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**THE KEY TO UNLOCKING THE POWER OF
SMALL SCALE RENEWABLE ENERGY:
LOCAL LAND USE REGULATION**

Patricia Salkin*

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I. INTRODUCTION

Myriad federal and state programs have been promoted to incentivize the research and development of renewable energy as a means of achieving sustainability and producing more affordable alternative energy systems, and these programs could potentially have a profound impact on the way that electricity is produced and consumed in the United States. Small-scale renewable energy generation from sources such as solar and wind, that can be used at the consumer level as a source of power for homes and small businesses, is an important part of this paradigm shift. However, regardless of the fiscal incentives offered to clean-tech companies to

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design and market these products, as well as the fiscal incentives to homeowners and business owners to purchase and install these technologies, state and local laws can inadvertently impede their installation. These barriers may be caused by outdated statutes and municipal codes or by historic district and aesthetic regulations. Restrictive covenants and deed restrictions in homeowners association communities may further impede the goal of siting small scale renewable energy sources.¹

In response to these problems, many state and local governments have sought to promote small-scale renewable energy development through amendments to comprehensive planning and zoning laws, as well as through utility regulations and various financial incentives. This article provides an overview of some of the strategies that have been used to increase the use of small-scale renewables, focusing on non-commercial renewable energy systems installed at the home or business level. The article begins in Part II with a discussion of various renewable energy incentives offered by the federal and state governments to promote the use of these alternative sources of electricity, including financial and permitting incentives. Part III continues with a detailed examination of how the land use regulatory system can be used to promote small-scale renewable energy by employing traditional zoning techniques, asserting that without an appropriate local land use regime, the incentives reviewed in Part II cannot be effectively utilized. Part IV concludes with a warning to local governments that if they fail to accommodate the emerging federal and state policies supporting the siting of renewable energy sources, they may face preemptive statutory measures in the area of land use regulation. This creates perhaps the greatest incentive for local governments to plan and regulate responsibly for promoting the appropriate use of small-scale renewable energy.

II. RENEWABLE ENERGY INCENTIVES

A. Financial Incentives

Financial incentives for small-scale renewable energy systems have been created at the federal, state, and local levels, and include tax abatements, rebates, grants, and low-interest loan pro-

1. See, e.g., Patricia E. Salkin, *Renewable Energy and Land Use Regulation (Part 1)*, A.L.I.-A.B.A. BUS. L. COURSE MATERIALS J., Feb. 2010, at 47; Patricia E. Salkin, *Renewable Energy and Land Use Regulation (Part 2)* A.L.I.-A.B.A. BUS. L. COURSE MATERIALS J., Apr. 2010, at 27.

grams, among other things.² At the federal level, for example, Congress created the Residential Renewable Tax Credit in 2005, which provides a tax credit for homeowners for up to thirty percent of the cost of constructing solar electric, solar water heating, fuel cell, small wind, or geothermal heat pump generation systems.³ The American Reinvestment and Recovery Act provided a significant boost by expanding the federal alternative energy investment tax credit to allow purchasers of small-scale systems to apply thirty percent of the total cost of a small wind system as a tax credit through 2016.⁴ Then in February 2011 the President announced the Better Buildings Initiative, which calls upon Congress to redesign tax deductions and offer more government-backed loans to businesses that retrofit existing buildings.⁵

The states have also devised numerous financial incentives for small-scale alternative energy development.⁶ For example, in Colorado, independently-owned residential solar electric generation systems that are not used for income production are exempt from property taxes.⁷ Another Colorado law authorizes counties to offer property tax or sales tax incentives for residential and commercial property owners who install renewable energy fixtures.⁸ The Illinois Renewable Energy Resource Solar and Wind Energy Rebate Program offers a rebate of up to \$30,000 for the construction and use of solar and wind energy sources for homeowners, businesses,

2. See generally DATABASE OF STATE INCENTIVES FOR RENEWABLES & EFFICIENCY, <http://www.dsireusa.org> (last visited July 5, 2012) (providing a comprehensive listing of these incentives).

3. 26 U.S.C.A. § 25D(a) (West 2012).

4. See American Reinvestment and Recovery Act of 2009, Pub. L. No. 111-5, § 1603, 123 Stat. 115 (2009) (codified as amended in 26 U.S.C. § 48). Most people prefer tax credits as opposed to deductions, because a tax credit reduces taxes dollar-for-dollar, while a deduction only removes a percentage of the tax that is owed.

5. Press Release, President Barack Obama, President Obama's Plan to Win the Future by Making American Businesses More Energy Efficient through the "Better Buildings Initiative" (Feb. 3, 2011), available at <http://www.whitehouse.gov/the-press-office/2011/02/03/president-obama-s-plan-win-future-making-american-businesses-more-energy>.

6. See generally *Financial Incentives for Renewable Energy*, DATABASE OF STATE INCENTIVES FOR RENEWABLES & EFFICIENCY, <http://www.dsireusa.org/summarytables/finre.cfm> (last visited July 5, 2012) (providing a summary of the financial incentives that promote renewable energy use). The U.S. Department of Energy also notes that the following organizations play a role in advancing renewable energy policies at the state, regional, and national levels: Association of State Energy Research and Technology Transfer Institutions; Interstate Renewable Energy Council; National Association of Counties Interest Areas; National Association of Regulatory Utility Commissioners; National Association of State and Community Service Programs; National Association of State Energy Officials; National Conference of State Legislatures; Renewable Energy Policy Project; and the State Technologies Advancement Collaborative. *Information Resources: Related Links*, U.S. DEPT OF ENERGY, http://apps1.eere.energy.gov/states/related_links.cfm (last updated May 1, 2008).

7. COLO. REV. STAT. ANN. § 39-3-102 (West 2012).

8. *Id.* § 30-11-107.3.

public agencies, and non-profit entities.⁹ Massachusetts has established a Renewable Energy Trust Fund to make grants, loans, equity investments, rebates, and provide other types of financial assistance for the development and increased use of renewable energy resources.¹⁰ The Fund, in operation with the Massachusetts Clean Energy Center,¹¹ offers numerous financial incentives,¹² such as the Micro Wind Initiative, which has assisted more than seventy projects to date and “provides rebates for the installation of small wind projects with power capacities from 1 kW to 99 kW and located at residential, commercial, industrial, institutional, and public facilities.”¹³

The New York State Energy Research and Development Authority (NYSERDA) provide incentives for on-site wind energy systems based on their annual energy output.¹⁴ A previous NYSEDA program, which is now closed, provided incentives of approximately 40% to 45% of the installation costs for residential and commercial solar electric systems.¹⁵ Residents in Oregon are eligible for income tax credits for adding solar energy systems to their homes, as well as for installing solar water heating equipment and solar pool heating equipment.¹⁶ Separate tax credits are available for active and passive solar space heating systems, and each tax credit is worth up to \$1,500 per year.¹⁷ Tax credits of up to \$900 are also provided for residential geothermal ground-source heat pumps.¹⁸ In Washington State, sales tax exemptions are available for machinery and equipment used for solar energy systems that generate less than ten kilowatts per year, as well as for labor charges related to the installation of such equipment.¹⁹ Individuals, busi-

9. *Solar and Wind Energy Rebate Program*, ILL. DEP'T OF COMMERCE & ECON. OPPORTUNITY, http://www.commerce.state.il.us/dceo/Bureaus/Energy_Recycling/Energy/Clean+Energy/01-RERP.htm (last visited July 5, 2012).

10. MASS. GEN. LAWS ANN. ch. 23J, § 9 (West 2012).

11. *Announcement*, MASS. RENEWABLE ENERGY TRUST, <http://www.masstech.org/renewableenergy/index.html> (last visited July 5, 2012).

12. *Renewable Energy Generation: Programs*, MASS. CLEAN ENERGY CTR., <http://www.masscec.com/index.cfm/page/Programs/pid/11159> (last visited July 5, 2012).

13. *Commonwealth Wind – MicroWind*, MASS. CLEAN ENERGY CTR., <http://www.masscec.com/index.cfm/cdid/11395/amp/pid/11159> (last visited July 5, 2012).

14. *NYSERDA – On-Site Small Wind Incentive Program*, DATABASE OF STATE INCENTIVES FOR RENEWABLES & EFFICIENCY, http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=NY35F&RE=1&EE=1 (last updated May 10, 2012).

15. U.S. ENVTL. PROT. AGENCY, STATE INCENTIVES FOR ACHIEVING CLEAN AND RENEWABLE ENERGY DEVELOPMENT ON CONTAMINATED LANDS, *available at* http://www.epa.gov/oswercpa/incentives/ny_incentives.pdf.

16. *Residential Energy Tax Credits for Solar*, OREGON.GOV, <http://www.oregon.gov/energy/RENEW/Pages/solar/Support-RETC.aspx> (last visited July 5, 2012).

17. *Id.*

18. *Ground-Source Heat Pumps*, OREGON.GOV, <http://www.oregon.gov/ENERGY/RENEW/Geothermal/GSHP.shtml> (last visited July 5, 2012).

