

# Thinking Globally, Acting Locally: Lessons from the U.S., Japan, and China

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*State and local climate action has played a prominent role in the global response to climate change. Rather than waiting for national action, states like California have surged ahead. This is not simply a U.S. phenomenon. Still, not all jurisdictions are engaged in emissions reductions, and some are actively recalcitrant. What prompts some state and local governments to take action while prompting others to resist?*

*This Article makes several contributions to understanding state and local climate policies. First, prior efforts have generally had a U.S. focus. We broaden the scope of the inquiry to include the two leading Asian economies. Second, we make use of a fifty-state survey of recent state climate and energy initiatives in the United States rather than focusing on a few prominent jurisdictions like California. Third, rather than concentrating on activist jurisdictions, we discuss the full range of stances on energy policy, from the leadership of states like California in the United States and cities like Shenzhen in China to the resistance of some rural areas of the United States, China, and Japan to climate action. We identify important economic, demographic, and geographic drivers of climate and energy policies in these diverse jurisdictions. Finally, we propose a new way of conceptualizing subnational climate action based on the peer production model used to create important digital resources. Like some open-source software and projects such as Wikipedia, important parts of global climate policy have been constructed by sub-nationals through a self-organized, bottom-up effort. This kind of “peer production” has previously been described in the private sector, but it may play an underappreciated role in the sphere of public policy.*

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## I. INTRODUCTION

There has been a flurry of climate action in the first decades of this century. Given that climate change is a global problem, national governments and international organizations are the obvious candidates to lead the charge. As it turns out, however, subnational governments have often seized the initiative, adopting policies more aggressive than their national counterparts.<sup>1</sup> In 2018, while the U.S. federal government was resolutely backpedaling on climate action, California mandated that all new homes have solar energy<sup>2</sup> and enacted

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<sup>1</sup> See generally Kazuo Matsushita, *Japan's Response to the Issue of Climate Change: An Innovative Transition Towards a Zero-Carbon and Resilient Society*, SASAKAWA USA (May 28, 2020), <https://spfusa.org/research/japans-response-to-the-issue-of-climate-change/> [<https://perma.cc/4XFU-YEYT>]; Sharmila L. Murthy, *States and Cities as "Norm Sustainers": A Role for Subnational Actors in the Paris Agreement on Climate Change*, 37 VA. ENV'T L.J. 1 (2019); Edward Ng & Chao Ren, *China's Adaptation to Climate & Urban Climatic Changes: A Critical Review*, 23 URB. CLIMATE 352 (2018).

<sup>2</sup> Ivan Penn, *California Will Require Solar Power for New Homes*, N.Y. TIMES (May 9, 2018), <https://www.nytimes.com/2018/05/09/business/energy-environment/california-solar-power.html> [<https://perma.cc/24GT-ZS7H>].

a mandate for carbon-free electricity by 2045.<sup>3</sup> Also during the fossil-fuel oriented Trump administration, Washington State set goals for zero reliance on coal by 2025, a carbon-neutral grid by 2030, and 100% renewable energy by 2045.<sup>4</sup> Along with Virginia, 147 cities and over a thousand companies, these two states are now part of the *America Is All In* coalition, which supports halving U.S. emissions by 2030 and reaching net zero emissions by 2050.<sup>5</sup>

State and local climate action is not a uniquely American phenomenon.<sup>6</sup> Across the Pacific, the Local People's Congress in the city of Shenzhen has adopted China's first citywide carbon trading program.<sup>7</sup> Operating in a very different setting in Japan, eighty-nine local governments, including Tokyo, Kanagawa Prefecture, and Yokohama City, have endorsed a 2050 goal of net-zero carbon emissions.<sup>8</sup> These local governments include about half of Japan's population, and a combined GDP of about \$2.8 trillion.<sup>9</sup>

California, Tokyo, and Shenzhen are prominent examples, but they do not stand alone. For instance, the Under2 coalition of state and regional governments crosses international borders, with members in the United States along with areas as diverse as Canada, Brazil, and Indonesia.<sup>10</sup> The coalition's Memorandum of Understanding (MOU) states that the "guiding principle for reduction of [greenhouse gas (GHG)] emissions by 2050 must be to limit global warming to less than 2°C," a goal that the MOU then translates into specific emissions targets.<sup>11</sup> The C40 coalition is a similar network composed of cities

<sup>3</sup> Marianne Lavelle, *California Ups Its Clean Energy Game: Gov. Brown Signs 100% Zero-Carbon Electricity Bill*, INSIDE CLIMATE NEWS (Sept. 10, 2018), <https://insideclimatenews.org/news/10092018/california-100-percent-clean-energy-electricity-vote-climate-change-leadership-zero-carbon-electric-vehicles/> [<https://perma.cc/T8JP-PJ7S>].

<sup>4</sup> Catherine Morehouse, *Washington Clean Energy Proposal Would Phase Out Coal by 2025*, UTIL. DIVE (Dec. 11, 2018), <https://www.utilitydive.com/news/washington-clean-energy-proposal-would-phase-out-coal-by-2025/544047/> [<https://perma.cc/2R55-KWH2>]; see also Wash. State Governor's Off., *Clean Electricity, Clean Buildings and Clean Transportation: Inslee Plan Would Launch Comprehensive Clean Energy Transition and Significantly Drive Down Emissions*, MEDIUM (Dec. 10, 2018), <https://medium.com/wagovernor/clean-electricity-clean-buildings-and-clean-transportation-inslee-plan-would-launch-19d789c99334> (on file with the *Ohio State Law Journal*).

<sup>5</sup> See *About*, AM. IS ALL IN, <https://www.americaisallin.com/about/> [<https://perma.cc/7KMP-VEE9>]; *Who's In*, AM. IS ALL IN, <https://www.americaisallin.com/whos-in/> [<https://perma.cc/P8QG-RR5P>].

<sup>6</sup> To avoid the need to constantly repeat the phrase "states or provinces," this Article will use the term "state" to include both forms of regional government.

<sup>7</sup> Jing Jing Jiang, Bin Ye & Xiao Ming Ma, *The Construction of Shenzhen's Carbon Emission Trading Scheme*, 75 ENERGY POL'Y 17, 17 (2014).

<sup>8</sup> Matsushita, *supra* note 1.

<sup>9</sup> *Id.*

<sup>10</sup> *Under2 Coalition*, CLIMATE GRP., <https://www.theclimategroup.org/our-work/states-and-regions-under2-coalition> [<https://perma.cc/78JP-XWQL>].

<sup>11</sup> THE CLIMATE GRP., GLOBAL CLIMATE LEADERSHIP MEMORANDUM OF UNDERSTANDING 1–2, <https://www.theclimategroup.org/sites/default/files/2020-09/under2-mou-with-addendum-english-us-letter.pdf> [<https://perma.cc/C8M5-3YSF>].

rather than states around the world.<sup>12</sup> Austin and Houston are members, as are Tokyo, Beijing, Chengdu, Shenzhen and other Chinese cities.<sup>13</sup> Because state and local climate actions take place in such different political systems and legal regimes, they clearly cannot be attributed to a unique characteristic of any one locale or to any one country's political dynamics or legal system.<sup>14</sup>

The ferment in climate policy at the state and local level presents something of a puzzle. Because it is a global problem requiring cooperation among the world's nations, climate change seems clearly suited for higher levels of governance, rather than local governments.<sup>15</sup> Yet, as scholars have observed, the emerging governance system in the climate sphere is far less centralized than expected.<sup>16</sup> Equally noteworthy, not all jurisdictions are engaged in emissions reductions, and some are actively recalcitrant.<sup>17</sup> This raises a key question: What prompts state and local governments to take action while prompting others to resist?

This Article seeks a fuller understanding of why some jurisdictions take the lead in climate action and others lag. As we will see, several factors seem linked to climate action, not just in the United States but elsewhere. Some are economic, including the obvious but important point that economies dependent on fossil fuels are often laggards.<sup>18</sup> On the other hand, even very conservative jurisdictions support renewable energy when doing so is sufficiently

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<sup>12</sup> *Our Cities*, C40 CITIES, <https://www.c40.org/cities> [<https://perma.cc/Y7VJ-CMCC>].

<sup>13</sup> *Id.*

<sup>14</sup> Based on three country-level case studies, Fisch also found that governmental structure did not seem to affect overall performance due to offsetting advantages and disadvantages. Justin Fisch, *The Case for Effective Environmental Politics: Federalist or Unitary State? Comparing the Cases of Canada, the United States of America, and the People's Republic of China*, 51 U. MICH. J.L. REFORM 777, 794–96, 806–07 (2018).

<sup>15</sup> Both liberal and conservative scholars agree that problems involving interjurisdictional spillovers are generally appropriate for federal rather than state regulation. See Jonathan H. Adler, *Jurisdictional Mismatch in Environmental Federalism*, 14 N.Y.U. ENV'T L.J. 130, 157–69 (2005); Richard L. Revesz, *The Race to the Bottom and Federal Environmental Regulation: A Response to Critics*, 82 MINN. L. REV. 535, 537–38 (1997).

<sup>16</sup> This development has been frequently discussed in terms of polycentric governance and environmental federalism. See Hari M. Osofsky, *Polycentrism and Climate Change*, in CLIMATE CHANGE LAW 325, 325–28 (Daniel A. Farber & Marjan Peeters eds., 2016). See generally Kirsten Engel, *Climate Federalism in the Time of COVID-19: Can the States "Save" American Climate Policy?*, 47 N. KY. L. REV. 115 (2020).

<sup>17</sup> See Albert C. Lin, *Uncooperative Environmental Federalism: State Suits Against the Federal Government in an Age of Political Polarization*, 88 GEO. WASH. L. REV. 890, 900 (2020).

<sup>18</sup> See Kate Sheppard, *House Passes Landmark Climate and Clean-Energy Bill*, GRIST (June 27, 2009), <https://grist.org/article/2009-06-26-climate-bill-senate-politics/> [<https://perma.cc/SHG8-C6VN>].

profitable.<sup>19</sup> More subtly, jurisdictions with the technical capacity to house energy technology innovators are more likely to take the lead in climate action.<sup>20</sup>

Another factor is demographic. Highly urbanized jurisdictions are more likely to take the lead in climate action, while rural areas tend to be more resistant.<sup>21</sup> The extent to which an area is exposed to climate-related risks like sea level rise is also a factor, although it may be less important than one might expect.<sup>22</sup> These factors are not wholly unrelated to each other. Coal mines and oil fields are unlikely to be found in cities, while technological expertise rarely clusters in small towns or farming areas.<sup>23</sup> Major cities are often found in coastal areas where they can benefit from maritime commerce, yet that location leaves them exposed to sea-level rise.<sup>24</sup> Cumulatively, however, these factors seem to drive much of the variation in how states and local governments respond to the climate issue.

The Article makes several important contributions. First, efforts to understand the diversity of subnational responses to climate issue have generally focused on the United States or countries with similar legal systems such as Australia.<sup>25</sup> We broaden the inquiry to include the very different situations of the two leading Asian economies, China and Japan.<sup>26</sup> We also make use of material that has not been readily available in English about Japanese and

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<sup>19</sup> See Barry G. Rabe, Mikael Román & Arthur G. Dobelis, *State Competition as a Source Driving Climate Change Mitigation*, 14 N.Y.U. ENV'T L.J. 1, 10, 37–39 (2005).

<sup>20</sup> See *id.* at 38–40.

<sup>21</sup> See ROBERT BONNIE, EMILY PECHAR DIAMOND & ELIZABETH ROWE, UNDERSTANDING RURAL ATTITUDES TOWARD THE ENVIRONMENT AND CONSERVATION IN AMERICA 4–5 (2020), <https://nicholasinstitute.duke.edu/sites/default/files/publications/understanding-rural-attitudes-toward-environment-conservation-america.pdf> [<https://perma.cc/LW9J-WDWC>]; see also *infra* note 284.

<sup>22</sup> See Rabe, Román & Dobelis, *supra* note 19, at 24–25.

<sup>23</sup> See Monica Nickelsburg, *Tech Concentration in Big Cities Is Growing, Leaving Rural America Behind, Study Finds*, GEEKWIRE (Dec. 17, 2018), <https://www.geekwire.com/2018/tech-concentration-big-cities-growing-leaving-rural-america-behind-study-finds/> [<https://perma.cc/UP3Q-RHJR>].

<sup>24</sup> See R.J. NICHOLLS ET AL., RANKING OF THE WORLD'S CITIES MOST EXPOSED TO COASTAL FLOODING TODAY AND IN THE FUTURE (2007), <https://climate-adapt.eea.europa.eu/metadata/publications/ranking-of-the-worlds-cities-to-coastal-flooding/11240357> [<https://perma.cc/3972-6BVG>].

<sup>25</sup> For examples of recent articles with a purely U.S. focus, see Katrina M. Wyman & Danielle Spiegel-Feld, *The Urban Environmental Renaissance*, 108 CALIF. L. REV. 305, 308 (2020); Murthy, *supra* note 1, at 7–8; Shannon Roesler, *Competitive Federalism: Environmental Governance as a Zero-Sum Game*, 49 ENV'T L. REP. NEWS & ANALYSIS 10858, 10858 (2019); Lin, *supra* note 17, at 900.

<sup>26</sup> China, the United States, and Japan are respectively the world's #1, #2, and #6 emitters of greenhouse gases (counting the EU as a single emitter). *Global Greenhouse Gas Emissions Data*, EPA, <https://www.epa.gov/ghgemissions/global-greenhouse-gas-emissions-data> [<https://perma.cc/K7A7-FJNH>]. Combined, they account for about half of global emissions from use of fossil fuels. *Id.*

Chinese developments.<sup>27</sup> Second, we make use of a fifty-state survey of recent state climate and energy initiatives in the United States.<sup>28</sup> Third, rather than emphasizing only the potential for subnational climate initiatives, we discuss the full range of stances on energy policy, from the leadership of states like California in the United States and cities like Shenzhen in China to the resistance of some rural areas of the United States, China, and Japan to climate action.<sup>29</sup> In short, we move beyond the focus in much of the scholarship literature which has focused on a few prominent U.S. states to provide a much fuller and richer picture of subnational climate policy.

We begin in Part II with China. Despite the centralized authority of the Chinese central government, cities play an active role in climate policy.<sup>30</sup> Under the guise of pilot programs, they have the ability to shape their own distinctive approaches, while cities and provincial governments may also either embrace or resist national goals they are charged with implementing.<sup>31</sup> Despite the common belief that Chinese governance is entirely top-down, these local jurisdictions can develop their own stances on climate policy.<sup>32</sup> To some degree, they have taken advantage of the central government's sponsorship of pilot projects, but they have also taken independent initiatives.<sup>33</sup> In contrast, some other areas of China have been recalcitrant.<sup>34</sup>

Turning to Japan, Part III considers that country's adaptation policy, which gives local governments much of the responsibility for dealing with issues like sea level rise and inland flooding.<sup>35</sup> Responses at the local level have been

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<sup>27</sup> Information about Japanese environmental law is particularly sparse. A search of the Westlaw "Law Reviews and Journals" database for the phrase "Japanese Environmental Law" produced only nineteen articles.

<sup>28</sup> A summary of the survey results is found in the Appendix.

<sup>29</sup> See Lavelle, *supra* note 3; INT'L CARBON ACTION P'SHIP, EMISSIONS TRADING WORLDWIDE: STATUS REPORT 2021, at 148 (2021), [https://icapcarbonaction.com/en/?option=com\\_attach&task=download&id=723](https://icapcarbonaction.com/en/?option=com_attach&task=download&id=723) [<https://perma.cc/7LSR-8VXM>].

<sup>30</sup> Ng & Ren, *supra* note 1, at 361–65.

<sup>31</sup> Zhao Hui, Zhu Xufeng & Qi Ye, *Fostering Local Entrepreneurship Through Regional Environmental Pilot Schemes: The Low-Carbon Development Path of China*, 14 CHINA: INT'L J. 107, 111–13 (2016).

<sup>32</sup> *Id.* at 119.

<sup>33</sup> Ye Qi, Li Ma, Huanbo Zhang & Huimin Li, *Translating a Global Issue into Local Priority: China's Local Government Response to Climate Change*, 17 J. ENV'T & DEV. 379, 397–98 (2008); *infra* note 130.

<sup>34</sup> Kevin Lo, He Li & Kang Chen, *Climate Experimentation and the Limits of Top-Down Control: Local Variation of Climate Pilots in China*, 63 J. ENV'T PLAN. & MGMT. 109, 112–14 (2020); *see infra* note 162.

<sup>35</sup> See Chikyū ondanka taisaku no suishin ni kansuru hōritsu [Act on Promotion of Global Warming Countermeasures], Law No. 117 of 1998, art. 4(1) ("Local governments shall implement programs for the control of greenhouse gases in accordance with the natural and social conditions of their local areas."), *translated in* (Japanese Law Translation [JLT DS]), <http://www.japaneselawtranslation.go.jp/law/detail/?ft=5&re=2&dn=1&gn=4&sy=&ht=A&no=117&x=40&y=12&ia=03&ja=04&ky=&page=2> [<https://perma.cc/K5AB-FVTJ>] (Japan).

varied. Some urban areas such as Tokyo have led the way in planning for climate adaptation.<sup>36</sup> Tokyo has also instituted its own emissions trading system.<sup>37</sup> Rural areas in Japan are promising sites for wind turbines and solar farms.<sup>38</sup> We examine how rural communities influence the siting and feasibility of renewable energy, not infrequently serving as barriers to Japan's ability to utilize these carbon-free energy sources.<sup>39</sup>

Part IV presents the story of state and local climate action in the United States. That story is especially striking because aggressive climate action by these lower-level governments is a sharp contrast to the generally dominant role of the federal government in environmental law.<sup>40</sup> Parts of this story are familiar, involving leaders in climate policy on the east and west coasts. The resulting conflicts with the federal government and other state governments reflect the complex geography of climate action in the United States. The cutting-edge policies on the coasts are only one part of the spectrum. For instance, renewable energy is a major part of the energy mix in the band of states from Texas north to Iowa.<sup>41</sup>

Part V teases out some of the factors that influence the stance of subnational governments on climate issues. The discussion is based on the case studies of China, Japan, and the United States.<sup>42</sup> Of course, distinctive features of each country do much to shape or constrain actions by subnational units of government.<sup>43</sup> Yet, despite dramatic differences in culture, legal systems, and governance structures, there are some striking commonalities in terms of geographic patterns of support and resistance to climate policies.

Subnational governments, then, are engaged in a joint effort to construct transnational climate policies, along with the national and international entities. This joint effort is analogous to peer production efforts, in which individuals

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<sup>36</sup> See TOKYO METRO. GOV'T, TOKYO CLIMATE CHANGE STRATEGY: PROGRESS REPORT AND FUTURE VISION 1 (Mar. 2010), [https://www.kankyo.metro.tokyo.lg.jp/en/climate/index.files/Tokyo\\_climate\\_change\\_strategy\\_progress\\_r.pdf](https://www.kankyo.metro.tokyo.lg.jp/en/climate/index.files/Tokyo_climate_change_strategy_progress_r.pdf) [<https://perma.cc/7GQD-76H7>].

<sup>37</sup> *Id.* (“The cap-and-trade system, which will be launched in April 2010, aims to reduce total energy-related carbon dioxide emissions, [and] is the third cap-and-trade system in the world . . .”).

<sup>38</sup> Yuka Obayashi, *Japan to Tackle Red Tape to Boost Renewable Energy*, REUTERS (Apr. 23, 2021), <https://jp.reuters.com/article/global-climate-japan-renewables-idAFL4N2MF11G> [<https://perma.cc/W45V-TXL2>].

<sup>39</sup> See *infra* note 285; see also MINISTRY OF ENV'T, JAPAN, FEASIBILITY STUDIES ON JOINT MECHANISM PROJECTS TOWARDS ENVIRONMENTALLY SUSTAINABLE CITIES IN ASIA 8 (2014), [https://www.env.go.jp/earth/coop/lowcarbon-asia/english/project/data/jcm\\_pamphlet.pdf](https://www.env.go.jp/earth/coop/lowcarbon-asia/english/project/data/jcm_pamphlet.pdf) [<https://perma.cc/KL6K-HLDZ>].

<sup>40</sup> See *infra* text accompanying notes 385–94.

<sup>41</sup> See *infra* text accompanying notes 513–17.

<sup>42</sup> See Matsushita, *supra* note 1; Murthy, *supra* note 1, at 7–8; Ng & Ren, *supra* note 1, at 361–65.

<sup>43</sup> See Fisch, *supra* note 14, at 794–95.

contribute work to online projects like Wikipedia or open-source software.<sup>44</sup> In both instances, dispersed groups are able to self-organize their efforts toward the kinds of accomplishments that were traditionally the domain of large, hierarchical organizations.<sup>45</sup> This form of coordination has even been embedded into the Paris Agreement, which calls for participants to announce voluntary commitments toward emission reductions.<sup>46</sup> Although subnational entities are not themselves parties to the Paris Agreement, they have played a subsidiary role and have organized their own collaborative networks.<sup>47</sup> We discuss the peer production model in Part V.D.

This Article can be seen as part of the broader project of understanding the dynamic relationships between central and local governments.<sup>48</sup> The current literature examines these debates in terms of American federalism.<sup>49</sup> Many conclusions carry over to the area of climate governance.<sup>50</sup> As our case studies

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<sup>44</sup> YOCHAI BENKLER, *THE PENGUIN AND THE LEVIATHAN: THE TRIUMPH OF COOPERATION OVER SELF-INTEREST* 2 (2011).

<sup>45</sup> *See id.* at 1.

<sup>46</sup> Murthy, *supra* note 1, at 9.

<sup>47</sup> *Id.* at 3.

<sup>48</sup> For contributions to this discussion, see Sarah Fox, *Localizing Environmental Federalism*, 54 U.C. DAVIS L. REV. 133, 136 (2020); William W. Buzbee, *Contextual Environmental Federalism*, 14 N.Y.U. ENV'T L.J. 108, 110–11 (2005); Robert L. Glicksman, *From Cooperative to Inoperative Federalism: The Perverse Mutation of Environmental Law and Policy*, 41 WAKE FOREST L. REV. 719, 720–21, 781–82 (2006); Denise A. Grab & Michael A. Livermore, *Environmental Federalism in a Dark Time*, 79 OHIO ST. L.J. 667, 671–72 (2018).

<sup>49</sup> *See* Heather K. Gerken, *Federalism 3.0*, 105 CALIF. L. REV. 1695, 1696 (2017); ERIN RYAN, *FEDERALISM AND THE TUG OF WAR WITHIN*, at xi–xii (2011); ROBERT A. SCHAPIRO, *POLYPHONIC FEDERALISM: TOWARD THE PROTECTION OF FUNDAMENTAL RIGHTS* 1–6 (2009); Abbe R. Gluck, *Federalism from Federal Statutes: Health Reform, Medicaid, and the Old-Fashioned Federalists' Gamble*, 81 FORDHAM L. REV. 1749, 1750 (2013); Cristina M. Rodriguez, *The Significance of the Local in Immigration Regulation*, 106 MICH. L. REV. 567, 570–71 (2008); Jessica Bulman-Pozen, *From Sovereignty and Process to Administration and Politics: The Afterlife of American Federalism*, 123 YALE L.J. 1920, 1922 (2014); Benjamin I. Sachs, *Despite Preemption: Making Labor Law in Cities and States*, 124 HARV. L. REV. 1153, 1155 (2011); Gillian E. Metzger, *Administrative Law as the New Federalism*, 57 DUKE L.J. 2023, 2025–26, 2089 (2008).

<sup>50</sup> Consider, for instance, Dean Gerken's overview of American federalism:

In our tightly integrated system, the states and federal government now regulate shoulder-to-shoulder. Sometimes they lean on one another, and sometimes they deliberately jostle one another, but neither reigns supreme. States are not sites where groups can shield themselves from national policy, national politics, or national norms. Instead, they are the sites where we *battle* over—and forge—national policy, national politics, and national norms. National movements, be they red or blue, begin at the local and state level and move their way up. National actors depend on states and localities to carry out national policies, which means that they need buy-in from state and local officials to get things done.

Gerken, *supra* note 49, at 1696.

of climate governance in China and Japan indicate, however, the focus on U.S. federalism is too narrow. The federalism debate would benefit greatly from a broader comparative perspective. We begin with a look at climate federalism in China before turning to Japan and the United States.

## II. CLIMATE POLICY IN CHINESE CITIES

China has announced plans to establish an emissions trading system,<sup>51</sup> but so far the nationwide system has only covered the electricity sector.<sup>52</sup> In 2016, the government published a draft climate change law that still remains a draft today.<sup>53</sup> As in the United States, national legislation to regulate carbon emissions seems to be stalled.<sup>54</sup> Also as in the United States, local actions have showed more vitality. We begin by explaining how, in a system where constitutional power is centralized, cities have been granted authority for individually tailored environmental policies.

### A. Legal Authority for City-Level Policy Development

Cities have long been regarded as environmental hotspots due to pollution, dense populations, waste, and sanitation problems.<sup>55</sup> The urgent need to respond to climate change has led to strong interest amongst both academic and policy communities in how Chinese cities might engage in mitigation to control emissions and in adaptation to cope with changes in climate.<sup>56</sup>

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<sup>51</sup> Ying Shen, *Crossing the River by Groping for Stones: China's Pilot Emissions Trading Schemes and the Challenges for a National Scheme*, 18 ASIA PAC. J. ENV'T L. 1, 17 (2015). In January 2021, China's Ministry of Ecology and the Environment published trial rules for the national ETS as part of China's efforts to meet a 2060 carbon neutrality goal through market mechanisms. See *China's Resolute Pursuit of Reducing Carbon Emissions*, MINISTRY OF ECOLOGY & ENV'T CHINA (Feb. 25, 2021), [http://english.mee.gov.cn/News\\_service/media\\_news/202102/t20210225\\_822336.shtml](http://english.mee.gov.cn/News_service/media_news/202102/t20210225_822336.shtml) [<https://perma.cc/2BNU-4RZC>].

<sup>52</sup> *China, Moving Cautiously, Starts Carbon Trading Market*, ASSOCIATED PRESS (July 16, 2021), <https://apnews.com/article/business-china-environment-and-nature-climate-change-34f03c047c1f54fde9ddb301cdfadf9b> [<https://perma.cc/A2GJ-5HCV>].

<sup>53</sup> Tian Danyu (田丹宇), *Tuidong Yingdui Qihou Bianhua Lifa Xitong Falu Zhidu Heli* (推动应对气候变化立法 形成系统法律制度合力), *Zhongguo Qihou Bianhua Xinxu Wang* (中国气候变化信息网) [China Climate Change Info-Net] (Oct. 25, 2019), <http://www.ccchina.org.cn/Detail.aspx?newsId=72509&TId=57%22%20title=推动应对气候变化立法%20形成系统法律制度合力> [<https://perma.cc/8GXY-QFZN>].

<sup>54</sup> Kate Aronoff, *Democrats Control New York but Can't Even Pass Climate Legislation*, NEW REPUBLIC (June 9, 2021), <https://newrepublic.com/article/162676/democrats-control-new-york-cant-even-pass-climate-legislation> [<https://perma.cc/4UYW-DAK5>].

<sup>55</sup> See generally RICHARD GILBERT, DON STEVENSON, HERBERT GIRARDET & RICHARD STREN, *MAKING CITIES WORK: THE ROLE OF LOCAL AUTHORITIES IN THE URBAN ENVIRONMENT* (1996).

<sup>56</sup> HARRIET A. BULKELEY, VANESA CASTÁN BROTO & GARETH A. S. EDWARDS, *AN URBAN POLITICS OF CLIMATE CHANGE: EXPERIMENTATION AND THE GOVERNING OF SOCIO-TECHNICAL TRANSITIONS 4* (2015).

In the past decade, local environmental legislation in China has grown dramatically, fostered by legal changes at the national level.<sup>57</sup> First, Article 6 of the 2014 Environmental Protection Law provides: “The local people’s governments at all levels shall be responsible for the environmental quality within their respective administrative regions.”<sup>58</sup> Second, Article 72 and Article 104 of the 2015 Legislation Law granted 282 “districted cities” and four “cities without districts” legislative power<sup>59</sup> which then led to over six hundred pieces of local legislation in three years,<sup>60</sup> among which 40% are related to environmental protection.<sup>61</sup> Finally, the term “ecological civilization” was written into China’s newly revised 2018 Constitution, which has turned climate change into a central theme in all government strategies and actions of all levels, that is, to put ecology and environment as priorities over economic growth.<sup>62</sup>

Cities have often copied legislation or regulations adopted by higher-level governments or have even regressed from those regulations.<sup>63</sup> The central government seems to be taking steps to encourage greater local creativity.<sup>64</sup> In March 2020, the announcement of the Guiding Opinions on Building a Modern Environmental Governance System<sup>65</sup> brought China’s local environmental law

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<sup>57</sup> See generally Xu Xiangmin (徐祥民), Wan Jiaxin (宛佳欣) & Kong Xiaoyu (孔晓雨), “Lifa Fa” (2015) Shishi Hou Difang Huanjing Lifa Xianzhuang Yu Yanjiu (《立法法》(2015)实施后地方环境立法现状分析与研究), *Zhongguo Yingyong Faxue* (中国应用法学) [CHINA APPLIED L.], no. 1, 2019.

<sup>58</sup> Environmental Protection Law of the People’s Republic of China (2014 Revision) (promulgated by the Standing Comm. Nat’l People’s Congress., Apr. 4, 2014, effective Jan. 1, 2015), art. 6, [https://www.pkulaw.com/en\\_law/c24f71752129d23dbdfb.html?keyword=环境保护法](https://www.pkulaw.com/en_law/c24f71752129d23dbdfb.html?keyword=环境保护法) (on file with the *Ohio State Law Journal*).

<sup>59</sup> Legislation Law of the People’s Republic of China (2015 Amendment) (promulgated by the Nat’l People’s Congress, Mar. 15, 2015, effective Mar. 15, 2015) arts. 72, 104, [https://www.pkulaw.com/en\\_law/9073d435178b9633bdfb.html?keyword=立法法](https://www.pkulaw.com/en_law/9073d435178b9633bdfb.html?keyword=立法法) (on file with the *Ohio State Law Journal*).

<sup>60</sup> Jiezhong Jinnian 8 Yue Woguo Xianxing Youxiao Falü 267 Jian Xin Fuyou Difang Lifa Quan de Shi Zhou Yi Lifa 621 Jian (截至今年8月我国现行有效法律267件 新赋予地方立法权的市州已立法621件), *Zhongguo Qiye Jia Boao Luntan* (中国企业家博鳌论坛) [BOAO F. FOR ENTREPRENEURS] (Sept. 16, 2018), [http://www.xinhuanet.com/legal/2018-09/16/c\\_1123437851.htm](http://www.xinhuanet.com/legal/2018-09/16/c_1123437851.htm) [<https://perma.cc/L2RM-SPPL>].

<sup>61</sup> Ye Wu et al., *Progress on the First Environment Legislation of Districted Cities in China*, *CHINESE J. ENV’T MGMT.* (2018).

<sup>62</sup> Chang Jiwen (常纪文), *Shengtai Wenming Ru Xian de Biyao Xing Yu Jianyi* (生态文明入宪的必要性与建议) [*Necessity and Suggestions on Writing Ecological Civilization into the Constitution*], *Zhongguo Huanjing Guanli* (中国环境管理) [CHINESE J. ENV’T MGMT.] (2016), <http://zghjgl.ijournal.cn/html/zghjgl/2016/6/20160603.htm> [<https://perma.cc/Z4GS-L6PZ>].

<sup>63</sup> Difang Huanjing Lifa Buneng Tai Renxing (地方环境立法不能太任性), *Zhongguo Huanjing* (中国环境) (July 25, 2017), [https://www.cenews.com.cn/opinion/plsp/201707/t20170725\\_843488.html](https://www.cenews.com.cn/opinion/plsp/201707/t20170725_843488.html) [<https://perma.cc/K56X-6CYN>].

<sup>64</sup> See Hui, Xufeng & Ye, *supra* note 31, at 109.

<sup>65</sup> Guiding Opinions on Building a Modern Environmental Governance System Issued by the General Office of the CPC Central Committee and the General Office of the State

into a new era. Under Article 24 of this guideline, “local authorities meeting certain conditions” shall be encouraged to “make laws ahead of the central government” in environmental governance.<sup>66</sup>

“Cities in China [also] play a key role in the implementation of . . . central policies and make concrete actions in response to climate change.”<sup>67</sup> Before the 2015 amendment of China’s Legislation Law, the State Council (SC) was responsible for the approval of so-called “larger cities,”<sup>68</sup> which were empowered to legislate through the 1986 amendment of China’s Regional Organization Law.<sup>69</sup> Local governments had been actively fighting for “larger cities” status for decades, until legislative power was enlarged to all “districted cities” plus four “cities without districts” in 2015.<sup>70</sup> Similarly, in the central government’s policy experiments, the term “local authorities meeting certain conditions” is often used to encourage local innovations according to local authorities’ specific circumstances and actual needs.<sup>71</sup> The next Part examines a particularly important use of local governmental powers.

