# Defining Power Property Expectations

by Michael Pappas

Michael Pappas is an Assistant Professor of Law at the University of Maryland Francis King Carey School of Law.

## I. Introduction

To date, most government efforts to promote distributed solar energy have involved incentivizing property owners to undertake voluntary installations. However, that approach is changing, as government actors move to increase distributed solar generation capacity not only through incentive programs, but also through requirements. Such a change from voluntary to mandatory measures represents a seismic shift in the approach to encouraging distributed solar generation, and it may raise objections about interference with property expectations.

The Comment addresses those concerns by exploring the nature of property expectations in the energy context and analyzing how courts and legislatures have balanced property expectations against past government measures to encourage energy production and development of underexploited resources. The Comment concludes that throughout the history of energy development in the United States, property owners' expectations have been understood to accommodate socially beneficial energy production, and that the concerns surrounding the promotion of distributed solar generation counsel a similar approach.

## II. Promoting Distributed Solar Installation

Distributed solar generation, such as solar installations on residential or commercial rooftops, represents an energy resource with great potential. Using largely unharnessed areas of already developed properties for on-site energy generation presents overlapping benefits, such as increased clean energy production without additional energy sprawl or transmission concerns.[1] Moreover, if many distributed solar energy sources are aggregated, that can lead to a substantial cumulative societal benefit.

Aggregating distributed solar sources, however, is an inherent challenge to maximizing their benefit. To reach the full potential of this energy source, both in terms of production capacity and in terms of network or microgrid efficiencies,[2] requires mass participation. Quite simply, the more distributed generators there are, the greater the impact of distributed generation. But because distributed power sources are, almost by definition, located across multiple properties with multiple owners, the installation of mass-distributed generation capacity requires the coordinated activity of multiple private actors, which can be difficult.

As a relatively new energy technology, distributed solar installation has had some success, but it still faces the challenges that many new technologies face in achieving broad acceptance. Some property owners are uncertain about adopting the technology, due to concerns over reliability, uncertainty about benefits relative to costs, or even cognitive barriers that prevent rational investment.[3] Further, the lack of adoption may be self-perpetuating, with some property owners waiting for widespread acceptance before investing themselves, while others await the price drop that will likely accompany increased production of solar panels. Finally, others may simply not wish to invest at all, perhaps because they believe that rooftop solar installations are not aesthetically pleasing or because they are unlikely to directly realize the benefits.[4] Whatever the cause, widespread adoption of distributed solar generation has not yet been realized, and the full potential of the resource has been hampered by the assembly problems frequently asso-

*Author's Note: This Comment is based on remarks at the Association of American Law Schools' Natural Resources and Energy Section 2015 annual conference.*

1. *See generally* Michael Pappas, *Energy Versus Property*, 41 Fla. St. U. L. Rev. 435, 439-41 (discussing benefits of distributed generation) [hereinafter Pappas, *Energy*].
2. *See, e.g.*, Sara C. Bronin, *Curbing Energy Sprawl With Microgrids*, 43 Conn. L. Rev. 547, 559 (2010) (discussing microgrids and their benefits).
3. *See* Pappas, *Energy*, *supra* note 1, at 441-43.
4. *See, e.g., id.* at 442 ("Landlords often have no incentive to invest in energy efficiency or renewable energy because the tenant pays the utility bill.").

ciated with attempts to coordinate the actions of multiple individual parties.[5]

Recognizing these assembly problems, some state and local governments have undertaken efforts to speed the adoption of distributed solar generation by offering incentive programs such as subsidies or tax breaks.[6] Some states have even counted distributed solar generation toward utilities' Renewable Portfolio Standard (RPS) requirements.[7] Consistently, these efforts to promote distributed solar generation have involved measures to encourage voluntary adoption. The policies incentivize solar installation, but they do not require it,[8] leaving individual property owners to decide for themselves and thus doing relatively little to alleviate the assembly problems in achieving mass adoption.

