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# Expanding Regional Renewable Governance

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*Energy drives economies and quality of life, yet accessible traditional fuels are increasingly scarce. Federal, state, and local governments have thus determined that renewable energy development is essential and have passed substantial requirements for its use. These lofty goals will fail, however, if policymakers rely upon existing institutions to govern renewable development. Renewable fuels are fugitive resources, and ideal property for renewable technology is defined by the strength of the sunlight or wind that flows over it. When a potential site for a utility-scale development is identified, a new piece of property, which I call a "renewable parcel," is superimposed upon existing boundaries and jurisdictional lines. The entities within the parcel all possess rights to exclude, and this creates a tragedy with anticommons and regulatory commons elements, which hinder renewable development.*

*In a renewable parcel, numerous rights of exclusion in the form of fee simple ownership, leasing rights, use rights, and regulation make use of a renewable parcel difficult and create anticommons-type problems. The multiple jurisdictions that may underlie the parcel also lead to a regulatory commons, wherein no one government is sufficiently incentivized to create a workable governance regime.*

*This Article argues that the many exclusion rights within renewable parcels must be consolidated and governed by a regional agency to address these barriers to renewable development, and it analyzes elements of existing regional institutions to begin to suggest the ideal structure of this agency. Once formed, the regional framework should be applied to other areas of energy planning. States and municipalities share oil and gas reservoirs, electricity transmission constraints, and energy generation needs, and collaborative governance in these areas is necessary for a secure future.*



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## INTRODUCTION

Energy is the necessary driver of economic growth and quality of life[1] — of manufacturing, commerce, communications, health services, and comfortable living spaces. Yet clean, affordable energy is an increasingly scarce commodity. America's economy relies primarily upon finite[2] fossil fuels,[3] which are increasingly demanded by other growing nations.[4] In 2010, a coal mining accident[5] and oil gushing into the Gulf of Mexico[6] were unusually vivid reminders of the consequences of this pattern, but a growing thirst for energy and diminishing supplies of conventional fuel have offered constant, less vivid warning signs since the 1970s.[7] America must move toward a

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[1] *See* David Lewis, *Hydrogen and its Relationship with Nuclear Energy*, 50 PROGRESS IN NUCLEAR ENERGY 394, 394 (2008) (explaining that "energy input to society is necessary to fuel economic development" and that "[a] nation's GDP/capita/annum and energy use/capita/annum are directly linked").

[2] U.S. ENERGY INFO. ADMIN., DEP'T OF ENERGY, ANNUAL ENERGY REVIEW 2003 v (2004), *available at* ftp://ftp.eia.doe.gov/multifuel/038403.pdf (describing fossil fuels as "finite in supply.").

[3] *See* U.S. ENERGY INFO. ADMIN., DEP'T OF ENERGY, ANNUAL ENERGY REVIEW 2009 5 (2010) [hereinafter EIA, ANNUAL ENERGY REVIEW 09], *available at* http://www.eia.doe.gov/aer/pdf/aer.pdf (showing that petroleum, natural gas, and coal made up more than 82% of total primary energy consumption in the United States in 2009).

[4] In July 2010, China's energy consumption officially exceeded the United States' consumption. *See* Spencer Swartz & Shai Oster, *China Tops U.S. in Energy Use*, WALL ST. J., July 18, 2010, at A1.

[5] *See* Mario Parker, *Massey Expects West Virginia Coal Mine Disaster Will Cost $212 Million*, BLOOMBERG, Apr. 22, 2010, *available at* http://www.bloomberg.com/news/2010-04-22/massey-expects-212-million-second-quarter-charge-for-fatal-mine-accident.html (explaining that 29 people were killed in an underground mining explosion).

[6] *See* John M. Broder, *Energy Secretary Emerges to Take a Commanding Role in Effort to Corral Well*, N.Y. TIMES, July 16, 2010, at B1 (explaining that more than 100 million gallons of oil flowed into the Gulf from BP's damaged well).

[7] *See* IGOR I. KAVASS & DORIS M. BIEBER, ENERGY AND CONGRESS: AN ANNOTATED BIBLIOGRAPHY OF CONGRESSIONAL HEARINGS AND REPORTS 1974–1978 vi–vii (1980)

modernized energy system — one that will guarantee a reliable energy supply for future generations and offer current generations adequate energy without overly compromising health and environmental quality.[8] Renewable energy, which is produced from abundant fuels that are replenished within a human lifetime,[9] will be an essential component of this system. Congress and state governments have already recognized this and have passed incentives for the development of renewable infrastructure[10] and ambitious requirements or goals for its use.[11] Without an improved governance structure

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(describing 1974 as the year "when the concern about oil and other energy sources began to intensify in the United States Congress"); THE NAT'L COMM'N ON ENERGY POLICY, ENDING THE STALEMATE: A BIPARTISAN STRATEGY TO MEET AMERICA'S ENERGY CHALLENGES vi (2004), *available at* http://bipartisanpolicy.org/sites/default/files/endi_en_stlmate.pdf (observing that "[r]ecent developments in world oil markets, including rapid growth in global demand and the emergence of terrorist threats to oil facilities, are bringing new urgency to perennial concerns about the nation's exposure to oil price shocks and supply distributions").

[8] America's bipartisan energy commission concluded that "[r]eliable access to the energy resources needed to support a healthy economy remains the core imperative, but in the 21st century energy security also means reducing the macroeconomic and terrorism-related vulnerabilities inherent in the current geopolitical distribution of oil supply and demand and coming to grips with environmental impacts of the current energy system." NAT'L COMM'N ON ENERGY POLICY, *supra* note 7, at vi. With respect to the role of renewable energy in the modernized energy system, the Director of the Office of Energy Projects of the Federal Energy Regulatory Commission (FERC) has stated that "renewable energy is going to figure prominently in FERC's activities." Janice M. Schneider et al., *The Future of Siting and Building Energy Infrastructure*, 40 ENVTL. L. REP. (ENVTL. LAW INST.) 10363, 10364 (2010). Similarly, the Executive Director of the International Energy Agency has stated that "[r]enewable energy technologies are a crucial element in achieving a balanced global energy future." Press Release, Int'l Energy Agency, Renewable Energy Technologies to Play an Important Role in a Clean, Clever, and Competitive Energy Future (Feb. 14, 2006), *available at* http://www.iea.org/press/pressdetail.asp?PRESS_REL_ID=172. Governors of both Republican and Democratic states have also recognized the necessity of renewable energy. *See, e.g.*, *Expansion of Renewable Energy,* OFFICE OF THE GOVERNOR RICK PERRY, http://governor.state.tx.us/priorities/infrastructure/energy/expansion_of_renewable_energy/ (last visited May 20, 2011) (on file with the Harvard Law School Library) (describing Texas's rising demand for energy and identifying renewable energy as playing a "key role" in diversifying the energy mix to meet future demand); Kerry Davis, *O'Malley Touts Offshore Wind Farms*, SOUTHERN MARYLAND ONLINE, http://somd.com/news/headlines/2011/13359.shtml (describing Maryland's governor's support for wind farms).

[9] Alicia Valero et al., *Inventory of the Exergy Resources on Earth Including its Mineral Capital*, 35 ENERGY 989, 989 (2009) (defining renewable resources as resources "that are regenerated on a human timescale."); *see also* U.S. ENERGY INFO. ADMIN., *supra* note 2 (describing renewable energy as "essentially inexhaustible because it can be replenished").

[10] *See, e.g.*, Energy Policy Act of 1992, 42 U.S.C. § 13317 (1992) (providing a production credit for renewable energy); Jessica A. Graf, *Federal Stimulus Provisions for Renewable Energy Development, Including Cash Grants*, PROB. & PROP., May-June 2010, at 58–59 (describing federal incentives for renewable energy which began in the late 70s, the expanded tax credit for renewables provided by the American Reinvestment and Recovery Act of 2009, and a cash grant for renewables under that same Act); *Financial Incentives for Renewable Energy*, DATABASE OF STATE INCENTIVES FOR RENEWABLES & EFFICIENCY, http://www.dsireusa.org/summarytables/finre.cfm (last visited May 20, 2011) (on file with the Harvard Law School Library) (showing that all fifty states have passed monetary incentives for renewable energy).

[11] *See, e.g.*, Office of the Governor of the State of Cal., Exec. Order No. S-14-08 (Nov. 17, 2008), *available at* http://www.gov38.ca.gov/index.php?/print-version/executive-order/11072/ (providing that in California, "[a]ll retail sellers of electricity shall serve 33 percent of their load with renewable energy by 2020"). Thirty-three other states and the District of Co-

for this energy transition, however, the growth of a renewable energy infrastructure will be costly, slow, and inadequate.

Developing a renewable energy infrastructure will pose several challenges, and one of the largest among them will be effective governance. Some of the cleanest and most abundant forms of renewable energy, sunlight and wind,[12] are unlike any of the traditional resources that dominate America's current energy infrastructure. Renewable fuels are fugitive resources, and technology such as wind turbines or solar collectors must be located on the land over which the fuels flow in order to capture them.[13] When utility-scale renewables — large installations that rival traditional power plants in the quantity of electricity that they produce[14] — are developed, a new artificial parcel of property is created. This parcel is defined by the intensity of sunlight that beats down on land or the strength of the wind that blows across it. This artificial piece of property, which this Article calls a "renewable parcel," is not defined by existing boundary lines or jurisdictions and thus often overlies several towns, counties, federally-owned or -managed lands, or even states.[15] The transmission lines necessary to transport energy from a renewable parcel also must run for hundreds of miles, typically across multiple jurisdictions, to reach human populations.[16] These unique qualities of the renewable resource pose distinct[17] challenges to the governance of renewable energy development. First, at its most basic level, the imposition of a fugitive estate (consisting of rights to sunlight or wind) over the land surface leads to an assembly problem, wherein a developer

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lumbia have passed similar requirements or goals for renewable energy use, although typically at a lower percentage. *See Renewable Portfolio Standards Fact Sheet*, EPA, http://www.epa.gov/chp/state-policy/renewable_fs.html (last visited May 20, 2011) (on file with the Harvard Law School Library).

[12] The energy from the sun heating the land and oceans is approximately equivalent to "three thousand times the present power needs of the entire world." Valero et al., *supra* note 9, at 992. And "even if only ~20% of . . . [the global wind power generated at locations with mean annual wind speeds = 6.9 m/s [meters per second] . . . for the year 2000] could be captured, it could satisfy 100% of the world's energy demand for all purposes." Cristina L. Archer & Mark Z. Jacobson, *Evaluation of Global Wind Power*, 110 J. GEOPHYS. RES. D12110, at 1 (June 30, 2005), *available at* http://www.stanford.edu/group/efmh/winds/2004jd005462.pdf.

[13] *See* Hadassah M. Reimer & Sandra A. Snodgrass, *Tortoises, Bats, and Birds, Oh My: Protected Species Implications for Renewable Energy Projects*, 46 IDAHO L. REV. 545, 583 (2010) ("Solar projects must be placed where there is ample sunlight. A wind project where there is no wind is a waste of time and money.").

[14] W. GOVERNORS' ASS'N & U.S. DEP'T OF ENERGY, WESTERN RENEWABLE ENERGY ZONES – PHASE 1 REPORT 2 n.1 (2009), *available at* http://www.westgov.org/wga/publicat/WREZ09.pdf (defining "utility-scale" renewables as those with the potential to produce 1,500 megawatts of solar or wind power).

[15] *See infra* note 182 and accompanying text (explaining that more than fifteen of the areas identified as ideal renewable zones in the West cover more than one state).

[16] *See* W. GOVERNORS' ASS'N & U.S. DEP'T OF ENERGY, *supra* note 14, at 3 (explaining that many of the "vast renewable resources" in the West "reside in remote areas without ready or cost effective access to transmission").

[17] Michael Heller introduced the concept of the anticommons in 1998. *See* Michael A. Heller, *The Tragedy of the Anticommons: Property in the Transition from Marx to Markets*, 111 HARV. L. REV. 621 (1998).

must persuade each and every property owner beneath the fugitive estate to grant, at minimum, a use right to the surface. But even where an ideal fugitive estate does not cross any boundaries on the surface and covers only one property, owned in fee simple, a renewable developer faces challenges beyond assembly. A renewable parcel contains anticommons-type qualities, wherein excessive exclusion rights to a property parcel lead to its underuse or, at minimum, higher transaction costs associated with its use. Further, the mismatch between renewable development and existing governing institutions — which results in no institution having primary authority over the developed resource — leads to a regulatory commons.[18] There are currently no adequate governance structures to address these challenges, and this Article argues that a regional governance regime must be implemented to ensure efficient siting of utility-scale renewables.

The assembly problem suggesting the need for a regional governance structure is relatively straightforward, but the anticommons and regulatory commons qualities of renewable parcel require more detailed introduction. Anticommons, which were first comprehensively identified and described by Michael Heller,[19] arise when multiple users of a finite resource hold the right to exclude others from the resource, thus preventing its efficient use. One individual may own a piece of land, for example, but lack the right to use the property. Another individual may own the right of use and production but not the right to sell products from the property, and so on.[20] In cases of anticommons tragedy,[21] this means that the resource cannot be efficiently used, and its benefits are wasted.[22] The anticommons is what Heller describes as a mirror image[23] of the familiar commons problem, which arises when numerous individuals share property rights in a finite resource pool, such as a fishery, and none of the individuals collecting the resource from the pool may exclude other users.[24] Anticommons allow too much exclusion from use,[25] while commons allow too little; both can lead to failure.

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[18] William Buzbee introduced the concept of the regulatory commons in 2003. *See* William W. Buzbee, *Recognizing the Regulatory Commons: A Theory of Regulatory Gaps*, 89 IOWA L. REV. 1 (2003).

[19] *See* Heller, *supra* note 17. Heller notes that prior to his article, Bob Ellickson mentioned an anticommons form of property in a footnote, using a wilderness preserve as an example, and that others described the idea in theory. *Id*. at 667–68 (citing Robert C. Ellickson, *Property in Land*, 102 YALE L.J. 1315, 1322 n.22 (1993)). Heller was the first, however, to provide a "useful definition" and apply the concept to real life. *Id*. at 668.

[20] *See id.* at 623 (explaining that in a typical anticommons, exemplified by a Moscow storefront, "one owner may be endowed initially with the right to sell, another to receive sale revenue, and still others to lease, receive lease revenue, occupy, and determine use").

[21] *See id.* at 624 (introducing the term).

[22] *Id*. at 676–77.

[23] *Id*. at 623.

[24] Hardin first introduced the concept of the commons in Garret Hardin, *The Tragedy of the Commons*, 162 SCI. 1243 (1968). His example of a quintessential commons was a pasture where all herdsmen had a right to graze their livestock. *Id*. at 1244.

[25] *See* Heller, *supra* note 17, at 624 (explaining that "[w]hen there are too many owners holding rights of exclusion, the resource is prone to underuse").

Somewhat similar to the anticommons tragedy, a regulatory commons, as introduced and defined by William Buzbee, also arises in "complex, multilayered legal regimes."[26] In a regulatory commons, a local activity or a combination of such activities has negative, often external effects ("social ills"), and there are no governance institutions that have primary jurisdiction over these effects or sufficient incentives to regulate them; the regulatory regime itself is a commons resource.[27] As Buzbee explains, "[i]n settings of regulatory fragmentation, mismatch, and overlap, regulatory commons dynamics will exist."[28]

The fuels that produce renewable energy — although a common pool — are nondepletable and do not pose traditional commons problems. On a global scale, sunlight and wind do not generally decline in quantity when harvested,[29] unlike schools of fish or grass in a pasture. The barriers to renewable energy thus arise not from the fuel itself but in the siting of technology to capture the abundant fuel; this is where the potential anticommons and regulatory commons tragedies emerge.

Land is a necessary element of renewable energy production, yet multiple individuals and institutions hold rights to this land and prevent efficient levels of use. Within one renewable parcel — even one that does not cross boundaries — one individual may own fee simple rights to the surface, another may own use rights, a third may claim the right to the fugitive resource flowing over the surface, a fourth may possess the right to block the fugitive resource that flows through the parcel, and multiple other entities may, through regulation, block the construction of the technology required to capture sunlight or wind. Where a renewable parcel crosses existing boundaries, even more individuals may hold fee simple ownership and use rights within the parcel. Several municipalities may also have the right to issue (or block) a permit to build the renewable technology,[30] thus preventing the use of the land even if a renewable developer overcomes leasing hurdles. And again, several state and federal agencies may block the use of the property on environmental, cultural, or historical grounds.[31] One proposed wind farm in California, for example, would cover more than 15,500 acres of land; various portions of this parcel are privately owned, managed by the Bureau of Land Management and the California State Land Commission, held by

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[26] Buzbee, *supra* note 18, at 5.

[27] *See id.* at 22.

[28] *Id.* at 21–22.

[29] Locally, however, wind turbines substantially reduce the quantities of wind for downwind users, thus leading to disagreements among wind developers. *See* Troy Rule, *A Downwind View of the Cathedral: Using Rule Four to Allocate Wind Rights*, 46 SAN DIEGO L. REV. 207, 208 (2009) ("The 'wake' of a commercial wind turbine causes turbulence and unsteady wind flow that can reduce the productivity of other wind turbines situated nearby.").

[30] *See infra* text accompanying note 175 (describing how the largest wind farm on the East Coast had to obtain zoning-related approval from four towns).

[31] *See infra* text accompanying note 165.

the Ewiiaapaayp Tribe, and governed by San Diego County.[32] As a result of these types of layered rights to exclude, the Western Governors' Association has noted that "political and regulatory obstacles to the permitting and construction of . . . renewable energy products"[33] must be overcome if renewable development is to succeed.

While numerous entities hold regulatory powers and property rights to exclude potential renewable developers from a renewable parcel, this apparent "overregulation" by an array of entities and institutions has substantial regulatory gaps; as often occurs within regulatory commons, no one entity has taken the helm to form a comprehensive regulatory structure for renewables development. A new form of regional governance institution must thus emerge to address the anticommons and related regulatory commons tragedy in renewable development. These institutions, which this Article describes as regional energy boards, must bundle together the multiple exclusion rights to renewable parcels — including private, municipal, state, and federal ownership and regulation — and must consolidate them into a coherent framework. The boards must be independent institutions with regulatory powers, and they must use these powers to resolve overlapping and conflicting rights and provide streamlined yet thorough processes for the approval of renewable energy siting and construction.

Once formed and tested, a regional energy governance[34] structure should also be employed for energy issues beyond renewables — issues that do not necessarily exhibit tragic anticommons qualities but that pose regional challenges. In addition to shared sun and wind resources, many states have oil and gas reservoirs in common.[35] In the Northeast, for example, geologists recently discovered that a massive shale formation underlying much of Appalachia — the Marcellus Shale — is an abundant source of now accessible unconventional natural gas.[36] Pennsylvania has allowed rapid gas production from the shale,[37] while New York has imposed a moratorium until it better understands the effects of this production;[38] municipalities have

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[32] *See* Notice of Intent to Prepare an Environmental Impact Statement for the Proposed Tule Wind Project and the Proposed East County Substation Project, San Diego, CA, 74 Fed. Reg. 68,860 (Dec. 29, 2009).

[33] W. GOVERNORS' ASS'N & U.S. DEP'T OF ENERGY, *supra* note 14, at 19.

[34] This term does not arise in the legal literature, but one editorial in *Global Environmental Change* uses it. *See* Anthony G. Patt, *Effective Regional Energy Governance — Not Global Environmental Governance — Is What We Need Right Now for Climate Change*, 20 GLOBAL ENVTL. CHANGE 33, 33 (2010).

[35] *See infra* note 405.

[36] *See* Terry Engelder, *Marcellus*, FORT WORTH BASIN OIL & GAS MAG., Aug. 2009, at 22, *available at* http://www.geosc.psu.edu/~engelder/references/link155.pdf (describing a calculation yielding a "50 percent probability that the Marcellus will ultimately yield 489" trillion cubic feet of natural gas).

[37] *Wells Drilled*, PA. DEP'T OF ENVTL. PROT., BUREAU OF OIL & GAS MGMT., http://www.dep.state.pa.us/dep/deputate/minres/oilgas/BOGM%20Website%20Pictures/2009/2009%20%20Wells%20Drilled.jpg (updated Jan. 25, 2010) (on file with the Harvard Law School Library) (showing 768 Marcellus Shale wells drilled in Pennsylvania in 2009 as reported by operators).

[38] DIV. OF MINERAL RES., N.Y. STATE DEP'T OF ENVTL. CONSERVATION, SUPPLEMENTAL GENERIC ENVIRONMENTAL IMPACT STATEMENT ON THE OIL, GAS AND SOLUTION MINING REG-

also attempted to impose their own limitations on gas development.[39] These and several other Appalachian states are struggling to appropriately regulate extraction techniques[40] and to determine an acceptable pace of development. While anticommons-type problems associated with unsustainable resources, such as fossil fuels, may not from a social policy perspective merit as broad of a solution as that proposed for renewables, collaboration through a regional governing entity would assist entities governing natural gas extraction as they struggle to catch up with and effectively regulate a rapid energy transition.

Beyond oil and gas, states in regions with limited access to electricity transmission or energy production share high energy prices and concerns about a reliable energy supply.[41] Coordinated planning for future energy development — constructing a power plant on the state border, for example, or expanding transmission lines from a power source outside of the region — could effectively address states' energy challenges. The southeastern states have identified this need and have formed the Southern States Energy Compact, which recognizes that "optimum benefit from and acquisition of energy resources and facilities require systemic encouragements, guidance, and assistance from the party states on a cooperative basis."[42]

Other states, recognizing the importance of regional decisionmaking to energy siting, have specifically empowered their agencies to participate in regional energy forums.[43] Yet despite the clear need for a regional approach

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ULATORY PROGRAM 1-1 (2009), *available at* ftp://ftp.dec.state.ny.us/dmn/download/OGdSGEISFull.pdf (describing the hold on high water volume hydraulic fracturing permits in New York State).

[39] *See, e.g.*, Penneco Oil Co. v. Cnty. of Fayette, 4 A.3d 722, 723, 729 (Pa. Commw. Ct. 2010) (discussing a Pennsylvania County zoning ordinance that allowed the zoning board to place additional conditions on gas wells and require a permit, and holding that the ordinance is not preempted by state law); Huntley & Huntley, Inc. v. Borough Council of the Borough of Oakmont, 964 A.2d 855, 858, 866 (Pa. 2009) (describing a town's objection to a gas well on zoning grounds); Range Resources v. Salem Township, 964 A.2d 869, 870, 877 (Pa. 2009) (describing a town's attempt to regulate surface use "associated with oil and gas drilling").