Pilot projects have received increasing attention in China as ways of fostering bottom-up innovation<sup>72</sup> and advancing legitimate government objectives.<sup>73</sup> For example, as part of an initiative to introduce competition into

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Council, PKULAW (2020), [http://www.pkulaw.cn/fulltext\\_form.aspx?Db=chl&Gid=fa5d5c0b816cf486bdfb&keyword=现代环境&EncodingName=&Search\\_Mode=accurate&Search\\_IsTitle=0](http://www.pkulaw.cn/fulltext_form.aspx?Db=chl&Gid=fa5d5c0b816cf486bdfb&keyword=现代环境&EncodingName=&Search_Mode=accurate&Search_IsTitle=0) (on file with the *Ohio State Law Journal*).

<sup>66</sup> *Id.* art. 24.

<sup>67</sup> Ng & Ren, *supra* note 1, at 353 (alteration in original).

<sup>68</sup> The SC approved eighteen “larger cities” in batches from 1984–1993 (not including Chongqing, since it became one of the four direct-administered municipalities in 1997). See Zheng Lei (郑磊), “Jiao Da de Shi” de Quanzhan You Duoda—Jiyu Xianfa Wenben de Kaocha (“较大的市”的权限有多大——基于宪法文本的考察), *Ai Sixiang* (爱思想) (May 19, 2009), <https://www.aisixiang.com/data/27359.html> [<https://perma.cc/2US2-VGV8>].

<sup>69</sup> *Id.*

<sup>70</sup> See Philipp Renninger, *Local Legislation Despite the Risks of Decentralization: Theory of Central-Local Relations in the P.R. China* 4–5 (Jan. 1, 2019) (unpublished manuscript), <https://ssrn.com/abstract=3599796> (on file with the *Ohio State Law Journal*); Jianwei Zhang, Xiaoyi Jiang & Xiaobin Pan, *Regional Legislation to Address Climate Change in China: Necessity and Feasibility*, 11 *INT’L J. CLIMATE CHANGE STRATEGIES & MGMT.* 536, 547 (2019).

<sup>71</sup> 有条件的地方, or “places where conditions permit.” For example, the Fourteenth Five-Year Plan states that “local authorities meeting certain conditions are encouraged to reach peak carbon emissions first.” See Zhonggong Zhongyang Guanyu Guomin Jingji He Shehui Fazhan Di Shisi Ge Wu Nian Guihua He Er Sanwu Nian Yuanjing Mubiao Di Jianyi (中共中央关于制定国民经济和社会发展第十四个五年规划和二〇三五年远景目标的建议) sec. 10, art. 35 (2020), [http://www.gov.cn/zhengce/2020-11/03/content\\_5556991.htm](http://www.gov.cn/zhengce/2020-11/03/content_5556991.htm) [<https://perma.cc/VN98-PEDC>].

<sup>72</sup> See, e.g., Hui, Xufeng & Ye, *supra* note 31, at 109.

<sup>73</sup> *Id.* at 109, 120. See generally Colleen V. Chien, *Rigorous Policy Pilots: Experimentation in the Administration of the Law*, 104 *IOWA L. REV.* 2313 (2019) (showing that rigorous government policy pilot projects tend to be feasible and increasingly common). Strictly speaking, a pilot project is “a small-scale, short-term experiment that helps an

electricity markets,<sup>74</sup> over twenty trial plans were submitted by local agencies.<sup>75</sup> Green projects such as the carbon trading pilot programs, the pilot low-carbon cities initiative, the green finance pilot zones, and pilots for a variety of renewable energy technologies, will also speed up the development of green industry and progress towards carbon neutrality.<sup>76</sup>

### B. Case Study of the Guangdong-Hong Kong-Macao Greater Bay Area (GBA)

Our case study focuses on an administrative cluster of cities containing some of China's economic powerhouses. In 2016, the GBA initiative was written into China's Thirteenth Five-Year Plan, aiming to build a world-class city cluster comparable to the San Francisco Bay Area across nine Pearl River Delta (PRD) cities and two special administrative regions in south China.<sup>77</sup> Guangzhou, as the capital of Guangdong Province, is at the heart of a network

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organization learn how a large-scale project might work in practice.” *Pilot Program (Pilot Study)*, TECHTARGET (June 2013), <http://searchcio.techtarget.com/definition/pilot-program-pilot-study> [<https://perma.cc/858L-7ZX5>]; see also STEPHEN B. HULLEY, STEVEN R. CUMMINGS, WARREN S. BROWNER, DEBORAH G. GRADY & THOMAS B. NEWMAN, DESIGNING CLINICAL RESEARCH 168–69 (Sonya Seigafuse & Nancy Winter eds., 3d ed. 2007). In contrast, a demonstration program is an effort to expand and improve the services authorized by this organization. See Nina Khanna, David Fridley & Lixuan Hong, *China's Pilot Low-Carbon City Initiative: A Comparative Assessment of National Goals and Local Plans*, 12 SUSTAINABLE CITIES & SOC'Y 110, 110, 117–18 (2014); see also Christopher J. Blackburn, Mallory E. Flowers, Daniel C. Matisoff & Juan Moreno-Cruz, *Do Pilot and Demonstration Projects Work? Evidence from a Green Building Program*, 39 J. POL'Y ANALYSIS & MGMT. 1100, 1105 (2020). Given that pilot projects in China are rarely if ever defined as failures, demonstration programs and pilot programs in China are generally interchangeable, with a distinction that the former may represent a higher honor, signaling government's strong confidence. See *id.*

<sup>74</sup> LIU XIYING & KONG LINGCHENG, A NEW CHAPTER IN CHINA'S ELECTRICITY MARKET REFORM 2 (Energy Stud. Inst., Policy Brief No. 13, 2016).

<sup>75</sup> 2002 Document Five, marked the beginning of China's Electricity Market Reform. See SC [2002] No. 5, NOTICE BY THE STATE COUNCIL OF ISSUING THE REFORM PLAN OF THE ELECTRICITY MARKET (2002), available at [http://www.gov.cn/zhengce/content/2017-09/13/content\\_5223177.htm](http://www.gov.cn/zhengce/content/2017-09/13/content_5223177.htm) [<https://perma.cc/N5H4-JJN7>].

<sup>76</sup> See Xinhua, *Green Finance High on China's Agenda to Achieve Carbon Neutrality*, CHINA.ORG.CN (July 15, 2021), [http://www.china.org.cn/business/2021-07/15/content\\_77628855.htm](http://www.china.org.cn/business/2021-07/15/content_77628855.htm) [<https://perma.cc/DW4Q-JJ4S>].

<sup>77</sup> See Outline Development Plan of the Central Government and the State Council for the Guangdong-Hong Kong-Macao Greater Bay Area (promulgated by the Cent. Comm. of the Communist Party of China State Council, Feb. 18, 2019, effective Feb. 18, 2019), [https://www.pkulaw.com/en\\_law/d9d4b7187a741b19bdfb.html](https://www.pkulaw.com/en_law/d9d4b7187a741b19bdfb.html) (on file with the *Ohio State Law Journal*); THE 13TH FIVE-YEAR PLAN FOR ECONOMIC AND SOCIAL DEVELOPMENT OF THE PEOPLE'S REPUBLIC OF CHINA 2016–2020, Chapter 55 (Compilation & Translation Bureau, Cent. Comm. of the Communist Party of China trans., Dec. 2017), <https://en.ndrc.gov.cn/policies/202105/P020210527785800103339.pdf> [<https://perma.cc/H9X9-7FL2>].

of supply chains that closely link China to the rest of the world.<sup>78</sup> For centuries, Guangzhou has been one of China's coastal cities that has seen the most flood and tidal surge disasters, which has caused severe damages.<sup>79</sup> Facing more frequent extreme rainfall, increasingly severe land subsidence, an ever more stressed Pearl River, and a rising South China Sea, cities of the PRD have pledged to invest more in urban flood control and to find ways to capitalize on strategies to offset climate change.<sup>80</sup>

Guangzhou is one of four major cities serving as core engines of China's economic development and involvement in international trade.<sup>81</sup> A second of these cities, Shenzhen, is also within the GBA.<sup>82</sup> As one of the world's leading high-tech innovation centers, Shenzhen has endeavored to become the spearhead of China's market capitalism, showcasing socialism with Chinese characteristics.<sup>83</sup> Shenzhen operates the country's first citywide carbon emissions trading system (ETS),<sup>84</sup> and pioneered cross-regional cooperation by launching the Shenzhen-Baotou (city of the Inner Mongolia Autonomous Region) ETS.<sup>85</sup> In order to mitigate excessive compliance costs, Shenzhen has made attempts to bring foreign investors into the trading system<sup>86</sup> and to launch

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<sup>78</sup> Michael Kimmelman, *Rising Waters Threaten China's Rising Cities*, N.Y. TIMES (Apr. 7, 2017), <https://www.nytimes.com/interactive/2017/04/07/world/asia/climate-change-china.html> (on file with the *Ohio State Law Journal*).

<sup>79</sup> See *id.*; see also Tran Viet Duc, *Which Coastal Cities Are at Highest Risk of Damaging Floods? New Study Crunches the Numbers*, WORLD BANK (Aug. 19, 2013), <https://www.worldbank.org/en/news/feature/2013/08/19/coastal-cities-at-highest-risk-floods> [<https://perma.cc/X2GS-4EFM>].

<sup>80</sup> See Kimmelman, *supra* note 78.

<sup>81</sup> Const. & Mainland Affs. Bureau, *Cities*, GREATER BAY AREA, <https://www.bayarea.gov.hk/en/focus/bayarea-cities.html> [<https://perma.cc/ZN82-3U7Y>].

<sup>82</sup> Const. & Mainland Affs. Bureau, *Overview*, GREATER BAY AREA, <https://www.bayarea.gov.hk/en/about/overview.html> [<https://perma.cc/X8BQ-JYQ8>].

<sup>83</sup> See, e.g., Roger Huang, *Shenzhen's Rise Shows China Is Centrally Focused on the Digital Yuan*, FORBES (Oct. 16, 2020), <https://www.forbes.com/sites/rogerhuang/2020/10/16/shenzhens-rise-shows-china-is-centrally-focused-on-the-digital-yuan/> [<https://perma.cc/2TP8-7Q46>].

<sup>84</sup> Jiang, Ye & Ma, *supra* note 7, at 17. For a description of China's emissions trading pilot programs, see generally Ling Xiong, Bo Shen, Shaozhou Qi, Lynn Price & Bin Ye, *The Allowance Mechanism of China's Carbon Trading Pilots: A Comparative Analysis with Schemes in EU and California*, 185 APPLIED ENERGY 1849 (2017).

<sup>85</sup> INT'L CARBON ACTION P'SHIP, *supra* note 29, at 148.

<sup>86</sup> Tan Jiaoyi Wang (碳交易网), Tan Jinrong Shichang Ronghe Shi Da Wan Qu Jian Xiang Fazhan, *Shenhua Jinrong Kaifang de Zhongyao Changshi (碳金融市场融合是大湾区践行绿色发展、深化金融开放的重要尝试)* (July 22, 2019), [http://www.tanpaifang.com/qingjienengyuan/2019/0722/64779\\_6.html](http://www.tanpaifang.com/qingjienengyuan/2019/0722/64779_6.html) [<https://perma.cc/BJ6U-9RBW>].

an electronic bidding system.<sup>87</sup> Shenzhen also has one of the few environmental trading systems that allows pledges of carbon quota as a way of financing.<sup>88</sup>

The Shenzhen ETS covers both direct and indirect emissions from most sectors and entities, leading to the greatest share of covered emissions within total emissions compared to other pilot regions.<sup>89</sup> Other eligible entities and individuals are encouraged to participate in the program.<sup>90</sup> Participation is also open to any financial institution.<sup>91</sup> The Shenzhen trading system uses a Carbon Quota Registry system as the basis of carbon quota ownership and its content,<sup>92</sup> and participates in the Chinese Certified Emissions Reductions (CCERs) program, which gave way to the Voluntary Greenhouse Gas Emission Reduction Trading Registry system.<sup>93</sup> Shenzhen is the first trading system to implement a variable fine, set at three times the market-clearing price multiplied by the excess emissions.<sup>94</sup>

The relationship between the Shenzhen trading system and the Guangdong regional system is unique because Shenzhen is a sub-provincial city under Guangdong.<sup>95</sup> Yet, the Shenzhen system has its own regulatory design, enforcement, and trading practices.<sup>96</sup> Among China's eight regional pilot

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<sup>87</sup> Su Meng (苏萌), Jia Zhihang (贾之航) & Yu Zhenshuo (于镇硕), King & Wood Mallesons, *Zhongguo Tan Paifang Quan Jiaoyi Chanpin*, Moshi, Shichang He Tan Jinrong Yanshang Pin—Qian Tan Shi Ge Dian (中国碳排放权交易产品、模式、市场和碳金融衍生品——浅谈十个点) (Nov. 3, 2017), <https://www.chinalawinsight.com/2017/11/articles/dispute-resolution/中国碳排放权交易产品、模式、市场和碳金融衍生/> [<https://perma.cc/9PL3-BH24>].

<sup>88</sup> Deng Minzhen (邓敏贞), *Woguo Tan Paifang Quan Zhiya Rongzi Falu Zhidu Yanjiu* (我国碳排放权质押融资法律制度研究), *Zhengzhi Yu Falu* (政治与法律), no. 6, 2015, at 98, 105.

<sup>89</sup> Wang Binhui (王彬辉), *Woguo Tan Paifang Quan Jiaoyi de Fa Zhan de Zhan Ji Qi Lifa Gen Jin* (我国碳排放权交易的发展及其立法跟进) (2015), <http://www.cqvip.com/%E2%80%8C8Cqk/87961x/201502/664310577.html> (on file with author).

<sup>90</sup> Shen, *supra* note 51, at 21.

<sup>91</sup> *Id.*

<sup>92</sup> *Shenzhen Shi Tan Paifang Quan Jiaoyi Guanli Zhanxing Banfa* (深圳市碳排放权交易管理暂行办法) arts. 45–47. The municipal government of Shenzhen has reserved some allowances to prevent dramatic price fluctuations, including a buyback mechanism with the annual buyback amount capped at 10% of the total allowances in that year, and 3% auction or 2% fixed-price sale of allowance from the Allowance Price Containment Reserve (APCR). Jiang, Ye & Ma, *supra* note 7, at 19.

<sup>93</sup> *Interim Measures for the Administration of Voluntary Greenhouse Gas Emission Reduction Trading*, INT'L ENERGY AGENCY (2013), <https://www.iea.org/policies/2010-interim-measures-for-the-administration-of-voluntary-greenhouse-gas-emission-reduction-trading> [<https://perma.cc/7QCM-MCWN>] [hereinafter *Interim Measures*].

<sup>94</sup> See Jiang, Ye & Ma, *supra* note 7, at 20 & n.3.

<sup>95</sup> *Zhongguo Tan Paifang Jiaoyi Wang* (中国碳排放交易网), *Jiedu Woguo Ge Tan Jiaoyi Shidian Wei Wancheng Luyue Mubiao Di Chengfa Cuoshi* (解读我国各碳交易试点未完成履约目标的惩罚措施) (Dec. 20, 2014), <http://www.tanpaifang.com/tanjiaoyi/2014/1220/41009.html> [<https://perma.cc/EVZ7-U4K7>].

<sup>96</sup> See JOSH MARGOLIS, DANIEL J. DUDEK & ANDERS HOVE, PAULSON INST., *ROLLING OUT A SUCCESSFUL CARBON TRADING SYSTEM* 15 (Sept. 2015).

carbon markets, Shenzhen took the lead in issuing the first local ETS regulation passed through its Local People's Congress (LPC).<sup>97</sup> On the other hand, the Guangdong provincial government took the approach of formulating local ETS rules.<sup>98</sup> Shenzhen also has the broadest ETS covering about twenty-six different sectors, while at the opposite extreme Guangdong focuses on four sectors.<sup>99</sup>

Guangzhou, as the capital of Guangdong Province, has the same regulatory and institutional capacity to conduct climate experimentation and legislation and the same development history of local legislative power as Shenzhen.<sup>100</sup> Yet, Guangzhou's local environmental regulations often simply copy state and provincial laws and regulations.<sup>101</sup> In October 2020, the China Securities Regulatory Commission announced the launching of the Guangzhou Future Exchange as a big step forward of China's GBA initiative and green finance experimentation.<sup>102</sup> But Guangzhou's existing climate governance mechanism of relying mostly on environmental enforcement (both judicial and administrative) rather than its trading systems will continue to be an obstacle to the effectiveness of any national trading system.<sup>103</sup>

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<sup>97</sup> SHENZHEN RSCH. CTR. FOR URB. DEV. & CHINA EMISSIONS EXCH., THE ANNUAL REPORT ON FIRST-YEAR OPERATION OF SHENZHEN ETS § 2.1 (Jan. 2015) [hereinafter SHENZHEN RSCH. CTR.].

<sup>98</sup> See DEUTSCHE GESELLSCHAFT FÜR INTERNATIONALE ZUSAMMENARBEIT GMBH, GUANGDONG ETS (Jan. 2014); see also *Interim Measures*, *supra* note 93. In practice, local regulations and local rules are considered "law," except the former are more legally binding according to China's Legislation and would therefore provide a more solid foundation of credibility for their respective carbon trading programs (Shenzhen and Beijing). See *Legislation Law of the People's Republic of China (Order of the President No. 31)*, GOV.CN (Mar. 15, 2000), [http://english1.english.gov.cn/laws/2005-08/20/content\\_29724.htm](http://english1.english.gov.cn/laws/2005-08/20/content_29724.htm) [<https://perma.cc/T56E-T23K>]; SHENZHEN RSCH. CTR., *supra* note 97, § 2.1; INT'L CARBON ACTION P'SHIP, CHINA – BEIJING PILOT ETS 1, [https://icapcarbonaction.com/en/?option=com\\_etsmap&task=export&format=pdf&layout=list&systems%5B%5D=53](https://icapcarbonaction.com/en/?option=com_etsmap&task=export&format=pdf&layout=list&systems%5B%5D=53) [<https://perma.cc/Z8SD-3234>].

<sup>99</sup> MARGOLIS, DUDEK & HOVE, *supra* note 96, at 20.

<sup>100</sup> Li Zhiping (李挚萍), *Difan Huanjing Lifa Fazhan Zouxian Fenxi——Yi Guangdong Huanjing Lifa Wei Kaocha Zhong* (地方环境立法发展走向分析——以广东环境立法为考察重), *Difan Lifa Yanjiu* (地方立法研究), no. 2, 2017, at 1, 5.

<sup>101</sup> *Id.* at 3, 4 Tbl. 3.

<sup>102</sup> Guangzhou Qihou Jiaoyi Suo Choubi Zu Chengli (广州期货交易所筹备组成立), Zhongguo Zhengquan Jiandu Guanli Weiyuanhui (中国证券监督管理委员会) [CHINA SEC. REGUL. COMM'N] (Oct. 9, 2020), [http://www.csrc.gov.cn/pub/newsite/zjhxwfb/xwdd/202010/t20201009\\_384047.html](http://www.csrc.gov.cn/pub/newsite/zjhxwfb/xwdd/202010/t20201009_384047.html) [<https://perma.cc/2B2Y-4HGK>].

<sup>103</sup> Guangzhou Shi Renmin Zhengfu Bangong Ting Guanyu Yinfa Guangzhou Shi Jieneng Jiang Tan Di Shisan Ge Wu Nian Guihua (2016–2020 Nian) de Tongzhi (广州市人民政府办公厅关于印发广州市节能降碳第十三个五年规划(2016—2020年)的通知), Guangzhou Shi Renmin Zhengfu (广州市人民政府) [PEOPLE'S GOV'T OF GUANGZHOU MUN.] (Apr. 17, 2017), [http://www.gz.gov.cn/zwgk/fggw/sfbgtwj/content/post\\_4758581.html](http://www.gz.gov.cn/zwgk/fggw/sfbgtwj/content/post_4758581.html) (on file with the *Ohio State Law Journal*).

Foshan and Dongguan, two sub-provincial GBA cities both known as world manufacturing hubs, provide another comparison.<sup>104</sup> Over the years, Foshan has engaged in legal innovation to achieve economic reform and pollution control.<sup>105</sup> These efforts have generated intense local opposition from compliance entities, but Foshan stood firm and took action to reform, implement, and enforce its regulations and rules preventing climate change.<sup>106</sup> In contrast, Dongguan continues to rely on a top-down steering mechanism.<sup>107</sup> Despite obtaining local legislative power in 2015, Dongguan's involvement in energy efficiency innovation was weak, but the city has a pattern of securing as many favorable policies and pilot programs as possible for its economic and political benefit.<sup>108</sup>

Another example is provided by the city of Hong Kong. Hong Kong and cities of mainland China have different economic, political, and legal systems.<sup>109</sup> Hong Kong law is based on English law, but mainland China's grip is strengthening.<sup>110</sup> Climate change was barely on the policy agenda in Hong Kong before 2010.<sup>111</sup> Hong Kong is known for its extremely low rate of car ownership compared to other developed countries or regions in the world.<sup>112</sup> Electricity consumed by buildings accounts for about 60% of Hong Kong's GHG emissions and for 90% of electricity produced in the city, 65% of which is consumed by commercial buildings.<sup>113</sup> The Hong Kong government has been

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<sup>104</sup> See Primrose Riordan & Christian Shepherd, *China's Economic Boom Leaves Manufacturing Hubs Short of Power*, FIN. TIMES (June 1, 2021), <https://www.ft.com/content/80b35489-a18d-4e51-8665-167a7d9e7ce1> (on file with the *Ohio State Law Journal*).

<sup>105</sup> Huo Tao, Difang Lifa Quan Jiang Kuo Zhi Quanguo 282 Ge She Qu Shi Huanjing Lifa Shuaixian Shifan (地方立法权将扩至全国282个设区市 环境立法率先示范), Zhong Xin Wang (中新网) (Dec. 17, 2014), <http://www.chinanews.com/ny/2014/12-17/6884979.shtml> [https://perma.cc/3YJK-PBMN].

<sup>106</sup> See Peter Corne & Johnny Browaeys, *China Cleans Up Its Act on Environmental Enforcement*, DIPLOMAT (Dec. 9, 2017), <https://thediplomat.com/2017/12/china-cleans-up-its-act-on-environmental-enforcement/> [https://perma.cc/SVT7-457T].

<sup>107</sup> Quanguo "Bu She Qu Di Ji Shi" Hai Sheng 4 Ge, Xin Yixian Chenshi Dongguan Yuanhe Shen Zai Qizhong (全国“不设区地级市”还剩4个·新一线城市东莞缘何身在其中), Sohu (搜狐) (Apr. 22, 2020), [https://www.sohu.com/a/390198729\\_120179484](https://www.sohu.com/a/390198729_120179484) [https://perma.cc/T2FG-V3CX].

<sup>108</sup> *Id.*

<sup>109</sup> See Lutz-Christian Wolff, *Comparing Chinese Law . . . But with Which Legal Systems?*, 6 CHINESE J. COMPAR. L. 151, 166 (2018).

<sup>110</sup> *Id.* at 166–67.

<sup>111</sup> Mee Kam Ng, *A Critical Review of Hong Kong's Proposed Climate Change Strategy and Action Agenda*, 29 CITIES 88, 88–89 (2012).

<sup>112</sup> The car ownership rate of Hong Kong was 68 per 1000 in 2014. See *Number of Private Cars per 100,000 Population*, SOC. INDICATORS OF H.K., [https://www.socialindicators.org.hk/en/indicators/environmental\\_quality/19.8](https://www.socialindicators.org.hk/en/indicators/environmental_quality/19.8) [https://perma.cc/55FA-PNWX].

<sup>113</sup> *New Regulations Urged to Force City to Cut Back on Its Use of Energy*, CLEAR THE AIR ENERGY BLOG (Apr. 26, 2011), <http://energy.cleartheair.org.hk/?p=919> [https://perma.cc/ARG8-4AY9]; *Background*, ELEC. & MECH. SERVS. DEP'T (Dec. 30, 2020), [https://www.emsd.gov.hk/beeo/en/mibec\\_beeo.html](https://www.emsd.gov.hk/beeo/en/mibec_beeo.html) [https://perma.cc/93JP-FE6D].

targeting air quality and pollution concerns, zoning and land use, urban planning, and sustainable building design and proposed a voluntary carbon intensity reduction target in 2010.<sup>114</sup> But criticisms remain of the strength of Hong Kong's proposed climate action agenda.<sup>115</sup>

Our examination of Chinese cities suggests that more urbanized and developed cities like Hong Kong, Guangzhou, and Shenzhen are more likely to focus on urban climatic planning and green buildings, while cities like Dongguan and Foshan tend to focus more on energy conservation and pollution control. Reputation is also important for the more activist cities in terms of tourism, appeal to international investment and talents, and image as a world-leading climate change champion or role model.<sup>116</sup> The less urbanized cities focus on energy and industrial resource allocation, which is closely tied to their local economic growth.<sup>117</sup> There could be a significant lag-time for these cities to catch up with the others.<sup>118</sup>

City governments with larger numbers of state-owned enterprises (SOEs) and local monopolies, such as Beijing and Shanghai, tend to rely on conventional environmental mandates and targets rather than innovatively creating new legal solutions.<sup>119</sup> Typically, cities with a more straightforward top-down governance model (for example, Guangzhou and Dongguan) have fewer local environmental laws in force.<sup>120</sup> Their governance structures are also accompanied by lower public- and private-business participation in dealing with climate issues, as the state-owned sector has greater bargaining power with regulators.<sup>121</sup> In the absence of explicit legislation, these factors influence the willingness of private companies and individuals to participate in technological or industrial innovation regarding climate change, as well as the transformation

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<sup>114</sup> See Ng & Ren, *supra* note 1, at 364–65; see also Kam Ng, *supra* note 111, at 88.

<sup>115</sup> See Kam Ng, *supra* note 111, at 97.

<sup>116</sup> See, e.g., Fisch, *supra* note 14, at 798.

<sup>117</sup> See *id.* at 801–02.

<sup>118</sup> Elizabeth C. Economy, C.V. Starr Senior Fellow & Dir. of Asia Stud., Council on Foreign Rels., China's Environmental Challenge: Political, Social and Economic Implications, Testimony Before the Congressional Executive Commission on China Roundtable on the Environment (Jan. 27, 2003) (transcript available at <https://www.cfr.org/report/chinas-environmental-challenge-political-social-and-economic-implications>) [<https://perma.cc/6QLQ-8VEX>].

<sup>119</sup> Beijing and Shanghai have the top two numbers of SOEs in the country, and more than 400- and 300- local rules/government documents on environmental protection currently effective, but relatively smaller numbers of local environmental regulations in comparison to Shenzhen (ranked no. 11 by SOEs).

<sup>120</sup> Guangzhou and Dongguan respectively formulated four and one piece(s) of city-level environmental regulations while Shenzhen has nine. Data collected via a Chinese online legal database, known as PKULAW.

<sup>121</sup> See Laura Hering & Sandra Poncet, *Environmental Policy and Exports: Evidence from Chinese Cities*, 68 J. ENV'T ECON. & MGMT. 296, 298 (2014).

from a manufacturing powerhouse to a service-driven economy.<sup>122</sup> Thus, local governments will need to close the gap between state and non-state firms in access to policy-making and in the number of political and administrative directives and fixed standards favoring politically connected firms and local monopolies.<sup>123</sup>

### C. *The Political Economy of Local Climate Policies*

Under China's climate governance system and top-down accountability structure, primary decision-making power rests with the central government, with local governments playing a secondary role.<sup>124</sup> Apart from the campaigns and mandates delegated by the central government that are discussed in Part II.A, local governments rarely face either direct public pressure or international pressure to take immediate and drastic climate actions.<sup>125</sup>

The central government can influence local legislation and administration through a range of review mechanisms and personnel and investigatory measures.<sup>126</sup> The "unified leadership"<sup>127</sup> of the Communist Party of China (CPC) and its overriding concern for political stability<sup>128</sup> gave rise to China's centralist national-regional-local hierarchies,<sup>129</sup> resulting in major state-led regulatory interventions or gigantic government-sponsored infrastructure projects in the environmental and energy field.<sup>130</sup> For example, the world's longest unit-train coal line—Hao-Ji Railway, with an investment of two hundred

<sup>122</sup> See generally Chien, *supra* note 73; cf. PIETER GLASBERGEN, CO-OPERATIVE ENVIRONMENTAL GOVERNANCE: PUBLIC-PRIVATE AGREEMENTS AS A POLICY STRATEGY 8–9 (1998) (contrasting a participatory approach to ecological modernization which sees the state as a positive force for tackling environmental issues with a rejectionist approach which views wide civic participation as an opportunity to overcome state support of dominant private interests that block ecological change).

<sup>123</sup> Cf. GLASBERGEN, *supra* note 122, at 8–9.

<sup>124</sup> See Qi, Ma, Zhang & Li, *supra* note 33, at 392, 397–98; see also Harriet Bulkeley, *Governing Climate Change: The Politics of Risk Society?*, 26 TRANSACTIONS INST. BRIT. GEOGRAPHERS 430, 440 (2001).

<sup>125</sup> Qi, Ma, Zhang & Li, *supra* note 33, at 393.

<sup>126</sup> See Renninger, *supra* note 70, at 17.

<sup>127</sup> For more discussion on the concept "unified leadership" (统一领导), see Renninger, *supra* note 70, at 18.

<sup>128</sup> Anita Engels, Comment, *Understanding How China Is Championing Climate Change Mitigation*, 4 PALGRAVE COMM'NS 101, 104 (2018).

<sup>129</sup> See, e.g., John A. Donaldson, *China's Administrative Hierarchy: The Balance of Power and Winners and Losers Within China's Levels of Government*, in ASSESSING THE BALANCE OF POWER IN CENTRAL-LOCAL RELATIONS IN CHINA 105, 131–32 (John A. Donaldson ed., 2017).

<sup>130</sup> See Engels, *supra* note 128, at 2–3; see also Zhu Yan (朱妍) & Yu Menglin (于孟林), Shijie Zui Zhang Mei Yun Zhuanxian Liyong Lü Jin Yi Cheng (Jizhe Diaocha) (世界最长煤运专线利用率仅一成 (记者调查)), Zhongguo Nengyuan Bao (中国能源报) (Sept. 7, 2020), [http://paper.people.com.cn/zgnyb/html/2020-09/07/content\\_2007903.htm](http://paper.people.com.cn/zgnyb/html/2020-09/07/content_2007903.htm) [https://perma.cc/5UL3-6PHR].

million RMB—begins from the far north of Inner Mongolia and ends at the south end of Jiangxi Province, aiming to reduce the emissions and pollutions from transporting coal using other types of cargo ships or trucks.<sup>131</sup> However, almost a year after being put to use, the utilization rate of this coal line remained below ten percent due to problematic local collecting and distributing networks.<sup>132</sup> And this is a recurring issue because different local governments vary significantly in resources and willingness to comply with the intent of the central government.<sup>133</sup>

While some cities may push ahead of national climate policy, others are resistant. For many cities, housing, sanitation, and waste disposal are the more urgent areas for city governance. These are manifestations of the so-called “main contradictions,”<sup>134</sup> redefined by President Xi as a “contradiction between people’s ever-growing needs for a better life and unbalanced and inadequate development.”<sup>135</sup> These pressing needs outweigh the distant objective of tackling climate change, providing little motivation for local governments to engage in genuine climate experimentation without adequate chances of financial gain and tax revenue.<sup>136</sup> Local bureaucrats pursue the “overall” or “general interest” with an aim of limiting the risk of failure, which often means sticking to familiar policy instruments favoring state-owned enterprises (SOEs) and asset-heavy companies rather than fostering low-carbon developments in all systems.<sup>137</sup>

The scholarly literature favoring western liberal democracy or federalism is particularly critical of local units as “instrumentalized agents” of the central state, adding that climate change is considered one of the most autonomous areas of local policy and that local governments are granted a certain leeway and discretion to deal with specific climate issues in ways that are tailored to local circumstances.<sup>138</sup> The political significance of environmental policies in relation to China’s entire policy context has also been addressed in the literature.<sup>139</sup> A different narrative portrays cities as the essential link between the available solutions—technology and behavioral change—and climate

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<sup>131</sup> Zhu & Yu, *supra* note 130.

<sup>132</sup> *Id.*

<sup>133</sup> *Id.*

<sup>134</sup> 主要矛盾, or “main contradictions,” derived from Mao’s theory in *On Contradiction*, refer to constant conflicting collective goals between different social classes. See generally MAO TSE-TUNG, *ON CONTRADICTION* (1967).

<sup>135</sup> Renninger, *supra* note 70, at 3.

<sup>136</sup> See Qi, Ma, Zhang & Li, *supra* note 33, at 379.

<sup>137</sup> 整体利益, or “overall interest,” refers to the governing concept of paying attention to the interests of the whole instead of individuals.

