Building Design & Construction

Benefits and Burdens of Incorporating Renewable Energy Technologies in LEED-Certified Buildings

Contributed by: Richard J. Sobelsohn, Esq., Moses & Singer LLP, David John Frenkil

Under the Leadership in Energy and Environmental Design (LEED) rating systems, the U.S. Green Building Council (USGBC)[1] encourages the incorporation of renewable energy by awarding points towards the certification of buildings.[2] In fact, the addition of renewable energy sources to a building may, in certain instances, be the deciding factor in determining whether the property will earn the point level necessary to achieve LEED certification. While the advent of technologically-advanced renewable devices, such as wind turbines and photovoltaic (PV) solar systems, have increased the importance of sustainable energy in the green building world, they also introduce additional layers of liability.[3] This article discusses the LEED system as it relates to renewable energy, and the benefits and burdens of incorporating these clean technologies in a LEED-certified property.

Treatment of Renewable Technologies under the LEED Rating Systems

Since the USGBC developed the LEED rating system with a holistic approach in mind, in order for the property to reach and maintain the LEED standard, renewable energy must be used in a way that works synergistically with all LEED rating system categories—even those that are not directly related to the consumption of energy.[4] Thus, the requirements covered under Energy & Atmosphere (E&A) category of the LEED 2009 Existing Building: Operations and Maintenance (EBOM) rating system must function in a coordinated way with that of the other five categories: (i) Sustainable Sites; (ii) Water Efficiency; (iii) Material & Resources; (iv) Indoor Environmental Quality; and (v) the Innovation & Design Process.

For example, considerations related to the consumption of energy are addressed in other categories outside of E&A. These include, among other things: heating, ventilation and air conditioning systems (HVAC); potable water consumption; the amount of light pollution emanating from the subject property to its neighbor (along with all other sections of Sustainable Sites); and renovation, furnishing, and operation of the building.

Energy & Atmosphere Category

The E&A category in the LEED 2009 for EBOM rating system[5] contains basic requirements for each section, as well as a credit system (also referred to as "points") for the applicant property to earn the level of certification desired.[6] After passing the E&A category prerequisites, the applicant for a LEED certified property must also examine what can be done to earn the following all-important credits.

Optimizing Energy Efficiency Performance

First, "EA Credit 1: Optimize Energy Efficiency Performance" provides for a maximum of 18 points. The basic intent in this section is to "achieve increasing levels of operating performance relative to typical buildings of similar type to reduce environmental and economic impacts associated with excessive energy use."[7] This credit category offers the property owner a way to earn points by showing an improvement in energy efficiency of at least "21% better than the average for typical buildings of similar type" and achieving energy efficiency performance better than the minimum requirements listed above.[8] Additionally, within this E&A credit section, there are also "Potential Technologies & Strategies" listed which include implementation of "energy-efficient retrofits and energy-saving techniques to reduce the building's energy use."[9]

When discussing the E&A credit category, the concept of having "ongoing accountability and optimization of building energy performance" and computer-based building automation systems is extremely important.[10]

On-Site and Off-Site Renewable Energy

However, for purposes of this article, perhaps the most relevant portion in the E&A category is "EA Credit 4: On-Site and Off-Site Renewable Energy." Under this Credit, if the basic requirements are met,[11] up to 6 points for existing building certification can be earned with renewable energy.[12] During a "Performance Period,"[13] the property owner may meet a portion of the building's total energy use with on-site or off-site renewable energy systems. According to the USGBC, the purpose of this is to "encourage and recognize increasing levels of on- and off-site renewable energy to reduce environmental and economic impacts associated with fossil fuel energy use,"[14] as Table 1 indicates below.[15]

Further, points for on-site and off-site renewable energy are earned according to Table 1, which shows percentages of renewable energy used by buildings during the Performance Period. Green power may be procured from a Green-e Energy certified power marketer or a Green-e Energy-accredited utility program, or through Green-e Energy-certified tradable renewable energy certificates (RECs) or their equivalent. For on-site renewable energy credits that are claimed under LEED 2009 for EBOM, the associated environmental attributes "must be retained or retired and cannot be sold."[16]

TABLE 1[17]

On site renewable energy		Off-site renewable energy certificates	Points
3%	or	25%	1
4.5%	or	37.5%	2
6%	or	50%	3
7.5%	or	62.5%	4
9%	or	75%	5
12%	or	100%	6

Table 2 below shows a similar breakdown of points that can be earned under the LEED 2009 New Construction (NC) rating system. Under this system, a maximum of seven points can be earned for On-Site Renewable Energy.