[40] *See generally* Hannah Wiseman, *Regulatory Adaptation in Fractured Appalachia*, 21 VILL. ENVTL. L.J. 229 (2010) (describing increased fracturing activity in Maryland, Ohio, and West Virginia and some of these states' modified regulations in response to the activity).

[41] *See* U.S. DEP'T OF ENERGY, NATIONAL TRANSMISSION GRID STUDY 6–7 (2002), *available at* http://www.ferc.gov/industries/electric/indus-act/transmission-grid.pdf ("As customer demand in an area surpasses the import capability of the transmission lines serving that area, operators are forced to meet the area's energy demand with more expensive local generation rather than less expensive generation from elsewhere in the region."); *id*. at 11–14 (describing the high level of transmission congestion in the East); *see also* Ashley C. Brown & Jim Rossi, *Siting Transmission Lines in a Changed Milieu: Evolving Notions of the "Public Interest" in Balancing State and Regional Considerations*, 81 U. COLO. L. REV. 705, 712 (2010) (defining "sink" states as "those . . . that consume more power than they produce within their borders," and describing the need to move "power from the producing 'source' states to the energy 'sink' states").

[42] GA. CODE ANN. § 12-10-1 (West 2010).

[43] *See, e.g.*, WASH. REV. CODE § 80.50.040(11) (2010) (empowering the State of Washington Energy Facility Site Evaluation Council to "present state concerns and interests to other states, regional organizations, and the federal government on the location, construction, and operation of any energy facility which may affect the environment, health, or safety of the citizens of the state of Washington").

to large-scale renewable energy development and energy planning more generally, the regional institutional framework lacks a coherent delineation in the literature[44] and has not yet been adopted on a meaningful scale.[45] The western states have embarked upon a regional effort to identify ideal areas for renewable energy development — many of which cross state and municipal lines — and to encourage transmission from these areas.[46] But even in the West, many states continue to diverge widely in their priorities for and approaches to energy development,[47] and this accentuates the challenges to renewable development. The Western Governors' Association has suggested that "standardized, streamlined, fast-track permitting procedures should be implemented" for utility-scale renewable plants.[48]

Although regional institutions have not widely emerged in the energy field, several existing regional governance structures can serve as models for the development of new energy institutions; these institutions have the authority to control land use activities and thus provide useful models for renewable governance. Interstate compact commissions for water basins, for example, govern states' uses of shared river water. The commissions are independent, congressionally-approved regional institutions that issue binding regulations for water use and sometimes water quality,[49] and they have some land use authority in order to protect water quality.[50] Similarly, the independent Tahoe Regional Planning Authority enacts land use regulations in the states within the Lake Tahoe watershed.[51] The most successful com-

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[44] Many authors have provided valuable pieces to the regional governance literature in the energy field, and this Article attempts to contribute one more piece. Robin Kundis Craig has addressed the constitutionality of "[m]ultistate efforts to encourage, market, transmit, or distribute renewable energy." *See generally* Robin Kundis Craig, *Constitutional Contours for the Design and Implementation of Multistate Renewable Energy Programs and Projects*, 81 U. COLO. L. REV. 771, 771 (2010). Jim Rossi has recognized that heightened regional governance over electricity transmission is likely inevitable but that "the precise form of regional governance bodies and the role states will play in the regional governance process seems quite uncertain." Jim Rossi, *The Trojan Horse of Electric Power Transmission Line Siting Authority*, 39 ENVTL. L. 1015, 1045 (2009). David Hurlbut, in turn, has recognized "changing public needs that span several states" — particularly needs associated with electricity — and the accompanying lack of legal institutions to meet these needs. *See* David J. Hurlbut, *Multistate Decisionmaking for Renewable Energy and Transmission: An Overview*, 81 U. COLO. L. REV. 677, 678 (2010).

[45] *See, e.g.*, Dan Tarlock, *The Most Popular Tool: Tax Increment Financing and the Political Economy of Local Government*, 77 U. CHI. L. REV. 65, 91 (2010) (discussing the "general lack of regional governance structures in our system").

[46] *See generally* W. GOVERNORS' ASS'N & U.S. DEP'T OF ENERGY, *supra* note 14.

[47] *See* Brown & Rossi, *supra* note 41, at 716 (discussing how New Mexico preempts local authority over transmission siting).

[48] *See* CLEAN AND DIVERSIFIED ENERGY INITIATIVE, W. GOVERNORS' ASS'N, SOLAR TASK FORCE REPORT 19 (2006), *available at* http://www.westgov.org/component/joomdoc/doc_download/96-solar.

[49] *See* GOV'T. ACCOUNTABILITY OFFICE, INTERSTATE COMPACTS: AN OVERVIEW OF THE STRUCTURE AND GOVERNANCE OF ENVIRONMENT AND NATURAL RESOURCE COMPACTS (2007), *available at* http://www.gao.gov/new.items/d07519.pdf (describing the functions of the Delaware River Basin Commission and the Susquehanna River Basin Commission).

[50] *See infra* text accompanying notes 321, 330, and 341.

[51] *See infra* text accompanying notes 281, 286-87 (describing the agency).

ponents of these and other regional institutions should inform the decision-making structure for the development of renewable energy and broader energy planning in America.

This Article identifies the anticommons and regulatory commons elements of utility-scale renewable energy development and then builds from existing regional governing entities to propose a formal governance framework to address these elements, as well as other energy challenges. Specifically, it describes why a regional governance structure is necessary and proposes a general structure that will best allow for steady development of solar and wind farms while ensuring the representation of local, state, and federal interests in the process of approving and guiding renewable development. It then describes why this regional model should be expanded to other types of energy planning.

Part I explains why the development of utility-scale renewables is an essential component of America's transition toward a sustainable energy system. Part II describes why a regional institutional approach to renewables development is necessary, applying Heller's anticommons and Buzbee's regulatory commons theories to renewable development. Part III investigates existing regional entities that have addressed similar issues, and Part IV builds from these models, suggesting an ideal general structure for a regional governance entity for renewables development (leaving for another day the specific mechanics of this entity). Finally, the Article concludes that a regional approach must be quickly advanced within the energy field so that essential experimentation with collaboration may begin. America's thirst for energy continues to rise,[52] and the energy crisis will not wait.

## I. The Importance of Large-Scale Renewables

America's energy challenges arise from a combination of growing factors, which this Part will describe. First, demand for energy has steadily grown and continues to rise, necessitating rapid development of energy resources. Second, the traditional fuels used to satiate this demand are nonrenewable, meaning that they are not replenished in a human lifetime.[53] In rapidly extracting and burning these resources to meet the majority of America's energy demand, we are expending the capital of future generations,[54] harming the environment and human health,[55] and jeopardizing do-

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[52] *See infra* text accompanying note 58 (describing rising energy demand).

[53] *See* Valero et al., *supra* note 9, at 989.

[54] This concept was likely coined by Richard Buckminster "Bucky" Fuller, who argued that fossil fuels are "nature's own savings account, deposited in our 'Earth bank' and not to be stolen by exploiters. Everyone knows that we should live on our (energy) income and not our savings account. Nor should we burn our capital-account production equipment in order to produce meter-marketable energy, for there will soon be no further production capability." R. Buckminster Fuller, Critical Path 223 (1981).

[55] *See* Nat'l Comm'n on Energy Policy, *supra* note 7.

mestic security.[56] This Part will explain why renewable energy will be a necessary component of the response to this energy crisis.

### *A. An Insatiable Thirst for Energy*

Economic growth is directly correlated with energy consumption,[57] and as the United States has grown, we have installed air-conditioning systems, built larger houses, watered more lawns and golf courses, driven more vehicles, and plugged in ever more sophisticated electronic gadgets. Total average U.S. energy consumption has more than doubled since 1950 to about 94 quadrillion British thermal units.[58] To produce this somewhat unfathomable quantity of energy, American companies operate more than 17,500 electric generating units[59] — including more than 1,400 coal, 100 nuclear, 5,400 natural gas, and 3,700 petroleum-burning units.[60] We also produce and import billions of gallons of fuels for primary energy consumption[61] — fuel burned to produce heat from a furnace or to run automobile engines, for example.[62] This trend, combined with current and projected population numbers and average individual consumption of energy, suggests that demand will continue to rise.[63]

In the meantime, global energy demand has also been shooting upward as international economies grow.[64] This, and the fact that the United States imports approximately thirty percent of all of the energy that it consumes,[65]

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[56] *See id.* at 98 (describing the bipartisan energy commission's security concerns related to energy).

[57] *See* Lewis, *supra* note 1, at 394.

[58] Numbers derived from EIA, ANNUAL ENERGY REVIEW 09, *supra* note 3, at 13.

[59] *See* U.S. ENERGY INFO. ADMIN., DEP'T OF ENERGY, EXISTING ELECTRIC GENERATING UNITS IN THE UNITED STATES (2008), http://www.eia.doe.gov/cneaf/electricity/page/capacity/existingunits2008.xls (data compiled from Form EIA-860 Annual Electric Generator Report).

[60] *Id.*

[61] Value derived from EIA, ANNUAL ENERGY REVIEW 09, *supra* note 3, at 37 (showing a total of 56.4 quadrillion BTUs of consumption of fuels for non-electrical energy in 2009).

[62] *See, e.g.*, *Use of Gasoline - Energy Explained*, U.S. ENERGY INFO. ADMIN., http://www.eia.doe.gov/energyexplained/index.cfm?page=gasoline_use (last updated Sept. 30, 2010) (on file with the Harvard Law School Library) (showing that Americans consumed about 137 billion gallons of gasoline in 2009).

[63] The U.S. Energy Information Administration projects that U.S. total energy consumption will rise by one half of one percent annually through 2035. U.S. ENERGY INFO. ADMIN., DEP'T OF ENERGY, ANNUAL ENERGY OUTLOOK 56 (2010), *available at* http://www.eia.doe.gov/oiaf/aeo/pdf/0383%282010%29.pdf; *see also* Benjamin K. Sovacool & Kelly E. Sovacool, *Identifying Future Electricity-Water Tradeoffs in the United States*, 37 ENERGY POL'Y. 2763, 2763 (2009) (stating that if Department of Energy projections are correct, "nationwide electricity demand" will double, from 2000 levels, before 2050).

[64] In 1980, global consumption of energy (excluding the United States) was 205 quadrillion BTUs; by 2006, it had risen to 372 BTUs. Numbers derived from U.S. ENERGY INFO. ADMIN., DEP'T OF ENERGY, WORLD PRIMARY ENERGY CONSUMPTION (BTU), 1980–2006, TABLE 1, *available at* http://www.eia.doe.gov/pub/international/iealf/tablee1.xls [hereinafter EIA, WORLD CONSUMPTION].

[65] *Id.* (showing U.S. energy consumption of 100 quadrillion BTUs in 2006); *Jan. 2011 Monthly Energy Rev., Energy Exports by Source and Total Net Imports*, U.S. ENERGY INFO ADMIN., http://www.eia.doe.gov/mer/query/mer_data.asp?table=to1.04b (last visited May 20,

means that other strong economies are increasingly competing for a substantial portion of the energy sources that we seek out.[66] In July 2010, China officially surpassed the United States in energy consumption.[67] Every country is a part of the energy crisis, and each must begin constructing alternatives.

### *B. The Traditional Remedy: Rapid Consumption of Nonrenewable Fuel Sources*

As the world searches for a sustainable alternative to the current energy pattern, fossil fuels will continue to be a dominant global energy source.[68] But they will become more expensive and scarce, and producers will have to rely upon more "unconventional" sources of these fuels — those that are difficult to extract compared to traditional sources.[69] As the Gulf oil spill has graphically demonstrated, Americans may be increasingly uncomfortable[70] with the effects of unconventional fossil fuel extraction on human health, the environment, and local economies. A single oil spill in 2010 temporarily shut down a large portion of the southern fishing industry, reduced income from tourism, killed wildlife, and dirtied beaches.[71] Offshore oil should not be the only point of focus, however. Other unconventional extraction techniques have important environmental, economic, and health-related externalities.

As conventional reserves become scarcer, energy production companies have increasingly moved toward unconventional onshore sources of petroleum such as tar sands (also called oil sands[72]) and oil shales. Tar sands "are

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2011) (on file with the Harvard Law School Library) (showing net energy imports of 30 quadrillion BTUs in 2006).

[66] Although U.S. consumption continues to rise, its consumption as a percentage of world consumption has declined — from about 27% of global consumption in 1980 to about 21% in 2006. *See* EIA, WORLD CONSUMPTION, *supra* note 64, at tbl.1.

[67] *See* Swartz & Oster, *supra* note 4.

[68] Certain fossil fuels will be scarce within a century, while others have a longer life span. *See, e.g.*, J.O. Jaber & S.D. Probert, *Environmental-Impact Assessment for the Proposed Oil-Shale Integrated Tri-Generation Plant*, 62 APPLIED ENERGY 169, 170 (1999) ("The availability of crude oil or natural gas can be measured in decades, whereas the identified readily-available oil-shale reserves are sufficient to satisfy the world's energy needs for several centuries.").

[69] *See* TED MCCALLISTER, U.S. ENERGY INFO. ADMIN., DEP'T OF ENERGY, IMPACT OF UNCONVENTIONAL GAS TECHNOLOGY IN THE ANNUAL ENERGY OUTLOOK 2000 1 (2001), *available at* http://www.eia.doe.gov/oiaf/analysispaper/pdf/uncongas/pdf (explaining the "technical difficulties inherent in developing" unconventional fuel resources).

[70] *See, e.g.*, Dalia Sussman, *Poll: Wide Majority See Spill as 'Disaster,'* N.Y. TIMES CAUCUS BLOG (May 27, 2010), http://thecaucus.blogs.nytimes.com/2010/05/27/poll-wide-majority-see-spill-as-disaster/?scp=2&sq=%22gulf%20oil%20spill%22%20and%20polls&st=cse (on file with the Harvard Law School library) (citing a USA Today/Gallup poll, which showed that a "broad majority" believed the Gulf Oil Spill to be a "disaster").

[71] *See* Campbell Robertson, *In Gulf, Good News Is Taken With Grain of Salt*, N.Y. TIMES, Aug. 4, 2010, at A1 (discussing the sight of oil on mud flats and the many commercial fishing waters along the Gulf Coast that had been closed to fishing as a result of the spill).

[72] *About Tar Sands*, OIL SHALE AND TAR SANDS PROGRAMMATIC EIS INFO. CENTER, ARGONNE NAT'L LAB., http://ostseis.anl.gov/guide/tarsands/index.cfm (last visited May 20, 2011) (on file with the Harvard Law School Library).

a combination of clay, sand, water, and bitumen, a heavy black viscous oil,"[73] and they are a potentially lucrative source of energy. It is estimated that there are more reserves of oil in tar sands than in conventional oil reservoirs,[74] and the Gulf spill "triggered a rush by Shell and other oil companies" to commence tar sands extraction operations "in Russia, Congo, and even Madagascar" — building from existing "successful development" of the tar sands in Canada.[75] To reach the sands, open surface mining is typically required, and operators then use large quantities of energy and water to extract the bitumen from the mined sands.[76] Only about ten percent of the mined sand is bitumen; the remaining ninety percent of mined material is waste.[77] The production of one barrel of crude oil from the sands consumes two and a half to four barrels of water[78] and between 500 and 1000 cubic feet of natural gas.[79] The tailings from the process are stored in "sludge ponds" on the surface for many years.[80]

Oil shale, "a fine-grained sedimentary rock" that contains solid organic matter in the form of kerogen,[81] is another alternative to conventional oil and is one of the most abundant remaining fossil fuel resources.[82] Like tar sands, oil shale requires energy- and land-intensive practices to be economically extracted. The most efficient means of obtaining the oil shale is surface mining, such as open pit (strip) mining,[83] and one of the common oil shale extraction technologies is called "retorting," wherein the shale is mined and a chemical process heats up the shale to release "petroleum-like liquids."[84]

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[73] *Id.* (emphasis omitted).

[74] O.V. Abramov et al., *Extraction of Bitumen, Crude Oil and its Products from Tar Sand and Contaminated Sandy Soil Under Effect of Ultrasound*, 16 ULTRASONICS SONOCHEMISTY 408, 408 (2008).

[75] Nigel Williams, *New Focus on Tar Sands*, 20 CURRENT BIOLOGY R461, R461 (2010).

[76] Yvon Theriault et al., *The Effect of Chemical, Physical, and Enzymatic Treatments on the Dewatering of Tar Sands Tailings*, 74 FUEL 1404, 1404 (1995) (explaining that at one oil sands extraction plant operating in Canada in the 1990s, 15 cubic meters of water were required to produce one cubic meter of synthetic crude oil from the bitumen).

[77] Elizabeth Kolbert, *Unconventional Crude*, THE NEW YORKER, Nov. 12, 2007, at 46.

[78] *Canada's Oil Sands: Opportunities and Challenges to 2015 – Questions and Answers*, CANADA NAT'L ENERGY BD., http://www.neb.gc.ca/clf-nsi/rnrgynfmtn/nrgyrprt/lsnd/pprtntsndchllngs20152004/qapprtntsndchllngs20152004-eng.html (last visited May, 2010) (on file with the Harvard Law School Library).

[79] *See id.*

[80] Williams, *supra* note 75, at R461 (explaining that tailings remained in sludge ponds for more than a decade).

[81] X.X. Han et al., *Studies of the Effect of Retorting Factors on the Yield of Shale Oil for a New Comprehensive Utilization Technology of Oil Shale*, 86 APPLIED ENERGY 2381, 2381 (2009).

[82] Estonia, Russia, and China are already using oil shales for energy production. Jaber & Probert, *supra* note 68, at 170. The quantity and locations of production and use will likely expand in the future. *See* Han et al., *supra* note 81, at 2381 (explaining that oil shale in China will be "very significant for alleviating the pressure of petroleum supplies" and that "many countries rich in oil shale resources" are investigating "means to produce and use shale oil").

[83] Jaber & Probert, *supra* note 68, at 178.

[84] *Oil Shale & Tar Sands Programmatic EIS Information Center, About Oil Shale*, ARGONNE NAT'L LAB., http://ostseis.anl.gov/guide/oilshale/ (last visited May 20, 2011) (on file with the Harvard Law School Library).

The retorting produces a waste product called shale char, which contains "several toxic compounds."[85] The earth disturbances and potential surface pollution resulting from mining, as well as the energy required for processing and the waste generated, make unconventional oil resources such as tar sands and oil shales problematic despite their abundance.

Coal, like unconventional oil, remains in abundant quantities worldwide but has familiar effects. Underground coal mining has steadily declined since the mid-1900s, but the remaining operations still carry high risks. An underground methane explosion in a West Virginia coal mine killed twenty-nine workers in 2010.[86] Surface mountaintop removal operations have replaced much of the risky underground mining but produce their own problems. Huge machines now scrape away the soil and rocks that form mountains and then fill valleys with the overburden.[87] In 2009, EPA announced that it would carefully scrutinize hundreds of mountaintop removal "valley fill" permits, as it was concerned that the fill, which smothers miles of mountain streams, was damaging water quality in violation of Clean Water Act standards.[88] The effects of burning coal are also potent; coal-fired power plants release large quantities of air pollutants, including mercury, into the air,[89] and the ash that is scrubbed out of power plant stacks and held in nearby surface impoundments contains "contaminants like mercury, cadmium, and arsenic."[90]

Natural gas, in contrast to coal and oil, is a cleaner fossil fuel because it emits fewer air pollutants (including greenhouse gases) when burned.[91] But both unconventional natural gas extraction techniques and burning natural gas to produce energy also have impacts. A common method of unconventional natural gas production is a technique called hydraulic fracturing ("fracing" or "fracking").[92] To frac a gas well, water mixed with sand and small quantities of chemicals is injected at high pressure into a well and

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[85] Han et al., *supra* note 81, at 2381.

[86] Greg Bluestein & Vicki Smith, *Mine Rescue Effort Turns to Recovery*, MSNBC, http://www.msnbc.msn.com/id/36183425/ (last visited Apr. 4, 2010) (on file with the Harvard Law School Library).

[87] *See* Ohio Valley Envtl. Coalition v. Corps, 556 F.3d 177, 186 (4th Cir. 2009) (describing surface coal mining operations).

[88] *See* Juliet Eilperin, *EPA to Scrutinize Permits for Mountaintop-Removal Mining*, WASH. POST, Mar. 25, 2009, at A13 (describing EPA's announcement to more closely scrutinize the permits and its reasons for doing so).

[89] *See* K.S. Park et al., *Emission and Speciation of Mercury from Various Combustion Sources*, 180 POWDER TECH. 151, 151 (2008) (describing "coal-fire power plants and incinerators" as a "[m]ajor mercury source[ ] from human activity").

[90] Press Release, EPA, EPA Announces Plans to Regulate Coal Ash (May 4, 2010), *available at* http://yosemite.epa.gov/opa/admpress.nsf/0/4ECA022F6F5C501185257719005DFB1B.

[91] *See* Jacqueline Lang Weaver, *The Traditional Petroleum-Based Economy: An "Eventful" Future*, 36 CUMB. L. REV. 505, 516 (2005–06) (describing the lower emissions of natural gas).

[92] *See* Ben Casselman & Russell Gold, *Drilling Tactic Unleashes a Trove of Natural Gas — And a Backlash*, WALL ST. J., Jan. 21, 2010, at A1 (noting that "[t]oday, the industry estimates that 90% of all new gas wells are fractured").

forced out into the shale surrounding the well.[93] A national study of the effects of the injection of fluids and their storage and disposal is still in its early stages,[94] but several incidents suggest that this extraction technique will not escape critique. Residents in Pennsylvania towns sued hydraulic fracturing operators in 2010, alleging that fracing had contaminated their wells.[95] The state's environmental agency also assessed a hefty fine against an operator after the company mistakenly caused several chemical spills at the surface of a frac site and a water well exploded nearby.[96] In Texas, urban areas have experienced much of the fracing boom; more than 1,000 wells have been drilled within Fort Worth alone, leading residents to question whether fracing and related gas operations are safe.[97]

A final source of non-renewable energy, which is not a fossil fuel but relies upon an exhaustible fuel resource, is nuclear power. Nuclear power, in addition to the fossil fuels described above, may be a necessary component of America's energy mix for the near future due to a lack of adequate alternatives.[98] In several respects, nuclear power is superior to fossil fuels. It emits far less carbon than do fossil fuel-fired power plants,[99] and scientists argue that the energy contained within the earth's nuclear fuels is "in a practical sense, limitless and thus able to supply the entire world primary energy needs for at least this century."[100] The uranium fuel must be mined, how-

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[93] *See* GROUND WATER PROT. COUNCIL & ALL CONSULTING, MODERN SHALE GAS DEVELOPMENT IN THE UNITED STATES: A PRIMER 56 (2009), *available at* http://www.netl.doe.gov/technologies/oil-gas/publications/EPreports/Shale_Gas_Primer_2009.pdf.