<sup>138</sup> See Kevin Lo, *How Authoritarian Is the Environmental Governance of China?*, 54 *ENV’T SCI. & POL’Y* 152, 152–53, 158 (2015).

<sup>139</sup> See Lewis Husain, *Logics of Government Innovation and Reform Management in China* 8 (STEPS Ctr., Working Paper No. 85, 2015).

action.<sup>140</sup> In particular, this narrative is hopeful of bottom-up innovations and collaborations involving citizens, businesses, non-governmental organizations (NGOs), and local governments<sup>141</sup> rooted in a democratic, free, and open society.<sup>142</sup>

Local governments in China act to some extent like profit-seeking businesses,<sup>143</sup> and yet they do not entirely behave in profit-maximizing ways.<sup>144</sup> On one hand, the flood of money into major state-led environmental campaigns and pilots is a source of inter-regional rivalry.<sup>145</sup> Past experiences have taught local governments to grab as much funding as possible before development quotas run out.<sup>146</sup> On the other hand, different regions must somehow coexist, as most environmental problems do not remain local—and most markets today are broader than local as well.

This is also in line with the GBA case. Regional protectionism is more widespread in regions and industries dominated by SOEs and their local monopolies.<sup>147</sup> Years of “teamwork” relationships, especially in the resource and energy industries, have led to strong connections and mutual trust between different governmental authorities and public companies.<sup>148</sup> Cooperative mechanisms or joint working groups (cross-regional “leading groups” on climate change, centers for inter-regional power exchange, etc.) are crucial to smoothly enforcing the law, implementing projects under construction, and avoiding abandoned, unfinished projects.<sup>149</sup> Indeed, some research has pointed out that cities embedded in multi-level governance systems or supported by dedicated coordinating organizations are more likely to take climate action than

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<sup>140</sup> Jeroen van der Heijden, *Studying Urban Climate Governance: Where to Begin, What to Look for, and How to Make a Meaningful Contribution to Scholarship and Practice*, EARTH SYS. GOVERNANCE, Jan. 2019, at 1, 2.

<sup>141</sup> *Id.*

<sup>142</sup> Karin Bäckstrand, *Scientisation vs. Civic Expertise in Environmental Governance: Eco-Feminist, Eco-Modern and Post-Modern Responses*, 13 ENV'T POL. 695, 702 (2004).

<sup>143</sup> Qi, Ma, Zhang & Li, *supra* note 33, at 394.

<sup>144</sup> *See, e.g., id.* at 397–98.

<sup>145</sup> Thomas Heberer & Anja Senz, *Streamlining Local Behaviour Through Communication, Incentives and Control: A Case Study of Local Environmental Policies in China*, 40 J. CURRENT CHINESE AFFS. 77, 103–04 (2011); *see also* Lo, Li & Chen, *supra* note 34, at 115–16.

<sup>146</sup> *See* Yuki, *Would China Finally Solve the Renewable Subsidy Deficit?*, ENERGY ICEBERG (Aug. 12, 2020), <https://energyiceberg.com/bond-to-rescue-subsidy-deficit/> [<https://perma.cc/KHU3-T63D>].

<sup>147</sup> *See* Sandra Poncet, *A Fragmented China: Measure and Determinants of Chinese Domestic Market Disintegration*, 13 REV. INT'L ECON. 409, 425 (2005).

<sup>148</sup> For a vivid description of the Shenzhen Municipal State-Owned Assets Supervision and Administrative Commission in Chinese, *see* Lu Jun (卢俊), Shenzhen Guozi Wei Shi Zenyang Shenqi Ban de Cunzai? (深圳国资委是怎样神奇般的存在?), Sohu (搜狐) (May 16, 2021), [https://www.sohu.com/a/466695509\\_226049](https://www.sohu.com/a/466695509_226049) [<https://perma.cc/NPM9-HNCR>].

<sup>149</sup> *See* CHINA COUNCIL FOR INT'L COOP. ON ENV'T AND DEV., POLICY RESEARCH REPORT ON ENVIRONMENT AND DEVELOPMENT 36 (2013), [https://www.iisd.org/system/files/publications/CCICED\\_annual\\_report.pdf](https://www.iisd.org/system/files/publications/CCICED_annual_report.pdf) [<https://perma.cc/Q8CV-LSDK>].

those that are not.<sup>150</sup> On the other hand, powerful existing systems of cooperation and influence may strongly favor SOEs that are resistant to change.<sup>151</sup>

In the Chinese context, the dynamics of climate action are heavily shaped by the continuing legacy of state socialism, which has left state enterprises in a powerful position to resist disruptive policies and innovative competitors.<sup>152</sup> During the process of designing government markets for climate governance purposes and midwifing infant low-carbon industries, small inventors such as start-up firms or emerging technology companies may never find their way to the negotiation table, especially when local governments want to protect a more traditional development model against disruption.<sup>153</sup> With SOEs holding the dominant market share in China's energy industry, the interests of these energy monopolies are often considered equivalent to China's national interests.<sup>154</sup>

At times environmental advocates must wait until a window of opportunity opens up due to local economic development strategies.<sup>155</sup> For example, the Guangdong provincial government's low-carbon industrial revolution aligns with its longstanding desire to upgrade and optimize its current resource- and labor-intensive, low-value-added, export-oriented economic structure.<sup>156</sup> Other regions may retain economic strategies based on resource exploitation and heavy industry, leaving them uninterested in developing carbon markets or other shifts in favor of lower carbon emissions.<sup>157</sup> Development strategies and economic opportunities vary in different localities, with implications for environmental policies.<sup>158</sup>

The central government shapes local policies through legislation, but also exercises a more subtle influence through the nationwide government personnel system, which increasingly emphasizes environmental indicators.<sup>159</sup> Career paths for officials are shaped by the cadre evaluation system, which is used by

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<sup>150</sup> See George C. Homsy & Mildred E. Warner, *Cities and Sustainability: Polycentric Action and Multilevel Governance*, 51 URB. AFFS. REV. 46, 66 (2015).

<sup>151</sup> See Alex Wang, *Chinese State Capitalism and the Environment*, in REGULATING THE VISIBLE HAND? THE INSTITUTIONAL IMPLICATIONS OF CHINESE STATE CAPITALISM, at 251, 252–53 (Curtis Milhaupt & Benjamin Liebman eds., 2015).

<sup>152</sup> As Alex Wang observed, scholars generally have viewed SOEs as obstacles to environmental progress, though he saw some hope that recent innovations by the central government may succeed in changing this dynamic. *See id.* at 1–2.

<sup>153</sup> See Lo, *supra* note 138, at 152–53, 156–57.

<sup>154</sup> See Wang, *supra* note 151, at 7–11.

<sup>155</sup> See Engels, *supra* note 128, at 4.

<sup>156</sup> See Lo, Li & Chen, *supra* note 34, at 117.

<sup>157</sup> See, e.g., *id.* at 118.

<sup>158</sup> Heberer & Senz, *supra* note 145, at 106.

<sup>159</sup> For example, ecology and environmental protection effectiveness of regions covered by the Ecological Conservation Red Line Initiative, green GDP for realizing the value of ecological products, etc. *See generally id.*

the central authorities to score the performance of officials.<sup>160</sup> The current top-down cadre evaluation system favoring measurable outcomes and tangible results is largely based on self-reporting, incentivizing local data manipulation.<sup>161</sup> Like any scoring system, such as law school rankings, it creates pressure to focus on the specific variables that enter into the score, leading to conduct that increases scores but does not necessarily improve actual outcomes.<sup>162</sup>

SOEs enjoy close relationships with local governments and financing sources, leaving more innovative private competitors at a competitive disadvantage.<sup>163</sup> Business lending often goes to less-efficient SOEs that can also count on huge government subsidies and government-channeled investment funds.<sup>164</sup> This can result in credit constraints on healthy private companies, leaving them without access to external funding.<sup>165</sup> This has been shown to be prevalent in China's major provinces of energy—Shaanxi, Inner Mongolia, Ningxia, Xinjiang—whose economies are dominated by SOEs and their local monopolies in the resource and energy industries.<sup>166</sup> A recent report shows that these regions have a high noncompliance rate in the public sector and are highly likely to fail to “cap” their energy consumption and energy intensity previously planned in the Thirteenth Five-Year Plan.<sup>167</sup> Even Guangdong, an area that has had some success with environmental policy pilots, had to encounter numerous obstacles given its growing need of electricity supply.<sup>168</sup> Due to these regional differences, while the overall climate agenda seems promising nationally, controversy between regions and sectors over energy and low-carbon goals and

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<sup>160</sup> For discussion of the cadre evaluation system, see Fisch, *supra* note 14, at 801–02, and Heberer & Senz, *supra* note 145, at 87.

<sup>161</sup> Lo, Li & Chen, *supra* note 34, at 115–16.

<sup>162</sup> When local officials in China do take action, they may be motivated purely by career advancement rather than an actual effort to achieve environmental goals. See Fisch, *supra* note 14, at 792. As Fisch observes, “[w]hereas national ministries set direction and goals, the decentralized nature of China’s governing structure allows local officials to elect which policies to implement and which to ignore, often impairing environmental programs.” *Id.* at 801. Local officials may, however, sometimes see improved environmental quality as a way to advance local economies, as Fisch also notes. *Id.* at 798 (giving examples).

<sup>163</sup> See Hering & Poncet, *supra* note 121, at 308.

<sup>164</sup> *Id.*

<sup>165</sup> *Id.*

<sup>166</sup> See NEA NEW ENERGY [2020] No. 31, NOTICE ON THE 2019 RESULTS ON MONITORING AND EVALUATION OF NATIONAL RENEWABLE ENERGY DEVELOPMENT (2020), PKULAW, CLI.4.342292 (on file with the *Ohio State Law Journal*).

<sup>167</sup> Zhu Yan (朱妍) & Yu Menglin (于孟林), Dujia Gun Duo de Qi Xian Neng Zong Liang Chaobiao Kun Ju (独家 | 多地齐陷能耗总量超标困局), *Zhongguo Nengyuan Bao* (中国能源报) (Nov. 22, 2020), <https://mp.weixin.qq.com/s/SUhB7dyhnTIBq-Ucc0AowQ> [<https://perma.cc/W5HK-RQUC>].

<sup>168</sup> Tao Mingyang, *Guangdong Limits Factories’ Electricity Supply as Summer Peak Comes Early*, *GLOB. TIMES* (May 26, 2021), <https://www.globaltimes.cn/page/202105/1224565.shtml> [<https://perma.cc/N7X3-2H7L>].

implementation will remain heated over a long period of time in China, as with any attempt to achieve a departure from its previous path.<sup>169</sup>

Skepticism over organizations not politically connected to the Party apparatus is firmly embedded in China's political culture and has only deepened over time.<sup>170</sup> At the national level, the result is an embedded distrust of the private sector.<sup>171</sup> It is up to local governments to assign a greater or lesser share of the green market to private firms or foreign investors, whose operations and inventions require strong legal safeguards as protection from SOEs' greater political and bargaining power.

Our examination of local climate policies in China suggests the influence of several key factors. One cluster of factors promotes adoption of climate policies. These factors include heavy urbanization, economic emphasis on the technology sector, and a relatively weak presence by SOEs.<sup>172</sup> Another cluster is associated with failure to adopt climate policies or resistance to those policies. Those factors include low urbanization, a high presence of SOEs, and economic reliance on heavy industry or resource extraction.<sup>173</sup>

Some aspects of the Chinese situation are unique, such as the role of SOEs and cadre evaluation.<sup>174</sup> Other factors operating in China, such as differences in local economies and degree of urbanization, also operate elsewhere.<sup>175</sup> In the next Part, we consider the role of provinces and cities in the very different legal, economic, and institutional setting of Japan.

### III. ADAPTATION AND WIND POWER GENERATION IN JAPAN

Unlike China, Japan is a capitalist democracy with a high level of economic development.<sup>176</sup> This Part will explore how provinces and cities have functioned in this very different context for climate policy.

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<sup>169</sup> See Long Zhang, Benjamin K. Sovacool, Jingzheng Ren & Adrian Ely, *The Dragon Awakens: Innovation, Competition, and Transition in the Energy Strategy of the People's Republic of China, 1949–2017*, 108 ENERGY POL'Y 634, 641–42 (2017).

<sup>170</sup> See Renninger, *supra* note 70, at 2–3.

<sup>171</sup> Sun Wen-bin & Wong Siu-lun, *The Development of Private Enterprise in Contemporary China: Institutional Foundations and Limitations*, CHINA REV., Fall 2002, at 65, 70.

<sup>172</sup> Engels, *supra* note 128, at 3.

<sup>173</sup> *Id.* at 3–4.

<sup>174</sup> See generally Wang, *supra* note 151; CENT. COMM. OF THE CHINESE COMMUNIST PARTY, PROPOSAL OF THE CENTRAL COMMITTEE OF THE CHINESE COMMUNIST PARTY ON DRAWING UP THE 14TH FIVE-YEAR PLAN FOR NATIONAL ECONOMIC AND SOCIAL DEVELOPMENT AND LONG-RANGE OBJECTIVES FOR 2030 (Nov. 3, 2020).

<sup>175</sup> See Ivan Turok & Gordon McGranahan, *Urbanization and Economic Growth: The Arguments and Evidence for Africa and Asia*, 25 ENV'T & URBANIZATION 465, 469–71 (2013).

<sup>176</sup> See *Japan's Economy*, ASIALINK BUS., <https://asialinkbusiness.com.au/japan/getting-started-in-japan/japans-economy?doNothing=1> (last visited Aug. 10, 2021).

As in China, the national government in Japan has failed to seize the initiative on climate policy. Until recently,<sup>177</sup> Japan has not taken a leadership role in addressing climate change. Although it joined the first period of the Kyoto Protocol, it did not join the second period.<sup>178</sup> In 1998, the Japanese Parliament (the Diet) passed the Act on Promotion of Global Warming Countermeasures,<sup>179</sup> which sought to control greenhouse gas emissions.<sup>180</sup> It aimed to promote global warming countermeasures with a plan for attaining targets under the Kyoto Protocol.<sup>181</sup> After the Fukushima nuclear disaster, Japan took further steps to promote renewable energy.<sup>182</sup> Nevertheless, the renewable energy sector has grown relatively slowly in Japan.<sup>183</sup> Japan also failed to ramp up its climate commitment in the second round of Paris Agreement national actions.<sup>184</sup>

This lack of strong national leadership on climate issues highlights the importance of action at the local level. Despite the centralization of formal governmental authority in Japan, local jurisdictions have substantial power as a

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<sup>177</sup> After a new prime minister took office, Japan announced an aggressive new climate goal. See Ben Dooley, Makiko Inoue & Hikari Hida, *Japan's New Leader Sets Ambitious Goal of Carbon Neutrality by 2050*, N.Y. TIMES (Nov. 30, 2020), <https://www.nytimes.com/2020/10/26/business/japan-carbon-neutral.html> [<https://perma.cc/7AZC-W3LY>].

<sup>178</sup> *Japan Says 'No' to Kyoto Protocol Second Commitment Period*, DOWN TO EARTH (Nov. 29, 2010), <https://www.downtoearth.org.in/news/climate-change/japan-says-no-to-kyoto-protocol-second-commitment-period-68198> [<https://perma.cc/9GH9-C7NL>].

<sup>179</sup> Chikyū ondanka taisaku no suishin ni kansuru hōritsu [Act on Promotion of Global Warming Countermeasures], Law No. 117 of 1998, *translated in* (Japanese Law Translation [JLT DS]), <http://www.japaneselawtranslation.go.jp/law/detail/?ft=5&re=2&dn=1&gn=4&sy=&ht=A&no=117&x=40&y=12&ia=03&ja=04&ky=&page=2> [<https://perma.cc/K5AB-FVTJ>] (Japan).

<sup>180</sup> *Id.* art. 2(2).

<sup>181</sup> *Id.* arts. 1, 2(4).

<sup>182</sup> See Daxin Li, *Japan's Shift Toward Renewable Energy in Response to the Fukushima Dai-Ichi Meltdown*, 3 ARIZ. J. ENV'T L. & POL'Y 1005, 1005 (2012).

<sup>183</sup> Ohta stated that:

However, power generation by renewables remains low compared to many European countries whose annual power generation share of renewables exceeds 30%. The ISEP estimated that the share of total renewable energy generation in Japan in 2018 had increased to 17.4% from 16.4% in the previous year. The share of solar PV power generation in Japan increased from 5.7% to 6.5% in 2018. Wind power (0.7%) and biomass (2.2%) also tend to increase in power generation, but hydropower and geothermal power continue to remain the same amount.

Hiroshi Ohta, *The Analysis of Japan's Energy and Climate Policy from the Aspect of Anticipatory Governance*, 13 ENERGIES 5153 (2020).

<sup>184</sup> Noémie Leprince-Ringuet, *Japan's New Climate Commitment Falls Woefully Short. Here's How to Improve It.*, WORLD RES. INST. (Mar. 30, 2020), <https://www.wri.org/blog/2020/03/japan-new-climate-commitment-falls-woefully-short-heres-how-improve-it> [<https://perma.cc/7W5X-XM3H>].

practical matter.<sup>185</sup> We will examine two aspects of local government action. We will first review the Japanese Climate Change Adaptation Act,<sup>186</sup> which places key responsibilities on local governments. We will then examine how communities have either embraced climate change mitigation or resisted renewable energy.

### A. National-Local Roles in Climate Adaptation

Japan is a long archipelago, extending from north to south.<sup>187</sup> The impacts of and temperature rise due to climate change differs dramatically across its regions.<sup>188</sup> As central and local governments cannot ignore the impact of climate change, they need to implement adaptive measures against it. Adaptation consists of measures to “prevent or reduce damage, and to contribute to a stable living environment, sound development of a society and economy, and to preserve the natural environment.”<sup>189</sup>

#### 1. The Statutory Framework for Adaptation

In 2018, the Diet passed the Climate Change Adaptation Act (CCAA),<sup>190</sup> which specifies the roles of central and local governments, business entities, and individuals in addressing climate change.<sup>191</sup> The national government proposed a draft of the “National Plan for Adaptation to the Impacts of Climate Change” in 2015, and the cabinet released the “National Plan for Adaptation to the Impacts of Climate Change” that same year.<sup>192</sup> The Ministry of the Environment prepared guidelines for local governments to promote its adaptation measures.<sup>193</sup>

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<sup>185</sup> See S. HAYDEN LESBIREL, *NIMBY POLITICS IN JAPAN: ENERGY SITING AND THE MANAGEMENT OF ENVIRONMENTAL CONFLICT* 7 (1998).

<sup>186</sup> *Id.*

<sup>187</sup> [*Japanese Archipelago*] *Wetland in Japan*, MINISTRY OF ENV'T, <https://www.env.go.jp/en/nature/npr/wetland/archi.html> [<https://perma.cc/BWK7-W36L>].

<sup>188</sup> MICHAEL CASE & ANDREA TIDWELL, WWF, *NIPPON CHANGES: CLIMATE IMPACTS THREATENING JAPAN TODAY AND TOMORROW* 5, [https://www.wwf.or.jp/activities/lib/pdf\\_climate/environment/WWF\\_NipponChanges\\_lores.pdf](https://www.wwf.or.jp/activities/lib/pdf_climate/environment/WWF_NipponChanges_lores.pdf) [<https://perma.cc/H7RG-8AVQ>].

<sup>189</sup> *Kikō hendō tekiō hō* [Climate Change Adaptation Act], Law no. 50 of 2018, art. 2, *translated in* (Japanese Law Translation [JLT DS]), <http://www.japaneselawtranslation.go.jp/law/detail/?id=3212&vm=04&re=01> [<https://perma.cc/4Y28-ZX2Y>] (Japan).

<sup>190</sup> *Id.*

<sup>191</sup> *Id.* arts. 3–6.

<sup>192</sup> Press Release, Ministry of the Env't, On National Plan for Adaptation to the Impacts of Climate Change (Nov. 27, 2015), <https://www.env.go.jp/en/headline/2258.html> [<https://perma.cc/XRV9-ZNMX>].

<sup>193</sup> *Id.* The full plan can be found at MINISTRY OF THE ENV'T, GOV'T OF JAPAN, NATIONAL PLAN FOR ADAPTATION TO THE IMPACTS OF CLIMATE CHANGE (2015), <https://www.env.go.jp/en/earth/cc/nationalplan151127-2.pdf> [<https://perma.cc/R9UN-2SAZ>] [hereinafter NATIONAL PLAN].

The CCAA calls for the participation of the central government, local governments, and the National Institute for Environmental Studies (NIES)<sup>194</sup> in climate adaptation. The central government must draft a national adaptation plan regarding the impacts of climate change on agriculture, forestry and fisheries, water resources and environment, natural ecosystems, natural disasters, public health, business and economic activities, and people's lives.<sup>195</sup> The central government also must promote the enhancement of scientific research on the adaptation to climate change and its impact<sup>196</sup> and establish a plan for climate change adaptation.<sup>197</sup> The Ministry of the Environment receives opinions from the central government council and reports on the comprehensive assessment of climate change every five years.<sup>198</sup> The central government is duty-bound to review the progress of climate change adaptation in detail, through the Climate Change Adaptation Plan, and develop an evaluation method.<sup>199</sup>

Local governments also participate in adaptation planning in their areas.<sup>200</sup> They must establish local climate change adaptation centers to collect, organize, analyze, and provide information about adaptation to climate change and its local impact.<sup>201</sup> These centers advise on the local implementation of climate change adaptation.<sup>202</sup> Local governments and climate change adaptation centers may establish Regional Councils on Climate Change Adaptation, which perform necessary consultations on climate change through wide-scale cooperation.<sup>203</sup> The Ministry of the Environment issues guidelines on government communication with local inhabitants, such as hosting workshops to raise awareness of climate change and its risks.<sup>204</sup>

The NIES provides support for the climate change adaptation plan.<sup>205</sup> It collects, organizes, analyzes, and provides information regarding the adaptation to climate change and its impact.<sup>206</sup> It provides technical advice and assistance to local governments on the formulation and promotion of local climate change

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<sup>194</sup> NAT'L INST. FOR ENV'T STUD., <https://www.nies.go.jp/index-e.html> [<https://perma.cc/5NYQ-A68L>]; see also CTR. FOR CLIMATE CHANGE ADAPTATION, <https://ccca.nies.go.jp/en/index.html> [<https://perma.cc/MD7B-E6LQ>].

<sup>195</sup> See Climate Change Adaptation Act, art. 13(1).

<sup>196</sup> *Id.* art. 16.

<sup>197</sup> *Id.* art. 7.

<sup>198</sup> *Id.* art. 10(1).

<sup>199</sup> *Id.* art. 9.

<sup>200</sup> *Id.* art. 12.

<sup>201</sup> Climate Change Adaptation Act, art. 13(1).

<sup>202</sup> *Id.* art. 13.

<sup>203</sup> *Id.* art. 14.

<sup>204</sup> *Keikaku sakutei manyuaru [Planning manual]*, A-PLAT, <https://adaptation-platform.nies.go.jp/jichitai/plan/manual.html> [<https://perma.cc/EA85-9G6U>]; *Chiiki kikō hendō tekiō keikaku sakutei manyuaru - tejun-hen [Regional Climate Change Adaptation Plan Manual Procedures]*, A-PLAT, [https://adaptation-platform.nies.go.jp/local/plan/files/pdf/jichitai\\_manual\\_201811rev.pdf](https://adaptation-platform.nies.go.jp/local/plan/files/pdf/jichitai_manual_201811rev.pdf) [<https://perma.cc/BF7N-4BXX>].

<sup>205</sup> Climate Change Adaptation Act, arts. 7(2)(v), 11.

<sup>206</sup> *Id.* art. 11(1)(i).

adaptation plans.<sup>207</sup> The NIES establishes a climate change adaptation information platform and provides data regarding the Social Implementation Program on Climate Change Adaptation Technology (SI-CAT)<sup>208</sup> and a web geographic information system (Web GIS),<sup>209</sup> that aims to predict climate change on a regional basis.<sup>210</sup> The NIES updates local governments' climate change plans and relevant information.<sup>211</sup> The Ministry of the Environment maintains a website for the Regional Adaptation Consortium Project to promote the evaluation of regional climate change adaptation, and successful examples in the private sector.<sup>212</sup> The Ministry of Economy, Trade and Industry (METI) also issues Climate Change Adaptation Good Practices to help private companies focus on mitigation and adaptation efforts in developing countries.<sup>213</sup>

## 2. Implementing the CCAA

The success of the Climate Change Adaptation Act (CCAA) depends on the manner and timing of adherence to Representative Concentration Pathways (RCP 2.6), issued by the Intergovernmental Panel on Climate Change's Fifth Assessment Report.<sup>214</sup>

The CCAA enables cross-departmental policy-making and helps the central government harmonize the adaptation policies promoted by local governments.<sup>215</sup> Although the NIES functions as a central data center, its data must be locally adapted.<sup>216</sup> With the help of SI-CAT and Web GIS, local

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<sup>207</sup> *Id.* art. 11(1)(ii).

<sup>208</sup> See SOC. IMPLEMENTATION PROGRAM ON CLIMATE CHANGE ADAPTATION TECH. (SI-CAT), <https://www.restec.or.jp/si-cat/en/> [<https://perma.cc/77DD-P95A>].

<sup>209</sup> See *Climate Change Adaptation Information Platform*, NAT'L INST. FOR ENV'T STUD., <https://adaptation-platform.nies.go.jp/en/index.html> [<https://perma.cc/25U5-AGKC>].

<sup>210</sup> *Id.*

<sup>211</sup> See, e.g., *For Local Governments*, NAT'L INST. FOR ENV'T STUD., <https://adaptation-platform.nies.go.jp/en/lots/local.html> [<https://perma.cc/C2YA-RT2C>].

<sup>212</sup> MINISTRY OF THE ENV'T, *Regional Adaptation Consortium Project*, A-PLAT, <https://adaptation-platform.nies.go.jp/conso/index.html> [<https://perma.cc/9Z7B-4PML>].

<sup>213</sup> MINISTRY OF ECON., TRADE & INDUS., CLIMATE CHANGE ADAPTATION GOOD PRACTICES BY JAPANESE PRIVATE SECTOR (Mar. 2020), [https://www.meti.go.jp/policy/energy\\_environment/global\\_warming/adaptation\\_goodpractice\\_FY2019ENG.pdf](https://www.meti.go.jp/policy/energy_environment/global_warming/adaptation_goodpractice_FY2019ENG.pdf) [<https://perma.cc/V73K-MWUK>].

<sup>214</sup> See INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, FIFTH ASSESSMENT REPORT (2014), <https://www.ipcc.ch/assessment-report/ar5/> [<https://perma.cc/FF7D-QKH9>]. The IPCC is now in the process of issuing its Sixth Assessment Report (AR6), which will undoubtedly require updating of Japan's plans.

<sup>215</sup> Kikō hendō tekiō hō [Climate Change Adaptation Act], Law No. 50 of 2018, arts. 3, 7, 13, translated in (Japanese Law Translation [JLT DS]), <http://www.japaneselawtranslation.go.jp/law/detail?id=3212&vm=04&re=01> [<https://perma.cc/4Y28-ZX2Y>] (Japan).

<sup>216</sup> *Id.* art. 13(2).

governments can collect and analyze raw data.<sup>217</sup> The System for Efficient content-based retrieval to Analyze Large volume climate data (SEAL) facilitates the search for data in the Database for Policy Decision-Making for Future Climate Change.<sup>218</sup> Local governments may solicit data from universities or non-governmental research centers, or refer to existing research literature to collect regional data to forecast the current and future local impacts of climate change.<sup>219</sup>

Each region has unique geographical and social features influencing the impact of climate change.<sup>220</sup> Regional Councils on Climate Change Adaptation are expected to encourage local governments to study the challenges of neighboring governments.<sup>221</sup> Additionally, local governments usually shape policies in collaboration with neighboring governments.<sup>222</sup> A local government's inaction will be emulated by its neighboring peers.<sup>223</sup>

Japanese municipalities have limited resources, which may hamper adaptation measures.<sup>224</sup> The Japanese Constitution grants autonomy to local governments in Chapter VIII.<sup>225</sup> Local governments depend on the financial support of the central government,<sup>226</sup> as they endeavor to establish climate change adaptive measures<sup>227</sup> despite their limited human and financial resources.<sup>228</sup>

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<sup>217</sup> See, e.g., *Welcome to d4PDF*, DATABASE FOR POL'Y DECISION-MAKING FOR FUTURE CLIMATE CHANGE (D4PDF), [https://www.miroc-gcm.jp/d4PDF/index\\_en.html](https://www.miroc-gcm.jp/d4PDF/index_en.html) [<https://perma.cc/7M2F-J8QB>].

<sup>218</sup> Yujin Nakagawa et al., *Development of a System for Efficient Content-Based Retrieval to Analyze Large Volumes of Climate Data*, 7 PROGRESS EARTH & PLANETARY SCI. 1 (Feb. 26, 2020), <https://progearthplanetsci.springeropen.com/track/pdf/10.1186/s40645-019-0315-9.pdf> [<https://perma.cc/M745-SK8G>]; *Welcome to d4PDF*, *supra* note 217; see also *About*, DIAS (DATA INTEGRATION ANALYSIS SYSTEM), <https://diasjp.net/en/about/> [<https://perma.cc/LZJ7-L42E>].

<sup>219</sup> See Climate Change Adaptation Act, art. 14; *For Local Governments*, *supra* note 211.

<sup>220</sup> Climate Change Adaptation Act, art. 12.

<sup>221</sup> See *id.* art. 14. See generally NATIONAL PLAN, *supra* note 193.

<sup>222</sup> See SHUNSUKE KIMURA, REGIONAL ADMINISTRATION IN JAPAN: DEPARTURE FROM UNIFORMITY 53, 69–71 (2017).

<sup>223</sup> See, e.g., *id.* at 73.

<sup>224</sup> See, e.g., Kenshi Baba et al., *Climate Change Adaptation Strategies of Local Governments in Japan*, OXFORD RSCH. ENCYC. OF CLIMATE SCI. (2017), <https://doi.org/10.1093/acrefore/9780190228620.013.597> (on file with the *Ohio State Law Journal*) (discussing the impact of limitations in budget, personnel, and expertise on the state of adaptation planning).

<sup>225</sup> NIHONKOKU KENPŌ [KENPŌ] [CONSTITUTION], ch. VIII, art. 94 (Japan).

<sup>226</sup> See, e.g., NOBUYOSHI ASHIBE, KENPŌ [CONSTITUTION] 381 (Kazuyuki Takahashi ed., 7th ed. 2019).

<sup>227</sup> Kikō hendō tekiō hō [Climate Change Adaptation Act], Law No. 50 of 2018, art. 12, *translated in* Japanese Law Translation [JLT DS]), <http://www.japaneselawtranslation.go.jp/law/detail?id=3212&vm=04&re=01> [<https://perma.cc/4Y28-ZX2Y>] (Japan).

<sup>228</sup> HIROSHI ŌTSU, BUNKEN KOKKA NO KENPŌ RIRON [CONSTITUTIONAL THEORY OF A DECENTRALIZED NATION], at 6–24 (2015).

In formulating adaptation measures, local governments must take into account what science has to say about local climate change impacts. The central government observes, monitors, projects, and assesses the broad impacts of climate change at the national level.<sup>229</sup> Scientific uncertainty can delay adaptive action, as can failure of local governments to heed scientists' warnings.<sup>230</sup> Data from the Climate Change Adaptation Platform (A-PLAT) can provide a basis for correcting misunderstandings surrounding climate change adaptation.<sup>231</sup>

Each region's unique nature renders it susceptible to its own climate change impacts and risks.<sup>232</sup> The government needs to communicate the feasibility of climate change adaptive action at the local scale. Communication is also required between experts, members of parliament, and the government. Local governments may need to establish advisory boards to bridge the cognitive gap between experts and ordinary people's interests.<sup>233</sup> Universities can provide experts to advisory boards to help people understand the risks and impacts associated with climate change. If strong leadership is required, the advisory board should be established in the governor's office. To contain political pressure, members might be required to be nominated by the governor and approved by the local parliament.

Advisory boards are expected to issue cross-departmental proposals. Local governments can be prone to siloing by agencies.<sup>234</sup> Each administrative organ and department may exclusively pursue its own interests and focus on its narrow administrative jurisdiction rather than comprehensive policies.<sup>235</sup> Some departments might have developed their own policies such as flood prevention or heat stroke prevention.<sup>236</sup> Since the establishment of the CCAA, local

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<sup>229</sup> Climate Change Adaptation Act, art. 16.

<sup>230</sup> See Sonja J. Vermeulen et al., *Addressing Uncertainty in Adaptation Planning for Agriculture*, 110 PROC. NAT'L ACAD. SCIS. 8357, 8357 (2013); see also Baba et al., *supra* note 224, at 14.

<sup>231</sup> See Nat'l Inst. for Env't Stud., *What Is "Climate Change Adaptation Information Platform"?*, A-PLAT, <https://adaptation-platform.nies.go.jp/en/info/about.html> [<https://perma.cc/Y82U-E6RY>].