The voluntariness approach is changing, however, with some jurisdictions going beyond incentives for voluntary installation and instead seeking to achieve widespread distributed solar generation through mandates. A number of recent codes and ordinances in California illustrate the rise of such requirements for distributed solar installation. First, California's statewide building code includes the 2013 California Building Energy Efficiency Standards, which became effective July 1, 2014.[9] Section 110.10 of the Standards provides "mandatory requirements for solar-ready buildings," including requirements for "solar-ready" rooftops that "make[ ] space available" for "easier installation" of solar cells.[10]

Second, in March 2013, the city of Lancaster, located about 70 miles north of Los Angeles, became the "first U.S. city to require solar [installations]" on all new homes.[11] Enacting solar requirements through its zoning ordinance, the city requires an average of one kilowatt of solar production per residential home, either through on-site production or through purchase of credits from other solar installations in the city.[12]

Finally, the San Francisco Board of Supervisors passed a resolution entitled Solar Vision 2020, which "requires solar installation on all new construction or substantial retrofits in the City,"[13] though the resolution, which has the force of an ordinance, tempers its requirements by mandating solar installation only "where feasible."[14] It was enacted in November 2014, but as of this writing, the implementation details were still being developed by San Francisco's Department of the Environment, consistent with the resolution's language.[15]

Taken together, the California measures demonstrate a trend toward promotion of distributed solar installations through mandates, rather than merely through property owners' voluntary action or incentives.

## III. Tension With Private-Property Expectations

The California examples, as well as any other mandates for installation of distributed solar technologies such as solar hot water systems in Hawaii and Puerto Rico,[16] represent a new governmental push toward mass-distributed solar development and an important step toward overcoming assembly problems. But they also raise questions about how these requirements impact individual property rights. Individual autonomy, particularly reflected through a right to exclude persons from and control uses of one's own property, is thought to be a core element of private

5. For a fuller discussion of assembly problems, see, e.g., Thomas W. Merrill & Henry E. Smith, Property: Principles and Policies 39 (2d ed. 2012).
6. *See* Database of State Incentives for Renewables or Efficiency (DSIRE), http://www.dsireusa.org (aggregating information on state incentive programs).
7. *See* California Renewable Portfolio Standard Eligibility Guidebook 7 (2010) (discussing credit available for distributed generation, and noting that further guidance will be available in the future), *available at* http://www.energy.ca.gov/2010publications/CEC-300-2010-007/CEC-300-2010-007-CMF.PDF.
8. Renewable Portfolio Standards (RPSs) impose mandatory requirements on investor-owned utilities, electric service providers, or aggregators. (For more information on California measures, visit the California Public Utilities Commission web page, http://www.cpuc.ca.gov/PUC/energy/Renewables/.) While such RPSs essentially create or enhance a market for renewables production, they do not actually require the production of renewables on the individual level. Thus, any individual producer of renewable energy still has the option to choose whether or not to produce renewable energy.
9. 2013 California Building Energy Efficiency Standards, *available at* http://www.energy.ca.gov/2012publications/CEC-400-2012-004/CEC-400-2012-004-CMF-REV2.pdf.
10. For a more detailed discussion of these standards, see Pappas, *Energy*, *supra* note 1, at 444.
11. For more information, visit Lancaster, California's, website, http://www.cityoflancasterca.org/index.aspx?page=1279 (with links available to updated city zoning ordinance as well as "residential solar initiative"); *see also* Herman K. Trabish, *Lancaster, CA Becomes First US City to Require Solar*, GreenTech Media, Mar. 27, 2013, *at* http://www.greentechmedia.com/articles/read/Lancaster-CA-Becomes-First-US-City-to-Require-Solar. *See also* Felicity Barringer, *With Help From Nature, a Town Aims to Be a Solar Capital*, N.Y. Times, Apr. 9, 2013, *at* http://www.nytimes.com/2013/04/09/us/lancaster-calif-focuses-on-becoming-solar-capital-of-universe.html?pagewanted=all&_r=1.
12. *See* City of Lancaster, *Spreading Sunshine All Over the Place*, *Residential Solar Initiative*, http://www.cityoflancasterca.org/index.aspx?page=1279.
13. The resolution is available at the San Francisco Board of Supervisors website, http://www.sfbos.org/ftp/uploadedfiles/bdsupvrs/resolutions14/r0406-14.pdf.
14. *Id.* ("The Board of Supervisors support[s] the requirement of solar installations and/or rooftop gardens on all new construction or substantial retrofits in San Francisco where feasible, and urges the Department of the Environment to convene stakeholders to propose how this requirement be implemented.").
15. *Id.*
16. *See* Haw. Rev. Stat. §196-6.5 ("Solar water heater system required for new single-family residential construction"); U.S. Department of Energy, *Puerto Rico Building Energy Code With Mandatory Solar Hot Water Heating*, http://energy.gov/savings/puerto-rico-building-energy-code-mandatory-solar-water-heating. *See also* Pappas, *Energy*, *supra* note 1, at 485 (discussing other mandates).