19. WASH. REV. CODE ANN. § 82.08.963 (West 2012).

nesses, and local governments that are not in the power business, as well as participants in community solar projects, are also eligible to apply to the public utility serving the solar energy system for an investment cost recovery incentive of up to \$5,000 per year.²⁰ The public utility, in turn, is given a tax credit equal to the amount it pays out in investment cost recovery incentive payments.²¹

Incentives have also been provided by many local governments, often under local options authorized by state law or with financing provided by state or federal agencies. For example, the Boulder, Colorado City Council approved a solar rebate ordinance in November 2006 that

[C]reated a renewable energy fund, where [thirty-five] percent of the fund [was] dedicated to rebates on sales tax on solar systems . . . and [sixty-five] percent of the fund [was] dedicated for the purpose of providing financial assistance through grants toward installation of photovoltaic (PV) or solar thermal systems on homes in the city's affordable housing program, on housing for low to moderate income persons owned or developed by nonprofit organizations, and on the facilities of site based nonprofit entities operating in Boulder.²²

Fort Lauderdale, Florida offers rebates of up to \$1,000 for the purchase and installation of residential solar water heaters and solar electric systems.²³ The rebate program is funded through the federal government's Energy Efficiency and Conservation Block Grant Program, which was authorized as part of the American Recovery and Reinvestment Act of 2009.²⁴ Harford County, Maryland offers property tax exemptions of up to \$2,500 each (\$5,000 total) for the installation of solar and geothermal energy devices,²⁵ and the City of Long Beach, California offers rebates of up to \$500 for the installation of residential solar hot water heaters.²⁶ The Honolulu Solar Roof Water Heating Loan Program "provides financing

20. *Id.* § 82.16.120.

21. *Id.* § 82.16.130.

22. *Solar Rebate and Grant Programs*, CITY OF BOULDER, COLO., http://www.bouldercolorado.gov/index.php?option=com_content&task=view&id=7700&Itemid=2845 (last updated Mar. 30, 2012).

23. *Save Energy and Money with a Smart Watts Rebate*, CITY OF FORT LAUDERDALE, <http://www.fortlauderdale.gov/rebates/> (last visited July 5, 2012).

24. *Id.*

25. *Solar/Geothermal Energy Tax Credit Application*, HARTFORD CNTY. GOV'T, <http://www.harfordcountymd.gov/Downloads.cfm?FormID=969> (last updated Sept. 16, 2011).

26. *Residential Energy Efficiency Rebate Program*, CITY OF LONG BEACH, <http://www.longbeach.gov/news/displaynews.asp?NewsID=4579&TargetID=100> (last visited July 5, 2012).

[for the installation of] solar water heating systems to homes of income-qualified homeowners.²⁷ The loans are based on income qualifications and are primarily aimed at helping low-income and moderate-income homeowners.²⁸

These incentives, which are aimed at encouraging consumers to purchase and install renewable energy systems, are an important component of creating a marketplace for the products resulting from federal and state investments in research and development in the clean-tech industries.²⁹ However, without a combination of permitting incentives, which are discussed below, and general receptivity in the planning and zoning regulatory framework adopted by individual municipalities, as discussed in the next Part, many of these fiscal incentives cannot be effectively used.

B. Permitting Incentives

Streamlined permitting and other expedited approval procedures provide an alternative (and less expensive) way for government agencies to encourage the development of renewable energy systems. At the federal level, the Department of Energy (DOE) has created fast-track procedures for granting renewable energy loans,³⁰ and it recently “announced the availability of more than \$27 million in new funding that will reduce the non-hardware costs of solar energy projects[.]”³¹ States such as California,³² Colorado, and Vermont have also acted to reduce the time and cost associated with renewable energy development permitting.³³

The local permitting process can be an even bigger obstacle for residents and business owners seeking to invest in renewable en-

27. *Housing Loans*, HONOLULU.GOV, <http://www1.honolulu.gov/dcs/housingloans.htm> (last updated Apr. 26, 2012).

28. *See id.*

29. *See* Garrick B. Pursley & Hannah J. Wiseman, *Local Energy*, 60 EMORY L. J. 877, 909-15 (2011).

30. *Department of Energy Streamlines Loan Guarantee Process for Renewable Energy*, WINDUSTRY, <http://www.windustry.org/news/department-of-energy-streamlines-loan-guarantee-process-for-renewable-energy> (last visited July 5, 2012).

31. *DOE Announces \$27 Million to Reduce Costs of Solar Energy Projects, Streamline Permitting and Installations*, ENERGY.GOV (Jun. 1, 2011, 12:00 AM), <http://energy.gov/articles/doe-announces-27-million-reduce-costs-solar-energy-projects-streamline-permitting-and>.

32. *DFG's Response to Renewable Energy Development in California*, CAL. DEPT. OF FISH & GAME, http://www.dfg.ca.gov/Climate_and_Energy/Renewable_Energy/ (last visited July 5, 2012); Chris Meehan, *California Bills Streamline Solar Project Permitting*, CLEANENERGYAUTHORITY.COM (Sept. 14, 2011), <http://www.cleanenergyauthority.com/solar-energy-news/california-bills-streamline-solar-project-permitting-091411/>.

33. Michael Mendelsohn, *Slicing Away at Installation Costs: Federal and State Initiatives Designed to Reduce PV Permitting Costs*, NAT'L RENEWABLE ENERGY LAB. (Sept. 6, 2011), <http://www.financere.nrel.gov/finance/content/slicing-away-installation-costs-federal-and-state-initiatives-designed-reduce-pv-permitting->.

ergy, especially in states where small energy projects are exempt from state-level approval requirements. As a 2008 report from the Network for New Energy Choices explained:

System installers often face planners and building inspectors with little experience permitting renewable energy systems, and with no formal education for certifying system safety and reliability. Complex permitting requirements and lengthy review processes delay installations and add significant costs to distributed renewable energy systems. Multiple permitting standards across jurisdictions create additional complications and inefficiencies for system installers. In many cases, these remaining bureaucratic hurdles stymie efforts by homeowners and business owners to install systems and hinder the development of a national market for distributed renewable energy systems.³⁴

The report recommends that the states should adopt uniform standards for interconnection and permitting requirements in order to mitigate the problems caused by inconsistent local laws.³⁵ For example, in New York State, interconnection of small scale distributed generation systems to the electric power grid, which involves compliance with both design requirements and operating requirements, was made easier when the state's standard interconnection requirements (SIR) were established by the Public Service Commission.³⁶ Specifically, SIR defines the application process and sets deadlines for applications while providing the technical interconnection requirements that apply to systems which generate two MW of power or less.³⁷ "In 2008, SIR was modified to incorporate newly passed net metering laws and to simplify the application process for projects which are 25 kW of power and below."³⁸ Under SIR, local utilities are also required

34. DAMIAN PITT, TAKING THE RED TAPE OUT OF GREEN POWER: HOW TO OVERCOME PERMITTING OBSTACLES TO SMALL-SCALE DISTRIBUTED RENEWABLE ENERGY 1 (2008), *available at* <http://www.newenergychoices.org/uploads/redTape-rep.pdf>.

35. *See id.* at 2, 18, 50.

36. *See* JOHN FORBUSH, GOV'T LAW CTR. OF ALBANY LAW SCH., SITING BACKYARD WIND POWER FACILITIES UNDER THE ZONING LAWS OF NEW YORK STATE 6-7 (2011), *available at* http://www.albanylaw.edu/media/user/esb/Siting_Backyard_Wind_Systems_080311.pdf.

37. *See generally* N.Y. STATE PUB. SERV. COMM'N, NEW YORK STATE STANDARDIZED INTERCONNECTION REQUIREMENTS AND APPLICATION PROCESS FOR NEW DISTRIBUTED GENERATORS 2 MW OR LESS CONNECTED IN PARALLEL WITH UTILITY DISTRIBUTION SYSTEMS (2010), *available at* http://www.cenhud.com/pdf/New_York_State_Standardized_Interconnection_Requirements.pdf.

38. ALBANY LAW SCH., GOV'T LAW CTR., LEGAL HANDBOOK FOR EARLY STAGE BUSINESS 202 (2010), *available at* <http://www.scribd.com/doc/61878429/310/III-NYS-Standardized-Interconnection-Requirements-SIR>.

to “implement a web-based system for interconnection project status and, for systems 25 kW and below, allow customers the ability to submit application via the web.”³⁹ This type of legislation was also adopted in Arizona in 2008.⁴⁰ It requires municipalities to adopt certain standards for issuing permits for the use of solar photovoltaic and solar water heating systems, and it also prohibits local governments from charging permitting fees in excess of the actual cost of issuing a permit.⁴¹ New Jersey law prohibits municipalities from charging fees altogether for solar energy system construction permits.⁴²

One of the primary recommendations in the Network for New Energy Choices report is for local governments to “[s]implify [photovoltaic] permit application forms and review processes.”⁴³ Many municipalities have followed this advice and created expedited permitting procedures for renewable energy projects. In Portland, Oregon, for example, plans and applications can be submitted electronically with a turn-around time of about twenty four hours.⁴⁴ A streamlined process for solar hot water and solar electricity projects is also available in Miami-Dade County.⁴⁵ The report also recommends “adopt[ing] flat permit fees or fee waivers for [photovoltaic] and small wind systems.”⁴⁶ One city where this approach has been adopted is Asheville, North Carolina, which waives building permit and plan review fees for certain renewable energy projects.⁴⁷ Santa Monica, California also waives application fees for solar energy systems.⁴⁸ In New York, the Town of Yorktown offers a fifty percent reduction in the building permit fee for projects that include solar improvements,⁴⁹ and the Town of Rotterdam exempts projects that include solar energy systems from site plan application fees.⁵⁰

39. *Id.*

40. See ARIZ. REV. STAT. ANN. §§ 9-468(A), 11-323(A) (2012) (West).

41. *Id.* § 9-468(B); § 11-323(B).