[94] Press Release, EPA, EPA Initiates Hydraulic Fracturing Study: Agency Seeks Input from Science Advisory Board (Mar. 18, 2010), *available at* http://yosemite.epa.gov/opa/admpress.nsf/e77fdd4f5afd88a3852576b3005a604f/ba591ee790c58d30852576ea004ee3ad!OpenDocument (announcing that the EPA would "conduct a comprehensive research study" of fracing and "the potential adverse impact" that fracing might have on "water quality and public health").

[95] Michael Rubinkam, *Pa. Residents Sue Gas Driller Over Polluted Wells*, THE FULTON COUNTY NEWS, Nov. 26, 2009, *available at* http://www.fultoncountynews.com/news/2009-11-26/Police_Reports/Pa_Residents_Sue_Gas_Driller_Over_Polluted_Wells.html; Press Release, Parker Waichman Alonso LLP, Together with Its Partner Law Firms, Files Suit Against Southwest Energy Production Company and Southwestern Energy Company on Behalf of Pennsylvania Families Who Have Had Water Supplies Fouled by Hydraulic Fracturing (Sept. 14, 2010), *available at* http://medhealth.tmcnet.com/news/2010/09/14/5007184.htm.

[96] *See* Rubinkam, *supra* note 95.

[97] Asher Price, *As Urban Gas Drilling Expands, So Do Health Concerns*, AUSTIN AM. STATESMAN, June 13, 2010, at A1 (quoting Senator Wendy Davis, who stated that "there's a growing concern from individuals, especially those in densely populated [cities], about whether (the drilling) is done safely").

[98] *See, e.g.*, *PRISM/MERGE Analyses 2009 Update*, ELECTRIC POWER RESEARCH INSTITUTE, http://www.smartclimatepolicy.org/consumers/EPRI%20Prism_MERGE%20Analyses%202009%20Update.pdf (last visited May 20, 2011) (on file with the Harvard Law School Library) (showing nuclear power as a component of a future electricity sector with reduced carbon emissions).

[99] Ralph E.H. Sims et al., *Carbon Emission and Mitigation Cost Comparisons Between Fossil Fuel, Nuclear and Renewable Energy Sources for Electricity Generation*, 31 ENERGY POL. 1315, 1317 (2003) ("The life-cycle from nuclear power plants [greenhouse gas] emissions per unit of electricity are at least two orders of magnitude lower than those from fossil fueled electricity generation and comparable to most renewables at near zero.").

[100] Lewis, *supra* note 1, at 396.

ever, and nuclear plants consume vast quantities of water.[101] The plants also produce radioactive waste, which does not break down quickly[102] and currently lacks any permanent location for disposal in the United States.[103]

In sum, the unsustainable forms of energy, which America has traditionally relied upon, all present risks to human health and the environment. These fuels are essential, at least in the short term; they continue to produce affordable energy, and there are currently insufficient energy alternatives to replace them. But our reliance upon them must gradually decline.

### *C. Renewables as a Part of the Sustainable Energy Solution*

Renewable energy — energy that is replenished on a human timescale[104] — is a clean, lower-risk source of energy in comparison to fossil fuels and nuclear energy. In an earlier article,[105] Garrick Pursley and I described the benefits of renewables, and I do not repeat those in detail here. In short, aggressively optimistic writers have argued that there is plenty of sun and wind to eventually meet global demand for energy.[106] Less optimistic writers have suggested that a combination of approaches will be necessary, including energy efficiency measures, renewables, nuclear, and continued reliance upon fossil fuels.[107] Regardless of the future scenario adopted, renewables will play a substantial role.

Unlike fossil fuel sources, renewable fuels are abundant and replenishable; most also have near-zero lifecycle carbon emissions.[108] The fuels are

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[101] *See, e.g.*, Todd Woody, *Nonprofit Group will Prod Companies to Report Their Water Use*, N.Y. TIMES, Apr. 7, 2010, at B3 (explaining that "New York State denied a permit for Entergy's Indian Point nuclear power plant because of its enormous consumption of water"); Sovacool & Sovacool, *supra* note 63, at 2764 (explaining that nuclear power plants use more water than any other thermodynamic plants).

[102] The half life of uranium-235 is approximately 1 billion years. Manfred Lenzen, *Life Cycle Energy and Greenhouse Gas Emissions of Nuclear Energy: A Review*, 49 ENERGY CONVERSION AND MGMT. 2178, 2179 (2008).

[103] *See Office of Civilian Radioactive Waste Mgmt.*, U.S. DEP'T OF ENERGY, http://www.energy.gov/environment/ocrwm.htm (last visited May 20, 2011) (on file with the Harvard Law School Library) (discussing President Obama's rejection of Yucca Mountain as a disposal facility for nuclear waste); Nuclear Regulatory Comm'n, Memorandum and Order, CLI-10-13, at 4 (Apr. 23, 2010) (discussing the Nuclear Regulatory Commission's adjudication of the Department of Energy's motion to withdraw its request for authorization to construct a permanent nuclear disposal site at Yucca Mountain).

[104] *See* Valero et al., *supra* note 9, at 989.

[105] *See* Garrick Pursley & Hannah Wiseman, *Local Energy*, 60 EMORY L.J. (forthcoming 2011).

[106] *See* Vasilis Fthenakis et al., *The Technical, Geographical, and Economic Feasibility for Solar Energy to Supply the Energy Needs of the US*, 37 ENERGY POL'Y 387, 397 (2009) (arguing that "[i]t is clearly feasible to replace the present fossil fuel energy infrastructure in the US with solar power and other renewables"); Valero et al., *supra* note 9, at 992 (observing that the energy from sunlight that hits the earth is about "three thousand times more than the present power needs of the whole world").

[107] *See* NAT'L COMM'N ON ENERGY POLICY, *supra* note 7, at vii (labeling as a "myth" the argument that "energy independence can be readily achieved through conservation measures and renewable energy sources alone").

[108] *See* Sims et al., *supra* note 99, at 202–03.

domestically available and thus reduce the need for any country to look beyond its borders for energy sources. The United States has abundant solar and wind resources, which serve as convenient complements. The wind rushing down through the Midwest wind corridor[109] blows most powerfully at night, while the sun that beats down on the Southwest[110] is strongest at noon.[111] Renewables also have a smaller impact on human health and the environment than do fossil fuels,[112] and they can bolster local, state, and national economies. Manufacturing, installing, and maintaining renewable equipment requires labor,[113] and the leases for the land that will host the equipment can have high pay-offs.[114] The benefits of renewables will not be adequately captured, however, without modifying the current governance structure for the siting and construction of utility-scale renewable plants.

## II. The Need for a Regional Energy Governance Structure

The transition to a sustainable energy system will require increased reliance on renewable technology, and implementation of this technology will be necessary at two levels: first, the distributed level, where solar technology is placed on the roofs of buildings or wind turbines are constructed in backy-

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[109] *See* Energy Efficiency and Renewable Energy, States and United States Wind Resource Maps, U.S. Dep't of Energy, http://www.windpoweringamerica.gov/wind_maps.asp (last visited June 30, 2010) (on file with the Harvard Law School Library) (showing the strongest onshore wind resources as occurring in the Midwest and West).

[110] *See* Nat'l Renewable Energy Lab., *United States Photovoltaic Solar Resource: Flat Plate Tilted at Latitude*, *available at* http://www.nrel.gov/gis/images/map_pv_national_hi-res.jpg (last visited May 20, 2011) (on file with the Harvard Law School Library) (showing the strongest solar photovoltaic resources in red in the Southwest region).

[111] Matthew L. Wald, *Storing Sunshine*, N.Y. Times, July 16, 2007 (explaining that "[i]n many parts of the country, wind is strongest at night); Paul Denholm & Robert Margolis, *Evaluating the Limits of Solar Photovoltaics (PV) in Traditional Electric Power Systems*, 35 Energy Pol'y 2852, 2854 (2007) (describing solar peak periods).

[112] *See* Pursley & Wiseman, *supra* note 105 (weighing the environmental benefits of renewables as compared to other sources).

[113] *See, e.g.*, *Texas Renewable Portfolio Standard*, State Energy Conservation Office, http://www.seco.cpa.state.tx.us/re_rps-portfolio.htm (last visited May 20, 2011) (on file with the Harvard Law School Library) (explaining that the $1 billion invested in wind energy in Texas has created jobs); U.S. Dep't of Energy, 20% Wind Energy by 2030: Increasing Wind Energy's Contribution to U.S. Electricity Supply 204 (July 2008), *available at* http://www1.eere.energy.gov/windandhydro/pdfs/41869.pdf (estimating, as a result of various models and scenarios assuming that twenty percent of electricity in the United States would come from wind energy by 2030, that "[c]umulative economic activity from the construction phase alone will reach more than $944 billion for direct, indirect, and induced activity in the nation" and would "stimulate[ ] an annual average of more than 250,00 workers required for employment.").

[114] *See, e.g.*, N.Y. State Energy Research and Dev. Auth., Wind Energy Toolkit 31, *available at* http://www.powernaturally.org/Programs/Wind/Wind%20Energy%20Toolkit.pdf (explaining that a school district in Madison, New York receives "approximately $30,000 each year" in wind power payments and that the town of Fenner, New York is receiving approximately $150,000 each year for fifteen years).

ards,[115] and second, the utility-scale level, where arrays of solar equipment or industrial-scale wind turbines are constructed over thousands of acres of land[116] to produce electricity in quantities similar to those generated by a traditional power plant. Distributed renewables are distinctly local and require governance by municipalities.[117] With technical guidance, municipalities can effectively govern and enable the siting of distributed renewables by modifying their zoning and building codes.[118] Utility-scale renewables or renewable "farms," on the other hand — which are the focus of this Article — require a new form of governance structure because existing institutions lack the necessary jurisdiction and geographical scope. As this Part will describe, the best sites for large arrays of renewable technology (called "renewable parcels") often cross municipal and state boundaries and multiple private property lines, as does the electricity transmission infrastructure that transports electricity. Even where renewable parcels do not cross boundaries, several separate entities often have lease and ownership rights and regulatory responsibilities in the parcel. Multiple parties therefore have a right to exclude potential developers of renewable infrastructure from a proposed site — whether through direct denial of a lease or indirect "exclusion" through regulation — and this creates a problem with "anticommons" elements. Furthermore, the several government entities with regulatory responsibilities within each renewable parcel often lack a shared vision for the parcel or a clear hierarchy that allows certain entities to take the lead in ensuring efficient and effective development of the parcel. This, in turn, suggests that renewable parcels may also have "regulatory commons" elements. This part addresses these attributes of renewable parcels and explains why these attributes have tragic implications for renewable governance.

### *A. Defining the Anticommons*

The property literature has traditionally recognized two forms of property: private property and commons. Private property is often viewed as a bundle of core rights in property,[119] such as the right of possession, the right

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[115] *See* Steven Ferrey, *Gate Keeping Global Warming: The International Role of Environmental Assessments and Regulation in Controlling Choices for Future Power Development*, 19 FORDHAM ENVTL. L. REV. 101, 139 (2009) (describing distributed renewables).

[116] *See, e.g.*, *Fast-Track Renewable Energy Projects*, U.S. DEP'T OF THE INTERIOR, BUREAU OF LAND MGMT., http://www.blm.gov/ca/st/en/fo/cdd/alternative_energy/fast-trackfast facts.html (last visited May 20, 2011) (on file with the Harvard law School Library) (describing renewable projects that require as many as 15,493 acres of land).

[117] *See generally* Pursley & Wiseman, *supra* note 105.

[118] Many municipalities have already done so. *See, e.g.*, N.Y. STATE ENERGY RESEARCH AND DEV. AUTH., WIND ENERGY MODEL ORDINANCE OPTIONS, 4 (2008), *available at* http://www.powernaturally.org/programs/wind/toolkit/2_windenergymodel.pdf (describing various municipal zoning requirements for wind turbines); *see also* Pursley & Wiseman, *supra* note 105, (describing zoning and building codes that address renewable technologies).

[119] *See* Jane B. Baron, *The Contested Commitments of Property*, 61 HASTINGS L.J. 917, 933 (2010) ("It has long been conventional to describe property as a 'bundle of rights.'").

to exclude, and the right to transfer possession when desired.[120] Through the bundle of rights possessed, the holder of private property may include select persons and exclude others. Any given piece of private property may have multiple holders,[121] and some of the rights within the bundle may have been severed or modified;[122] one individual may hold the rights to the minerals beneath the land, for example, while a second may own the land, or a non-owner may have an easement to drive over the property. But the rights within the bundle and the holders of each of those rights can still typically be conveniently identified, and each owner has a clear and transferable exclusion right.[123]

Commons, unlike private property, do not allow any owner to exclude others by right. In Garrett Hardin's classic example, cattle herders all shared access to a local pasture.[124] Any herder could graze livestock there, and each herder was incentivized to graze as much livestock as possible as often as possible in order to raise a large herd of the fattest cattle.[125] Yet no herder could exclude other herders; because the herders lacked defined boundaries of private ownership and had no right to construct fences around an individual plot, the pasture became an overused resource. A collection of individuals, each trying to raise as many fat cattle as possible, led to tragedy.[126]

Beyond classic private ownership and the commons tragedy, Henry Smith has introduced a third type of property - a hybrid of commons and private property that he describes as a semicommons. Semicommons involve property that is both privately used for an important purpose and open to multiple users for another important purpose.[127] Smith identifies medieval fields, where several large plots around a village were shared by peasants, as a classic example of semicommons. Within these fields, "peasants had private property rights to the grain they grew on their individual strips of under 1 acre," but "during certain seasons, peasants would be obligated to throw the land open to all the landowners for grazing their animals (especially sheep) in common."[128] Semicommons introduced costs — such as the difficulty of monitoring legitimate and illegitimate uses[129] — but Smith describes

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[120] *See* Heller, *supra* note 17, at 663 (describing A.M. Honore's list of property's "standard incidents").

[121] *See* Baron, *supra* note 119, at 933 (observing that "[t]here is widespread agreement that . . . property rights in a single asset can be divided among people and divided over time").

[122] *See, e.g.*, Daphna Lewinsohn-Zamir, *More Is Not Always Better Than Less: An Exploration in Property Law*, 92 MINN. L. REV. 634, 657 (2008) (describing how servitudes allow property owners to sever certain property rights).

[123] Under Henry Smith's view, property rights provide this information. *See* Henry E. Smith, *The Language of Property: Form, Content, and Audience*, 55 STAN. L. REV. 1105, 1147 (2003) (arguing that a property right sends informational signals to the "outside world").

[124] Hardin, *supra* note 24, at 1244.

[125] *Id.*

[126] *Id.* (explaining that "[e]ach man is locked into a system that compels him to increase his herd without limit" and that "[r]uin is the destination toward which all men rush").

[127] Henry E. Smith, *Semicommon Property Rights and Scattering in the Open Fields*, 29 J. LEGAL STUD. 131, 131–32 (2000).

[128] *Id.* at 132.

[129] *Id.* at 144.

how the individuals using the semicommons invented unique methods to enhance the net benefits of this form of property.[130]

Within this array of property types we find Michael Heller's anticommons. Heller's anticommons may be viewed as a fourth form of property[131] — a "property regime in which multiple owners hold effective rights of exclusion in a scarce resource."[132] An anticommons emerges when one owner holds one core right of a bundle of rights, such as possession, and "a second owner holds the same or another core right in the object, and so on, with no hierarchy among these owners' rights or clear rules for conflict resolution."[133] Owner A may own the right of "exclusive possession" of a property, for example, while Owner B may also own the right of exclusive possession of that property or alternatively, the core right of "personal use" of the property.[134] And neither owner has the ultimate say; the property regime does not make clear that Owner A's right of exclusive possession trumps Owner B's, or that Owner B may make personal use of the property even if Owner A claims exclusive possession and the right to exclude. In an anticommons there are too many private property rights and too many owners with the right to exclude; no matter how clear the rights are, the property is underused.

Heller describes the anticommons as the "mirror image" of commons,[135] but one can also envision it as a former commons where too many conflicting private property-type rights have been imposed. Imagine Hardin's pasture where hundreds of herders graze their cattle and compete for precious inches of grass. Suddenly, a local government takes possession of the pasture and decides to divide it into small parcels. The government fences each parcel and records the metes and bounds of each on paper. It then transfers possession of each parcel and its associated paper record to a herder who has historically used the pasture, and the government keeps a second copy of each record in a designated town office. Each herder whose cattle previously grazed freely on the pasture is now limited to a small fenced parcel. In doling out papers, however, the town has likely missed some herders who previously used the pasture. These herders now rush to the town office, declaring that they, too, deserve a parcel and have a right to use the parcel for grazing; they continue grazing their cattle, but the town

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[130] *See id*. at 144–54 (explaining, for example, that scattering privatized strips among private property equalized the costs imposed on strips – such as trampling by the animals in the commons – as well as the benefits of manure droppings for fertilizer).

[131] *But see infra* text accompanying note 147 (arguing that anticommons are not a distinct form of property).

[132] Heller, *supra* note 17, at 668 (emphasis omitted). *But see* Lee Anne Fennell, *Common Interest Tragedies*, 98 NW. U. L. REV. 907, 909, 933 (2004) (placing anticommons problems "within the family of common resource dilemmas" and arguing that both commons and anticommons tragedies should be grouped within one taxonomy of "common interest tragedies").

[133] Heller, *supra* note 17, at 670.

[134] *Id*. at 663.

[135] *Id*. at 623.

has no provisions for adverse possession. Other herders who no longer wish to raise cattle also run to the town office, demanding that they be allowed to sell their land. The town replies that the land may not be alienated and that only heirs may inherit the parcel. On top of this confusion, a higher level of government weighs in, stating that even if herders own a parcel, they may not graze cattle there until they obtain a certificate of grazing use from the National Agricultural Council, a certificate of compliance from the National Environmental Agency, and five other certificates from various regulators. And finally, the highest level of government declares that it owns all leasing rights to the parcel; if herders wish to temporarily allow another individual to use the parcel, that individual must first obtain permission from the national government.

This imagined pasture is a classic example of an anticommons, and this form of property is not mythical. Heller describes how similar anticommons emerged in post-Soviet Russia, for example, where the government privatized formerly state-owned property by creating multiple private rights in that property. In Russian storefronts, at least four "owners" emerged in the privatization of the 1990s.[136] First, local government councils technically owned storefronts and could sell or lease them, but the national government retained more powerful ownership control, such as the ability to define an acceptable price for the sale. Second, workers' collectives — bakers who had been using the store for years, for example — remained as squatters.[137] Third, entities called balance-sheet holders (somewhat analogous to trustees), also had some exclusion power; they had certain rights to "use and dispose of the property" within the storefront, sometimes as co-lessors.[138] And finally, there were at least six different agencies, such as the city architect and a historic preservation office, which had to approve all storefront leases.[139]

Beyond Russia, Heller provides examples of anticommons in traditional market economies. In Kobe, Japan, attempts to redevelop privately-owned property were nearly impossible after an earthquake destroyed much of the city.[140] Flawed land use laws allowed a small piece of land to be divided into thousands of parcels, and "renters, lessees, landowners, and subletters" often had overlapping claims to buildings.[141] One owner was able to block any attempts at rebuilding, thus excluding the multiple other users and creating underuse of the property. Yet another anticommons emerged in the United States, when Congress divested tribal land held in federal trust to Native American heads of household.[142] The government prohibited alienation of this divested land, and due to the method of rights creation and inher-

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[136] *Id.* at 636.
[137] *Id.* at 636–37.
[138] *Id.* at 637.
[139] *Id.*
[140] *Id.* at 684.
[141] *Id.*
[142] *Id.* at 685–86.

itance, the land was eventually divided among so many owners that in some cases, profits from leases amounted to pennies per owner.[143]

Anticommons, as demonstrated by Heller's examples, may arise in states with or without market-based economies, and they need not involve divesture of land; land use laws can independently create anticommons. No matter where or how they emerge, anticommons all have three factors in common, which distinguish them from private property and commons. First, "multiple owners hold effective rights of exclusion to a scarce resource."[144] Second, these owners' rights allow them to "prevent other owners from obtaining a core bundle of rights in an object."[145] This means each owner can block other owners from using the resource to its full potential. And finally, the objects within the anticommons may be difficult to alienate or use productively, and the owners of the objects lack a "clear hierarchy of decision-making authority."[146] Even if the owners wish to sort out their rights and determine how to trade them in order to productively use the property, they will have trouble identifying and working with the authorities who hold the rights.

Scholars have critiqued Heller's theory from several angles. Some argue that anticommons are not in fact a unique type of property but are rather simply a "manifestation of circumstances in which private property may be misused or lead to undesirable outcomes."[147] Others have suggested that anticommons identified by Heller do not empirically demonstrate full anticommons characteristics.[148] From the definitional standpoint, Heller himself concedes that "the difficult cases involve finding the boundary of viable private ownership beyond which a tragedy of the anticommons is likely to arise and persist,"[149] but he believes that this line can be identified. Heller describes a true anticommons as a property resource for which "ownership fragments do not function productively on an ordinary scale of use."[150] In one of his strongest examples of an anticommons tragedy, the property interests "have become so fragmented that their economic value derives primarily for their use in blocking others."[151] In other cases, fragmentation of private property is beneficial and creates wealth, not an anticommons.[152]

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[143] *Id.* at 686.
[144] *Id.* at 673.
[145] *Id.*
[146] *Id.*
[147] Daphna Lewinsohn-Zamir, *Contemporary Property Law Scholarship: A Comment*, 2 THEORETICAL INQUIRIES IN L. 97, 98 (2001).
[148] *See, e.g.*, Brian Sawers, *Reevaluating the Evidence for Anticommons in Transition Russia*, 16 COLUM. J. EUR. L. 233, 238 (2010) (arguing that factors other than an anticommons, including "credit shortages, taxes, corruption, favor exchange practices, and organized crime" create barriers to a thriving Russian retail system).
[149] Michael A. Heller, *The Boundaries of Private Property*, 108 YALE L.J. 1163, 1198 (1999).
[150] *Id.* at 1222.
[151] *See id.* at 1221.
[152] *Id.*

With these critiques and definitional difficulties in mind, the following subpart will argue that renewable parcels have strong anticommons qualities, even if the parcels simply exemplify the occasional flaws of a private property system[153] and do not fit perfectly within an anticommons definition. From the perspective of siting, the many fragments of an industry-scale renewable parcel do not "function productively"[154] together. While renewable parcels do not likely rise to a level where the ownership interests are valuable only in terms of the ability to block others from using the parcel, I suggest that the productivity of parcels is substantially diminished due to fragmented rights. The parcels may not be true "anticommons," in other words (assuming that a clear definitional line for anticommons can be drawn), but they exhibit important anticommons characteristics.