<sup>232</sup> See CASE & TIDWELL, *supra* note 188, at 9.

<sup>233</sup> See Satoru Ohsugi, *The Organization of Local Government Administration in Japan* 4–5 (Council of Local Auths. for Int'l Rels., Papers on the Local Governance System and its Implementation in Selected Fields in Japan No. 11, July 2009), <http://www.clair.or.jp/j/forum/honyaku/hikaku/pdf/BunyabetsuNo11en.pdf> [<https://perma.cc/RU6P-ECXL>] (explaining how consultative organs in Japanese local government function "with the aim of utilizing specialist knowledge, or in order to enable the will of the people to be reflected").

<sup>234</sup> See Francesca Froy, *Breaking Out of Silos: Joining Up Policy Locally*, ORGANISATION FOR ECON. CO-OPERATION & DEV., <https://www.oecd.org/regional/lead/43056251.pdf> [<https://perma.cc/6NB9-DSGS>].

<sup>235</sup> See Baba et al., *supra* note 224, at 1 (noting that "different bureaus, such as agriculture, public health, and disaster prevention, focus on different outcomes of climate change due to their different missions").

<sup>236</sup> See *id.* at 10–11 (noting that awareness of and response to extreme changes like high heat and flooding was more common among local bureaus); see also Froy, *supra* note 234, at 1.

governments must review those existing policies and integrate them into their adaptive action.<sup>237</sup> Leadership by governors can penetrate compartmentalized local administrations, and parliaments can monitor departments to mitigate self-oriented decisions.<sup>238</sup>

Resource constraints can also limit adaptation planning. The human-resource capacity of smaller local governments is limited.<sup>239</sup> If a specialized person leaves the office, the adaptive action may falter.<sup>240</sup> Budget allocation is critical in local governance as well.<sup>241</sup> Local governments must fund continuous research on the long-term impact of climate change. The use of the departments' budgets is ultimately left to voters' discretion regarding the manner in which communities prevent long-term risk.<sup>242</sup>

Large jurisdictions like Tokyo are in a much different position than smaller localities. Tokyo's adaptation plan contains a broad portfolio of adaptation measures.<sup>243</sup> The city forecasts major increases in torrential rain events,<sup>244</sup> accompanied by more landslides,<sup>245</sup> dramatic increases in number of extremely hot, humid days,<sup>246</sup> and greater coastal flooding due to increased wave action,

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<sup>237</sup> See, e.g., Leslie Mabon, Kayoko Kondo, Hiroyuki Kanekiyo, Yuriko Hayabuchi & Asako Yamaguchi, *Fukuoka: Adapting to Climate Change Through Urban Green Space and the Built Environment?*, 93 CITIES 273, 273 (2019), <https://www.sciencedirect.com/science/article/pii/S0264275118312125> [<https://perma.cc/HK89-PNL7>] (discussing one municipality's implementation and integration of climate adaptation policies from the 1997 Kyoto Protocol through the CCAA).

<sup>238</sup> See Ohsugi, *supra* note 233, at 5–14 (detailing the structure of local government under the leadership of prefectural governors); see, e.g., *The Work of the Assembly*, FUKUOKA PREFECTURAL ASSEMBLY SUMMARY, <http://www.gikai.pref.fukuoka.lg.jp/language/english/work.html> [<https://perma.cc/URC2-A6X6>] (“The assembly conducts the administrative work of the prefecture and carries out examinations and investigations of different operations to determine whether they are being properly implemented in accordance with the assembly’s decisions.”); *Functions of the Metropolitan Assembly*, TOKYO METRO. ASSEMBLY, <https://www.gikai.metro.tokyo.jp/english/functions.html> [<https://perma.cc/DJQ3-CMWD>] (detailing the power of the Tokyo Metropolitan assembly to “conduct inspections or audits of the implementation status of the administrative activities of the metropolitan government”).

<sup>239</sup> Yuichiro Tsuji, *Climate Change Action and Adaptation in Tokyo*, 11 WASH. J. ENV'T L. & POL'Y 89, 93 (2020).

<sup>240</sup> See *id.* at 95; see Baba et al., *supra* note 224, at 7–8 (exploring how expert knowledge and experience are crucial to implementing adaptation strategies).

<sup>241</sup> See Hiromitsu Ishi, *Budgets and the Budgetary Process in Japan*, 37 HITOTSUBASHI J. ECON. 1, 6 (1996).

<sup>242</sup> See *id.* at 6–11 (detailing how the bulk of final consumption expenditure by the government occurs at the local level subject to prefectural or municipal budgeting).

<sup>243</sup> See TOKYO METRO. GOVT, TOKYO CLIMATE CHANGE ADAPTATION POL'Y 14–15 (Dec. 2019), <https://www.kankyo.metro.tokyo.lg.jp/files/Full.ver-adaptation-policy.pdf> [<https://perma.cc/45KB-RWT5>].

<sup>244</sup> *Id.* at 12.

<sup>245</sup> *Id.* at 16.

<sup>246</sup> *Id.* at 11.

more intense (though fewer) typhoons, and sea level rise.<sup>247</sup> The proposed responses include measures such as expansion of reservoirs and stormwater capacity to deal with increased rainfall,<sup>248</sup> promoting urban greening,<sup>249</sup> and creating “cool spots” and low-heat pavement to deal with heat waves.<sup>250</sup>

Another example of adaptation planning, distant from Tokyo in both space and scale, is Fukuoka City on the island of Kyushu.<sup>251</sup> In the far south of Japan, this city of 1.5 million has a subtropical climate, making increased temperatures a pressing concern.<sup>252</sup> Temperatures have already increased by 2.5°C since the turn of the last century.<sup>253</sup> In response to this threat, Fukuoka has adopted a plan to increase greenspace in order to reduce air temperatures.<sup>254</sup> With similar climates, Kobe and Hiroshima have also begun planning for increased heat, with greenspace as a central strategy (along with creation of a wind corridor for cooling in Kobe).<sup>255</sup>

A 2017 nationwide survey of local governments’ adaptation planning revealed some important trends.<sup>256</sup> Many local officials identified local expertise and bureaucratic siloing as barriers to adaptation planning.<sup>257</sup> After the survey was completed, some larger jurisdictions started adding information to the five-year revisions of their mitigation plans.<sup>258</sup> The upshot was that “while some prefectures and major cities have already begun to prepare adaptation strategies, the majority of municipalities have yet to consider such strategies.”<sup>259</sup>

## B. Local Government and Emission Reduction Measures

### 1. Local Government Actions: Cap-and-Trade in Tokyo

Local governments can also play an important role in terms of mitigation issues. That role can be either positive or negative, depending on local attitudes and interests.<sup>260</sup> Smaller local governments are less knowledgeable about

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<sup>247</sup> *Id.* at 13–16. A coastal barrier has also been proposed to address the threat posed by sea level rise. Miguel Esteban et al., *Climate Change Adaptation in Tokyo Bay: The Case for a Storm Surge Barrier*, 34 COASTAL ENG’G PROC. 3364, 3374 (2014).

<sup>248</sup> TOKYO METRO. GOV’T, *supra* note 243, at 17.

<sup>249</sup> *Id.* at 23–24.

<sup>250</sup> *Id.* at 23.

<sup>251</sup> See Mabon, Kondo, Kanekiyo, Hayabuchi & Yamaguchi, *supra* note 237, at 273.

<sup>252</sup> *Id.* at 275.

<sup>253</sup> *Id.* at 278.

<sup>254</sup> *Id.* at 279.

<sup>255</sup> *Id.*

<sup>256</sup> See generally Baba et al., *supra* note 224.

<sup>257</sup> See *id.* at 7–8.

<sup>258</sup> See *id.* at 9.

<sup>259</sup> *Id.* at 16.

<sup>260</sup> See E. Tjernström & T. Tietenberg, *Do Differences in Attitudes Explain Differences in National Climate Change Policies?*, 65 ECOLOGICAL ECON. 315, 321–22 (2008); Ayako

climate change measures and resist adaptation to climate change due to lack of financial and human resources.<sup>261</sup> On the other hand, large cities such as Tokyo and Saitama tend to be more aggressive in implementing climate change measures.<sup>262</sup> In April 2002, the Tokyo Metropolitan Government introduced the “Global Warming Countermeasure Protocol,” which required large business establishments to set, calculate, and report their greenhouse gas emission targets,<sup>263</sup> and then to adopt voluntary and systematic reduction measures.<sup>264</sup> The Tokyo Metropolitan Government also amended its environmental assurance ordinance in June 2008<sup>265</sup> and launched a cap-and-trade program in 2010 to mandate total emission reductions,<sup>266</sup> suggesting that the central government should implement an internationally acceptable system that clearly mandates total emission reductions.

The Tokyo Metropolitan Government set a target of reducing emissions by 6% to 8% over the five years from 2010 to 2014, and by 15% to 17% from 2015 to 2019.<sup>267</sup> Emission allowances were then allocated to the industrial sector free

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Kawano, *Japan: Greenhouse Gas Emissions Trading Schemes*, WHITE & CASE (Sept. 20, 2017), <https://www.whitecase.com/publications/insight/japan-greenhouse-gas-emissions-trading-schemes> [<https://perma.cc/67R4-ERY3>].

<sup>261</sup> See Tsuji, *supra* note 239, at 95.

<sup>262</sup> As in the United States, local governments in Japan can generally adopt environmental regulations that are stricter than national requirements. See Shiro Kawashima, *A Survey of Environmental Law and Policy in Japan*, 20 N.C. J. INT’L L. & COM. REGUL. 231, 243, 260 (1995). The discussion of the Tokyo plan in the text draws on Tsuji, *supra* note 239.

<sup>263</sup> Tomin no kenkō wo anzen o kakuho suru kankyō ni kansuru jōrei [Ordinance on the Environment to Ensure the Health and Safety of the People of Tokyo], Ordinance No. 215 of 2000, arts. 8, 8-1 to 8-5 (Japan), [https://www.kankyo.metro.tokyo.lg.jp/basic/guide/security\\_ordinance/index.html](https://www.kankyo.metro.tokyo.lg.jp/basic/guide/security_ordinance/index.html) [<https://perma.cc/W9FB-YUKP>]; see also *Descriptions of Local Green Policy Initiatives and Plans: Tokyo Metropolis*, GREEN LOC. GOV’T PORTAL, [http://www.climate-lg.jp/en/local\\_gov/archives/metropolitan\\_tokyo.html](http://www.climate-lg.jp/en/local_gov/archives/metropolitan_tokyo.html) [<https://perma.cc/AYY2-9QFZ>] [hereinafter *Tokyo Metropolis*].

<sup>264</sup> See generally TŌKYŌTO KANKYŌ KYOKU [TOKYO METRO. GOV’T BUREAU OF ENV’T], CHIKYŪONDANKATAISAKU KAIKAKUSHO SEIDO [GLOBAL WARMING COUNTERMEASURE PROTOCOL] (2005), [https://www.kankyo.metro.tokyo.lg.jp/climate/large\\_scale/overview/current\\_program/index.files/h18riifuretto.pdf](https://www.kankyo.metro.tokyo.lg.jp/climate/large_scale/overview/current_program/index.files/h18riifuretto.pdf) [<https://perma.cc/4JJ2-4AHZ>].

<sup>265</sup> TOKYO METRO. GOV’T, TOKYO CLIMATE CHANGE STRATEGY: PROGRESS REPORT AND FUTURE VISION 2 (Mar. 2010), [https://www.kankyo.metro.tokyo.lg.jp/en/climate/index.files/Tokyo\\_climate\\_change\\_strategy\\_progress\\_r.pdf](https://www.kankyo.metro.tokyo.lg.jp/en/climate/index.files/Tokyo_climate_change_strategy_progress_r.pdf) [<https://perma.cc/C625-M57K>]; *Tokyo Metropolis*, *supra* note 263.

<sup>266</sup> BUREAU OF ENV’T, TOKYO METRO. GOV’T, TOKYO CAP-AND-TRADE PROGRAM: JAPAN’S FIRST MANDATORY EMISSIONS TRADING SCHEME 11–12 (2010), [https://www.kankyo.metro.tokyo.lg.jp/en/climate/cap\\_and\\_trade/index.html](https://www.kankyo.metro.tokyo.lg.jp/en/climate/cap_and_trade/index.html) [<https://perma.cc/KR7Z-CDB4>] [hereinafter TOKYO CAP-AND-TRADE PROGRAM].

<sup>267</sup> BUREAU OF ENV’T, TOKYO METRO. GOV’T, “TOKYO CAP-AND-TRADE PROGRAM” FOR LARGE FACILITIES [DETAILED DOCUMENTS] 2(3), 2(5) (May 2015), [https://www.kankyo.metro.tokyo.lg.jp/en/climate/cap\\_and\\_trade/index.files/TokyoCaT\\_detailed\\_documents.pdf](https://www.kankyo.metro.tokyo.lg.jp/en/climate/cap_and_trade/index.files/TokyoCaT_detailed_documents.pdf) [<https://perma.cc/5VY2-RDV4>] [hereinafter CAP-AND-TRADE FOR LARGE FACILITIES]

of charge using a grandfathering method rather than auctioning.<sup>268</sup> Since the grandfathering system determines emission reduction quotas based on past emissions, more emission reduction quotas were allocated than were necessary to reach the emission reduction target.<sup>269</sup> As a result, the price of carbon may fall and the effect of reducing emissions may be diminished.<sup>270</sup>

More recently, the Tokyo Metropolitan Government<sup>271</sup> adopted goals for achieving zero emissions and transforming into a decarbonized society.<sup>272</sup> As one of its efforts, the Tokyo Metropolitan Government formulated the 2019 ZEV Tokyo Strategy<sup>273</sup> to promote Zero Emission Vehicles (ZEVs).<sup>274</sup> The Tokyo Metropolitan Government is also trying to promote cross-sectoral climate change measures and strengthen its existing policies on energy conservation and renewable energy in buildings.<sup>275</sup> In 2020, Tokyo decided to increase the use of renewable energy by advancing the cap-and-trade system through ordinances and also by promoting the use of renewable energy in Tokyo's facilities.<sup>276</sup>

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(describing how first compliance period is from 2010 to 2014. The second compliance period is from 2015 to 2019, and thereafter, the period shall be set at five-year intervals).

<sup>268</sup> See TOKYO CAP-AND-TRADE PROGRAM, *supra* note 266, at 19; see also CAP-AND-TRADE FOR LARGE FACILITIES, *supra* note 267, at 3(50) (“Credits offered by TMG or the Tokyo Environmental Public Service Corporation may be sold by a uniform price auction or at a fixed price.”).

<sup>269</sup> See Toru Morotomi, Masataka Shimizu & Kae Takase, WWF JAPAN, DECARBONIZING JAPAN - A PROPOSAL FOR DOMESTIC EMISSIONS TRADING SCHEME 20 (Nozomu Kawamoto & WWF Japan trans., 2008), [https://www.wwf.or.jp/activities/lib/pdf\\_climate/emissions-trading/080312ETSReport\\_ENG.pdf](https://www.wwf.or.jp/activities/lib/pdf_climate/emissions-trading/080312ETSReport_ENG.pdf) [<https://perma.cc/659U-PNK5>].

<sup>270</sup> Compare *id.* at 32 (describing how overabundance of carbon allowances led to a price crash in the European Union ETS), with Sven Rudolph, *Carbon Pricing in Japan and the Prospects for Northeast Asia Carbon Market Linking*, in CARBON MARKET COOPERATION IN NORTHEAST ASIA: ASSESSING CHALLENGES AND OVERCOMING BARRIERS 94, 97 (Jackson Ewing ed., 2018).

<sup>271</sup> The population of the historic city of Tokyo is under ten million, but the area encompassed by the Tokyo prefecture has a population of thirty-seven million, comparable to the state of California. *Tokyo Population 2021*, WORLD POPULATION REV., <https://worldpopulationreview.com/world-cities/tokyo-population> [<https://perma.cc/R6GA-U4XE>].

<sup>272</sup> *Shifting to a Decarbonized Society Amid Climate Change*, JAPAN TIMES (Jan. 22, 2019), <https://www.japantimes.co.jp/news/2019/01/22/business/shifting-decarbonized-society-amid-climate-change/> [<https://perma.cc/N4RK-GZ9A>].

<sup>273</sup> See TOKYO METRO. GOV'T, TOKYO ZEV PROMOTION STRATEGY 1 (2019), [https://www.kankyo.metro.tokyo.lg.jp/en/about\\_us/zero\\_emission\\_tokyo/strategy.files/Full-ver.ZEV-strategy.pdf](https://www.kankyo.metro.tokyo.lg.jp/en/about_us/zero_emission_tokyo/strategy.files/Full-ver.ZEV-strategy.pdf) [<https://perma.cc/MXP7-WZBX>].

<sup>274</sup> Tsuji, *supra* note 239, at 107–10.

<sup>275</sup> *Zero Emission Tokyo Strategy*, BUREAU OF ENV'T, TOKYO METRO. GOV'T (last updated Dec. 27, 2019), [https://www.kankyo.metro.tokyo.lg.jp/en/about\\_us/zero\\_emission\\_tokyo/strategy.html](https://www.kankyo.metro.tokyo.lg.jp/en/about_us/zero_emission_tokyo/strategy.html) [<https://perma.cc/SX2C-UJGS>].

<sup>276</sup> See BUREAU OF ENV'T, TOKYO METRO. GOV'T, TMG FINALIZES THE CAP FOR TOKYO CAP-AND-TRADE PROGRAM AFTER 2020 (Mar. 2020), [https://www.kankyo.metro.tokyo.lg.jp/en/climate/cap\\_and\\_trade/index.files/TCaT\\_after2020.pdf](https://www.kankyo.metro.tokyo.lg.jp/en/climate/cap_and_trade/index.files/TCaT_after2020.pdf) [<https://perma.cc/KBX2-M6W4>].

The Tokyo Metropolitan Government argues that the national government should build upon the city's emissions trading program.<sup>277</sup> The metropolitan government's proposal is that the national government set the total emission allowances and trading rules by law in the Diet, but local governments be allowed to expand the scope of regulations and set stricter local requirements.<sup>278</sup> The national government would regulate large-scale power plants and steel mills, while local governments would regulate large-scale office buildings and factories in accordance with Tokyo's cap-and-trade system.<sup>279</sup>

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<sup>277</sup> See Junko Edahiro, *Tokyo Takes the Lead in Climate Change Mitigation Measures in Japan*, JAPAN FOR SUSTAINABILITY NEWSLETTER (Apr. 30, 2008), [https://www.japanfs.org/en/news/archives/news\\_id027949.html](https://www.japanfs.org/en/news/archives/news_id027949.html) [<https://perma.cc/6USM-37H2>] (quoting then Governor Ishihara describing Tokyo's leading role, and his belief that its policies would "drag [the] country into the emission trading market"). Japan had experimented earlier with emissions trading at the national level but abandoned the effort in 2012. See ENV'T DEFENSE FUND, JAPAN: AN EMISSIONS TRADING CASE STUDY 2 (May 2015), <https://www.edf.org/sites/default/files/japan-case-study-may2015.pdf> [<https://perma.cc/4392-AHTP>].

<sup>278</sup> CAP-AND-TRADE FOR LARGE FACILITIES, *supra* note 267, at 1(3); see also NIHONKOKU KENPŌ [KENPŌ] [CONSTITUTION], art. 94 (Japan) (stating that local government may enact their own regulations within the law). An emissions trading system has not been realized by law in Japan. Kawano, *supra* note 260. In light of Article 94 of the Constitution, there is a contentious issue as to whether local governments can set up a stricter system than that enacted by the Diet in the event that the central government enacts an emissions trading scheme by law, or whether local governments can regulate the scheme by ordinance in the event that the emissions trading scheme has not been enacted by law.

<sup>279</sup> See TŌKYŌTO KANKYŌ KYOKU [TOKYO METRO. GOV'T BUREAU OF ENV'T], DAIKIBO JIGYŌSHO NI TAISURU (ONSHITSU KŌKA GASU HAISHUTSU SŌRYŌ SAKUGEN GIMU TO HAISHUTSURYŌTORIHIKI SEIDO) [OBLIGATION TO REDUCE TOTAL GREENHOUSE GAS EMISSIONS AND OBLIGATIONS UNDER AN EMISSIONS TRADING SYSTEM FOR LARGE-SCALE BUSINESSES] 7 (May 2019), [https://www.kankyo.metro.tokyo.lg.jp/climate/large\\_scale/overview/movie\\_data.files/shinki\\_combined.pdf](https://www.kankyo.metro.tokyo.lg.jp/climate/large_scale/overview/movie_data.files/shinki_combined.pdf) [<https://perma.cc/R387-4PRE>]. See generally MINISTRY OF THE ENV'T, KOKUNAI HAISHUTSURYŌTORIHIKI SEIDO NO HŌTEKI KADAI NI TSUITE [LEGAL ISSUES OF THE DOMESTIC EMISSIONS TRADING SCHEME] (2012), [https://www.env.go.jp/earth/ondanka/det/other\\_actions/ir\\_1203.pdf](https://www.env.go.jp/earth/ondanka/det/other_actions/ir_1203.pdf) [<https://perma.cc/DA3X-Q8QY>]. This report analyzes that first, as a precondition for the introduction of a domestic emissions trading scheme, it is necessary to regulate greenhouse gas emissions in some way for businesses. The report analyzes the following two issues: first, whether imposing such restrictions on corporate activities violates the freedom of business guaranteed by the Constitution; and second, if emission allowances are set for a fee, companies that are unable to bid for the allowances may face significant hindrance in their production activities, and whether such a situation violates the freedom of business. The Constitution stipulates the principle of equality. The report points out that the equality principle may be violated if incumbents and new entrants are not treated equally when setting emission allowances. For example, if emission allowances are set free of charge to incumbents based on their past emission performance through grandfathering, while allowances are set for new participants based on benchmarking or for a fee, and strict targets are imposed on new participants, the vested rights of incumbents could be protected. In addition, the report states that the principle of equality may be violated if certain entities are given unfairly disadvantageous treatment

Tokyo is not alone in seeking to reduce emissions. Eighty-nine local governments, including Tokyo, Kanagawa Prefecture, and Yokohama City have endorsed a 2050 goal of net-zero carbon emissions.<sup>280</sup> These local governments include about half of Japan's population, and a combined GDP of about \$2.8 trillion.<sup>281</sup>

## 2. National Environmental Assessment Requirements and Wind Farm Siting

NIMBYism is a long-standing problem in siting Japanese energy facilities such as nuclear power plants.<sup>282</sup> It is amplified for renewable facilities such as utility-scale solar and wind farms because of their larger land requirements.<sup>283</sup>

Some rural provinces have resisted climate change measures such as the expansion of wind power.<sup>284</sup> While wind power is expected to be one of the renewable energy sources used to meet carbon targets, there is opposition from local residents and local parliaments against wind power.<sup>285</sup> For example, they

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compared to others. Furthermore, if there is a difference in the way emission allowances are set between competing industries, it may violate the principle of equality.

<sup>280</sup> Matsushita, *supra* note 1.

<sup>281</sup> *Id.*

<sup>282</sup> See LESBIREL, *supra* note 185, at 2–4. Lesbirel points out:

Collective action opposing noxious facilities is a feature of politics in all industrialized nations. The extent to which such resistance impedes bargaining and the use of compensation methods depends on the magnitude of the per-capita costs of projects and the degree to which those costs are spread evenly across losers.

*Id.* at 145. NIMBY stands for Not in My Back Yard. *Id.* at xiii.

<sup>283</sup> *Siting for Renewables Needs Bottom-Up Approach*, JAPAN TIMES (Apr. 30, 2013), <https://www.japantimes.co.jp/news/2013/04/30/business/siting-for-renewables-needs-bottom-up-approach/> [<https://perma.cc/HRE9-CA3H>].

<sup>284</sup> *Cf.* LESBIREL, *supra* note 185, at 6. Rural opposition to large-scale renewables is not limited to Japan. See Christian Roseland, *San Bernardino County Bans Large-Scale Solar, Wind in Some Areas*, PV MAG. (Mar. 1, 2019), <https://pv-magazine-usa.com/2019/03/01/san-bernardino-county-bans-large-scale-solar-wind-in-some-areas/> [<https://perma.cc/A9QR-V84B>] (“California’s largest county has banned renewable energy projects that doesn’t serve local needs in 14 communities and ‘rural living’ zoning districts, covering more than one million acres.”). Rural communities in New England have exhibited similar resistance. *Id.*

<sup>285</sup> Ryo Sanada, (*Shiga*) *jigyō-sha ‘chūshi ari uru’ Maibara no furyokuhatsuden kensetsu keikaku* [*Shiga Operator ‘May Cancel’ Wind Power Project in Maibara*], ASAHI SHIMBUN (Jan. 12, 2018), <https://www.asahi.com/articles/ASL1C5CHXL1CPTJB00J.html> [<https://perma.cc/9VM3-F95G>] Maibara City in Shiga is concerned about the impact of the project on birds and are calling for a detailed survey and evaluation by experts. The project opponent who attended the meeting said that the project would be cancelled “after an investigation”. Maibara City and others have raised concerns about the project, saying it would have a serious impact on the living environment, including noise and the shadow of the wind turbines, as well as on birds such as golden eagles. *Id.* Some sections of the prefectural government also called for a “fundamental review of the project plan, including

argue that investment in wind power is financially risky for small municipalities, that wind power destroys local aesthetics, and that large-scale wind power facilities destroy ecosystems and cause other natural disasters.<sup>286</sup>

Local residents may not learn of the existence of a wind power proposal until the items for primary environmental impact consideration at the early stage are released.<sup>287</sup> That can provide the trigger for local resistance efforts. An example of how this process works is provided by a renewable energy company plan to build a wind power generation plant in the mountain forest that straddles the city of Maibara in the Shiga Prefecture and the town of Sekigahara in the Gifu Prefecture.<sup>288</sup>

The proposed site described in the environmental impact statement overlaps with the habitat of golden eagles.<sup>289</sup> Golden eagles and Hodgson's hawk eagles are on the International Union for Conservation of Nature Red List (the Extinct and Endangered Species Listed in the Red Data Book),<sup>290</sup> which is published by the Ministry of the Environment.<sup>291</sup> The Ministry of the Environment takes a primary environmental impact consideration (PEIC) document into consideration regarding bird-flight routes.<sup>292</sup> In 2007, the Ministry of the Environment began to survey bird collisions with wind power plants and to

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accessing the possible cancellation (the "Zero Option") of the project (considering the impact on birds and other species)." *Id.*

<sup>286</sup> See YASUSHI MARUYAMA, MAKOTO NISHIKIDO, SHOTA FURUYA & TETSUNARI IIDA, AALBORG UNIVERSITY, SOCIAL ACCEPTANCE AND SOCIAL INNOVATION IN WIND POWER TECHNOLOGY (2008).

<sup>287</sup> Kankyō eikyō hyōka hō [Environmental Impact Assessment Act], Law No. 81 of 1997, art. 3-2(1), *translated in* (Japanese Law Translation [JLT DS]), <http://www.japanese-lawtranslation.go.jp/law/detail/?id=3375&vm=&re=> [https://perma.cc/GX5Q-NC4M] (Japan).

<sup>288</sup> MINISTRY OF THE ENV'T, MAIBARA FURYOKU HATSUDEN JIGYŌ NI KAKARU KEIKAKU DANKAI KANKYŌ HAIRYO-SHO NI TAISURU KANKYŌ DAIJIN IKEN NO TEISHUTSU NI TSUITE [SUBMISSION OF THE MINISTER OF THE ENVIRONMENT'S OPINION ON THE ENVIRONMENTAL CONSIDERATION STATEMENT FOR THE PLANNING STAGE OF THE MAIBARA WIND POWER PROJECT] (Dec. 25, 2017), <https://www.env.go.jp/press/104949.html> [https://perma.cc/43MX-MGBY] (noting that besides minimizing the impact on birds, the Minister of the Environment has requested that businesses take into consideration the shadows and noise of the wind turbines).

<sup>289</sup> *Id.* (requesting that businesses conduct appropriate surveys, forecasts, and assessments, and take conservation measures based on the results, in order to avoid significant impacts on golden eagles and hawks).

<sup>290</sup> *State of Japan's Environment at a Glance: Extinct and Endangered Species Listed in the Red Data Book*, MINISTRY OF THE ENV'T, <https://www.env.go.jp/en/nature/biodiv/reddata.html> [https://perma.cc/2LPJ-DXDD].

<sup>291</sup> Akihiro Tanaka & Ryo Sanada, (*Shiga*) *maibarashi, Gifu kenkyō ni furyokuhatsuden keikaku Tōkyō no jigyōsho* [Wind Power Generation Plan for the border between Maibara City and Gifu Prefecture (Tokyo office)], ASAHI SHIMBUN (Dec. 20, 2017), <https://www.asahi.com/articles/ASKDM3VT0KDMPTJB00B.html> [https://perma.cc/Z35H-B76J].

<sup>292</sup> See Environmental Impact Assessment Act, art. 3-3.

specify the items for impact assessment in the 2011 guidelines.<sup>293</sup> However, further research was required on bird collisions, especially to examine the death toll of the white-tailed eagle, which is listed in class 1B of the endangered species list.<sup>294</sup> Consequently, from 2010 to 2012, the Ministry of the Environment considered measures to prevent bird collision.<sup>295</sup>

The company submitted a document to Shiga and Gifu prefectures on primary environmental impact considerations, the first stage of the environmental assessment.<sup>296</sup> The letter also acknowledged the possibility that the noise and wind from the wind turbines will have a significant impact on birds and that migratory birds such as golden eagles may collide with the turbines.<sup>297</sup> However, the operators may contend that these damages can be decreased by reducing the placement and number of wind turbines.<sup>298</sup> It remains to be seen whether the project sponsors can contend with these concerns.

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<sup>293</sup> MINISTRY OF THE ENV'T, CHŌRUI-TŌ NI KANSURU FURYOKU HATSUDEN SHISETSU RITCHI TEKISEI KA NO TAME NO TEBIKI [GUIDE FOR APPROPRIATE SITES OF WIND POWER GENERATION FACILITIES FOR BIRDS] (Sept. 2015), [https://www.env.go.jp/nature/yasei/sg\\_windplant/guide/post\\_91.html](https://www.env.go.jp/nature/yasei/sg_windplant/guide/post_91.html) [<https://perma.cc/AP36-Y6D8>] (choose chapters from the links at the bottom of the page); MINISTRY OF THE ENV'T, ENVIRONMENTAL IMPACT ASSESSMENT IN JAPAN 1, 3–4 (May 2012), <https://www.env.go.jp/en/focus/docs/files/20120501-04.pdf> [<https://perma.cc/SRK3-DBQ3>].

<sup>294</sup> See sources cited *supra* note 293; ALAMEDA COUNTY SCI. REV. COMM., GUIDELINE FOR SITING WIND TURBINES RECOMMENDED FOR RELOCATION TO MINIMIZE POTENTIAL COLLISION-RELATED MORTALITY FOR FOUR FOCAL RAPTOR SPECIES IN THE ALTAMONT PASS WIND RESOURCE AREA 6–7, 23 (2010), [http://altamontsrcarchive.org/alt\\_doc/p70\\_src\\_relocation\\_guidelines.pdf](http://altamontsrcarchive.org/alt_doc/p70_src_relocation_guidelines.pdf) [<https://perma.cc/BC9E-XSBD>].

<sup>295</sup> *Furyoku hatsuden ni kakaru bādosutoraiiku bōshi saku* [Preventive Measures for Bird Collision in Wind Power Generation Facilities], MINISTRY ENV'T, [https://www.env.go.jp/nature/yasei/sg\\_windplant/birdstrike.html](https://www.env.go.jp/nature/yasei/sg_windplant/birdstrike.html) [<https://perma.cc/9AHX-WEQX>].

<sup>296</sup> Environmental Impact Assessment Act, art. 3-3.

<sup>297</sup> See Tanaka & Sanada, *supra* note 291. For more information on the Red list, see IBARAKI NI OKERU ZETSUMETSU NO O SORE NO ARU YASEI SEIBUTSU: RED DATA BOOK 2016 [ENDANGERED WILDLIFE IN IBARAKI] (2016), [https://www.pref.ibaraki.jp/seikatsukankyo/shizen/tayousei/redbook/documents/ibaraki\\_rdb2016\\_4web.pdf](https://www.pref.ibaraki.jp/seikatsukankyo/shizen/tayousei/redbook/documents/ibaraki_rdb2016_4web.pdf) [<https://perma.cc/B5SB-4WGL>].

