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ENERGY VERSUS PROPERTY

MICHAEL PAPPAS*

ABSTRACT

This Article is the first to detail the balance legislatures and courts have struck between private property rights and the compelling public interest in energy production. By examining how property rights have consistently yielded to energy development from colonial times to the most recent decisions involving hydraulic fracturing (“fracking”), it identifies a coherent energy/property balance that has shaped property expectations to accommodate energy needs. The Article then applies this insight to current disputes pitting aggressive renewable energy policies—such as nuisance immunity or mandatory installations on private property—against fundamental property expectations: the right to exclude and the right to use and enjoy. In doing so, it analyzes how the energy/property balance informs reasonable property expectations and helps resolve Fifth Amendment takings claims. The central conclusion is this: throughout our legal history and into our energy future, when circumstances pit private property rights against the societal need for energy, i.e., when it comes to energy versus property, energy tends to win.

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I. INTRODUCTION

Energy is a big deal right now. Whether the concern is fostering domestic energy security, developing energy resources sustainably and economically, or adjusting the energy portfolio in response to climate change, the United States is searching for the proper policies to shape its energy future.

As a result, *renewable* energy is a big deal right now. With the potential to address all of the concerns listed above, renewable energy development has become a favored policy at all levels of government. In fact, some state and municipal governments have begun aggressively promoting renewable energy projects even at the residential level. With such policies hitting close to home, questions arise about how far governments may go in encouraging or even mandating the installation of renewable energy technologies on private property. After all, property is also a big deal.

Part of the answer is that both energy and property have been a big deal for a long while, and this is not the first time they have come into tension. Even in the days when firewood was our principal energy source, the pressing social need for energy production fell into conflict with private property expectations. Though these energy-versus-property disputes have arisen across multiple centuries and in a variety of resource contexts, the results maintain a surprising coherence. In striking the energy/property balance, legislatures and courts have consistently shaped private property expectations to accommodate energy development. Thus when it comes down to energy versus property, energy tends to win.

This Article is the first to trace and synthesize this energy/property balance comprehensively, analyzing how property rights have yielded to energy development in instances spanning from firewood gathering in colonial times to the most recent decisions involving hydraulic fracturing (“fracking”). The Article also examines how this legal tradition applies to current policies promoting and mandating renewable energy installation, offering guidance to both policymakers and courts in applying the energy/property balance to an emerging set of conflicts.

Part II begins by offering the context for current and emerging disputes between energy development and property rights, particularly regarding residential and small-scale renewable energy projects. First, it offers a background overview of the value of small-scale renewable energy and the barriers that inhibit its development. It then describes aggressive government policies and scholarly proposals for overcoming these barriers by, for example, mandating renewable energy installations on private property or limiting neighbors’ rights to interfere with these projects. Part III examines how

these aggressive policies create tension with core private property rights. It begins by summarizing basic private property expectations, such as the right to exclude and the right to use and enjoy, as well as the expected property-rule and liability-rule remedies that protect these rights. Next, it discusses how aggressive renewable energy policies alter expectations regarding property rights and remedies, leading to legal conflicts in the form of takings claims. In turn, Part IV contextualizes these conflicts, describing how our legal tradition has consistently imposed an energy/property balance that shapes property expectations to accommodate energy development. In doing so, it reviews precedent spanning from early energy sources such as firewood and water, to emerging electrical production from coal, water, and utilities, to oil and gas production, and even to farm production. Part V then applies this energy/property balance to aggressive renewable energy policies. It begins by analyzing how the energy/property balance shapes reasonable property expectations. Then, it offers normative reasons for applying the energy/property balance to renewable energy development. Finally, it examines how the energy/property balance influences the takings inquiry for aggressive renewable energy policies, concluding that none of these policies create compensable takings. Lastly, Part VI offers overall conclusions.

II. RENEWABLE ENERGY

Renewable energy occupies a central role in the planning of our energy future. This Part outlines the values of small-scale, distributed renewable energy measures from environmental, social, and economic perspectives. It then discusses the market failures and legal disputes that have handicapped the advance of renewables and that justify government intervention to promote renewable energy programs. Finally, it offers an overview of aggressive policy measures and scholarly suggestions to promote renewable energy development.

A. *The Value of Renewable Energy*

“At a point in the future that is no longer unimaginably remote, renewable energy will be necessary to human survival.”¹ Even today, the majority of Americans favor renewable energy,² and this broad

1. Garrick B. Pursley & Hannah J. Wiseman, *Local Energy*, 60 EMORY L.J. 877, 891 (2011).

2. See, e.g., PIKE RESEARCH, ENERGY & ENVIRONMENT CONSUMER SURVEY 5, 50 (2012) (surveying more than one thousand adults and finding that over 75 percent of respondents favored wind and solar energy, although only 47 percent supported biofuels, another touted form of renewable energy); Jeffrey M. Jones, *In U.S., Alternative Energy Bill Does Best Among Eight Proposals*, GALLUP (Feb. 2, 2011), <http://www.gallup.com/poll/145880/Alternative-Energy-Bill-Best-Among-Eight-Proposals.aspx> (surveying more than one thousand adults and finding that 83 percent of respondents would support congressional legislation that provides incentives for the use of solar and other renewable energy

support is not surprising given the environmental and national security benefits of renewables. A shift to clean energy will not only reduce greenhouse gas emissions³ that contribute to the enormous and exigent problem of climate change,⁴ but it will also represent a major step toward achieving sustainability⁵ and domestic energy security.⁶ Moreover, with electricity demand expected to double by 2050⁷ and with the United States at only 10 percent of its potential renewable capacity,⁸ renewable energy expansion must be part of the nation's energy agenda.

The challenge, then, is in how to increase renewable energy production. One tactic is to rely on large, utility-scale renewables operations, such as major solar-power or wind-power installations. Such grand projects, with their attendant challenges of siting, transmission, and environmental tradeoffs, have received a great deal of popular and scholarly attention,⁹ and they will certainly be a part of our energy future. However, smaller scale distributed generation sources also have a role to play. Though they have received less attention than utility-scale facilities, distributed generation projects "are just as essential as large-scale installations to establishing a stable nationwide energy infrastructure powered substantially by renewable resources."¹⁰

sources); Humphrey Taylor, *Large Majorities in U.S. and Five Largest European Countries Favor More Wind Farms and Subsidies for Bio-fuels, but Opinion Is Split on Nuclear Power*, HARRIS INTERACTIVE (Oct. 13, 2010), <http://www.harrisinteractive.com/NewsRoom/HarrisPolls/FinancialTimesHarrisPolls/tabid/449/ctl/ReadCustom%20Default/mid/1512/ArticleId/584/Default.aspx> (surveying more than one thousand adults in a Financial Times/ Harris poll and finding that 87 percent of respondents favored an increase in the number of wind farms).

3. See, e.g., Uma Outka, *The Renewable Energy Footprint*, 30 STAN. ENVTL. L.J. 241, 253 (2011).

4. See Outka, *supra* note 3, at 253 (suggesting that despite competing concerns, climate change concerns should be the primary driver behind setting energy policy); Pursley & Wiseman, *supra* note 1, at 890 (noting climate change impacts including "rising seas, more severe storms, and longer droughts to higher extinction rates for animal and plant species"); Karin P. Sheldon, *Upstream of Peril: The Role of Federal Lands in Addressing the Extinction Crisis*, 24 PACE ENVTL. L. REV. 1, 2 (2007) ("[Climate change] includes and eclipses all other environmental issues we face in the twenty-first century . . .").

5. Hannah Wiseman et al., *Formulating a Law of Sustainable Energy: The Renewables Component*, 28 PACE ENVTL. L. REV. 827, 836-39 (2011).

6. See Pursley & Wiseman, *supra* note 1, at 890.

7. Sara C. Bronin, *Curbing Energy Sprawl with Microgrids*, 43 CONN. L. REV. 547, 549 (2010).

8. Outka, *supra* note 3, at 247.

9. See, e.g., Bronin, *supra* note 7; Ronald H. Rosenberg, *Making Renewable Energy a Reality—Finding Ways to Site Wind Power Facilities*, 32 WM. & MARY ENVTL. L. & POL'Y REV. 635 (2008) (focusing on wind development).

10. Pursley & Wiseman, *supra* note 1, at 880; see also GARY D. ALLISON & JOHN L. WILLIAMS, *THE EFFECTS OF STATE LAWS AND REGULATIONS ON THE DEVELOPMENT OF RENEWABLE SOURCES OF ELECTRIC ENERGY* 4 (2010), available at <http://www.rff.org/RFF/>

Distributed generation sources are on-site electrical generation facilities linked closely with their ultimate uses.¹¹ Examples can range from “[s]mall-scale renewables on rooftops, parking garages, factories, and in yards”¹² to “[b]uilding-related renewable energy,” such as “solar, wind, geothermal, and fuel cell technologies . . . incorporated into inhabited structures and used by those structures’ occupants.”¹³

Among the advantages of distributed generation are the quick startup times that can “quickly reduce America’s dependence on fossil fuels.”¹⁴ While utility-scale projects may take years to come online, “[a] homeowner or business in an area with adequate enabling regulations for small-scale renewable electricity generation can have a system up and running in several months.”¹⁵ Government entities, particularly at the state or local level, have looked to distributed generation as “an immediate and substantial step toward increasing renewable energy capacity.”¹⁶

Additionally, distributed generation achieves efficiency by eliminating transmission costs and losses. With distributed generation, energy production is decentralized and proximate to its end uses.¹⁷ This “maximizes efficiency, because little energy is lost during transmission. Thus nearly all of the energy produced by the generator can be directly used by the end user.”¹⁸ Reducing these transmission losses represents a major energy savings. Since roughly 10 percent of our energy is lost in transmission to buildings¹⁹ and since “buildings consume 40 [percent] of our energy, use two-thirds of our electricity, and emit 40 [percent] of our greenhouse gases,”²⁰ the advantages of minimizing transmission are far from negligible. In the same vein, distributed generation reduces the need for transmission infrastructure,²¹ which saves further costs and leaves a smaller geographic footprint than do larger energy installations. By increas-

Documents/RFF-BCK-AllisonandWilliams-StateLaws.pdf; MAXIMILLIAN AUFFHAMMER & ALAN H. SANSTAD, ENERGY EFFICIENCY IN THE RESIDENTIAL AND COMMERCIAL SECTORS 2 (2011), available at <http://www.rff.org/RFF/Documents/RFF-BCK-AuffhammerSandstad-EEResComm.pdf>.

11. Outka, *supra* note 3, at 256.

12. Pursley & Wiseman, *supra* note 1, at 899.

13. Sara C. Bronin, *Building-Related Renewable Energy and the Case of 360 State Street*, 65 VAND. L. REV. 1875, 1881 (2012).

14. Pursley & Wiseman, *supra* note 1, at 899.

15. *Id.*

16. *Id.*

17. Bronin, *supra* note 7, at 559.

18. Bronin, *supra* note 13, at 1891.

19. Bronin, *supra* note 7, at 556.

20. Bronin, *supra* note 13, at 1884.

21. See Pursley & Wiseman, *supra* note 1, at 897.

ing renewable energy production in already developed areas, distributed generation avoids both the “energy sprawl” and negative ecosystem and species impacts associated with geographically expanding energy development.²²

Another advantage of distributed generation sources is that they can combine to form a “microgrid” system of neighborhood-scale energy grids, localizing and sharing energy production. “Microgrids organize distributed generation technology into a closed, low-voltage system that may address the needs of multiple users using multiple kinds of technologies.”²³ For example, a microgrid might allow an entire block of homeowners to share and store the power generated by an array of solar cells.²⁴ Microgrids therefore allow for additional renewable energy capacity and distribution while still reducing demands on both the grid and transmission infrastructure.²⁵

Further, these microgrids are valuable in that “[t]hey allow property owners to achieve economies of scale by spreading the costs and the risk of installation and maintenance among many parties.”²⁶ Even though distributed generation installation may have negative costs (i.e., more than pay for itself),²⁷ the upfront cost may be difficult for individuals to bear or may be difficult to finance on individual levels.²⁸ Microgrids, however, can allow for easier financing, risk spreading, and cooperation.²⁹ For example, a group of neighbors might coordinate to install a wind turbine on a vacant lot or invest in a solar panel to share the cost and the output.³⁰ This coordination also allows groups of neighbors collectively to locate renewable energy generating stations in the most advantageous location.

Finally, microgrid users can also incorporate multiple sources of power generation, such as wind and solar, to smooth out supply, and because microgrid users may require power at different times of day, the shared enterprise can help spread demand.³¹ Microgrids’ decentralization may even offer greater power reliability because if one power source goes down, other power sources can remain fully

22. See Outka, *supra* note 3, at 243.

23. Bronin, *supra* note 7, at 559.

24. *Id.*

25. See *id.* at 561-62; Outka, *supra* note 3, at 303.

26. Bronin, *supra* note 7, at 547.

27. ALAN J. KRUPNICK ET AL., TOWARD A NEW NATIONAL ENERGY POLICY: ASSESSING THE OPTIONS – EXECUTIVE SUMMARY 9 (2010), available at http://www.rff.org/RFF/Documents/RFF_NEPI_Exec_Summary.pdf.

28. Bronin, *supra* note 7, at 563.

29. *Id.*

30. See *id.* at 551; Bronin, *supra* note 13, at 1882.

31. Bronin, *supra* note 7, at 563.

functional, making energy infrastructure more secure from disaster or attack.³²

Among the distributed renewable options, solar and wind energy are primary candidates because they represent two of the four key resources for land-based renewable energy,³³ are available at a distributed level,³⁴ have smaller land footprints than other energy alternatives,³⁵ and require less water than do other energy sources.³⁶ Moreover, unlike hydropower, solar and wind energy do not require proximity to rivers or construction of dams, which come with their own economic and environmental costs. As a result, distributed generation of wind and solar technologies is particularly attractive at the state and local level, and this Article focuses primarily on these forms of renewable energy development.

B. Renewable Energy Challenges

Despite the benefits of such clean energy sources, challenges remain in implementing these projects. First, market irrationality or distortion often prevents private investment in distributed renewables and energy efficiency measures. Second, disputes or lack of cooperation with neighboring property owners increases costs, creates delays, and sometimes forecloses altogether the installation of distributed renewables.

While market forces have led to some progress in clean energy installation,³⁷ market interventions—either through government incentives or mandates—have spurred much of the clean energy development.³⁸ Such intervention has been necessary due to what has been termed “the energy paradox”³⁹ or the “energy efficiency gap”⁴⁰ (collectively “the paradox”). The paradox is as follows: though “[m]any studies have shown that investing today in energy efficient [and renewable energy] technologies will return fuel savings that significantly outweigh the initial investment cost over the lifetime of the purchase[s,] . . . businesses and consumers often reject such investments.”⁴¹

32. *Id.*

33. Outka, *supra* note 3, at 247.

34. *See* Bronin, *supra* note 13, at 1877.

35. Outka, *supra* note 3, at 249.

36. *See id.* at 253.

37. *See id.* at 247.

38. *Id.*

39. KRUPNICK ET AL., *supra* note 27, at 9.

40. *See, e.g.*, Brandon Hofmeister, *Bridging the Gap: Using Social Psychology to Design Market Interventions to Overcome the Energy Efficiency Gap in Residential Energy Markets*, 19 SOUTHEASTERN ENVTL. L.J. 1, 4 (2010).

41. KRUPNICK ET AL., *supra* note 27, at 9.

A number of market irrationalities or distortions can account for the paradox. First, consumers frequently misjudge or discount the benefit of renewable energy investments, often demanding “payback periods of perhaps 4 years or less on investments with lifetimes of 15 to 50 years, implying required rates of return that are well above market rates.”⁴² Additionally, an array of cognitive barriers can also prevent rational investment in energy efficiency or renewable energy.⁴³ For example, the endowment effect and failure to ignore sunk costs leads people to rely on previous investments rather than reinvesting in new, more efficient technologies, even when a pure cost-benefit analysis suggests such reinvestment.⁴⁴ Second, a status quo bias influences people to rely on default positions, such as dated construction practices or non-renewable energy sources, rather than reevaluating investment in renewables or energy efficiency.⁴⁵ Third, people tend to undervalue costs and benefits that are not “vivid” or “emotional,” and many basic efficiency or energy-supply choices do not register as vivid.⁴⁶ Fourth, many irrationally perceive environmentally friendly products as either poorer performing or bearing a cost premium.⁴⁷ Fifth, in our mobile society, people may believe they will sell properties or move before they see a payoff for a renewable energy investment.⁴⁸ Finally, split incentives may exist for property owners; for example, landlords often have no incentive to invest in energy efficiency or renewable energy because the tenant pays the utility bill.⁴⁹ The net result of these phenomena singularly or in combination is that the market becomes distorted against distributed generation of renewable energy, hampering its expansion.

