menu of such co-benefits, including energy efficiency, energy supply security, and mitigation of air pollution. Some had argued to invert the logic of co-benefits, ditch the discussion of climate change, and focus only on the former. What was new in the building blocks was the idea of envisioning co-benefits as the primary driving force toward cooperation on greenhouse-gas mitigation. In fact, a year after publication of the building blocks article, the Chinese-US bilateral of 2014 provided a lived example of the concept's power.

A telling critique, which we first heard from Scott Barrett, is that co-benefits arising from building block institutions would produce little more in the way of greenhouse-gas mitigation than what is embodied in a business-as-usual emissions pathway. This is very much an "economist's argument" resembling the old joke about the twenty-dollar bill lying on a sidewalk—when a friend strolling with the economist points to the bill, the economist says it can't be there—if it had been there, someone would have pocketed it already. As much as Stewart's views are in line with those of many economists, his view in the building blocks is optimistic on this point—outside influences driving institutional innovation, like NGOs and firms, and inside influences like governmental policy entrepreneurs, can provide the eyeglasses that the mythical economist lacked. This is especially so in the context of multilateral relationships where multiple co-benefits present themselves simultaneously to different parties: for example, due to China's growing dominance in renewable energy markets, it was able to feed policy-driven demand from Germany and the US while improving its own air quality and

providing a benefit to domestic renewable energy firms.[20] Arrangements like that can occur accidentally, but the building blocks framework envisions them as occurring more rapidly and more broadly when forethought goes into imaging the possibilities.

The second key twist related to participation and compliance. Among the three institutional types recognized in the article, one involved partially repurposing already-existing institutions whose enforcement powers could be extended to include greenhouse gases. The Montreal Protocol provided a ready example because some Parties were already discussing extending the MP to cover the greenhouse gases called hydrofluorocarbons, chemicals produced as substitutes for the ozone depleting CFCs (Freons) and related compounds under the Protocol. The MP is a multifaceted example of a building-block institution: it was organized for a different purpose than greenhouse-gas mitigation, but since hydrofluorocarbons were produced originally to satisfy the needs of Montreal Parties for substitutes, it did not require a wholesale change of purpose to include them. After all, greenhouse gas reductions have long been a desirable byproduct (co-benefit) of the Protocol (since CFCs were potent greenhouse gases as well as ozone depleters.) In the process, the hypothetically strong trade sanctions serving as enforcement of participation (and conceivably, compliance) under the Protocol could now be leveraged to provide a credible enforcement mechanism for hydrofluorocarbons of the sort totally absent from the UNFCCC and the KP. It is also worth noting that while the MP Parties were states, the level of collaborative, formal support for it from industry, NGOs, and relevant expert communities

[20] R Quitzow, *Dynamics of a policy-driven market: The co-evolution of technological innovation systems for solar photovoltaics in China and Germany*, Environmental Innovation and Societal Transitions, Volume 17, December 2015, Pages 126-148

prefigured the sort of formal arrangements involving nonstate Parties envisioned by the building blocks.[21]

With the adoption of the Kigali amendments[22] to the MP, signed in 2017, the Protocol has been partly repurposed to cover a non-depleting greenhouse gas and the possibility of trade sanctions presumably applies as well. Interestingly, the stretching of enforcement to cover non-depleting substances was not controversial as the amendments were negotiated. Another application of this concept arose a few years later when the International Civil Aviation Organization (ICAO), which can choose to encourage Parties to exercise strong enforcement through their control of landing rights, adopted a relatively weak agreement on greenhouse-gas emissions for aircrafts tied to an offset system to allow flexibility in compliance. If and when ICAO increases the stringency of these limits, we will have another test of the durability of strong enforcement as the domain of such agreements is stretched.

A third key idea of the building blocks is the suggestion that policy entrepreneurs should use the three institutional forms emphasized in the paper (existing institutions whose power can be redirected to greenhouse gas mitigation, new club-like arrangements that penalize free-riders, and dominant market actors) to innovate new arrangements that transcend the traditional state/nonstate models. We'll return to this idea later.