### *B. Renewable Parcels as Anticommons*

Wind and sunlight are universally abundant resources, and some quantity of these renewable fuels can be captured over every inch of the globe's surface. But large-scale renewable development is only economical in regions where wind and sunlight are strongest and where land uses beneath fugitive wind and sunlight are amenable to technology construction. In other words, two parallel "estates" layered together — a fugitive and surface estate — are required. The technology to capture wind and sunlight must be placed within an area that combines abundant fugitive resources and an accessible surface, an area which this Article calls a "renewable parcel." The multiple entities who have use, ownership, and regulatory rights to land within renewable parcels create a problem with anticommons qualities because each entity within the parcel has one or several exclusion rights.

The exclusion rights within a renewable parcel arise in several ways. First, where a renewable parcel happens to cross multiple jurisdictional boundaries and private property lines, this new, artificially-drawn parcel has collected an array of rights holders. This is, at its most basic level, a land assembly problem. But the collection of property within one new renewable parcel also pulls together numerous rights to exclude, which do not always emanate from the surface and therefore exhibit more than an assembly problem. This is demonstrated by a second development scenario, which creates a renewable anticommons when a development is proposed on one piece of property that does not cross private or jurisdictional boundaries. This second type of parcel does not require any assembly of land, yet individual rights holders can still block renewable development. Entities within the renewable parcel without direct surface ownership rights could still impede the grant of a wind lease (where rights to a severed fugitive wind estate are

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[153] *See supra* text accompanying note 147.
[154] Heller, *supra* note 149, at 1222.

recognized, for example,[155] and a developer must lease the wind itself), existing holders of easements and mineral development rights could block the use of the surface, and multiple regulatory authorities could deny required permits.[156]

Regardless of the manner in which exclusion rights within a renewable parcel emerge — whether through the assembly of a new parcel that crosses jurisdictional and private property lines or through the acquisition of one existing piece of property for renewable development — exclusion rights present substantial impediments to developing the renewable parcel. These rights are held by the public and private owners of property within the parcel who could simply refuse to lease the property or wind or block the use of renewable technology. A number of municipal, state, and federal agencies also have opportunities to block the development through permitting processes, which are themselves rights of exclusion. Depending on the location of the parcel, the developer may have to obtain an incidental take permit under the Endangered Species Act, a permit under the Clean Water Act for dredge and fill activities, a Clean Water Act stormwater permit for earth disturbance activities, a hazard determination from the Federal Aviation Administration, a Spill Prevention, Control, and Countermeasure Plan from the EPA for potential fuel spilled on site (renewable plants require back-up generators), a permit under the Archaeological Resources Protection Act, and an authorization from the Bureau of Land Management or a permit from another federal agency that owns the land.[157]

Additionally, the renewable power plant developer may have to obtain a certificate of public convenience and necessity from the state's public utility commission,[158] state water rights, certifications under various state environmental statutes, a special use permit from one or several municipal

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[155] For a more in-depth discussion of severed wind rights and how these differ from traditional mineral rights (which, unlike severed wind rights, grant a developer automatic access to reasonable use of the surface), see Hannah Wiseman et al., *Formulating a Law of Sustainable Energy: The Renewables Component*, 28 PACE ENVTL. L. REV. (forthcoming 2011).

[156] Whether the exclusion rights within a renewable parcel arise from a grouping of multiple properties and jurisdictions within one parcel (an assembly-type problem) or the existence of multiple rights holders within one property is ultimately unimportant. In Heller's examples, certain anticommons arise from the breaking of property into small pieces as a result of inheritance, while others arise directly from regulation that recognizes too many types of rights within one piece of property. No matter the origin of these layered rights, the relevant anticommons qualities arise *after* rights creation.

[157] AM. WIND ENERGY ASS'N, WIND ENERGY SITING HANDBOOK 4-1 – 4-42 (2008), *available at* http://www.awea.org/sitinghandbook/downloads/Chapter_4_Regulatory_Framework.pdf.

[158] *See, e.g.*, 220 ILL. COMP. STAT. ANN. 5/16-115 (West 2010) ("Any alternative retail electric supplier must obtain a certificate of service authority from the Commission . . . before serving any retail customer or other user located in this State."); GREAT LAKES WIND COLLABORATIVE, GREAT LAKES COMM., STATE AND PROVINCIAL LAND-BASED WIND FARM SITING POLICY IN THE GREAT LAKES REGION: SUMMARY AND ANALYSIS 3 (2010), *available at* http://www.glc.org/energy/wind/pdf/GLWC-LandBasedSiting-Jan2010.pdf (explaining that most of the states in the Great Lakes region require wind facilities to "demonstrate consumer need for the electricity to be generated and receive a certificate of need from the appropriate regulatory authority").

zoning authorities, and construction approval from local airports.[159] Finally, a renewable developer must obtain permission from a transmission line owner to interconnect to the grid, which requires a series of tests to prove that the grid will be able to accommodate the new input of electricity.[160] A denial of any one of these permits or authorizations could block the project.

As an example of these layered exclusion rights, California is currently experiencing a surge in proposals for large solar plants.[161] One of the proposed solar plants in the early stages of review in California will require more than ten square miles of land (6,500 acres),[162] portions of which include private property and Bureau of Land Management acreage.[163] A proposed wind project in California, described in the introduction, similarly involves 15,500 acres of BLM, Native American, state, and private lands.[164] The Bureau of Land Management must authorize projects based on the preparation of an Environmental Impact Statement, determinations under the National Historic Preservation Act and Endangered Species Act, and consultations with Native American tribes.[165] Ultimately, the BLM could block the project by refusing authorization. In addition, the developer may not commence construction of a solar plant until it has complied with local airports' land use plans, towns' general plans for land use, and municipal and county codes.[166] A similar array of laws will apply in most other states,

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[159] *See* Cal. Energy Comm'n, Victorville 2 Hybrid Power Project, Final Commission Decision A-14-15 (July 2008), *available at* http://www.energy.ca.gov/2008publications/CEC-800-2008-003/CEC-800-2008-003-CMF.PDF (requiring the Victorville solar/natural gas plant to comply with the San Bernardino County General Plan, the San Bernardino County Development Code, the City of Victorville General Plan, the City of Victorville Municipal Code, City of Hesperia Municipal Code, and the Southern California Logistics Airport Specific Plan).

[160] For a more lengthy discussion of the multiple steps and permissions required for a renewable developer to site, construct, and begin operating a utility-scale renewable plant, see Wiseman et al., *supra* note 155.

[161] *See Large Solar Energy Projects,* CAL. ENERGY COMM'N, http://www.energy.ca.gov/siting/solar/index.html (last visited May 20, 2011) (on file with the Harvard Law School Library) ("Many large solar energy projects are being proposed in California's desert area on federal Bureau of Land Management (BLM) land.").

[162] U.S. BUREAU OF LAND MGMT. AND CAL. ENERGY COMM'N, SES SOLAR TWO PROJECT: STAFF ASSESSMENT AND DRAFT ENVIRONMENTAL IMPACT STATEMENT AND DRAFT CALIFORNIA DESERT CONSERVATION AREA PLAN AMENDMENT ES-1 (2010), *available at* http://www.energy.ca.gov/2010publications/CEC-700-2010-002/CEC-700-2010-002-SA-DEIS.PDF.

[163] *Id.* at ES-2.

[164] *See supra* text accompanying note 32.

[165] Memorandum of Understanding Between the U.S. Dept. of the Interior, Bureau of Land Mgmt. Cal. Desert Dist. and the Cal. Energy Comm. Staff Concerning Joint Environmental Review for Solar Thermal Power Plant Projects 1 (Aug. 8, 2007), *available at* http://www.energy.ca.gov/siting/solar/BLM_CEC_MOU.PDF.

[166] *See* Cal. Energy Comm'n, *supra* note 159 (requiring the Victorville solar/natural gas plant to comply with the San Bernardino County General Plan, the San Bernardino County Development Code, the City of Victorville General Plan, the City of Victorville Municipal Code, City of Hesperia Municipal Code, and the Southern California Logistics Airport Specific Plan). *Cf.* CAL. PUB. RES. CODE § 25514(a)(2) (West 2010) (requiring the Energy Commission, in its final report on site certification, to include "[a]pplicable local, regional, state, and federal standards, ordinances, and laws, including any long-range land use plans or guidelines adopted by the state or by any local or regional planning agency, which would be applicable but for the exclusive authority of the commission to certify sites and related facilities" (for

where streamlined permitting processes have not been implemented for renewable development.[167]

A developer attempting to build on a renewable parcel that crosses several municipal boundaries will face even more layers of regulation in most states.[168] The town of Cohocton, New York, for example, prohibits wind turbines higher than 500 feet,[169] while the neighboring town of Springwater sets a height limit of 400 feet for commercial turbines.[170] Cohocton requires that an industrial windmill be set back one-hundred feet "plus the maximum structure height" from the property line — a setback of 500 feet if 400-foot tall turbines were installed.[171] Springwater, on the other hand, requires that the turbine be one and one-half times its height from the property line — 600 feet from the property line for the same turbine height.[172] Cohocton requires that the developer post a bond in an amount sufficient to remove the windmill,[173] while Springwater requires a bond in an amount "no less than 125% of the cost of the removal of the tower and restoration of the site and roadways."[174]

Conflicting regulations are not themselves exclusion rights but rather inconvenient barriers to a developer. Municipalities and private property owners, however, also have the explicit power to exclude a developer from a renewable parcel. The largest wind farm on the East Coast, for example, covers four New York towns and numerous farming plots,[175] and town officials and residents could have blocked the proposed development through several venues. One landowner reneged on a wind lease, and town officials

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thermal facilities)); CAL. PUB. RES. CODE § 25500 (West 2010); (preempting all local authority over siting); CAL. PUB. RES. CODE § 25502 (West 2010) (only requiring developers proposing the construction of *thermal* power plants and power lines to apply for a site certificate). Wind farms and solar photovoltaic plants are not thermal plants (they do not heat up water to turn a turbine) and thus do not receive siting certificates from the California Energy Commission. For a more detailed discussion of states that preempt local authority over power plant siting – including the siting of renewables, *see* Wiseman et al., *supra* note 155.

[167] *See, e.g.*, AM. WIND ENERGY ASS'N, *supra* note 157, at 4-41 (explaining that "[a]t most proposed wind energy project sites, one or more local approvals will be required"); *id.* at 4-35. (explaining that Kansas vests all siting authority in local governments); Katherine Daniels, *One Community's Experience with Wind Development*: *An Interview with Richard J. Graham, Esq.*, N.Y. STATE ENERGY RESEARCH AND DEV. AUTH. 1–3, http://www.powernaturally.org/Programs/Wind/toolkit/donovaneditsdanielsNYSERDAwindinterview2grahamcomments accept.pdf (last visited May 20, 2011) (on file with the Harvard Law School Library) (explaining how the county and towns worked together in determining acceptable terms for the lease and in determining whether they would accept the project).

[168] *See* Patricia E. Salkin & Ashira Pelman Ostrow, *Cooperative Federalism and Wind: New Framework for Achieving Sustainability,* 37 HOFSTRA L. REV. 1049, 1065 (2009) (explaining that "in many states, local zoning authorities are primarily responsible for approving and siting wind farms and other energy facilities").

[169] Cohocton, N.Y., Windmill Local Law § II (C)(1) (2006), *available at* http://www.gflrpc.org/programareas/wind/LL/CohoctonWindmillLaw.pdf.

[170] Springwater, N.Y., Local Law No. 1, Wind Energy Conversion Systems § 2(3)(H)(2) (2006), *available at* http://www.gflrpc.org/programareas/wind/LL/Springwater_WECS.pdf.

[171] Cohocton, N.Y. Windmill Local Law § II (B)(1)(a) (2006).

[172] Springwater, N.Y. Wind Energy Conversion System § 2(3)(C), (2006).

[173] Cohocton, N.Y. Windmill Local Law § II (F)(4) (2006).

[174] Springwater, N.Y. Wind Energy Conversion System § 2(3)(J)(2) (2006).

[175] Daniels, *supra* note 167, at 1.

initially rejected the lease payment plan proposed by the developer.[176] None of the four towns underlying the renewable parcel initially had zoning laws that expressly permitted wind development when the project was first proposed;[177] each town eventually revised its code to allow wind development but required the developer to first complete a site plan review and receive a special use permit.[178] Further, the law for the proper building inspection of the site was unclear. Town officials first insisted on reviewing safety through a typical building inspection under New York's Uniform Fire and Building Code, but they eventually reached an agreement with the developer to accept certificates of completion from contractors as evidence of satisfactory construction.[179] This complex zoning and permitting process lagged on for approximately six years before a turbine was finally operational.[180]

Some renewable parcels also cross state borders, thus increasing the potential for conflicting regulations and rights of exclusion within a given parcel. A map prepared by the Western Governors' Association and the Department of Energy suggests that more than half of the best western areas for renewable development lie over the borders of two or three states.[181] According to this map, the ideal parcel for a solar developer, for example, may plausibly lie directly over the intersection of southwest New Mexico and southeast Arizona, or eastern California and western Arizona.[182] There is also evidence that trans-state renewable projects are not only hypothetical; the aptly named "Stateline" wind farm, which has 300 megawatts of capacity, is located in Umatilla County, Oregon, and Walla Walla County, Washington.[183] The renewable developer of this type of parcel must obtain multiple permits from several states and municipalities, whose requirements for permit approval may differ substantially. In some cases, the developer will have to conduct several lengthy environmental reviews, each for a different state.[184]

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[176] *Id.* at 1–2, 5.

[177] *Id.* at 4 (explaining that none of the towns had "land use regulations to allow wind energy facilities").

[178] *Id.*

[179] *Id.* at 5.

[180] *Id.*

[181] W. GOVERNORS' ASS'N & U.S. DEP'T OF ENERGY , *supra* note 14, at 13 (showing more than fifteen "Qualified Resource Areas" that fall over the borders of two or three states). To identify Qualified Resource Areas, or QRAs, the Western Governors' Association first mapped out the areas of the Western United States, Canada, and Northern Mexico with the highest incident solar radiation and wind velocity. It then modified these areas based on statutory and regulatory limitations and geographic limitations within these areas that would make development of renewable technology difficult or impossible. *Id.* at 6–11.

[182] *Id.* at 12.

[183] *NextEra Energy Resources Portfolio Type — Fuel Type*, NEXTER ENERGY Resources, Jan. 31, 2011, http://www.nexteraenergyresources.com/content/where/portfolio/pdf/portfolio_by_fuel.pdf (last visited May 20, 2011) (on file with the Harvard Law School Library).

[184] Washington State, for example, has a State Environmental Policy Act, which requires all branches of government considering a proposed development to prepare detailed statements about the environmental impacts of the proposed action and possible alternatives. *See* WASH. REV. CODE ANN. §43.21C.030 (a)-(d) (West 2010). California requires a similar analysis under its California Environmental Quality Act. *See* CAL. PUB. RES. CODE § 21080.1 (West

The property regime of a renewable parcel, with its many layered private, municipal, state, and federal rights and regulations, appears to match, to some degree, all three of Heller's characteristics for an anticommons. First, the myriad property owners within the proposed parcel — ranchers, farmers, Native American tribes, homeowners, the federal government, and states — ensure that "multiple owners hold effective rights of exclusion to a scarce resource."[185] Where renewable parcels are imposed upon an existing map of private property lines and jurisdictional boundaries, creating an apparent assembly problem, multiple parties within the parcel hold effective rights to exclude. Beyond merely assembling the land, the developer must also contend with multiple jurisdictional directives. Where a renewable development is proposed on property owned by one individual within one jurisdiction, regulatory methods of exclusion remain at the local, state, and federal permitting levels; various private rights holders also hold rights in the form of mineral development interests, ownership of the wind itself, or private use rights. These exclusion rights are problematic in the renewables context because renewable parcels are also scarce; not all areas within a given region, state, or municipality have adequate resources for efficient renewable development. Even those areas with strong sunlight and wind often have existing conflicting land uses that prevent such development.[186] Exclusion rights to scarce resources can therefore stifle efficient development.

Second, the multiple owners' rights within a scarce renewable parcel allow these owners to "prevent other owners from obtaining a core bundle of rights in an object . . . ."[187] Where a renewable parcel crosses jurisdictional lines, if one municipality wished to accept a lease offer from a wind developer, a neighboring municipality within the proposed renewable parcel could block the proposed development through zoning. Further, the Fish and Wildlife Service could deny the development on the grounds that it would unlawfully take a species within the municipality;[188] the BLM — if there is federal land involved — could refuse to authorize the project based on environmental or cultural concerns;[189] and state agencies could deny nec-

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2010) (requiring an environmental impact report or negative declaration). A federal environmental impact statement must also be completed for proposed developments on Bureau of Land Management and other federal lands under the National Environmental Policy Act. *See, e.g.*, Notice of Intent to Prepare an Environmental Impact Statement for the Proposed Tule Wind Project and the Proposed East County Substation Project, San Diego, CA, 74 Fed. Reg. 68860 (Dec. 29, 2009) (describing the required environmental impact statement).

[185] Heller, *supra* note 17, at 673.

[186] *See, e.g.*, W. GOVERNORS' ASS'N & U.S. DEP'T OF ENERGY, *supra* note 14, at 11 (describing the land use limitations that modified the initial areas identified for the most economical development of renewables).

[187] Heller, *supra* note 17, at 673.

[188] *See, e.g.*, CAL. ENERGY COMM'N, RENEWABLE ACTION TEAM, MILESTONES TO PERMIT CALIFORNIA RENEWABLE PORTFOLIO STANDARDS ENERGY PROJECTS BY DECEMBER 3 (2010), *available at* http://www.energy.ca.gov/33by2020/documents/2009-10-15_Milestones_REAT.PDF (describing obtaining an incidental take project as a "key milestone" for solar projects).

[189] *See, e.g.*, *Questions and Answers on BLM's Directive on Sage-grouse Management*, BUREAU OF LAND MGMT., http://www.blm.gov/wo/st/en/info/newsroom/sage_grouse_conservation/sage-grouse_FAQ.html (last visited May 20, 2011) (on file with the Harvard Law

essary environmental permits. Even a renewable parcel superimposed upon one piece of private property within one jurisdiction contains multiple rights holders that may prevent acquisition of an adequate rights bundle. The transmission line authority could deny a request to interconnect to the grid, the owner of the wind rights (where they exist) could block the right to lease the fugitive resource, the municipality could refuse to issue a rezoning or variance for the turbines, and multiple state and federal agencies could deny required permits.

Most importantly from the perspective of the anticommons, these competing owners also lack a "clear hierarchy of decisionmaking authority."[190] No rights owners may force others to give up a right to exclude. States *could* legislatively declare authority over local land use decisions for renewables and thus could remove the municipal right to exclude (as some have done),[191] but many have left nearly exclusive land use authority to municipalities.[192] A state could therefore grant an environmental certificate for a renewable power plant, for example, but the municipality could refuse to authorize construction on the proposed site. There would be no clear hierarchy to resolve the conflicting assertions of rights. Partially due to this lack of hierarchical authority, as well as the many owners of rights within a renewable parcel, the objects within the parcel may be difficult to alienate or use productively. Commercial operation of the East Coast's largest wind farm began in 2006;[193] the permitting and leasing process began seven years earlier.[194]

Ultimately, renewable parcels may be better described as "complicated collections of rights" than as an anticommons. But perhaps this could be true of any property claimed to have anticommons qualities. In a Russian storefront in the 1990s, one entity had to approve the lease, another had to

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School Library) (describing how the BLM might deny a proposed traditional or renewable energy development due to interference with sage-grouse habitat).

[190] Heller, *supra* note 17, at 673.

[191] *See infra* notes 385–86 and accompanying text (describing preemption of local authority in California and Minnesota).

[192] *See, e.g.*, 55 ILL. COMP. STAT. ANN. 5/5-12020 (West 2010) ("A county may establish standards for wind farms and electric-generating wind devices."); 65 ILL. COMP. STAT. ANN. 5/11-13-26 (West 2010) ("A municipality may regulate wind farms and electric-generating wind devices within its zoning jurisdiction and within the 1.5 mile radius surrounding its zoning jurisdiction."); KAN. ENERGY COUNCIL, WIND ENERGY SITING HANDBOOK: GUIDELINE OPTIONS FOR KANSAS CITIES AND COUNTIES 2 (Apr. 2005) (explaining that "[t]he authority to regulate land use in Kansas is under the purview of local governments" and describing four Kansas counties' wind energy regulations); *supra* notes 169–74 (describing New York towns' varied ordinances addressing wind turbines); GREAT LAKES WIND COLLABORATIVE, *supra* note 158, at 6 (explaining that in Indiana, "[s]iting and permits for wind development are handled entirely at the local level").

[193] *Maple Ridge Wind Farm*, HORIZON WIND ENERGY, http://www.horizonwind.com/projects/whatwevedone/mapleridge/ (last visited May 20, 2011) (on file with the Harvard Law School Library) (explaining that commercial operation of the wind turbines on the farm began in 2006).

[194] Daniels, *supra* note 167, at 1 (explaining that in 1999, Horizon began "meeting with local officials and school districts" to discuss the proposed development and leasing and payment options).

approve the price of the good sold, a third claimed use rights to the store, and multiple government agencies could deny permits. Under one view this storefront exemplifies complicated, layered rights to one piece of quasi-private property rather than an embodiment of a unique property form. Regardless of the label chosen, the more exclusion rights that exist within one property, and the less hierarchical organization there is among these rights, the more difficult development becomes. This is the case for Russian storefronts, renewable parcels, and many other forms of property.