property.[17] Measures mandating installation of solar technologies limit owners' abilities to exclude or control uses, and thus revisit a core tension found in property law: balancing strong individual autonomy principles[18] with more societally focused goals and values.[19] As a result, mandates may raise strong feelings and significant objections about infringement on private-property rights.

Reducing conceptual concerns with property rights to the most concrete claim that may arise, property owners who object to mandatory rooftop solar installations may claim that such requirements amount to a taking of their property, evoking the canonical *Loretto* decision establishing that a regulation compelling physical invasion of property is a per se taking under the Fifth Amendment.[20] In *Loretto*, the U.S. Supreme Court held that a New York City ordinance requiring property owners to allow cable boxes on their roofs constituted a compensable taking of property because the regulation required a third-party physical invasion and thus a curtailment of the "right to exclude" that is central to private property. Property owners upset with required solar installations might claim that mandatory solar panels on a rooftop present a strikingly similar fact pattern and represent the same invasion of the right to exclude. Thus, such property owners may argue that mandatory solar rooftop installations constitute a per se taking of property rights and require compensation.

In response to such claims, states and municipalities could engage in case-by-case defenses, highlighting specific factual differences to distinguish their distributed generation requirements from the situation at issue in *Loretto*.[21] While arguments based on distinguishing the facts may be convincing and may ultimately prevail, it is not certain ex ante that a court would accept such lines of distinction; accordingly, the risk of potential Takings Clause liability may chill governments from adopting requirements for distributed generation. To supplement factual arguments distinguishing *Loretto*, the next section offers a broader context for understanding how such mandates fit with property expectations, particularly when understood in light of past government efforts to promote similar development of important resources.

17. *See, e.g.*, Merrill & Smith, *supra* note 5, at 16.
18. William Blackstone, 2 Commentaries 1 (characterizing property as "that sole and despotic dominion which one man claims and exercises over the external things of the world, in total exclusion of the right of any other individual in the universe.").
19. *See, e.g.*, David Schorr, *How Blackstone Became a Blackstonian*, 10 Theoretical Inquiries L. 103, 104-05, nn.2-3 (2009) (describing juxtaposition of Blackstonian view with more "community-oriented property law" theories).
20. Loretto v. Teleprompter Manhattan CATV Corp., 458 U.S. 419 (1982).
21. The *Loretto* opinion specifically noted that a per se taking would not arise from "the State's power to require . . . compl[iance] with building codes and provi[sion of] utility connections, mailboxes, smoke detectors, fire extinguishers, and the like." *Id.* at 440. Government actors could argue that distributed generation requirements are similar to such building codes or utility connections and thus do not create per se takings liability.

## IV. Property Expectations in Context

Government efforts to promote the development of energy resources date back to the earliest fuel sources, and many of these efforts imposed limitations on private-property owners' rights to exclude and their general autonomy. For centuries, courts and legislatures have been forced to balance private-property expectations against the needs of energy development, and consistently the result has been that private-property protections must yield to important resource needs.