42. N.J. STAT. ANN. § 52:27D-130.2 (West 2012).

43. PITT, *supra* note 34, at 2.

44. *Solar Permitting in Portland*, BUREAU OF PLANNING & SUSTAINABILITY, <http://www.portlandonline.com/bps/index.cfm?c=47394&> (last updated Nov. 2010).

45. *Miami-Dade County – Expedited Green Buildings Process*, DATABASE OF STATE INCENTIVES FOR RENEWABLES & EFFICIENCY, http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=FL73F&re=1&ee=1 (last updated Sept. 26, 2011).

46. PITT, *supra* note 34, at 2.

47. *City of Asheville – Building Permit Fee Waiver*, DATABASE OF STATE INCENTIVES FOR RENEWABLES & EFFICIENCY, http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=NC46F&re=1&ee=1 (last updated Sept. 22, 2011).

48. *City of Santa Monica – Building Permit Fee Waiver for Solar Projects*, DATABASE OF STATE INCENTIVES FOR RENEWABLES & EFFICIENCY, http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=CA129F&re=1&ee=1 (last updated Nov. 30, 2011).

49. YORKTOWN, N.Y., TOWN Code § 15-16(F) (2012).

50. ROTTERDAM, N.Y., CODE § 270-137.1(A)(1) (2012).

The issue of permitting incentives has recently been the subject of some debate, especially where governments provide the up-front incentives of streamlined and quicker review processes as well as fee waivers in advance of the ability to inspect the final built-out project.⁵¹

In municipalities where applicants for green projects [(which may include the installation of renewable energy sources)] are offered a streamlined permit review process up-front, these governments should consider whether they may impose monetary penalties should applicants later fail to comply with promised green standards. Further, governments may consider disqualifying applicants who fail to deliver promised “green” results from receiving offered incentives for a period of time. Municipalities may also explore whether authority exists to require refundable permit fees to cover the cost of third-party independent compliance audits to verify whether the project has met the promised or expected green standards.⁵²

C. Renewable Portfolio Standards

A majority of states have enacted mandatory Renewable Portfolio Standards (RPS) that require an increasing percentage of electricity sold by utilities to be generated by renewable energy sources such as solar, wind, and geothermal.⁵³ When coupled with incentive programs, RPS goals may be more easily met.⁵⁴ For example, Oregon’s Renewable Energy Act of 2007 requires the state’s largest utilities to generate at least five percent of their electricity from renewable sources by 2011, increasing to twenty-five percent by 2025.⁵⁵ While large public utilities may seek to meet RPS requirements primarily through industrial-scale renewable energy projects, small-scale projects can still contribute significantly to meeting these goals.

51. See Graham Grady et al., *Government “Green” Requirements and “LEEDIGATION”*, 40 REAL EST. L.J. 496, 498-503 (2012).

52. *Id.* at 513.

53. *Rules, Regulations, & Policies*, DATABASE OF STATE INCENTIVES FOR RENEWABLES & EFFICIENCY, <http://www.dsireusa.org/incentives/allsummaries.cfm?ImplementingSector=S&SearchType=RPS&&re=1&ee=0> (last visited July 5, 2012).

54. See U.S. DEP’T OF ENERGY, *SOLAR POWERING YOUR COMMUNITY: A GUIDE FOR LOCAL GOVERNMENTS 25-26* (2d ed. 2011), available at http://www4.eere.energy.gov/solar/sunshot/resource_center/sites/default/files/solar-powering-your-community-guide-for-local-governments.pdf.

55. S.B. 838, 74th Leg. Assemb., Reg. Sess. § 6(1)(a), (d) (Or. 2007).

D. Net Metering and Feed-In Tariffs

Another regulatory mechanism intended to bolster renewable energy production is net metering, which allows electricity customers with qualified renewable energy systems to sell excess electricity back to their local utility.⁵⁶ Most states have enacted legislation requiring net metering. Under the Arkansas Renewable Energy Development Act of 2001, for example, the state Public Service Commission is charged with establishing rates, terms, and conditions for net metering contracts between utilities and their net metering customers.⁵⁷ In New York, recent amendments to the law expanded the state's solar net metering program applying it to businesses and increased the size of eligible solar photo-voltaic systems to 25 KW for residential customers and to 2 MW for non-residential customers.⁵⁸ Net metering is also authorized for wind technology for all utility customer classes.⁵⁹ Furthermore, "net-metering customers are billed only when they consume more power than they generate."⁶⁰ If, at the conclusion of a billing period, a customer providing power back to the grid "through net metering technology has produced 'a net surplus of power,' the customer will receive a rebate from the utility instead of a bill."⁶¹ Several states, including New York, permit customers to net meter under a "Time of Use" (TOU) tariff, a cost allocation method that rewards customers for putting surplus energy onto the grid during peak hours. This time of use cost compensation structure enables net metering customers to be compensated more when they produce surplus power during peak load periods. Net metering is expected to

play a significant role in New York's effort to achieve its . . . [RPS] goal of obtaining 30% of its electricity from renewable sources by 2015, by allowing for surplus power produced at distributed locations to reduce the overall demand for power generated by far-away fossil-fuel burning generators.⁶²

Feed-in tariffs are similar to net metering laws, but they require utilities to purchase renewable energy at a fixed rate and

56. FORBUSH, *supra* note 36, at 9.

57. ARK. CODE ANN. § 23-18-604(b)(1) (West 2012).

58. S. 7171-B, 2008 Gen. Assemb., Reg. Sess. § 2 (N.Y. 2008).

59. S. 8481, 2008 Gen. Assemb., Reg. Sess. §§ 1-2 (N.Y. 2008).

60. David Kirby, *The Year in Ideas; Net Metering*, N.Y. TIMES, Dec. 15, 2002 (magazine), <http://www.nytimes.com/2002/12/15/magazine/the-year-in-ideas-net-metering.html>.

61. FORBUSH, *supra* note 36, at 9.

62. *Id.* at 10.

they are typically covered by long-term contracts.⁶³ Local governments have the option to use feed-in tariffs with RPS as a way to encourage the production of renewable energy and meet the public policy goals set forth in the RPS.⁶⁴ Gainesville, Florida became the first city in the United States to require a solar feed-in tariff in 2009, requiring utility companies to buy electricity produced from solar panels at a fixed rate of \$0.35 per Kwh over a twenty year period.⁶⁵ While the tariff may be more attractive to large-scale solar energy facilities that intend primarily to sell electricity, residents and business owners that produce excess energy using solar voltaic cells will also benefit from the tariff.⁶⁶ The feed-in tariff model has been very successful in Europe, and although implementation issues remain,⁶⁷ its popularity in the United States is growing.⁶⁸ Rhode Island, for example, adopted a limited feed-in tariff law in June 2011.⁶⁹

E. Property Assessed Clean Energy Financing

Another recent trend at the state and local level has been to authorize Property Assessed Clean Energy (PACE) financing, which allows property owners to borrow money from their local government to pay for the installation of renewable energy systems.⁷⁰ The costs are then paid back through assessments attached to their property tax bills.⁷¹ PACE financing is attractive because it offers long-term, fixed-rate financing, and because the loans are transferable with the property.⁷² Since 2009, when only California and Colorado authorized PACE financing, more than twenty states have enacted legislation authorizing local governments to

63. See *Feed-In Tariffs*, NAT'L RENEWABLE ENERGY LAB., http://www.nrel.gov/applying_technologies/state_local_activities/basics_tariffs.html (last updated June 30, 2011).

64. U.S. DEP'T OF ENERGY, *supra* note 54, at 33.

65. See GAINESVILLE, FLA., CODE OF ORDINANCES app. A (2012).

66. U.S. DEP'T OF ENERGY, *supra* note 54, at 33-35; See *Gainesville Solar Feed-in Tariff a Done Deal*, RENEWABLE ENERGY WORLD (Feb. 9, 2009), <http://www.renewableenergyworld.com/rea/news/article/2009/02/gainesville-solar-feed-in-tariff-a-done-deal>.

67. *Feed-In Tariffs*, *supra* note 63.

68. U.S. DEP'T OF ENERGY, *supra* note 54, at 33-36; See John Farrell, *Overcoming the Roadblocks to Democratizing the Electricity System – Part 5 of 5*, RENEWABLE ENERGY WORLD BLOG (Sept. 22, 2011), <http://www.renewableenergyworld.com/rea/blog/post/2011/09/overcoming-the-roadblocks-to-democratizing-the-electricity-system-part-5-of-5>.

69. See Paul Gipe, *Rhode Island Rapidly Implementing Feed-in Tariffs for Distributed Generation*, RENEWABLE ENERGY WORLD (Sept. 15, 2011), <http://www.renewableenergyworld.com/rea/news/article/2011/09/rhode-island-rapidly-implementing-feed-in-tariffs-for-distributed-generation>.