TABLE 2[18]

LEED for NEW CONSTRUCTION v3.0					
Registered Project Checklist					
Yes	?	No		**Energy & Atmosphere**	35 Points
Y			Prereq 1	**Fundamental Commissioning of the Building Energy Systems**	Required
Y			Prereq 1	**Minimum Energy Performance**	Required
Y			Prereq 1	**Fundamental Refrigerant Management**	Required
			Credit 1	**Optimize Energy Performance**	1 to 19
				12% New Buildings or 8% Existing Building Renovations	1
				14% New Buildings or 10% Existing Building Renovations	2
				16% New Buildings or 12% Existing Building Renovations	3
				18% New Buildings or 14% Existing Building Renovations	4
				20% New Buildings or 16% Existing Building Renovations	5
				22% New Buildings or 18% Existing Building Renovations	6
				24% New Buildings or 20% Existing Building Renovations	7
				26% New Buildings or 22% Existing Building Renovations	8

LEED for NEW CONSTRUCTION v3.0					
				28% New Buildings or 24% Existing Building Renovations	9
				30% New Buildings or 26% Existing Building Renovations	10
				32% New Buildings or 28% Existing Building Renovations	11
				34% New Buildings or 30% Existing Building Renovations	12
				36% New Buildings or 32% Existing Building Renovations	13
				38% New Buildings or 34% Existing Building Renovations	14
				40% New Buildings or 36% Existing Building Renovations	15
				42% New Buildings or 38% Existing Building Renovations	16
				44% New Buildings or 40% Existing Building Renovations	17
				46% New Buildings or 42% Existing Building Renovations	18
				48% New Buildings or 44% Existing Building Renovations	19
			Credit 2	**On-Site Renewable Energy**	1 to 7
				1% Renewable Energy	1
				3% Renewable Energy	2
				5% Renewable Energy	3
				7% Renewable Energy	4
				9% Renewable Energy	5
				11% Renewable Energy	6
				13% Renewable Energy	7

The USGBC encourages applicants to employ as many renewable energy sources as possible to "design and specify the use of on-site non polluting renewable technologies to contribute to the total energy requirements of the building."[19] Solar, geothermal, wind, biomass, and biogas technologies are all recommended. In the LEED 2009 for EBOM rating system manual, the USGBC promotes the purchase of renewable energy or tradable RECs to meet some or all of the building's energy requirements. The USGBC recommends that applicants for LEED certification:

> research power providers in the area and select a provider that guarantees that a portion of its delivered electric power is derived from net nonpolluting renewable technologies. If the project is in an open-market state, investigate green power and power marketers licensed to provide power in that state. Grid power that qualifies for this credit originates from solar, wind, geothermal, biomass or low-impact hydro sources.[20]

Points Available for Use of Renewable Energy Sources

With an understanding of the USGBC point system structure, it is important to note how many points can be earned through renewable energy in LEED buildings. The following three tables (Tables 3, 4, and 5) show the incorporation of renewable energy in projects designed using the post-"LEED 2009" rating systems and the pre-"LEED 2009" systems, respectively.[21] Table 6 illustrates the points available under the LEED rating systems for renewable energy use. The significance of these statistics is two-fold. First, they illustrate that LEED is clearly committed to the adopted of renewable energy technologies.[22] Also, these statistics in-

dicate the ease with which building developers are increasingly integrating renewable technologies in LEED-certified properties[23]—or, at the very least, the ability of building operators to purchase energy from off-site renewable suppliers if the property itself is unable to employ these technologies.[24]

TABLE 3[25]