### *C. Renewable Parcels as Regulatory Commons*

One must look beyond the exclusion rights to a renewable parcel to understand the depth of the challenge to renewable energy development. In 2003, William Buzbee noted that when the overuse or underuse of a resource is observed, few tend to notice a corresponding regulatory problem that can emerge in the form of the regulatory commons.[195] A regulatory commons is a regulatory environment in which no one government entity controls the policy realm or has sufficient incentive to lead it. Within this commons, "social ills match no particular political-legal regime or jurisdiction, but instead encounter fragmented political-legal structures";[196] there is a "mismatch of underlying resources and government jurisdiction."[197] William Buzbee introduced the concept of the regulatory commons in response to Heller's anticommons[198] and suggested that regardless of whether a resource is over- or under-used, the regulatory context surrounding that resource sometimes creates a commons problem, resulting in regulatory gaps.

The regulatory commons differs from an anticommons in several respects. First, it focuses on the governance framework that overlies a resource; whereas an anticommons may result in underinvestment in a resource itself, the regulatory commons involves underinvestment in regulatory opportunities to address a problem related to the resource — a problem that often has multijurisdictional effects. Second, while the anticommons theory views regulations as one of the many types of exclusion rights within one parcel — rights that cause underuse — the regulatory commons theory sees the regulations (or lack thereof) as problematic because they lead to some other bad result — pollution and sprawl, for example. In the case of renewables, both anticommons and regulatory commons happen to lead to the same bad result. The layered and sometimes competing private use rights and regulations within one parcel could lead to underuse of the parcel. Furthermore, these same regulations, which often emanate from multiple jurisdictions, create an appearance of overregulation but in fact may miss the boat entirely. With each jurisdiction addressing different aspects of the pro-

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[195] Buzbee, *supra* note 18, at 4–5.
[196] *Id.* at 6.
[197] *Id.* at 7.
[198] *See id.* at 6 (describing the regulatory commons as the converse of Hellers's anticommons).

ject — or the same aspects of the project in conflicting ways — certain guidance to the developer may be omitted entirely. No one government, however, takes the lead to collect these regulations, create clearer guidance, and reduce transaction costs — guidance which could better enable renewable development and also ensure that the development is comprehensively governed to protect the public interest.

Buzbee provides three examples of regulatory commons, including aquaculture, urban sprawl, and global climate change.[199] In the cases of both aquaculture and urban sprawl, the underlying resource in question is not a commons. Through aquaculture, producers of fish have avoided the commons resource problem by privatizing the fishery resource and raising their own varieties of fish in individual ponds or fenced off portions of the ocean.[200] While this averts the classic commons tragedy, it has negative effects beyond the fishery fences. Bioengineered fish may escape into surrounding environments, for example, and the pollution from fish farms may have widespread impacts.[201] Yet no one institution has primary jurisdiction over aquaculture.[202]

Urban sprawl involves a similarly local activity with widespread effects. Homeowners within individual localities create this problem by moving toward the urban fringe.[203] As a result of this movement toward the suburbs, more roads must be built to accommodate the exiting masses, newly-constructed houses break up ecosystems, and the urban core suffers.[204] Although individual municipalities could partially remedy this problem through zoning, they do not always have control over or the incentive to curb its regional effects, and few states have taken up the charge.[205]

A third type of regulatory commons emerges from a classic commons situation — climate change[206] — but has unique problems that extend beyond the commons resource. In the case of climate change, the atmosphere is a physical commons. Individuals may emit unlimited quantities of greenhouse gases into the atmosphere and may not exclude others from doing so; the result may be tragedy for all, in the form of rising temperatures and seas, increased rates of disease, and more severe storms.[207] As with all commons, regulation is needed to address these adverse effects. Property rights could be allocated in the form of a cap and trade system, for example, but no one government is "logically situated to take the lead and address global warming's causes and anticipated harms."[208] Several nations and even states have taken piecemeal approaches to the problem, but none have come close to

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[199] *Id.* at 12.
[200] *Id.* at 8.
[201] *Id.* at 8–9.
[202] *Id.* at 9.
[203] *See id.* at 10.
[204] *Id.*
[205] *See id.* at 10.
[206] *Id.* at 11.
[207] *Id.* at 12.
[208] *Id.* at 13.

solving it. In Buzbee's words, within a regulatory commons, there may be "a lot of regulation" of a resource, but this does not mean that there is "too much regulation."[209] The multi-jurisdictional half-solutions to one component of the resource problem may falsely create an illusion of overregulation, while in fact there remain significant regulatory gaps.

Renewable development could, in several respects, emerge as a fourth example of a regulatory commons. The underlying resource has anticommons qualities: numerous rights to exclude developers from the physical renewable parcel lead to underinvestment in this resource. But these numerous rights to exclude can also create a regulatory conundrum: there is not always an "obvious political-legal regime with regulatory primacy over them."[210] As described above, municipal, state, tribal, and federal governments, as well as private property owners, may all have some rights to the parcel, some of which overlap. But renewable developments — like Buzbee's urban sprawl, aquaculture, and climate change — have impacts within and beyond their physical borders, and the multiple governments with rights to exclude developers from a renewable parcel do not always have the jurisdiction or the incentive to control these impacts.

In the case of renewable development, the social ill that is mismatched with the political-legal regime could be viewed as the underdevelopment of renewables due to siting difficulties (and the attendant ills of energy dependence and climate change, among others). In this scenario, the many governments with slices of jurisdiction over renewable parcels may have inadequate incentives to fix the social ill for at least three reasons. First, "numerous regulators could be blamed for the ill," in that no one regulator may be "perceived as the institution most responsible for a problem or its correction."[211] Indeed, many towns have failed to enact zoning or building codes that recognize renewables, while the towns' home states similarly lack regulations for renewable siting;[212] the institution responsible for impeding renewable development in this situation is not entirely clear. Second, if one government institution were to fix the underdevelopment problem, other institutions might enact competing or even conflicting solutions and take credit for this move.[213] In a state where renewable siting policy is left primarily to municipalities, towns could enact various zoning codes, only to later be preempted by the state or to find that their code directly conflicted with that of neighboring towns, where a development was proposed. Finally, governments may prefer the status quo of layered and sometimes conflicting

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[209] *Id.* at 7.
[210] *Id.* at 23.
[211] *Id.* at 31.
[212] *See, e.g.*, *supra* text accompanying note 167 (describing New York towns' failure to address renewables in their code). New York does, however, provide some guidance as to potential content for local codes. *See* New York State Energy Research and Development Authority, Wind Energy Model Ordinance Options (Oct. 2005), *available at* http://www.powernaturally.org/programs/wind/toolkit/2_windenergymodel.pdf.
[213] Buzbee, *supra* note 18, at 32–33.

regulation of renewable development.[214] With respect to renewables, for example, a state may not want to take away municipalities' authority over siting — even if that authority conflicts — and the states and municipalities may be fearful of limiting in any respect the strong property rights of private owners. All of these failures could lead to a regulatory commons, where the many institutions with partial jurisdiction to fix the social ill may lack the adequate incentives to address it.

Alternatively, or additionally, the social ill that may be mismatched with the legal regime for renewables could be analogized to urban sprawl. While conflicting regulations and a lack of primary jurisdiction over some aspects of renewable development can lead to underdevelopment, this regulatory morass can also fail to address legitimate public concerns surrounding renewable development, including land use and environmental impacts, among others.

### *D. The Tragedy of Renewable Governance*

Renewable parcels' regulatory commons and anticommons-type qualities are not all tragic. Renewable developments require large infrastructural decisions that should not be made lightly. Regulation is essential in the renewables field to address safety concerns, visual and noise effects,[215] water use,[216] habitat disruption,[217] and local economic impacts, among other effects. In separate pieces, Sara Bronin and Uma Outka have described the potential land use impacts of renewables, including "energy sprawl"[218] and the associated possibility of "severe" land impacts.[219] Although other energy technologies — including nonrenewables — also have a large land footprint,[220] these effects should not be ignored in the renewables area. Outka has also highlighted the importance of effectively planning for and mitigating the land and wildlife impacts of renewable development through

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[214] *See id.* at 33–34.

[215] *See* Theocharis Tsoutsos et al., *Environmental Impacts from the Solar Energy Technologies*, 33 ENERGY POL. 289, 290 (2005) (referencing the visual effects of solar panels, as well as noise effects during the construction or demolition process); Leda-Ioanna Tegou et al., *Environmental Management Framework for Wind Farm Siting: Methodology & Case Study*, 91 J. ENVTL. MGMT. 2134, 2134 (referencing visual and noise effects of wind farms).

[216] *See* Todd Woody, *Alternative Energy Projects Stumble on a Need for* Water, N.Y. TIMES, Sep. 29, 2009, at B1 (explaining that renewable energy can sometimes "depend on a huge amount of water"). Solar thermal plants, for example, heat up a substance, which is then used to boil water and turn a turbine to produce electricity. PAUL BREEZE, POWER GENERATION TECHNOLOGIES 190 (2005).

[217] *See infra* note 415.

[218] Sara Bronin, *Curbing Energy Sprawl*, 43 CONN. L. REV. (forthcoming 2011).

[219] Uma Outka, *The Renewable Energy Footprint*, 30 STAN. ENVTL. L. J. (forthcoming 2011) (manuscript at 9).

[220] *See id.* at 8 (citing Robert McDonald, et. al., *Energy Sprawl and Energy Efficiency: Climate Policy Impacts on Natural Habitat for the United States of America*, PLoS ONE 4(8): e6802 (2009)) (describing a Nature Conservancy study that found biomass to have the largest "land footprint," followed by wind, hydropower, petroleum, and solar photovoltaics and the next four highest consumers of land).

governmental action by, for example, encouraging the development of renewables on "brownfields" (polluted lands) and existing infrastructure as well as comprehensively considering impacts in the siting process.[221] Indeed, complex regulation can be beneficial in many cases and is necessary for safe and effective renewable development. As Heller points out, a subdivision where all property owners have agreed to restrictive covenants is an anticommons,[222] but it may benefit the community. Some of the negative traits of anticommons and regulatory commons, however, must be avoided in the renewables realm; regulation should continue, but the many exclusion rights contained within the regulations should be combined and streamlined into a manageable package. Without this governance change, too little development on renewable parcels will occur.

The current governance system allows too little renewable development because property with anticommons-type qualities creates high transaction costs. In Heller's privatized Soviet storefront example, an individual wanting to lease the store and sell goods from it might have to bribe officials or hire someone to identify the multiple individuals who control permits and to sort out their rights.[223] The transaction costs do not rise to this level in the renewables realm, but they are still quite high. Because "[t]he process for obtaining a . . . siting permit varies not only between states, but also within each state,"[224] a developer must identify the numerous permits to be obtained from municipal, state, and federal officials, and the environmental, cultural, and historic reviews that must first be completed. Then, the developer must determine the correct officials to work with and participate in a number of public hearings as part of the permitting process. As the American Wind Energy Association directs developers: "Early in project development, it is important to conduct a detailed analysis of the potential permits, approvals, and consultations that might apply to a wind project."[225]

In some cases, overcoming the transaction costs necessary to identify the many rights holders in a renewable parcel and the required siting and development permits is not enough, thus compounding the tragedy; one owner with rights to the parcels may effectively block all development. In Texas, for example, the state's electric reliability agency identified Gillespie County as one of the top twenty-five areas for wind development. In response, the four county commissioners passed a resolution opposed to "the construction and installation of industrial wind farms in Gillespie County and the surrounding Hill Country area."[226] Towns around the country have

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[221] *See generally id.*
[222] Heller, *supra* note 17, at 666.
[223] *Id.* at 643.
[224] Salkin & Ostrow, *supra* note 168, at 1065.
[225] AM. WIND ENERGY ASS'N, *supra* note 157, at 4-1.
[226] *County Commissioners Say No to Wind Farms*, FREDERICKSBURG STANDARD, Dec. 27, 2007, *available at* http://www.fredericksburgstandard.com/articles/2007/12/27/news/03news.txt.

similarly placed moratoria[227] or bans[228] on wind development and have blocked proposed projects. The transaction costs of renewable development, as well as the ability for rights owners to trump the wishes of other owners within renewable parcels, have contributed to underuse of some of the best areas for renewable development.

Further, the numerous fragmented governance structures that apply to renewable parcels appear at first sight to overregulate renewable development; the many federal, state, municipal, and tribal rules and rights that apply seem to provide an abundance of guidance to renewables developers, thus enabling siting. But they sometimes leave regulatory gaps[229] and provide insufficient or conflicting guidance, thus failing to provide a comprehensive siting regime. The many layers of regulation that apply to siting sometimes miss aspects of siting regulation altogether — such as guidance on equipment specifications required by building codes[230] — and they further contribute to the underdevelopment problem. Renewable parcels therefore face a regulatory commons problem, wherein government agencies have failed to take the helm in collecting rights and filling regulatory gaps in the renewables arena. Perhaps due to a lack of adequate incentive to address the underdevelopment problem, only a few states have chosen to systematize, collect, or preempt local regulation of aspects of renewable siting, for example, and thus have failed to create a comprehensive statewide system for renewable siting.[231] While streamlining is not the only method of avoiding the tragedy of the regulatory commons, this type of consolidated system would fill regulatory gaps by providing uniform zoning and building code provisions or requiring consistent environmental review. In many cases, this type of consolidation and gap filling has not occurred where needed.

### *E. Transmission Assurance: A Final Challenge Necessitating Regional Governance of Renewables*

In addition to the anticommons tragedy and potential regulatory commons problems, a final element of renewable development that necessitates regional action is renewables' wholesale reliance upon transmission. A large wind or solar farm is useless if not connected to a transmission line that

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[227] *See, e.g.*, Kristin Choo, *The War of Winds*, ABA J., Feb. 1, 2010 (discussing moratoria on wind development passed by New York towns).

[228] Zimmerman v. Cnty. Bd. of Comm'rs., 218 P.3d 400, 413 (Kan. 2009) (upholding a Wabaunsee County, Kansas Board of Commissioners' ban on commercial wind turbines); Choo, *supra* note 227.

[229] *See, e.g.*, Outka, *supra* note 219 (manuscript at 35–36) (describing how local siting ignores comprehensive impacts of renewable energy and how federal processes such as the National Environmental Policy Act also fail to account for cumulative environmental impacts.)

[230] *See, e.g.*, *supra* text accompanying note 212.

[231] *See supra* note 168; *see also* Outka, *supra* note 219, (manuscript at 22–23) (describing how even states with centralized siting authority only offer centralized siting for relatively large facilities — a benchmark that many renewable developments may not meet).

carries the electricity generated to consumers.[232] To complicate this problem, some of the best areas for renewable development are not only on state borders but also in regions far from population centers. There is a large ideal renewable zone in western Utah, for example, which is far south of Salt Lake City and far north of Las Vegas.[233] Another zone lies over southeast Colorado and the tip of the Oklahoma panhandle, far from Denver, Boulder, and the large Texas and Oklahoma cities.[234] And the most substantial renewable energy zone identified by the Western Governors' Association covers much of New Mexico, thus offering renewable opportunities for Albuquerque and Santa Fe but not for nearby states' most populous cities.[235] Transmission is necessary to transport the vast quantities of renewable energy that could be produced to populous areas, and the construction of thousands of miles of shared infrastructure is no easy task. The federal government has attempted to address this challenge by modifying the process for siting transmission lines,[236] but states and their municipal agents still maintain the bulk of authority over the process and tend to block proposed transmission projects.[237]

Even within states, the transmission challenge for renewable energy can be insurmountable without substantial government intervention. In Texas, for example, where the strongest wind blows in the western portion of the state,[238] the legislature set a renewable portfolio standard, which identifies a percentage of electricity that must be provided by renewables within a certain timeframe. It later raised the standard.[239] In order to ensure that more renewable energy would be available to meet this higher standard, the legislature passed several bills to jumpstart wind energy development. The bills

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[232] *See, e.g.*, *Western Renewable* Energy Zones, W. GOVERNORS' ASS'N, http://www.westgov.org/index.php?option=com_content&view=article&id=219&Itemid=81 (last visited July 2, 2010) (on file with the Harvard Law School Library) ("There is broad agreement that a significant increase in the use of renewable energy is dependent on expansion of the existing transmission grid.").

[233] *See* W. GOVERNORS' ASS'N & U.S. DEP'T OF ENERGY, *supra* note 14, at 12.

[234] *See id.*

[235] *See id.*

[236] *See* Brown and Rossi, *supra* note 41, at 741 (explaining that the Energy Policy Act of 2005 allowed the "Department of Energy to designate National Interest Energy Transmission Corridors" and empowered the Federal Energy Regulatory Commission "to preempt state siting authorities to expand transmission in limited regions of the country facing transmission constraints").

[237] *Id.* at 718 (explaining that municipalities — to which much of state siting authority has been delegated — have conflicting objectives that can serve as substantial obstacles to the transmission line siting process); *see also* Jim Rossi, *Moving Public Law Out of the Deference Trap in Regulated Industries*, 40 WAKE FOREST L. REV. 617, 647 (2005) (observing that "[t]wenty-two states even authorize localities to block transmission expansion projects" and that transmission projects "frequently generat[e] state and local opposition").

[238] *Texas' Renewable Energy Resources,* TEXAS STATE ENERGY CONSERVATION OFFICE, http://www.infinitepower.org/reswind.htm (last visited May 20, 2011) (on file with the Harvard Law School Library) (explaining that "[t]he Panhandle contain[s] areas with winds precisely suitable for electric power generation").

[239] *See Texas Renewable Portfolio Standard*, *supra* note 113 (explaining the two standards).

required the Texas Public Utility Commission (PUC) to identify Competitive Renewable Energy Zone or "CREZ" areas.[240] These areas were to be the "hot spots" for wind energy renewable development and were to be identified based on the strength of the wind in a given region and wind companies' commitment and financial ability to develop in the region.[241] Once the CREZ areas were identified, the legislature directed the PUC to map out transmission zones[242] for these renewable areas, which would carry electricity to Dallas, Houston, Austin, and other populous parts of the state.[243] The PUC was to choose utility companies that would commit to developing the transmission and then solidify the transmission routes through administrative proceedings.[244] These bills have been surprisingly successful and have spurred a flurry of wind development in the state; Texas now produces more wind energy than any other state.[245] With an assurance of transmission, wind developers are able to move forward with their projects.

Western states have recognized the need for renewable energy transmission development and have embarked upon a project similar to Texas's CREZ areas. As Texas has already done, the Western Governors' Association aims to identify "those areas . . . that feature the potential for large scale development of renewable resources in areas with low environmental impacts" and to "facilitate the development of high voltage transmission to those areas."[246] It has already made progress toward this goal, as it has completed a map of the WREZ areas and is beginning to discuss transmission plans.[247] Further, the Association has resolved to support federal policies that "[e]ncourage proactive, transparent, stakeholder-driven regional transmission expansion planning" and "defer to existing regional and sub-regional processes that meet such standard."[248] But if there is no agency to implement the transmission plan, as the Public Utility Commission did in Texas, or to advise developers regarding development in the WREZ areas,

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[240] *See* Senate Bill 20 § 3(g)(1), enrolled version (July 2005), *available at* http://www.capitol.state.tx.us/tlodocs/791/billtext/pdf/SB00020F.pdf (directing the Texas Public Utility Commission to "designate competitive renewable energy zones").

[241] Senate Bill 20 § 3(g)(1),(3).

[242] Senate Bill 20 § 3(g)(2).

[243] *See* ERCOT, COMPETITIVE RENEWABLE-ENERGY ZONES TRANSMISSION OPTIMIZATION STUDY 10 (2008), *available at* http://www.ercot.com/content/news/presentations/2008/ERCOT_Website_Posting.zip (after opening zip file, follow "CREZ TOS STUDY FINAL" file link).

[244] Senate Bill 20 § 2(e).

[245] *Texas Renewable Portfolio Standard*, *supra* note 113 (describing Texas as "the nation's leader in wind energy").

[246] W. GOVERNORS' ASS'N & U.S. DEP'T OF ENERGY, *supra* note 14, at Executive Summary.

[247] *Id. See also WREZ Transmission Model Page*, W. GOVERNORS' ASS'N, http://www.westgov.org/index.php?option=com_content&view=article&catid=102%3Ainitiatives&id=220%3Awrez-transmission-model-page&Itemid=81 (last visited May 20, 2011) (on file with the Harvard Law School library) (describing efforts to suggest ideal transmission routes).

[248] W. Governors' Ass'n, *Clean and Diversified Energy for the West*, Policy Resolution 06-10 (June 11, 2006), *available at* http://tribalclimate.org/PDFs/WGAResolutiononclean-energyforthewest.pdf.

regional renewables development in the West may not occur at the pace that it needs to. For areas like the Midwest that have strong wind potential but no identified renewables areas or transmission plans, the pace of development may be even slower. Potential developers in promising renewable areas will not have any assurance that a transmission line will be built or that the costs of the line will be shared by other renewable developers. And without this assurance, development of renewable infrastructure may be too risky and expensive.

To make the renewable anticommons and regulatory commons manageable, as well as to solve transmission assurance problems, some of the property rights within renewable parcels must be bundled together and placed within the control of one regional entity. The following Part describes existing models to suggest how this form of governance could be effectively organized.

## III. Models for Regional Governance of the Anticommons

As described in Part II, utility-scale renewable energy development faces two distinct challenges. First, the multiple rights to exclusion within a renewable parcel create a problem with anticommons elements, and combined regulatory rights over the parcel may lead to a regulatory commons tragedy. Second, renewable projects rely upon an assurance of available transmission lines to transport their product to population centers, and these transmission lines must typically cross municipal and even state barriers. Both of these impediments necessitate a regional solution.

Fortunately, states, municipalities, and federal agencies have already dealt with similar challenges in areas outside of the energy field that can provide some precedent for a regional solution. The states within the Susquehanna River Basin, for example — all of which share the river's water — identified challenges with strong parallels to the renewables tragedy: "[t]he water resources of the basin are presently subject to the duplicating, overlapping, and uncoordinated administration of a large number of governmental agencies which exercise a multiplicity of powers resulting in a splintering of authority and responsibility."[249] States within the Delaware River Basin described nearly identical barriers to effective management, observing that the basin's water resources were subject to administration by "forty-three State agencies, fourteen interstate agencies, and nineteen Federal agencies,"[250] all of which also exercised a "multiplicity of powers"[251] over the resources.

The problems faced by users of shared resources beyond the renewables arena align somewhat closely with the challenges in the renewable energy

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[249] Susquehanna River Basin Compact, Preamble (July 17, 1968), *available at* http://www.srbc.net/about/srbc_compact.pdf.

[250] Delaware River Basin Compact, Preamble (Nov. 2, 1961), *available at* http://www.state.nj.us/drbc/regs/compa.pdf.