70. U.S. DEP'T OF ENERGY, *supra* note 54, at 41.

71. *Id.*

72. *Id.* at 43.

create PACE financing districts.⁷³ In December 2009, New York State passed the Municipal Sustainable Energy Loan Act, authorizing municipalities to establish loan programs to finance efficiency improvements and renewable energy measures.⁷⁴ Municipalities issue revolving loans with federal grant money paid back through a PACE model, whereby the loan is recovered through property taxes.⁷⁵ The Act requires an energy audit and/or feasibility study of the residence and limits the availability of loans to those projects that are economically feasible.⁷⁶ There is also a restriction that limits the loan amount to ten percent of the total value of the property.⁷⁷

Unfortunately, the prospects for PACE financing dimmed in 2010 when the Federal Housing Finance Authority (FHFA) declared that PACE programs with first liens posed problems and risk management challenges for mortgage lenders.⁷⁸ As a result, FHFA directed Fannie Mae and Freddie Mac to limit financial assistance for homeowners living in PACE-designated districts.⁷⁹ Several states, however, have attempted to resolve this problem. As an expert from the Brookings Institution recently explained:

Maine introduced enabling legislation for municipalities to create loans to property owners for clean energy technologies that placed the lien in a subordinate position behind a mortgage. For its part, Michigan passed PACE legislation that limits the tool's use to commercial and industrial property owners and requires those with outstanding mortgages to show written consent from their mortgage holders.⁸⁰

At the federal level, the PACE Assessment Protection Act was introduced in Congress in 2011 and would direct "the Federal entities responsible for mortgage lending to adopt underwriting standards that are consistent with the PACE guidelines issued by

73. See *id.* at 41-42. For example, in 2008, voters in Boulder County, Colorado voted to set aside \$40 million in funds to offer financing for solar energy for local property owners. *Id.* at 44. In Boulder County, these "loans to homeowners are repaid over 15 years as a special assessment on the homeowner's property tax bill." *Id.* In its inaugural form, 393 Boulder County residents were provided loan assistance at an interest rate of 5.20% and 6.68%. *Id.* Uniquely, the county places all the applicants into a pool and then issues a larger bond based on demand as opposed to several smaller bonds. *Id.*

74. See N.Y. GEN. MUN. LAW § 119-ee (McKinney 2012).

75. *Id.* § 119-gg(1), (9).

76. *Id.* § 119-gg(7).

77. *Id.* § 119-gg(6).

78. Mark Muro & Devashree Saha, *Bringing the Property Assessed Clean Energy Program Back to Life*, BROOKINGS: UP FRONT BLOG (Aug. 30, 2011 1:21 PM), http://www.brookings.edu/opinions/2011/0830_clean_energy_muro_saha.aspx.

79. *Id.*

80. *Id.*

DOE.”⁸¹ It “would also ensure that no Federal agency can discriminate against communities implementing or participating in a PACE program, offering critical protection and security to home owners, businesses, and local governments.”⁸²

In August 2011, a federal district court in California refused to dismiss a case challenging the FHFA’s attempt to shut down PACE financing programs and ruled that the federal agency must allow public input in its PACE directive.⁸³ The court also found that the FHFA failed to comply with the National Environmental Policy Act, explaining that “[t]he FHFA’s dual obligations to ensure that the regulated entities operate safely and soundly and in the public interest do not indicate that the agency’s consideration of the environmental impact resulting from its actions with regard to the PACE programs is precluded.”⁸⁴

III. USING THE LAND USE REGULATORY SYSTEM TO PROMOTE RENEWABLE ENERGY

Through their land use control authority, local governments are adopting a variety of ordinances and regulations to ensure that solar, wind, and geothermal energy sources can all be appropriately utilized in a community.⁸⁵ Recently scholars have described the potential for local land energy rules as the key to ensuring the successful implementation of a national renewable energy policy.⁸⁶ However, this potential must be balanced with the realization that some localities have ordinances that have the effect of inhibiting the installation of renewable energy facilities.⁸⁷ As a result, some states have enacted laws that preserve the right to install and use solar panels despite the local regulatory regime. For example, the

81. Bryan Howard, *USGBC Lends Support to get PACE Programs Moving*, U.S. GREEN BLDG. COUNCIL BLOG (Sept. 12, 2011), <http://usgbcblog.blogspot.com/2011/09/usgbc-lends-support-to-get-pace.html>.

82. *Id.*

83. California ex rel. Harris v. Fed. Hous. Fin. Agency, No. C 10-03084 CW, 2011 U.S. Dist. LEXIS 96235, at *53-55 (N.D. Cal. Aug. 26, 2011).

84. *Id.* at *45-46.

85. See, e.g., Dwight H. Merriam, *Regulating Backyard Wind Turbines*, 10 VT. J. ENVTL. L. 291 (2009); Patricia E. Salkin, *Cooperative Federalism and Climate Change: New Meaning to “Think Globally- Act Locally,”* 40 ENVTL. L. REP. (Envtl. Law Inst.)10562 (2010).

86. See Pursley & Wiseman, *supra* note 29, at 937 (asserting that revision of local land energy laws in order to enable deployment of small wind turbines and distributed solar energy technologies “requires consideration of a variety of site-specific conditions”).

87. For example, former Vice-President Al Gore encountered such an ordinance when he attempted to install solar panels on his Belle Meade home, and he petitioned the town board to have the ordinance altered. Belle Meade’s ordinance prevented the placement of “power generating equipment” anywhere but on the ground. *Gore’s Solar Plans Thwarted by Upscale Neighborhood’s Rules*, USA TODAY, Mar. 22, 2007, http://www.usatoday.com/weather/climate/globalwarming/2007-03-20-gore-solar_N.htm.

Solar Rights Acts in Florida⁸⁸ and Arizona⁸⁹ provide the right to install solar panels, regardless of any local ordinances or community covenants that would otherwise prohibit the installation, and Maryland's Solar Protection laws require that restrictions not impose an "unreasonable limitation" on the installation of solar collection systems.⁹⁰ What follows is a description of a variety of planning and zoning techniques that can be used to advance local policies to encourage the siting of small-scale residential and commercial renewable energy systems.

A. Comprehensive Planning

Most state enabling statutes require that zoning regulations be developed and implemented in accordance with a comprehensive land use plan. Comprehensive plans represent an articulation of the shared vision for the future growth and development of a municipality through a variety of elements addressing housing, public infrastructure needs, recreational facilities, transportation, economic development, open space, and agriculture.⁹¹ Some of these elements are required to be included in local plans under state enabling acts, while others are optional or are independently developed by local governments. Some states have encouraged comprehensive planning that focuses on sustainability and renewable energy by including language in their enabling statutes that expressly requires the consideration of energy conservation and emission reductions. Since 2007, for example, Arizona's larger cities and counties have been required to prepare an energy element as part of their comprehensive plans.⁹² This element must describe incentives and other strategies to encourage the efficient use of energy and the growth of renewable energy use.⁹³ And Colorado municipalities are advised to include in their comprehensive plans strate-

88. FLA. STAT. § 163.04 (2011); *See also* FLA. SOLAR ENERGY INDUS. ASS'N, FLORIDA SOLAR RIGHTS LAWS 1-2, available at <http://www.flaseia.org/Legislative/SolarLaws/SolarRightsLaw.pdf>.

89. ARIZ. REV. STAT. ANN. § 33-439 (2012) (West).

90. MD. CODE ANN., Real Property § 2-119(b) (West 2012); *Maryland: Solar Easements & Rights Laws*, DATABASE OF STATE INCENTIVES FOR RENEWABLES & EFFICIENCY, http://www.dsireusa.org/library/includes/incentive2.cfm?Incentive_Code=MD01R&state=MD&CurrentPageID=1&RE=1&EE=1 (last updated Mar. 8, 2012). For other solar access laws, see *Green Building Codes/Ordinances*, SMART CMTYS. NETWORK, <http://www.smartcommunities.ncat.org/buildings/gbcodtoc.shtml#solar> (last updated Apr. 20, 2004).

91. *See, e.g.*, AM. PLANNING ASS'N, GROWING SMART LEGISLATIVE GUIDEBOOK: MODEL STATUTES FOR PLANNING AND THE MANAGEMENT OF CHANGE, 7-201 to -304 (Stuart Meck ed., 2002), available at <http://www.planning.org/growingsmart/guidebook/>.

92. ARIZ. REV. STAT. ANN. § 9-461.05(E)(10) (2012) (West) (mandatory part of plan for cities with over 50,000 people); *Id.* § 11-804(B)(4) (mandatory part of plan for counties with over 125,000 people).

93. ARIZ. REV. STAT. ANN. § 9-461.05(E)(10); *Id.* § 11-804(B)(4).

gies for ensuring “access to appropriate conditions for solar, wind, or other alternative energy sources[.]”⁹⁴ Pennsylvania's enabling statute also suggests that municipalities include an energy conservation element in their comprehensive plans.⁹⁵ The statute explains that this element should assess current and future energy needs and develop strategies “to reduce energy consumption and to promote the effective utilization of renewable energy sources.”⁹⁶ Connecticut planning commissions are directed to consider “the objectives of energy-efficient patterns of development [and] the use of solar and other renewable forms of energy and energy conservation[.]”⁹⁷ New Jersey⁹⁸ and Florida⁹⁹ have also emphasized renewable energy in their comprehensive planning enabling acts.

At the local level, the Marin County, California plan includes dozens of policies and goals relating to sustainability.¹⁰⁰ Some of the more specific strategies relating to renewable energy include using energy efficient building techniques by emphasizing renewable energy¹⁰¹ and encouraging agricultural operations to adopt methane recovery technology.¹⁰² The King County, Washington comprehensive plan supports solar energy through land use policies, building regulations, and incentives.¹⁰³ A number of municipalities in New York, including the Town of Bethlehem,¹⁰⁴ the Town of East Hampton,¹⁰⁵ and the Town of Kent,¹⁰⁶ specifically indicate that solar energy and access to sunlight are important public purposes of their general land use regulations. The Village of Alta-

94. COLO. REV. STAT. ANN. § 30-28-106(3)(a)(VI) (West 2012) (counties); *Id.* § 31-23-206(1)(f) (cities and towns).

95. 53 PA. CONS. STAT. ANN. § 10301.1 (West 2012).