	# of projects	%	
v2009 LEED-Certified Projects ("excludes LEED CI")*	137	100%	
all projects	137	100%	
LEED CS	15	11%	
LEED EB	98	72%	
LEED for Schools	1	1%	
LEED NC	23	17%	
Renewable Energy LEED Projects	37	27%	points
LEED CS ("1% On-Site")	1	3%	4
LEED EB	29	78%	1 thru 6
5%/37.5% On-Site/Off-Site	3	10%	2
6%/50% On-Site/Off-Site	3	10%	3
8%/62.5% On-Site/Off-Site	1	3%	4
9%/75% On-Site/Off-Site	4	14%	5
12%/100% On-Site/Off-Site	18	62%	6
LEED NC	7	19%	1 thru 7
5% On-Site	1	14%	3
7% On-Site	1	14%	4
9% On-Site	1	14%	5
13% On-Site	4	57%	7
Verified On-Site Renewable Energy Projects ("excludes LEED EB")**	8	6%	
LEED Projects without Renewable Energy ("excludes LEED CI")	100	73%	

* The LEED CI rating system does not have an on-site renewable energy credit

** The LEED EB rating system does not differentiate between off-site or on-site renewable energy

TABLE 4[26]

	# of projects	%
Pre-v2009 LEED-Certified Projects (“excludes LEED CI”)*	5732	100%
LEED CS	646	11%
LEED EB	785	14%
LEED for Schools	94	2%
LEED NC	3949	69%
LEED Retail (“CI”)	181	3%
LEED Retail (“NC”)	77	1%
Renewable Energy LEED Projects	684	12%
LEED CS	40	6%
LEED EB	195	29%
LEED for Schools	22	3%
LEED NC	420	61%
LEED Retail (“CI”)	2	0.3%
LEED Retail (“NC”)	5	1%
Verified On-Site Renewable Energy Projects (“excludes LEED EB”)**	489	9%
LEED Projects without Renewable Energy (“excludes LEED CI”)	5048	88%

* The LEED CI rating system does not have an on-site renewable energy credit

** The LEED EB rating system does not differentiate between off-site or on-site renewable energy

TABLE 5[27]

	# of projects	%
Renewable Energy LEED Projects	684	100%
1% On-Site	42	6%
All	42	100%
LEED CS	40	95%
LEED Retail (“CI”)	2	5%

	# of projects	%
2.5% On-Site	124	18%
All	124	100%
LEED for Schools	10	8%
LEED NC	112	90%
LEED Retail (“NC”)	2	2%
3%/25% On-Site/Off-Site (“LEED EB”)**	25	4%
5% On-Site (“LEED NC”)	19	3%
6%/50% On-Site/Off-Site (“LEED EB”)	32	5%
7.5% On-Site	55	8%
All	55	100%
LEED for Schools	2	4%
LEED NC	2	4%
LEED Retail (“NC”)	51	93%
9%/75% On-Site/Off-Site (“LEED EB”)	20	3%
10% On-Site (“LEED NC”)	18	3%
12%/100% On-Site/Off-Site (“LEED EB”)	118	17%
12.5% On-Site	188	27%
All	188	100%
LEED for Schools	10	5%
LEED NC	177	94%
LEED Retail (“NC”)	1	1%
15% On-Site (“LEED NC”)	0	0%
20% On-Site (“LEED NC”)	43	6%

** The LEED EB rating system does not differentiate between off-site or on-site renewable energy

TABLE 6[28]

Renewable Energy Credit - Point Achievement Reference Table				
Rating System	version	points achieved	% renewable energy	% off site renewable**
LEED NC	2	1	20%	
LEED NC	2.1	1	5%	
		2	10%	
		3	15%	
LEED NC	2.2	1	2.5%	
		2	7.5%	
		3	12.5%	
LEED for Schools	2	1	2.5%	
		2	7.5%	
		3	12.5%	
LEED Retail (“NC”)	1.0 Pilot	1	2.50%	
		2	7.50%	
		3	12.50%	
LEED CS	2	1	1%	
LEED EB	2	1	3%	25%
		2	6%	50%
		3	9%	75%
		4	12%	100%
LEED Retail (“CI”)	1.0 Pilot	1	1%	

** The LEED EB rating system does not differentiate between off-site or on-site renewable energy

Practical Concerns Related to Renewable Energy in LEED Properties

LEED certification adds an extra layer of complexity to the development of renewable energy technologies. Although the apportionment of risk is obviously a major component of any agreement related to the development of renewable energy, when such technologies are incorporated into a LEED property, the agreement must also take into account the interests of third parties—the USGBC and/or a local municipality.