42. *Id.* Economists disagree as to whether this energy paradox is caused by hidden costs (for example, if new technologies are unreliable or inferior), or market failures (such as imperfect information about the benefits of new technologies, split incentives of those renting versus owning property, or lack of capital and other financing problems) that would require affirmative policies to correct. *See id.* For an in depth discussion of the theories, particularly market failure scenarios, underlying the energy paradox, see AUFFHAMMER & SANSTAD, *supra* note 10, at 20-29; Hofmeister, *supra* note 40, at 14-18.

Many advocates of standards to mandate or promote energy-efficiency technologies believe that market failure alone explains the energy paradox, but studies can measure the costs and benefits of energy-efficiency policies with differing assumptions for complete, partial, and no market failures. *See* KRUPNICK ET AL., *supra* note 27, at 8-10, 13-14.

43. *See* Hofmeister, *supra* note 40, at 18-31.

44. *Id.* at 21.

45. *Id.* at 22.

46. *See id.* at 28-29.

47. *Id.* at 30.

48. *See* Pursley & Wiseman, *supra* note 1, at 903-04.

49. *See, e.g.,* Lucas Davis & David I. Levine, *Renting Inefficiency*, ENERGY ECONOMICS EXCH. (Nov. 26, 2012), <http://energyathaas.wordpress.com/2012/11/26/renting-inefficiency>; *see also* Matthew L. Wald, *Why Renters Use More Electricity*, N.Y. TIMES (Dec. 20, 2012, 2:27 PM), <http://green.blogs.nytimes.com/2012/12/20/why-renters-use-more-electricity>.

In addition to these market irrationalities, a lack of cooperation between neighboring property owners has also inhibited distributed generation and microgrid development.⁵⁰ For example, even though shared distributed generation and microgrid projects can drive costs down and increase reliability for neighbors, few of these projects exist⁵¹ because development of these projects requires coordination and shared infrastructure such as piping, distribution lines, and monitoring equipment.⁵²

Beyond failing to cooperate, neighbors may also be outright hostile to renewable energy development. As Troy Rule has put it, “The greatest opponents of renewable energy development are often those living next door.”⁵³ This has certainly been the case for proposed wind installations, which have been the frequent target of nuisance suits from neighbors whose complaints have ranged from aesthetic impacts and light reflection, to noise and vibrations, to the risks of ice being thrown from the blades.⁵⁴ Moreover, opposition by neighbors is a particularly acute impediment to distributed generation and microgrids, which may bring renewables projects closer to objecting homes, businesses, and populated areas.⁵⁵ For example, neighbors “may reject microgrid technologies, taking a ‘not-in-my-backyard’ approach that drives distributed generation projects outward,”⁵⁶ or they may “object to restrictions placed on their activities when a renewable energy project is sited nearby.”⁵⁷ Altogether, these issues of market distortion and lack of cooperation among property owners impede distributed generation and microgrid development.

C. Aggressive Efforts to Promote Renewable Energy

To overcome these barriers, both government entities and scholars have called for aggressive efforts to promote distributed renewable energy installation through both mandates and limitations on neighbors’ ability to interfere with renewable energy projects.

50. See Bronin, *supra* note 13, at 1878; Bronin, *supra* note 7, at 568, 570-72.

51. Bronin, *supra* note 7, at 565.

52. *Id.* at 583.

53. Troy A. Rule, *Renewable Energy and the Neighbors*, 2010 UTAH L. REV. 1223, 1223.

54. See Renner Kincaid Walker, *The Answer, My Friend, Is Blowin’ in the Wind: Nuisance Suits and the Perplexing Future of American Wind Farms*, 16 DRAKE J. AGRIC. L. 509, 520-21 (2011); Brett Slensky & Angela Pappas, *Wind Power Projects, Nuisance Claims, and Right-to-Farm*, ABA AGRIC. MGMT. COMM. NEWSL., Nov. 2010, at 9, 9-11 (summarizing common complaints against wind installations).

55. See Bronin, *supra* note 13, at 1892; see also Bronin, *supra* note 7, at 571-72.

56. Bronin, *supra* note 7, at 579.

57. Bronin, *supra* note 13, at 1893.

1. Renewable Energy Mandates

Most policies to encourage renewables either rely on market incentives, such as tax rebates, or utility-driven initiatives,⁵⁸ like renewable portfolio standards (“RPS”)⁵⁹ or net metering.⁶⁰ While these have certainly helped promote renewable energy, they have not effectively spurred distributed generation.⁶¹ In response, some government entities have turned to mandates for distributed renewable energy.⁶² After all, “[i]t is much easier to be efficient when the user has no choice.”⁶³

As a modest example of such mandates, all states have developed some kind of energy efficiency building code.⁶⁴ Moreover, several municipal governments, including Boston, have imposed mandatory green building standards on the private sector,⁶⁵ similar to the approach taken by some members of the European Union.⁶⁶ Taking these mandates a step further, New Jersey requires that a developer of a new home offer to install or have someone else install solar energy for the prospective owner.⁶⁷

California has been even more aggressive. The California Energy Commission recently approved standards for new homes and commercial buildings set to take effect on July 1, 2014.⁶⁸ These standards require, among other measures, that both residential and commercial

58. See ALLISON & WILLIAMS, *supra* note 10, at 4.

59. RPS mandate that a certain percentage or amount of electrical energy come from renewable sources, but these impact utilities most directly. *Id.*

60. With net metering, a customer-generator can sell electricity back to the grid while still relying on the grid when their renewable source is not performing. *Id.*

61. See *id.*; see also Melissa Powers, *The Cost of Coal: Climate Change and the End of Coal as a Source of “Cheap” Electricity*, 12 U. PA. J. BUS. L. 407, 434 (2010).

62. Substantial government market intervention, including mandates, has been used to promote development of other energy resources. See, e.g., 1 BRUCE M. KRAMER & PATRICK R. MARTIN, *THE LAW OF POOLING AND UNITIZATION* § 1.02 (3d ed. 1989) (“The history of oil and gas development in the United States leads to the inevitable conclusion that the legal, economic, and engineering worlds have never reached a level of coordination that would allow for the efficient and equitable development of oil and gas reservoirs without substantial governmental intervention.”).

63. Bronin, *supra* note 13, at 1888.

64. ALLISON & WILLIAMS, *supra* note 10, at 154.

65. See Carl J. Circo, *Using Mandates and Incentives to Promote Sustainable Construction and Green Building Projects in the Private Sector: A Call for More State Land Use Policy Initiatives*, 112 PENN. ST. L. REV. 731, 758-59 (2008).

66. See Nancy J. King & Brian J. King, *Creating Incentives for Sustainable Buildings: A Comparative Law Approach Featuring the United States and the European Union*, 23 VA. ENVTL. L.J. 397, 449 (2005).

67. N.J. STAT. ANN. § 52:27D-141.4(a) (West 2013); Pursley & Wiseman, *supra* note 1, at 911-12.

68. *Revised Effective Date for the 2013 California Building Energy Efficiency Standards*, CAL. ENERGY COMM’N (Dec. 11, 2013), http://www.energy.ca.gov/title24/2013standards/2013_standards_revised_effective_date.html.

roofs include “solar-ready” rooftops to allow for the future addition of photovoltaic panels.⁶⁹ While the standards merely require that roofs “make[] space available” for “easier installation” of solar cells “at a future date”⁷⁰ and do not command the immediate installation of solar cells,⁷¹ they still impose affirmative mandates to support distributed generation.⁷² The code also requires that electrical service panels have a reserved space for breakers serving “future solar electric installation[s].”⁷³

Some U.S. jurisdictions have imposed even further reaching policies by mandating installation of certain renewable and energy efficient technologies. This is the approach taken in Puerto Rico,⁷⁴ which requires installation of solar hot water heaters. Similarly, the California Energy Commission has adopted the “Zero Net Energy” goal that by 2020 all new homes and by 2030 all commercial buildings “must use a combination of improved efficiency and distributed renewable generation to meet 100 percent of their annual energy need.”⁷⁵ To meet this goal, further mandates, such as rooftop photovoltaic cells, appear imminent.

In addition to these policies, scholars and commentators endorse even more ambitious mandates to promote distributed renewables and energy efficiency.⁷⁶ Some scholars justify such mandates as nec-

69. News Release, Cal. Energy Comm’n, Energy Commission Approves More Efficient Buildings for California’s Future (May 31, 2012), *available at* http://www.energy.ca.gov/releases/2012_releases/2012-05-31_energy_commission_approves_more_efficient_buildings_nr.html.

70. CAL. ENERGY COMM’N, CALIFORNIA’S 2013 — RESIDENTIAL: BUILDING ENERGY EFFICIENCY STANDARDS (2013), *available at* http://www.energy.ca.gov/title24/2013standards/rulemaking/documents/2013_Building_Energy_Efficiency_Standards_infographics.pdf.

71. Dana Hull, *California Poised to Require ‘Solar Ready Roofs’ on New Homes and Buildings*, SAN JOSE MERCURY NEWS (May 30, 2012, 3:06 PM), http://www.mercurynews.com/business/ci_20744057/california-poised-require-solar-ready-roofs-new-homes.

72. CAL. ENERGY COMM’N, PROPOSED 2013 BUILDING ENERGY EFFICIENCY STANDARDS 74, 129, 132 (2012), *available at* <http://www.energy.ca.gov/2012publications/CEC-400-2012-004/CEC-400-2012-004-15DAY.pdf>.

73. *Id.* at 131.

74. *Puerto Rico – Building Energy Code with Mandatory Solar Water Heating*, DSIRE, http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=PR03R&re=0&ee=1 (last updated Feb. 21, 2013).

75. News Release, Cal. Energy Comm’n, *supra* note 69. Further, cities like San Jose have set goals to “[r]eceive 100 percent of [its] electrical power from clean renewable sources’ by 2025.” Pursley & Wiseman, *supra* note 1, at 897 (quoting CITY OF SAN JOSE, 2009-2010 CLEAN TECH LEGISLATIVE AGENDA 2 (2009), *available at* <http://www.sanjoseca.gov/DocumentCenter/View/3701>).

76. *See, e.g.,* King & King, *supra* note 66, at 449 (2005) (“The lack of federal legislation mandating or providing incentives for sustainable construction practices constitutes a significant impediment to the development of nationwide sustainable construction programs in the United States.”); *cf.* Circo, *supra* note 65, at 764 (“Many studies expose the relative merits of imposing regulations and other government mandates on markets versus using

essary to overcome the market failures⁷⁷ and cognitive barriers⁷⁸ discussed above or to correct for externalities in building development.⁷⁹ Others assert that even if the market is functioning correctly, renewable energy mandates are appropriate because of the benefits of bringing renewables into production⁸⁰ and because mandates are effective as a regulatory tool for achieving policy objectives cost-effectively.⁸¹ Additionally, such renewables mandates generate “greater demand (to spur technological progress)” and “cost reductions that come from both experience and economies of scale.”⁸² Finally, mandates for distributed generation, whether solar or wind, would reduce the footprint of renewable energy, allowing for greater generation without further environmental disturbance.⁸³ To quote one commentator, “[G]overnment should no more recoil from green building [and renewable energy] mandates than it does from sanitary codes.”⁸⁴

Commentators have even suggested specific forms that the mandates may take. One thoughtful scholar has suggested that clean energy mandates are justified not only for new homes,⁸⁵ as California has imposed, but also for existing buildings.⁸⁶ Further, a number of

incentives and other economic instruments to adjust market forces. Among other things, we know that economic instruments carefully designed to work with market forces are often effective, but we also know that direct regulation may be essential in the face of market failures or in light of institutional and historical factors.”); Pursley & Wiseman, *supra* note 1, at 901 (“[M]unicipal governments must be free to enact all local land use regulations and standards, including building codes and zoning, necessary to encourage and ensure relatively predictable regulation of the installation of renewables.”); *id.* at 907 (“The need to enable (or, in some cases, command) local governments to reshape land use laws to accommodate distributed renewables . . . was well documented during the failed push toward renewables in the 1970s . . .”).

77. Hofmeister, *supra* note 40, at 63 (“Closing the energy efficiency gap is important enough to justify market interventions by the government.”).

78. *See id.* at 21, 66.

79. *See Circo, supra* note 65, at 744, 753, 762-63.

80. *See ALLISON & WILLIAMS, supra* note 10, at 156; *see also Circo, supra* note 65, at 732-33.

81. *See Hofmeister, supra* note 40, at 69.

82. KRUPNICK ET AL., *supra* note 27, at 18; *see also Hofmeister, supra* note 40, at 55.

83. *Cf. Outka, supra* note 3, at 302 (“Much like reusing land for a large-scale facility, onsite energy generation minimizes the footprint with rooftop solar panels, small-scale wind, and combined heat and power systems built into existing structures. . . . Yet ‘cities and residences cover about 140 million acres of land’ in the U.S., according to DOE, and considering land use only, solar panels could supply ‘every kilowatt-hour of our nation’s current electricity requirements’ on just 7 percent of that area—‘on roofs, on parking lots, along highway walls, on the sides of buildings, and in other dual use scenarios.’” (quoting U.S. DEPT OF ENERGY, PV FAQs: HOW MUCH LAND WILL PV NEED TO SUPPLY OUR ELECTRICITY? (2004), available at <http://www1.eere.energy.gov/solar/pdfs/35097.pdf>)).

84. Circo, *supra* note 65, at 780.

85. Hofmeister, *supra* note 40, at 70.

86. *Id.* at 72-73.

scholars have pointed out the need for policies to promote microgrid development and siting,⁸⁷ and Sara Bronin has suggested that states “should consider laws that provide special treatment for siting microgrid projects,”⁸⁸ including “requir[ing] localities to include microgrid siting as a mandatory element of their comprehensive plans.”⁸⁹

Finally, some scholars and policy advisors have called for even more ambitious measures to promote maximum renewable energy productivity for immediate greenhouse gas reductions,⁹⁰ though concerns over takings challenges have constrained these policies.⁹¹ For example, to promote microgrids and overcome neighbors’ lack of coordination, scholarship suggests that states might need to impose mandatory microgrid installation in certain small-scale energy districts.⁹² Similarly, to derive maximum benefit from renewable energy installations, a state might require installation of renewable energy facilities on prime locations for wind and solar energy production.⁹³ Finally, to maximize expansion of distributed generation and tie it into existing energy grids, a state might mandate that certain parcels or buildings allow third parties, such as utilities, to install and operate renewable technologies on their rooftops.⁹⁴

87. See, e.g., Bronin, *supra* note 7, at 580-81 (surveying scholarship).

88. *Id.* at 579.

89. *Id.* at 580.

90. See, e.g., Div. on Earth & Life Studies, Nat’l Research Council, *Expert Report: Limiting the Magnitude of Climate Change*, NAT’L ACAD. OF SCIS. (2010), <http://dels.nas.edu/Report/Limiting-Magnitude-Climate-Change/12785> (calling for immediate implementation of renewable energy to the maximum possible capacity); cf. Bronin, *supra* note 13, at 1891 (“Over the next twenty-three years, three-fourths of our building stock will be built new or renovated. In light of that opportunity, the ease with which property owners could either develop buildings with BRRE, or retrofit existing buildings with BRRE, is a matter of pressing concern. If we get the legal framework correct now, it is more likely that we will be able to count on more BRRE being developed in the future.” (footnote omitted)); Alexandra B. Klass, *The Frontier of Eminent Domain*, 79 U. COLO. L. REV. 651, 689 (2008) (“This is a critical time to be reflecting on property rights The nation as a whole is struggling with energy needs, climate change, and a host of other concerns that rest in large part on how to best use and allocate property and resources.”).

91. E.g., Bronin, *supra* note 7, at 583; Troy Rule, *A Downwind View of the Cathedral: Using Rule Four to Allocate Wind Rights*, 46 SAN DIEGO L. REV. 207, 242 (2009).

92. *But cf.* Bronin, *supra* note 7, at 583.

93. Cf. Rule, *supra* note 91, at 213 (“All else equal, public policy favors rules that allocate competing wind rights so as to maximize the amount of wind energy produced over the long run from discrete quantities of property and capital investment. Properties with consistent average wind speeds and other characteristics ideal for wind energy production are a scarce and highly valuable resource. Additionally, although wind is itself renewable, the costs of relocating a wind turbine after initial installation can be quite substantial. . . . [R]ules are needed to ensure efficient use of property that is situated near boundary lines and is thus at risk of being underutilized.” (footnotes omitted)).