96. *Id.*

97. CONN. GEN. STAT. ANN. § 8-23(d) (West 2012).

98. See N.J. STAT. ANN. § 40:55D-28(b)(16) (West 2012).

99. See FLA. STAT. § 163.3177(6) (2011).

100. MARIN CNTY. CMTY. DEV. AGENCY, MARIN COUNTYWIDE PLAN *passim* (2007), available at http://www.co.marin.ca.us/depts/cd/main/fm/cwpdocs/CWP_CD2.pdf.

101. *Id.* at 3-75 to -91.

102. *Id.* at 2-104.

103. KING CNTY., KING COUNTY COMPREHENSIVE PLAN 2008: WITH 2010 UPDATE, 4-15 (2010), available at http://www.kingcounty.gov/property/permits/codes/growth/CompPlan/2008_2010update.aspx#cover.

104. “The purpose and objectives of this chapter are . . . [t]o facilitate, as far as environmental conditions may permit, the accommodation of solar energy systems and equipment and access to sunlight necessary therefor.” BETHLEHEM, N.Y., CODE § 128-8(A)(8) (2012), available at <http://www.ecode360.com/ecode3-back/getSimple.jsp?custId=BE1011&guid=8993782>.

105. “It is the Planning Board's policy to encourage the use of alternative energy sources, including but not limited to solar, wind and water power, as a conservation measure.” EAST HAMPTON, N.Y., CODE § 220-1.05(G)(2) (2012), available at <http://www.ecode360.com/ecode3-back/getSimple.jsp?&guid=8163507&j=256>.

106. “This chapter is adopted . . . [t]o make provision for access to sunlight and the accommodation of solar energy systems and equipment and other alternative energy systems.” KENT, N.Y., CODE § 77-2(B)(7) (2012) available at <http://www.ecode360.com/ecode3-back/getSimple.jsp?&guid=8322939&j=256>.

mont, New York also articulates a sustainability policy in its comprehensive land plan which provides, among other things, that the Village “[e]stablish zoning and development standards that encourage use of and remove impediments to using solar and green buildings[.]”¹⁰⁷ and that the Village “[e]ncourage and offer incentives for cooperative sharing of residential solar power.”¹⁰⁸

B. General Zoning Regulations

As previously noted, due to control over zoning and other land use controls, local governments may be the most important players when it comes to encouraging the development of small-scale renewable energy systems. Fortunately, municipal governments are adopting a variety of ordinances and regulations to ensure that solar, wind, and geothermal energy sources can all be appropriately utilized in a community. Some local governments have determined that renewable energy devices should be permitted as of right,¹⁰⁹ which simplifies the development process for residents and business owners seeking to install small-scale solar or wind devices. Municipalities may have free-standing wind or solar ordinances or both, or they may incorporate siting requirements into local zoning laws and codes.

Rooftop and small-scale freestanding wind turbines are gaining momentum in the renewable energy sector.¹¹⁰ The DOE observed that “[s]mall wind turbines added a total of 17.3 megawatts of generating capacity throughout the United States in 2008, according to the American Wind Energy Association (AWEA). That growth equaled a 78% increase in the domestic market for small wind turbines”¹¹¹

The Texas State Energy Conservation Office observed that:

[t]he small wind turbine industry estimates that 60% of the United States has enough wind resources for small turbine use. Small wind energy systems cost from \$3,000 to \$5,000 for every kilowatt (kW) of generating capacity. One

107. VILL. OF ALTAMONT COMPREHENSIVE PLANNING COMM., FINAL COMPREHENSIVE PLAN VILLAGE OF ALTAMONT 27 (2006), available at http://www.altamontvillage.org/Pages/AltamontNY_Building/masterplan.pdf.

108. *Id.*

109. *See, e.g.*, TUCSON, ARIZ., LAND USE CODE § 3.2.12.1 (1995) (solar energy collectors); ITHACA, N.Y., CODE § 270-219.4 (2012) (small wind energy facilities); ITHACA, N.Y., CODE § 270-219.1 (2012) (solar collectors and installations).

110. *See Small Wind Power Market to Double by 2015—\$634 Million*, W. FARM PRESS (Oct. 5, 2011, 9:14 AM), <http://westernfarmpress.com/management/small-wind-power-market-double-2015-634-million>.

111. AWEA: *U.S. Market for Small Wind Turbines Grew 78% in 2008*, U.S. DEP'T OF ENERGY (Jun. 10, 2009), http://apps1.eere.energy.gov/news/news_detail.cfm/news_id=12571.

kW is equal to 1,000 watts, which is the amount of electricity that can illuminate ten 100-watt light bulbs. According to the U.S. Department of Energy (DOE), a small wind-powered electric generator can reduce a homeowners [sic] electric bills by 50% to 90%. . . . Small wind energy systems may be connected to the electricity distribution system, the grid. Grid-connected, residential-scale models (1-10 kW) are the fastest growing market segment. A grid-connected wind turbine can reduce consumption of utility-supplied electricity for lighting, appliances, and electric heat. When the turbine cannot deliver the amount of energy needed, the utility makes up the difference.¹¹²

Despite the many advantages of wind energy relative to conventional forms of energy, a number of obstacles inhibit its widespread development, including connectivity and economic issues. Local opposition to wind turbines, often labeled NIMBYism,¹¹³ is also common.¹¹⁴ In fact, some communities have adopted moratoria on siting wind turbines.¹¹⁵ As an example of the various complaints made about wind turbines, consider *Muscarello v. Ogle County*

112. *Small Wind Systems*, TEX. STATE ENERGY CONSERVATION OFFICE, http://www.seco.epa.state.tx.us/re_wind_smallwind.htm (last visited July 5, 2012). See also GLOBAL ENERGY CONCEPTS, WIND TURBINE TECHNOLOGY: OVERVIEW 9-10 (2005), available at http://www.cedengineering.com/upload/Wind_Turbine_Technology.pdf (discussing small wind turbines).

113. See William A. Fischel, *Voting, Risk Aversion, and the NIMBY Syndrome: A Comment on Robert Nelson's "Privatizing the Neighborhood,"* 7 GEO. MASON L. REV. 881, 881, 884-85 (1999) (providing an economic explanation for NIMBYism).

114. See Robert D. Kahn, *Siting Struggles: The Unique Challenge of Permitting Renewable Energy Power Plants*, ELEC. J., Mar. 2000, at 21, 26 (describing NIMBY opposition to the Kenetech Windpower project in the early 1990s, where residents from over thirty miles away complained about "visual pollution"); Mark Clayton, *America's Future Wind Web?*, CHRISTIAN SCI. MONITOR (Feb. 18, 2009), <http://www.csmonitor.com/Innovation/Responsible-Tech/2009/0218/americas-future-wind-web> (describing local opposition to transmission lines); Op-Ed., *Wind Power, Rhetoric*, TIMES UNION (New York), Oct. 8, 2008, at A10, available at <http://albarchive.merlione.net/mweb/wmsql.wm.request?oneimage&imageid=7039338> (describing NIMBY opposition to a wind energy project in upstate New York). In Long Island, a citizen group known as the Save Jones Beach Ad Hoc Committee was formed to prevent the installation of forty offshore wind turbines. *Ad Hoc Committee to Save Jones Beach*, SAVEJONESBEACH.ORG, <http://www.savejonesbeach.org/who-we-are.html> (last visited July 5, 2012); Mark Harrington, *Green vs. Green: Environmental Activists Differed on LIPA's offshore wind farm proposal*, NEWSDAY (New York), Aug. 29, 2007, at A43 (discussing recommended postponement of the Long Island Power Authority offshore project for cost reasons).

115. See, e.g., *Ecogen, LLC v. Town of Italy*, 438 F. Supp. 2d 149, 152, 162 (W.D.N.Y. 2006) (upholding moratorium on wind turbines enacted after producer sought to build twenty-three turbines in town); *Zimmerman v. Bd. of Cnty. Comm'rs of Wabaunsee Cnty.*, 218 P.3d 400, 405-07 (Kan. 2009) (town enacted moratorium on wind farms after being contacted by a wind farm company that was interested in building wind farms in the county); *Emerging Energies, LLP v. Manitowoc Cnty.*, No. 2008AP1508, 2009 WL 529910 (Wis. Ct. App. Mar. 4, 2009) (town enacted moratorium one month after energy company applied for conditional use permit to build a seven turbine wind energy system).