For example, New York City law requires 50,000 square foot commercial buildings to reduce energy consumption over a set period of time, while also reporting on such reductions.[29] Similarly, the USGBC mandates, among other things, that LEED-certified property owners report their energy consumption.[30] Failure to meet these specifications or reporting requirements could be grounds for the decertification of a property by the USGBC, or the possible

lowering of the building's certification level.[31] Thus, these requirements, and the apportionment of the associated risks, must be addressed in the project documents. For instance, a long-term commercial lease may hold the landlord to an affirmative covenant to deliver and maintain a LEED Gold certified building.[32] If, for some reason, the renewable energy devices in the building do not operate as planned and the expected energy reduction is not realized, who should bear the risk of such failure? This is especially true if points are lost as a result, which leads to a downgrade in the building's certification level or loss of its certification altogether.[33] This may also result in the loss of a certificate of occupancy, denial of alteration permits, or even fines and penalties for non-compliance with local law.

Clients who seek to incorporate renewable energy technologies into their building design must also take into account resource availability. For example, in August 2008, New York City Mayor Michael Bloomberg announced an ambitious plan to install wind turbines on the city's bridges and skyscrapers.[34] However, the initiative did not catch on because the economics of the plan did not make sense due to resource inefficiencies.[35] In New York City, the best ground-based wind sites have a wind-power density of less than 1 kilowatt (kW) per square meter.[36] Although the jet stream is roughly 16 times stronger, difficulties associated with intermittency of wind makes the placement of turbines on the rooftops of skyscrapers a dubious investment. Even where wind is not intermittent, it blows strongest at night when consumer demand for electricity is low.[37]

Solar panels, by contrast, are most efficient when consumer demand for electricity is at its height—on hot, sunny days.[38] However, the installation of solar panels can be prohibitively expensive, while space for the panels is often scarce due to the placement of telecommunications and other equipment on roofs. Further, shadows from taller buildings may block access to sunlight during peak hours.

Whether or not a building's location is ideal for harnessing the wind or sun, building managers tend to prefer to "pick the low hanging fruit" instead of necessarily adopting renewable energy devices. The trend is to start by installing more efficient lighting or heating and cooling systems. These energy conservation measures typically have a much shorter payback period (as low as 1 year, depending on the location of the building).[39]

Similarly, the low cost and plentiful supply of natural gas in the United States serves as an impediment to the adoption of renewable energy. The price of natural gas has dropped by nearly 70 percent from a peak of about $13.60 per million British thermal units (BTUs) in July 2008, to $4.37 at the end of January 2011.[40] At the same time, production at the Fayetteville Shale formation in Arkansas and surrounding states has seen a 400 percent increase, leading to a plentiful shale-gas supply in the United States.[41] Therefore, natural gas produces energy for a cheaper cost than most renewable sources of energy, which reduces the incentive to shift fuel sources to renewable technologies.

In addition to economic roadblocks, building structural limitations may also impede the integration of renewable technologies in LEED-certified buildings. For instance, in order to accommodate Mayor Bloomberg's plan, "[s]kyscrapers would have to be designed—or retrofitted at great cost—to accommodate the extra weight, vibration and swaying of wind turbines."[42] Also, the turbines would have to be designed in such a way so as not to pose environmental concerns. For example, eight vertical wind turbines were originally integrated into the design of 1 World Trade Center (formerly known as "Freedom Tower"). Under the original design, the turbines would have been situated within an open-air, cable-framed structure towards the top of the tower. However, the plan for the turbines was scrapped due to concerns of icing during the winter and the potential threats they posed to migratory birds.[43]

Another factor in the development of renewable energy projects relates to the financing of these technologies. With a return on investment (ROI) of up to 25 years for small wind turbines, the adoption of wind turbines or photovoltaics is, in many cases, unrealistic for property owners because most do not typically plan to hold onto these assets for that length of time. Although various states provide attractive incentives for investors and property owners to adopt renewable technologies, these incentives often serve only as additional revenue streams, but do not provide enough financial support for the project to compete with traditional, less expensive fossil fuels.[44]