[251] *Id.*

area, and the lessons from the regional organizations that address these problems can inform regional energy boards. This is not to say that shared resources such as rivers and lakes are identical to the shared land and fugitive resources within a renewable parcel.[252] But the institutions formed to address the multiple and sometimes competing rights to water resources at minimum suggest that regional governance is possible and provide a useful analogy. This Part examines these existing organizations as models and also looks to an informal regional organization that has already emerged in the renewables area.

### *A. Informal Planning for Shared Renewable Zones*

This Article focuses most closely on interstate organizations that have well-developed institutional structures and formalized mechanisms for implementing and enforcing regional rules. Only these types of institutions will ensure effective utility-scale renewable development. Within the energy area, however, several less formal organizations have already emerged, and these demonstrate that states are interested in forming regional alliances, including alliances geared toward renewable energy.

All of the regional organizations addressed here have some unique element of relevance to renewables. Western Renewable Energy Zones are of course directly relevant, despite their lack of regulatory authority. River basin commissions have some land use authority in order to protect water quality, and they have also been active in responding to recent energy developments in the Northeast, suggesting that they have relatively effective structures for addressing energy development.[253] Finally, the Tahoe River Basin Commission has direct and extensive land use authority — an element that will be essential for a Regional Energy Board. I do not intend to suggest, however, that these are the only relevant regional organizations to be considered. Due to space limitations, this Article does not discuss in detail many other regional organizations that could provide equally or more effective models for Regional Energy Boards.

#### 1. *The Western Governors' Association's Western Renewable Energy Zones Effort*

The Western Governors' Association is a regional organization specifically oriented toward renewable energy through its "Western Renewable En-

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[252] Water and renewable development do share, on a localized basis, similar fugitive resource challenges. Just as an upstream user can pollute or overuse water, upstream developers can block wind and sunlight. For a description of these upstream challenges, see Wiseman et al., *supra* note 155.

[253] *See* Natural Gas Development Regulations, Delaware River Basin Commission (proposed Dec. 9, 2010), *available at* http://www.state.nj.us/drbc/naturalgas-draftregs.pdf (proposed in response to a flurry of applications for hydraulic fracturing of the Marcellus Shale).

ergy Zones" (WREZ) effort. This "collaborative process"[254] is only advisory[255] and thus lacks the power to approve energy siting and construction, but aspects of this organization should be emulated in the formation of regional energy boards. The western states' regional effort to expand renewable energy production began in earnest around 2004, when the Western Governors' Association launched the "Clean and Diversified Energy Initiative."[256] The Association aimed, among other goals, to develop more "clean energy" resources, including renewables, throughout the West and to improve electricity transmission.[257] Eleven state members of the Association have since joined two Canadian provinces[258] and the U.S. Department of Energy in an effort to spur renewable energy development. These parties, through several committees of the Western Governors' Association, first set out to identify ideal renewable areas in the West (Western Renewable Energy Zones, or WREZ), which are defined as the "most cost effective and developable," as well as the "highest quality" areas for a given renewable resource.[259]

The WREZ Steering Committee — which included the governors of the eleven member states, Canadian premiers, officials from state public utility commissions, and representatives of several federal agencies — guided the process of identifying ideal renewable zones.[260] The Steering Committee formed a Technical Committee of energy experts and non-governmental organizations; this committee, in turn, directed three working groups. One working group identified the areas in the West with the highest levels of incident solar radiation and wind velocity as well as the fewest land uses or regulations that might impede the construction of renewable technology.[261] A second identified wildlife and environmental constraints in the areas listed as potential renewable zones,[262] and a third group developed a model to calculate the cost and "economic attractiveness" of the potential zones identified.[263] These working groups produced several draft products and held a

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[254] W. GOVERNORS' ASS'N, WESTERN RENEWABLE ENERGY ZONES, CHARTER (2008), *available at* communities.nrri.org/c/document_library/get_file?folderId=195538&name=DLFE-4579.pdf.

[255] *See id.* (showing that the WRE process will identify ideal areas for renewable development, develop "conceptual" transmission plans to augment this development, build "interstate cooperation" and coordinate power plants' "renewable procurement"); *see also* W. GOVERNORS' ASS'N & U.S. DEP'T OF ENERGY, *supra* note 14, at 12 (emphasizing that the ideal "hubs" identified for renewable development do not indicate that development will in fact occur within the hub).

[256] Press Release, Office of the Governor, Western Governors Unanimously Approve Governor's Clean and Diversified Energy Initiative (June 22, 2004), *available at* http://gov38.ca.gov/press-release/2985.

[257] W. Governors' Ass'n, *supra* note 248 (describing the June 2004 initiative (resolution 4-13)).

[258] W. GOVERNORS' ASS'N & U.S. DEP'T OF ENERGY, *supra* note 14, at 1.

[259] *Id.* at 7, 8.

[260] *Id.* at 4.

[261] *Id.* at 4, 6–9 (describing the work of the Zone Identification and Technical Analysis working group).

[262] *Id.*

[263] *Id.* at 4–5.

one-month public comment period on the drafts.[264] Staff reviewed the more than eighty comments received and modified the drafts accordingly.[265] The Steering Committee then produced a map of the WREZ areas, which participating states and provinces reviewed prior to publication in order to "reduce or eliminate" suggested renewables areas that posed wildlife concerns.[266] The final WREZ areas therefore show the regions of the West with the highest renewable energy potential and fewest use conflicts, which are likely the most economical areas for renewable development.

The Western Governors' Association also produced a modeling tool that allows developers to assess the attractiveness of a particular renewable zone in terms of the cost of generating and delivering power from that zone.[267] It is now working to identify the best location of transmission corridors that would run from the renewable areas.[268] Finally, the Association eventually aims to aggregate the purchasing of renewable electricity throughout the West[269] and to address "the political and regulatory obstacles to the permitting and construction of cross-jurisdictional transmission lines and renewable energy projects."[270]

The WREZ process provides an important starting point for the regional governance that is necessary for large-scale renewables development because it highlights ideal zones to potential builders and suggests where transmission lines might be located. In drawing such zones, it has begun to create renewable parcels. Further, the process aims to aggregate demand for and provision of renewable energy by region,[271] encourage the construction of transmission lines from newly-built renewable resources to energy customers,[272] enhance regional collaboration, and reduce regulatory barriers to renewables development. But the Western Governors' Association, as currently chartered, lacks the legal authority to sufficiently reduce the governance challenges associated with renewable parcels. The Association does not have the authority to review and certify proposed renewable development within these zones, streamline approval processes for these projects, or permit the necessary transmission lines from the zones.

### 2. *Other Regional Energy Organizations*

A number of other regional energy organizations exist that could inform the regional effort proposed in this Article. As mentioned in the Introduction, the Southern States Energy Board is an interstate compact that aims, among other goals, to eliminate "barriers to the use of efficient energy and

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[264] *Id.* at 10, 14.
[265] *Id.* at 14.
[266] *Id.* at 16.
[267] *Id.* at 16–17.
[268] *Id.* at 19.
[269] *Id.*
[270] *Id.*
[271] *Id.*
[272] *Id.*

environmental technologies," "facilitate the implementation of energy and environmental policies between federal, state and local governments and the private sector," and "support improved energy efficient technologies that pollute less and contribute to a clean global environment."[273] This group has not tended to focus on renewable siting, however, and has instead concentrated its energies on identifying ideal areas for carbon sequestration and supporting sequestration techniques,[274] tracking state and federal legislation related to the environment and energy (including renewable portfolio standards),[275] and supporting other activities that do not address siting issues.[276]

For the western region, Uma Outka has identified several movements toward regionalism in energy.[277] Working under the auspices of the Western Governors' Association, several western states have focused more specifically on renewables in interstate agreements. Idaho, Montana, and Nevada, for example, have entered into a formal memorandum of understanding that creates a "State Advisory Committee" to "develop, facilitate, and coordinate a consolidated siting and permitting process" for two interstate transmission lines that will, among other things, expand these states' access to new renewable and "clean coal" generation.[278] Similarly, Colorado, New Mexico, Utah, and Wyoming, have considered "collaborative decision making" opportunities for permitting renewable generation and transmission.[279]

These existing energy institutions have taken important steps toward demonstrating that regional governance in the energy field is possible and is slowly moving forward. But a regional authority that has some land use and permitting authority is necessary, and no institutions with these powers have yet to be formed in this area. Several existing regional organizations outside of the renewables areas have this type of authority, however, including the Tahoe Regional Planning Agency and two river basin commissions in the Northeast, and these provide further pieces of a model for regional energy boards.

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[273] *About Us*, S. STATES ENERGY BD., http://www.sseb.org/about-us.php (last visited May 20, 2011) (on file with the Harvard Law School Library).

[274] *Carbon Management*, S. STATES ENERGY BD., http://www.sseb.org/secarb.php (last visited May 20, 2011) (on file with the Harvard Law School Library).

[275] *Energy and Environmental Legislative Monitoring*, S. STATES ENERGY BD., http://www.sseb.org/legislative-monitoring.php (last visited May 20, 2011) (on file with the Harvard Law School Library).

[276] *See* Programs, S. STATES ENERGY BD., http://www.sseb.org/programs.php (last visited May 20, 2011) (on file with the Harvard Law School Library) (not describing renewables or siting among its programs).

[277] Outka, *supra* note 219, at 31–32.

[278] Memorandum of Understanding Among the Governors of Idaho, Montana, and Nevada for Purposes of Coordinating Siting and Permitting the Northernlights Transmission Projects 2 (May 23, 2006), *available at* http://governor.mt.gov/news/docs/NorthernLights_GovenorsMOU.pdf.

[279] Hurlbut, *supra* note 44, at 680.

### *B. Regional Governance of Land Uses Surrounding a Shared Lake*

The Tahoe Regional Planning Agency was formed to address pollution issues in the Lake Tahoe basin, which lies over the California-Nevada border.[280] The lake is a celebrated tourist destination and development magnet, but it has slowly been degraded[281] due to soil and other surface pollutants that run off from the land surrounding the lake into the water below.[282] The land contributing to this runoff falls within several municipal jurisdictions and two different states.[283] Even if one town agreed to impose restrictions on development and to require careful erosion control, several others could refuse these measures, thus causing continued pollution of the lake. A regional authority with land use control was thus needed, and California and Nevada entered into a compact, which was approved by Congress in 1980.[284]

As is necessary for any regional organization, the compact defined the bounds of the region to be governed, which included portions of California and Nevada counties and cities that are adjacent to the lake.[285] It then created a regional governing institution as a "separate legal entity,"[286] named it, and defined its organization. The Compact provided that the Agency's governing body would include a California and a Nevada delegation, and each delegation was to consist of members appointed by county commissioners, the state governor along with natural resource-related agencies, and a member selected by the appointed delegation members.[287] The Compact then described how agency members were to avoid conflicts of interest in voting, provided that members would receive compensation for their expenses, and required the members to meet at least monthly in a hearing open to the public.[288] It also defined member term lengths, vacancies, and voting procedures.[289] Under the Compact, the governing board was not to act alone; it was required to appoint an advisory planning commission, for which the compact also specified appointment and voting procedures.[290] And finally, the Compact directed the board to establish an "office within the region,"[291] thus ensuring that the regional governing body had a physical space for its operations; the Compact also identified the personnel positions that must be formed to manage the office and support the agency.[292]

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[280] *See* Tahoe Regional Planning Compact, sec. II(a), Dec. 19, 1980, *available at* http://www.trpa.org/documents/about_trpa/Bistate_Compact.pdf.

[281] *See id*. at sec. I(a).

[282] *See* Tahoe-Sierra Pres. Council v. Tahoe Reg'l Planning Agency, 535 U.S. 302, 307–08 (2002) (describing the runoff).

[283] *See id*. at 307–08 (describing the areas contributing to the pollution of the lake).

[284] See Tahoe Compact, *supra* note 280.

[285] *Id*. at sec. II(a).

[286] *Id*. at sec. III (a).

[287] *Id*. at sec. III (a).

[288] *Id*. at sed. III (a)(5), (b), (d).

[289] *Id*. at sec. III(e)-(g).

[290] *Id*. at sec. III(h).

[291] *Id*. at sec. III(i).

[292] *Id*. at sec. IV.

In addition to establishing the organizational structure of a new regional agency, the Tahoe Compact defined the duties and powers of the agency's governing board and planning commission. It directed the agency to consult with California and Nevada as well as several federal agencies in order to establish "environmental threshold carrying capacities"[293] for the Tahoe region, meaning environmental standards necessary to maintain scenic and recreational qualities of the area, among others.[294] The agency was to then adopt a regional plan,[295] which was to be a "single enforceable"[296] plan that covered transportation, land use, recreation, conservation, public services and facilities, and air quality within the region.[297] And — in a provision that will be key to regional governance of renewable development — the Agency was required to "adopt all necessary ordinances, rules, and regulations to effectuate the adopted regional plan,"[298] which were to set standards for everything from "subdivision" and "zoning" to "tree removal; solid waste disposal; sewage disposal; land fills, excavation, cuts and grading" and "mobile-home parks; house relocation; [and] outdoor advertising."[299] To give more teeth to the already extensive powers of this new regional commission, the Compact provided that these rules were to preempt requirements adopted by "[a]ny political subdivision or public agency," unless these entities adopted a stricter standard.[300] From an anticommons perspective, this provision clearly delineated the hierarchy among rights holders. Finally, to further empower the regional agency to regulate area land uses, any project proposed in the region covered by the Compact could not occur without the prior review and approval of the agency.[301] And in a provision that prompted a takings challenge in the U.S. Supreme Court,[302] the Compact even temporarily halted "works of development in the region" that could cause disharmony with the required regional plan — as directed by the legislatures of California and Nevada.[303]

Using the powers set forth in the Compact, the Tahoe Regional Planning Agency has since actively controlled development in the Lake Tahoe region. It adopted the required "Environmental Threshold Planning Capacities" in 1982[304] and a regional plan in 1987.[305] The Code of Ordinances

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[293] *Id.* at sec. V(b).
[294] *Id.* at sec. II(i).
[295] *Id.* at sec. V(c).
[296] *Id.*
[297] *Id.* at sec. V(c)(1)-(5), V(e).
[298] *Id.* at sec. VI(a).
[299] *Id.*
[300] *Id.*
[301] *Id.* at sec. VI(b).
[302] *See* Tahoe-Sierra Pres. Council v. Tahoe Reg'l Planning Agency, 535 U.S. 302, 306 (2002) (addressing a takings claim filed by real estate owners who challenged moratoria on development "imposed . . . [by the Tahoe Regional Planning Agency] during the process of devising a comprehensive land-use plan").
[303] Tahoe Compact, *supra* note 280, at sec. VI(c).
[304] *Environmental Issues*, TAHOE REG'L PLANNING AGENCY, http://www.trpa.org/default.aspx?tabindex=2&tabid=347 (last visited May 20, 2011) (on file with the Harvard Law School Library).

within the regional plan sets forth detailed permitting procedures for actions within the governed area. Many activities may not be approved by the Agency unless the Agency first finds that the proposed "project is consistent with, and will not adversely affect implementation of the Regional Plan," that it will "not cause the environmental threshold carrying capacities to be exceeded," and that the project will meet "federal, state or local air and water quality standards."[306] If approved, a project is then "subject to inspections" by the Agency "at any reasonable time," and if a project fails an inspection, the Agency may issue correction notices and cease and desist orders.[307] As shown by the powers granted to the Agency in the Compact and its subsequent activities, the Agency has broad discretion to control land uses in the Lake Tahoe region and to regulate the activities within that region. Parts of this model should be transferred to renewable energy boards, in that the boards should have the power to permit proposed development, determine acceptable locations of the development, regulate the safety of the renewable technology, and wield other land use-related powers. The extent to which existing state and local powers in this area should be ceded to a regional energy board is discussed in Part IV.

### *C. Regional Governance of Shared River Resources*

Just as development surrounding a once-pristine lake on a state border requires regional oversight, rivers that flow across state borders pose regional challenges. This is demonstrated in the Northeast, where the Susquehanna River Basin drains from Pennsylvania, New York, and Maryland (including 67 counties),[308] and the Delaware River flows through New York, Pennsylvania, New Jersey, and Delaware.[309] Municipalities and industry pump water from these rivers for drinking water and other uses,[310] power plants continuously demand water for cooling;[311] pollution runs over land

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[305] *Regional Plan Update*, TAHOE REG'L PLANNING AGENCY, http://www.trpa.org/default.aspx?tabindex=1&tabid=130 (last visited May 20, 2011) (on file with the Harvard Law School Library).

[306] TAHOE REG'L PLANNING AGENCY, CODE OF ORDINANCES § 6.3.A, *available at* http://www.trpa.org/documents/docdwnlds/ordinances/COCh06.pdf.

[307] TAHOE REG'L PLANNING AGENCY, CODE OF ORDINANCES § 8.3, *available at* http://www.trpa.org/documents/docdwnlds/ordinances/COCh08.pdf.

[308] Susquehanna River Basin Comm'n, Susquehanna River Basin, http://www.srbc.net/pubinfo/docs/Susq%20River%20Basin%20General%20%2811_06%29.PDF (last visited Nov. 2006) (on file with the Harvard Law School library).

[309] *See* Delaware River Basin Commission, Delaware River Basin, http://www.state.nj.us/drbc/drbc4.htm (last visited May 20, 2011) (on file with the Harvard Law School library) (showing a map last updated Nov. 2006).

[310] *See, e.g.*, Delaware River Basin Commission, Application Status Page as of 2/15/2011, http://www.state.nj.us/drbc/dockets/PRBdocketsNJ021710.pdf (last visited May 20, 2011) (on file with the Harvard Law School Library) (showing requests from school districts, municipalities, and industry for water withdrawals).

[311] *See, e.g.*, *Information Sheet*, SUSQUEHANNA RIVER BASIN COMM'N, http://www.srbc.net/pubinfo/docs/35779_1.pdf (last visited May 20, 2011) (on file with the Harvard Law

from farms, golf courses, parking lots, and lawns into the river;[312] and factories and wastewater treatment plants pipe pollutants directly into the water.[313] As a result of these shared uses, states began sparring over rights to these river waters, and following a resolution in the Supreme Court in 1954, they began devising formal compacts to avoid future litigation.[314] Congress approved the Delaware River Basin Compact in 1961[315] and the similar Susquehanna River Basin Compact in 1970[316] and appointed river basin commissions to implement and administer these formal agreements.[317]

The Delaware and Susquehanna River Basin Compacts, like the Tahoe Compact, define a region to be governed,[318] create an independent legal entity as a governing organization, and set out the composition, voting structure, and powers of the organization. The United States and the four states within the Delaware River Basin formed the Delaware River Basin Compact in 1961 with the goal of developing a comprehensive plan for the management and use of the river.[319] The Compact created an "agency and instrumentality of the governments of the respective signatory parties" in the form of the Delaware River Basin Commission,[320] which was to govern all land that drains into the Delaware River and its tributaries — and even land outside of the basin when necessary.[321] As directed by the Compact, the Commission was composed of the governors of the signatory states and one Commissioner appointed by the President,[322] and each had one vote.[323] The Compact assigned numerous powers and duties to the Commission, including, among others, to "adopt and promote uniform and coordinated policies for water conservation, control, use and management in the basin";[324] adopt

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School Library) (describing evaporation of water from cooling towers at power plants as a consumptive water use of the Susquehanna).

[312] *See, e.g.*, Kevin H. McGonigal, *Nutrients and Suspended Sediment Transported in the Susquehanna River Basin, 2008, and Trends, January 1985 Through December 2008, Dec. 31, 2009*, at 2–4, 30, SUSQUEHANNA RIVER BASIN COMM'N, *available at* http://www.srbc.net/pubinfo/techdocs/publication_267/techreport267.PDF (discussing land uses in the basin and nutrient and sediment loads due to runoff).

[313] *See, e.g.*, *Determining Total Maximum Daily Load in the Susquehanna River Basin*, SUSQUEHANNA RIVER BASIN COMM'N (Sept. 2009), *available at* http://www.srbc.net/pubinfo/docs/TMDLsheet%289_09%29.PDF (describing point sources of river pollutants).

[314] GOVT. ACCOUNTABILITY OFFICE, *supra* note 49, at 39.

[315] *Id.* at 40.

[316] *Id.* at 42.

[317] *Id.* at 40, 42.

[318] *See* Susquehanna River Basin Compact, *supra* note 249, *at* sec. 2.7 (defining the bounds of regional jurisdiction as the bounds of the river basin, which is determined by geographic features); Delaware River Basin Compact, *supra* note 250, at sec. 1.2(a) (defining the Basin as "the area of drainage into the Delaware River and its tributaries, including Delaware Bay").

[319] Delaware River Basin Compact, *supra* note 250, at sec. 1–3 (stating preamble.

[320] *Id.* at sec. 2.1.

[321] *See id.* at sec. 1.2(a) (defining the basin); *id.* at sec. 2.7 (describing the area of jurisdiction of the Commission).

[322] *Id.* at sec. 2.2.

[323] *Id.* at sec. 2.5.