<sup>298</sup> ELECTRIC POWER DEVELOPMENT CO., LTD. (J-POWER), FUKUI ŌNO IKEDA UINDOFĀMU JIGYŌ KANKYŌEIKYŌHYŌKAHŌHŌSHO NI TSUITE NO IKEN NO GAIYŌ TO JIGYŌ-SHA NO KENKAI [FUKUI OHNO-IKEDA WIND FARM PROJECT - SUMMARY OF COMMENTS ON THE ENVIRONMENTAL IMPACT ASSESSMENT SCOPING DOCUMENT AND VIEWS OF THE PROJECT PROPONENT] (Mar. 2021), [https://www.meti.go.jp/shingikai/safety\\_security/kankyo\\_shinsa/furyoku/pdf/2021\\_012\\_02\\_01\\_03.pdf](https://www.meti.go.jp/shingikai/safety_security/kankyo_shinsa/furyoku/pdf/2021_012_02_01_03.pdf) [<https://perma.cc/BDZ8-92XJ>]. For example, in Fukui for wind power generation, residents argue that an environmental impact assessment requires a certain amount of planning before residents can make predictions, assessments, and take measures. In this case, when the location of the wind turbines has not been decided yet, new surveys are expected to be conducted. In that case, the operator should conduct additional investigation, prediction, evaluation, and countermeasures without hesitation. In response to this opinion, the project proponent explains that in the procedure of the scoping document, it sets up an area that includes all the places where wind power generation

The environmental assessment process has two key features that help shape the process. First, it provides transparency and opportunities for public participation that are uncommon in Japanese law.<sup>299</sup> Second, because compliance with the required procedures is not judicially enforceable, project opponents have to use other legal theories in litigation.<sup>300</sup> There are two options for lawsuits over the assessment procedures: lawsuits to confirm the illegality<sup>301</sup> and lawsuits by residents against local governments.<sup>302</sup> The first option would be for the citizens to file a lawsuit to confirm the illegality and demand that the report and briefs be redone. The approval authority is allowed a certain amount of discretion in granting permits and approvals, and even when the EIAA states that there are significant environmental impacts, if there is a more important public interest need, it cannot be said that granting permits would be immediately illegal. However, if the content of the assessment is not properly

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facilities may be installed or modified in the future as the “target project area”, and also sets up a “assumed range of wind turbine installation” that covers the assumed range of wind turbine installation. However, additional surveys may be required depending on the changes in the plan, and in such cases, the process will be described in the preparation document. Please note that the next briefing will be held at the stage of the preparation document, but not immediately before construction, as construction will start after the evaluation report is finalized.

<sup>299</sup> Lara Fowler, *From Technical Fix to Regulatory Mix: Japan’s New Environmental Law*, 12 PAC. RIM L. & POL’Y J. 441, 466 (2003).

<sup>300</sup> EXPERT COMM. ON ENV’T IMPACT ASSESSMENT SYS., ‘KONGO NO KANKYŌ EIKYŌ HYŌKA SEIDO NO ARIKATA NI TSUITE’ HIARINGU SHIRYŌ [HEARING MATERIALS ON *THE FUTURE OF THE ENVIRONMENTAL IMPACT ASSESSMENT SYSTEM*] 5 (Dec. 11, 2009) (Japan), <https://www.env.go.jp/council/02policy/y0210-hearing01/mat03.pdf> [<https://perma.cc/2KUX-A2L6>]. The Committee points out that under the Environmental Impact Assessment Act (EIAA) while public organizations such as mayors of prefectures and municipalities, competent authorities, and the Ministry of the Environment are involved in the assessment procedures, they lack the authority to order the operator to collect reports, submit materials and take other corrective measures that are necessary for public organizations to exercise their authority effectively. *Id.* Under the EIAA, involvement of public bodies is nominal, and they are only able to request voluntary cooperation from businesses through administrative guidance. *Id.* For public agencies to participate substantially and effectively in the procedures of the EIAA, and to compensate for the lack of reliability of procedures under the business assessment system, public agencies must be given the right to order and conduct administrative investigations on businesses. *Id.* Penalties for violations of the major procedural provisions under the EIAA should be established because the EIAA is mandatory law, and a violation presumptively causes widespread environmental damage. *Id.* A lawsuit under the Administrative Case Litigation Act allows the government to mandate an assessment for a business. *Id.* However, there is no such provision in the EIAA allowing for an order to the business operator. *Id.* Since such a situation does not meet the requirements for a mandatory lawsuit, it is therefore impossible for the court to mandate the business to conduct the assessment. *Id.*

<sup>301</sup> Gyōsei jiken soshō hō [Administrative Case Litigation Act], Law No. 139 of 1962, art. 3(5), translated in (Japanese Law Translation [JLT DS]), <http://www.japaneselawtranslation.go.jp/law/detail/?ft=2&re=02&dn=1&yo=administrative+case+litigation+act&x=0&y=0&ia=03&ja=04&ph=&ky=&page=1> [<https://perma.cc/PZ2U-L3T8>] (Japan).

<sup>302</sup> Chihō jichi hō [Local Autonomy Act], Law No. 67 of 1947, art. 242-2 (Japan).

taken into account in the granting of the permit, a lawsuit for revocation of the permit can be filed.<sup>303</sup> In an action for revocation of a license or permit, the court may focus on the matters that should be considered in granting a license or permit and the weight of those matters, and the court may consider the results of the assessment and the existence of defects in its review of the decision-making process for granting a license or permit.<sup>304</sup>

If the residents in the surrounding area do not use the Administrative Case Litigation Act to have the court review the details of the construction of the power plant by the operator, they will seek a preliminary injunction in a civil suit based on personal rights. The Supreme Court has rejected a lawsuit seeking an injunction against an offshore wind farm based on personal rights.<sup>305</sup> A serious assessment violation is considered to exist in the following cases: There are clear violations of mandatory procedures such as public notice, public inspection, and briefing sessions.<sup>306</sup> There is a clear error in the methodology of investigation, prediction, and assessment. The project proponent did not respond to the opinion of the Minister of the Environment.<sup>307</sup> There is a risk that the granting of permits and licenses may cause health hazards to local residents due to failure to consider safer alternatives. In each of these situations, it is possible to conclude that there is a serious flaw in the assessment and that the license disposition is illegal.

Second, in a lawsuit by residents against a local government under the Local Autonomy Law, even if a legal flaw in the assessment procedure is found, it is necessary that the flaw invalidates subsequent financial accounting, and that the local government suffers damages. However, given the impossibility of calculating the value to be gained by the proper implementation of the assessment procedure, especially in relation to the latter requirement of damage, a lawsuit by residents against a local government may not be considered to be an appropriate means of contesting the defects of the assessment.

As illustrated by the wind project discussed above, the Environmental Impact Assessment Act (EIAA) provides the main legal vehicle for disputes over wind power siting.<sup>308</sup> Environmental assessment requirements have also acted as a barrier to developing important resources such as offshore wind.<sup>309</sup>

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<sup>303</sup> Administrative Case Litigation Act, arts. 3(2) to (3).

<sup>304</sup> *See id.* art. 30 (considering whether “the disposition has been made beyond the bounds of the agency’s discretionary power or through an abuse of such power”).

<sup>305</sup> Saiko Saibansho [Sup.Ct.] July 3, 2020, Reiwa 1 (o) no. 1303.

<sup>306</sup> *See* Kankyō eikyō hyōka hō [Environmental Impact Assessment Act], Law No. 81 of 1997, art. 16, *translated in* (Japanese Law Translation [JLT DS]), <http://www.japanese-lawtranslation.go.jp/law/detail/?id=3375&vm=&re=> [<https://perma.cc/GX5Q-NC4M>] (Japan).

<sup>307</sup> *Id.* art. 3-6.

<sup>308</sup> *See generally id.*

<sup>309</sup> *Renewable Energy for Japan: A Post-Fukushima Quest*, KNOWLEDGE@WHARTON (Oct. 3, 2013), <https://knowledge.wharton.upenn.edu/article/renewable-energy-japan-post-fukushima-quest/> [<https://perma.cc/44EP-LXET>] (“Japan’s Asahi Shimbun newspaper reports that bureaucratic hurdles are another impediment to the country’s development of

Below, we discuss the statutory scheme, its implementation, its special application to wind projects, and the role of localities in siting decisions.

The first Environmental Impact Assessment Act was enacted in 1997,<sup>310</sup> and revised in 2011, with enforcement of the revision beginning in 2013.<sup>311</sup> The revised EIAA added several planning procedures intervening during a project's implementation,<sup>312</sup> emulating the National Environmental Policy Act (NEPA) in the United States.<sup>313</sup> Under the EIAA, the proponent of a class-1 project, which is among the thirteen types of specified projects, or of a larger-scale project subjected to a cabinet order, must implement the project's assessment.<sup>314</sup> A class-1 project's proponent must perform an Environmental Impact Assessment (EIA).<sup>315</sup> Class-2 projects, framed by Article 2(3) of the EIAA, are formulated on a smaller scale than class-1 projects, and they are subjected to the cabinet's determination of the severity of their environmental impact.<sup>316</sup> Article 4 of the EIAA addresses the assessment requirement for a class-2 project.<sup>317</sup> The government individually determines whether the EIA is required for class-2 projects.<sup>318</sup> The government hears the opinion of the prefecture in which the project is implemented.<sup>319</sup>

At the planning stage, a class-1 project proponent must consider "items for primary environmental impact consideration" and "the possible project implementation area,"<sup>320</sup> promptly submit the relevant documents on primary environmental impact consideration (PEIC) to competent ministers, and make the summary document available to the public.<sup>321</sup> In the PEIC process, a project proponent must hear opinions from citizens, prefecture governors, and the ministry in the project's planning phase.<sup>322</sup> After conducting an EIA of the

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wind power, despite an abundant supply (especially along the extensive coastline). Holding installation back, the newspaper reports, "is a requirement that they [the developers] first carry out a lengthy and complex environmental impact assessment."").

<sup>310</sup>For a discussion of the 1997 Act, see Fowler, *supra* note 299, at 457–58. The Act was part of a series of statutes around the turn of the century to improve transparency and public input on environmental issues. *See id.* at 464–66.

<sup>311</sup>MINISTRY OF THE ENV'T, GOV'T OF JAPAN, ENVIRONMENTAL IMPACT ASSESSMENT IN JAPAN 1–2 (2012).

<sup>312</sup>Environmental Impact Assessment Act, art. 3-2.

<sup>313</sup>*See* National Environmental Policy Act of 1969, 42 U.S.C. § 4321.

<sup>314</sup>Environmental Impact Assessment Act, art. 3-3; MINISTRY OF THE ENV'T, *supra* note 311, at 1–2.

<sup>315</sup>MINISTRY OF THE ENV'T, *supra* note 311, at 3.

<sup>316</sup>Environmental Impact Assessment Act, art. 2(3).

<sup>317</sup>*See id.* art. 4.

<sup>318</sup>*See id.* art. 4(2).

<sup>319</sup>*See id.* art. 4(3).

<sup>320</sup>*Id.* art. 3-2.

<sup>321</sup>*Id.* art. 3-4.

<sup>322</sup>*See* Kankyō eikyō hyōka hō [Environmental Impact Assessment Act], Law No. 81 of 1997, art. 3-7, *translated in* (Japanese Law Translation [JLT DS]), <http://www.japanese-lawtranslation.go.jp/law/detail/?id=3375&vm=&re=> [<https://perma.cc/GX5Q-NC4M>] (Japan).

target project, the project proponent must draft an environmental impact statement (EIS),<sup>323</sup> hear opinions from related governmental organs,<sup>324</sup> make the EIS draft available to the public for a month,<sup>325</sup> and host an EIS explanatory meeting for local inhabitants.<sup>326</sup> After hearing opinions from the Ministry of the Environment,<sup>327</sup> the governors of prefectures,<sup>328</sup> related administrative organs,<sup>329</sup> and inhabitants, the project proponent must revise the relevant EIS draft, if necessary.<sup>330</sup>

The cost and time required by the EIAA is an obstacle to wind power developers.<sup>331</sup> The Japan Wind Power Association argues that the number of wind power assessments has been increasing.<sup>332</sup> Wind power generation above a certain scale is now automatically subject to assessment under the EIAA, which means a four to five year period and hundreds of millions of yen in assessment costs to be borne by the company.<sup>333</sup> At a stage when the outcome

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The EIAA provides three opportunities for the general public to comment on the project proponent, and the PEIC procedure states that the project proponent shall endeavor to hear comments from the general public. *See id.* art. 7. The PEIC procedures provide that the project proponent shall make every effort to hear comments from the public, and any person who has comments may submit written comments on the primary environmental impact consideration document, scoping document, and Draft EIS from the perspective of environmental conservation. *See id.* arts. 3-7, 8, 18. The public may comment upon the Draft EIS for a period of one and a half months after their publication. *Id.* art. 8.

<sup>323</sup> *Id.* art. 14.

<sup>324</sup> *See id.* arts. 15, 16.

<sup>325</sup> Environmental Impact Assessment Act art. 16.

<sup>326</sup> *Id.* art. 17.

<sup>327</sup> *Id.* art. 23.

<sup>328</sup> *Id.* art. 20.

<sup>329</sup> *See id.* art. 24.

<sup>330</sup> *Id.* arts. 21, 25.

<sup>331</sup> Eric Johnston, *Balance of Power: Shift Toward Renewable Energy Appears to Be Picking Up Steam*, JAPAN TIMES (Oct. 14, 2017), <https://www.japantimes.co.jp/news/2017/10/14/business/balance-power-shift-toward-renewable-energy-appears-picking-steam/> [<https://perma.cc/87M8-6VCR>] (“[E]nvironmental restrictions mean projects can take a long time to get approval because of the assessment process.”).

<sup>332</sup> JAPAN WIND POWER ASS’N, FURYOKUHATSUDEN NI OKERU KANKYŌ ASESUMENTO NO MINAOSHI NI TSUITE [REVIEW OF ENVIRONMENTAL ASSESSMENT FOR WIND POWER GENERATION] 1, 6 (Dec. 2015), <https://www8.cao.go.jp/kisei-kaikaku/kaigi/meeting/2013/wg4/toushi/151222/item1.pdf> [<https://perma.cc/2SZX-L4FQ>].

<sup>333</sup> MINISTRY OF THE ENV’T, KANKYŌ EIKYŌ HYŌKA NO TAISHŌ TO NARU FURYOKUHATSUDEN-SHO NO KIBO NO KENTŌ NO IKISATSU NI TSUITE ~ FURYOKUHATSUDEN-SHO NO KANKYŌ ASESUMENTO ~ [BACKGROUND OF THE STUDY ON THE SIZE OF WIND FARMS SUBJECT TO ENVIRONMENTAL IMPACT ASSESSMENT ~ ENVIRONMENTAL ASSESSMENT OF WIND FARMS~] 4, 6 (Jan. 2021), [https://www.meti.go.jp/shingikai/safety\\_security/renewable\\_energy/pdf/001\\_02\\_00.pdf](https://www.meti.go.jp/shingikai/safety_security/renewable_energy/pdf/001_02_00.pdf) [<https://perma.cc/PH27-J2C2>]. The METI and the Ministry of the Environment have been working on the smooth implementation of the environmental assessment of wind farms by preparing guides and guidelines that summarize technical knowledge and ideas. In addition, the national assessment is conducted in parallel with the

of a project is unclear, it is very difficult for a wind power business to bear the huge cost.

According to a cabinet order for enforcement of the EIAA<sup>334</sup> and the revised 2011 EIAA, a wind power project generating 10,000 or more kilowatts in total electricity is considered a class 1 project requiring an EIA.<sup>335</sup> The 2011 EIAA enables citizens' involvement with a project and provides the necessary information to make public comments.<sup>336</sup> From the perspective of project proponents, the EIAA hinders the smooth introduction of wind power generation.<sup>337</sup> Article 3-3 of the EIAA obligates a class-1 project proponent to prepare a document on environmental impact consideration (PEIC) at an early stage.<sup>338</sup> In the planning stage, the proponent conducts an examination of items for the PEIC and the possible project implementation area,<sup>339</sup> as detailed in the scoping document.<sup>340</sup> The PEIC document requires a class-1 project proponent to consider environmental conservation in relation to the relevant project in one or more areas.<sup>341</sup> The Ministry of the Environment advises on area selection for the project site.<sup>342</sup>

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local government assessment. The report suggests that the national government has reached out to local governments to speed up the process. A checklist will be developed to identify issues commonly raised at the Environmental Review Advisory Committee. In addition, a collection of case studies for smooth review will be published to streamline the operation of the Advisory Committee for Environmental Assessment.

<sup>334</sup>Kankyō eikyō hyōka hō shikōkisoku [Enforcement Order of the Environmental Impact Assessment Act], Cabinet Order No. 346 of 1997, tbl. 1, *translated in* (Japanese Law Translation [JLT DS]), <http://www.japaneselawtranslation.go.jp/law/detail/?ft=2&re=01&dn=1&yo=カンキョウエイキョウヒョウカホウ&ia=03&ph=&x=44&y=9&ky=&page=1> [<https://perma.cc/54WA-S8GW>] (Japan).

<sup>335</sup>MINISTRY OF THE ENV'T, *supra* note 311, at 4.

<sup>336</sup>*Id.* at 2.

<sup>337</sup>*See id.*; JAPAN WIND POWER ASS'N, FURYOKUHATSUDEN NO FUKYŪ KAKUDAI NI MUKETE – FURYOKUHATSUDEN NI KAKARU KANKYŌ EIKYŌ HYŌKA NI TSUITE [ENVIRONMENTAL IMPACT ASSESSMENT FOR WIND POWER GENERATION – TOWARD THE EXPANSION OF WIND POWER GENERATION] (Dec. 6, 2018), [http://assess.env.go.jp/files/0\\_db/contents/4645\\_02/siryō\\_2-1.pdf](http://assess.env.go.jp/files/0_db/contents/4645_02/siryō_2-1.pdf) [<https://perma.cc/F7JE-NPS2>].

<sup>338</sup>Kankyō eikyō hyōka hō [Environmental Impact Assessment Act], Law No. 81 of 1997, art. 3-3, *translated in* (Japanese Law Translation [JLT DS]), <http://www.japaneselawtranslation.go.jp/law/detail/?id=3375&vm=&re=> [<https://perma.cc/GX5Q-NC4M>] (Japan).

<sup>339</sup>*Id.* art. 3-2(1).

<sup>340</sup>*Id.* art. 5(1).

<sup>341</sup>*Id.* art. 3-2(1).

<sup>342</sup>*See id.* art. 3-2(2). The business operator prepares the EIA and sends it to the authority that grants the license or approval. *Id.* art. 3-3. With regard to the EIA, the Minister of the Environment submits opinions on environmental conservation to the licensee, if necessary, and the licensee submits opinions on environmental conservation to the proponent based on the opinions. *Id.* arts. 23, 24. The project proponent shall review the evaluation report based on the opinion of the Minister of the Environment and the opinion of the licensee and revise the evaluation report after conducting additional investigations if necessary. *Id.* art. 25(1). The business proponent publishes the final evaluation report and makes it available for public inspection (the public inspection period is one month). *Id.* art. 27.

The EIAA ensures screening for environmental impacts, regardless of whether an EIA is conducted.<sup>343</sup> Some smaller-scale wind projects may need to conduct EIAs depending on local factors such as the presence of an endangered golden eagle's habitat, the effect on a national park, or the placement of a street in an area significantly subjected to air pollution.<sup>344</sup>

A wind project proponent specifies several possible implementation areas in the early stage, in addition to the areas identified in the PEIC, to conduct a simpler environmental assessment of the potential harm to birds.<sup>345</sup> By intentionally avoiding the boundaries of significant wildlife habitats, wildlife protection areas, or important wetlands in the PEIC phase, project proponents can understate the target area's influence on birds.<sup>346</sup> While attempting to exclude areas that may pose problems, project proponents also have an incentive to define the project area broadly enough to provide flexibility.<sup>347</sup> Moving the facility outside of the project's implementation area after the outcome of the EIA warrants a new assessment.<sup>348</sup> To circumvent this burden, a project proponent tends to merely move the facility within the identified area.<sup>349</sup>

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<sup>343</sup> See *id.* arts. 2(2) to (3) (explaining that it must be determined whether the project is considered a class-1 project or a class-2 project).

<sup>344</sup> Kankyō eikyō hyōka hō [Environmental Impact Assessment Act], Law No. 81 of 1997, art. 2(2) to (3), translated in (Japanese Law Translation [JLT DS]), <http://www.japaneselawtranslation.go.jp/law/detail/?id=3375&vm=&re=> [<https://perma.cc/GX5Q-NC4M>] (Japan). Wind power plants were added to the list of projects subject to the EIAA in 2012. Class 1 projects fall under the category of 10,000 kW or more, and Class 2 projects fall under the category of 7,500 kW or more but less than 10,000 kW. *Id.* art. 4. The numerical value specified by the Enforcement Order of the EIAA referred to in Article 2(3) of EIAA shall be 0.75. See *id.* art. 2(3) (explaining the use of a ratio of project scale in relation to class-1 projects to determine what constitutes class-2 projects).

<sup>345</sup> *Id.* art. 3-2.

<sup>346</sup> Ministry of Econ., Trade & Indus., *Concept of the Project Sequence in the Environmental Impact Assessment Based on the Environmental Impact Assessment Act and the Electricity Business Act for Solar and Wind Power Plants (Draft)* 2 (Mar. 2021), <https://www.meti.go.jp/press/2021/07/20210730012/20210730012.html> [<https://perma.cc/5DEU-FGZC>]. This report was prepared by METI and the Ministry of the Environment in order to prevent the project from being excluded from the environmental impact assessment due to the division of locations. Wind power plants with an output of 10 MW or more are considered Type-1 projects that require an environmental assessment. As for Type-2 projects, which have a larger impact and require an assessment if necessary, in accordance with Type-1 projects, wind power is 7.5 MW or more. Therefore, in order to evade this regulation, project proponents may intentionally divide their business or reduce its size to increase its number in order to avoid falling under the size requirement of Type-1.

<sup>347</sup> *Id.* at 3 (report suggests that the EIAA allows developers to carry out environmental impact assessments based on the characteristics of the site at their own discretion).

<sup>348</sup> Kankyō eikyō hyōka hō [Environmental Impact Assessment Act], Law No. 81 of 1997, art. 28, translated in (Japanese Law Translation [JLT DS]), <http://www.japaneselawtranslation.go.jp/law/detail/?id=3375&vm=&re=> [<https://perma.cc/GX5Q-NC4M>] (Japan).

<sup>349</sup> See generally Ministry of Econ., Trade & Indus., *supra* note 346. In order to prevent project opponents from avoiding areas of important natural environment, the Ministry of the

Litigation provides another avenue for project opponents, although Japanese law places limits on their legal options. Under the Administrative Case Litigation Act (ACLA) or the Code of Civil Procedure for Public Land,<sup>350</sup> environmental advocates lack standing to seek the revocation of development permits within public forests.<sup>351</sup> For wind generation litigation, inhabitants may argue that their personal right derived from the “pursuit of happiness” clause in Article 13 of the Japanese Constitution is infringed upon<sup>352</sup> and seek an injunction or damages under the Civil Code.<sup>353</sup> Otherwise, they may seek the revocation of the construction permit of a wind power facility under the ACLA. The courts frequently deny standing, however, if the alleged damage caused by the noise of a wind generation facility is within the legal noise tolerance limit.<sup>354</sup>

Since there is no legal provision in Japan to directly challenge the procedures and contents of an EIA, which is implemented by a private operator, other types of lawsuits outside the EIAA are used.<sup>355</sup> If the EIA is defective, the construction permit based on it will be also illegal under the ACLA.<sup>356</sup> In the

Environment has been providing information on various land use regulations and bird sensitivity maps through the Environmental Assessment Database (EADAS), and it is necessary to continue strengthening the collection and provision of information.

<sup>350</sup> Gyōsei jiken soshō [Administrative Case Litigation Act], Law No. 139 of 1962, art. 9, *translated in* (Japanese Law Translation [JLT DS]), <http://www.japaneselawtranslation.go.jp/law/detail/?ft=2&re=02&dn=1&yo=administrative+case+litigation+act&x=0&y=0&ia=03&ja=04&ph=&ky=&page=1> [https://perma.cc/PZ2U-L3T8] (Japan); Minji soshō-hō [Code of Civil Procedure], Law No. 109 of 1996, arts. 28–37, *translated in* (Japanese Law Translation [JLT DS]), <http://www.japaneselawtranslation.go.jp/law/detail/?ft=2&re=02&dn=1&yo=code+of+civil+procedure&x=0&y=0&ia=03&ja=04&ph=&ky=&page=1> [https://perma.cc/3ZLZ-DDVF] (Japan).

<sup>351</sup> Akita Chihō Saibansho [Akita Dist. Ct.] Nov.13, 2006, Heisei 17 (wa) no. 155. In Japan, in lawsuits for the protection of nature, standing is not granted for destruction of nature that does not directly cause harm to human life, body, or property. A researcher of an endangered plant species has filed a civil suit claiming that the species will be lost due to construction work to prevent disasters during heavy rains. This researcher didn’t own property in this region.

<sup>352</sup> NIHONKOKU KENPŌ [KENPŌ] [CONSTITUTION], art. 13 (Japan).

<sup>353</sup> Minpō [Civil Code], Law No. 89 of 1896, art. 709, *translated in* (Japanese Law Translation [JLT DS]), <http://www.japaneselawtranslation.go.jp/law/detail/?ft=2&re=02&dn=1&yo=民法&x=66&y=10&ia=03&ja=04&ph=&ky=&page=3> [https://perma.cc/BM9S-BE3T] (Japan).

<sup>354</sup> See Ayako Kawano & Kazuo Kasai, *Japan, in* WHITE & CASE, OFFSHORE WIND PROJECTS: ASSESSING THE ENVIRONMENTAL IMPACT 12, 15 (2019), <https://www.whitecase.com/sites/default/files/offshore-wind-projects-assessing-the-environmental-impact-final.pdf> [https://perma.cc/L7EH-YT9M]. See generally Yuichiro Tsuji, *The Legal Issues on Environmental Administrative Lawsuits Under the Amendment of ACLA in Japan*, 1 YONSEI L.J. 339 (2010).

<sup>355</sup> See Jonathan A. Cole, *The Right to Demand: Citizen Activism and Environmental Politics in Japan*, 3 J. ENV’T & DEV. 77, 87 (1994); *infra* notes 356–57.

<sup>356</sup> Gyōsei jiken soshō [Administrative Case Litigation Act], Law No. 139 of 1962, arts. 9(2), 31(2), *translated in* (Japanese Law Translation [JLT DS]), <http://www.japaneselawtranslation.go.jp/law/detail/?ft=2&re=02&dn=1&yo=administrative+case+litigation+act&x=0&y=0&ia=03&ja=04&ph=&ky=&page=1> [https://perma.cc/PZ2U-L3T8] (Japan).

administrative case litigation, local inhabitants will file a lawsuit against the operator for revocation of the permit under the ACLA.<sup>357</sup> Plaintiffs may argue that the EIA lacks scientific basis for its permit, or that it does not appropriately cite alternative options, but it is difficult for local inhabitants to provide scientific evidence to the court.<sup>358</sup> Otherwise, in the litigation against the local government, plaintiffs use the Local Autonomy Act to challenge spending by the administrative agency.<sup>359</sup> It is difficult to challenge the illegality of the assessment when a party other than the local government is the operator.<sup>360</sup> Article 242-2 of the Local Autonomy Act grants the inhabitants standing for this cause of action.<sup>361</sup> This type of litigation only creates a cause of action for governmental project proponents, excluding private entities.<sup>362</sup> In several lawsuits in Japan, inhabitants interfered with an EIA survey by destroying research equipment, and project proponents have pretended to have carried out the assessment.<sup>363</sup>

Small projects and projects with minimal impacts do not require an EIA under the EIAA.<sup>364</sup> The EIAA allows local governments to conduct smaller-scale or simple EIAs through local ordinances.<sup>365</sup> Local administrative organs

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<sup>357</sup> See *id.* arts. 9(1), 11(1).

<sup>358</sup> See Tsuji, *supra* note 354, at 348.

<sup>359</sup> Chihō jichi hō [Local Autonomy Act], Law No. 67 of 1947, art. 242-2 (Japan).

<sup>360</sup> Noriko Ōhkubo, *Nihon ni okeru kankyō asesumento soshō to kadai* [Current Situation and Issues of Environmental Assessment Litigation in Japan], 6 ENV'T L. & POL'Y 5, 8 (2011), [http://cls.kangwon.ac.kr/data/file/sub41/1917250915\\_0b1a59c3\\_6\\_1\\_D3DECE F9DCC1D0AEEDAD.pdf](http://cls.kangwon.ac.kr/data/file/sub41/1917250915_0b1a59c3_6_1_D3DECE F9DCC1D0AEEDAD.pdf) [<https://perma.cc/TL2J-D7U7>].

<sup>361</sup> Local Autonomy Act, art. 242-2. The purpose of a lawsuit against a local government filed by a resident is to prevent the occurrence of illegal or unjust acts or omissions by the executive body or staff of a local government, or to seek compensation for damages caused by such acts or omissions, in order to ensure the financial adequacy of the local government and protect the interests of all residents.

<sup>362</sup> *Id.* In Japan, lawsuits by individuals for their own rights and interests (subjective lawsuits) are the general rule. The exceptions are lawsuits established by law to ensure the legality of administration (objective lawsuits). See Administrative Case Litigation Act arts. 3–6; *Comments on the Amendment to the Environmental Impact Assessment Act*, TOKYO BAR ASS'N (Feb. 9, 2009), <https://www.toben.or.jp/message/ikensyo/post-207.html> [<https://perma.cc/K7CK-DCA Y>] (Tokyo Bar Association has suggested that certain groups should be allowed to stand for violations of the EIAA).

<sup>363</sup> See generally *Wind Power Project Contractor Sues Opponents for Destroying Measuring Instruments*, ASAHI SHIMBUN, Nov. 15, 2015. The company had installed measuring instruments at 10 locations to collect data for environmental impact assessment during construction, but on September 14 last year, four people removed the measuring instruments and brought them to the company's employee dormitory. In doing so, they reportedly broke the instruments by overturning them.

<sup>364</sup> See Kankyō eikyō hyōka hō [Environmental Impact Assessment Act], Law No. 81 of 1997, art. 4(3), *translated in* (Japanese Law Translation [JLT DS]), <http://www.japanese-lawtranslation.go.jp/law/detail/?id=3375&vm=&re=> [<https://perma.cc/GX5Q-NC4M>] (Japan).

<sup>365</sup> See Kenichiro Yanagi & Thomas Makoto Naruse, *Present Situation and Problems of the “Simplified Environmental Assessment”—from the Legal Perspectives*, 27 NIHON FUDŌ SAN GAKKAISHI 34, 35 (2013).



the federal EIA is unavailable, this recourse to the local EIA process may provide the best option.<sup>378</sup>

In summary, resource limitations facing Japanese local governments may hinder their ability to play independent roles in climate policy. Nevertheless, the central government has mandated their participation in adaptation planning.<sup>379</sup> Jurisdictions such as the Tokyo Metropolitan Government have been able to undertake vigorous adaptation planning and have also undertaken their own efforts to control carbon emissions.<sup>380</sup> In contrast, rural communities may resist expansion of renewable energy, especially wind turbines, co-opting the environmental review procedures to this end.<sup>381</sup>

The institutional framework for local governments differs greatly between China and Japan, though both legal systems stress central authority.<sup>382</sup> The Japanese government is generally less reliant than the Chinese government on provinces and cities as instruments for policy implementation.<sup>383</sup> Nevertheless, there are some commonalities, particularly the distinctions between major urban areas and smaller rural communities.<sup>384</sup>

#### IV. ENVIRONMENTAL FEDERALISM IN THE UNITED STATES

In the United States, state governments are involved in administering the major federal environmental laws, although in a secondary role.<sup>385</sup> They also sometimes enact environmental initiatives that go beyond what the federal

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<sup>378</sup> See Frances M. Rosenbluth & Michael F. Thies, *The Political Economy of Japanese Pollution Regulation*, 20 AM. ASIAN REV. 1, 23–24 (2002). In the related area of large-scale solar development, prefectures and municipalities may also have the ability to either block or promote development. They can also play a role in encouraging smaller-scale projects. See Timothy Fraser & Andrew J. Chapman, *Social Equity Impacts in Japan's Mega-Solar Siting Process*, 42 ENERGY FOR SUSTAINABLE DEV. 136, 143, 147 (2018).

<sup>379</sup> See Tsuji, *supra* note 239, at 94.

<sup>380</sup> *Id.* at 103–10.

<sup>381</sup> See Noriko Akita et al., *Managing Conflicts with Local Communities Over the Introduction of Renewable Energy: The Solar Rush Experience in Japan*, 9 LAND (SPECIAL ISSUE) 1, 1, 4 (2020).

<sup>382</sup> See Lingxuan Liu, Shotaro Matsuno, Bing Zhang, Beibei Liu & Oran Young, *Local Governance on Climate Mitigation: A Comparative Study of China and Japan*, 31 ENV'T & PLAN. C: GOV'T & POL'Y 475, 480 (2013). Compare, Zhili Bai & Juan Liu, *China's Governance Model and System in Transition*, 9 J. CONTEMP. E. ASIA STUD. 65, 67–69 (2020) (describing China's governance structure), with Tsuji *supra* note 239, at 91 (describing the role of Japan's central government).