94. Powers, *supra* note 61, at 435-36 (“[I]n urban areas, instead of encouraging ratepayers to install privately owned photovoltaic cells on their roofs, utilities could perform the installation and retain ownership of the solar array, while providing the ratepayer a discounted electricity rate in exchange for allowing the utility to site the solar array on the

2. *Limits on Neighbors' Rights*

Along with mandates, some jurisdictions and commentators also support efforts to promote renewable energy by limiting neighbors' ability to challenge or interfere with renewables projects. For example, New Jersey⁹⁵ and, arguably, Vermont⁹⁶ have statutorily limited nuisance suits against wind installations. Similarly, some state laws "protect the right to install solar panels on one's home."⁹⁷ Commentators have called for expansion and widespread adoption of such nuisance-immunizing policies,⁹⁸ noting that "[t]he time may be approaching when the federal government may need not only to encourage the use of clean energy devices, but also to protect the right to install, use, and maintain them."⁹⁹

In addition to limiting nuisance suits, states have also created regimes that prevent neighbors from using their property in a manner that might interfere with the productivity of installed renewables. For example, both Wyoming and New Mexico have statutes that protect installed solar energy cells from interference by imposing an easement in the airspace above neighboring properties.¹⁰⁰ Again, commentators have called for expansion of such policies, suggesting that state-level lawmakers "eliminate both preexisting and future deed restrictions that impinge on solar rights, restrict neighbors' ability to obstruct existing solar collectors, prevent homeowners' associations from limiting solar rights, and require localities

ratepayer's roof. If the utility could recover expenses associated with the installation and construction of the infrastructure necessary to implement the distributed generation system, it would have ample incentives to revolutionize the electricity system. Because the technology to develop distributed generation already exists, utilities could undertake the process almost immediately." (footnote omitted)); Nathaniel Gronewald, *Industry's N.J. Boom Casts Shadow over Program that Spurred It*, GREENWIRE (Aug. 25, 2011), <http://www.eenews.net/stories/1059953151> (Gronewald describes the utility-driven process for solar development, where, as opposed to independently owned rooftop projects, a utility company owns and operates a rooftop solar system located on another property owner's rooftop. In these instances, the property owner signs a purchase power agreement to buy the electricity produced at a discounted rate. Though entry into such programs has been voluntary, mandates may be necessary to increase such renewable capacity). These installations have been especially popular with "big-box" retail stores. See Sarah Korones, *Big-box Stores Lead the Pack in Solar Power Use*, SMARTPLANET (Sept. 12, 2012, 1:35 AM), <http://www.smartplanet.com/blog/bulletin/big-box-stores-lead-the-pack-in-solar-power-use>.

95. See Walker, *supra* note 54, at 525-26; Slensky & Pappas, *supra* note 54, at 9.

96. See Slensky & Pappas, *supra* note 54, at 11.

97. LaVonda N. Reed-Huff, *Dirty Dishes, Dirty Laundry, and Windy Mills: A Framework for Regulation of Clean Energy Devices*, 40 ENVTL. L. 859, 881 (2010).

98. See *id.* at 877; Joseph Haupt, Note, *A Right to Wind? Promoting Wind Energy by Limiting the Possibility of Nuisance Litigation*, 3 GEO. WASH. J. ENERGY & ENVTL. L. 256 (2012).

99. Reed-Huff, *supra* note 97, at 911; see also Walker, *supra* note 54.

100. N.M. STAT. ANN. § 47-3-4(B)(1) (2013); WYO. STAT. ANN. § 34-22-103(b)(i) (2013); see also Troy A. Rule, *Property Rights and Modern Energy*, 20 GEO. MASON L. REV. 803, 824 (2013).

to protect solar rights through zoning ordinances.”¹⁰¹ In the wind context, similar policies would protect wind installations from upwind interference.¹⁰²

Scholars have identified even further-reaching approaches to maximizing wind and solar energy production by not only preventing neighbors from interfering with renewable energy installations but also compelling neighbors to play a role in developing these resources. For example, Troy Rule has suggested that policies should “encourage or facilitate agreements among neighboring landowners to promote development of the most productive turbine sites, *regardless of proximity to property lines*.”¹⁰³ Such policies could encourage the greatest output from renewable energy installations, but scholars have again expressed reservations that takings concerns might limit the implementation of such policies.¹⁰⁴

III. TENSION WITH PROPERTY EXPECTATIONS

As discussed above, by bringing energy production closer to its places of use, distributed generation offers many benefits. However, by moving energy production closer to homes, businesses, and populated areas, it also breeds potential conflicts with property expectations. To examine these conflicts, this Part first offers an overview of core property rights expectations. Then it discusses property owners’ expectations for the remedies to protect these rights. Finally, it addresses how aggressive renewable energy policies create tension with these expectations.

A. *Property Rights Expectations:*

The Right to Exclude and the Right to Use and Enjoy

Two key expectations lie at the core of the “bundle of rights” that comprise property ownership: the right to exclude and the right to use and enjoy.

In vernacular conceptions of property, the right to exclude is paramount. The “home as castle” metaphor remains common, and many perceive the right to exclude as both straightforward and inviolate. As one scholar has put it:

Real property law is often treated as a refuge for clear legal rights, free from the need to balance competing interests. To take the most basic example, I have a right to prevent my neighbor from

101. Sara C. Bronin, Response, *Solar Rights for Texas Property Owners*, 89 TEX. L. REV. 79, 80 (2011) (paraphrasing Jamie E. France, Note, *A Proposed Solar Access Law for the State of Texas*, 89 TEX. L. REV. 187, 188-89 (2010)).

102. See Rule, *supra* note 91, at 208-09.

103. *Id.* at 215 (emphasis added).

104. See *id.* at 242.

trespassing or encroaching on my land, and my neighbor has a correlative duty not to trespass or encroach.¹⁰⁵

While the perception of an absolute right to exclude might not get the law absolutely right,¹⁰⁶ right-to-exclude expectations maintain substantial importance even in the highest and most theoretical legal conceptions of property. For example, the Supreme Court has recognized the right to exclude as one of the most central and sacred of property rights,¹⁰⁷ and most jurists and property theorists name the right to exclude as a core,¹⁰⁸ if not essential and irreducible,¹⁰⁹ aspect of property rights.

Also central to property expectations is the right to use and enjoy, which functions both as a right and a limitation on property uses. On the one hand, use and enjoyment is a concept of autonomy; a property owner's expectation includes the right to use and enjoy her property as she wishes without disturbance. On the other hand, this use and enjoyment concept limits a property owner's autonomy because she may not make an unreasonable use that injures her neighbor's correlative expectation of use and enjoyment.¹¹⁰ Thus the expectation of use and enjoyment is reciprocal, both protecting and limiting property uses.

B. Property Remedies Expectations: Property Rules and Liability Rules

Property expectations in the right to exclude and the right to use and enjoy would be of little good without government-enforced remedies.¹¹¹ After all, without the government remedying infringements of property expectations, our property system would amount to nothing

105. Stewart E. Sterk, *Property Rules, Liability Rules, and Uncertainty About Property Rights*, 106 MICH. L. REV. 1285, 1296 (2008).

106. See Joan Williams, *The Rhetoric of Property*, 83 IOWA L. REV. 277, 281 (1998) (“[A]n important distinction exists between the (political and legal) rhetoric of absolute property rights and the practice of limited ones.” (emphasis in original)); see also *id.* at 283 (“[The] intuitive image of absoluteness does not match social practice.”).

107. *Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 435 (1982); *Kaiser Aetna v. United States*, 444 U.S. 164, 179-80 (1979); see also Thomas W. Merrill, *Property and The Right to Exclude*, 77 NEB. L. REV. 730, 735 (1998).

108. See, e.g., Merrill, *supra* note 107, at 749.

109. *Id.* at 754.

110. As the maxim *sic utere tuo ut alienum non laedas* instructs, generally one must not use property in such a way as to injure the lawful rights of one's neighbors. 57A AM. JUR. 2D *Negligence* § 89 (1989).

111. See, e.g., Guido Calabresi & A. Douglas Melamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*, 85 HARV. L. REV. 1089, 1090 (1972) (noting that society must enforce the choice of property entitlements).

more than “might makes right.”¹¹² Therefore, a key part of property rights expectations is the expectation of remedies.

As famously categorized, there are two types of remedies available to protect property expectations: property-rule remedies and liability-rule remedies.¹¹³ Property-rule remedies are more absolute and leave more autonomy with the holder of the right. If someone wishes to infringe upon a right protected by a property rule, that person “must buy it from him in a voluntary transaction in which the value of the entitlement is agreed upon by the seller.”¹¹⁴ Thus, when protected by a property right, the property owner has complete authority to veto any infringement on his rights, and courts will use injunctive relief to protect these rights.

Liability-rule remedies, on the other hand, leave a property holder with less autonomy and control. Rather, a liability-rule protected right will give way when a third party is “willing to pay an objectively determined value for it.”¹¹⁵ Under liability-rule protection, a property holder does not have an absolute veto power; payment of monetary damages will be sufficient to compromise his property right.

Though the traditional dichotomy for remedies is between property-rule and liability-rule schemes, a third option is available: the “no-liability rule,” which offers no legal remedy for infringement on property rights.¹¹⁶

These different types of remedies significantly and concretely impact a property owner’s autonomy and, as discussed below, the owner’s practical exercise of rights such as exclusion or use of the property. An important component of a property’s owner’s expectations is, therefore, not only the rights available but also the remedy to enforce those rights. A property owner’s expectation may include the absolute protection of a property rule, and since “real property law is generally marked by a preference for property rules rather than liability rules,”¹¹⁷ such a robust expectation is reasonable. This expected remedy comports with autonomy concepts underlying much of our property law and includes the advantages of “encouraging investment, facilitating market exchange, and protecting subjective value.”¹¹⁸

Nonetheless, in some cases—particularly those involving conflicting beneficial uses of neighboring properties or government programs

112. *Id.*

113. *See id.* at 1092.

114. *Id.*

115. *Id.*

116. Sterk, *supra* note 105, at 1316 (“The discussion of property rules and liability rules has ignored a third alternative: impose no liability . . .”).

117. *Id.* at 1319.

118. *Id.* at 1335.

facing problems of coordinating multiple parties¹¹⁹—property owners might expect only liability-rule protection. Normally, however, a liability-rule remedy is the minimum expected remedy. Since violations of property rights nearly always occasion some type of remedy (thereby avoiding being reduced to a “might makes right” system), no-liability rules are typically outside the realm of expectation.¹²⁰

Therefore, as detailed below, courts typically enforce the right to exclude and the right to use and enjoy with property-rule schemes. While courts occasionally employ liability-rule remedies in certain circumstances, no-liability schemes are a remarkable rarity in the context of property expectations. Accordingly, property expectations have developed to include not only rights—those of exclusion and of use and enjoyment—but also particular remedies—frequently property rules and sometimes liability rules.

1. Remedies Protecting the Right to Exclude

Courts normally enforce the right to exclude through property rules, though in the takings context, where government action infringes on the right for a public purpose, courts apply a liability rule.¹²¹ For example, a strong property rule is the norm for protecting the right to exclude against private individuals. Thus if a third party infringes on a property owner’s right to exclude, the property owner need not even demonstrate harm¹²² to enforce her right through trespass and may enjoin future or repeated trespasses.¹²³

As against governmental entities acting in their sovereign capacity, the right to exclude is enforced through a liability rule guaranteed by the Fifth Amendment takings doctrine, preventing the government from taking private property for public use without just compensation.¹²⁴ The Fifth Amendment guards property rights against both regulatory takings (i.e., government regulation that goes too far)¹²⁵ and physical takings (i.e., physical invasion) of pri-

119. *Id.* (“Even the most fervent advocates of property rule protection, however, have recognized that context is critical. Sometimes, an exclusive focus on market ordering would lead to unacceptable inefficiencies.”); *see also* Calabresi & Melamed, *supra* note 111.

120. Sterk, *supra* note 105, at 1316 (noting that a no-liability scheme “appears inconsistent with any notion of property rights because it leaves an ‘owner’ with no recourse against an encroacher”).

121. *See, e.g.*, Calabresi & Melamed, *supra* note 111, at 1093 (“Taney’s house may be protected by a property rule in situations where Marshall wishes to purchase it [or] by a liability rule where the government decides to take it by eminent domain”)

122. *See, e.g.*, *Jacque v. Steenberg Homes, Inc.*, 563 N.W.2d 154, 159-60 (Wis. 1997) (noting that violation of the owners’ property right is, in itself, actual harm).

123. *See, e.g.*, *Baker v. Howard Cnty. Hunt*, 188 A. 223, 230-31 (Md. 1936) (outlining the court’s jurisdiction to enjoin continuing or repeated trespass).

124. U.S. CONST. amend. V.

125. *Pa. Coal Co. v. Mahon*, 260 U.S. 393, 415 (1922).

vate property;¹²⁶ there are separate legal inquiries, however, for the two contexts.¹²⁷

In determining whether a compensable regulatory taking has occurred, the court generally employs the *Penn Central* analysis to determine if regulation has gone too far in limiting private property rights.¹²⁸ This test examines investment-backed expectations, diminution of value, and character of government action.¹²⁹ It is a fact-intensive and ad hoc process with each case turning on its own circumstances, but the right to exclude remains important to the inquiry regarding both the character of government action¹³⁰ and the investment-backed expectation. In fact, the right to exclude plays such a prominent role that infringement on this right can create a taking even when the economic impact is small. As Joseph Singer has described:

[T]he Court has sometimes held that property owners' right to exclude others from property is so fundamental to ownership that government action limiting that right is a taking regardless of the overall effect on the value or use of the property. Thus, in *Kaiser Aetna v. United States*, the Court held that imposing the long-recognized navigational servitude, allowing public access to navigable waters, on a private marina that became navigable because of private development, required compensation under the takings clause. And in *Nollan v. California Coastal Commission*, the Court held that state imposition of an easement for public access to beachfront property constituted a taking requiring compensation. In neither case was the overall effect on the value or use of the property deemed relevant to whether a taking had occurred. Rather, under the Court's conceptual severance reasoning, simply because an important strand in the bundle of property rights, here the right to exclude, had been taken, a taking was found to have occurred.¹³¹

While the regulatory takings framework considers the right to exclude as an important component of its balancing test, in the physical takings context the right to exclude is the paramount concern. When the government physically invades property, no matter how small the

126. See *Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 435 (1982).

127. See *Tahoe-Sierra Pres. Council, Inc. v. Tahoe Reg'l Planning Agency*, 535 U.S. 302, 324 (2002).

128. *Penn Central Transp. Co. v. City of New York*, 438 U.S. 104 (1978); John D. Echeverria, *Is Regulation of Water a Constitutional Taking?*, 11 VT. J. ENVTL. L. 579, 591 (2010).

129. *Penn Central*, 438 U.S. at 124-25; see also *Tahoe-Sierra*, 535 U.S. at 315 n.10.

130. John D. Echeverria, *Making Sense of Penn Central*, 23 UCLA J. ENVTL. L. & POL'Y 171, 186 n.59 (2009).

131. Joseph William Singer & Jack M. Beermann, *The Social Origins of Property*, 6 CAN. J. L. & JURISPRUDENCE 217, 223 (1993) (footnotes omitted).

physical incursion, the court directly vindicates the right to exclude by recognizing a per se taking.¹³² The physical occupation of even a single square foot of property arises to a per se taking¹³³ because “constitutional protection for the rights of private property cannot be made to depend on the size of the area permanently occupied.”¹³⁴ The Court held as much in *Loretto*, explaining that “a physical invasion is a government intrusion of an unusually serious character”¹³⁵ and “the most serious form of invasion of an owner’s property interests.”¹³⁶ To protect against such invasions, which strike at the heart of the right to exclude, the court evaluates physical takings not through a balancing test but rather through a formalistic single question.¹³⁷ The court simply asks whether there is a physical occupation of the property or not, and if there is then it is a compensable taking. Hence, while all Fifth Amendment takings law protects property through liability rules, the formalistic standard for physical takings can be seen as an even more protective version of the liability rule. With per se takings the court protects the core right to exclude with a “strict liability” rule.¹³⁸

Courts have not shied from applying this strict-liability per se takings doctrine; rather, they have routinely found physical takings when government actors have entered or mandated entry by third parties onto private land.¹³⁹ For example, the Court of Appeals for the Federal Circuit found a physical taking when the Environmental Protection Agency mandated that a property owner allow government agents to access his land and install wells for monitoring groundwater contamination.¹⁴⁰ In a similar case, the court held that the Border Patrol had committed a physical taking by “assuming sta-

132. *Tahoe-Sierra*, 535 U.S. at 322.

133. *Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 435 (1982).

134. *Id.* at 436-37.

135. *Id.* at 433.

136. *Id.* at 435.

137. Singer & Beermann, *supra* note 131, at 225 (*Loretto* “formalistically identifies the ‘right to exclude’ as a core property right which cannot be taken or infringed without compensation. It therefore provides a paradigm case of the Court’s formalistic, natural rights approach to the takings clause.”).