[324] *Id.* at sec. 3.1.

a comprehensive plan to effectuate these policies;[325] issue permits for requested "allocations, diversions and releases"[326] from the river; "assume jurisdiction to control future pollution and abate existing pollution in the waters of the basin," if necessary;[327] and regulate hydroelectric development of the river.[328] The Commission has since adopted water quality standards, a program to allocate waste load among various users of the river, and "regulations for implementing and enforcing the standards."[329] It has also regulated development within the floodplain of the river, passed regulations that require water metering for large water withdrawals, and passed several regulations limiting pollutants that may be released into the river.[330] No project with a "substantial effect on the water resources of the basin" may be undertaken "by any person, corporation or governmental authority" without first having been approved by the Commission.[331] Further, the Commission may enforce its laws by issuing orders to violators following investigation and a hearing.[332]

To carry out this broad range of duties, the Commission consults and works with its member parties[333] and appoints advisory committees, where needed.[334] Whenever the Commission embarks upon a project to physically improve water quality, it must first "review and consider all existing rights, plans and programs of the signatory parties, their political subdivisions, private parties, and water users" and hold a public hearing.[335] To avoid conflicts among the parties to the Commission, no party may plan Commission-related projects or make any expenditures for river-related facilities and projects without first consulting with the Commission.[336]

The Susquehanna River Basin Commission — another regional organization that governs shared water resources — emerged just over a decade after the Delaware River Basin Compact took effect, and its jurisdiction, powers, and duties are similar to those of the Delaware Commission. The Compact that forms the Commission also defines the area of jurisdiction by physical boundaries, which in this case include the area of drainage of the Susquehanna River and its tributaries.[337] Like the Delaware Commission, the Susquehanna River Basin Commission is "an agency and instrumental-

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[325] *Id*. at sec. 3.2.
[326] *Id*. at sec. 3.3.
[327] *Id*. at sec. 5.2.
[328] *Id*. at sec. 9.2.
[329] Delaware River Basin Commission, Listing of DRBC Milestones and Accomplishments, http://www.state.nj.us/drbc/milestones.htm (last visited May 20, 2011) (on file with the Harvard Law School library).
[330] *Id*.
[331] Delaware River Basin Compact, *supra* note 250, at sec. 3.8.
[332] *Id*. at sec. 5.4.
[333] *Id*. at sec. 3.9.
[334] *Id*. at sec. 3.10.
[335] *Id*. at sec. 4.4.
[336] *Id*. at sec. 11.1–2.
[337] Susquehanna River Basin Compact, *supra* note 249, at sec. 1.2 (1972).

ity" of its signatory parties.[338] Its members — each with one vote on the Commission[339] — are the governors of the party states and an appointee of the President.[340] The Compact directs the Commission to "[e]stablish standards of planning, decision, and operation of all projects and facilities in the basin to the extent they affect water resources";[341] plan for the management of water resources;[342] regulate water allocation and diversion, where needed;[343] approve hydroelectric dams;[344] and assume jurisdiction over water quality, where necessary,[345] among other powers. Like the Delaware River Commission, the Susquehanna River Commission has since issued regulations to carry out its responsibilities,[346] and it has the power to issue penalties for violations.[347] In 2010, the Commission ordered a natural gas company to stop all water withdrawal operations after the company failed to obtain a water withdrawal permit,[348] and it fined another company $20,000 for withdrawing more water than was allowed in its permit.[349]

Both river basin commissions are unique, in that states and the federal government have ceded substantial planning and regulatory authority to a regional entity. These entities must consult with constituent parties and affected private parties, but they have the authority to independently implement and enforce their regulations. This type of system is sensible for a region that shares a vital water resource, and its lessons transfer substantially to shared renewable land resources and other energy areas, as discussed in Part IV.

### *D. Streamlined Permitting Processes for Energy Siting*

A final existing regional institution that consolidates local, state, and federal requirements within one forum is the streamlined permitting process. Typically, individual states mandate these processes, and such procedures therefore lack the interstate qualities of the water and land use-based institutions described above. But they combine multiple authorities within one process and are thus regional in nature.

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[338] *Id.* at sec. 2.1.
[339] *Id.* at sec. 2.5.
[340] *Id.* at sec. 2.2.
[341] *Id.* at sec. 3.4.
[342] *Id.* at sec. 3.5.
[343] *Id.* at sec. 3.8.
[344] *Id.* at sec. 10.1.
[345] *Id.* at sec. 5.2.
[346] *See generally* 18 C.F.R. pts. 801, 806, 807, 808 (2008).
[347] Susquehanna River Basin, *supra* note 249, at sec. 15.17.
[348] *See* Press Release, Susquehanna River Basin Commission, SRBC Orders Natural Gas Driller to Stop all Water-Related Work at Drilling Sites in Tioga County, PA (Jan. 13, 2010), *available at* http://www.srbc.net/pubinfo/press/docs/Project%20ReviewNaturalGasNovus CeaseOrder11310.pdf.
[349] *See* James Loewenstein, *Chesapeake Energy Fined $20,000 Over Water Withdrawal Violations*, DAILY REVIEW, Mar. 23, 2010, *available at* http://thedailyreview.com/news/chesapeake-energy-fined-20-000-over-water-withdrawal-violations-1.696315.

In Washington State, the legislature recognized the need for the "development of a procedure for the selection and utilization of sites for energy facilities" to "avoid costly duplication in the siting process and ensure that decisions are made timely and without unnecessary delay."[350] To accomplish this, the legislature created the Energy Facility Site Evaluation Council and empowered the Council "to integrate its site evaluation activity with activities of federal agencies having jurisdiction in such matters to avoid unnecessary duplication;"[351] to issue air quality permits under the state-run Clean Air Act program;[352] and to "serve as an interagency coordinating body for energy-related issues."[353] The Council may also provide expedited review to renewable energy facilities in certain circumstances.[354] Most entities proposing an energy development must apply to the Council for site certification; the Council reviews the proposed development for social and environmental impacts, ensures that the development will comply with all state and municipal laws applicable to the project, and then makes a recommendation to the governor.[355] As part of its recommendation, it includes a Site Certification Agreement with conditions for the construction of the energy project.[356] If the project is approved, the Council is then responsible for enforcing state laws and the conditions within the Certification Agreement.[357]

A minority of other states have implemented similar streamlined energy siting processes. Oregon's Energy Facility Siting Council, for example, receives applications for many large energy facility sites; reviews the applications; hears comments from state agencies, cities, and counties; and approves or rejects the applications.[358] In determining whether or not to grant a site certificate, the Council "consults with other state and local agencies to ensure that the Council considers all governmental concerns."[359] Applicants still face separate municipal laws, but they may choose to have the Council determine compliance.[360]

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[350] WASH. REV. CODE ANN. § 80.50.010 (West 2010).

[351] *Id.* § 80.50.040(10).

[352] *Id.* § 80.50.040(12) (empowering the Council to "issue permits in compliance with applicable provisions of the federally approved state implementation plan adopted in accordance with the Federal Clean Air Act").

[353] *Id.* § 80.50.040(13).

[354] *Id*. § 80.50.075 (allowing a person to "apply to the council for an expedited processing" of a certification for an energy facility).

[355] Washington State, *Siting/Review Process*, ENERGY FACILITY SITE EVALUATION COUNCIL, http://www.efsec.wa.gov/cert.shtml (last visited May 20, 2011) (on file with the Harvard Law School library).

[356] *See id*.

[357] *See id*.

[358] *See* OR. REV. STAT. ANN. 469.350, 469.370 (West 2010).

[359] *The Siting Process for Energy Facilities*, OREGON.GOV, http://www.oregon.gov/ENERGY/SITING/process.shtml (last visited May 20, 2011) (on file with the Harvard Law School Library).

[360] *Id*. ("When the Preliminary Application is submitted, the applicant must choose whether to seek land use approval from the local jurisdiction or to have the Council make the land use determination.").

For large thermal power plants, California has similarly placed all authority over energy siting within the California Energy Commission, which replaces the previous requirements of all other state, local, regional, or even federal agencies, where the Commission is not preempted by federal law.[361] The Commission, in addition to pulling together what was once a host of different permitting and approval requirements, has also attempted to streamline its processes. For certain solar developments, it has entered into agreements with the Bureau of Land Management and other federal agencies to ensure that duplicate information is not requested for federal and state environmental reviews and that required federal and state public hearings are joined, where possible.[362]

Some streamlined processes, such as Oregon's, simply collect the many state and local regulations within one agency and provide a "one-stop shop" for developers; others, like California's, preempt lower level regulations for the siting of certain projects while also coordinating processes among numerous agencies. Regardless of the procedure followed, streamlined processes and independent agencies operating under compacts help to overcome anticommons barriers by collecting rights of exclusion and sometimes creating a hierarchy among these rights.

### *E. Brief Consideration of Other Regional Institutions*

Many other regional institutions could serve as similarly useful models for regional governance of renewables. Although space does not permit a thorough analysis of these institutions, a brief mention of several is merited.

The Columbia River Gorge Commission, like the Tahoe Regional Planning Agency, has land use authority over a shared interstate resource — a scenic area that "includes portions of three Oregon and three Washington counties."[363] The Commission was formed by the Columbia River Gorge National Scenic Area Act,[364] which, among other things, delineates the boundaries of the region governed[365] and directs the Commission to "develop land use designations for the use of non-Federal lands within the

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[361] *See* CAL. PUB. RESOURCES CODE § 25500 (West 2010) ("In accordance with the provisions of this division, the commission shall have the exclusive power to certify all sites and related facilities in the state, whether a new site and related facility or a change or addition to an existing facility. The issuance of a certificate by the commission shall be in lieu of any permit, certificate, or similar document required by any state, local or regional agency, or federal agency to the extent permitted by federal law.").

[362] *See, e.g.*, Memorandum of Understanding Between the U.S. Dept. of the Interior, Bureau of Land Mgmt. Cal. Desert Dist. and the Cal. Energy Comm. Staff Concerning Joint Environmental Review for Solar Thermal Power Plant Projects 1, *supra* note 165 (describing the agencies' agreement to coordinate processes wherever possible).

[363] *About the Scenic Area*, COLUMBIA RIVER GORGE COMM'N, http://www.gorgecommission.org/about_scenic_area.cfm?CFID=12544773&CFTOKEN=39820430 (last visited May 20, 2011) (on file with the Harvard Law School Library).

[364] 16 U.S.C. § 544c.

[365] *Id.* § 544b.

scenic area" as part of a Scenic Area Management Plan[366] and approve or reject county land use ordinances that are consistent with the management plan.[367] The Commission has formal land use regulatory authority, and — like a local zoning board — issues determinations about acceptable property uses in the area by approving or denying various development requests under the Act and the Plan.[368] Also similar to the Tahoe Regional Planning Authority, the Commission has formal enforcement authority, including the ability to seek injunctions to prevent individuals in non-urban portions of the scenic area from violating the Act, the management plan, land use ordinances, or Commission guidelines.[369]

A renewable development is not exactly analogous to a shared lake, river, or scenic area. The quality of the fugitive resource is at issue — as too many developments within one area can, for example, shade solar panels or reduce wind flow — but the primary concern is the need to have a regional land use authority. All of the regional institutions discussed above are relevant, however, because they exhibit some degree of this type of authority, with the exception of the Western Renewable Energy Zones. Other regional models to consider are those formed to site undesirable land uses, such as nuclear waste dumps.[370] Although these regional bodies do not typically create a commission with regional land use authority, and have encountered problems,[371] they were intended to assist in initial siting decisions[372] — a consideration that will be important for utility-scale renewable developments.

All of these regional models, whether addressing a shared fugitive resource, a scenic area that crosses boundaries, or a common waste problem, may to some extent help to overcome anticommons or regulatory commons-type challenges by creating a defined area of governance, establishing primary governing authority in one institution, and collecting and streamlining regulations within that institution. This both defines the problem to be addressed and the government to take the lead — thus avoiding the anticommons tragedy — and streamlines exclusion rights within a manageable

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[366] *Id.* § 544d.

[367] *Id.* § 544e.

[368] *See, e.g.*, COLUMBIA RIVER GORGE COMM'N, Director's Decision, C10-0013-K-G-19 (Jan. 26, 2011), *available at* http://www.gorgecommission.org/client/pdfs/projects/C10-0013%20Ernst%20decision.pdf (approving a landowner's request to remove a garage and a barn); COLUMBIA RIVER GORGE COMM'N, Director's Decision, C10-0013-K-G-11 (Nov. 10, 2010), *available at* http://www.gorgecommission.org/client/pdfs/projects/C10-0006%20Davis%20decision.pdf (approving landowners' request to construct a house).

[369] 16 U.S.C. § 544m.

[370] *See* Samantha Dreilinger, Note, *Fall-Out: New York v. United States and the Low-Level Radioactive Waste Problem*, 5 NW. J. L. & SOC. POL'Y 183, 190–94 (2010) (discussing the Low-Level Radioactive Waste Policy Amendment Act of 1985, which "encouraged states to enter into interstate compacts to provide for the establishment and operation of low-level radioactive waste sites") (citing 42 U.S.C. § 2021e (2006).

[371] *Id*. at 197–98 (describing how *New York v. United States* has restricted the availability of tools necessary to "enforce interstate compact decisions") (citing 505 U.S. 144, 154 (1992).

[372] *Id*. at 191 (describing monetary incentives provided to states that located a selected host site and developed a "siting plan") (citing 42 U.S.C. § 2021e(e)(1)(B)(i-ii)).

process, thus reducing the transaction costs of development. The following Part discusses how this regional solution should be accomplished in the renewable field.

## IV. Building from Regional Models to Form Regional Energy Boards

As described in Part II, utility-scale renewable energy development faces anticommons and regulatory commons-types tragedies — tragedies that also arise in other resource areas. Just as regional organizations have been formed to address shared water challenges, these tragedies will best be solved by the formation of a regional governing authority or "regional energy board." To operate effectively, this board must have many of the characteristics of the regional governance models outlined above. First, the board must be an independent agency; it must not function within an existing federal, state, or municipal entity. Second, it must have the authority to issue siting permits and to conduct the associated reviews that occur prior to issuing a permit, including environmental, cultural, historic, economic, and other reviews. In other words, many regulatory powers that now govern at the federal, state, and municipal level must be procedurally, and partially substantively, consolidated within one governing entity. This Part, building from the models described above, suggests how regional energy boards can be successfully organized; it proposes broad solutions and leaves specific mechanics of the boards for future work.

### *A. Forming Independent Regional Entities*

Regional energy boards to govern the development of utility-scale renewables must be independent regional entities similar to those established by the regional institutions described in Part III. Many of the parties that hold rights within renewable parcels already have their own entrenched processes — municipal zoning decisions and state energy commission reviews, for example — and these processes would not be easily modified to incorporate the many other parties with exclusion rights in a parcel. Further, the siting of renewable energy is a contentious process subject to public choice concerns. Private property owners often oppose the technology on the grounds of nuisance and aesthetics,[373] certain industry actors object to the

[373] *See* Susan Lorde Martin, *Wind Farms and NIMBYs: Generating Conflict, Reducing Litigation*, 20 Fordham Envtl. L. Rev. 427, 441–42 (2010) (discussing residents' objections to a proposed wind farm in Nevada); Rick Strange, *Weaving a Tangled Web: The Intersection of Energy Policy and Broader Governmental Policies*, 5 Tex. J. Oil Gas & Energy L. 1, 32–33 (2009–10) (describing several "NIMBY challenges to wind farms" around the county); Stephen Harland Butler, Comment, *Headwinds to a Clean Energy Future: Nuisance Suits Against Wind Energy Projects in the United States*, 97 Calif. L. Rev. 1337, 1354–72 (2009) (describing nuisance suits against wind farms).

cost[374] or the competition posed by renewables,[375] and some nonprofit groups worry about the environmental effects.[376] The creation of an independent agency will not prevent the capture of the process by these interested parties, but in the short term it will provide a new forum not previously captured by repeat players. All parties will have a seat at the table, and all will have to familiarize themselves with the new process. For proposed sites that cross municipal and state borders, no one government will solely control the decisionmaking process, and homefield advantage will be eliminated.

An additional justification for the formation of an independent agency is the importance of equitably sharing governance responsibilities. Agencies require buildings, staff, and funding, and an independent agency that follows the directions of its charter can help to ensure a fair cost-sharing structure. The Delaware River Basin Compact, for instance, required the Commission to "develop equitable cost sharing and reimbursement formulas for the signatory parties" by entering into "contracts and arrangements for sharing financial responsibility," developing procedures to properly allocate cost based on the purpose of each project, and establishing a reimbursement system.[377] An independent regional entity to govern renewables development could implement a similar system to accurately and fairly allocate costs.

To establish the independent regional energy board suggested here, states that share ideal renewable resources should work with Congress to form a compact. Federal involvement is necessary because the Federal Energy Regulatory Commission has jurisdiction over wholesale interstate sales of electricity and interstate transmission,[378] and the Bureau of Land Management controls many of the lands with the highest concentrations of renewable fuels.[379] To provide a concrete example of a possible independent regional energy board, Arizona, Southern California, Nevada, New Mexico, and Utah, for example, could form a Southwest Regional Energy Compact,

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[374] *See, e.g.*, Scott Bauer, *Manufacturers Oppose Wisconsin Clean Energy Plan*, MANUFACTURING.NET (Jan. 7, 2010), http://www.manufacturing.net/News-Manufacturers-Oppose-Wisconsin-Clean-Energy-Plan-010710.aspx (reporting that industry opposed the Wisconsin governor's plan "that calls for increasing the use of renewable fuels").

[375] *See, e.g.*, *Energy, the Environment and Natural Resources in the Canada/U.S. Context, Discussion Following the Remarks of Dr. Jhirad,* 28 CANADA-U.S. L.J. 329, 333 (2002) (arguing that oil, natural gas, and coal companies all oppose renewables).

[376] *See, e.g.*, Martin, *supra* note 373, at 442–43 (discussing environmental groups' opposition to wind projects).

[377] Delaware River Basin Compact, *supra* note 250, at sec. 11.4.

[378] *See* 16 U.S.C. § 824(a) (declaring federal jurisdiction over "business which consists of the transmission of electric energy in interstate commerce and the sale of such energy at wholesale in interstate commerce").

[379] *See Energy Efficiency and Renewable Energy, States and United States Wind Resource Maps*, U.S. DEP'T OF ENERGY, http://www.windpoweringamerica.gov/wind_maps.asp (on file with the Harvard Law School Library) (showing the strongest onshore wind resources to be located in the Midwest and West). BLM lands are primarily located within the same regions. *See Federal Lands*, NATIONALATLAS.GOV, http://www.nationalatlas.gov/printable/fedlands.html (follow "Federal Lands" hyperlink under "Map Maker" hyperlink) (last visited June 30, 2010) (on file with the Harvard Law School Library) (showing BLM lands in yellow appearing primarily in the Midwest and West).

which would establish the Southwest Regional Energy Board. Once approved by Congress, the Compact would direct the Board to plan for future renewables development, just as the water commissions described above implement comprehensive plans for water management. Much renewable planning work in the West has already been completed through the Western Renewable Energy Zone process[380] and could be adopted in large part. Like the water commissions, the board would also be responsible for writing and enforcing regulations that would implement its plan. It would specify the environmental reviews necessary prior to site development, standards to mitigate wildlife impacts, required setbacks of renewable technology from other land uses, and minimum bonding requirements, among other regulations. To accomplish these many tasks, this regional energy board should have its own offices and staff and should implement careful cost-sharing measures.

Independent renewable energy boards will avoid entrenching the renewable development approval process within an existing institution where one state or several interested parties have strong participatory advantages, ensure more equitable costs, and provide a clear point of contact for developers and concerned parties. To ensure this clear point of contact, however, the board will have to consolidate multiple rights that currently exist within renewable parcels, and this will require a careful balancing of interests.

### *B. Consolidating Rights of Exclusion Within One Agency*

As this Article has established, planned utility-scale renewable developments often cross private boundaries and municipal and county lines. The Bureau of Land Management, several property owners, many municipal and county governments, and several state and federal entities may therefore all have a right to exclude the proposed development through the denial of a lease, a review process that is particularly deferential to objectors, or various permitting and zoning processes. An institution to govern utility-scale renewables development and to address these challenges must pull these many exclusion rights within one organization. This is not to say that exclusion rights must be weakened or modified — although in some cases this may be necessary; the consolidation will, first and foremost, be procedural. The many parties who have a right to block a development must exercise their exclusion rights through a process led by one institution, and the hierarchies among these parties must be clarified.

As discussed in Part III, several states have created streamlined site certification processes or "consolidated energy facility siting programs"[381] for energy projects, which accomplish this necessary collecting of rights within one process and, in some cases, substantively consolidate the rights

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[380] *See supra* text accompanying note 255 (describing how the Western Governors' Association has identified the ideal regions for renewable development in the West).

[381] *Comparison of Siting Requirements*, OR. DEPT. OF ENERGY, http://www.oregon.gov/ENERGY/SITING/compare.shtml (last visited May 20, 2011) (on file with the Harvard Law School Library).

through preemption. Generally, these processes give one agency the power to review, apply, and enforce all federal, state, and local laws that govern an energy project. In Washington, the Energy Facility Site Evaluation Council has the exclusive power to receive and review certain energy facility site applications,[382] as do similar institutions in California,[383] Oregon,[384] and several other states. A similar streamlined process at the regional level for renewables development would substantially alleviate the transaction costs associated with the renewable anticommons. The renewable energy board could eliminate overlapping parties' rules, combine certain processes (such as multiple environmental reviews required prior to permit release), and develop compromise standards where rules conflict. If a proposed renewable development would cover four towns, for example — all with different requirements for the height of a wind turbine — the agency could hold a meeting of the town councils where they would agree upon an acceptable compromise height; this height would then become a part of the regional energy board's regulations. Through this streamlining or consolidation, most rights of exclusion would not be wholly eliminated, but the developer would no longer have to identify and deal separately with each party.

In some cases — where one municipality bans renewable technologies, for example — procedural mediation will be insufficient. Some hierarchy among rights holders must be established, and this may be most efficiently accomplished through partial preemption of authority over renewables. As Minnesota[385] has done, a state may remove municipalities' land use authority over the siting of renewable energy infrastructure. States have also limited or preempted municipalities' ability to regulate, through their building codes, the engineering specifications of renewable equipment and methods and materials for installation, such as the required strength of a tower supporting a wind turbine.[386]

Preemption of local or even state and federal laws by the regional energy board in some of these areas may be necessary — where such preemption is constitutional — both to promote regulatory efficiencies and to reduce burdens on developers. Indeed, there is precedent for this at the state level. California's streamlined energy siting process for large thermal power plants provides that "[t]he issuance of a certificate by the [state energy]

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[382] *See* Wash. REV. CODE § 80.50.040 (West 2010).

[383] *See supra* note 361.

[384] *See supra* note 358.

[385] *See* MINN. STAT. ANN. § 216F.07 (West 2010) (providing that a site permit granted by the state for a commercial wind turbine "is the only site approval required for the location" of the turbine and that "[t]he site permit supersedes and preempts all zoning, building, or land use rules, regulations, or ordinances adopted by regional, county, local, and special purpose governments").

[386] *See, e.g.*, CAL. GOV'T CODE § 65896(b) (West 2010) (prohibiting counties in California from enacting ordinances more restrictive than the wind energy requirements set forth in the revised California code, which address tower heights, acceptable decibel levels, and other technical aspects of wind turbines). Acceptable height and decibel levels are notably different from equipment "specifications," however, and may implicate legitimate local concerns that differ depending on terrain and residents' sensitivity to noise.

commission . . . shall supersede any applicable statute, ordinance, or regulation of any state, local, or regional agency, or federal agency to the extent permitted by federal law."[387] To avoid wholly discounting the unique interests of municipalities and states, preemption of laws by the regional energy board need not be complete, however. Patricia Salkin and Ashira Ostrow, for example, propose partial preemption of local wind laws similar to the preemption within the Telecommunications Act.[388] For wind energy siting, Salkin and Ostrow would adopt provisions similar to the Act's language, which prohibits municipal bans on cell phone towers, heightens judicial review of local zoning decisions, requires zoning decisions to be made within a reasonable time, and requires the decisions to be made in writing.[389]

Partial or full preemption in several areas of renewable development is necessary. Specifications for the engineering of solar and wind equipment and its installation should not need to differ widely, provided a federal or state standard ensures their safety. There are already model standards for solar panel glass, for example, written by the International Organization for Standardization, and standards for installation of solar equipment prepared by an international association of mechanical officials.[390] It is likely more efficient for one central entity with engineering expertise to set engineering and installation standards than for multiple authorities to do the same. Further, if these types of regulations were uniform, burdens on renewable developers would decline. For a developer who consistently installs one type of industrial-scale wind turbine, for example, neighboring municipalities' conflicting specifications for tower strength could substantially increase cost.