Even with the right incentives in place, LEED property owners must also take into consideration whether state and local laws protect the adoption of renewable energy technologies. For example, the 1978 California Solar Rights Act establishes the legal right to an easement for solar energy systems and limits local governments from adopting ordinances that would unreasonably restrict the use of solar technologies. As the rights of property owners extend to the airspace directly above their land, the Solar Rights Act specifies that owners may grant access to the sunlight that transverses their property to a solar energy system owner on an adjacent parcel.[45] Also, where such an easement is not granted, the California Solar Shade Control Act provides protection to solar energy system owners from shading caused by trees and shrubs on adjacent properties.[46] Few other states have adopted similar measures.[47]

Such laws are important because, where adoption of renewable energy technologies is prohibited, property owners are unable to avail themselves of the credits for renewable energy devices and possibly not obtain the LEED certification level they desire. In various states, such as Pennsylvania, Massachusetts and Illinois, recent lawsuits have proved to be a major impediment to the development of renewable energy projects.[48] Under these suits, plaintiffs seek to enjoin the operation of completed wind and solar facilities based on aesthetic concerns, wind turbine noise and vibrations, and subsequent detriment caused to the value of adjacent or nearby properties.

Thus, in the absence of laws similar to the California Solar Rights Act, project developers and LEED certified building candidates are exposed to the risk of a court-ordered shut-down of on-site renewable energy equipment which may jeopardize the certification of a LEED building, or, at the very least, the added operational cost of attorneys fees to fight pending litigation. Fortunately, state legislatures are beginning to address this issue. For example, Wyoming passed a bill effective April 1, 2011 that protects the property rights of wind energy projects in the state in the same way that the Solar Rights Act protects solar projects in California.[49] In addition to protecting the rights of project developers, state governments may also consider granting indemnification to developers in order to protect them against exposure to future lawsuits based on the nuisance claims described above, or other related issues such as health problems that have been alleged from renewable energy facilities.[50]

Conclusion

As the use of renewable energy technologies by LEED-certified property owners grows, it is important for practitioners to effectively guide their clients through this difficult technological and legal terrain. The various issues associated with credits under LEED rating systems, the allocation of risk, resource availability, structural limitations, and local law, each add a layer of complexity to the property owner's typical burdens when developing plans to employ renewable technologies. Further, as laws and regulations at the federal, state, and local levels continue to adapt to the increasingly carbon-constrained economy, the nuances discussed in this article will only become more complex and new issues will ultimately emerge. Now more than ever, practitioners must adjust their understanding of this area accordingly in order to facilitate the deployment of renewable energy technologies in green buildings.

Richard J. Sobelsohn earned his accreditation from the U.S. Green Building Council as a Leadership in Energy and Environmental Design Accredited Professional (LEED AP). As a LEED AP, Richard has in-depth knowledge of the LEED Green Building Rating System, the globally accepted rating and certification program for design, construction, operation, and maintenance of green buildings. An attorney in the Real Estate practice group of Moses & Singer LLP, he represents developers, corporations, financial institutions and individuals concerning a variety of commercial real estate transactions including sustainable development, acquisitions, dispositions, financing, condominium offerings and leasing. Richard is a Fellow in the Institute of Green Professionals, serves as a member of the National Legal Working Group of the U.S. Green Building Council, an adjunct professor of law at both Brooklyn Law School and New York Law School, and lectures and writes extensively on the subject of sustainable development. Richard can be contacted at rsobelsohn@mosessinger.com.

David John Frenkil is an Associate with Van Ness Feldman in Washington, D.C. He is also the publisher of EfficiencyLaw.com, a website that provides analysis on issues related to the energy efficiency and renewable energy sectors. With a focus in renewable energy and cleantech financing, he represents clients in the development of wind and solar projects, among others. He has presented at various conferences for professionals in the cleantech, green building, and government contracting industries. David can be contacted at Frenkil@gmail.com.