138. Abraham Bell, *Not Just Compensation*, 13 J. CONTEMP. LEGAL ISSUES 29, 55 (2003).

139. While in a few instances courts have allowed limited physical incursions without takings protection, these typically occur only in the case of countervailing constitutional rights. See, e.g., Marc R. Poirier, *The Virtue of Vagueness in Takings Doctrine*, 24 CARDOZO L. REV. 93, 108 n.56 (2002) (citing illustrative cases to show compromises of the right to exclude in the face of countervailing rights).

140. *Hendler v. United States*, 175 F.3d 1374, 1377-78 (Fed. Cir. 1999). The court, however, found that the landowners were due no compensation for the taking because the special benefits conferred by the pollution remediation and monitoring offset the compensation that would be owed. See *id.* at 1379-83.

tionary positions on [Plaintiff's] land, creating new roads, constructing a permanent tented structure on [Plaintiff's] land, and installing underground motion-detecting sensors."¹⁴¹

In sum, courts have consistently enforced property owners' right to exclude expectations against private parties through strong property rules. While the takings doctrine reduces protection to a liability rule in the case of government infringement on the right to exclude, in the case of physical invasions courts protect the right with a *per se* strict-liability rule. As a result, property expectations in the right to exclude include the expectations of property-rule and strict-liability-rule remedies to enforce that right.

2. Remedies Protecting the Right to Use and Enjoy

The right to use and enjoy is also protected by a combination of property and liability rules. When a private party infringes on the right, a property owner has at least a liability-rule remedy and may even have a property-rule remedy. When the government infringes on the right, the landowner is protected by liability rules.

Of course, for a property owner to receive any of these remedies she must show an infringement on her right, which is more complicated in the right to use and enjoy context than it is in the right to exclude context. Unlike infringements on the right to exclude, which manifest in fairly absolute and physical scenarios, infringements on the right to use and enjoy involve a balancing of correlative rights. For example, determination of whether a neighbor's actions infringe on a landowner's right to use her property involves balancing the neighbor's usage rights against the landowner's usage rights.¹⁴² In such a balancing test, the landowner may not be as certain to demonstrate an infringement as she would in the right to exclude context.¹⁴³ For example, to establish a nuisance—the primary cause of action for challenging interference with the right to use and enjoy—a property owner must show that a third party has acted unreasonably and in doing so infringed on the property's owner's right to use and enjoy her land.¹⁴⁴ This nuisance inquiry usually requires a fact-specific determination of reasonableness and balancing of conflicting uses.¹⁴⁵

Though the nuisance inquiry may be murky and contextual, the ability to bring nuisance suits represents an important property ex-

141. *Otay Mesa Prop., L.P. v. United States*, 670 F.3d 1358, 1361, 1365 (Fed. Cir. 2012).

142. THOMAS W. MERRILL & HENRY E. SMITH, *PROPERTY: PRINCIPLES AND POLICIES* 27 (2d ed. 2012).

143. *Id.*

144. *See id.*

145. *Id.*

pectation, namely the possibility of vindicating the right to use and enjoy and the possibility of receiving a remedy for infringements of those rights. In fact, the expectation of the right to bring a nuisance suit, as well as the corollary expectation that a property owner may not create a nuisance, are so long-held and fundamental as to be considered background principles of property law.¹⁴⁶

Assuming that a landowner could show that a nuisance is occurring and thus demonstrate an infringement on her right to use and enjoy, a property-rule remedy—injunctive relief—was traditionally expected.¹⁴⁷ In modern times, however, courts have held that a liability-rule remedy is sufficient to vindicate the right to use and enjoy in certain situations.¹⁴⁸ In nuisance cases where the offending use has sufficient social utility, for example, courts have allowed monetary damages in place of injunctive relief.¹⁴⁹ Therefore, as against interference by private parties, the right to use and enjoy is usually protected by a property rule, though the court may substitute a liability rule in certain situations.¹⁵⁰

On the other hand, when a government entity infringes on the right to use and enjoy, the Fifth Amendment takings doctrine imposes a liability-rule remedy. As discussed above, the court will apply the *Penn Central* balancing test to determine if a restriction on the right to use and enjoy rises to the level of a taking, and if so, monetary compensation is due. For example, *Penn Central* itself dealt with a restriction on the right to use property, ultimately concluding that a limitation on development above Grand Central Station did not amount to a taking of property. *Lucas* also considered a limit on the right to use property, holding that a regulation completely foreclosing development and removing all value from a property was a per se taking and awarding monetary damages to vindicate the infringement on the right to use.

Thus property owners can seek to protect their right to use and enjoy either through a nuisance action, as against a private party, or a takings claim, as against a government entity. While in both instances courts employ a balancing test to determine whether there is a compensable infringement on the right to use and enjoy, regardless of the result of the balancing, an important property expectation is the ability to seek vindication of these rights in court. Further, if a

146. Robin Kundis Craig, *Public Trust and Public Necessity Defenses to Takings Liability for Sea Level Rise Responses on the Gulf Coast*, 26 J. LAND USE & ENVTL. L. 395, 402 (2011).

147. See, e.g., *Boomer v. Atlantic Cement Co.*, 257 N.E.2d 870 (N.Y. 1970).

148. *Id.* at 875.

149. See *id.* at 872-75.

150. See generally *id.*

property owner succeeds in either of these claims, the right to use and enjoy is protected by at least a liability rule.

C. Conflicts Between Aggressive Renewable Energy Policies and Property Expectations

Aggressive policies to encourage renewable energy, whether through mandates or limitations on neighbors' ability to interfere with renewables projects, create tension with expectations and remedies regarding the right to exclude and the right to use and enjoy. Specifically, these policies can conflict with expectations by altering remedies from property rules to liability rules or by instituting no-liability rules. By altering these remedy expectations, these policies effectively alter property owners' substantive rights to exclude and rights to use and enjoy, and they breed legal challenges, particularly in the form of takings claims.

For example, policies mandating distributed generation or microgrid installation¹⁵¹ run up against expectations regarding the right to exclude and the right to use and enjoy because such mandates, to the extent that they do not provide for compensation,¹⁵² impose a no-liability rule for infringements of these rights. A property owner who is compelled to install solar panels or windmills or to join a microgrid may object that this physically invades her property or limits her right to use and enjoy it. Moreover, the property owner's argument will be even stronger if a policy requires her to install commonly owned or third-party-owned equipment on her property.¹⁵³ Normally the property owner could expect property-rule protection (via trespass) against the third party's encroachment, and to the extent that the government compelled such invasion, the property owner would expect at least liability-rule protection through a takings claim. Indeed, multiple scholars have suggested that while government policies mandating renewables would effectively advance renewables productivity, distributed generation installation, and microgrid development,¹⁵⁴ takings claims represent a major impediment to these policies.¹⁵⁵

Furthermore, policies that limit neighbors' rights to challenge or interfere with renewable energy projects also create tensions with

151. See discussion *supra* Part II.C.1.

152. These proposals do not provide for compensation likely because they would become impossibly expensive.

153. See *Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419, 435 (1982) (stressing that a third-party physical invasion occasions a taking); see also Bronin, *supra* note 7, at 583.

154. See *supra* Part II.C.1.

155. Bronin, *supra* note 7, at 583.

the right to use and enjoy. For example, laws precluding nuisance suits against windmills or solar installations¹⁵⁶ alter a neighbor's expectation in asserting her right to use and enjoy the property. Similarly, solar- or wind-rights regimes that prohibit certain activities, such as installing structures that might shade a solar collector or interfere with wind passage, also limit exercise of rights to use and enjoy.

While the neighbor's expectations regarding the right to use and enjoy may be malleable and subject to a balancing test, a real and important component of this expectation includes both the ability to bring a legal challenge determining whether the right has been infringed and the possibility of receiving a remedy vindicating that right. Laws that preclude such legal challenges *ex ante*, however, conflict with that expectation. By removing the ability to bring a suit, these policies take away the possibility of a landowner receiving either a property-rule or liability-rule protection of the right. Instead, these policies institute a de facto no-liability rule (if a neighbor cannot challenge an action, she is assured of getting no remedy). Again, scholars have noted that to the extent such government policies interfere with property owners' expectations regarding their rights and remedies in the use and enjoyment of their property, takings claims are likely to ensue.¹⁵⁷

IV. THE ENERGY/PROPERTY BALANCE: DIMINISHED PROPERTY EXPECTATIONS IN THE ENERGY CONTEXT

Aggressive efforts to promote clean energy are not the first set of energy-production measures to run up against core property expectations like the right to exclude and the right to use and enjoy. Rather, many past energy policies and doctrines have altered rights and remedies for these fundamental property expectations, and legislatures and courts have consistently compromised property expectations in the face of energy needs. This Part recounts that tradition of compromise and describes the long history of decreased property expectations when energy development or production is at stake. Based on the importance of developing energy resources, legislatures and courts have recognized an energy/property balance whereby property expectations give way to energy production.

In demonstrating this energy/property balance, this Part recounts treatment of pre-electrical energy sources, electricity production and

156. See discussion *supra* Part II.C.2.

157. Bronin, *supra* note 101, at 82 (“[A] court might find that a regulatory taking was effected on a property owner whose ability to infringe on her neighbors’ solar access was unexpectedly eliminated by the adoption of the preexisting restrictions proposal because the character of the restriction was far-reaching and reduced her property’s resale value, and because the property owner purchased the property with the expectation that she would not have such a restriction.”).

provision via water, coal, and utilities, oil and gas production, and even farming production.

A. *Pre-Electrical Energy Sources: Firewood and Water*

Even from the earliest moments in American history, when energy production was more primitive, courts and legislatures curtailed property expectations to strike an energy/property balance. For example, in colonial times a property holder's right to exclude was limited to accommodate neighbors' energy needs; neighbors had rights over adjoining landowners to hunt and gather wood—both crucial sources of energy at the time.¹⁵⁸ In fact, in a major blow to the right to exclude, a generally held right to hunt on unenclosed land was paramount even to a landowner's express demand to the contrary.¹⁵⁹ The normal law of trespass simply did not apply in this context, and the right to exclude that was normally protected by a property-rule remedy was not even protected by a liability rule. Rather, a no-liability rule meant that it was not protected at all in this context.

Additionally, the need to gather firewood for energy overcame the otherwise rigid law of waste that governed a tenant's right to use land.¹⁶⁰ Under the English law of waste that first governed the American colonies, a landlord could expect that his tenant would return the property to him unchanged, and a major application of this doctrine was to preclude the clearing of forests or cutting of wood.¹⁶¹ This restriction protected the landlord's (or other future interest holder's) expectation in the right to use and enjoy that resource in the future, and since the landlord could enjoin his tenant from committing waste, this expectation was protected by a property rule. However, one of the few exceptions to this English law of waste was that "tenants could take from the land . . . the timber that was necessary for maintaining buildings, making tools, and warming themselves in winter, called respectively 'house bote,' 'tool bote,' and 'fire bote.'"¹⁶² Hence, one of the few default exceptions to the landlord's expectation, the fire bote, was in the interest of energy production, and while the landlord normally enjoyed property-rule protection to enjoin a tenant

158. FRED BOSSELMAN ET AL., *ENERGY, ECONOMICS AND THE ENVIRONMENT* 169 (3d ed. 2010) ("Ever since prehistoric humans discovered how to make fire they have been cutting down trees to obtain wood as a fuel. Wood . . . continued to be the dominant source of energy until the mid-nineteenth century."); Williams, *supra* note 106, at 282 ("An owner's neighbors also had substantial rights over his land—including the right to hunt, gather wood, graze animals, pass over, and use water from his land—many of which were carried over to the colonies and persisted well into the nineteenth century.").

159. *McConico v. Singleton*, 9 S.C.L. (1 Mill) 244 (S.C. Ct. App. 1818).

160. See Jedediah Purdy, *The American Transformation of Waste Doctrine: A Pluralist Interpretation*, 91 CORNELL L. REV. 653, 658 (2006).

161. *Id.* at 662-63.

162. *Id.* at 663.

from waste, the fire bote created a no-liability rule in the case of firewood energy production.

Like the gathering and burning of firewood, the use of water for direct kinetic energy occasioned a similar energy/property balance. Well before water was harnessed to generate electricity, it was an important energy source in driving water mills that powered factories in both England and America,¹⁶³ and such mills were common in America from the time of the colonies until after the 1850s.¹⁶⁴ Dam construction ensured continuous water power for these mills, but the dams also led to flooding and consequently to property conflicts between mill owners and their aggrieved neighbors.¹⁶⁵ To resolve such conflicts in favor of continued waterpower, state legislatures passed "mill acts," which curtailed neighbors' ability to challenge the mills under common law property theories and instead provided the exclusive remedy for flooding.¹⁶⁶ For example, a 1795 Massachusetts statute allowed mill owners "to raise a dam and flood the land of his neighbor, so long as he compensated him according to the procedures established by the act."¹⁶⁷ Typically such mill acts allowed neighbors to receive only yearly damages for even permanent flooding.¹⁶⁸ Importantly, the acts also forced neighbors to forego more advantageous common law property remedies. For example, the acts disallowed neighbors from bringing trespass actions and thus foreclosed the opportunity for neighbors to enjoin the flooding.¹⁶⁹ In doing so, the acts replaced the long-held property-rule expectations with mere liability-rule damages, even when the flooding caused permanent physical invasion.¹⁷⁰ Moreover, the acts not only removed the possibility of punitive damages but also allowed a mill owner to escape all liability if he could show that the dam benefitted the neighbor on the balance.¹⁷¹ As a result, under certain scenarios the acts further diminished the protection of the right to exclude from a liability-rule remedy to a no-liability rule.

163. BOSSELMAN ET AL., *supra* note 158, at 117-18.

164. *Id.* at 118.

165. *Id.*

166. MORTON J. HORWITZ, THE TRANSFORMATION OF AMERICAN LAW 1780-1860, at 47 (1977).

167. *Id.* at 48.

168. *Id.*

169. *Id.*

170. *See id.* at 48. Permanent physical trespass or repeated trespass have traditionally been remedied with property-rule injunction. *E.g.*, MERRILL & SMITH, *supra* note 142, at 44-57 (discussing *Baker v. Howard Cnty. Hunt*, 188 A. 223 (Md. 1936), and *Pile v. Pedrick*, 31 A. 647 (Pa. 1895)).

171. HORWITZ, *supra* note 166, at 48.

In applying and justifying these acts, courts directly acknowledged the compromise of property expectations in favor of important energy resources. The Massachusetts Supreme Court noted that the acts were “at variance with that absolute right of dominion and enjoyment which every proprietor is supposed by law to have in his own soil.”¹⁷² Nonetheless, the court justified the act’s adjustment of property expectations based on the social importance of the mills as energy resources.¹⁷³ The court further reasoned that the physical location of the neighbors’ land on watercourses meant that the neighbors’ property expectation must bow to the common good of efficient energy production, stressing that the acts were “designed to provide for the most useful and beneficial occupation and enjoyment of natural streams and water-courses, where the absolute right of each proprietor, to use his own land and water privileges, at his own pleasure, cannot be fully enjoyed, and one must of necessity, in some degree, yield to the other.”¹⁷⁴

The mill acts offer an early example not only of the energy/property balance limiting property expectations but also of courts and legislatures specifically adjusting the expectations of property owners physically located on or near desirable energy resources. As Morton Horwitz describes, these acts “offer some of the earliest illustrations of American willingness to sacrifice the sanctity of private property in the interest of promoting economic development”¹⁷⁵ and demonstrate that “a conception of absolute and exclusive dominion over property was incompatible with the needs of industrial development.”¹⁷⁶ In the mill acts, legislatures and courts recognized that waterpower was too important an energy resource to yield to neighboring property owners’ subjective values or inclination to hold out from cooperating. Accordingly, the legislatures and courts reshaped property expectations to accommodate energy development.

B. Electricity Production and Provision: Water, Coal, and Utilities

As our primary energy base shifted to electricity,¹⁷⁷ legislatures and courts again diminished expectations in the right to exclude and the right to use and enjoy to facilitate electrical production and distribution. As coal became an important energy resource, first for smaller in-home and early industrial uses and later for large-scale

172. *Fiske v. Framingham Mfg. Co.*, 29 Mass. (1 Pick.) 68, 70 (1831).

173. *Id.* at 70-71.

174. *Id.* at 71.