For example, as discussed below, measures to promote production of energy resources across property lines have curtailed property owners' rights to exclude, and courts have upheld the measures and found no takings liability. Additionally, anti-waste measures have limited the autonomy of private-property owners and steered property uses to promote the development of underutilized resources; there, too, courts have held that the measures are valid and noncompensable. This section examines both types of measures limiting property expectations in favor of resource development, and applies them to the context of mandatory solar installation, ultimately finding that the same underlying justifications also apply in the distributed solar context.

### *A. Energy Development and the Right to Exclude*

Throughout the nation's history, courts and legislatures have promoted energy development through measures that have limited property owners' rights to exclude.[22] This has particularly been the case when the establishment, development, or expansion of an energy resource has required overcoming assembly problems and linking or spanning multiple different properties. Two specific examples are the Mill Acts, which promoted early hydropower development; and forced pooling and unitization laws, which aided in oil and gas extraction.

Throughout the 1800s, legislative passage and judicial application of Mill Acts demonstrated how American property law was seen to prioritize energy production and development over landowners' rights to exclude.[23] The laws encouraged the development of water mills, which harnessed kinetic hydropower generated by water continuously flowing from dam-controlled reservoirs. Building reservoirs to establish or expand water mills frequently caused flooding of neighboring lands, leading to property claims that threatened to curtail water mill development.[24]

To resolve disputes and allow continued expansion of hydropower sources, state legislatures passed Mill Acts limiting potential causes of action and remedies for the flooding. For example, the acts disallowed neighbors from bringing trespass actions and thus foreclosed the oppor-

22. *See generally* Pappas, *Energy*, *supra* note 1.
23. *Id.* at 460.
24. *See* Morton J. Horwitz, The Transformation of American Law 1780-1860, at 47 (1977).

tunity for neighbors to enjoin the flooding; moreover, the acts even allowed mill owners to escape liability altogether by showing that, on balance, the mill benefitted the complaining neighbor.[25] In essence, these acts restricted neighboring property owners' rights to exclude the impacts of water mill development. In upholding the Mill Acts against challenges, courts stressed that, at the margins, a property owner's right to exclude must yield to the important social necessity of energy development.[26]

Modern courts have employed similar reasoning in upholding measures that limit the right to exclude to promote development of oil and gas resources. For example, through forced pooling and unitization statutes, state legislatures have required neighboring landowners whose property overlies continuous oil or gas reservoirs to join together in extracting hydrocarbon energy resources through cooperative wells.[27] Even though the landowners have different property tracts, each with its own surface boundaries as well as its own rights to withdraw oil and gas, these statutes force cooperation to promote more efficient and complete access to the oil and gas resources.[28]

Such acts serve not only to force recalcitrant landowners to extract energy resources when they otherwise would not do so, but also to require unwilling landowners to accommodate third-party physical invasion, such as trucks, pipelines, and wells, of the surface and subsurface of their properties.[29] Despite these significant compromises of the right to exclude, the laws have been uniformly upheld and found to trigger no compensation liability for Takings Clause challenges, all based on the reasoning that the right to exclude can be constitutionally limited for the purpose of conserving and utilizing publicly beneficial energy resources.[30]

### *B. Anti-Waste Measures and Autonomy*

In addition to limiting property owners' rights to exclude, laws have also limited landowners' autonomy regarding the use of resources through "anti-waste" measures.[31] Such laws have particularly been applied to spur the development of underused or developing resource bases that have not been tapped to their full societal potential. The purpose of such legal measures is to eliminate wasteful underuse by requiring that certain resources be more effectively harnessed.