Board of Commissioners, a Seventh Circuit case in which the plaintiff, complaining about the siting of turbines, alleged that:

she would be deprived of the full extent of the kinetic energy of the wind and air as it enters her property[,] . . . [that] her property would be subject to ‘shadow flicker’ and reduction of light[,] . . . [that] she [would] have to endure severe noise[,] . . . [that] ice [might] be physically thrown onto her property by the rotating blades[, that] there was risk of . . . ‘blade throw’ meaning that . . . the rotor blades [could] come loose and be thrown onto her property[, that] the windmills [would] cause radar interference on her property . . . [and interfere with cell phone and GPS service, that the turbines would] enhance her risk of sustaining damage from lightening[sic][, that] she [would] be exposed to higher levels of electromagnetic radiation [and could] suffer injury from stray voltage[,] and [that the turbines would] prevent her from conducting crop-dusting operations on her fields.¹¹⁶

Based on these complaints, she asserted a takings claim arguing that there would be uncompensated adverse impacts for her and other nonresidential property owners nearby.¹¹⁷ The court found that her takings claim was not ripe because she failed to exhaust all administrative remedies, and that regardless, it failed on the merits, because the wind farm would not cause her to lose all economically beneficial use of her land.¹¹⁸

1. Setback and Height Limitations

When dealing with the installation of small-scale solar energy systems, municipalities may treat the equipment as a non-specified accessory use and hence typically require such use to be screened, which may affect solar access.¹¹⁹ Such requirements, including setback requirements, should be designed in a way that will not adversely affect the functionality of the solar energy system. For example, Berkeley’s code “allows solar energy equipment to project into required yard setbacks with an administrative use permit, if the zoning office finds that the modification is necessary for the effective use of the equipment and that the principal build-

116. *Muscarello v. Ogle Cnty. Bd. of Comm’rs*, 610 F.3d 416, 419 (7th Cir. 2010).

117. *Id.* at 420.

118. *Id.* at 422-24.

119. Brian Ross & Suzanne Sutro Rhees, *Solar Energy and Land-Use Regulation*, in *ZONING PRACTICE 4* (2010).

ing meets city standards for energy conservation.”¹²⁰ Portland, Oregon provides that “solar installations that are six feet or less in height may be placed in setbacks[,]” and that “[i]nstallations taller than six feet may be allowed within setbacks through a land-use review adjustment process.”¹²¹ “Architectural features that are part of a solar energy system [in Tucson, Arizona] may project up to four feet into required front yard setbacks.”¹²²

To mitigate impacts and prevent opposition over proposed wind energy systems, local governments often enact setback and height limitations, as well as other zoning regulations. Meriden, Connecticut, for example, does not permit wind turbines to be more than eighty feet tall.¹²³ The city also prohibits windmills from required yard areas and requires them to be setback from all lot lines a distance at least equal to their height.¹²⁴ In Wells, Maine, the required setback is equal to the height of the wind turbine plus the underlying setback for structures in the district.¹²⁵ In Dagsboro, Delaware windmills must be located on the rear of the property, and “[a]ll principal parts of the windmill and tower [must] be setback from all property lines . . . a distance not less than 1.1 times the total height of the tower.”¹²⁶ The Town of Ithaca, New York limits small-scale wind turbines to 145 feet in height and prohibits them within 500 feet of any public park, natural area, nature preserve, “or within 500 feet of the ordinary high-water line of the Cayuga Lake shoreline,” unless the property owner receives special permission from the planning board.¹²⁷ Ithaca’s wind turbine zoning also provides that “the number of wind energy towers per lot shall be limited to one for lots of less than two acres in size[,]” and for larger lots, one additional tower will be available subject to special permit requirements.¹²⁸ However, “there is no limit on the number of building-mounted small wind energy facilities.”¹²⁹

For safety reasons, wind ordinances also often specify the lowest minimum distance permitted between the ground and the tips of the blades. In Ithaca, for example, the lowest part of the turbine blade must pass no closer to the ground than thirty feet, and for building mounted turbines, Ithaca requires the blades to be at least fifteen feet above the ground and above any “outdoor surfaces

120. *Id.*

121. *Id.* at 4-5.

122. *Id.* at 5.

123. MERIDEN, CONN., CODE § 213-53(A)(1) (2011).

124. *Id.* § 213-53(A)(2)-(3).

125. WELLS, ME., CODE § 145-59.1(D)(7) (2011).

126. DAGSBORO, DEL., CODE § 275-26(F)(4)(c)-(d) (2011).

127. ITHACA, N.Y., CODE § 270-219.4(C)(1)-(2) (2008).

128. *Id.* § 270-219.4(C)(6).

129. *Id.*

intended for human occupancy. . . that are located directly below the facility.”¹³⁰ The wind ordinance in the Town of Eden, New York takes a slightly different approach and measures the thirty-foot minimum turbine blade height from “the highest existing major structure or tree within a [250]-foot radius.”¹³¹

Another step that municipal governments can take to promote small-scale renewable energy development is to permit solar panels and wind energy systems to exceed the maximum height regulations for their zoning districts. Height limits that exist in municipal codes may have an adverse effect on the functionality of a solar energy system because they may impede the collectors’ ability to access necessary sunlight.¹³² In Los Angeles, for example, property owners who wish to install solar panels on their roofs are permitted to exceed the maximum height of the building by five feet.¹³³ The additional height allowance in Tucson is ten feet,¹³⁴ while Sacramento permits building owners to exceed the maximum allowable height of a structure by twenty percent when installing solar panels.¹³⁵ In the Village of Airmont, New York, the Planning Board has the authority to modify any height restriction in the code for solar energy systems.¹³⁶ This is if the system is erected only so high as necessary for proper functioning and the correct amount of sunlight to accomplish its energy purpose.¹³⁷ Renewable energy equipment may also be exempted from other land use provisions. For example, in Northhampton, Massachusetts, solar energy systems are exempted from historic preservation regulations,¹³⁸ and in Tucson they are excluded from lot coverage calculations.¹³⁹ Marin County, California similarly exempts free-standing solar devices from minimum yard requirements.¹⁴⁰

2. Visual Impact Assessments

Height restrictions and setbacks are only two of the ways in which local governments have attempted to mitigate the aesthetic impacts of wind turbines. Many wind ordinances require the completion of a visual impact assessment as part of the permitting

130. *Id.* § 270-219.4(C)(4).

131. EDEN, N.Y., CODE § 217-4(C)(11) (2008).

132. *See* Ross & Rhees, *supra* note 119, at 5.

133. L.A., CAL., MUN. CODE § 12.21.1(B)(3)(a) (2012).

134. TUCSON, ARIZ., LAND USE CODE § 3.2.7.3(A)(2) (2012).

135. SACRAMENTO, CAL., CODE § 17.60.040(A) (2012).

136. AIRMONT, N.Y., CODE § 210-40(C) (2012).

137. *Id.*

138. *See* NORTHAMPTON, MASS., CODE § 156-5(C)(10) (2012).

139. TUCSON, ARIZ., LAND USE CODE § 3.2.9.3(A)(5) (2012).

140. MARIN COUNTY, CAL., CODE § 22.72.0151(B) (2012).

process.¹⁴¹ In Cohocton, New York, the visual impact analysis must address impacts within a five mile radius, and applicants may be required to submit scenic resource maps, viewshed maps, photographic simulations, and suggested visual mitigation strategies.¹⁴² Other common provisions require turbines and blades to be painted in neutral, non-reflective colors,¹⁴³ and many wind ordinances prohibit wind facilities from displaying advertisements.¹⁴⁴ Lighting is generally limited to that required by the Federal Aviation Administration,¹⁴⁵ and transmission lines are typically required to be placed underground.¹⁴⁶ A few ordinances require wind turbine applicants to assess the “shadow flicker” effect. In the Town of Bethany, New York, for example, the shadow flicker¹⁴⁷ must be limited to less than thirty hours per year and thirty minutes per day.¹⁴⁸

141. *See, e.g.*, BETHANY, N.Y., LOCAL LAW NO. 1 § V, art. VI(C)(8), (D)(6)-(7) (2008), available at [http://www.townofbethany.com/other pdf files/WindEnergyZoningAmendments.pdf](http://www.townofbethany.com/other%20pdf%20files/WindEnergyZoningAmendments.pdf); LACKAWANNA, N.Y., CODE § 230-85(A)(1)(c) (2008); SOUTH BRISTOL, N.Y., LOCAL LAW NO. 2, §§ 170-40(B)(7), 170-41(B)(7) (2003), available at <http://www.gflrpc.org/programareas/wind/LL/TofSouthBristol.pdf>; WESTFIELD, N.Y., CODE § 185-43(J)(3)(a)(2), (3) (2008).

142. COHOCTON, N.Y., WINDMILL LOCAL LAW §§ I(B)(7), II(B)(6) (2006), available at <http://www.gflrpc.org/programareas/wind/LL/CohoctonWindmillLaw.pdf>.

143. *See, e.g.*, BETHANY, N.Y., LOCAL LAW NO. 1 § V, art. VI(D)(6) (“The system’s tower and blades shall be painted a non-reflective unobtrusive color”); ITHACA, N.Y., CODE § 270-219.4(F)(2) (2008) (“Small wind energy facilities shall be painted or finished with a non-reflective, unobtrusive color”); SOUTH BRISTOL, N.Y., LOCAL LAW NO. 2 § 170-40(C)(3) (requiring residential windmills to be battleship gray).

144. *See, e.g.*, BETHANY, N.Y., LOCAL LAW NO. 1 § V, art. VI(D)(11) (“No brand names, logo or advertising shall be placed or painted on the tower, rotor, generator or tail vane where it would be visible from the ground, except that a system or tower’s manufacturer’s logo may be displayed on a system’s generator housing in an unobtrusive manner.”); ITHACA, N.Y., CODE § 270-219.4(F)(1) (“No small wind energy facilities shall be used for signage, promotional or advertising purposes Reasonable identification of the manufacturer or owner of the small wind energy facility is permitted.”).

145. *See, e.g.*, BETHANY, N.Y., LOCAL LAW NO. 1 § V, art. VI(D)(8) (“Exterior lighting on any structure associated with the system shall not be allowed except that which is specifically required by the Federal Aviation Administration (FAA).”); EDEN, N.Y., CODE § 217-4(C)(16) (2008) (“Lighting of the tower for aircraft and helicopters will conform with FAA standards for wattage and color, when required.”); SOUTH BRISTOL N.Y., LOCAL LAW NO. 2 § 170-40(B)(6)(a); WESTFIELD, N.Y., CODE § 185-43(J)(3)(f)(5) (“The permittee shall meet all FAA requirements for lighting.”).

