Section of Environment, Energy, and Resources
AMERICAN BAR ASSOCIATION

Renewable, Alternative, and Distributed Energy Resources Committee Newsletter

Vol. 2, No. 2 February 2014

MESSAGE FROM THE RADER CO-CHAIRS

Kimberly E. Diamond and Roger D. Stark

We are pleased to kick off 2014 with the announcement of interesting upcoming events and other activities in which you, our fellow Renewable, Alternative, and Distributed Energy Resources (RADER) Committee members, may participate. So that we may offer programs and events in line with members' expectations, we recently circulated via e-mail to all RADER Committee members a link containing a brief "two-minute" survey that will enable us to better gauge member interest. If you have not already completed such survey, we ask that you please do so in order to allow us to better serve you and meet your expectations.

Currently, we have a number of upcoming events in which RADER Committee members may become involved. First, for those interested in gaining insight from experts on cutting-edge topics in the renewable, alternative, and distributed energy space while earning CLE credit, we invite you to attend our signature monthly Renewable Energy Webinar & Teleconference Series that we cosponsor with the American Council on Renewable Energy (ACORE). Our most recent program, held on December 18, 2013, and entitled "The Microgrids Next Door: Their Growing Role in Your Power Supply," focused on the benefits of microgrids to their hosts and to the grid, federal regulations that are building support for microgrids, how microgrids are financed and related investment opportunities, and the evolving relationship of local distribution companies to microgrids. Featured speakers included Ted Borer, energy plant manager at Princeton University; Larisa Dobriansky, senior vice president at General Microgrids; Sara Bronin, professor of law and program director at the University of Connecticut School of Law's Center for Energy & Environmental Law; and Clarke Bruno, senior vice president of Anbaric Transmission. The panel was moderated by our RADER colleague, C. Baird Brown, partner at Drinker Biddle & Reath LLP. Information about upcoming programs, speakers, CLE credit, and registration information may be found at http://renewableenergyinfo.org/. Please visit our RADER Committee home page at http://apps.americanbar.org/dch/committee.cfm?com=NR252300 for more information.

Second, for those RADER Committee members who would like the opportunity to judge a law school writing competition, you are in luck. Our RADER Committee will once again be the lead sponsor of the 2014 Energy Law Student Writing Competition, a national competition in which students who attend accredited law schools across the country are invited to participate. If you are interested in being a judge for this competition, or would like more information about such

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competition, please contact our vice chair and assistant vice chair of Communications/Outreach, K. K. DuVivier and Nadia Luhr, respectively, at kkduvivier@law.du.edu and nadia@ncconservationnetwork.org.

Third, for those of you who like to write and would like to see your piece published, please consider submitting an article proposal to a Section publication or to our own RADER Committee Newsletter. As an example, our SEER publication, *Natural Resources & Environment*, is currently seeking proposals for its Fall 2014 issue, the theme of which is "Transactions." Please contact Jean Feriancek at jferiancek@hollandhart.com if you are interested in submitting an article proposal. Moreover, if you would like to share your knowledge and insight on a hot issue, legislative development, recent case law decision, or other topic in the renewable, alternative, or distributed energy area, please consider writing an article for our RADER Committee Newsletter. For more information about article proposals and submissions, please contact our vice chair, Publications, Jonathan Skinner-Thompson, at jskinner-thompson@stoel.com.