Much of the history of American water law reflects such a concern with eliminating wasteful underuse of water resources, and the development of water law regimes reflects a shifting of property expectations to allow and encourage resource use. For example, the development of American water law from the English natural-flow doctrine to the doctrine of reasonable-use riparian rights represented a legal transition that curtailed the property expectations of downstream landowners in order to encourage expanded use and withdrawal of water resources that were perceived as underutilized.[32]

Under the original English system, property owners along a watercourse had an expectation in the undiminished flow of water past the property; as a result, a downstream landowner could assert a property right to prevent an upstream owner from withdrawing water. Because this system limited water use and led to perceived wasteful underuse of water, American states altered property expectations to embrace the riparian rights system, which allowed all owners of land abutting or containing a watercourse (that is, "riparian" land) to make reasonable use of water, even if that use involved a withdrawal that diminished the flow.[33]

The riparian rights doctrine worked in the eastern states, but when it proved insufficient for development in the arid western states, the rise of the prior appropriations doctrine demonstrated another shift in property expectations to prevent resource underuse.[34] Since riparian land was

25. *Id.* at 48; Pappas, *Energy*, *supra* note 1, at 460.
26. *See, e.g.*, Fiske v. Framingham Mfg. Co., 29 Mass. (1 Pick.) 68, 70-71 (1831), noting that the Mill 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.
27. *See* Pappas, *Energy*, *supra* note 1, at 465-74.
28. *See generally* 1 Bruce M. Kramer & Patrick R. Martin, The Law of Pooling and Unitization §6.02 (3d ed. 1989). For representative compulsory unitization statutes, see, e.g., Ark. Code Ann. §§15-72-308 to 15-72-315; Cal. Pub. Res. Code §§3640 et seq.; Kan. Stat. Ann. §§55-1301 et seq.; La. Rev. Stat. Ann. §30:5; Miss. Code Ann. §53-3-7; N.M. Stat. Ann. §§70-7-1 et seq.; Okla. Stat. Ann. tit. 52, §§287.1 et seq.; and Wyo. Stat. §30-5-110.
29. For example, New Mexico recognizes rights of well operators to enter and use the surface or land within a force-unitized area even when not part of the operator's lease, and even though the same entry onto non-unitized land would constitute trespass. Kysar v. Amoco Prod. Co., 93 P.3d 1272, 1282 (N.M. 2004). *See also* Continental Res., Inc. v. Farrar Oil Co., 559 N.W.2d 841 (N.D. 1997)) (holding that even though a force-pooled tract suffered a subsurface physical invasion, the invasion did not amount to trespass or a compensable claim because the forced pooling statute superseded such property law principles). *See also* Pappas, *Energy*, *supra* note 1, at 469-72. *Cf.* Coastal Oil & Gas Corp. v. Garza Energy Trust, 268 S.W.3d 1, 11-17 (Tex. 2008) (holding that a hydraulic fracturing operation that crossed property lines two miles below the surface, injected materials under the neighbor's lands, and withdrew gas from under the neighbor's land created no actionable trespass absent injury to the surface of the land).
30. *See, e.g.*, Ohio Oil Co. v. Indiana, 177 U.S. 190, 210-11 (1900) (emphasizing 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); Champlin Refining Co. v. Corporation Comm'n of Okla., 286 U.S. 210, 233-34 (1932); 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).
31. *See* Michael Pappas, *Anti-Waste*, 56 Ariz. L. Rev. 741, 771-78 (2014).
32. *See, e.g.*, Harris v. Brooks, 283 S.W.2d 129, 132-33 (Ark. 1955) (discussing the nature of the natural-flow doctrine and the riparian reasonable-use doctrine, and rejecting the natural-flow approach in favor of a riparian reasonable-use regime in order to promote "the benefits accruing to society in general from a maximum utilization of our water resources.").
33. *Id.*; *see also* Pappas, *Anti-Waste*, *supra* note 31, at 776-77.
34. *See, e.g.*, In re Adjudication of the Existing Rights to the Use of All the Water, 2002 MT 216, ¶ 9, 311 Mont. 327, 332, 55 P.3d 396, 399 (Mont. 2002):

relatively scarce in the West, the riparian rights doctrine, which limited water rights to use on riparian tracts, led to underuse of water and impediments to land development.[35] The prior appropriation doctrine sought to eliminate this underuse by decoupling water rights from the ownership of riparian land and instead grounding water rights in the diversion and beneficial use of water.[36] Further, the prior appropriations doctrine defined it as "wasteful" to allow water to flow by unused,[37] further encouraging the use of water and premising the continued existence of water rights on continued beneficial use of the water.[38] As this history reflects, each of these transitions in the development of American water law involved altering a property expectation to correct a perceived underuse of a resource, thereby prioritizing resource development over previously held autonomy interests.