175. HORWITZ, *supra* note 166, at 47.

176. *Id.*

177. See generally Pursley & Wiseman, *supra* note 1, at 884-86 (outlining the development of electricity as the nation’s primary energy source).

production of electricity, lawmakers and courts repeatedly relied on the energy/property balance to facilitate coal production. For example, in 1886 the Pennsylvania Supreme Court held that a private property owner was entitled to neither an injunction nor even damages for water pollution caused by a neighboring coal mine,¹⁷⁸ thereby imposing a no-liability rule in place of property-rule or at least liability-rule expectations. The court offered the same energy/property balance reasoning used to justify the mill acts, holding that “mere private personal inconveniences . . . must yield to the necessities of a great public industry, which, although in the hands of a private corporation, subserves a great public interest. To encourage the development of the great natural resources of a country trifling inconveniences to particular persons must sometimes give way to the necessities of a great community.”¹⁷⁹

Courts continued to apply the energy/property balance to foster coal production with the advent of new mining techniques. For example, in the 1950s, when surface mining¹⁸⁰ began to replace underground mining as the prevalent form of coal extraction, conflicts arose because the surface mining interfered with the surface owners’ right to exclude and right to use and enjoy the land in ways that underground mining had not. Though the surface mining techniques and impacts were not foreseen at the time the surface owners granted away their mineral rights, courts initially interpreted the mineral-rights grants to mean that the surface owners could not prevent mineral-rights holders from surface mining.¹⁸¹ Similarly, when underground coal mining shifted to the “longwall” technique that led to increased and immediate subsidence of surface estates, West Virginia courts ruled that the change in technique did not impact the right of subadjacent support.¹⁸² These rulings demonstrate “the attitude prevalent in the nineteenth century—that because coal was dramatically increasing peoples’ ability to produce goods and raise their standard of living, the law ought to construe instruments in a way that encouraged the production of this valuable commodity.”¹⁸³ In

178. Pa. Coal Co. v. Sanderson, 6 A. 453 (Pa. 1886).

179. *Id.* at 459.

180. Surface mining is also referred to as strip mining. In coal production, estates are often split between the surface estate and the mineral estate. Klass, *supra* note 90, at 685 (“Much of the land in the Interior West is in “split-estate” ownership, meaning one party owns the surface rights of the land and another party owns the subsurface and mineral rights.”).

181. BOSSelman ET AL., *supra* note 158, at 201. In fact, when the Kentucky legislature tried to limit surface mining by limiting mineral-rights holders to using techniques common at the time the mineral deeds were executed, the Kentucky Supreme Court invalidated the statute, and a constitutional amendment was enacted to change the practice. *See id.*

182. *See id.* at 202.

183. *Id.*

both situations, the courts again adjusted surface-rights owners' expectations to favor energy production by instituting a no-liability scheme instead of protecting the right to exclude and the right to use and enjoy with a property-rule or liability-rule remedy.

The development of hydropower also saw private property yield in service of energy production. However, unlike the examples discussed above, which utilized no-liability rules to advance energy development, hydropower developed through the use of liability rules.¹⁸⁴ Specifically, hydropower projects relied heavily on eminent domain authority exercised by federal entities like the Tennessee Valley Authority ("TVA") and Bonneville Power Authority ("BPA").¹⁸⁵ The hydroelectric dams created by the TVA and the BPA "displaced thousands of people, but the promised economic benefits of the new technology were so great that the minor hardship [of those compensated to move] was widely seen as simply the price of progress."¹⁸⁶ While a government's exercise of eminent domain power does not truly alter property expectations,¹⁸⁷ the rationale for the TVA's and BPA's eminent domain authority reflects the same concepts underlying the energy/property balance: that private property must make way for energy development, especially when new technologies make production more efficient.

More noteworthy than the government's use of eminent domain authority to install hydropower facilities is the government's granting private entities eminent domain authority to facilitate energy development. Such grants represent another example of the energy/property balance shaping property expectations by changing the remedy for third-party interference from a property-rule scheme to a liability-rule scheme. For example, some state legislatures "have given broad authority to natural resource developers to exercise the power of eminent domain directly to promote development of coal, oil, gas, and other state natural resources."¹⁸⁸ Importantly, these grants of eminent domain power differ materially from the standard condemnation authority given to private entities. As Alexandra Klass has observed, unlike the more common state grants of eminent domain power to railroads, power companies, or other common carriers

184. Interestingly, also unlike the examples discussed above, hydropower projects were generally undertaken by the government as opposed to private parties.

185. Robert L. Bradley, Jr., *The Origins of Political Electricity: Market Failure or Political Opportunism?*, 17 ENERGY L.J. 59, 94-99 (1996).

186. BOSSELMAN ET AL., *supra* note 158, at 125.

187. As noted earlier, the rights to exclude and to use and enjoy only receive liability-rule protection against government intrusion.

188. Klass, *supra* note 90, at 652; *see also id.* at 659 ("Statutes in Arizona, Colorado, Idaho, Montana, Nevada, North Dakota, Oklahoma, South Dakota, Utah, and Wyoming specifically grant eminent domain authority to private companies in connection with mining, oil and gas, and other natural resource development.").

for “use by the public,” eminent domain power exercised by private energy developers “will not be subject to public access or public use and is only ‘public’ in the sense that the resource development will add to the growth of the overall state economy.”¹⁸⁹

This private eminent domain power is another example of legislatures striking the energy/property balance to promote development,¹⁹⁰ and courts have upheld these measures based on the importance of energy production. For example, in 1979 the Wyoming Supreme Court interpreted a statute granting private eminent domain power for “mining” to include authority for a private oil company to condemn land for oil and gas exploration and development.¹⁹¹ The court justified its decision in part on the “great public interest in an imminent need for energy.”¹⁹² Under similar justifications, “federal law and the law in many states expressly delegates the power of eminent domain to power companies and oil and gas companies for the construction of electric transmission lines and oil and gas pipelines.”¹⁹³

In the same vein, the legal treatment of public utilities reflects the prioritization of energy’s social values over private property expectations. Historically, as private property rights in electrical production and distribution infrastructure led to natural monopolies, the industry was regulated and certain rights were restricted because of the overarching social importance of electrical energy. Thus previously private utility property was pushed into a “partly public, partly private status.”¹⁹⁴ Ratemaking replaced a purely property-rights-based market, and the duty to serve customers replaced any right to exclude individuals from service. Moreover, this was all done under a no-liability framework. Government regulators pressed utilities’ property interests into public service, but courts did not find this to be a compensable taking so long as the rates set were not so low as to be unjust, which was the case even when rates did not allow for com-

189. *Id.* at 659.

190. *Id.* at 661 (“Whenever eminent domain is authorized, it is a statement by a government authority that it wishes to promote the public interest through reallocation of property rights in a context where it does not trust the market to reach an optimal result. These statutes and constitutional provisions in the Interior West exist as a reflection of the desire of these states to use their property laws to promote particular forms of economic growth without interference from other private property interests.” (footnote omitted)).

191. *Coronado Oil Co. v. Grieves*, 603 P.2d 406 (Wyo. 1979).

192. *Id.* at 411; *see also* *Klass*, *supra* note 90, at 665.

193. *Klass*, *supra* note 90, at 675.

194. *Duquesne Light Co. v. Barasch*, 488 U.S. 299, 307 (1989); *see also id.* (“Although their assets are employed in the public interest to provide consumers of the State with electric power, they are owned and operated by private investors.”).

plete or timely recoupage of expenditures.¹⁹⁵ Moreover, despite the fact that most utilities are privately owned, regulators can mandate a minimum level of equipment and maximum level of output.¹⁹⁶ Regulators can require sufficient plant capacity to service peak load, even if it is rarely used, or they can require certain providers to stop sending energy to the grid in instances of overproduction.¹⁹⁷ Under other circumstances, such interference with the right to exclude or the right to use private property would at least give rise to a claim for compensation, but under the energy/property balance, “the public-private nature of shared energy”¹⁹⁸ allows the government to regulate with a heavier hand without incurring compensation liability.

C. Oil and Gas Production

From their origins to the present day, oil and gas doctrines in the United States also demonstrate how the energy/property balance affects property expectations. As a leading treatise has put it, “While oil and gas have been justifiably regarded as private property in every state where discovered, their production, storage, and transportation have always been treated as being affected by public interest.”¹⁹⁹ In light of these public interest concerns, states have mandated conservation measures to encourage production and avoid waste of oil and gas resources, and such measures include the nearly ubiquitous state laws requiring compulsory pooling,²⁰⁰ compulsory unitization, and pipeline regulation. As discussed in detail below, each of these measures alters expectations of the right to exclude or the right to use and enjoy, but all have withstood takings analysis based on the concept “that the private property rights of a mineral owner could be constitutionally limited for the purpose of conserving the resource for

195. See *Duquesne Light Co.*, 488 U.S. 209 (holding that a Pennsylvania law preventing electricity providers from setting utility rates to reflect investments in as-yet-unused plant did not violate the Takings Clause of the Fifth Amendment).

196. See, e.g., Janice A. Beecher, *Economic Regulation of Utility Infrastructure*, in *INFRASTRUCTURE AND LAND POLICIES* 87, 88, 91-93, 102, 105, 108 (2013), available at <http://ipu.msu.edu/research/pdfs/Beecher%20Economic%20Regulation%20of%20Infrastructure%20Lincoln%202013.pdf>.

197. *Id.* at 92-93; Ted Sickinger, *Too Much of a Good Thing: Growth in Wind Power Makes Life Difficult for Grid Managers*, OR. LIVE (July 17, 2010), http://www.oregonlive.com/business/index.ssf/2010/07/too_much_of_a_good_thing_growt.html (discussing curtailments of renewable energy production when spikes in generation could overwhelm energy grids); *Peaking Power Plants*, WIS. PUB. SERV., <http://www.wisconsinpublicservice.com/company/peaking.aspx> (last visited Mar. 4, 2014) (discussing peaking power plants).

198. Bronin, *supra* note 7, at 547.

199. KRAMER & MARTIN, *supra* note 62, § 3.02.

200. *Id.* § 3.02[1], [2] (“Compulsory pooling statutes exist today in all major producing states except Kansas. . . . Compulsory unitization statutes were enacted in many of the major oil-producing states during the 1950’s, so that today only Texas remains without a compulsory unitization process.”).

the public benefit.”²⁰¹ Thus, just as in other energy contexts, legislatures and courts have employed the energy/property balance to promote oil and gas development by instituting no-liability rules for otherwise compensable infringements on the right to exclude or the right to use and enjoy.

As a baseline for examining these oil and gas conservation measures, it is worth quickly reviewing the law of capture and correlative rights principles that underlie oil and gas law. In defining ownership of oil and gas resources, states universally adopted the rule of capture, which provides that “the owner of a tract of land acquires title to the oil and gas that is produced from wells drilled on the tract even if it can be shown that the oil or gas migrated from adjoining lands.”²⁰² Consequently, if a tract owner can pump it, he owns it, regardless of whether the oil or gas comes from under his land or his neighbor’s.²⁰³ This concept itself reflects a version of the energy/property balance because it encourages energy production via a no-liability rule for draining oil or gas from under a neighbor’s tract.²⁰⁴ Under the rule of capture, the only option to protect your oil and gas from your neighbor is to drill your own well and intercept the oil and gas before it is drained away.²⁰⁵

However, this rule of capture scheme causes two major problems: overdrilling—too many wells drilled creating a higher capital cost than necessary to drain the oil and gas reserve—and premature dis-

201. *Id.* § 3.02.

202. *Id.* at ch. 2 Scope.

203. Often surface and mineral rights are severed; however, this does not change the analysis of the balance between neighboring property rights holders. Nonetheless, it is worth noting the legal relationship when land is divided into “‘split estate’ ownership, meaning one party owns the surface rights of [a tract] and another party owns the subsurface and mineral rights” underlying the tract, which demonstrates another example of property expectations adjusted in favor of energy development such as mining or oil and gas. Klass, *supra* note 90, at 685.

“Until recently, the law had been fairly settled with regard to the rights of mineral owners and surface owners. As a matter of common law, the mineral estate was the ‘dominant’ estate and the mineral owner had the right to use that portion of the surface estate reasonably necessary to develop the severed mineral interests. In addition, the owner of the mineral right was not liable for surface damage in the absence of negligence unless there was a contractual agreement to pay damages or a statute providing a right to damages. Moreover, any recoverable damages often were limited to damages to ‘crops’ and ‘improvements’ and did not include damages to natural vegetation, non-agricultural buildings, or general loss of land value.” *Id.* at 686 (footnote omitted). Thus the common law expectation favored energy production, and while some states have passed statutes requiring mineral owners to make accommodations such as requiring advanced written notice to access private lands for oil and gas operations or requiring agreements for surface use, the background property expectation remains that the mineral owner, with its interest in energy production, has the dominant interest. *See id.* at 686-87.

204. *See* KRAMER & MARTIN, *supra* note 62, § 2.01 (describing the rule of capture as a “non-liability” rule).

205. *See id.*

sipation of the natural reservoir energy—that is, dissipation of the pressure that would naturally push the oil and gas up the wellhead, ultimately leading to a higher cost of production and inability to produce as much of the oil and gas in the reservoir.²⁰⁶ In response to these problems, state legislatures developed conservation regulations to prevent physical and economic waste of oil and gas and to protect tract holders' correlative rights to produce their fair share of the energy resources under their land.²⁰⁷ Central to these conservation regulations was the concept of well spacing for efficient drainage of oil and gas reservoirs; by regulating spacing, conservation agencies can regulate the number of wells over a reservoir and thereby prevent overdrilling and premature dissipation.²⁰⁸ However, since reservoir shapes and spacing requirements do not necessarily track surface-property boundaries, conservation measures frequently operate across property lines and thus create tension with the right to exclude and the right to use.

Compulsory pooling offers a prime example of a legislatively enacted conservation measure curtailing the right to exclude. Most basically, pooling is cooperation by separate entities in a single well; it involves combining property interests in separate tracts of land that will all most efficiently be drained by a single well, regardless of differing ownership across property lines.²⁰⁹ The separate tracts all contribute to the production cost of the well and share in the proceeds.²¹⁰

Pooling can be voluntary, which raises no affront to the right to exclude or the right to use and enjoy, but when parties do not voluntarily agree to pool interests, state statutes can force certain tracts—usually small or irregularly sized ones—to pool.²¹¹ Such compulsion infringes on the right to exclude and the right to use and enjoy because owners may be forced into a pool and thus forced to exploit mineral resources that they do not wish to exploit. If a tract is part of a pool, its minerals will be drained; the owner cannot choose to wait to use those resources at a later date or to not use them at all. While the tract owner is paid for the value of her share of the drained minerals, she receives no compensation for giving up her choice about whether to drain them. Under this no-liability rule, the tract owner effectively loses the right to exclude and the right to use and enjoy.

206. *Id.* § 2.02.

207. *Id.*

208. *Id.* § 3.02[4][b].

209. *Id.* § 6.01 (“A prerequisite of most pooling provisions is that there be two or more separately owned tracts or interests located within a spacing or drilling unit.”).

210. *Id.* More precisely, the working-interest owners share the production costs and all owners of rights in the minerals share the production. *Id.*

211. *Id.*

Moreover, some states' forced pooling regimes tread further on non-consenting owners' expectations by not only forcing development of resources through compulsory pooling but also forcing non-consenting owners to pay additional surcharges.²¹² In such states, non-consenters must not only pay their share of production costs out of their share of oil and gas, but they must also compensate the operator for the risk of drilling a non-profitable well.²¹³ In these situations, there is double curtailment of property expectations; the non-consenting owner not only loses her right to exclude mineral production from her tract after it is pooled, but she also has to pay a premium for choosing not to voluntarily enter the pool. As a result, not only has her right to exclude vanished into a no-liability scheme *after* the forced pooling occurs, but she also incurs a liability for using her right to exclude. With this additional surcharge, the property owner is fined for exercising her right to exclude even *before* the forced pooling has gone into effect. This form of compulsory pooling turns a basic property expectation on its head: through a no-liability rule it effectively erases the right to exclude entirely, and then it charges a property owner for having attempted to exercise the right at all.

Compulsory unitization, which involves a similar concept to pooling but on a grander scale, limits the right to exclude in the same way. While pooling focuses on the area that can be efficiently drained by a single well, unitization consolidates differing interests in a common supply (for example, consolidating the interests in an entire oil field) to maximize production efficiency.²¹⁴ Thus a unitized area may include many pooled units.²¹⁵ Again, like pooling, parties may voluntarily unitize and benefit from the efficiency gains.²¹⁶ However, despite the economic advantages, such voluntary unitization rarely occurs due to coordination or holdout problems, so state legislatures have enacted compulsory unitization statutes to force non-consenting interests to unitize.²¹⁷ Like in the pooling context, some states also impose unitization risk penalties, forcing non-consenting parties to pay more than their share of the cost of production.²¹⁸ For example, Tennessee imposes a risk penalty up to 350 percent.²¹⁹ Just as

212. While some states allow for a "free rider" approach, where the non-consenting owners' share of production costs is subtracted from their share of production, other states impose a risk penalty on non-consenters. *Id.*

213. *Id.*

214. *Id.* § 6.02.