Another aspect of the building blocks was the acceptance that a Kyoto-type global market in emissions allowances, motivated by a desire for efficiency that would lower overall cost of compliance, was a long way off and yet the market can be mobilized differently: market power

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[21] S Barrett, Environment and statecraft: the strategy of environmental treaty-making, Oxford : Oxford University Press, 2005, chapter 8. R Benedick, Ozone Diplomacy: new directions in safeguarding the planet. World Wildlife Fund, ©1991, 1998. Chapter (TBD)

[22] text at: https://treaties.un.org/Pages/ViewDetails.aspx?src=IND&mtdsg_no=XXVII-2-f&chapter=27&clang=_en; brief explanation of significance at https://www.unenvironment.org/news-and-stories/press-release/world-takes-stand-against-powerful-greenhouse-gases-implementation

of firms could be leveraged to increase emissions mitigation. The interests of dominant market actors in maintaining or enhancing their positions under a regulatory transition can be mobilized in favor of a regulatory race-to-the-top as opposed to a weaker compromise.[23] For example, in the run-up to the Montreal Protocol, the DuPont Corporation, which had invested years earlier in research to synthesize non-depleting substitutes for ozone-depleting coolants, made an historic switch in dropping its opposition and supporting strong limitations on production of the latter chemicals.[24] This concession made it far easier for states, especially the US, to reach agreement on the MP and succeeding amendments that rapidly eliminated production of the key ozone-depleting chemicals, while not undermining DuPont's market position.

Stewart's recognition of the importance of aligning the profit motive (if not profit maximization, at least an improved outcome compared to the competition) with the goal of increased environmental stringency argues for policy entrepreneurs taking the political economy of regulation seriously at an early stage of their efforts and identifying such opportunities as fundamental to solving the problem at hand. How many opportunities as effective as DuPont's 1986 intervention in the Montreal case exist in the real world remains unclear, however. With certain sectors becoming dominated by fewer players, seeking dominant market actors could become a dominant strategy for climate policy entrepreneurs. But when new regulation of previously unregulated aspects of large sectors, like energy, looms, and firms are engaged politically, historical behemoths may refuse to go along, dig in their opposition, and either win or expire. The current division in oil-and-gas producer strategies between US and EU firms will provide an interesting test of which strategy wins. We should all watch the political actions of

[23] Bradford A (2013) The Brussels effect. Northwest Univ Law Rev 107:1–67
[24] M Oppenheimer, RH Boyle, Dead Heat: the race against the greenhouse effect, pp.159-160; Benedick, (TBD)

Big Oil, not merely their public pronouncements or even their investments, to see if some begin to press seriously for greenhouse gas limitations. If they do, the dominant market actor strategy will hold considerable promise.

Where is Paris Headed?

We see that the ways the Paris Agreement addresses problematic aspects of the Kyoto Protocol are complemented by the building-blocks framework. Where Kyoto negotiated political targets, apparently to be updated every five years after torturous negotiation, Paris offers states the opportunity to define their own objectives, also every five years and, in principle, the building-blocks provide a growing non-governmental source of experience and information to support evolution of the national plans. Where Kyoto feigned strong enforcement with penalties that simply backloaded obligations onto subsequent compliance periods,[25] the PA instead relies explicitly upon the name-and-shame or pledge-and-review approach, creating a role for building-blocks institutions in auditing emissions data and calling out poor performance. Some building blocks would go further than the PA by repurposing strong enforcement by (or associated with) existing institutions in the service of greenhouse-gas mitigation. Where Kyoto forwarded a global emissions trading system that relied upon a hypothetical transparency of national emissions data to support the value of emissions allowances, the Paris approach to transparency remains to be fully codified and its ultimate shape is unclear.[26] Absent the US, will China opt for

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[25] On compliance with quantitative obligations under the Kyoto Protocol, see https://unfccc.int/process/the-kyoto-protocol/compliance-under-the-kyoto-protocol/introduction; On compliance in the Paris Agreement, see https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjG5q_U6YnsAhUtTd8KHXiwAxAQFjAAegQIAhAB&url=https%3A%2F%2Funfccc.int%2Fsites%2Fdefault%2Ffiles%2Fenglish_paris_agreement.pdf&usg=AOvVaw0zlRMrgQd-osmeYln0iP-B Note Article 15, paragraph 2, which states "The [compliance] mechanism referred to in paragraph 1 of this Article shall consist of a committee that shall be expert-based and facilitative in nature and function in a manner that is transparent, non-adversarial and non-punitive."

[26] For a discussions of the significance of transparency provisions in the Paris Agreement, see https://www.edf.org/climate/implementing-paris-climate-agreement and https://www.carbonbrief.org/cop25-key-outcomes-agreed-at-the-un-climate-talks-in-madrid

an opaque approach, undermining the entire global market concept which, after all, survives if in tentative form, in Article 6? Especially if transparency is lacking in the end, the building blocks could provide a backup capability for tracking, accounting, and verifying emissions, if only for certain sectors, especially as detection by remote sensing achieves greater resolution.