Finally, for those of you who like to read about current developments in the renewable, alternative, and distributed energy resources space, it gives us great pleasure to introduce our second RADER Committee Newsletter of this ABA year. This version of the newsletter features a diverse array of topics. First, the article "Defining the Intangible: Renewable Energy Certificate Claims and Ownership in the Green Guide Era," by Robin Quarrier and John P. Rose, discusses issues associated with renewable energy credits (RECs), including why the Commodity Futures Trading Commission determined that RECs as intangible commodities are similar to swaps and derivatives as financial instruments, but are not subject to regulation under the Dodd-Frank Act as well as why RECs are prone to double-counting and double-claiming by companies that want to publicly appear environmentally conscious and renewable energy-friendly. Second, the article "Connecticut Microgrid Reforms May Signal Changes in Other States," by Jeff Winmill, analyzes the importance of microgrids for purposes of electricity generation and distribution, why the lack of specific enabling legislation in states other than Connecticut has impeded the growth and expansion of microgrids, why microgrids face challenges from electric distribution companies, and why two specific Connecticut laws should serve as models for other states with respect to microgrid development. Finally, the article "Be-aware of the Dark Side of Trees," by K. K. DuVivier, and the article "Solar Access Rights and Tree Rights Are Compatible," by Dan Staley, should be read in tandem. Specifically, the former article provides enlightenment with respect to trees' brush with the dark side, focusing on how a tree's shade footprint can block sunlight from reaching certain surrounding areas and suggesting setback guidelines for reducing a tree's adverse shade impact, while the latter article postulates that rooftop solar panels can co-exist with trees in an urban environment if mandated or informal access to sunlit areas, in the form of solar access zones, is created. On behalf of the RADER Committee, we'd like to extend a hearty thank-you to Jonathan Skinner-Thompson for his work compiling and editing this volume of the newsletter.

As always, please feel free to reach out to either of us at any time with your ideas, thoughts, and suggestions. We look forward to working with you during the balance of this ABA year.

Kimberly E. Diamond may be reached at *kdiamond@lowenstein.com*. ***Roger D. Stark*** may be reached at *rdstark@stoel.com*.

DEFINING THE INTANGIBLE: RENEWABLE ENERGY CERTIFICATE CLAIMS AND OWNERSHIP IN THE GREEN GUIDE ERA

Robin Quarrier and John P. Rose

As environmental commodities, renewable energy certificates (RECs) may expose their owners and traders to potentially conflicting obligations and regulations from state and federal agencies. In particular, because REC ownership is commonly understood to include the right to make an environmental claim, the commodities are akin to advertisements or commercial speech, and could be subject to scrutiny under section 5 of the Federal Trade Commission Act, which "prohibits entities from engaging in unfair or deceptive acts or practices in interstate commerce," and the Federal Trade Commission's (FTC's) *Green Guides*. At the same time, because they are tradable but intangible commodities, RECs retain similarities to financial instruments such as derivatives and swaps, and have been considered for regulation by the Commodity Futures Trading Commission (CFTC). In addition, state public utility commissions may have electricity generation reporting requirements that compel utilities and power companies to sidestep best practices outlined in the *Green Guides*. Such overlapping regulatory obligations can create uncertainty and increase risk, potentially undermining the critical goal of fostering a vibrant market for renewable energy.

RECs have two main purposes. They can be used by load-serving entities to comply with state renewable portfolio standards (RPSs, collectively referred to as the "compliance market"), or they can be used by organizations and individuals who purchase them to make claims of renewable energy use (in what is known as the "voluntary market"). Each REC constitutes a claim to the environmental attributes of one megawatt-hour of renewable energy. A REC is created each time a megawatt-hour of renewable energy is generated, and may be bought or sold with the underlying electricity (known as a "bundled product") or sold separately from the electricity as a REC-only product. (See Center for Resource Solutions, *Best Practices in Public Claims for Green Power Purchases and Sales*, Oct. 7, 2010, available at www.green-e.org/docs/energy/Best Practices in Public Claims.pdf). If the electricity is unbundled from the REC, that electricity loses all environmental attributes of generation and is referred to as "null power." For greenhouse gas accounting purposes, a user of null power (for example, the electricity from a solar panel from which the RECs have been sold) should assign it the emissions profile of what they would have received as default electricity service from their electricity supplier. A purchaser of null power cannot legally make an environmental claim regarding the purchase of the power, even if the power was generated from a renewable source because the right to that claim is transferred with the REC.