215. *Id.*

216. *Id.*

217. *Id.* For compulsory unitization, statutes typically require at least a minimum percentage of interests to consent. *Id.*

218. *Id.*

219. TENN. COMP. R. & REGS. 0400-55-01-.01(1)(d) (2013).

with forced pooling, this penalty deals a double blow to the right to exclude.

In addition to curtailing the conceptual right to exclude and right to use, compulsory pooling and unitization statutes also eliminate property owners' rights to exclude physical entry or occupation of their property. Numerous physical invasions can arise when properties are pooled or unitized. For example, the optimal surface or bottomhole²²⁰ location of a well may require physical invasion of a tract that has been forced into the pooling or unitization (i.e., has not consented to either draining oil or physical invasion) or on a tract that has voluntarily joined the pool for purposes of draining its oil but has not otherwise agreed to surface or subsurface physical invasion.²²¹ Alternatively, even if the surface well or bottomhole is not located on one of these non-consenting tracts, the oil or gas production operations may still physically invade the non-consenting land for access or production-related activities.²²² In such instances, courts frequently find uncompensated, implied easements over the non-consenting land for production activities because the purpose of the pooling and unitization would otherwise be defeated.²²³ Hence, even though the well operator would be physically trespassing on the non-consenting land in the absence of the unitization or pooling statutes, courts have held that there is no trespass under the unitization or pooling schemes.²²⁴

In sum, through unitization and pooling, legislatures and courts have eliminated expectations that the right to exclude physical invasions is protected by property rules or strict-liability per se taking

220. "Bottomhole" refers to "[t]he lowest or deepest part of a well." 8-B WILLIAMS & MEYERS, OIL AND GAS LAW, B Terms (2013). One can think of this as the furthest physical extent of the well.

221. 2 KRAMER & MARTIN, *supra* note 62, § 20.06[1] ("The optimum surface or bottom-hole location of the unit well might be on the land of an unleased owner or an owner who has not consented to pooling or unitization.").

222. *Id.* ("There may be need for use of land within a unit for access to the unit well and for production related activities ranging from treatment plants to oil tanks to gathering lines.").

223. *Id.* ("If a unit operator is unable to gain access to and unable to use the land for unit operations . . . the purposes sought to be attained by the state conservation order may be defeated. Pooling and unitization are generally favored, so it is not surprising that the courts frequently find that there is an implied easement to use the land for unit operations . . . or that an order of the conservation agency gives the right of use for unit operations.").

224. *Id.* ("The question arises, however, whether the unit operator will be able to make use of the land of an unleased owner whose interest has been included in the unit and will share in the production from the unit well. Unless the unit order provides a defense, use of the surface or subsurface would be a trespass. . . . The courts that have ruled on this issue have concluded that the unit order will prevent the unit operations from constituting a trespass."); *see also id.* ("The cases that have taken up the implied rights issue have almost uniformly concluded that the mineral rights owner may use the lands for unit activities whether the unit well was on or off the land burdened by the mineral interest.").

rules. Instead, they have installed no-liability rules. State legislatures require not only that non-consenting landowners submit to development of their oil-and-gas resources but also that landowners endure physical invasion of the surface of their land²²⁵ or of the subsurface.²²⁶ As long as the physical invasion is done for oil and gas production²²⁷ under the pooling or unitization scheme,²²⁸ no compensation is owed for the physical incursion or use of the land,²²⁹ and

225. For example, New Mexico recognizes rights of well operators to enter and use the surface or land within a unit even when not part of the operator's lease; however, it does not extend the same protection to non-unitized portions of the same tract, where such entry would be trespass. *Kysar v. Amoco Prod. Co.*, 93 P.3d 1272, 1282 (N.M. 2004) ("We hold that under New Mexico law a mineral lessee's implied surface right of reasonable ingress and egress to reach a well located inside the production unit that the lessee is operating pursuant to a pooling arrangement extends across lease boundaries within the unit to the surface of the entire area subject to the arrangement, regardless of where within the unit production is taking place."); *id.* at 1273 ("[A] mineral rights lessee does not, by virtue of having entered into a communitization agreement with the permission of the prior fee owner, enjoy a right of access over the surface estate of the portion of the leased area that is not subject to the agreement.").

226. Moreover, most states that produce oil and gas find that physical invasion of the subsurface of the land is not a trespass. For example, "the North Dakota Supreme Court has joined the other producing states [sic] courts that have ruled that when a unit operator has drilled the unit well in accordance with the orders and regulations of the state conservation agency, the agency authorization will preclude a suit by the landowner in trespass, even though the well bore may enter the landowner's property at a subsurface location." 2 KRAMER & MARTIN, *supra* note 62, § 20.06[1][f] (citing *Cont'l Res., Inc. v. Farrar Oil Co.*, 559 N.W.2d 841 (1997)). The North Dakota court was clear that even though the tract was forced-pooled and suffered a subsurface physical invasion, that did not amount to trespass or a compensable claim because the forced pooling statute superseded such property law principles. *Id.* ("[The] forced pooling order was a proper exercise of the state's police power that superseded the property law of trespass. So long as Continental complied with the rules and regulations of the Industrial Commission in drilling the well, the forced pooling order would preclude any claim by Farrar against Continental for a subsurface trespass even though the horizontal hole would transect much of Farrar's leased formation in the southwest quarter. The court stated that 'property law is necessarily superseded' by the Resources Act under which the pooling was undertaken, and to hold otherwise would 'frustrate the purposes of the North Dakota Resources Act and would make an Industrial Commission's forced pooling order ineffectual.'" (quoting *Cont'l Res.*, 559 N.W.2d at 846)).

227. When such invasions have not been pursuant to oil and gas production, the courts have not allowed the incursions without the payment of damages. Despite finding such an implied usage right for oil and gas production on unitized tracts, though, a New Mexico appeals court did not find an implied easement for a groundwater pollution monitoring well associated with the oil and gas extraction. *See Smith & Marrs, Inc. v. Osborn*, 180 P.3d 1183 (N.M. Ct. App. 2008).

228. Incursions to land for non-production reasons or to non-unitized tracts receive no such immunity *See Kysar*, 93 P.3d at 1282 ("We hold that under New Mexico law a mineral lessee's implied surface right of reasonable ingress and egress to reach a well located inside the production unit that the lessee is operating pursuant to a pooling arrangement extends across lease boundaries within the unit to the surface of the entire area subject to the arrangement, regardless of where within the unit production is taking place."); *id.* at 1273 ("[A] mineral rights lessee does not, by virtue of having entered into a communitization agreement with the permission of the prior fee owner, enjoy a right of access over the surface estate of the portion of the leased area that is not subject to the agreement.").

229. The only case that implies compensation is due for the mere use of land without damages is *Cormack v. Wil-Mc Corp.*, 661 P.2d 525 (Okla. 1983), but, as addressed in the

even if there is physical damage to the property, the nonconsenting landowner will only be compensated to the extent that she can prove actual surface damages.²³⁰ The right to exclude goes unprotected, and

next footnote, that analysis is grounded in the idea of surface damages rather than the right to exclude or takings, and the case has since been superseded by Oklahoma's surface damages act, which again focuses on damages rather than compensation for use. See 1 WILLIAMS & MEYERS, *supra* note 220, § 218.

230. For example, the Louisiana Supreme Court has "held the enactment of conservation regulation statutes superseded the general concept of ownership of the subsurface of land. When a unit has been created by order of the Commissioner of Conservation, a legally actionable trespass has not occurred by the operator who drills the well." 2 KRAMER & MARTIN, *supra* note 62, § 20.06[1][d] (citing *Nunez v. Wainoco Oil & Gas Co.*, 488 So. 2d 955 (La. 1986)). In a footnote in that case, the court observed that damages might be required if they could be proven, but held nothing was due to the owner because there were no observable surface consequences of the physical invasion two miles below the surface. See *Nunez*, 488 So. 2d at 964-65 n.29. Thus the court did not require compensation for the physical invasion but instead tied it to the showing of actual damages. A subsequent case in federal district court in Louisiana observed that *Nunez* relied on "the precise nature of unitization, that is, the creation of correlative rights and the redefining of traditional property lines, which justifies precluding an action in trespass." *Mongrue v. Monsanto Co.*, No. 98-2531, 1999 WL 219774, at *14 (E.D. La. Apr. 9, 1999).

Similarly, "[t]he Oklahoma cases in general have recognized a power of the operator under a unit order to use land in connection with unit operations even when the owner has not consented to the use of the land." 2 KRAMER & MARTIN, *supra* note 62, § 20.06[1][d]. Oklahoma courts have dismissed suits challenging access to land for unit operations on the grounds that "[i]f plaintiff's contentions [challenging access] were upheld, the whole intent and purpose of the unitization law could be defeated by one or more recalcitrant surface owners within a unit area. As we interpret the law, the Unit Operator has the right to use any surface within the unit for the purpose of efficiently carrying out the approved unit plan, so long as such use is reasonable and not unduly burdensome to any particular surface area." *Nelson v. Texaco Inc.*, 525 P.2d 1263, 1266 (Okla. 1974) (citation omitted).

Additionally, while Oklahoma has ruled that a "force-pooled, unleased landowner has a legal right to damages for use of his land by the operator of the unit well," this was not a takings or trespass claim but merely one for surface damage. 2 KRAMER & MARTIN, *supra* note 62, § 20.06[1][d]. Moreover, since that time, Oklahoma, as well as a number of other states, has "enacted surface damages acts requiring operators to compensate surface owners for loss of future use of the land, the market value of crops destroyed, and diminution in the value of the surface." 1 WILLIAMS & MEYERS, *supra* note 220, § 218. Again, these statutes are not aimed at protecting or compensating for physical use or invasion but rather are designed to compensate for actual damage caused, and absent the statute, the surface owner would not even be able to recover for the actual damages, much less the physical invasion or trespass. *But cf. id.* § 218.11 ("Many contemporary leases and deeds contain express provision requiring the mineral owner or lessee to compensate the surface owner 'for all damages done in said operation to the lands, trees, shrubs or to any structure, or to any livestock thereon.' Such a provision may be of particular importance to a lessor who joins in a community lease or whose lease contains authority for pooling or unitization, inasmuch as he may otherwise be unfairly dealt with if the well drilled under the community lease or pooling or unitization agreement is upon his land, in which event he will suffer all the surface damage and yet be entitled only to a proportionate share of the royalties." (quoting *Meyer v. Cox*, 252 S.W.2d 207, 208 (Tex. Civ. App. 1952)); *id.* § 218.12 ("An oil and gas lease or an instrument severing minerals from the surface may by express provision impose an obligation on the lessee or mineral owner to restore the condition of the premises after cessation of mineral operations."); see also 2 KRAMER & MARTIN, *supra* note 62, § 20.06[1] ("Of course, there is a distinction between payment for damages to land and payment for use. However, loss of use and damage can closely approximate one another . . ."). The treatise authors also endorse a view that there should be compensation in

the only relief remaining is a common tort duty to reimburse for actual harm caused.

Comparing the results of forced pooling and unitization with cases discussed above in the context of typical property expectations further illustrates the significance of the energy/property balance on property rights and remedies. For example, while mandatory installation of EPA's water quality monitoring wells on private property constituted a physical taking, mandatory installation of third-party oil and gas production wells on private property is not a compensable taking under forced pooling and unitization schemes. In fact, New Mexico courts have ruled that compulsory installation of water monitoring wells to record pollution from oil and gas production requires compensation, while the compulsory drilling of the oil and gas production wells under a unitization scheme does not.²³¹ This side-by-side comparison of typical property expectations versus energy/property balance expectations shows the stark difference.

Oil and gas pipeline regulation demonstrates a similar curtailment of the right to exclude. Oil and gas fields—particularly those focused on natural gas production—can be at the mercy of pipelines that, as the only methods of conveying gas from the fields, hold monopoly²³² power.²³³ To prevent pipeline owners from causing waste or inefficiency by failing to coordinate with other parties, strategically holding out for higher prices, or excluding certain interests outright,²³⁴ regulations require pipelines “to purchase and take ratably oil or gas from each well in a reservoir or on the purchaser’s pipeline

either case, but the courts have yet to implement such a view. *Id.* (“The courts that have ruled on this issue have concluded that the unit order will prevent the unit operations from constituting a trespass. Nevertheless, damages should be available to the landowner who has been force-pooled and whose land has been used for unit activities. . . . [W]e believe compensation needs to be paid when the land is used without formal consent being provided.”).

231. See *Smith & Marrs, Inc. v. Osborn*, 180 P.3d 1183 (N.M. Ct. App. 2008).

232. See BLACK'S LAW DICTIONARY 1098 (9th ed. 2009) (“Monopsony [is defined as a] market situation in which one buyer controls the market ‘Monopsony is often thought of as the flip side of monopoly. A monopolist is a seller with no rivals; a monopsonist is a buyer with no rivals. A monopolist has power over price exercised by limiting output. A monopsonist also has power over price, but this power is exercised by limiting aggregate purchases. Monopsony injures efficient allocation by reducing the quantity of the input product or service below the efficient level.’” (quoting LAWRENCE A. SULLIVAN & WARREN S. GRIMES, *THE LAW OF ANTITRUST: AN INTEGRATED HANDBOOK* 137-38 (2000))).

233. See *KRAMER & MARTIN*, *supra* note 62, § 5.04[1].

234. *Id.* (“Physical waste can occur, particularly in circumstances where the gas in question is associated gas, when a pipeline does not take ratably from a reservoir because an owner of a well in competition with other wells will find it necessary to flare natural gas in order to produce the oil. As a further measure for the prevention of physical waste, some states have not only required ratable taking but have established a priority of takes, so that a pipeline must take gas on its system so as to limit the necessity of flaring gas in order to produce oil or to take gas first from distressed wells or wells that would become uneconomic if the gas flow were to diminish.”).

system.”²³⁵ Thus the pipeline regulations expressly eliminate the pipeline owners’ right to exclude since the pipeline must not only transport but also purchase a third party’s oil or gas. Again, laws forcing a property owner to submit to physical invasion by a third party normally occasions a per se taking protected by a strict-liability rule, but pipeline regulations reduce this expectation to a no-liability rule for the physical invasion and even impose an obligation to purchase the third party’s oil or gas.

Each of these oil-and-gas conservation measures has been challenged as a compensable taking of private property, and each has survived based on energy/property balance reasoning.²³⁶ In finding no compensable takings, courts have deferred to the states’ valid exercise of the police power to prevent the waste of crucial energy resources²³⁷ and have repeatedly held that “the private property rights of a mineral owner [can] be constitutionally limited for the purpose of conserving the resource for the public benefit.”²³⁸

Further, though most of these oil and gas conservation programs survived their constitutional challenges before the modern takings era,²³⁹ the manifestation of the energy/property balance in the oil and gas context has continuing effect and increasing relevance as fracking assumes a more important role in the United States’ energy portfolio.²⁴⁰ Fracking is a method of oil and gas extraction that involves

235. *Id.*

236. *See* Champlin Refining Co. v. Corp. Comm’n of Okla., 51 F.2d 823, 824-25, 838 (W.D. Okla. 1931) (upholding prorationing measures); Palmer Oil Corp. v. Phillips Petroleum Co., 231 P.2d 997, 1004-05 (Okla. 1951) (upholding compulsory unitization statutes); Patterson v. Stanolind Oil & Gas Co., 77 P.2d 83, 95 (Okla. 1938) (upholding compulsory pooling statutes). Thus as a leading treatise has put it, “It is well beyond cavil that state conservation statutes will be upheld under a per se equal protection, taking, or due process argument.” 2 KRAMER & MARTIN, *supra* note 62, § 24.01. Moreover, in the limited instances where courts have found oil and gas conservation statutes to create as-applied takings, the courts focused on complete prohibitions on energy production that denied all economically valuable uses of lands and were not centered on a right-to-exclude analysis. *See id.* Therefore, in the oil and gas context, the courts have found takings only when production is impeded but not when land boundaries are compromised to encourage production.

237. KRAMER & MARTIN, *supra* note 62, § 3.02. For example, in the leading case on the matter, *Ohio Oil Co. v. Indiana*, 177 U.S. 190 (1900), the United States Supreme Court emphasized that a state’s police power allowed it to prevent the waste of energy resources and allowed state legislatures to define property rights not to include wasteful extraction of the resources. *Id.* at 210-11. Similarly, in *Champlin Refining Co. v. Corp. Commission of Oklahoma*, 286 U.S. 210 (1932), the Court again recognized that the property interests in the capture of oil and gas did not encompass the right to waste hydrocarbons. *Id.* at 233-34.