<sup>383</sup> See Liu, Matsuno, Zhang, Liu & Young, *supra* note 382, at 481. See generally Bai & Liu, *supra* note 382 (describing the role of China's governance structure).

<sup>384</sup> See Liu, Matsuno, Zhang, Liu & Young, *supra* note 382, at 480.

<sup>385</sup> See DAVID M. DRIESEN, ROBERT W. ADLER & KIRSTEN H. ENGEL, ENVIRONMENTAL LAW: A CONCEPTUAL AND PRAGMATIC APPROACH 60, 63 (3rd ed. 2016).

government requires.<sup>386</sup> Some of these state initiatives have minor significance, but state climate initiatives have become more important in recent times.<sup>387</sup> The U.S. Congress has never passed legislation dealing with climate change because the issue has been so politically divisive.<sup>388</sup> For the same reason, administrative policies have fluctuated depending on the party controlling the White House.<sup>389</sup> Given the absence of effective long-term leadership from the federal government, many state governments have decided to adopt their own climate policies.<sup>390</sup>

The degree of state climate activity in the United States is a deviation from the general pattern in American environment law.<sup>391</sup> The federal government is the most important regulator in the field of the environment. It comprehensively regulates water pollution, air pollution, and toxic chemicals.<sup>392</sup> In many areas, however, states are explicitly incorporated into federal programs.<sup>393</sup> This kind of arrangement is often called cooperative federalism.<sup>394</sup> For instance, the EPA issues water pollution standards for different industries.<sup>395</sup> But state

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<sup>386</sup> See Sam Ricketts, Rita Clifton, Lola Oduyeru & Bill Holland, *States Are Laying a Road Map for Climate Leadership*, CTR. FOR AM. PROGRESS (Apr. 30, 2020), <https://www.americanprogress.org/issues/green/reports/2020/04/30/484163/states-laying-road-map-climate-leadership/> [https://perma.cc/84K9-HB5R].

<sup>387</sup> See Kirsten Engel, *Climate Federalism in the Time of COVID-19: Can the States "Save" American Climate Policy?*, 47 N. KY. L. REV. 115, 124 (2020).

<sup>388</sup> See Samantha Gross, *Republicans in Congress Are Out of Step with the American Public on Climate*, BROOKINGS (May 10, 2021), <https://www.brookings.edu/blog/planetpolicy/2021/05/10/republicans-in-congress-are-out-of-step-with-the-american-public-on-climate/> [https://perma.cc/UA9H-7JWK]; see also Amber Phillips, *Congress's Long History of Doing Nothing on Climate Change, in 6 Acts*, WASH. POST (Dec. 1, 2015), <https://www.washingtonpost.com/news/the-fix/wp/2015/12/01/congresss-long-history-of-inaction-on-climate-change-in-6-parts/> [https://perma.cc/FW8T-E2EA].

<sup>389</sup> See Karen A. Winters, Allen A. Kacenjar Jr., Carolyn L. McIntosh & Kendra S. Sherman, *Looking Ahead to 2021 – Implications of a Change in Administration on Environmental Policy*, NAT'L L. REV. (Dec. 7, 2020), <https://www.natlawreview.com/article/looking-ahead-to-2021-implications-change-administration-environmental-policy> [https://perma.cc/GMV3-35JK].

<sup>390</sup> See Philip A. Wallach, *Where Does US Climate Policy Stand in 2019?*, BROOKINGS (Mar. 22, 2019), <https://www.brookings.edu/2019/03/22/where-does-u-s-climate-policy-stand-in-2019/> [https://perma.cc/TCV7-ZHKG].

<sup>391</sup> See Rebecca Bromley-Trujillo & Mirya R. Holman, *Climate Change Policymaking in the States: A View at 2020*, 50 PUBLIUS: J. FEDERALISM 446, 446 (2020).

<sup>392</sup> *Pollution Issues*, USA.GOV (July 21, 2021), <https://www.usa.gov/pollution> [https://perma.cc/2WSP-BJAL].

<sup>393</sup> See Arnold W. Reitze, Jr., *Air Quality Protection Using State Implementation Plans—Thirty-Seven Years of Increasing Complexity*, 15 VILL. ENV'T L.J. 209, 211 (2004).

<sup>394</sup> See *id.*; *The Evolution of Cooperative Federalism*, TUL. UNIV. L. SCH. (Apr. 15, 2021), <https://online.law.tulane.edu/blog/the-evolution-of-cooperative-federalism> [https://perma.cc/DT9F-MZXV].

<sup>395</sup> See CLAUDIA COPELAND, CONG. RSCH. SERV., RL30030, CLEAN WATER ACT: A SUMMARY OF THE LAW 4 (Oct. 2016), <https://fas.org/sgp/crs/misc/RL30030.pdf> [https://perma.cc/R39Z-8S8E].

governments issue water pollution permits to individual polluters, which apply the federal industry standards.<sup>396</sup> There are variations on cooperative federalism in almost all of the federal regulatory statutes relating to the environment.<sup>397</sup> Although cooperative federalism does leave states an active role, the federal government is the dominant partner in the relationship.<sup>398</sup>

This Part will describe the role that states and cities have played in addressing climate change, with the main emphasis being on state governments. Because the literature regarding state climate programs is already so robust, we will provide only a general overview here. The positions of states regarding climate change could hardly be more diverse. Some states are doing little to limit carbon emissions, while others are on the forefront of climate action.<sup>399</sup> Still, there does seem to be broad state support for at least making some effort to encourage renewable energy.<sup>400</sup> Some states, like California, have been especially aggressive in their efforts to address climate change.<sup>401</sup>

We will then turn to the conflicts between states and the federal government during the Trump Administration.<sup>402</sup> The basic energy policy of the Trump Administration was to expand the use of oil, natural gas, and coal, while minimizing attention to climate change.<sup>403</sup> For that reason, the Trump Administration attempted to limit state climate programs in pursuit of its goal

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<sup>396</sup> *Id.*

<sup>397</sup> See David M. Welborn, *Conjoint Federalism and Environmental Regulation in the United States*, 18 PUBLIUS: J. FEDERALISM 27, 30–31 (1988).

<sup>398</sup> States cannot have standards weaker than the federal standards. *United States v. Akzo Coatings of Am., Inc.*, 949 F.2d 1409, 1454 (6th Cir. 1991). Under most environmental statutes, however, they are allowed to have stronger standards. *Id.* This is called “floor preemption” because states cannot go beneath federal legislation in their requirements, but they can go above it by setting higher environmental requirements. *Id.* For a defense of this approach, see Robert L. Glicksman & Richard E. Levy, *A Collective Action Perspective on Ceiling Preemption by Federal Environmental Regulation: The Case of Global Climate Change*, 102 NW. U. L. REV. 579, 583–84 (2008).

<sup>399</sup> See Ricketts, Clifton, Oduyeru & Holland, *supra* note 386.

<sup>400</sup> *Id.*

<sup>401</sup> See Engel, *supra* note 387, at 121.

<sup>402</sup> For a recent overview of state climate action, see generally Vicki Arroyo, *From Paris to Pittsburgh: U.S. State and Local Leadership in an Era of Trump*, 31 GEO. ENV'T L. REV. 433 (2019).

<sup>403</sup> See *President Donald J. Trump Remains Committed to Expanding Energy Production and Increasing Manufacturing in the United States*, WHITEHOUSE.GOV (Aug. 13, 2019), [https://trumpwhitehouse.archives.gov/briefings-statements/president-donald-j-trump-remains-committed-expanding-energy-production-increasing-manufacturing-united-states/?utm\\_source=twitter&utm\\_medium=social&utm\\_campaign=wh](https://trumpwhitehouse.archives.gov/briefings-statements/president-donald-j-trump-remains-committed-expanding-energy-production-increasing-manufacturing-united-states/?utm_source=twitter&utm_medium=social&utm_campaign=wh) [<https://perma.cc/5WMG-NAP8>] [hereinafter WHITE HOUSE]; see also Arroyo, *supra* note 402, at 434 (“From his earliest days in office, Donald Trump and his Administration have worked to unravel the climate policies and programs put in place under President Obama.”).

of increasing fossil fuel production.<sup>404</sup> That made the actions of the state governments even more important.

### A. State and Local Climate Programs

American state governments have actively engaged with the issue of climate change on many fronts.<sup>405</sup> States have also been active in promoting renewable energy, sometimes under the climate umbrella and sometimes independently.<sup>406</sup> California began to pursue its own climate policies as early as the presidency of George W. Bush, when the federal government steadfastly refused to take any action at all to reduce emissions, and seemed dedicated to increasing them through expanded production of fossil fuels.<sup>407</sup> In this way, the Trump Era is similar to this earlier period.<sup>408</sup> For instance, as soon as Trump announced his intent to withdraw from the Paris Agreement, the governors of New York and California announced the formation of the U.S. Climate Alliance along with their intentions to comply with the United States' Paris Agreement commitments.<sup>409</sup>

Many states have adopted renewable portfolio standards (RPS), which require that a certain percentage of electricity sold by each utility comes from renewable sources.<sup>410</sup> By forcing utilities to buy renewable energy, an RPS promotes the development of more solar and wind energy.<sup>411</sup> California's RPS

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<sup>404</sup> See generally Nicholas Kusnetz, *Trump Aims to Speed Pipeline Projects by Limiting State Environmental Reviews*, INSIDE CLIMATE NEWS (Apr. 11, 2019), <https://insideclimatenews.org/news/11042019/trump-pipeline-executive-order-environmental-review-keystone-xl-clean-water-act-states-rights/> [<https://perma.cc/R6XW-BXC6>].

<sup>405</sup> See generally Rebecca Cooper, *States Take the Lead to Address Climate Change*, NAT'L ACAD. FOR STATE HEALTH POL'Y (Dec. 2, 2019), <https://www.nashp.org/states-take-the-lead-to-address-climate-change/> [<https://perma.cc/NP67-K3C4>].

<sup>406</sup> *Id.*

<sup>407</sup> See Arroyo, *supra* note 402, at 434 (“Subnational climate action began in earnest in the early days of the George W. Bush Administration when governors and state legislators began to fill the gap in climate action after the U.S. pulled out of Kyoto Protocol negotiations.”).

<sup>408</sup> On the conflict between states and the Trump Administration over climate policy, see Engel, *supra* note 387, at 124, and Murthy, *supra* note 1, at 2 (“President Donald Trump’s declared intent to withdraw the United States from the Paris Agreement on climate change has prompted many states and cities in the United States to redouble their efforts on climate change and to pledge support for the international treaty.”).

<sup>409</sup> Arroyo, *supra* note 402, at 435. Moreover, Arroyo reports, a few days later on June 5, 2017, “an even broader cross-sectoral coalition of businesses, investors, cities, states, universities and other organizations formed the ‘We Are Still In’ coalition, pledging a shared commitment to helping the U.S. meet the Paris Agreement goals.” *Id.* at 436.

<sup>410</sup> *Renewable Portfolio Standards*, NAT'L RENEWABLE ENERGY LAB'Y, <https://www.nrel.gov/state-local-tribal/basics-portfolio-standards.html> [<https://perma.cc/2D5M-A5P4>].

<sup>411</sup> See generally *id.* (“A renewable portfolio standard (RPS) is a regulatory mandate to increase production of energy from renewable resources . . . .”)

has a 60% target for 2030.<sup>412</sup> There are significant variations in these standards from state to state in terms of the targets, deadlines, and types of energy generation classified as renewable.<sup>413</sup> Currently thirty states have an RPS, and another seven have voluntary standards or nonbinding targets.<sup>414</sup> In addition, as of 2019, twenty states plus the District of Columbia had adopted greenhouse gas targets of some kind, twenty-six had some type of energy efficiency program, and over half were engaged in some form of adaptation planning.<sup>415</sup>

There is a clear political division in terms of renewable energy mandates, with Democrat-leaning states the most likely to have strong requirements.<sup>416</sup> There are two regions of the United States that have refused to enact RPS measures; one, in the West, consists of Idaho, Wyoming, and Nebraska.<sup>417</sup> The other is in the Southeast, where states have lagged in adopting renewable energy.<sup>418</sup> These states are dominated by conservative Republicans.<sup>419</sup>

Among the states that are addressing climate change in meaningful ways, California has played a leading role.<sup>420</sup> “California legislation focusing specifically on climate change dates back to a 1988 law mandating an inventory of California greenhouse gas emissions.”<sup>421</sup> In 2002, the state took advantage of an exception to federal preemption of emissions standards for new cars by

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<sup>412</sup> *Renewable Portfolio Standard (RPS) Program*, CAL. PUB. UTIL. COMM’N, <https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/electric-power-procurement/rps> [<https://perma.cc/7J59-XKW7>]. The program’s targets have escalated rapidly:

California’s RPS program was established in 2002 by Senate Bill (SB) 1078 (Sher, 2002) with the initial requirement that 20% of electricity retail sales must be served by renewable resources by 2017. The program was accelerated in 2015 with SB 350 (de León, 2015) which mandated a 50% RPS by 2030. . . . In 2018, SB 100 (de León, 2018) was signed into law, which again increases the RPS to 60% by 2030 and requires all the state’s electricity to come from carbon-free resources by 2045.

*Id.*

<sup>413</sup> GALEN BARBOSE, LAWRENCE BERKELEY NAT’L LAB’Y, U.S. RENEWABLES PORTFOLIO STANDARDS 2021 STATUS UPDATE: EARLY RELEASE 10 (Feb. 2021), [https://eta-publications.lbl.gov/sites/default/files/rps\\_status\\_update-2021\\_early\\_release.pdf](https://eta-publications.lbl.gov/sites/default/files/rps_status_update-2021_early_release.pdf) [<https://perma.cc/4TTL-DCVG>].

<sup>414</sup> Laura Shields, *State Renewable Portfolio Standards and Goals*, NAT’L CONF. STATE LEGISLATURES (Apr. 7, 2021), <https://www.ncsl.org/research/energy/renewable-portfolio-standards.aspx> [<https://perma.cc/9VN5-FMAW>].

<sup>415</sup> See Murthy, *supra* note 1, at 19, 21, 23.

<sup>416</sup> See Wyman & Spiegel-Feld, *supra* note 25, at 307 n.5, 331–33 (discussing the general tendency of Democratic state and local leaders to favor stronger environmental regulations where their Republican counterparts favor deregulation).

<sup>417</sup> Shields, *supra* note 414.

<sup>418</sup> *Id.*

<sup>419</sup> See *State Partisan Composition*, NAT’L CONF. STATE LEGISLATURES (May 13, 2021), <https://www.ncsl.org/research/about-state-legislatures/partisan-composition.aspx#> [<https://perma.cc/3UNQ-PJ9G>].

<sup>420</sup> See DANIEL A. FARBER, BERKELEY L. CTR. FOR L., ENERGY & THE ENV’T, BEYOND THE BELTWAY: A REPORT ON STATE ENERGY AND POLICIES 6 (Feb. 2018).

<sup>421</sup> *Id.*

enacting legislation requiring reduction of CO<sub>2</sub> emissions.<sup>422</sup> In 2006, Governor Arnold Schwarzenegger signed the California Global Warming Solutions Act, usually referred to as A.B. 32, which requires California to reduce emissions to the 1990 level by 2020.<sup>423</sup> California's cap-and-trade program set a declining, statewide cap on greenhouse gas emissions.<sup>424</sup> An emissions trading program sets a ceiling on the amount of total amount of emissions (the "cap") and establishes a market in which firms can trade the right to emit specified amounts (the "trade").<sup>425</sup>

Elsewhere in the United States, the Regional Greenhouse Gas Initiative (RGGI) created a multistate trading system for power plant emissions with the goal of achieving reductions of 50% or more of 2009 emissions by 2019.<sup>426</sup> In 2014, the previous cap was lowered to 91 million tons of carbon, down from 165 million tons, requiring more substantial reductions in emissions.<sup>427</sup> The cap is set to decline by 2.5% annually.<sup>428</sup> Another multistate venture was launched in late 2020 to establish a trading system for transportation emissions, with three states, and Washington, D.C., joining immediately and eight more states considering joining later.<sup>429</sup>

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<sup>422</sup> See MICHAEL R. PEEVEY & DIANE O. WITTENBERG, CALIFORNIA GOES GREEN: A ROADMAP TO CLIMATE LEADERSHIP 106–09 (2017).

<sup>423</sup> Assemb. B. 32, 2005–2006 Leg., Reg. Sess. (Cal. 2006) (codified at CAL. HEALTH & SAFETY § 38500).

<sup>424</sup> CAL. AIR RES. BD., CAL. ENV'T PROT. AGENCY, CAP-AND-TRADE REGULATION INSTRUCTIONAL GUIDANCE 12 (Sept. 2012).

<sup>425</sup> Detailed information about the program can be found on the California Air Resources Board's website. CAL. AIR RES. BD., CAL. ENV'T PROT. AGENCY, FAQ CAP-AND-TRADE PROGRAM, <https://ww2.arb.ca.gov/resources/documents/faq-cap-and-trade-program> [<https://perma.cc/62E9-HNVC>].

<sup>426</sup> See *Elements of RGGI*, REG'L GREENHOUSE GAS INITIATIVE, <https://rggi.org/program-overview-and-design/elements> [<https://perma.cc/JA6L-5VU2>] (listing definitive allowance reductions by year).

<sup>427</sup> *Id.*

<sup>428</sup> CERES, THE REGIONAL GREENHOUSE GAS INITIATIVE: A FACT SHEET 1, <https://www.ceres.org/sites/default/files/Fact%20Sheets%20or%20misc%20files/RGGI%20Fact%20Sheet.pdf> [<https://perma.cc/K247-YWGD>]. The cap is set to reduce by 30% from 2020 to 2030. *RGGI States Announce Proposed Program Changes: Additional 30% Emissions Cap Decline by 2030*, REG'L GREENHOUSE GAS INITIATIVE (Aug. 2018), [https://www.rrgi.org/sites/default/files/Uploads/Program-Review/8-23-2017/Announcement\\_Proposed\\_Program\\_Changes.pdf](https://www.rrgi.org/sites/default/files/Uploads/Program-Review/8-23-2017/Announcement_Proposed_Program_Changes.pdf) [<https://perma.cc/5U6X-JKGS>] ("The RGGI states propose a regional cap trajectory that will provide an additional 30% cap reduction by the year 2030, relative to 2020.").

<sup>429</sup> Brad Plumer, *A Plan by Eastern States to Cap Tailpipe Emissions Gets Off to a Slow Start*, N.Y. TIMES (Dec. 27, 2020), <https://www.nytimes.com/2020/12/21/climate/cap-trade-cars-emissions.html?searchResultPosition=1> [<https://perma.cc/W66K-TT5J>].

In the Appendix, we present a fifty-state survey of climate change and renewable energy policy changes during the Trump Administration.<sup>430</sup> The national political switch from Obama to Trump does not seem to have discouraged state efforts.<sup>431</sup> Indeed, if anything, efforts at nonfederal climate action seem to have redoubled since Trump's election.<sup>432</sup> By 2018, there were already signs of a state backlash against Trump,<sup>433</sup> including an increasing number of states adopting California's Zero Emission Vehicle mandate.<sup>434</sup> Consider these three examples from that year. First, California mandated that all new homes have solar energy<sup>435</sup> and adopted bold new goals in a statute mandating 100% carbon-free electricity by 2045.<sup>436</sup> Second, Connecticut adopted new laws requiring utilities to get 40% of their power from renewable sources by 2030, mandating that the state cut greenhouse gases 45% below 2001 levels by 2030, and requiring that government-funded coastal projects take into account a projected sea rise of two feet by 2050.<sup>437</sup> And third, New Jersey's Governor signed an executive order to begin rejoining the RGGI regional carbon trading system.<sup>438</sup> He also signed new legislation increasing the renewable energy mandate to 35% by 2025 and 50% by 2030, with special provisions to encourage solar and offshore wind.<sup>439</sup>

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<sup>430</sup> Besides the efforts of individual states, resistance to the Trump Administration's climate policies has also sparked cooperative actions involving states and cities. Murthy, *supra* note 1, at 2. According to Murthy, Trump's withdrawal from the Paris Agreement "spurred new initiatives in the United States, such as the U.S. Climate Alliance and We Are Still In, and given momentum to existing domestic efforts, such as Climate Mayors, and to transnational networks, such as the Under2 Coalition and C40 Cities." *Id.* at 2, 17–18.

<sup>431</sup> *Id.* at 51.

<sup>432</sup> *Id.* at 1.

<sup>433</sup> See Daniel A. Farber, *States Rally Around Renewables: States Have Ignored Trump to Promote Clean Energy Within Their Borders*, LEGAL PLANET (Oct. 25, 2018), <http://legal-planet.org/2018/10/25/despite-trump-energy-policy-moves-forward/> [<https://perma.cc/9DBW-2L4A>] (listing actions in multiple states).

<sup>434</sup> Engel, *supra* note 387, at 133–34.

<sup>435</sup> Penn, *supra* note 2.

<sup>436</sup> Lavelle, *supra* note 3.

<sup>437</sup> Bill Cummings, *Malloy Signs Clean Energy and Climate Bills*, CT POST (June 20, 2018), [https://www.ctpost.com/news/article/Malloy-signs-clean-energy-and-climate-bills-13010842.php?utm\\_source=Federal+State+Policy+Updates+June+2018&utm\\_campaign=State](https://www.ctpost.com/news/article/Malloy-signs-clean-energy-and-climate-bills-13010842.php?utm_source=Federal+State+Policy+Updates+June+2018&utm_campaign=State) [<https://perma.cc/637J-6U6H>].

<sup>438</sup> Peter Maloney, *New Jersey to Rejoin RGGI in New Executive Order*, UTIL. DIVE (Jan. 29, 2018), <https://www.utilitydive.com/news/new-jersey-to-rejoin-rggi-in-new-executive-order/515802/> [<https://perma.cc/G4M7-2FMH>].

<sup>439</sup> David Roberts, *The Latest State to Get Serious About Climate Change Is . . . New Jersey?*, VOX (May 25, 2018), <https://www.vox.com/energy-and-environment/2018/4/20/17255872/new-jersey-nuclear-renewable-energy-phil-murphy> (on file with the *Ohio State Law Journal*).

State efforts accelerated after 2018, as the Trump Administration escalated its own efforts to roll back federal climate policy.<sup>440</sup> For instance, in 2019, Minnesota Governor Tim Walz proposed a deadline to have zero-carbon power in 2050.<sup>441</sup> “Between Trump’s election and the end of 2018, six states, including California and New York, made binding commitments to 100% renewable or carbon-free power by 2050 or even earlier.”<sup>442</sup> Washington state set goals of zero reliance on coal by 2025, a carbon-neutral grid by 2030, and 100% renewable energy by 2045.<sup>443</sup> Clearly, the drive toward climate action at the state level was strong enough to survive the adverse national political climate.

In addition to state action, many cities have adopted climate action plans.<sup>444</sup> Although cities have less extensive regulatory powers than states under U.S. law, there are some aspects of emission reduction directly related to municipal activities.<sup>445</sup> City planning can be used to limit sprawl and encourage development near mass transit to counter the increasing tread of commuting via automobile.<sup>446</sup> For instance, Chicago provides incentives in the form of relaxed building restrictions for development near mass transit hubs.<sup>447</sup> Cities can use their building codes to mandate more energy-efficient buildings.<sup>448</sup> Some cities

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<sup>440</sup> In an earlier era, the Bush Administration’s refusal to support the Kyoto Protocol led to resistance by state and local governments, including the formation of the US Mayors Climate Protection Agreement. See Hari M. Osofsky & Janet Koven Levit, *The Scale of Networks?: Local Climate Change Coalitions*, 8 CHI. J. INT’L L. 409, 410 (2008).

<sup>441</sup> Elizabeth Dunbar, *Minnesota Pledges 100 Percent Carbon-Free Energy. Is it Possible?*, MPR NEWS (Mar. 7, 2019), <https://www.mprnews.org/story/2019/03/07/minnesota-pledges-100-percent-carbon-free-energy-is-it-possible> [<https://perma.cc/SR6Y-23BB>].

<sup>442</sup> Daniel Farber, *State Governmental Leadership in U.S. Climate Policy*, WILSON CTR. ENV’T CHANGE & SEC. PROGRAM (June 23, 2021), <https://www.wilsoncenter.org/article/state-governmental-leadership-us-climate-policy> [<https://perma.cc/JVW2-XKC5>].

<sup>443</sup> Morehouse, *supra* note 4.

<sup>444</sup> See generally STATE OF CAL. GOVERNOR’S OFF. OF PLAN. & RSCH., CALIFORNIA JURISDICTIONS ADDRESSING CLIMATE CHANGE (June 2014), [https://www.ca-ilg.org/sites/main/files/file-attachments/california\\_jurisdictions\\_addressing\\_climate\\_change\\_pdf\\_0.pdf?1436995986](https://www.ca-ilg.org/sites/main/files/file-attachments/california_jurisdictions_addressing_climate_change_pdf_0.pdf?1436995986) [<https://perma.cc/Z3S9-UECL>].

<sup>445</sup> See Katherine A. Trisolini, *All Hands on Deck: Local Governments and the Potential for Bidirectional Climate Change Regulation*, 62 STAN. L. REV. 669, 697 (2010) (citing four areas for municipal action: “(1) buildings and energy efficiency; (2) zoning and land use, including the setting of parameters for building permits; (3) garbage and waste collection and processing; and (4) local governments as proprietors—of buildings, public utilities, and streetlights, among many other things”).

<sup>446</sup> See *id.* at 711 (discussing the link between compact city development and planning and lower driving levels in urban spaces).

<sup>447</sup> Wyman & Spiegel-Feld, *supra* note 25, at 344.

<sup>448</sup> Trisolini stated that:

[A] number of locales have adopted green building programs that create incentives, mandates, or both to improve the environmental performance in governmental, residential, and commercial construction and retrofitting projects. Some have revised

give public ratings to buildings on energy efficiency, while others have legislated mandates to improve energy efficiency or decrease the carbon footprints of buildings.<sup>449</sup> City governments can also reduce their own energy use and create renewable sources of energy.<sup>450</sup> Given the proportion of the population and the economy found in urban areas, these can be considered significant steps.

### B. *Litigation Between Jurisdictions*

It is instructive to consider the geographic areas involved in conflicts. One important category of cases involves claims that a state law interferes with interstate commerce. These cases are particularly interesting in that they involve efforts to protect economic interests, generally in rural areas, against the effects of state climate actions. The most important ruling to date on that subject is *Rocky Mountain Farmers Union v. Corey*.<sup>451</sup> The Ninth Circuit upheld California's low-carbon fuel standard (LCFS) against charges that it discriminated against interstate commerce.<sup>452</sup> The court held that it was legitimate for the state to take geography into account when assessing the total emissions in the lifecycle of a fuel.<sup>453</sup> Notably, the case had been brought by biofuel producers in agricultural areas in the Midwest, including states that lacked major urban centers of their own.<sup>454</sup> California, while it does have an

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building codes to mandate increased efficiency, an approach identified by the IPCC as central to overcoming impediments to improving building efficiency.

Trisolini, *supra* note 445, at 701.

<sup>449</sup> Wyman & Spiegel-Feld, *supra* note 25, at 310, 343. New York City has created an emissions trading program like Tokyo's for building-related carbon emissions. *Id.* at 343–44.

<sup>450</sup> As Trisolini observed:

Local governments' most direct (and likely least politically challenging) route to reducing downstream energy consumption is through targeting their own resources and operations. Potential reductions from proprietary activities alone may be substantial given the sheer number of local governments, the size of their operations, and the types of things that they own and operate.

Trisolini, *supra* note 445, at 723.

<sup>451</sup> See generally *Rocky Mountain Farmers Union v. Corey*, 730 F.3d 1070 (9th Cir. 2013).

<sup>452</sup> *Id.* at 1078.

<sup>453</sup> *Id.* at 1090.

<sup>454</sup> See generally *id.* (discussing the role Midwest-based biofuel producers played in the challenge to the California regulatory system, including their attempt to ensure that home-generated power was not blocked from California markets).

important agricultural sector, has a heavy urban population and an economy that leans much more toward technology and media.<sup>455</sup>

Another case involving interstate commerce was *North Dakota v. Heydinger*,<sup>456</sup> which involved a challenge to a Minnesota law limiting purchases of electricity by utilities from coal-fired power plants.<sup>457</sup> The case was brought by the neighboring state of North Dakota and rural electricity providers within the state of Minnesota.<sup>458</sup> Two of the judges on the court agreed that the Minnesota law was unconstitutional, though they disagreed about the reason.<sup>459</sup> North Dakota is a very rural state with a large coal-mining industry.<sup>460</sup> Minnesota has a large urban area (Minneapolis-St. Paul) and no coal or oil resources.<sup>461</sup>

More recently, Montana and Wyoming filed an original jurisdiction action in the U.S. Supreme Court against the State of Washington.<sup>462</sup> They argued that Washington's denial of a permit that was required to build an export facility for coal deprived their mining companies of access to foreign markets, creating an unconstitutional barrier to foreign commerce.<sup>463</sup> Notably, the case was filed only after the would-be facility operator's challenge to the permit denial had lost in the courts.<sup>464</sup> Although the effort to litigate in the Supreme Court was unsuccessful, the case illustrates the geographic dimension of conflicts over fossil fuels and renewable energy.

The conflict between Trump and states like California can also be seen in geographic terms. Trump's support is heavily rural and is centered in the middle of the country.<sup>465</sup> The Trump Administration strongly allied itself with the oil

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<sup>455</sup> See Victor Davis Hanson, *The Oldest Divide*, CITY J., Autumn 2015, <https://www.city-journal.org/html/oldest-divide-14042.html> [<https://perma.cc/S6GS-N4Z4>] (discussing the urbanization of California and the ratio of farmer to urbanite in the US today).

<sup>456</sup> *North Dakota v. Heydinger*, 825 F.3d 912, 914 (8th Cir. 2016).

<sup>457</sup> *Id.* at 915–16.

<sup>458</sup> *Id.* at 913.

<sup>459</sup> *Id.* at 923, 927.

<sup>460</sup> *North Dakota: State Profile and Energy Estimates*, U.S. ENERGY INFO. ADMIN. (May 20, 2021), <https://www.eia.gov/state/analysis.php?sid=ND> [<https://perma.cc/522T-HCGP>] (discussing North Dakota's energy production and consumption by source).

<sup>461</sup> *Minnesota: State Profile and Energy Estimates*, U.S. ENERGY INFO. ADMIN. (June 17, 2021), <https://www.eia.gov/state/print.php?sid=MN> [<https://perma.cc/C7GX-VVRE>] (discussing Minnesota's energy production and consumption by source).

<sup>462</sup> *Montana v. Washington*, No. 22O152 (filed Jan. 21, 2020). Case documents are available at *Montana and Wyoming v. Washington*, SCOTUSBLOG, <https://www.scotusblog.com/case-files/cases/montana-and-wyoming-v-washington/> [<https://perma.cc/2KK7-DNRK>].

<sup>463</sup> See Reply in Support of Motion for Leave to File Bill of Complaint at 12–13, *Montana v. Washington*, No. 22O152 (U.S. 2021).

<sup>464</sup> See generally Brief for the United States as Amicus Curiae, *Montana v. Washington*, No. 22O152 (U.S. 2021) (discussing the history of the issue through both the lower courts and the permitting process).

<sup>465</sup> Nathaniel Rakich & Dhrumil Mehta, *Trump Is Only Popular in Rural Areas*, FIVETHIRTYEIGHT (Dec. 7, 2018), <https://fivethirtyeight.com/features/trump-is-really->

and coal industries, which are economically central in rural states like West Virginia, North Dakota, and Wyoming.<sup>466</sup> In contrast, the strongest opposition is found in urbanized states on the Pacific and North Atlantic Coasts.<sup>467</sup> Indeed, major cities—even those in states that Trump won in 2016—favor climate action.<sup>468</sup>

An interesting example of these dynamics involved litigation in 2020. California linked its emissions trading scheme with the Canadian province of Quebec.<sup>469</sup> The Trump Administration filed a lawsuit challenging this linkage.<sup>470</sup> California's action was attacked for being inconsistent with the Trump Administration's withdrawal from the Paris Agreement.<sup>471</sup> The court rejected this argument.<sup>472</sup> It found no evidence that the agreement interfered with President Trump's supposed efforts to obtain a better deal than the Paris Agreement perhaps—though the court was too tactful to say so—because no such efforts existed.<sup>473</sup>

Another interesting example involves the conflict between the Trump Administration and California over emissions standards for CO<sub>2</sub> from new vehicles.<sup>474</sup> When faced with a threat of federal preemption of its carbon

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popular-in-rural-areas-other-places-not-so-much/ (on file with the *Ohio State Law Journal*); see also David Wasserman & Ally Flinn, *Introducing the 2021 Cook Political Report Partisan Voter Index*, COOK POL. REP. (Apr. 15, 2021), <https://cookpolitical.com/analysis/national/pvi/introducing-2021-cook-political-report-partisan-voter-index> [<https://perma.cc/ZWM6-EGPP>] (identifying the most “red” and “blue” areas of the country after the 2020 election).