Similarly, the development of the adverse possession doctrine, particularly as applied to wild lands, represents a legal measure designed to combat perceived underuse of resources, even at the expense of sacrificing autonomy.[39] The adverse possession doctrine transfers property title from a landowner to an adverse possessor if the adverse possessor demonstrates sufficient use of the land.[40] In the case of wild lands, courts have shown a particular willingness to transfer "unexploited" lands to an adverse-possessing party that has taken measures to develop them.[41] By setting a relatively low bar for transferring title from "idle" landowners, who left their property in a wild state, to "industrious" adverse possessors, who made developmental use of the land, the doctrine reflected an attempt to remedy a perceived underdevelopment of productive land resources.[42] The doctrine poses serious challenges to a landowner's autonomy to control the use of property and even institutes a no-liability rule for transferring the title of the property, but it has nonetheless been upheld and justified on the basis of spurring beneficial development of an underutilized resource base.[43]

### *C. Exclusion, Autonomy, and Solar Mandates*

As the previous sections discuss, when conflicts have arisen between property expectations on the one hand, and measures to develop energy sources or tap underutilized resources on the other, courts and legislatures have emphasized that property expectations must yield to the socially important energy or underutilization concerns. Similar energy development and underutilization concerns animate measures requiring rooftop solar panels, and thus the same reasoning justifies preempting property owners' expectations of exclusion or autonomy.

The Mill Acts and forced pooling and unitization measures were necessary to promote energy development in the face of assembly problems,[44] and distributed solar generation faces the same challenges. To reach its potential as an energy source, distributed generation requires sufficient installed capacity across multiple property tracts; to build

> Miners in California developed a water use system as an alternative to the riparian water system prevalent in England and the eastern United States. While riparians allowed owners of land abutting the water source to control it, the more arid climes of the American West required a different approach. Prior appropriation, adapting flexibly to the needs of a developing society, allowed diversion to a distant location and simply required use of the water for a beneficial purpose. Western states adopted the miners' customs through both court decisions and codification, and the doctrine of prior appropriation became the law of the western states.

(*citing* A. Stone, Selected Aspects of Montana Water Law 7 (1978); Christine A. Klein, *The Constitutional Mythology of Western Water Law*, 14 Va. Envtl. L.J. 343, 347-48 (1995)). *See also* Charles F. Wilkinson, Crossing the Next Meridian: Land, Water, and the Future of the West 231-35 (1992).

35. *See* In re Adjudication of the Existing Rights to the Use of All the Water, *supra* note 34, 55 P.3d at 399.
36. *Id.*:

> The common law elements of a valid appropriation are intent, notice, diversion and application to beneficial use. However, in Montana, as in many western states, the flexibility of the prior appropriation doctrine has allowed acquisition of the right to use a specific amount of water through application of the water to a beneficial use.