238. KRAMER & MARTIN, *supra* note 62, § 3.02.

239. 2 *id.* § 24.01[2].

240. *See, e.g.*, Hannah Wiseman, *Urban Energy*, 40 FORDHAM URB. L.J. 1793, 1795-97 (2013) (noting that the vast quantities of oil and gas available through fracking techniques have set the United States “on track to be one of the world’s largest oil producers and a major exporter of natural gas, something few would have predicted only a few years earlier”).

drilling wells vertically down some distance, then turning horizontally to follow productive reservoirs; such wells may extend a great horizontal distance across numerous property lines.²⁴¹ As described above, while in other contexts this subsurface invasion would appear to be a trespass, if committed by a private entity, or a physical taking, if mandated by the government. However, in the energy context courts have held that it is not a compensable violation of property rights. As recently as 2008, the Texas Supreme Court reaffirmed that subsurface physical invasions from fracking fall under the same no-liability scheme discussed above.²⁴² From the earliest doctrines encouraging oil and gas development to the most recent contests over fracking, the pattern has been simple and consistent: when energy development and production is at stake, the energy/property balance will adjust private property expectations to accommodate.

D. Farm Production

Finally, even legislative measures to resolve conflicts between property expectations and farm production reflect the energy/property balance at work. While farming may not fall entirely within the vernacular conception of energy, biofuel production, particularly ethanol, is emerging as a non-negligible energy source. For example, since 2005 the federal government has mandated that gasoline contain ethanol, which is primarily derived from corn.²⁴³ Ethanol accounted for 10 percent of the volume of gasoline consumed in the United States in 2011.²⁴⁴ Moreover, in 2012, roughly 8.6 percent of all the harvested acreage in the United States was used directly for ethanol production,²⁴⁵ which is up from 7 percent in

241. BOSSELMAN ET AL., *supra* note 158, at 279.

242. *Coastal Oil & Gas Corp. v. Garza Energy Trust*, 268 S.W.3d 1, 11-17 (Tex. 2008) (holding that a fracking operation that crossed property lines two miles below the surface, injected materials under the neighbors lands, and withdrew gas from under the neighbor's land created no actionable trespass absent injury to the surface of the land).

243. See, e.g., *Nearly Half of Corn Devoted to Fuel Production Despite Historic Drought*, HUFFINGTON POST (Aug. 18, 2012, 12:51 PM), http://www.huffingtonpost.com/2012/08/17/ethanol-mandate_n_1799046.html.

244. *Frequently Asked Questions: How Much Ethanol Is in Gasoline and How Does It Affect Fuel Economy?*, U.S. ENERGY INFO. ADMIN., <http://www.eia.gov/tools/faqs/faq.cfm?id=27&t=10> (last updated Apr. 12, 2013).

245. According to the National Corn Growers Association, in 2012, 30.8 percent of corn grown in the United States was used for ethanol production. See NAT'L CORN GROWERS ASS'N, WORLD OF CORN: UNLIMITED POSSIBILITIES 11 (2013), available at <http://www.ncga.com/upload/files/documents/pdf/WOC%202013.pdf>. Since corn comprised roughly 87.4 million of the 310.6 million crop acres harvested in the United States that year, this means corn accounted for roughly 28 percent of all United States crop acres harvested that year. See *id.* at 4. Thus, if we assume that 30.8 percent of that 28 percent of acreage was used for ethanol production (i.e., if acreage is proportional to the amount of corn produced and used in ethanol production), then that shows 8.6 percent of acreage was used for ethanol production. Expressed mathematically: 30.8% (corn used for ethanol) x

2011.²⁴⁶ Thus farm production has a substantial impact on energy production, and due to the vast area of farmland harvested for ethanol production—almost 23 million acres in 2011²⁴⁷ and 26.3 million acres in 2012²⁴⁸—many property disputes over farmland are also necessarily disputes over energy-producing land.²⁴⁹

When farm production, and its attendant smells, dust, and noise, has come into conflict with property expectations regarding the right to use and enjoy, state “right-to-farm” statutes have limited or even eliminated landowners’ abilities to bring nuisance challenges against farms.²⁵⁰ Every state has a statute limiting nuisance suits against farms, but the limitations vary.²⁵¹ Milder approaches essentially create a statute of limitations for challenging objectionable activity²⁵² or codify the common law “coming to the nuisance” doctrine that prevents landowners from moving next to a preexisting activity and then challenging it as a nuisance.²⁵³ Slightly more expansive statutes foreclose nuisance challenges against certain “qualifying management practices”²⁵⁴ or against expansion and increased production.²⁵⁵ Finally, some states have offered blanket nuisance immunity for farming operations.²⁵⁶

28% (acreage of land used for corn) = 8.6% (acreage of land used for corn that was ultimately used in ethanol).

246. According to the National Corn Growers Association, in 2011, 27.3 percent of corn grown in the United States was used for ethanol production, and corn comprised 28.5 percent of all United States crop acres harvested that year. See NAT’L CORN GROWERS ASS’N, CORN: ROOTED IN HUMAN HISTORY 4-5, 7 (2012), available at http://www.ncga.com/uploads/useruploads/woc_2012.pdf. Thus, if we assume that 27.3 percent of that 28.5 percent of acreage was used for ethanol production (i.e., if acreage is proportional to the amount of corn produced and used in ethanol production), then that shows 7 percent of acreage was used for ethanol production. Expressed mathematically: 27.3% (corn used for ethanol) x 28.5% (acreage of land used for corn) = 7.7% (acreage of land used for corn that was ultimately used in ethanol).

247. See NAT’L CORN GROWERS ASS’N, *supra* note 246, at 5, 7. This 23 million figure is based on the following calculation (which assumes a proportional yield of corn per acreage): 83.9 million (total acres of corn harvested) x 27.3% (corn used for fuel ethanol) = 22.9 million (acres of corn to be used for ethanol).

248. See NAT’L CORN GROWERS ASS’N, *supra* note 245, at 4, 12. This 26.3 million figure is based on the following calculation (which assumes a proportional yield of corn per acreage): 87.3 million (total acres of corn harvested) x 30.2% (corn used for fuel ethanol) = 26.3 million (acres of corn to be used for ethanol).

249. More conceptually, farm production in the form of food is an essential energy source for humans.

250. Terence J. Centner, *Governments and Unconstitutional Takings: When Do Right-to-Farm Laws Go Too Far?*, 33 B.C. ENVTL. AFF. L. REV. 87, 142 (2006).

251. *Id.* at 87, 94-95.

252. *Id.* at 98.

253. *Id.* at 95.

254. *Id.* at 107.

255. *Id.* at 102-04.

256. *Id.* at 114 (describing this approach as “extremely favorable dispensation to agriculture”).

Since the inquiry into nuisance has always turned on principles of reasonableness,²⁵⁷ these milder limitations that effectively define reasonable behavior do not create a great shift in property rights. However, measures insulating farms from nuisance actions effectively create a no-liability rule by removing property owners' expectation of seeking possible property-rule or liability-rule protection.

In addition, right-to-farm statutes have also consistently withstood takings challenges.²⁵⁸ Of the fifty states' right-to-farm statutes, only Iowa's, which took the extreme approach of granting expansive immunity for animal feeding operations,²⁵⁹ has been found to create a compensable taking.²⁶⁰ Further, commentators have roundly criticized the Iowa decision for applying the incorrect legal standard,²⁶¹ suggesting that had the court applied the appropriate standard it would have found no taking²⁶² and that the decision should not be followed.²⁶³

Therefore, while right-to-farm statutes may not be the quintessential example of energy-development policies, they do encourage energy production and demonstrate a similar energy/property balance.

257. See, e.g., RESTATEMENT (SECOND) OF TORTS § 822(a) (1979).

258. Centner, *supra* note 250, at 138 ("Under state laws that employ the traditional right-to-farm doctrine, plaintiffs will not be able to mount successful takings challenges. The coming to the nuisance doctrine is a permissible extension of state law." (footnote omitted)); *id.* at 139 ("Right-to-farm laws that provide statutes of limitation have been challenged and have withstood scrutiny."); *id.* ("Right-to-farm laws that extend their protection to minor adjustments of activities should withstand scrutiny.")

259. *Id.* at 140.

260. See *id.* at 125 (observing that invasions of personal interests in land do not constitute a physical invasion so they are not per se takings); Jeffrey R. Gittins, Comment, *Bormann Revisited: Using the Penn Central Test to Determine the Constitutionality of Right-to-Farm Statutes*, 2006 BYU L. REV. 1381, 1396 (noting that Iowa's *Bormann* decision has not been accepted by courts outside of Iowa); Jason Jordan, Comment, *A Pig in the Parlor or Food on the Table: Is Texas's Right to Farm Act an Unconstitutional Mechanism to Perpetuate Nuisances or Sound Public Policy Ensuring Sustainable Growth?*, 42 TEX. TECH. L. REV. 943, 960-62, 972-77 (2010) (summarizing Oregon, California, Idaho, and Indiana cases upholding the constitutionality of right-to-farm laws and evaluating a Texas anti-nuisance law to conclude that it does not result in a unconstitutional physical taking).

261. See Adam Van Buskirk, *Right-to-Farm Laws as "Takings" in Light of Bormann v. Board of Supervisors and Moon v. North Idaho Farmers Association*, 11 ALB. L. ENVTL. OUTLOOK J. 169, 192-96 (2006) (arguing that the *Penn Central* balancing test is the appropriate test for evaluating whether right-to-farm statutes constitute takings); Centner, *supra* note 250, at 119-20; Gittins, *supra* note 260, at 1407-10 (arguing for the *Penn Central* test for evaluating right to farm statutes).

262. Jennifer L. Beidel, *Pennsylvania's Right-to-Farm Law: A Relief for Farmers or an Unconstitutional Taking?*, 110 PENN ST. L. REV. 163, 176-84 (2005) (arguing that the *Penn Central* test is the appropriate standard and that under that test the Iowa statutes would not have been takings); Gittins, *supra* note 260, at 1382 (arguing that most right-to-farm statutes will not be found to be takings under the *Penn Central* balancing test).

263. Centner, *supra* note 250, at 137-38 ("Federal regulatory takings jurisprudence suggests it is doubtful that other courts will follow the Iowa decisions to find that a right-to-farm law effects a taking."); see also *supra* notes 259-60 and accompanying text.

E. Conclusion

As detailed above, legislatures and courts have consistently shaped property expectations to accommodate energy production and development. The overarching justification for striking this energy/property balance has been that at the margins the broad social importance of energy production outweighs individual property protections. Thus courts and legislatures have altered property expectations, frequently by instituting no-liability rules or by shifting remedies from property rules to liability rules, to encourage the development of burgeoning energy resources, to increase the efficiency of production, and to overcome coordination failures or holdout problems.²⁶⁴ This energy/property balance has informed property expectations since colonial reliance on firewood and water, and it continues to play a role in supporting modern energy sources from fracking to ethanol and beyond.

V. APPLYING THE ENERGY/PROPERTY BALANCE TO AGGRESSIVE RENEWABLE ENERGY POLICIES

This Part examines how the energy/property balance applies to the modern energy context, particularly in terms of current energy-versus-property conflicts presented by aggressive efforts to promote distributed generation and microgrid development. First, this Part discusses how the energy/property balance informs a property owner's reasonable expectations when the right to exclude and the right to use and enjoy are pitted against energy production. Next, it highlights the normative justifications for applying the energy/property balance to renewable energy projects. Finally, it considers how the energy/property balance informs takings claims regarding aggressive renewable energy policies, ultimately concluding that takings concerns offer no impediment to these policies.

A. Reasonable Expectations

While mere historical practice alone may not be sufficient to justify the continuation of legal regimes,²⁶⁵ much of our law is based on synthesized patterns of historical operation and expectation. This is particularly true of property law, which is centered upon expectations²⁶⁶ drawn from "background principles," "existing rules [and]

264. In a follow-up piece, I plan to offer a full discussion of how the energy/property balance fits into modern property theory in its approach to addressing these concerns.

265. See, e.g., OLIVER WENDELL HOLMES, *The Path Of The Law*, in COLLECTED LEGAL PAPERS 167, 187 (1920) ("It is revolting to have no better reason for a rule of law than that so it was laid down in the time of Henry IV.").

266. See, e.g., Carol M. Rose, *Crystals and Mud in Property Law*, 40 STAN. L. REV. 577, 577 (1988) ("[A]s Jeremy Bentham said long ago, property is 'nothing but a basis of expect-

understandings,” past practices, common-law precedents, and past actions of state legislatures to form and shape property rights.²⁶⁷ These expectations form the basis of the right to exclude or the right to use and enjoy, and they indicate whether owners can count on property-rule, liability-rule, or no-liability-rule remedies for infringement on these rights. It is little wonder that doctrines focus on “investment-backed expectations”²⁶⁸ and “background principles”²⁶⁹ to determine whether government action constitutes a compensable taking of property rights.

In this light, the previous Part’s review of the energy/property balance shows more than just a historical pattern. Rather, it shows how legislatures and courts have consistently shaped rules and understandings of property to create an expectation that property rights are less robust and less compensable when they conflict with energy development. In fact, with its roots tracing back to colonial times and beyond, the energy/property balance has sufficient historical pedigree to qualify as one of the background principles of property.²⁷⁰ At the very least, the energy/property balance informs a property owner’s reasonable expectations regarding the remedies she might have regarding renewable energy projects. Thus just as the energy/property balance indicates that a property owner’s expectations are diminished in the face of traditional energy sources such as oil and gas or coal extraction, so a property owner’s expectations are also limited in the face of renewable energy development. This diminished expectation indicates that the right to exclude or the right to use and enjoy may be subject to no-liability remedies if infringed by renewable energy projects.

tation.’” (quoting J. BENTHAM, THEORY OF LEGISLATION, PRINCIPLES OF THE CIVIL CODE pt. 1, ch. 8, at 68 (Baxi ed., Hildreth trans., 1975) (1802))).

267. *Lucas v. S.C. Coastal Council*, 505 U.S. 1003, 1029 (1992) (discussing common law background principles as the basis for property rights and expectations); *see also id.* at 1030 (noting that “‘existing rules or understandings that stem from an independent source such as state law’ . . . define the range of interests that qualify for protection as ‘property’”).

268. *Penn Central Transp. Co. v. City of New York*, 438 U.S. 104, 127 (1978).

269. *Lucas*, 505 U.S. at 1029.

270. In *Lucas*, the Court described the background principle thusly: “Any limitation so severe cannot be newly legislated or decreed (without compensation), but must inhere in the title itself, in the restrictions that background principles of the State’s law of property and nuisance already place upon land ownership. A law or decree with such an effect must, in other words, do no more than duplicate the result that could have been achieved in the courts—by adjacent landowners (or other uniquely affected persons).” *Id.*

B. Normative Justifications

As Justice Holmes famously observed:

It is revolting to have no better reason for a rule of law than that so it was laid down in the time of Henry IV. It is still more revolting if the grounds upon which it was laid down have vanished long since, and the rule simply persists from blind imitation of the past.²⁷¹

However, far from being a blind imitation of the past, application of the energy/property balance to emerging renewable energy projects has strong normative justifications. For example, renewable energy projects face the same challenges and concerns that animated the energy/property balance in the case of firewood, water, coal, hydro-power, oil and gas, and farm production. Specifically, distributed generation and microgrid projects occasion the same location-specific siting challenges, coordination and holdout problems, establishment hurdles, and efficiency justifications that were common to past energy developments. Thus the energy doctrines discussed above remain strong and relevant comparators to the renewable energy context. Moreover, the exigencies of climate change and historic subsidies for fossil fuel energy sources make an even more compelling case that renewable energy projects deserve the advantages that property law has afforded to other energy sources.

First, renewable energy shares the same location-specific concerns that traditional energy sources relied on the energy/property balance to address. Frequently, access to specific locations is a limiting factor in the efficient extraction or production of energy resources, and the energy/property balance reached was necessary to facilitate such access. For example, oil and gas or coal deposits are only located beneath certain tracts, and forced pooling and unitization as well as private eminent domain measures provided access to exploit these location-specific resources. Similarly, dams used for waterpower or hydroelectricity flooded tracts located nearby. Since neither the tracts nor bodies of water could be moved, it was necessary to resolve these location conflicts; the mill acts and eminent domain exercises provided a means of doing so quickly. Even doctrines related to the gathering of firewood addressed location-specific concerns. Though trees were abundant across the landscape, the difficulty of transporting wood over great distances meant that meaningful access to firewood had to be proximate to its ultimate place of use. Hence the fire bote and access to a neighbor's land provided convenient locations for gathering wood at relatively low effort and cost. Similar concerns animated oil and gas pipeline regulations; the location of fields and

271. HOLMES, *supra* note 265, at 187.

pipelines meant that often only a single pipeline provided a means of transporting oil and gas from the field, so the law required the pipeline to take from all the wells on the pipeline.