---

[1] Throughout this article, our reference to the USGBC also includes the Green Building Certification Institute (GBCI), which was established in 2008. The GBCI is a third-party organization (under USGBC) which "provides independent oversight of professional credentialing and project certification programs relating to green building." GBCI, *About*, http://www.gbci.org/org-nav/about-gbci/about-gbci.aspx (last visited Mar. 14, 2011).

[2] For example, LEED for Existing Buildings: Operations & Maintenance (EBOM) awards up to 6 points and LEED for New Construction awards up to 7 points towards certification.

[3] *See e.g.,* Complaint, *Boyd v. First Wind Energy, LLC*, No. CARSC-CV-09 (Me. Super. Ct. Mar. 2009) (on file with author).

[4] The USGBC Rating Systems designate individual categories which breakdown various aspects of a building.

[5] The LEED 2009 Green Building Rating System for EBOM is the latest USGBC rating system available for existing buildings, and sets forth performance standards and a point structure for existing institutional, commercial, or high-rise residential buildings.

[6] The E&A category is broken down into the following subcategories: (i) Energy Efficiency Best Management Practices; (ii) Minimum Energy Efficiency Performance; (iii) Fundamental Refrigerant Management; (iv) Optimize Energy Efficiency Performance; (v) Existing Building Commissioning; (vi) Investigation and Analysis, Implementation, Ongoing Commissioning; (vii) Performance Measurement: Building Automation System and System Level Metering; (viii) On-Site and Off-Site Renewable Energy; and (ix) Enhanced Refrigerant Management and Emissions Reduction Reporting. *See* USGBC, *LEED 2009 for Existing Building Operations and Maintenance* (last updated Feb. 2011), *available at* http://www.usgbc.org/ShowFile.aspx?DocumentID=88765 (hereinafter *LEED 2009 EBOM*).

[7] *Id* at 27.

[8] *Id.* at 28.

[9] *Id.* at 29.

[10] *Id.* at 33.

[11] *Id.* at 23-26.

[12] *Id.* at 35-36.

[13] Defined as a "continuous, unbroken time during which sustainable operations performance is being measured. The performance period may not have any gaps, defined as any period of time longer than 1 full week". *Id.* at xvii.

[14] *Id.* at 35.

[15] *Id.* Note that for New Construction, the project has a potential of earning seven points towards certification.

[16] *Id.*

[17] Source: *LEED 2009 for EBOM*, *supra* note 6, at 35. Data from USGBC Research Program based on LEED certified projects through November 2011.

[18] Data from USGBC Research Program based on LEED certified projects through November 2011.

[19] *LEED 2009 for EBOM*, *supra* note 6, at 35.

[20] *Id.* at 35-36.

[21] All charts were supplied on January 26, 2011 by Christopher Pyke, Vice President Research, USGBC (on file with author).

[22] The USGBC website asserts its commitment to the deployment of renewable energy technologies: "Utilizing renewable energy for a building's energy needs reduces the dependency on less environmentally sound energy sources, which have a variety of impacts on the environment and human health. Using renewable energy impacts a building's carbon footprint, contribution to fossil fuel depletion, ozone depletion and rate of particulates (which can lead to chronic and acute respiratory symptoms)." USGBC, *LEED 2009: Technical advancements to the LEED rating system*, http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1971 (last visited Mar. 14, 2011).

[23] 61 percent of all pre-LEED 2009 New Construction and 29 percent of pre-LEED 2009 Existing Buildings had incorporated renewable energy into the property make-up. *See* Table 4 above.

[24] For example, LEED EBOM awards points for usage of off-site renewable energy sources.

[25] Data from USGBC Research Program based on LEED certified projects through November 2011.

[26] Data from USGBC Research Program based on LEED certified projects through November 2011.

[27] Data from USGBC Research Program based on LEED certified projects through November 2011.

[28] Data from USGBC Research Program based on LEED certified projects through November 2011.

[29] New York City Local Law No. 87, Int. No. 967-A (Dec. 2009).

[30] *See generally* USGBC, *LEED 2009 Minimum Program Requirements* (last updated Jan. 2011), *available at* http://www.usgbc.org/ShowFile.aspx?DocumentID=6715 (hereinafter LEED 2009 MPR).

[31] *See id.*

[32] The LEED rating system certifies properties under four levels (certified, silver, gold and platinum).