146. *See, e.g.*, BETHANY, N.Y., LOCAL LAW NO. 1 § V, art. VI(D)(9) (providing that all wiring is to be underground or on existing wires, except for tie-in lines and by permission of the town board for reasons relating to the terrain); ITHACA, N.Y., CODE § 270-219.4(D)(2)(a)-(b) (requiring underground wires, except for wires going from the turbine to the base, and all wiring associated with building-mounted turbines); SOUTH BRISTOL, N.Y., LOCAL LAW NO. 2 § 170-40(C)(9).

147. The “shadow flicker effect” refers to the blinking shadows that may be caused by spinning turbine blades. GLOBAL ENERGY CONCEPTS, OTHER POTENTIAL ENVIRONMENTAL IMPACTS 7 (2005), available at <http://www.envirothonpa.org/pdfs/SbOtherPotentialEnvImpacts.pdf>.

148. BETHANY, N.Y., LOCAL LAW NO. 1 § V, art. VI(F).

3. Accessory Uses

In some municipalities, renewable energy devices may be regulated as accessory uses. In the Village of Briarcliff Manor, New York, for example, a local law enacted in 2007 allows solar energy collectors as permitted accessory uses in single-family residential districts, multi-family residential districts, and commercial districts.¹⁴⁹ Also in New York, Albany's solar energy regulations permit solar energy equipment as accessory uses in all zoning districts, and the law expressly states that “[w]hile there are aesthetic considerations, the City has determined that the environmental and economic benefits outweigh potential aesthetic impacts.”¹⁵⁰ Wind energy systems may also be limited to noncommercial, accessory uses. The Town of Wells, Maine, for example, provides that “[t]he primary purpose of a proposed wind energy conversion system will be to provide mechanical or electrical power for the principal use of the property whereon said wind energy conversion system is to be located.”¹⁵¹ In Ithaca, New York small wind energy facilities are permitted “as accessory structures [when they provide] power primarily to structures on the same lot, [or] as principal structures providing power primarily to structures on an adjacent lot.”¹⁵²

[T]he Town of Brighton designates “[s]olar energy and wind energy collection devices” as a special accessory use available to the residents of the district and subject to the approval of the Brighton Planning Board.¹⁵³ Brighton’s zoning code defines “accessory structures” and “accessory uses” which are “detached from a principal building, located on the same lot and customarily incidental and subordinate to the principal building or use.”¹⁵⁴ The implications of this designation are that Brighton exempts wind energy conversion facilities, as “accessory uses,” from site plan review by the town planning board.¹⁵⁵

149. BRIARCLIFF MANOR, N.Y., CODE § 220-9.1(C)-(D) (2009).

150. ALBANY, N.Y., CODE § 375-93(C)(2) (2009).

151. WELLS, ME., CODE § 145-59.1(A)(1) (2009).

152. ITHACA, N.Y., CODE § 270-219.4 (C) (2008).

153. FORBUSH, *supra* note 36, at 23 (citing TOWN OF BRIGHTON, N.Y., CODE § 203-146(B)(4) (2010)).

154. *Id.* (citing TOWN OF BRIGHTON, N.Y., CODE § 201-5).

155. *Id.*

C. Site Plan Review

In some jurisdictions site plan review may be required. The purpose of a site plan review is to evaluate the plans for specific types of development to ensure compliance with all appropriate land development regulations and consistency with the municipality's permitting and building codes. The process is usually initiated when an application for a building permit is submitted. Upon receipt, the appropriate authority within the municipality will determine whether the project is subject to a site plan review. If the project is subject to such a review, the plans are usually transmitted to the planning board or zoning board for review and action. No permit for the development or use of the project will be issued until an approved site development plan is authorized by the municipality.¹⁵⁶ The Town of Southport, New York mandates that a "solar access plan" be included in the site plan submitted for review for residential development that is over 100 acres or more than 200 dwelling units.¹⁵⁷ Such a solar access plan shall detail requirements for the siting of the solar energy system on the property to enhance the access to sunlight.¹⁵⁸ Further, the installation of solar energy systems can also be waived from the traditional site plan review process to encourage the use of renewable energy.¹⁵⁹

D. Special Permit Review

Some municipalities opt to require applicants for small-scale renewable energy systems to obtain special use permits.¹⁶⁰ By using the special use permit process, municipalities indicate that the use is allowed in a given zoning district but that an additional set of articulated review criteria is applied when considering the application to ensure compatibility with the community.¹⁶¹ Also, municipalities declaring backyard wind generators to be "accessory uses" often impose additional requirements on applicants through a special use permit or site plan review provision.¹⁶² Special permit procedures are generally more restrictive than accessory use stat-

156. PATRICIA E. SALKIN, *AMERICAN LAW OF ZONING* § 36:9 (5th ed. 2011) [hereinafter *AMERICAN LAW OF ZONING*].

157. SOUTHPORT, N.Y., CODE § 525-86 (2008).

158. *See id.*

159. BOULDER CNTY., COLO., LAND USE CODE § 4-802(C)(7) (2011).

160. *See, e.g.*, NISKAYUNA, N.Y., CODE § 218-5(A)(1) (2010).

161. For a general discussion of special use permits, see *AMERICAN LAW OF ZONING*, *supra* note 156, at Ch. 14.

162. *See, e.g.*, ROCHESTER, N.Y., CODE § 120-163(A)(1)(m) (2010).

utes, but they often contain similar criteria focusing on aesthetics and safety.¹⁶³

E. Subdivision Requirements

Making sure that subdivisions and planned developments are designed in a manner conducive to the future installation of renewable energy systems is another method that state and local governments can use to promote small-scale alternative energy generation. In Eugene, Oregon, for example, seventy percent of the lots in subdivisions located in the R-1 and R-2 districts must be designed as “solar lots” and laid out so as to have increased solar access.¹⁶⁴ The Marin County Code similarly provides that

[t]he design of a subdivision . . . shall provide, to the extent feasible, for future passive or natural heating or cooling opportunities in the subdivision Examples of passive or natural heating opportunities in subdivision design include design of lot size and configuration to permit orientation of a structure in an east-west alignment for southern exposure. Examples of passive or natural cooling opportunities in subdivision design include design of lot size and configuration to permit orientation of a structure to take advantage of shade or prevailing breezes.¹⁶⁵

Boulder also has solar siting requirements for subdivisions and planned use developments, but they vary depending on which Solar Access Area the property is located in.¹⁶⁶ Unlike the regulations in Eugene and Marin County, Boulder also requires certain structures to be capable of supporting solar collectors.¹⁶⁷

New Jersey goes beyond requiring subdivisions to accommodate future solar energy development and mandates that “[w]here technically feasible . . . a developer shall offer to install . . . a solar energy system into a dwelling unit when a prospective owner enters into negotiations with the developer to purchase a dwelling unit.”¹⁶⁸ The law applies to all residential developments with twenty-five or more units.¹⁶⁹ Similar legislation was enacted

163. *See, e.g.*, EAST ROCHESTER, N.Y., CODE § 193-60(H) (2011).

164. EUGENE, OR., CODE § 9.2790(2) (2002).

165. MARIN CNTY., CAL., CODE § 20-20-030 (2011).

166. BOULDER, COLO., CODE § 9-9-17(c) (2009).

167. *Id.* § 9-9-17(g)(1).

168. N.J. STAT. ANN. § 52:27D-141.4(a) (West 2012).

169. *Id.* § 52:27D-141.3.

in Colorado in 2009, requiring homebuilders to offer purchasers an option for solar pre-wiring and to provide them with a list of solar installers.¹⁷⁰

F. Planned Unit Development

To facilitate greater design flexibility and community density, local governments may adopt “planned unit development” (PUD) provisions in their municipal zoning codes.¹⁷¹

PUDs allow “the owners of several adjacent parcels [to] apply for a special permit to create a higher density, mixed use development, with considerable design flexibility.” . . . Since a primary rationale for PUDs is to promote wider availability of more environmentally sustainable communities, these provisions often include allowance for on-site renewable energy generation, including small-scale [wind energy conversion systems].

PUDs could serve as an effective venue to experiment with and demonstrate the advantages of smaller-scale wind power[, and] PUD provisions in zoning ordinances represent an opportunity for partnership between wind or real estate developers and local leadership, particularly if a local comprehensive plan aspires to adopt more renewable energy production and there is land available for development not already tapped for green space preservation.¹⁷²

G. Renewable Energy Protection Laws

As previously noted, a number of states have acted to preempt local ordinances or deed restrictions that interfere with the development of solar energy systems, and a smaller number apply similar laws to wind energy equipment. In Arizona, “[a]ny covenant, restriction or condition contained in any deed, contract, security agreement or other instrument affecting the transfer or sale of, or any interest in, real property which effectively prohibits the installation or use of a solar energy device . . . is void and unenforceable.”¹⁷³ Colorado¹⁷⁴ and Maryland¹⁷⁵ have similar statutes. In Wis-

170. COLO. REV. STAT. ANN. § 38-35.7-106(1)-(2) (West 2012).

171. FORBUSH, *supra* note 36, at 22.

172. *Id.* at 22-23.