These same location-specific concerns are present in distributed generation and microgrid projects as well as in measures to site renewable energy on advantageous parcels. Many of the benefits of distributed generation and microgrids are premised on their location; the close proximity of energy production to its place of use allows these projects to avoid transmission losses and energy sprawl. Similarly, efforts to site renewable energy facilities on particularly advantageous parcels, such as ideal wind or solar corridors, rely fundamentally on access to specific locations.²⁷² Just as with many of our traditional energy resources, location can be key to the efficient and effective production of renewable energy.

Renewable energy projects also encounter the same coordination failures and holdout problems that the energy/property balance helped traditional energy production overcome. Oil and gas development suffered from coordination problems that hampered beneficial development.²⁷³ For example, despite the economically advantageous and efficient results of pooling and unitization, parties rarely joined together voluntarily. Forced pooling and unitization responded to this coordination failure by mandating cooperation. By the same token, when property owners surrounding bodies of water failed to coordinate and develop waterpower or hydroelectric projects through private market agreements, the mill acts and eminent domain condemnations overcame this failure to deal and allowed projects to go forward. Relatedly, strategic holdouts and NIMBY²⁷⁴ objections would have forestalled energy development if not for energy/property balance interventions. For example, pipeline regulations prevent pipeline owners from strategically refusing to buy and carry oil and gas from certain producers, and right-to-farm statutes prevent NIMBY objections to farming operations.

Reminiscent of unitization, microgrid development also lags due to coordination problems. As discussed above, despite the advantages of microgrid systems, few have developed voluntarily, and cognitive barriers or market irrationality prevent coordination in these efforts. Similarly, renewables projects may face strategic holdout or NIMBY opposition. For instance, “[s]trategic behavior, endowment effects,

272. See, e.g., Rule, *supra* note 91.

273. See KRAMER & MARTIN, *supra* note 62, § 1.02 (“The history of oil and gas development in the United States leads to the inevitable conclusion that the legal, economic, and engineering worlds have never reached a level of *coordination* that would allow for the efficient and equitable development of oil and gas reservoirs without substantial governmental intervention.” (emphasis added)).

274. “Not in my backyard.”

asymmetric information, or other factors could potentially undermine adjacent landowners' ability to consistently negotiate arrangements that allocate scarce wind resources to their highest valued user,"²⁷⁵ and efforts to allocate wind or solar rights²⁷⁶ are an attempted response to some of these coordination problems.

In addition to overcoming coordination and holdout problems, the energy/property balance fostered energy sources in their infancy, aiding new technologies or resources in overcoming establishment hurdles. For example, the mill acts helped waterpower gain a foothold as a major energy source of the time, and both the doctrine of capture and conservation measures helped spur the rise of oil and gas. The energy/property balance nurtured oil and gas, hydropower, and coal development, and now it is necessary to support burgeoning distributed generation and microgrid projects.

Finally, the efficiency and reciprocity of advantage reasoning that justified the energy/property balance for traditional energy sources applies with equal force to renewable energy. The collective social benefits of greater energy production at lower costs justified diminishing property expectations to promote efficient energy development. Therefore, while oil could still be produced without forced pooling and unitization or pipeline regulations, while coal could still be mined without updated techniques and private eminent domain, while waterpower and hydroelectricity could have developed without mill acts and eminent domain, and while farming could still occur without nuisance protection, in the absence of these regimes all would have proceeded more slowly, more expensively, and less efficiently. Legislatures and courts determined that the social benefits of quicker, cheaper, and more efficient energy development were shared by all of the property owners who suffered diminished property expectations, and this reciprocity of advantage helped justify application of the energy/property balance.

Renewable energy too offers major, long-term reciprocity of advantage that will only increase with quicker, cheaper, and more efficient development. In fact, the advantages of renewable energy surpass those of traditional energy sources because renewables offer the additional benefits of domestic energy supplies, reduced greenhouse gas emissions, lower transmission costs and losses, and reduced energy sprawl.

Moreover, the combination of climate change realities and historic subsidies for fossil fuel sources offers even more compelling justifications for applying the energy/property balance to renewables. Currently, greenhouse gas pollution from energy production is accelerat-

275. Rule, *supra* note 91, at 218.

276. See, e.g., *id.*

ing climate change and its major impacts on human and environmental health.²⁷⁷ In response, numerous scientific, policy, and advocacy organizations have called for a major and immediate greenhouse gas reduction. For example, the National Academy of Sciences (“NAS”) has concluded that the United States “needs to get started now in aggressively pursuing available emission reduction opportunities” and has suggested that this will “require a major departure from ‘business as usual’ in how we produce and use energy.”²⁷⁸ NAS has thus concluded that “essentially all available options for reducing greenhouse gas emissions (e.g., for energy efficiency, for *low-carbon electricity production*, for low-carbon fuels) will need to be *deployed at levels near the maximum extent of what . . . is technically possible*” and that a key policy strategy is “promoting widespread implementation of existing technologies for energy efficiency and low-carbon energy sources (such as renewables).”²⁷⁹ These suggestions highlight the importance of aggressive efforts to promote renewables and the necessity of applying the energy/property balance in support of these efforts. Climate change considerations also underscore the “goose/gander” argument that if the energy/property balance favored energy sources that contributed to climate change, then it should also favor renewable sources that help reduce the extent of climate change. Put another way, since the energy/property balance has contributed to the problem, it should also be part of the solution.

In that vein, applying the energy/property balance to promote renewable energy is also necessary to remove market distortions and give renewables a chance of competing with traditional fossil fuel sources. A history of favoritism has distorted the market to favor fossil-fuel-based energy. Fossil fuel sources not only enjoy the advantage of entrenchment in United States infrastructure, economy, and law, but they also continue to benefit from a long history of preferential treatment, including both direct monetary subsidies²⁸⁰ and

277. *The Hard Facts of Global Warming*, SIERRA CLUB, http://action.sierraclub.org/site/PageServer?pagename=NH_GW_Facts (last visited Mar. 4, 2014) (“[O]ur emission of greenhouse gas pollution is causing global warming to occur at a much faster rate than ever before. The world’s leading climate scientists project that during our children’s lifetimes, global warming will raise the average temperature of the planet by 3 to 10 degrees Fahrenheit – a shift that will rival the change in temperature since the last ice age. Unless we slow, and ultimately reverse, the buildup of greenhouse gases in the atmosphere, we will have decades – not millennia – to deal with radical changes in weather patterns, sea levels and threats to human health.”).

278. Div. on Earth & Life Studies, *supra* note 90.

279. *Id.* (emphasis added).

280. Due to entrenched favoritism of fossil fuel sources in the United States, even a policy that treats all energy sources equally will systematically favor fossil fuel sources. See, e.g., Amy Wilson Morris & Jessica Owley, *Mitigating the Impacts of the Renewable Energy Gold Rush*, 15 MINN. J.L. SCI. & TECH. 293, 301 (2014) (noting that the “entrenched, subsidy-receiving fossil fuel industry” stands as a limiting factor for solar development).

implicit subsidies, such as the no-liability rules established by the energy/property balance. Among fossil fuels, natural gas enjoys a particular position of advantage at the moment. Gas is currently cheap due in part to both loosely regulated fracking²⁸¹ and the benefits of the energy/property balance.²⁸² Absent significant efforts to promote renewable energy, gas is likely to come to dominate electrical energy production, causing retrenchment of fossil-fuel-based energy production and thereby exacerbating climate change impacts.²⁸³ To begin leveling the playing field with natural gas requires at least that renewable energy benefit from the same energy/property balance that gas enjoys.

C. Takings

The major concern expressed regarding the furthest-reaching aggressive renewable energy policies is that they would constitute takings. However, under the energy/property balance, which frequently imposed a no-liability rule for similar infringements on property expectations, such actions would not be compensable takings. As has been the pattern with energy development in the past, policymakers can pursue these aggressive measures to encourage renewable energy production without fear that courts will find them to be takings.

As noted earlier, aggressive renewable energy policies such as mandates or limitations on neighbors' rights create tension with ordinary property expectations and occasion concern about takings claims.²⁸⁴ However, the energy/property balance diffuses this tension by reforming these expectations when they run up against energy production, and this shift in expectation diminishes takings concerns. Importantly, these shifted property expectations do not change the takings inquiry employed by the courts, but they inform its application and, unsurprisingly, make it less likely that energy projects will constitute takings. Thus the energy/property balance influences both regulatory takings and physical takings analyses.

First, the energy/property balance may inform the *Penn Central* balancing test for regulatory takings in two ways. It may create a background principle that forecloses takings liability for energy de-

281. See, e.g., Thomas W. Merrill, *Four Questions About Fracking*, 63 CASE W. RES. L. REV. 971, 977-980 (2013) (discussing fracking, cheap natural gas, and the need for regulation).

282. As noted above, courts have applied a no-liability rule when fracking operations have invaded otherwise protected property rights, and this freedom from liability can act as a form of subsidy, reducing the cost of natural gas development. See *Coastal Oil & Gas Corp. v. Garza Energy Trust*, 268 S.W.3d 1 (Tex. 2008); see also *supra* notes 241-42 and accompanying text.

283. Merrill, *supra* note 281, at 992 ("Cheap gas . . . is poison for renewables").

284. See discussion *supra* Part IV.

velopment, or, even if it is not a background principle, the energy/property balance informs the balancing test such that it will be difficult to show a taking absent an enormous economic deprivation.

As noted above, the history underlying the energy/property balance is sufficiently long and consistent enough that it may be considered a background principle of property. Background principles of property law inhere with property title and limit property rights; laws that simply restate or recreate those background principles have not altered, and thus cannot have taken, any existing property right.²⁸⁵ Accordingly, if a property owner has no expectation of a remedy when energy development projects infringe on otherwise protected property rights, then he has no expectation to be free of energy development activities and has no property right that can be taken by laws promoting energy development.²⁸⁶ If there is no property expectation infringed, then the *Penn Central* balancing test becomes unnecessary because there cannot be a regulatory taking without an underlying property right to take.

Alternatively, even if the energy/property balance is not a background principle, it at least influences the *Penn Central* balancing inquiry, particularly in terms of the investment-backed expectation and character of government action. A property owner has little investment-backed expectation to be free from energy development. As extensively discussed, the energy/property balance shapes property owners' expectations such that they should not expect a remedy for energy development that infringes on otherwise protected rights to exclude or use and enjoy. Given the long history of the energy/property balance, a property owner can be considered aware of these diminished expectations and reasonably anticipate them; the expectation prong therefore cuts against finding a taking.²⁸⁷ Further, the energy/property balance impacts the character of the government action prong because the promotion of energy development advances an important public interest and creates a great reciprocity of ad-

285. As the Supreme Court has stated, "We held in *Lucas* that the government must pay just compensation for such 'total regulatory takings,' except to the extent that 'background principles of nuisance and property law' independently restrict the owner's intended use of the property." *Lingle v. Chevron*, 544 U.S. 528, 538 (2005) (quoting *Lucas v. S.C. Coastal Council*, 505 U.S. 1003, 1026-1032 (1992)).

286. See *Stop the Beach Renourishment, Inc. v. Fla. Dep't of Env'tl. Prot.*, 560 U.S. 702 (2010) (holding that under established background principles of property law, a beach restoration project did not constitute a taking of property rights).

287. See *Echeverria*, *supra* note 130, at 184 (discussing the relevant inquiry for reasonable investment-backed expectation to include "(1) whether the plaintiff operated in a 'highly regulated industry;' (2) whether the plaintiff was aware of the problem that spawned the regulation at the time it purchased the property; and (3) whether the plaintiff could have 'reasonably anticipated' the possibility of such regulation in light of the 'regulatory environment' at the time of purchase" (quoting *Apollo Fuels, Inc. v. United States*, 381 F.3d 1338, 1349 (Fed. Cir. 2004))).

vantage.²⁸⁸ As a result, this prong also counsels against takings liability. Unless an energy production measure arises to a per se taking by eliminating all of a property's value,²⁸⁹ the energy/property balance virtually ensures that it will not be considered a taking under the *Penn Central* test.

Second, the energy/property balance informs the per se physical takings rule by adding nuance to the otherwise formalistic framework. Specifically, the energy/property balance shifts the expected remedy for a physical invasion from a strict-liability rule to a no-liability rule or possibly a liability rule subject to a balancing test, depending on the impact to the property. For example, with physical intrusions that did not completely foreclose other uses of the property, no-liability rules were the norm, as demonstrated by doctrines regarding firewood gathering, coal mining, forced pooling, forced unitization, pipeline regulation, and subsurface drilling. When, however, a physical invasion foreclosed other property uses, as in the case of flooding under the mill acts, a landowner was compensated unless she benefitted on the whole. In this case, protection for the right to exclude was reduced from a strict-liability rule to a liability-rule with a balancing component akin to the *Penn Central* test. The only instance of per se compensation, a strict-liability rule, was in the eminent domain context, such as for coal or hydropower, where full title to property actually transferred.²⁹⁰ Under the energy/property balance the remedy for physical invasions seems to turn on the quality of the invasion, reflecting a shift from a formalist to a functionalist inquiry due to the diminished right to exclude energy production activities.

Applying these takings tests as informed by the energy/property balance to aggressive renewable energy policies shows that the policies do not constitute compensable takings. First and most simply, existing policies—such as New Jersey's law that a builder must offer the option of solar energy, California's "solar ready" rooftop requirement, mandatory solar hot water heaters in Hawaii and Puerto Rico, or measures to implement California's "Zero Net Energy" policy—

288. See *id.* at 186-210 (discussing the meaning of the character of the government action prong to include "reciprocity of advantage" and "public interest"); see also Hanoch Dagan, *Just Compensation, Incentives, and Social Meanings*, 99 MICH. L. REV. 134, 136 (2000) ("A takings doctrine attuned to the virtues of social responsibility and equality . . . should start with a rule of long-term reciprocity of advantage . . .").

289. See *Lucas*, 505 U.S. 1003; see also Echeverria, *supra* note 130, at 186 (noting that most takings challenges do not succeed unless a regulation eliminates nearly all of a property's value). Moreover, as discussed earlier, if the energy/property balance is considered a background principle, then an energy production measure will not constitute a taking even if it eliminates all of a property's value. See *Lingle*, 544 U.S. at 538.

290. Under the mill acts, there was no transfer of title to the flooded lands. Cf. HORWITZ, *supra* note 166, at 47.

have little to fear from takings claims. None reduces all the economic value of a property nor causes a physical invasion that curtails all other uses.

Second, more aggressive policy proposals should survive takings challenges for largely the same reasons. For example, laws creating solar rights or wind rights that foreclose certain land uses²⁹¹ or a policies absolving solar and wind projects from nuisance suits²⁹² face only the *Penn Central* balancing test because they involve no third-party physical invasion. Factoring in the energy/property balance, as long as these measures do not reduce all the economic value of the property, they do not create takings. Further, mandatory microgrid installation or mandatory energy development on promising parcels, even if they involved compulsory installation of third-party equipment or compulsory third-party access, should not create a taking. These measures would not reduce all economic value of the parcel. Additionally, as long as the third-party physical invasions did not prevent all other use of the property or transfer title outright via eminent domain, a no-liability rule should foreclose takings claims.

As a result, state and local governments should not allow takings concerns to stand in the way of implementing these and other aggressive renewable energy policies.²⁹³ The energy/property balance shows that as new energy sources have emerged, the law has shaped property rights to accommodate them; after all, “[t]he police power embodies the community’s ability to regulate and alter the scope of entitlements over time as their social meaning changes. This power to change the scope of property rights is necessary to *preserve* their social function.”²⁹⁴

VI. CONCLUSION

When legislatures and courts have weighed energy versus property, energy has gotten a thumb on the scale. Throughout our legal history, courts have accommodated the societal interests in promoting energy production even when that meant reshaping fundamental private property expectations in the right to exclude, the right to use

291. See, e.g., Rule, *supra* note 91, at 242.

292. See Walker, *supra* note 54.

293. The energy/property balance is, of course, bounded by political checks; a government must first enact a policy mandating energy development or limiting neighbors’ rights for the energy/property balance to impact a takings claim. Further, abuse of the energy/property balance in other non-renewable energy contexts, such as to promote hydraulic fracturing, is not a concern because the law already allows similar practice in those contexts. See, e.g., *Coastal Oil & Gas Corp. v. Garza Energy Trust*, 268 S.W.3d 1 (Tex. 2008). Existing energy sources already benefit from the energy/property balance and from the no-liability rules it imposes.

294. Singer & Beermann, *supra* note 131, at 228.

and enjoy, and the remedies available for those rights. Now that renewable energy projects face the same hurdles that past energy developments did, the energy/property balance should tip the same way.