[33] For example, if a property received a LEED Gold certification with 60 points and, due to a failure of the renewable energy source, the expected energy reduction was not obtained, the property could be down-graded to silver. Or, if the property was only at the certified level and lost points due to the renewable energy device failing to live up to its manufacturer's promise, the property could lose its certification. Similarly, if a local municipality required a certain level of energy reduction and it was not obtained, penalties or fines could be assessed, or worse, certificates of occupancy could be affected or the issuance of alteration permits could be denied until the energy reduction is achieved.

[34] *See* Michael Barbaro, New York Times, *Bloomberg Offers Windmill Power Plan* (Aug. 19, 2008), *available at* http://www.nytimes.com/2008/08/20/nyregion/20windmill.html.

[35] *See* Ken Belson and David W. Dunlap, New York Times, *Architects and Engineers Express Doubt About Bloomberg's Windmill Proposal* (Aug. 20, 2008), *available at* http://www.nytimes.com/2008/08/21/nyregion/21wind.html?pagewanted=&_r=-&em.

[36] *See* Alex Madrigal, Wired Online, *High-Altitude Wind Machines Could Power New York City*, (June 15, 2009), *available at* http://www.wired.com/wiredscience/2009/06/highaltitudewindpower/#.

[37] *See* Belson and Dunlap, *supra* note 35.

[38] *Id.*

[39] See http://www.greenandsave.com/__table.html.

[40] *See* Myra P. Saefong, MarketWatch, *Natural gas: the commodity world's 'ugly duckling'* (Jan. 28, 2011), *available at* http://www.marketwatch.com/story/natural-gas-the-commodity-worlds-ugly-duckling-2011-01-28?pagenumber=2.

[41] *Id.*

[42] Belson and Dunlap, *supra* note 35. Although, with new advances to wind turbine design, this impediment may be negated.

[43] *Id.*

[44] These incentives include renewable energy certificates (RECs), feed-in tariffs, net-metering and on-bill financing, among other programs. State and local government incentives are often offered in conjunction with the local utilities and other energy service providers.

[45] *See* Cal. Civ. Code § 714 et seq.

[46] *See generally* Cal. Pub. Res. Code §§ 25980–25986.

[47] *See, e.g.*, Fla. Stat. § 163.04.

[48] *See* Tom Zeller, Jr., New York Times, *For Those Near, the Miserable Hum of Clean Energy* (Oct. 5, 2010), *available at* http://www.nytimes.com/2010/10/06/business/energy-environment/06noise.html.

[49] *See* Wy. Senate File No. 0022.

[50] *See* Zeller, *supra* note 48 (explaining that "[t]he wind industry has long been dogged by . . . elaborate allegations that they have direct physiological impacts like rapid heart beat, nausea and blurred vision caused by the ultra-low-frequency sound and vibrations from the machines.").

MOSES & SINGER LLP

Disclaimer

Viewing this or contacting Moses & Singer LLP does not create an attorney-client relationship.

This is intended as a general comment on certain developments in the law. It does not contain a complete legal analysis or constitute an opinion of Moses & Singer LLP or any member of the firm on the legal issues herein described. This contains information that may be modified or rendered incorrect by future legislative or judicial developments. It is recommended that readers not rely on this general guide in structuring or analyzing individual transactions or matters but that professional advice be sought in connection with any such transaction or matter.

Attorney Advertising

It is possible that under the laws, rules or regulations of certain jurisdictions, this may be construed as an advertisement or solicitation.

MOSES & SINGER LLP

Disclaimer

Viewing this or contacting Moses & Singer LLP does not create an attorney-client relationship.

This is intended as a general comment on certain developments in the law. It does not contain a complete legal analysis or constitute an opinion of Moses & Singer LLP or any member of the firm on the legal issues herein described. This contains information that may be modified or rendered incorrect by future legislative or judicial developments. It is recommended that readers not rely on this general guide in structuring or analyzing individual transactions or matters but that professional advice be sought in connection with any such transaction or matter.

Attorney Advertising

It is possible that under the laws, rules or regulations of certain jurisdictions, this may be construed as an advertisement or solicitation.