Kyoto was a states-to-states agreement whereas the PA explicitly recognized the political and practical importance of firms, NGOs, subnational government units, and other nonstate actors by underscoring the Non-State Actor Zone for Climate Action (NAZCA)[27] initiated at COP-20 which evolved into the Global Climate Action platform at COP-22. The latter provides for expert meetings and high-level events at which non-state actors could play a dominant role and also created ministerial high-level "champions" to encourage, among other initiatives, the development of outside coalitions and clubs which are reminiscent of the building blocks. These ideas are all consistent with the spirit of the building block concept and its emphasis on flexibility of the form of participation in the diplomatic and implementation process. This calls for an evolution away from a state monopoly over the influence that arises from participation in the various diplomatic mechanisms while maintaining the states' monopoly of ultimate power.

Can a traditional form of power and newly developing structures that allow flexibility on targets and participation and thus diverse channels of influence, proceed collaboratively or will stresses arising from the inherent difference between power and influence undermine the effectiveness of such arrangements? Whether Paris is effective in the long term will be partly determined by whether the tradeoff allowing broader participation and more flexibility, but weak overall enforcement and, potentially, a lack of transparency, works to encourage or discourage state, nonstate, and private action. The Montreal Protocol process succeeded partly by including

[27] On nonstate actors and the Paris Agreement, see https://climateaction.unfccc.int/views/about.html and http://climateinitiativesplatform.org/index.php/Welcome

scientists and industry experts in the process of developing, evaluating, and projecting the effects of potential regulations. Its Technical Advisory Panels[28] are often cited as examples of successful multi-sector collaboration aimed at understanding solutions to a complex problem involving scientific, technological, and socioeconomic components (as most problems do). ICAO embodies similar arrangements with respect to developing air pollution and other standards.[29] Such inclusiveness had, before Paris, been notably absent in the UNFCCC structure, which for instance, holds the Intergovernmental Panel on Climate Change (IPCC) at arm's length (perhaps by mutual agreement). As noted above, both ICAO[30] and the MP embody the potential for strong enforcement, however. If the inclusive approach, absent strong, credible and comprehensive enforcement succeeds, the PA will be hailed as having perceived how an evermore complex world with multiple actors vying for influence could cooperate to solve a problem vastly more complex than any of the international institutions had previously tackled. If the PA fails, it may be remembered as a pusillanimous attempt by states who caved in to current political reality instead of leading the way to transcending it.

UNFCCC Article 2 – A Key to the Future of Paris?

I'll make a final point that may provide a hint at what the future holds. by recalling Article 2 of the UNFCCC, the long-term objective of that Convention – including the injunction to avoid "dangerous anthropogenic interference with the climate system" by stabilizing greenhouse gas concentrations. Article 2 is an aspirational goal with questionable legal force. Even if it had legal force, it is doubtful that in practice it could be enforced because it is a goal

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[28] Benedick (TBD)

[29] See https://www.greenaironline.com/news.php?viewStory=2007 for non-compliance situations and the possibility of enforcement of greenhouse-gas offsets and standards under ICAO. While strong provisions pertain to safety issues (e.g., suspension of landing rights), the extent to which these can be stretched to greenhouse gas obligations is unclear. Such actions, if any, would likely be enforced by states because ICAO itself has not direct enforcement capability.

[30] *Id.*

that can only be achieved collectively, meaning that no individual state can be accused of failing to implement it. Article 2 initially received little attention from negotiators. However, the Council of the EU adopted a numerical temperature target (two degrees Celsius above preindustrial temperatures) in 2004, and in 2008, the G-8 adopted this target, followed the next year by acceptance of the target at COP-15. At the same time, developing countries argued strenuously for a 1.5-degree target, and the Paris Agreement contains both objectives, albeit with more rigorous language attached to two-degrees. By that time, hope among many observers was scarce that either target could actually be achieved without first exceeding it for an extended period.

However, the Paris Agreement took one additional step in this direction by requesting a report on the consequences and implementation of 1.5 degrees of warming. Whether due to the exogenous circumstance of a concatenation of extreme weather events; or the hostility to the entire climate issue on the part of the Trump Administration; or IPCC's credibility combined with what much of the interested media considers its caution and the contrast of the latter with the stern tone of the resulting report; or the brewing concern about the issue among the younger generation and the advent of Greta Thunberg, the climate world seemed to erupt in response. The IPCC report became exhibit A in the prosecution of governmental failure to act to stem emissions.

The eruption changed everything in terms of the public framing of the issue and nothing (so far) in terms of action. What it did demonstrate is how inviting nonstate actors into the state process, even tangentially, can alter public perceptions considerably. Intentionally or not, the power of states combined with the expertise and messaging of nonstate actors to reframe the issue of governmental commitments around the largely-ignored Article 2. We have no idea

where this will end but it provides a useful demonstration of the possibilities embodied by a more inclusive approach. Policy entrepreneurs are surely taking heed.