173. ARIZ. REV. STAT. ANN. § 33-439(A) (2012) (West).

174. COLO. REV. STAT. ANN. § 38-33.3-106.7(1)(A) (West 2012).

175. MD. CODE ANN., REAL PROP. § 2-119(b)(1) (West 2012).

consin¹⁷⁶ and New Mexico¹⁷⁷ municipal restrictions on solar collectors are preempted, although the New Mexico law provides an exception for historic districts. Florida's solar rights law preempts local ordinances as well as private deed restrictions that attempt to prohibit the installation of solar collectors or other renewable energy devices.¹⁷⁸ And similarly, in addition to prohibiting private restrictions on solar energy development,¹⁷⁹ California law provides that

[a] city or county may not deny an application . . . to install a solar energy system unless it makes written findings based upon substantial evidence . . . that the proposed installation would have a specific, adverse impact upon the public health or safety, and there is no feasible method to satisfactorily mitigate or avoid the specific, adverse impact.¹⁸⁰

Other solar protection laws relate to solar access and attempt to prevent neighboring landowners from blocking the sunlight needed to supply preexisting solar collectors. The California Solar Shade Control Act, for example, provides that

[a]fter the installation of a solar collector, a person owning or in control of another property shall not allow a tree or shrub to be placed or, if placed, to grow on that property so as to cast a shadow greater than [ten] percent of the collector absorption area upon that solar collector surface at any one time between the hours of 10 a.m. and 2 p.m. . . ."¹⁸¹

In Wisconsin, local governments are authorized to adopt ordinances relating to the trimming of vegetation that blocks solar or wind energy.¹⁸² "The ordinance may not require the trimming of vegetation that was planted by the owner or occupant of the property on which the vegetation is located before the installation of the solar or wind energy system."¹⁸³

Another approach to solar protection taken in some states is to authorize the creation of solar easements. These laws protect

176. WIS. STAT. ANN. § 66.0401(1m) (West 2012).

177. N.M. STAT. ANN. § 3-18-32(A) (West 2012).

178. FLA. STAT. § 163.04 (2011).

179. CAL. CIV. CODE § 714(a) (West 2012).

180. CAL. HEALTH & SAFETY CODE § 17959.1(a) (West 2012); CAL. GOV. CODE § 65850.5(c) (West 2012).

181. CAL. PUB. RES. CODE § 25982 (West 2012).

182. WIS. STAT. ANN. § 66.0401(2) (West 2012).

183. *Id.*

property owners' interests in sunlight but also recognize the rights of neighboring land owners. Under the North Dakota solar easement law, for example, solar easements must include "any terms or conditions . . . under which the . . . easement was granted or will be terminated," as well as "[a]ny provisions for compensation of the owner of the property benefiting from the solar easement in the event of interference with the enjoyment of the solar easement or compensation of the owner of the property subject to the solar easement for maintaining the solar easement."¹⁸⁴ The New Jersey solar easement law is mostly identical.¹⁸⁵ Solar rights can also be officially claimed in New Mexico, and once vested, they are considered to be easements appurtenant.¹⁸⁶ The statute also provides that

[i]n disputes involving solar rights, priority in time shall have the better right except that the state and its political subdivisions may legislate, or ordain that a solar collector user has a solar right even though a structure or building located on neighborhood property blocks the sunshine from the proposed solar collector site.¹⁸⁷

Similar types of solar protection laws have also been enacted at the local level. Regulations in Boulder, Colorado, for example, divide the city into three solar access areas and provide varying levels of solar access protections in order "to provide maximum solar access protection . . . consistent with planned densities, topography, and lot configurations and orientations."¹⁸⁸ The code creates hypothetical "solar fences" for properties located in two of the three solar access areas and explains that "[e]ach solar fence completely encloses the lot in question, and its foundation is contiguous with the lot lines. Such fence is vertical, opaque, and lacks any thickness."¹⁸⁹ In the most protective solar access area, the code states that "[n]o person shall erect an object or structure on any other lot that would shade a protected lot . . . to a greater degree than the lot would be shaded by a solar fence twelve feet in height . . ."¹⁹⁰ For the next solar access area, the regulation stipulates a twenty-five foot high solar fence,¹⁹¹ and no solar fences are hypothesized

184. N.D. CENT. CODE ANN. § 47-05-01.2(2)-(3) (West 2012).

185. N.J. STAT. ANN. § 46:3-26(b)-(c) (West 2012).

186. N.M. STAT. ANN. § 47-3-8 (West 2012).

187. *Id.* § 47-3-4(B)(2).

188. BOULDER, COLO., CODE § 9-9-17(c) (2009).

189. *Id.* § 9-9-17(d)(1).

190. *Id.* § 9-9-17(d)(1)(A).

191. *Id.* § 9-9-17(d)(1)(B).

for lots located in the least protected solar access area.¹⁹² Property owners who want to build a structure that would interfere with these solar rights provisions can apply for an exception,¹⁹³ and property owners who believe that their solar protection is inadequate can apply for solar access permits.¹⁹⁴

The City of Eugene, Oregon protects solar access in R-1 and R-2 districts through the use of solar setback standards.¹⁹⁵ Properties are exempt from these requirements, however, under several circumstances, as where the land is already shaded or the shadow to be created would have only insignificant impacts.¹⁹⁶ In Tucson, shadows are to be taken into account during the development process, and “[w]here such shadows adversely affect solar energy systems between the hours of 9:00 a.m. and 3:00 p.m., a site plan shall show that the multistory structure has been reoriented on the site to mitigate this effect.”¹⁹⁷

Municipal regulations may allow solar energy collectors as permitted accessory uses in some or all zoning districts,¹⁹⁸ or provide exemptions from height restrictions for solar energy equipment.¹⁹⁹ In another approach, the Town of Oro Valley requires all single family and two family residences to be built to accommodate the future connection of solar systems.²⁰⁰

Another example of local innovation is from Chattanooga, Tennessee, where “The Green Power Switch Program” was initiated for local energy providers to offer environmentally friendly electric energy to consumers.²⁰¹ This program encourages community members to utilize alternative energy sources, such as solar panels and wind turbines, to help promote the city’s efforts to reduce emissions.²⁰²

192. *Id.* § 9-9-17(d)(1)(C).

193. *Id.* § 9-9-17(f).

194. *Id.* § 9-9-17(h).

195. EUGENE, OR., CODE § 9.2795(2)(a)-(b) (2006).

196. *Id.* § 9.2795(3).

197. TUCSON, ARIZ., LAND USE CODE § 3.2.12.2 (1995).

198. *See, e.g.*, BRIARCLIFF MANOR, N.Y., CODE § 220-9.1(C), (D) (2007); ALBANY, N. Y., CODE § 375-93 (1995); ITHACA, N.Y., CODE § 270-219.1(A) (2008); ERIE, PA., CODE § 305.54 (2010); POTTSTOWN, PA., CODE § 503(1) (2009).

199. *See, e.g.*, AMSTERDAM, N.Y., CODE § 250-15 (2010); BEDFORD, N.Y., CODE § 125-20 (2011); SEATTLE, WASH., MUN. CODE § 23:43.040(B)(2) (2011) (solar collectors can exceed height limits in the residential small lot section by four feet).

200. ORO VALLEY, ARIZ., CODE § 6-1-7 (2009).

201. CHATTANOOGA GREEN COMM., THE CHATTANOOGA CLIMATE ACTION PLAN 28 (2009), available at <http://www.chattanooga.gov/images/citymedia/chattgreen/Sustainability/ClimateActionPlanFinalPrint.pdf>.

202. *See id.*

IV. CONCLUSION

Local governments hold the critical key to the siting of small-scale renewable energy in residential and business/commercial districts. Despite the growing number of fiscal incentives designed to encourage market growth for renewable energy products, from outright grants and loans to tax credits, as well as the possibility of credits for contributing unused generated renewable energy back to the grid, the fact remains that the ultimate use of these energy sources require land use and building permits from local governments. Therefore, federal and state governments must do more to educate, train, and provide technical assistance to local governments who in turn must conduct a “renewable energy audit” of local comprehensive plans and land use regulations to ensure that the regulatory regime is designed to accommodate and welcome the use of small-scale renewable energy.

While some have touted the benefits of local control and the creation of laboratories of innovation, to the design and customization of regulatory regimes that best meet unique community needs,²⁰³ the industry has already expressed concern that variation in local permitting processes adds to the time and cost of siting renewable energy technology.²⁰⁴ The call for uniformity, if successful, will at worst preempt or at best significantly diminish local siting and permitting control. Industry concerns should not be taken lightly as other industries have had reasonable success in advocating for federal standards and guidelines.²⁰⁵ Local governments will only be successful in maintaining control over the renewable energy siting process for small scale systems if they step up to the plate and adopt and incorporate some of the examples of best practices described in part III.

203. *See, e.g.*, Pursley & Wisemann, *supra* note 29, at 937.

204. *E.g.*, SUNRUN, *THE IMPACT OF LOCAL PERMITTING ON THE COST OF SOLAR POWER: HOW A FEDERAL EFFORT TO SIMPLIFY PROCESSES CAN MAKE SOLAR AFFORDABLE FOR 50% OF AMERICAN HOMES* 3-8 (2011) (estimating that it costs on average \$2,516 per installation for local compliance).

205. *See, e.g.*, Telecommunications Act of 1996, Pub. L. No. 104-04, 110 Stat. 56 (codified as amended in scattered sections of 47 U.S.C.) (setting forth a national framework for the siting of wireless communications facilities).