<sup>466</sup> See generally WHITE HOUSE, *supra* note 403 (listing the various steps that the Trump administration took to expand energy production, primarily by expanding fossil fuel production and use, and naming where each step occurred).

<sup>467</sup> See Wasserman & Flinn, *supra* note 465.

<sup>468</sup> See Richard Florida, *Mapping How America's Metro Areas Voted*, BLOOMBERG CITYLAB (Dec. 1, 2016), <https://www.bloomberg.com/news/articles/2016-12-01/mapping-how-america-s-metros-voted-in-the-2016-election> (on file with the *Ohio State Law Journal*) (mapping the urban areas where Hillary Clinton and Donald Trump received the most, and by extension the least, support in the 2016 presidential election).

<sup>469</sup> Sharmila L. Murthy, *California's Cap-and-Trade Agreement with Quebec: Surviving Constitutional Scrutiny*, HARV. L. SCH. ENV'T & ENERGY L. PROGRAM (Nov. 4, 2019), <http://eelp.law.harvard.edu/wp-content/uploads/Murthy-Final.pdf> [<https://perma.cc/A3QV-TYJB>].

<sup>470</sup> *Id.*; see also Sharmila L. Murthy, *The Constitutionality of State and Local “Norm Sustaining” Actions on Global Climate Change: The Foreign Affairs Federalism Grey Zone*, 5 U. PA. J. L. & PUB. AFFS. 447, 478–84 (2020) (discussing the cap-and-trade program linking California to Quebec as the least constitutionally vulnerable program of its type prior to any litigation unfolding in court).

<sup>471</sup> Murthy, *supra* note 469.

<sup>472</sup> *United States v. California*, Case 2:19-cv-02142-WBS-EFB, slip op. at 29–30 (E.D. Cal. July 17, 2020).

<sup>473</sup> *Id.* at 28.

<sup>474</sup> Juliet Eilperin & Brady Dennis, *Major Automakers Strike Climate Deal with California, Rebuffing Trump on Proposed Mileage Freeze*, WASH. POST (July 25, 2019),

emission standards for new vehicles, California adopted a novel approach to reducing emissions.<sup>475</sup> The state reached a preliminary agreement with the four major carmakers who wished to avoid the uncertainty of prolonged litigation.<sup>476</sup> The Trump Administration threatened an antitrust investigation into the agreement, which was later dropped.<sup>477</sup> When the deal was finalized, it included an additional carmaker and set a stricter emission standard than the Trump Administration's.<sup>478</sup>

This conflict between California and the Trump Administration is particularly significant because the car industry was not the moving force behind the Administration's hostility to the California standards, as shown by the willingness of some companies to continue complying.<sup>479</sup> The California standards did, however, reduce gasoline consumption, leading to resistance from the oil industry.<sup>480</sup> Unlike the car industry, the oil industry is centered in

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<https://www.washingtonpost.com/climate-environment/2019/07/25/major-automakers-strike-climate-deal-with-california-rebuffing-trump-proposed-mileage-freeze/> [<https://perma.cc/FGJ9-XPVJ>].

<sup>475</sup> *See id.*

<sup>476</sup> *Id.*

<sup>477</sup> Nicholas Iovino, *White House Drops Antitrust Probe of California Emissions Deal with Automakers*, COURTHOUSE NEWS SERV. (Feb. 7, 2020), <https://www.courthousenews.com/white-house-drops-antitrust-probe-of-california-emissions-deal-with-automakers/#:~:text=The%20deal%20reached%20between%20California,attempting%20to%20revoke%20that%20authority> [<https://perma.cc/4EAA-DFK4>].

<sup>478</sup> Coral Davenport, *Defying Trump, 5 Automakers Lock in a Deal on Greenhouse Gas Pollution*, N.Y. TIMES (Aug. 17, 2020), <https://www.nytimes.com/2020/08/17/climate/california-automakers-pollution.html> [<https://perma.cc/38RY-AHUZ>].

Under the California agreement, the automakers, which together make up about 30 percent of the United States auto market, will be required to increase their average fuel economy from about 38 miles per gallon today to about 51 miles per gallon by 2026. By comparison, the Trump administration's national rule on auto emissions, which was completed this spring, rolled back a 2012 rule that required automakers' fleets to average about 54 miles per gallon by 2025. Instead, the fleets now must only average about 40 miles per gallon.

*Id.* The carmakers who took part in the deal represent about one-third of the U.S. market. *Id.*

<sup>479</sup> *See* Ronald Brownstein, *Trump's War on Blue America*, ATLANTIC (Sept. 19, 2019), <https://www.theatlantic.com/politics/archive/2019/09/trump-epa-california-car-emissions/598381/> [<https://perma.cc/AH82-6K2N>]; Hiroko Tabuchi, *The Oil Industry's Covert Campaign to Rewrite American Car Emissions Rules*, N.Y. TIMES (Dec. 13, 2018), <https://www.nytimes.com/2018/12/13/climate/cape-emissions-rollback-oil-industry.html> [<https://perma.cc/DT7R-92UC>].

<sup>480</sup> *See* Nikos Tsafos, *Why the California Waiver Matters*, CTR. FOR STRATEGIC & INT'L STUD. (Sept. 24, 2019), <https://www.csis.org/blogs/energy-headlines-versus-trendlines/why-california-waiver-matters> [<https://perma.cc/2MDT-VQ6B>].

rural areas across the United States and thus is particularly important to Trump's political coalition.<sup>481</sup>

Conflicting state positions on climate change were highlighted by the litigation over the Obama Administration's initial effort to address greenhouse gas emissions under the Clean Air Act.<sup>482</sup> Nineteen states intervened on the side of the Obama Administration, while another eighteen joined fossil fuel interests in attacking the emissions cuts.<sup>483</sup> A statistical analysis showed that the main driver was politics, as measured by the party affiliation of the state's attorney general and whether the state voted for Obama or his Republican opponent in 2008.<sup>484</sup> Other factors, such as whether the state was located on a coast, were not statistically significant.<sup>485</sup>

Earlier studies found that the expected costs of climate change mitigation are correlated with congressional voting patterns, and that individuals are more likely to support climate change mitigation if they live in areas that are at high risk.<sup>486</sup> In Part V, we will take a closer look at how subnational action is also related to geography.

There have been similar conflicts between cities and state governments, particularly in states that have large rural populations.<sup>487</sup> The issue of fracking has led to many conflicts, as municipal governments seek to protect themselves against the local environmental impacts in states that favor the oil industry.<sup>488</sup> Generally, state governments have prevailed in these conflicts, reflecting the restricted autonomy that state constitutions give local governments.<sup>489</sup> The

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<sup>481</sup> See, e.g., Christopher Collins & Lise Olsen, *Rural Voters Stepped on the Gas for Trump Across the Texas Oil Patch*, TEX. OBSERVER (Nov. 23, 2020), <https://www.texasobserver.org/rural-voters-stepped-on-the-gas-for-trump-across-the-texas-oil-patch/> [<https://perma.cc/YZ2K-2AH2>].

<sup>482</sup> Further information on this and other litigation between conservative states and Obama can be found in Roesler, *supra* note 25, and Lin, *supra* note 17.

<sup>483</sup> Caroline Cecot, Note, *Blowing Hot Air: An Analysis of State Involvement in Greenhouse Gas Litigation*, 65 VAND. L. REV. 189, 202 (2012). During the administrative process, illustrating the disjuncture between state governments under the influence of rural constituents, "236 mayors from 47 states submitted comments on the proposed repeal of the Clean Power Plan while urging then-administrator Scott Pruitt to retain the rule." Arroyo, *supra* note 402, at 437.

<sup>484</sup> Cecot, *supra* note 483, at 218, 226.

<sup>485</sup> *Id.* at 225.

<sup>486</sup> *Id.* at 210–12.

<sup>487</sup> See Shannon M. Roesler, *Federalism and Local Environmental Regulation*, 48 U.C. DAVIS L. REV. 1111, 1115 (2015). Notably, even in states with large fossil fuel resources, cities have taken their own paths, as exemplified by the 2007 decision of Tulsa, Oklahoma, to join the U.S. Mayors Climate Protection Agreement. See Osofsky & Levit, *supra* note 440, at 421–22.

<sup>488</sup> See, e.g., Jamal Knight & Bethany Gullman, *The Power of State Interest: Preemption of Local Fracking Ordinances in Home-Rule Cities*, 28 TUL. ENV'T L.J. 297, 310–12 (2015).

<sup>489</sup> See *id.* at 307; Alex Ritchie, *Fracking in Louisiana: The Missing Process/Land Use Distinction in State Preemption and Opportunities for Local Participation*, 76 LA. L. REV.

greater success of states in conflicts with the federal government is due to the constitutional status of federalism.<sup>490</sup>

### C. Environmental Federalism and Climate Exceptionalism

As a general matter, the federal government is the dominant partner in environmental regulation.<sup>491</sup> States also participate in regulation, but generally under the supervision of the federal government.<sup>492</sup> In most areas, they have the option to impose stronger regulations than the federal government does.<sup>493</sup> Many states do not, however, make use of this power.<sup>494</sup> States may also push back on federal regulation, as many conservative states did with litigation against the Obama Administration.<sup>495</sup>

Climate change is an exception to this pattern. Although the regulatory system as a whole has shown more continuity than transformation, the balance of power is different in the climate arena.<sup>496</sup> What is happening there is perhaps the most significant shift in regulatory approaches since the 1970s. Contrary to expectations, state activity has been greatest in an area of global concern, rather than with local issues.<sup>497</sup> Moreover, these environmental initiatives are not limited to state governments; the state initiatives are accompanied by initiatives from cities and private firms from Apple to Walmart.<sup>498</sup> These entities are not acting in isolation from each other.<sup>499</sup> This more diverse group of actors has also created robust cooperative networks that cross sectors and national borders.<sup>500</sup>

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809, 824–25, 847 (2016). For more on conflicts between states and cities over climate change, see Jacqueline Peel & Hari M. Osofsky, *Sue To Adapt?*, 99 MINN. L. REV. 2177, 2178–84 (2015).

<sup>490</sup> See, e.g., Roesler, *supra* note 487, at 1116–17; Dorothea Allocca, Note, *Special State Standing Is Environmental: Clarifying Massachusetts v. EPA*, 45 WM. & MARY ENV'T L. & POL'Y REV. 193, 204 (2020); see Lin, *supra* note 17, at 921–22.

<sup>491</sup> Lin, *supra* note 17, at 896–97.

<sup>492</sup> See Robert L. Fischman, *Cooperative Federalism and Natural Resources Law*, 14 N.Y.U. ENV'T L.J. 179, 190–93 (2005).

<sup>493</sup> See William W. Buzbee, *Asymmetrical Regulation: Risk, Preemption, and the Floor/Ceiling Distinction*, 82 N.Y.U. L. REV. 1547, 1551–52 (2007).

<sup>494</sup> Fischman, *supra* note 492, at 191.

<sup>495</sup> Roesler, *supra* note 25, at 10860.

<sup>496</sup> See generally Dan Farber, *Continuity and Transformation in Environmental Regulation*, 10 ARIZ. J. ENV'T L. & POL'Y 1 (2019).

<sup>497</sup> See Roesler, *supra* note 487, at 1146.

<sup>498</sup> E.g., Osofsky & Levit, *supra* note 440, at 414; Lauren Goode, *Apple Sets Climate Goals for 2030, Joining Amazon and Microsoft*, WIRED (July 21, 2020), <https://www.wired.com/story/apple-sets-climate-goals-for-2030/> [<https://perma.cc/W2N4-CEQU>]; Kathleen McLaughlin & Andrew Steer, Opinion, *Why Walmart and Other Companies Are Sticking with the Paris Climate Deal*, N.Y. TIMES (Nov. 6, 2019), <https://www.nytimes.com/2019/11/06/opinion/climate-change-walmart-paris.html> [<https://perma.cc/3Z5F-CCFR>].

<sup>499</sup> E.g., Osofsky & Levit, *supra* note 440, at 414; Goode, *supra* note 498.

<sup>500</sup> See, e.g., Osofsky & Levit, *supra* note 440, at 431–32.

And within each level of government, non-environmental agencies—especially energy regulators—have assumed important roles.<sup>501</sup> This effort has no clear precedents in the earlier decades of environmental law.

In short, the United States has augmented a hierarchical system based on a dominant federal environmental role with a pluralist system of multiple climate actors interacting through multiple networks. The federal government still plays the largest role in environmental regulation.<sup>502</sup> But despite its importance, it shares the stage with other actors and other methods of environmental protection. How to coordinate and guide this complex system may be the key challenge of institutional design confronting the United States. Its importance stems not only from the urgency of climate change, but also from the fact that climate change is interwoven with so many other environmental problems.

#### V. UNDERSTANDING THE GEOGRAPHY OF SUBNATIONAL CLIMATE POLICY

Scholars have long puzzled over the motivations for subnational climate actions.<sup>503</sup> Indeed, economic theory suggests that it is irrational for jurisdictions to act in the absence of a global agreement.<sup>504</sup> This Part will examine some of the key factors that help determine whether a jurisdiction takes a leadership position on climate change, remains passive, or actively resists efforts to reduce carbon emissions.

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<sup>501</sup> See, e.g., Rich Glick & Matthew Christiansen, *FERC and Climate Change*, 40 ENERGY L.J. 1, 4–5 (2019).

<sup>502</sup> See, e.g., Lin, *supra* note 17, at 896–97.

<sup>503</sup> Kirsten H. Engel & Barak Y. Orbach, *Micro-Motives and State and Local Climate Change Initiatives*, 2 HARV. L. & POL'Y REV. 119, 119–20 (2008).

Local climate change initiatives, therefore, invite two questions: First, assuming local actions to reduce emissions have no impact on global concentrations, why are the public and decisionmakers willing to invest any resources in their creation or implementation? Second, even assuming local actions can affect global greenhouse gas concentrations at a meaningful level, why are the public and local decisionmakers willing to invest in such measures when they will share the benefits of their investments with everyone on the globe?

*Id.* at 20.

<sup>504</sup> J.R. DeShazo & Jody Freeman, *Timing and Form of Federal Regulation: The Case of Climate Change*, 155 U. PA. L. REV. 1499, 1517–19 (2007).

Neither a single state, nor a small handful of states, should be willing to invest in emissions regulation—both because a few jurisdictions acting alone cannot hope to make meaningful progress on the problem, and because the nature of global warming means that proactive states cannot fully internalize the benefits of their regulatory efforts, and must instead share those benefits.

*Id.* at 1518.

### A. Economic Geography

It seems to be no more than common sense that a jurisdiction's approach to climate policy will be heavily shaped by economic factors. In particular, one would expect that jurisdictions whose economies rely heavily on fossil fuels would be unenthusiastic about reducing carbon emissions.<sup>505</sup> On the other hand, jurisdictions with high potential for producing renewable energy would be more likely to favor emissions reductions.<sup>506</sup>

As one striking example, consider the vote on the Waxman-Markey climate change bill, which passed the U.S. House of Representatives by a single vote in 2009 before dying in the Senate.<sup>507</sup> The vote was highly influenced by economic factors: “[f]orty-four Democrats voted against it, the vast majority representing Midwestern, Southern, coal-producing, and industrial states.”<sup>508</sup>

To take another example, Texas is by far the largest oil-producing state in the United States.<sup>509</sup> When ExxonMobil was sued by the New York Attorney General for misleading the public about climate change, a Texas state court issued an injunction against the New York lawsuit, and the Texas Attorney General filed a brief in New York court asking the suit to be dismissed.<sup>510</sup> The state has also intervened in litigation in an effort to prevent oil companies from having to pay damages for climate change.<sup>511</sup> Similarly, provinces with high energy resources in China tend to be resistant to climate action.<sup>512</sup>

Senator Chuck Grassley from Iowa is an interesting example of how economic interests may cut the other way. Iowa is a rural state that produces a

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<sup>505</sup> See, e.g., Osofsky & Levit, *supra* note 440, at 421–22.

<sup>506</sup> See, e.g., David E. Adelman & Kirsten H. Engel, *Reorienting State Climate Change Policies to Induce Technological Change*, 50 ARIZ. L. REV. 835, 851–52 (2008) (discussing the variety of state approaches and advancements to developing renewable energy based on the resources available in a particular state).

<sup>507</sup> See Sheppard, *supra* note 18; David Roberts, *The Once and Future Democratic Consensus on Climate Change*, VOX (Nov. 18, 2017), <https://www.vox.com/energy-and-environment/2017/11/18/16669094/democratic-consensus-on-climate-change> [<https://perma.cc/2HMT-E9AB>].

<sup>508</sup> See Sheppard, *supra* note 18.

<sup>509</sup> *Texas State Energy Profile*, U.S. ENERGY INFO. ADMIN., <https://www.eia.gov/state/print.php?sid=TX> [<https://perma.cc/H368-H47S>].

<sup>510</sup> Press Release, Tex. Att’y Gen., AG Paxton Leads 12-State Coalition in Brief Supporting First Amendment in Public Policy Debates (Aug. 10, 2018), <https://www.texasattorneygeneral.gov/news/releases/ag-paxton-leads-12-state-coalition-brief-supporting-first-amendment-public-policy-debates> [<https://perma.cc/ZWG6-P32F>].

<sup>511</sup> See, e.g., Press Release, Tex. Att’y Gen., AG Paxton Joins 11-State Brief Supporting Fight Against Job Killing Climate Change Lawsuit (Oct. 5, 2018), <https://www.texasattorneygeneral.gov/news/releases/ag-paxton-joins-11-state-brief-supporting-fight-against-job-killing-climate-change-lawsuit> [<https://perma.cc/6XYF-EGEE>]. On the role of fossil fuel industries in promoting litigation against environmental regulations by state attorneys general, see Roesler, *supra* note 25, at 10866–67.

<sup>512</sup> See *supra* notes 121–22, 114–15 and accompanying text.

large amount of wind power and grows corns for use in biofuels.<sup>513</sup> Grassley, a conservative Republican,<sup>514</sup> received an award from the American Wind Energy Association for his work promoting wind.<sup>515</sup> In granting the award, the head of the Association said, “[h]is vision and decades of tireless support for America’s wind workers forged wind power into a major pillar of U.S. energy production, Iowa’s economy, and rural communities across the nation.”<sup>516</sup> In June 2020, Senator Grassley threatened to hold up approval for the appointment of EPA officials unless the Trump Administration backed down from giving biofuel waivers that would favor the oil industry.<sup>517</sup>

States may also seek economic advantage from being first-movers on climate change by developing related intellectual property and industries.<sup>518</sup> By adopting their own clean energy programs, “sister states may create new demand for agricultural fuels and wind-powered electricity, thus generating profits for the states that develop these products.”<sup>519</sup> There is reason to believe that this motivation has played a significant role in some states: “Many states, for example, are motivated by the direct economic advantages (e.g., new jobs, energy security) of fostering green innovation and the prospect of gaining a ‘first mover’ advantage by cultivating a critical mass of green industries in their jurisdictions.”<sup>520</sup> Cities and states wishing to maintain post-industrial, high-tech economies are also drawn toward climate action (and environmental initiatives more generally).<sup>521</sup> These industries and their workers place a high value on quality of life, including environmental quality.<sup>522</sup>

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<sup>513</sup> *Wind Energy*, IOWA ENV’T COUNCIL, <https://www.iaenvironment.org/our-work/clean-energy/wind-energy> [<https://perma.cc/WM4Z-YLJA>]; Donnelle Eller, *Iowa Farm Groups Bemoan Lawmakers’ Failure to Boost Renewable Fuels*, DES MOINES REG. (May 21, 2021), <https://www.desmoinesregister.com/story/money/agriculture/2021/05/21/iowa-legislature-ends-session-without-biofuels-standard/5186859001/> [<https://perma.cc/F9WM-47XR>].

<sup>514</sup> Burgess Everett, *Chuck Grassley Is the 80-Something Everyone’s Waiting On*, POLITICO (May 10, 2021), <https://www.politico.com/news/2021/05/10/chuck-grassley-2022-485648> [<https://perma.cc/8RRT-FGV8>].

<sup>515</sup> Press Release, Am. Clean Power Ass’n, Sen. Grassley Receives “U.S. Wind Champion Award” (Aug. 6, 2018), <https://cleanpower.org/news/sen-grassley-receives-u-s-wind-champion-award/> [<https://perma.cc/TS6Z-MFGV>].

<sup>516</sup> *Id.*

<sup>517</sup> See Stephanie Kelly, *U.S. Senator Grassley Backs Plan to Block EPA Nomination over Biofuel Waivers*, REUTERS (June 30, 2020), <https://www.reuters.com/article/us-usa-biofuels-grassley/u-s-senator-grassley-backs-plan-to-block-epa-nomination-over-biofuel-waivers-idUSKBN2412LE> [<https://perma.cc/C7SX-MW5U>].

<sup>518</sup> See, e.g., Rabe, Román & Dobelis, *supra* note 19, at 20 (“[A] state may fund university research on zero-emission vehicles even though it has no hope of recouping those moneys through in-state sales of the resulting technology, because it predicts that other jurisdictions will also regulate and will therefore be willing to pay for this technology.”).

<sup>519</sup> *Id.* at 26.

<sup>520</sup> Adelman & Engel, *supra* note 506, at 837.

<sup>521</sup> Wyman & Spiegel-Feld, *supra* note 25, at 308–09, 328.

<sup>522</sup> *Id.* at 327.

Another economic motive may be particularly strong among jurisdictions that have needed to import fuels from other countries to power their electricity systems, which exposes them to price instability and potential supply shortages.<sup>523</sup> Renewable energy may be an appealing way for these states to hedge these supply risks:

These local sources of energy have many economic advantages besides their potential benefit of reducing greenhouse gas emissions. First, they are relatively stable sources, relying on predictable geological and meteorological patterns. Second, they reduce reliance on the policies of foreign governments, which largely control the production of oil and gas. Finally, they reduce reliance on international market forces and foreign trade, which may be a boon given the sometimes precarious status of the international trading system.<sup>524</sup>

### B. Demographics

We would also expect the extent of urbanization to be an important factor in determining a jurisdiction's propensity to take climate action. Oil and gas production, along with coal mining, are generally found outside of cities, so rural areas are also more likely to have an economic interest in fossil fuel production. Moreover, farming in many places is heavily reliant on artificial fertilizer.<sup>525</sup> Nitrogen fertilizer is produced with natural gas, and farmers therefore have an interest in maintaining an abundant supply of gas.<sup>526</sup> Another factor that does not operate in the U.S. context is exposed by our case study of Japan: scarcity of arable land escalates resistance from rural interests to alternative land uses such as wind farm siting.<sup>527</sup>

Cities are often on the forefront of climate action, as is illustrated by our study of Tokyo's emissions trading system and attention to climate change adaptation.<sup>528</sup> Rural areas have tended to lag.<sup>529</sup> Urbanized areas, in contrast, have strong reasons to support climate action.<sup>530</sup> Most efforts to reduce carbon

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<sup>523</sup> See Rabe, Román & Dobelis, *supra* note 19, at 28–30.

<sup>524</sup> *Id.* at 28–29.

<sup>525</sup> Jenny Hopkinson, *Can American Soil Be Brought Back to Life?*, POLITICO (Sept. 13, 2017), <https://www.politico.com/agenda/story/2017/09/13/soil-health-agriculture-trend-usda-000513/> [<https://perma.cc/Y8S7-WECJ>].

<sup>526</sup> See Tom Philpott, *Our Other Addiction: The Tricky Geopolitics of Nitrogen Fertilizer*, GRIST (Feb. 12, 2010), <https://grist.org/article/2010-02-11-tracking-u-s-farmers-supply-nitrogen-fertilizer/> [<https://perma.cc/ZK6N-UZ8R>].

<sup>527</sup> See *supra* notes 273–76 and accompanying text.

<sup>528</sup> See *supra* notes 282–85 and accompanying notes; see also Roesler, *supra* note 487, at 1137–38.

<sup>529</sup> See BONNIE, DIAMOND & ROWE, *supra* note 21, at 14.

<sup>530</sup> Wyman & Spiegel-Feld, *supra* note 25, at 308–09, 328. In the United States, residents of cities tend to be more politically progressive than those in rural areas, another factor favoring climate action. *Id.* at 331.

dioxide emissions involve cutting use of fossil fuels.<sup>531</sup> Fossil fuels are major sources of serious air pollution, which can stem in particular from coal and oil-fired powerplants, or from cars, buses, and trucks.<sup>532</sup> Urban areas are not the only ones impacted by air pollution, but they are probably the most important because people, transportation systems, and often power generation are packed into a smaller area.<sup>533</sup> Thus, some scholars have observed, “California has led the way in reducing greenhouse gases in part because of a convergence with the distinctly local problem of smog.”<sup>534</sup>

The prevalence of air pollution is significant for another reason. Jurisdictions that have had experience in regulating air pollution have established regulatory infrastructure that can then be turned to addressing climate change.<sup>535</sup> According to Professor Ann Carlson, this was an important factor in California’s climate programs.<sup>536</sup> She argues that “prior to enacting ambitious climate change legislation, the state had created regulatory institutions of extraordinary sophistication and capacity and real political agility. Without such regulatory capacity, the state simply could not lead as ably or quickly as it has.”<sup>537</sup> Specifically, she argues,

A state is less likely to engage in ambitious new environmental regulation unless its previous efforts have succeeded, both politically and in measurable environmental outcome. Such past regulatory success—particularly in air pollution regulation—helps explain why California has been willing to lead on climate change regulation. In repeatedly achieving demonstrable regulatory success by reducing automobile emissions, California’s Air Resources Board has won the confidence of both the public and of elected officials.<sup>538</sup>

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<sup>531</sup> See *Fossil Fuels and Climate Change: The Facts*, CLIENTEARTH (Nov. 11, 2020), <https://www.clientearth.org/latest/latest-updates/stories/fossil-fuels-and-climate-change-the-facts/> [https://perma.cc/W7M5-6F38].

<sup>532</sup> See *id.*; see also *How We Use Energy*, NAT’L ACAD. OF SCIS., ENG’G, & MED. (2021), <http://needtoknow.nas.edu/energy/energy-use/transportation/> [https://perma.cc/4244-ZXVN].

<sup>533</sup> See Heather Strosnider, Caitlin Kennedy, Michele Monti & Fuyuen Yip, *Rural and Urban Differences in Air Quality, 2008–2012, and Community Drinking Water Quality, 2010–2015—United States*, 66 MORBIDITY & MORTALITY WEEKLY REP. SURVEILLANCE SUMMARIES 1, 1, 2, 7 (2017) (noting that contextual, structural, environmental, and ecological features vary between rural and urban areas).

<sup>534</sup> Rabe, Román & Dobelis, *supra* note 19, at 18.

<sup>535</sup> See, e.g., Erin McKenzie, *Our Impact: Recognizing the Clean Air Act’s Potential to Address Climate Change*, NICHOLAS INST. FOR ENV’T POL’Y SOLS., DUKE UNIV., <https://nicholasinstitute.duke.edu/our-impact/recognizing-clean-air-act-potential-to-address-climate-change> [https://perma.cc/XGX6-N94M].

<sup>536</sup> Ann E. Carlson, *Regulatory Capacity and State Environmental Leadership: California’s Climate Policy*, 24 FORDHAM ENV’T L. REV. 63, 64–65 (2013).

<sup>537</sup> *Id.*

<sup>538</sup> *Id.* at 65. In an earlier work, she describes how California’s leadership in combatting air pollution from vehicles increased its regulatory capacity, which the state then applied to

A similar story lies behind the development of RGGI, the carbon trading system among the northeastern American states.<sup>539</sup> Carlson points out that the states forming the core of the program had begun their cooperative effort in the context of conventional air pollution.<sup>540</sup> Specifically, they had banded together to deal with pollution that crossed state lines within this group, as well as pollution blowing in from high emission states to the West and South.<sup>541</sup> The 1990 amendments to the Clean Air Act formalized this cooperation by creating the Ozone Transport Commission, which was made up of these states.<sup>542</sup> These states created an emissions trading program for NO<sub>x</sub>, a chemical that forms ozone when exposed to sunlight in the atmosphere.<sup>543</sup> That trading program formed the template for the RGGI carbon trading program.<sup>544</sup>

Once states have begun to take action on climate change, they may seek to obtain reputational benefits from doing so. Having begun to enact restrictions on carbon emissions to deal with local air pollution, “these states have become climate change ‘players.’”<sup>545</sup> This can establish “a self-reinforcing cycle”: “[t]hese players can choose to publicize themselves as environmentally virtuous and thus improve their reputations with some potentially important audiences.”<sup>546</sup> This effort to score reputational points is not peculiarly American, also providing a motivation to Chinese cities such as Dongguan and Foshan.<sup>547</sup>

### C. Risk Exposure

One might expect that people who are more exposed to climate-related risks like sea level rise would be more prone to support vigorous action to reduce emissions. There are two reasons why this effect might not materialize. First, for ideological reasons, people may be reluctant to recognize a link between weather threats and human emissions of carbon.<sup>548</sup> This is clearly true throughout much of the U.S. South, even though many southern states face serious risks from sea level rise.<sup>549</sup> Second, especially in smaller jurisdictions,

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greenhouse gas emissions from vehicles. Ann E. Carlson, *Iterative Federalism and Climate Change*, 103 NW. U. L. REV. 1097, 1136–37 (2009).

<sup>539</sup> Carlson, *supra* note 538, at 1141–42.

<sup>540</sup> *Id.* at 1142.

<sup>541</sup> *Id.* at 1143–51.

<sup>542</sup> *Id.* at 1145.

<sup>543</sup> *Id.* at 1145–47.

<sup>544</sup> *Id.* at 1151.

<sup>545</sup> Rabe, Román & Dobelis, *supra* note 19, at 18–19.

<sup>546</sup> *Id.* at 19.

<sup>547</sup> See *supra* notes 107–11, 119–23 and accompanying text.

<sup>548</sup> Raul P. Lejano, *Ideology and the Narrative of Climate Skepticism*, 100 BULL. AM. METEOROLOGICAL SOC'Y 415, 415–16 (2019).

<sup>549</sup> See Megan Mayhew Bergman, *Why People in the US South Stay Put in the Face of Climate Change*, GUARDIAN (Jan. 24, 2019), <https://www.theguardian.com/environment>



#### D. Decentralized Production of Climate Policy

The Introduction described two of the international coalitions formed by state and local authorities, sometimes joined by some national governments and actors from the private sector.<sup>557</sup> Among other benefits, such coalitions can increase the spread of emission reduction efforts and thereby lower the risk of carbon leakage, a phenomenon in which emissions reductions in one place stimulate higher emissions elsewhere.<sup>558</sup> These coalitions are two among many. Another coalition, *We're Still In*, includes ten states, and over 250 cities and counties,<sup>559</sup> having begun as “a promise to world leaders that Americans would not retreat from the global pact to reduce emissions and stem the causes of climate change.”<sup>560</sup>

There are yet more examples. The International Council for Local Environmental Initiatives (ICLEI) has more than 1,750 members in over a hundred countries.<sup>561</sup> It includes a significant number of Japanese and Chinese cities, including Tokyo and Kyoto in Japan, and Changchun, Shanghai, and Hong Kong in China.<sup>562</sup> There is also a World Mayors Council on Climate Change, which operates under the aegis of the ICLEI, and the Climate Mayors, a U.S. organization of mayors that opposed Trump Administration efforts to reduce climate actions.<sup>563</sup> United Cities and Local Governments (UCLG)

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<sup>557</sup> See *Under2 Coalition*, *supra* note 10; *The Power of C40 Cities*, C40 CITIES, <http://www.c40.org/cities> [<https://perma.cc/Y7VJ-CMCC>].

<sup>558</sup> For discussion of the importance of policy spread to combat leakage, see generally Daniel A. Farber, *Carbon Leakage Versus Policy Diffusion: The Perils and Promise of Subglobal Climate Action*, 13 CHI. J. INT'L L. 359 (2013). On the potential contribution of state and local actions to achieving climate goals, see generally Richard B. Stewart, *States and Cities as Actors in Global Climate Regulation: Unitary vs. Plural Architectures*, 50 ARIZ. L. REV. 681 (2008). According to Murthy, Trump's withdrawal from the Paris Agreement “has spurred new initiatives in the United States, such as the U.S. Climate Alliance and We Are Still In, and given momentum to existing domestic efforts, such as Climate Mayors, and to transnational networks, such as the Under2 Coalition and C40 Cities.” Murthy, *supra* note 1, at 2.

<sup>559</sup> *Who's In, WE ARE STILL IN*, <https://www.wearestillin.com/signatories> [<https://perma.cc/H8TH-UGCP>].

<sup>560</sup> *We Are Still In' Coalition Launches Campaign to Drive Wave of Local Climate Action to Deliver on America's Pledge*, WE ARE STILL IN, <https://www.wearestillin.com/news/we-are-still-coalition-launches-campaign-drive-wave-local-climate-action-deliver-america> [<https://perma.cc/AU2P-SEX2>]; see also *About, WE ARE STILL IN*, <https://www.wearestillin.com/about> [<https://perma.cc/N6B5-QE9Y>].