Alternatively, regional energy boards could generally preempt local and state laws in a compromise standard that left enforcement authority to the constituent parties, thus granting them some power through delegation. Municipalities would have to follow the permitting regulations of the regional board but could implement the regulations and perhaps augment them with their own limited rules, provided they were not more restrictive. The Tahoe Regional Planning Agency ("TRPA") has followed this type of system. For certain regulations that address the construction of residences and signs, the agency has entered into memoranda of understanding with many municipalities and counties in the Lake Tahoe region. The memoranda typically delegate TRPA permitting authority to the local authority and require that the authority follow all TRPA requirements in granting a permit.[391] The agency

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[387] CAL. PUB. RES. CODE § 25500 (West 2010).

[388] Salkin & Ostrow, *supra* note 168, at 1095–96.

[389] *Id.* at 1093–97.

[390] *See, e.g.*, AUSTIN TEX. CODE §§ 25-12-191(A), 193 (2010) (adopting portions of the Uniform Solar Energy Code published by the International Association of Plumbing and Mechanical Officials and revising some of the installation standards contained within that code).

[391] *See, e.g.*, Memorandum of Understanding Between Tahoe Regional Planning Agency and the City of South Lake Tahoe Relating to City-Wide Signage Ordinance at 1, signed May 25, 2000, *available at* http://www.trpa.org/documents/MOUs/Appendix_CC_CSLT_Signs_2000.pdf ("Given the existing comprehensive regulatory structure of the CITY as it pertains to

allows these municipalities, however, to impose their own "reasonable conditions of approval" on land use permits within the Lake Tahoe region.[392]

No matter the level or method of preemption of municipal, state, and even federal authority, the key element of a regional energy board will be its procedural consolidation of rights and rights holders within one institution and process. Where a federal and a state environmental review were previously required, the parties within a regional energy board would collaborate and produce one report, which would include all overlapping elements of the review and any additional information required by the state or federal government. Where separate public informational hearings were mandated by neighboring municipalities, these would be combined in a process administered by the regional energy board at a fair and convenient location. Where multiple private landowners had concerns about leasing to a renewable developer, they could negotiate within one forum administered by the board. Landowners interested in leasing — some of whom are already forming pools and approaching renewable developers with lease offers[393] — could have an automatic and accessible forum for collaboration. While the transaction costs of forming pools on small acreages are likely low, the renewable farms that cover thousands of acres of land could make pooling difficult, and an accessible, centralized institution with expertise in the development are could reduce these costs. Just as the Western Governors' Association has already begun to do,[394] the more formal regional energy board could also aggregate buyers of renewables by informing them of developments in the approval process.

Finally, regional energy boards could group together the many interested parties in the transmission construction process and assist in transmis-

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the installation of signs within the City of South Lake Tahoe . . . the CITY and TRPA agree that the City shall review permanent signage activities within the CITY limits of South Lake Tahoe. Such review by the CITY shall include application of all applicable TRPA regulations to signage projects otherwise subject to TRPA review."); Memorandum of Understanding Between Tahoe Regional Planning Agency and Placer County at 1, signed May 11, 1997, *available at* http://www.trpa.org/documents/MOUs/Appendix_DD_Placed_Signs_1997.pdf (providing the same for Placer County); Memorandum of Understanding Between Tahoe Regional Planning Agency and Placer County at 1, signed Feb. 27, 1995, *available at* http://www.trpa.org/documents/MOUs/Appendix_R_Placer_Residential_1995.pdf ("Given the existing comprehensive regulatory structure of COUNTY as it pertains to construction of residential structures within the County of Placer . . . COUNTY and TRPA agree that COUNTY shall review construction of new single and multiple-family structures . . . to be constructed within the COUNTY limits of Placer County. Such review by COUNTY shall include application of all applicable TRPA regulations to residential construction projects otherwise subject to TRPA review"); Memorandum of Understanding Between Tahoe Regional Planning Agency and the County of El Dorado, signed Jan. 15, 1993, *available at* http://www.trpa.org/documents/MOUs/Appendix_W_El_Dorado_Residential_1992.pdf (providing the same for El Dorado County).

[392] *See*, *e.g.*, Memorandum of Understanding Between Tahoe Regional Planning Agency and the City of South Lake Tahoe Relating to City-Wide Signage Ordinance, *supra* note 391, at ¶4.

[393] Martin, *supra* note 373, at 444–45 ("In Colorado, Kansas, New Mexico, and Wyoming, some landowners are pooling their land to form wind associations that market the land to wind energy companies.").

[394] *See supra* note text accompanying note 269.

sion siting. This regional process, too, has already been jumpstarted by the Western Governors' Association in its effort to plan for transmission corridors in collaboration with federal agencies;[395] the regional energy board thus has a base from which to expand. Many existing procedures and rules for transmission siting would need to change if the boards were to have primary jurisdiction over transmission siting,[396] but the federal government has already gained potential control over the transmission siting process,[397] and regional entities would serve as important procedural forums for this process — as they already are doing in the West.[398] With an improved transmission process, where states and municipalities collaboratively agreed upon acceptable siting for transmission lines running from renewable parcels, developers would have an up-front assurance of transmission and could build with more confidence.[399]

### *C. Applying the Regional Model to Other Energy Anticommons*

Large-scale renewable projects operate within a distinct anticommons because renewable parcels — new property lines — are drawn around areas with strong sunlight and wind. Each parcel may overlie land owned by several private property owners and governed by several municipalities, states, and the federal government. Other energy projects, although different, face somewhat similar anticommons obstacles.

Nuclear power plants may continue to be a necessary piece of America's energy portfolio.[400] Concerns about high water use, terrorist at-

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[395] *See Energy and Transmission Initiative*, W. GOVERNORS' ASS'N, http://www.westgov.org/index.php?option=com_content&view=article&id=129&Itemid=57 (last visited May 20, 2011) (on file with the Harvard Law School Library) (noting that under a Department of Energy Grant, "[t]he Western Governors' Association, Western Interstate Energy Board and Western Electricity Coordinating Council are working with diverse stakeholders through the Regional Transmission Expansion Project to analyze transmission requirements . . . and to develop long-term, interconnection-wide transmission expansion plans").

[396] *See, e.g.*, Brown & Rossi, *supra* note 41, at 714–16 (explaining that "in Colorado, all proposed new transmission lines are required to obtain local approvals"; in Utah, all applicants must obtain a local siting permit; and in Wyoming, local approvals are also required).

[397] *See id.* at 741 (explaining that through the Energy Policy Act of 2005, Congress delegated "authority to Department of Energy ('DOE') to designate National Interest Energy Transmission Corridors ('NIETCs') and to FERC to exercise some 'backstop' permitting authority over states within the NIETCs").

[398] *See* W. GOVERNOR'S ASS'N, *supra* note 395.

[399] One final means of addressing the anticommons-type challenges to renewable development is not addressed here but merits future research. If states were to recognize a "fugitive estate" — similar to the mineral estate for oil and gas — this could substantially reduce the tragedy. Just as lessees of mineral estates have the right to reasonable use of the surface — regardless of the exclusion rights in the surface estate — owners of a wind or solar estate could trump certain surface rights in order to capture the sun or wind flowing over property. Ernest Smith and Becky Diffen observe that states like Texas have begun to recognize severed wind rights, for example, and that further application of oil and gas law principles to the field of wind will likely benefit wind developers. Ernest E. Smith & Becky H. Diffen, *Winds of Change: The Creation of Wind Law*, 5 TEX. J. OF OIL, GAS, & ENERGY L. 165 (2010).

[400] *See supra* text accompanying note 100.

tacks, and storage and disposal of the waste are substantial, however.[401] Due to the need for careful regulation of the plants, multiple parties have the right to block their construction and thus nullify the entire property bundle. One party may object to the location, another to the construction of the physical plant, and another to the economic feasibility of the plant. Even with federal preemption of state regulation of nuclear safety, states and municipalities have found ways to exclude nuclear plants.[402] The plants have historically been so expensive to site and build — largely due to the thick layer of regulations that they face — that most nuclear power plants are old facilities with extended licenses; developers have only recently begun to propose new construction.[403] This new surge in applications is due in part to innovative federal programs that have started to address the anticommons challenge in nuclear power. Through the Nuclear Regulatory Commission's Early Site Permit program, for example, the Commission consolidates "safety issues, environmental protection issues, and plans for coping with emergencies" into one process and notifies all stakeholders of a single participatory process to address these issues.[404] Only federal incentives and streamlined permitting processes like this will allow nuclear energy, with its layers of onerous yet necessary regulations, to thrive. As with any form of energy development, however, "streamlining" should not mean less substantive regulation or laxer review. Rather, the regulation necessary to ensure the safety of the energy infrastructure and the mitigation of its impacts should be procedurally consolidated in a process that reduces transaction costs to all parties who participate in regulatory decisions, including the developer and the public.

Fossil fuels such as oil and gas may also face unique regional challenges, since reservoirs of these resources do not follow existing jurisdictional or private property lines.[405] Local, state, and some federal regulations in the environmental and land use areas all apply to the extraction of these fuels,[406] although production companies have received exemptions from

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[401] *See* FRED BOSSELMAN, ET AL., ENERGY, ECONOMICS, AND THE ENVIRONMENT, 1045–49, 1122 (3d ed. 2010) (discussing terrorism and waste issues).

[402] *See, e.g.*, Pacific Gas & Elec. Co. v. Energy Res. and Dev. Comm'n, 461 U.S. 190, 216 (1983) (holding that California's ban on nuclear power plants until they had adequate temporary and permanent disposal systems for their fuel rods was not preempted by federal law).

[403] *See* BOSSELMAN ET AL., *supra* note 401, at 1018–19 (describing how the "104 presently operating nuclear power reactors were licensed" under old regulations, how under this statute, "many issues . . . [that industry] thought were resolved in the construction permit stage were reopened in the operating permit stage" and how applications commenced again only after the NRC changed the regulations).

[404] *Early Site Permit Applications for New Reactors*, NUCLEAR REGULATORY COMM'N, http://www.nrc.gov/reactors/new-reactors/esp.html (last visited May 20, 2011) (on file with the Harvard Law School Library).

[405] *See, e.g.*, *Shale Gas Plays*, U.S. ENERGY INFO. ADMIN., DEP'T OF ENERGY, http://www.eia.doe.gov/oil_gas/rpd/shale_gas.pdf (last visited Mar. 10, 2010) (on file with the Harvard Law School Library) (showing a map where most shale plays cross several state lines).

[406] *See, e.g.*, GROUND WATER PROT. COUNCIL & ALL CONSULTING, *supra* note 93, at 25 ("The development and production of oil and gas in the U.S., including shale gas, are regulated under a complex set of federal, state, and local laws.").

many of the major federal regulations.[407] As with renewable technology or nuclear power plants, a zoning board may object that oil or gas drilling is not permitted in the area in which it is proposed, another party may find that the drilling itself will cause too much environmental damage, and yet another might refuse to offer a lease for mineral production. The challenges of siting and operating rigs to extract these fuels have been highlighted recently in the Appalachian region, where New York has placed a moratorium on a new form of natural gas extraction (slickwater hydraulic fracturing, or "fracing"),[408] while Pennsylvania has welcomed it,[409] although it has imposed additional regulations.[410] Further, towns in Pennsylvania have attempted to exert their own rights by zoning out the practice.[411] Collaboration through regional forums might help states and municipalities to share their information about risks and benefits of oil and gas extraction practices and potentially reach compromise standards.

Construed broadly, anticommons-type problems could potentially arise in any situation where a complicated layer of regulations and ownership rights applied to a property.[412] But in the most compelling examples, the rights of exclusion actively block productive activity and allow less of the activity than is desirable, as has occurred with renewables and perhaps other forms of energy. In many cases, these regulations are justified and necessary, and "desirable" levels of production must be accurately measured by gauging environmental and social impacts. New York, for example, is conducting a thorough environmental analysis of the effects of hydraulic fracturing in the midst of its moratorium;[413] until it is convinced of the safety of the practice, it is willing to reject the potential profits.[414] For other states, a careful balance between renewable technology installation and protected

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[407] *See* Wiseman, *supra* note 40, at 241–48 (discussing exemptions of hydraulic fracturing and certain oil and gas activities more generally from portions of the Clean Water Act, Safe Drinking Water Act, Emergency Planning and Community Right to Know Act, and Resource Conservation and Recovery Act).

[408] *See* DIV. OF MINERAL RES., *supra* note 38 (explaining that the Department had received applications for slickwater hydraulic fracturing and that permits would not be issued until the impact statement was completed); *Governor Paterson Vetoes Natural Gas Drilling Moratorium*, CBS News, Dec. 11, 2010 (explaining that the governor vetoed a moratorium on gas drilling that passed the New York State Senate and Assembly but prohibited hydraulic fracturing for natural gas through at least July 2011).

[409] *See supra* note 37 and accompanying text.

[410] *See*, *e.g.*, Wiseman, *supra* note 40, at 260–67 (discussing Pennsylvania requirements for the disposal of flowback water from hydraulic fracturing).

[411] *See supra* note 39 (discussing towns' attempts to restrict hydraulic fracturing).

[412] Indeed, in 1976 — addressing large non-renewable power plant siting — Professors Norman Wengert and Robert Lawrence expressed puzzlement "as to why the regional system has received so little attention in the data used by state governments in considering energy facility siting decisions" and "why siting decisions do not give more emphasis to regional system interrelationships." NORMAN WENGERT & ROBERT M. LAWRENCE, REGIONAL FACTORS IN SITING AND PLANNING ENERGY FACILITIES IN THE ELEVEN WESTERN STATES: A REPORT TO THE WESTERN INTERSTATE NUCLEAR BOARD I–10 (1976).

[413] *See* DIV. OF MINERAL RES., *supra* note 38 (examining the potential environmental and health effects of hydraulic fracturing).

[414] *See id.*

habitat must be met,[415] and the costs of renewable development to consumers must be carefully considered.

"Desirable" energy production is not unlimited production. But if a better method of combining, implementing, and enforcing the many exclusion rights within regional energy developments could be achieved, all parties would benefit. Transaction costs for producers would decline. Those opposed to development, although no longer able to block a project by withholding a single stick of the bundle,[416] would have a central forum where they could voice all concerns. And within this coherent forum, an efficient level of production would ideally be determined by debate and consensus, not unmanageable transaction costs.

Beyond the physical siting and development of energy infrastructure, energy planning more generally faces substantial hurdles because regional energy planning institutions are scarce. Energy resources are not allocated along state lines, but energy planning is. Generally, states individually determine the need for new energy resources and grant certificates of convenience and necessity to new power plants that are deemed beneficial to the public. But many states lack sufficient electricity generation resources and must import electricity through transmission lines. If states collaborated in determining when and where new power plants and transmission lines should be built, "source" and "sink" states could have a much more efficient system of energy provision.[417] Sink states that imported electricity could collaborate with neighboring sink states to build needed transmission or form a purchasing pool. Producing states with better knowledge of export needs could better plan for the expansion of power plants. Some of this coordination already occurs through regional entities, which address the reliability of transmission, and regional transmission organizations ("RTOs") and independent system operators ("ISOs") that run the wholesale transmission market. These transmission organizations identify constraints and bottlenecks in the lines,[418] ensure that the lines are physically intact and operating smoothly,[419] arrange for the expansion or construction of new

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[415] *See* Bronin, *supra* note 218, at 11 (describing the potential habitat impacts of wind energy); S.A. Abbasi & Naseema Abbasi, *The Likely Adverse Environmental Impacts of Renewable Energy Sources*, 65 APPLIED ENERGY 121, 132 (2000) (discussing solar farms' potential "direct destruction of desert habitats for burrowing animals and other desert wildlife").

[416] *See* Heller, *supra* note 17, at 639 (explaining that in an anticommons, "even if only one party opposes the use, that party may be able to block others from exercising their rights").

[417] *See* U.S. DEP'T OF ENERGY, *supra* note 41.

[418] There are two types of regional transmission organizations. The first — regional entities — are tasked solely with ensuring the physical reliability of the grid. The second — independent system operators and regional transmission organizations — plan for grid expansion, schedule flows of electricity over the grid, and run transmission markets. *See generally* FERC, Regional Transmission Organizations, 18 C.F.R. § 35 (1999) (describing RTOs and ISOs); Clinton A. Vince et al., *What is Happening and Where in the World of RTOs and ISOs?*, 27 ENERGY L.J. 65, 66–74 (2006) (same); Scott Grover, *FERC Guidance Order Shows Inter-Agency Tension*, 23 NAT. RES. & ENV'T. 61, 62–67 (2009) (describing regional entities).

[419] *See* Grover, *supra* note 418, at 67.

transmission lines,[420] and schedule flows of electricity through the grid.[421] All of this takes place on a regional basis, since transmission lines do not follow jurisdictional boundaries. But when the Federal Energy Regulatory Commission tried to require states to more generally plan for future energy needs on a regional basis, they resisted.[422] As energy prices continue to fluctuate, however, and states struggle to provide a constant supply of energy to their residents, this resistance might fade. Further, a successful demonstration of regional governance through a regional energy board could convince states of the benefit of this type of coordination beyond renewables.

## CONCLUSION

Renewable energy is an essential component of America's future energy mix, and governments have placed a strong priority on its rapid development. There are substantial obstacles to the construction of utility-scale renewable farms, however, which must be remedied.

First, renewable energy development has many characteristics of a classic anticommons tragedy, and this has contributed to the underdevelopment of renewables. Ideal renewable parcels exist where the fugitive sun or wind resources flowing over the land are particularly steady and strong. Numerous private property lines and jurisdictional boundaries, which were typically formed in ignorance of these fugitive resources, divide many renewable parcels. Alternatively, even for a parcel overlying just one piece of property within one jurisdiction, multiple parties within the parcel all have existing rights to the land and potentially to the fugitive resources flowing over it, and thus numerous opportunities exist to exclude renewable developers by denying a lease, rejecting a proposed permit, or blocking the project on numerous regulatory grounds.

Second, where multiple jurisdictions have partial responsibility over renewable siting, as is often the case, regulatory gaps often remain. No one entity has the power or incentive to take the regulatory helm, and this regulatory commons tragedy can lead to insufficient governance frameworks for renewable siting. In turn, this may lead to the underdevelopment of renewable technology, or development may occur in a fashion that insufficiently

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[420] *See, e.g.*, Ill. Commerce Comm'n. v. FERC, 576 F.3d 470, 474 (2009) (discussing a new transmission line planned by a regional transmission organization and financed by the organization's members in the Midwest region); Conn. Dept. of Pub. Util. Control v. FERC, 593 F.3d 30, 32 (2010) (discussing planned transmission expansions by an independent system operator in the New England region).

[421] *See* Vince, *supra* note 418, at 66–74 (describing RTO and ISO functions).

[422] *See* FERC, Remedying Undue Discrimination Through Open Access Transmission Service and Standard Electricity Market Design, 67 Fed. Reg. 55,4252, 55,479 (July 31, 2002) (to be codified at 18 C.F.R. pt. 35) (proposing "regional state advisory committees" to coordinate and plan regional electricity markets); FERC, WHOLESALE POWER MARKET PLATFORM, (2003) (backing away from the requirement of creating or joining Independent Transmission Providers but still requiring public utilities to join regional transmission organizations on their own timeline).

addresses environmental and social concerns associated with the siting of semi-permanent infrastructure.

Finally, renewable energy is typically transported as electricity, and the best renewable resources are often far from population centers. New transmission lines must be built, like the renewable projects themselves, cross multiple property lines and jurisdictions. Without an assurance of available transmission, developers will not build.

To address these challenges to the siting of utility-scale renewable energy, municipalities, states, Native American tribes, and the federal government must collaborate to form regional institutions called regional energy boards. Each board must pull together the exclusion rights of multiple authorities within a region. Each must possess regulatory powers over the siting of renewable plants; provide processes through which the parties can negotiate and resolve conflicting rights; create clear hierarchies among rights (through preemption, if necessary); and offer centralized and accessible processes through which the rights are applied to the renewable parcel. These regional energy boards must offer a consolidated forum of manageable exclusion rights in order to reduce the high transaction costs of the renewable energy anticommons.

At first blush, this proposed governance institution may appear to be an unrealistic hypothetical, but history proves this to be untrue. States and Congress have entered into formal compacts delegating substantial regulatory authority over land use and water resources to regional entities. In the water resource area, regional institutions formed by states and the federal government and approved by Congress have managed comprehensive regulatory schemes for more than thirty years.[423] In the renewables area, the Western Governors' Association has already formed regional institutions, which, although informal, aim to identify renewable zones and develop transmission corridors from these zones. Further, states have recognized the need for regional governance of energy more generally and have authorized their agencies to participate in regional forums.[424] Existing regional models provide ample patterns to emulate in the formation of new regional boards.

Regional energy boards must be implemented and tested not only to hasten renewable development but also to encourage regional governance beyond renewable technology. From the mining or drilling of fuel from common reservoirs to planning for electricity production and transmission needs, energy is inherently a regional enterprise that requires collaborative attention. States cannot close their eyes to the resource activities surrounding their borders, and regional governance would allow for shared expertise, avoidance of overlapping regulation, and fewer transaction costs for all parties in the energy development and planning process.

It is time for the modernization of energy governance in the United States, and small yet important steps toward regional energy models suggest

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[423] *See supra* text accompanying notes 282–346.
[424] *See supra* notes 42–43 and accompanying text.

that there is adequate momentum for this change. Regional energy boards are a necessary step toward this transition, not only to reduce the obstacles to the development of this essential form of energy but also to demonstrate how other areas of energy development could benefit from a regional governance structure. The isolation and fragmentation of energy planning and development in the United States is a flaw that can no longer be ignored. Without the rapid implementation of an improved system, our security — indeed, our economy and way of life — will remain at risk.