37. *See, e.g.*, Eskelsen v. Town of Perry, 819 P.2d 770, 775 (Utah 1991) (noting that western states are "vitally interested in seeing that none of the [state's] waters are allowed to run to waste or go without being applied to a beneficial use") (*citing* Deseret Live Stock Co. v. Hooppiania, 239 P. 479, 481 (Utah 1925)). *See also* 2 Cal. Jur. 3d Water §33 (2005) ("The policy of the state courts may be summarized to be that the rivers and streams of the state that *waste into the sea* should, if possible, be conserved for beneficial uses.") (emphasis added).
38. *See, e.g.*, United States v. Alpine Land & Reservoir Co., 27 F. Supp. 2d 1230, 1243 (D. Nev. 1998) ("Under the established tenet that a beneficial use is the measure and limit of a water right, when the necessity for the use of the water ceases to exist or is reduced, the extent of the water right is limited to the extent of the beneficial purpose which remains."); Smith v. Hawkins, 120 Cal. 86, 52 P. 139, 140 (1898) ("If plaintiffs could forfeit their entire right of appropriation by nonuser, equally will they be held to forfeit less than the whole by like failure."); State v. Hagerman Water Right Owners, Inc., 947 P.2d 400, 407-08 (Idaho 1997) (holding that partial forfeiture is available in Idaho and that a contrary holding would be inconsistent with the principle of beneficial use); In re Musselshell River Drainage Area, 255 Mont. 43, 840 P.2d 577, 579 (1992) ("The controlling principle upon which water 'rights' in Montana are perfected and continue to possess legal validity is that of beneficial use; water rights cease when the water is no longer applied to a beneficial use." (internal quotation marks omitted)); In re Birdwood Irrigation Dist., 154 Neb. 52, 46 N.W.2d 884, 888 (1951) ("We conclude that the power to cancel the whole of an appropriation for irrigation purposes for nonuser carries with it the right to cancel a part.").
39. *See* Pappas, *Anti-Waste*, *supra* note 31, at 773-74.
40. *See, e.g.*, John G. Sprankling, *An Environmental Critique of Adverse Possession*, 79 Cornell L. Rev. 816, 824 (1994) ("The successful adverse possessor must hold actual, hostile, exclusive and continuous possession of land in an open and notorious manner under a claim of right or color of title for a requisite period.").
41. *Id.* at 828-29:

> Almost all states allow adverse possession of wild lands based on activities which are inferior in quality and duration to those required for developed lands. In some states this rule is express: the adverse possessor of lands which are characterized as "wild," "outlying and uncultivated," unsuited for "any useful permanent improvement" or "undeveloped," need only perform the activities which are suited or adapted to the land in its natural condition. In most states, the rule is implicit: the adverse possessor must use the land in the same manner that a reasonable owner would, in light of its nature, character and location.

42. *Id.* at 821; *see also id.* at 826 ("Most modern adverse possession decisions involve claims to either tracts of wild land or disputed border strips in developed areas.").
43. *See, e.g.*, Pappas, *Anti-Waste*, *supra* note 31, at 774.
44. *See, e.g.*, Kramer & Martin, *supra* note 28, at §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.").

this critical mass of energy production requires avoiding assembly problems and securing the cooperation of numerous individual property owners. Just as measures curtailing the right to exclude were necessary to force cooperation across property boundaries in the cases of hydropower development and oil and gas extraction, so some compromise of the right to exclude may be justified in the case of distributed solar generation.

Moreover, just as anti-waste measures limited the autonomy of individual property owners in order to promote development of underused resources, mandates for solar energy installation seek to tap the underutilized capacity of rooftops to generate energy. In the same way that allowing water to flow by without using it was once considered waste, now the untapped energy potential of sunlight hitting roofs can also be seen as waste, and government actors may be justified in taking measures to harness the untapped potential, even if doing so imposes some limits on landowner autonomy. The same challenges that confronted past resource development now confront the expansion of distributed solar installations, and the same justifications for limiting property expectations to accommodate development of these energy sources are once again applicable.

## V. Conclusion

Efforts to promote distributed solar generation through mandates may represent a new direction in the policy to expand renewable energy capacity, but the approach is not so novel when considered in light of past energy-promotion and anti-waste measures. Past experiences provide context for understanding the balance between property expectations and new requirements for rooftop solar generation, and they should offer insight for both planners and property owners when considering whether renewable energy mandates run afoul of property rights. As discussed, there is a long and consistent history of property expectations yielding to concerns about energy resource development and underuse, and with this history in mind, the advent of mandatory distributed solar appears not to be such a seismic shift after all.