<sup>561</sup> INT'L COUNCIL FOR LOCAL ENV'T INITIATIVES, <https://www.iclei.org/> [<https://perma.cc/AV35-WUBT>].

<sup>562</sup> See *All ICLEI Members*, ICLEI: LOCAL GOV'TS FOR SUSTAINABILITY, <https://iclei.org/en/members-search.html?region=East%2520Asia> [<https://perma.cc/H64Q-CPSB>].

<sup>563</sup> See *Climate Mayors, 407 U.S. Climate Mayors Commit to Adopt, Honor and Uphold Paris Climate Agreement Goals: Statement from the Climate Mayors in Response to President Trump's Withdrawal from the Paris Climate Agreement*, MEDIUM (June 1, 2017),

participates along with ICLEI in international climate negotiations to represent the interests of its members.<sup>564</sup> As Hari Osofsky has described, “participating governments create agreements in which they voluntarily commit to taking steps within their local control,” agreements that “have become more detailed over time, and have evolved from initially focusing primarily on mitigation to increasingly including adaptation.”<sup>565</sup>

The importance of such networks’ climate policy has been generally recognized.<sup>566</sup> These networks provide “useful services that maximize a city’s emissions reduction efforts, including (1) direct assistance through on-the-ground support staff and expert consultative services; (2) peer-to-peer exchange; and (3) research, data, knowledge, and communication management services that identify problems and successes, and measure the progress of the network.”<sup>567</sup> They also provide the opportunity for learning through policy

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<https://medium.com/@ClimateMayors/climate-mayors-commit-to-adopt-honor-and-uphold-paris-climate-agreement-goals-ba566e260097> (on file with the *Ohio State Law Journal*). ICLEI says that it has promoted “urban low emission development and climate resilience across more than 60 cities worldwide, using a multilevel governance approach to urban climate action. Through Urban-LEDS, cities develop comprehensive urban Low Emissions Development Strategies (LEDS) and work together to implement their plans and develop pilot projects and finance models for LEDS implementation.” *Urban-LEDS*, INT’L COUNCIL FOR LOCAL ENV’T INITIATIVES, [https://iclei.org/en/Urban\\_LEDS.html](https://iclei.org/en/Urban_LEDS.html) [<https://perma.cc/TM66-39VM>]. Cooperation by U.S. Mayors dates back to the mid-2000s:

In June 2005, the U.S. Conference of Mayors adopted the Mayors Climate Protection Agreement that urges cities to adopt measures designed to meet or exceed the target and timetable for reducing greenhouse gases established by the Kyoto Protocol—a reduction of 7 percent below 1990 levels by the year 2012. As of Nov 5, 2007, the mayors of over 710 cities had joined the Agreement.

Engel & Orbach, *supra* note 503, at 122.

<sup>564</sup> *Climate Change*, UNITED CITIES & LOCAL GOV’TS, <https://www.uclg.org/en/issues/climate-change> [<https://perma.cc/5P97-8AMM>].

<sup>565</sup> Hari M. Osofsky, *Rethinking the Geography of Local Climate Action: Multilevel Network Participation in Metropolitan Regions*, 2015 UTAH L. REV. 173, 192 (2015).

<sup>566</sup> See Xueqing Shan, *Coordinating Local Adaptive Strategies Through a Network-Based Approach*, 29 DUKE ENV’T L. & POL’Y F. 183, 184 (2018); Devani G. Adams, *Why We Cannot Wait: Transnational Networks as a Viable Solution to Climate Change Policy*, 13 SANTA CLARA J. INT’L L. 307, 321 (2015); Osofsky & Levit, *supra* note 440, at 410; Craig Holt Segall, *Networked Federalism: Subnational Governments in the Biden Era*, 18 ECOLOGY L. CURRENTS 1, 2 (2021), <https://www.ecologylawquarterly.org/currents/networked-federalism/> [<https://perma.cc/LF2H-JKCY>]. The idea of networked governance has broader roots in the literature on international law and international relations. ANNE-MARIE SLAUGHTER, *A NEW WORLD ORDER* 15 (2004); Kenneth Anderson, *Squaring the Circle? Reconciling Sovereignty and Global Governance Through Global Government Networks*, 118 HARV. L. REV. 1255, 1257 (2005). In the environmental sphere, see generally Daniel Bodansky, *The Legitimacy of International Governance: A Coming Challenge for International Environmental Law?*, 93 AM. J. INT’L L. 596, 619–20 (1999). On the role of state governments in international governance networks, see Frédéric Gilles Sourgens, *States of Resistance*, 14 DUKE J. CONST. L. & PUB. POL’Y 91, 121 (2019).

<sup>567</sup> Adams, *supra* note 566, at 322.

experimentation.<sup>568</sup> Scholars stress the important role that networks play in information exchange and (to a lesser extent) public outreach and political coalition building.<sup>569</sup> The network model captures some important features of the emerging climate governance regime, but does not illuminate the motivations for jurisdictions to participate.<sup>570</sup>

Another possible model is provided by the concept of peer production, which has been especially influential in the area of information technology.<sup>571</sup> Although the analogy has its limits, it may help illuminate the willingness of these jurisdictions to contribute to reduction of global carbon emissions.

For many readers, the most familiar example of peer production may be Wikipedia.<sup>572</sup> Editors and contributors to Wikipedia receive no financial reward.<sup>573</sup> Today, Wikipedia has fifty-five million entries, with 270,000 active editors per month.<sup>574</sup> While imperfect, the accuracy, too, has turned out better than expected.<sup>575</sup> A classic example, though less familiar outside the tech sphere, is Linux, an open source operating system that is especially favored for use in web servers.<sup>576</sup> One characteristic of peer production is that the participants receive no direct pecuniary benefits, often simply enjoying the satisfaction of doing the work, but also benefitting in terms of intangible benefits such as professional reputation and sense of community.<sup>577</sup>

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<sup>568</sup> *Id.* at 328.

<sup>569</sup> *Id.* at 329–30.

<sup>570</sup> *See generally id.*

<sup>571</sup> The leading scholar on peer production in the legal academy is Yochai Benkler. For an introduction to the topic, see generally BENKLER, *supra* note 44.

<sup>572</sup> *See Wikipedia Is 20, and Its Reputation Has Never Been Higher*, ECONOMIST (Jan. 9, 2021), <https://www.economist.com/international/2021/01/09/wikipedia-is-20-and-its-reputation-has-never-been-higher> [<https://perma.cc/2XV4-ZJJ7>] [hereinafter ECONOMIST]. Wikipedia has more than twenty billion page views per month. *Id.*

<sup>573</sup> Heather Kelly, *On Its 20th Birthday, Wikipedia Might Be the Safest Place Online*, WASH. POST (Jan. 15, 2021), <https://www.washingtonpost.com/technology/2021/01/15/wikipedia-20-year-anniversary/> [<https://perma.cc/B2NX-ZKKH>].

<sup>574</sup> *Id.*

<sup>575</sup> *See* Dariusz Jemielniak, *Wikipedia: Why Is the Common Knowledge Resource Still Neglected by Academics?*, 8 GIGASCIENCE 1, 1 (2019); ECONOMIST, *supra* note 572. In Benkler's view, "Wikipedia, for all its warts, is an amazing example of how people can work together, at large distances, not just to resolve conflicts but to solve discrete problems and produce actual outcomes—in this case, a stable, reliable text." BENKLER, *supra* note 44, at 157.

<sup>576</sup> For more on Linux, see BENKLER, *supra* note 44, at 217–20.

<sup>577</sup> For discussions of the motivations of participants in peer production, see Sebastian Spaeth & Sven Niederhöfer, *User Motivation in Peer Production*, in THE HANDBOOK OF PEER PRODUCTION 123, 124 (Mathieu O'Neil, Christian Pentzold & Sophie Toupin eds., 2021). BENKLER, *supra* note 44, at 63–80. The question of whether it is rational to participate in a group action such as an election or reducing carbon (or writing code for Linux) is complex. For a philosophical treatment of the issue, see RICHARD TUCK, FREE RIDING 30–88 (2008) (arguing that it is rational to participate when doing so can make one part of the

Climate policies adopted by states, cities, and companies exhibit some of the same features to the extent that they are building blocks toward global emissions reduction strategies. As with contributors to open source software, reputational benefits may play a role.<sup>578</sup> Jurisdictions like California and Shenzhen may want to gain or burnish their reputations for being forward-looking and sustainable, which can help attract business and residents for a post-industrial economy.<sup>579</sup> By giving politicians a way to signal their commitments to constituents and obtain external validation for their climate policies, organizations of jurisdictions may also increase the political rewards for politicians in adopting climate policies, incentivizing them to do more.<sup>580</sup> Like software engineers participating in a project like Linux, sub-nationals also get the chance to build their technical expertise by tackling hard problems.<sup>581</sup> Finally, the more jurisdictions participate, the more they are able to take advantage of economies of scale due to increased production of solar panels, wind turbines, storage batteries, and so forth.<sup>582</sup>

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set of actors causing the desired result). Participation seems to make the most sense in instrumental terms where taking an action increases the likelihood that others will do so, making it more likely that the ultimate goal will be achieved. This factor may be especially important for the initial participants, such as California and Germany in the case of renewable energy.

<sup>578</sup> Rumina Dhalla, *Climate Action Helps Companies Build Reputations and Attract Investors*, CONVERSATION (Feb. 19, 2019), <https://theconversation.com/climate-action-helps-companies-build-reputations-and-attract-investors-111303> [<https://perma.cc/5TPJ-VKQS>].

<sup>579</sup> *See id.*

<sup>580</sup> The signaling function is illustrated by the decision to make Tulsa the five-hundredth city to join the U.S. Conference of Mayors climate coalition in order to maximize “marketing splash” for the city, the mayor, and the coalition itself, given Tulsa’s historic ties to the fossil fuel industry. *See* Osofsky & Levit, *supra* note 440, at 424–26.

<sup>581</sup> THE LINUX FOUND., ANNUAL REPORT 2020: ADVANCING OPEN COLLABORATION AMID THE CHALLENGES OF A LIFETIME 1 (2020), [https://www.linuxfoundation.org/wp-content/uploads/2020-Linux-Foundation-Annual-Report\\_120520.pdf](https://www.linuxfoundation.org/wp-content/uploads/2020-Linux-Foundation-Annual-Report_120520.pdf) [<https://perma.cc/FJH4-TS4D>].

<sup>582</sup> A key factor in peer production may be the existence of platforms in the sense of standardized interfaces that link individual contributions. *See* David Singh Grewal, *Before Peer Production: Infrastructure Gaps and the Architecture of Openness in Synthetic Biology*, 20 STAN. TECH. L. REV. 143, 196–99 (2017). In the formation of climate change policy, this role may be played by technologies such as wind turbines and PVC solar as the “core components,” with the interface role being played by the legal toolkit that has developed for incentivizing their deployment such as emissions trading systems and renewable portfolio standards. *See id.* at 195 & n.263 (on lumpiness and granularity in shareable goods). Benkler argues elsewhere that “[c]reative labor in the context of peer production can be harnessed when a project is broken up into discrete modules, whose granularity is varied and sufficiently fine grained to allow individuals with diverse motivations to engage in the effort at levels appropriate for their motivations.” Yochai Benkler, *Sharing Nicely: On Shareable Goods and the Emergence of Sharing as a Modality of Economic Production*, 114 YALE L.J. 273, 336 (2004). Climate policy has a great deal of modularity, in terms of both geographic scope and type of emissions reduction strategy, all the way from efforts to close a single coal-fired power plant or install rooftop solar for a

Incentives for subnational climate action may also take other forms that have no clear analogy in other forms of peer production. Efforts to reduce carbon emissions may also reduce local air pollution, simply by cutting back on the use of fossil fuels (particularly coal).<sup>583</sup> Local jurisdictions may also anticipate national climate policies and want to prepare for future mandates. The commonalities between subnational climate action and peer production, however, should not be underestimated. In both situations, achieving a project's core benefits requires the voluntary participation of many dispersed contributors. From the point of view of conventional economics, one might have thought that the temptation to free ride on the contribution of others would doom such decentralized efforts. Yet Linux, Wikipedia, and global networks of subnational climate actors all offer clear evidence to the contrary.

## VI. CONCLUSION

This Article has examined case studies of subnational climate action in China, Japan, and the United States. These countries have very different legal systems, political institutions, and economic systems. In China, for instance, powerful State Operated Enterprises often operate in opposition to efforts at climate action, whereas Japan and the United States are more strongly capitalist. Like incumbent industries elsewhere, SOEs resist actions that would disrupt the existing economic order, but their scale and close connections with government give them unique influence.<sup>584</sup> One of the features of these case studies is that they invite an appreciation of the singular circumstances of each country. At a more granular level, each local jurisdiction has its own history, geography, and political dynamics. Yet in each country, state and local jurisdictions have taken prominent roles in climate policy even in countries that lack federalist systems of government.

As we have seen, several factors seem likely to promote climate action by state and local governments. A jurisdiction seems most likely to take action if it is not rich in fossil fuels, has a developed technology industry, is heavily urbanized, has high potential to produce renewable energy, and is exposed to high risk from climate change. Correspondingly, resistance to climate action is most likely to be found in jurisdictions with fossil fuel riches, small tech sectors, low urbanization, and lower levels of climate risk. Strikingly, these trends are

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particular house up to international treaties. *See, e.g.*, Jody Freeman & Daniel A. Farber, *Modular Environmental Regulation*, 54 DUKE L.J. 795, 837–99 (2005) (discussing a case study of modularity, the CalFed Bay-Delta Program).

<sup>583</sup> *Sources of Greenhouse Gas Emissions*, EPA, <https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions> [<https://perma.cc/H9JM-4E62>]; *see Air Quality – Multiple Benefits of Energy Efficiency – Analysis*, INT'L ENERGY AGENCY, <https://www.iea.org/reports/multiple-benefits-of-energy-efficiency/air-quality> [<https://perma.cc/4BQC-X56L>].

<sup>584</sup> *See* Amir Gulzade, *How Reform Has Made China's State-Owned Enterprises Stronger*, WORLD ECON. F. (May 21, 2020), <https://www.weforum.org/agenda/2020/05/how-reform-has-made-chinas-state-owned-enterprises-stronger/> [<https://perma.cc/52ZF-FC6M>].

common to China, Japan, and the United States, despite their many economic and political differences.

Across very different societies, these factors help explain a good deal of the conflict over climate change at the global, national, and regional levels. They also reinforce the importance of bottom-up strategies for climate action.<sup>585</sup> In many regions, major cities may be ready to undertake climate action before their national or even state governments, and such action can be made particularly attractive by emphasizing its connection with urban air pollution and advanced technology sectors. These urban efforts can provide a nucleus for building support at larger geographic scales. Resistance from rural areas can sometimes be overcome by emphasizing the economic opportunities stemming from renewable energy production.<sup>586</sup>

A map of subnational climate action would highlight some states and provinces like California and Guangdong.<sup>587</sup> It would also include bright lights for major cities such as New York City, Tokyo, and Shenzhen, as well as many smaller ones.<sup>588</sup> Some of these jurisdictions are surrounded by more conservative areas that have resisted climate action. Those areas might appear dark on the map. Many of the climate-friendly jurisdictions are connected by cooperative networks, which we might envision as bright lines linking these jurisdictions. In an era where international agreement on climate action has been frustratingly slow, much of the real initiative has taken place in these smaller jurisdictions.

As is true of examples of peer production such as Wikipedia and Linux, subnational climate policy is not the product of individuals working in isolation whose work happens to add up to something larger. Instead, like individual Wikipedia editors or Linux developers, the existence of a network of participants is crucial to the success of the project, given that few contributors can expect to shape the project as a whole. States and cities that engage in climate action may reap some local benefits like reduced air pollution, but they also benefit from the knowledge that they are part of a much larger, cumulative effort.

None of this is to deny the critical importance of national efforts and formal international agreements. Yet, without the leadership of subnational governments, national and international efforts would have less experience on

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<sup>585</sup> Over time, we might expect the gap between jurisdictions to decrease as renewable energy becomes increasingly competitive in cost and begins to dominate in the marketplace. This is not to say that the world can wait until emission reductions have arisen spontaneously everywhere. Aurora D'Aprile, *Leading from the Bottom Up: Climate Action Is Getting Local*, FORESIGHT (Sept. 17, 2018), <https://www.climateforesight.eu/global-policy/leading-from-the-bottom-up-climate-action-is-getting-local/> [<https://perma.cc/L6GR-WKSH>].

<sup>586</sup> See RURAL CLIMATE NETWORK, RURAL CLIMATE POLICY PRIORITIES: SOLUTIONS FROM THE GROUND 5–6 (2015).

<sup>587</sup> See *supra* Part II.B; see, e.g., Penn, *supra* note 2.

<sup>588</sup> Jiang, Ye & Ma, *supra* note 7, at 17; see, e.g., Wyman & Spiegel-Feld, *supra* note 25, at 339, 343–44.

which to draw. Rather than merely being part of the supporting cast, subnational jurisdictions have turned out to play leading roles in the global response to climate change. Our effort in this Article has been to explain how and where this has happened.

APPENDIX<sup>589</sup>

This survey covers energy and climate policy developments in U.S. states from 2017 through 2020, corresponding to President Trump's term in office.<sup>590</sup>

State	Energy Mix	Renewable Portfolio Standard	Climate Target	Other
Alabama	2019 Natural Gas: 40% Nuclear: 31% Coal: 19% Hydro: 8%	None		
Alaska	2018 Natural Gas: 47% Hydro: 27% Petroleum: 13% Coal: 10% Wind & Biomass: 3%	None		

<sup>589</sup> The following is a list of additional resources on the topics below. For a graphic representation of change of electricity source over time, see Nadja Popovich & Brad Plumer, *How Does Your State Make Electricity?*, N.Y. TIMES (Oct. 28, 2020), <https://www.nytimes.com/interactive/2020/10/28/climate/how-electricity-generation-changed-in-your-state-election.html?action=click&module=TopStories&pgtype=Homepage> [<https://perma.cc/S7C9-JYA8>]. This is a great resource to see beyond the current electricity source. For a map showing states that have RPS, and basic info by state, see *State Renewable Portfolio Standards and Goals*, NAT'L CONF. STATE LEGISLATURES (Aug. 13, 2021), <https://www.ncsl.org/research/energy/renewable-portfolio-standards.aspx> [<https://perma.cc/ZST3-2DZQ>]. For a map showing states and cities with climate targets for 100% clean energy (current up to April 2020), see Sam Ricketts, Rita Clifton, Lola Oduyeru & Bill Holland, *States Are Laying a Roadmap for Climate Leadership*, CTR. AM. PROGRESS (Apr. 30, 2020), <https://www.americanprogress.org/issues/green/reports/2020/04/30/484163/states-laying-road-map-climate-leadership/> [<https://perma.cc/84K9-HB5R>]. Note this misses states that have made climate goals that fall below 100% clean energy.

<sup>590</sup> Supporting citations and links can be found on the website of the Center for Law, Energy, and Environment. The extensive research behind the table was conducted by Jetta Cook (Berkeley JD class of 2022). See Jetta Cook, *Greater than the Sum: Sub-National Renewable Energy Policy During the Trump Administration*, BERKELEY L. CTR. FOR L., ENERGY & ENV'T (2021), <https://www.law.berkeley.edu/wp-content/uploads/2021/04/Greater-Than-the-Sum-Sub-national-Renewable-Energy-Policy-during-the-Trump-Administration-Jetta-Cook.pdf> [<https://perma.cc/SK3X-LA5M>].

Arizona	2018 Nuclear: 30.5% Coal: 30% Natural Gas: 27.8% Renewables: 11.1%	15% by 2025  Set in 2006		
Arkansas	2019 Coal: 38% Natural Gas: 33% Nuclear: 22% Hydro: 7%	None		
California	2018 Renewables: 48.7% Natural Gas: 39.5% Nuclear: 11.8%	100% Carbon-free energy by 2045  Set in 2018  (This is up from 60% by 2030 set in 2002 <sup>591</sup> )	100% Carbon-free energy by 2045  Set in 2018	
Colorado	2018 Coal: 52% Natural Gas: 26% Nuclear: 11.8%	30% by 2020 (IOUs); 10% or 20% for municipalities	90% below 2005 by 2040  Set in 2019 in S.B. 236  Legislation codified Xcel's 100% carbon-free by 2050	
Connecticut	2019 Natural Gas: 52% Nuclear: 41%	44% by 2030  Set in 1998	Governor's executive order in 2019 calling for 100% carbon-free power by 2040	

<sup>591</sup> David Roberts, *California Just Adopted Its Boldest Energy Target Yet: 100% Clean Electricity*, VOX (Sept. 10, 2018), <https://www.vox.com/energy-and-environment/2018/8/31/17799094/california-100-percent-clean-energy-target-brown-de-leon> (on file with the *Ohio State Law Journal*).

Delaware	2018 Natural Gas: 83.9% Coal: 9.6% Renewables: 2.1% Petroleum: 4.4%	25% by 2025  Set in 2005		
Florida	2018 Natural Gas: 70% Nuclear: 12% Renewables: 17% Petroleum: 1%	None	Lawmakers have submitted bills for 100% clean energy by 2050 but no real movement	
Georgia	2018 Natural Gas: 41% Nuclear: 26% Coal: 25% Renewables: 8%	None	Atlanta committed to 100% clean energy by 2035  Set in 2019	
Hawaii	2018 Petroleum: 69% Coal: 13% Renewables: 13%	100% generation by renewables by 2045  Set in 2015 by legislature	100% renewable energy target set as state's RPS in 2015	2020: Hawaii passed S.B. 2619 "banning" coal-fired power plants by 2023
Idaho	2019 Hydro: 55% Natural Gas: 21% Wind: 16% Biomass & Solar: 7%	None		
Illinois	2019 Nuclear: 45% Coal: 27% Natural Gas: ~10% Wind: 18%	25% renewables by 2025  Set in 2018		

Indiana	2018 Coal: 75.7% Natural Gas: 18.8% Renewables: 5.4%	Voluntary 10% by 2025  Set in 2011		
Iowa	2019 Wind: 42% Coal: 35% Natural Gas: 13% Nuclear: 8%	105 MW of generating ca- pacity for IOUs  Set in 1983		
Kansas	2019 Wind: 41% Coal: 33% Nuclear: 18% Natural Gas: 7%	15% by 2015– 2019; 20% by 2020  Established 2009, changed to voluntary goal 2015		
Kentucky	2019 Coal: 73% Natural Gas: 20% Hydro, Biomass, Petroleum, & Solar: ~10%	None		Controversial law S.B. 100 was signed into law, which imposes net metering measures that will not promote solar in the state
Louisiana	2019 Natural Gas: 70% Nuclear: 14% Renewable: 9% Coal: 7%	None	Democratic Governor John Bel Edwards signed executive order in August 2020 to set goal of net zero GHG emissions by 2050	2018 Energy Mix: Natural Gas: 45.4% Nuclear: 26.3% Coal: 19.7% Renewable: 1.8%  This shows what a major change there was from one year (coal down 12%, nat- ural gas up 25%)

Maine	2019 Hydro: 31% Biomass: 25% Wind: 24% Natural Gas: 16%	80% by 2030  Updated 2019	Statewide target of 100% renewables by 2050	
Maryland	2018 Nuclear: 34.1% Natural Gas: 31.7% Coal: 22.9% Renewable: 12.5%	50% renewable energy by 2030  Set in 2019 by S.B. 516	Same bill (S.B. 516) created committee to conduct study to evaluate moving RPS to 100% by 2040	
Massachusetts	2019 Natural Gas: 66% Renewables: 25% Nuclear: 10%	16% renewable in 2018, with 2% annual increase yearly  Maxes out at 80% in 2050	Net-zero GHG by 2050	
Michigan	2018 Coal: 39.7% Nuclear: 27.9% Natural Gas: 23.3% Renewable: 7.7% Petroleum: 1.4%	15% by 2021  Updated 2016	Goal of 35% of electricity needs met through renewables, efficiency, demand reduction	
Minnesota	2018 Coal: 40.6% Nuclear: 25.6% Renewables: 22.4% Natural Gas: 11.3%	26.5% by 2050 (IOUs), 25% by 2020 (other utilities) <sup>592</sup>  Set in 2007	Governor Walz announced plan for 100% clean energy by 2050  Not binding	

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<sup>592</sup> See MINN. STAT. § 216B.1691 (2007).

Mississippi	2019 Natural Gas: 74% Nuclear: 17% Coal: 7%	None		
Missouri	2019 Coal: 73% Nuclear: 12% Natural Gas: 10% Wind: ~5%	15% by 2021 (IOUs)  Established 2008 by voter initiative		
Montana	2018 Coal: 47% Hydro: 40% Wind: 8% Natural Gas: 2% Petroleum Coke: 2%	15% by 2015  Set in 2005		
Nebraska	2019 Coal: 55% Wind: 10% Nuclear: 19% Hydro & Biomass: 6%	None		
Nevada	2018 Natural Gas: 62.8% Renewables: 28.6% Coal: 8.5%	50% renewables by 2030  Established in 1997	100% carbon- free by 2050  Passed state legislature in 2019	2017: Renewable Energy Bill of Rights (2018 bill) guarantees right to self- generation and storage
New Hampshire	2019 Nuclear: 60% Natural Gas: 20% Biomass: 8% Hydro: 7% Coal & Wind: ~5%	25.2% renewable energy by 2025  Set in 2007		

New Jersey	2018 Nuclear: 50% Natural Gas: 44.1% Renewables: 3.1% Coal: 2.5%	50% renewable energy by 2030  Set in 2018  Also increased solar RPS to 5.1% by 2021	100% clean energy by 2050  Governor Murphy issued by executive order	Governor Murphy issued executive order to rejoin RGGI
New Mexico	2018 Coal: 44% Natural Gas: 33.3% Renewable: 22.7%	100% carbon-free electricity on retail market by 2045  Set in 2019  Interim goals of 50% by 2030, and 80% by 2040	Committed to Paris Agreement in 2019	
New York	2018 Nuclear: 36.3% Natural Gas: 34.6% Renewables: 27.4%	100% zero-emission electricity by 2040, 70% by 2030  Sets equity provisions to ensure 40% clean energy funds go to disadvantaged communities  Set in 2019 under Climate Leadership and Community Protection Act (CLCPA)	100% zero emission electricity by 2040	CLCA sets targets of 9,000 MW of offshore wind by 2035; 3,000 MW of energy storage by 2030; 6,000 MW of solar by 2025

North Carolina	2018 Natural Gas: 33% Nuclear: 31% Coal: 24.8% Renewables: 11.2%	12.5% by 2021 (IOUs); 10% by 2018 (municipals and co-ops)  Established 2007 <sup>593</sup>	Carbon neutral by 2050  Set by Clean Power Plan under Governor's order	
North Dakota	2019 Coal: 63% Wind: 27% Hydro: 7% Biomass: 3%	Voluntary 10% by 2015  Set in 2007		
Ohio	2019 Natural Gas: 43% Coal: 39% Nuclear: 14% Renewables: 3%	8.5% by 2026, and kills the standard after 2025  This was a reduction, got rid of solar carve-out, and gave hundreds of millions in subsidies to two nuclear plants		After passage of H.B. 6 (which slashed RPS), Ohio Speaker of the House was arrested for accepting \$61 million in bribes  Lots of future changes likely to follow
Oklahoma	2019 Natural Gas: 53% Wind: 35% Coal: 9% Hydro: 3%	Voluntary 15% by 2015  Set in 2010		

<sup>593</sup> *North Carolina State Energy Profile*, ENERGY INFO. ADMIN. (Nov. 19, 2020), <https://www.eia.gov/state/print.php?sid=NC> [<https://perma.cc/KVK3-TGLU>].

Oregon	2018 Hydro: 60% Natural Gas: 25% Renewables: & Coal: 2%	Utilities with 3% or more of the state's load (all updated 2016): 25% by 2025; 50% by 2040  Utilities with less than 1.5% of the state's load: 5% by 2025 <sup>594</sup>		Shut down their last coal-fired plant in 2020
Pennsylvania	2019 Natural Gas: 43% Nuclear: 36% Coal: 17% Renewables: 4%	18% by 2020  Set in 2004 <sup>595</sup>	2019 executive order of Democratic Governor set goals of 26% reduction of GHG emissions from 2005 levels by 2025, and 80% reduction of GHG emissions from 2005 by 2050	2020 Governor issued executive order committing to join RGGI, which has been fought by the state legislature as illegitimate
Rhode Island	2018 Natural Gas: 93.1% Renewable: 5.9% Petroleum: 1%	16% by 2020, with increases of 1.5% each year until 38% by 2035  Updated 2016	2020: executive order by Governor with goal of 100% renewable energy by 2030	

<sup>594</sup> *Oregon State Energy Profile*, ENERGY INFO. ADMIN. (Jan. 21, 2021), <https://www.eia.gov/state/print.php?sid=OR> [<https://perma.cc/CS85-CQLW>]; *Renewable Portfolio Standard*, DSIRE (May 20, 2021), <https://programs.dsireusa.org/system/program/detail/2594> (on file with the *Ohio State Law Journal*).

<sup>595</sup> *Pennsylvania State Energy Profile*, ENERGY INFO. ADMIN. (Sept. 17, 2021), <https://www.eia.gov/state/print.php?sid=PA> [<https://perma.cc/PG88-2WPB>].

South Carolina	2018 Nuclear: 56.2% Coal: 20.4% Natural Gas: 18.2% Renewable: 4.9%	Voluntary target of 2% by 2021		2019: South Carolina Energy Freedom Act made solar more accessible, raising net metering caps and allowing independent power producers to sell power to grid
South Dakota	2019 Hydro: 45% Wind: 24% Coal: 21% Natural Gas: 11%	Voluntary 10% by 2015  Set in 2008		
Tennessee	2019 Nuclear: 43% Coal: 23% Natural Gas: 20% Hydro: 12%	None		
Texas	2018 Natural Gas: 41.9% Coal: 29.2% Renewable: 18.2% Nuclear: 10.7%	5,880 MW by 2015; 10,000 MW by 2025 <sup>596</sup>  Already achieved both, no new ones yet		
Utah	2018 Coal: 64% Natural Gas: 24% Solar: 7%	Voluntary renewable portfolio goal of 20% renewables by 2025  Set in 2008	Salt Lake City committed to goal of net 100% clean energy by 2030	Tussle between utility and public utility commission over solar rates in net metering

<sup>596</sup> TEX. UTIL. CODE ANN. § 39.904 (West 2007); *State Renewable Portfolio Standards and Goals*, NAT'L CONF. STATE LEGISLATURES (Aug. 13, 2021), <https://www.ncsl.org/research/energy/renewable-portfolio-standards.aspx> [<https://perma.cc/B6F6-LUFZ>].

Vermont	2019 Hydro: 51% Biomass: 18% Wind: 16% Solar: 14%	55% by 2017; 75% by 2032  Established as voluntary in 2005; turned standard in 2015	80% below 1990 levels by 2050  Bill creates cause of action for citizens to sue the state for non-attainment	
Virginia	2018 Natural Gas: 53% Nuclear: 31% Coal: 10% Renewable: 7%	2020 Virginia Clean Economy Act set new RPS: 100% carbon-free elec- tricity by 2050 for Appalachian Power Co.	100% carbon- free electricity by 2050  Originally set in 2019 by ex- ecutive order, codified in 2020 VCEA	2020: Virginia joined RGGG  VCEA created Percentage of Income Payment Program to promote equity
Washington	2018 Hydro: 69% Natural Gas: 9% Nuclear: 8% Coal: 5% Wind: 6%	15% renewable by 2020; 100% GHG neutral by 2030; 100% renewable or zero-emitting by 2045  Updated 2019 in Clean Energy Transformation Act	2020 update to align targets with most re- cent science to reduce GHG: 45% below 1990 levels by 2030; 70% below 1990 levels by 2040; net zero or 95% below 1990 levels by 2050	2019 CETA also adopts Obama administration's social cost of carbon model  Equity provi- sions, including energy assistance provisions
West Virginia	2019 Coal: 92% Renewables: 5.3% Natural Gas: 2.1%	No current standard: 10% from 2015– 2019, 15% from 2020–2024; 25% by 2025.  Set in 2009, repealed in 2015		Solar bill passed to allow utilities to install up to 200 MW of solar, with streamlined permitting

Wisconsin	<p>2019  Coal: 54.2%  Natural Gas: 20.9%  Nuclear: 16.8%  Renewable: 7.8%  Petroleum: 0.3%</p>	<p>10% by 2015</p> <p>Set in 1998, has not been updated (making Governor's goal a big step)</p>	<p>2019: executive order committing to 100% carbon-free consumption within state by 2050</p> <p>Goal to comply with Paris Agreement</p>	
Wyoming	<p>2018  Coal: 86%  Wind: 9%</p>	None		<p>A "reverse RPS" bill gained traction in 2019 (though not passed) which would have penalized utilities for using renewables</p>