For a business that wishes to advertise its use of renewable electricity, the right to make an environmental claim is the primary value of that REC. For example, Company A purchases RECs and launches an ad campaign about its use of renewable energy. Company A's ownership of RECs enables it to make legitimate marketing claims regarding its renewable electricity use. These claims constitute a unique type of statement—a statement whose veracity depends on Company A's purchase of RECs. Moreover, for the statement to be legitimate, those particular RECs must not be otherwise claimed by another party (for example, by the user of the null power generated with the RECs) and must be retired on behalf of the end user.

The value of these claims may be muddled by another party's public communications. A business generating renewable electricity cannot make legitimate statements regarding renewable electricity use if the business has sold the RECs from that generation. The legitimacy of such statements is entirely based on REC ownership, and who generated the REC is less relevant than who owns them. For example, Company B purchases renewable power but sells the associated RECs to Company A. Consequently, Company B has no legitimate marketing claim over the environmental attributes of the purchased renewable power. While this structure may seem complex, REC markets reflect a commitment by legislatures, regulators, and stakeholders to track and represent renewable energy production and ownership through this intangible environmental commodity; REC markets are a response to the impossibility of tracking or directing actual electrons on the grid. RECs also provide a common unit of measurement for states to determine whether regulated entities are meeting RPS requirements.

The Role of RECs in Marketing After the Revised FTC *Green Guides*

RECs have become a powerful tool for companies to substantiate advertisements and environmental claims that highlight the companies' green credentials. By purchasing a commodity that entitles them to advertise that a product is manufactured with "renewable electricity," companies aim to attract the growing number of consumers who consider environmental factors in their purchasing choices. According to "Consumer Attitudes About Renewable Energy: Trends and Regional Differences," a 2011 study by the Natural Marketing Institute and National Renewable Energy Laboratory, the majority of consumers (80%) indicated that they care about the use of renewable energy. Further, in a 2012 TNS Gallup survey commissioned by Vestas, 85 percent of respondents worldwide prefer increased use of renewable energy, and 49 percent of respondents indicated they were willing to pay more for products produced with renewable energy.

However, the legal complexity and abstract nature of RECs combined with the strong incentives for companies to advertise renewable electricity use create problems with "double-counting." According to the Center for Resource Solutions' *Regulator's Handbook on Tradable Renewable Certificates*, double-counting occurs when a REC is sold to or associated with more than one purchaser, which may happen inadvertently or fraudulently. A potentially more prevalent but less obvious type of double-counting is double-claiming, in which two or more parties lay claim to the same renewable attributes, typically in the form of marketing statements.

Double-claiming may occur when a manufacturer that owns a rooftop renewable energy generation unit states publicly that the products manufactured at the facility are made with renewable energy, even though it has sold the RECs associated with the installation. This issue also comes up if a generator makes statements about supplying its customers with renewable generation from particular facilities, when the RECs from those facilities are sold elsewhere.

A principal mandate of the FTC is to take action against companies employing misleading or deceptive practices affecting commerce, and while the *Green Guides* are not binding regulations, they describe the types of environmental claims that the FTC believes are deceptive or misleading under section 5 of the FTC Act. Thus, companies making environmental claims that fail to comply with the *Green Guides* risk facing an FTC action. Moreover, many states, such as California, incorporate the *Green Guides* into their deceptive-advertising statutes. As a result, companies could also face state actions for noncompliance with the *Green Guides*.

In October 2012 the FTC released a revised version of the *Green Guides*. This new version and its supporting "Statement of Basis and Purpose" directly addresses renewable energy-related advertising claims made by facilities that are using renewable energy. The *Green Guides* provided new guidance to generators that are making statements about their generation while selling the RECs created from that generation. The *Green Guides* advise that claims to "host" a renewable energy facility are likely to mislead customers if the company has sold off its RECs; the FTC bases its conclusion on a survey indicating that 62 percent of respondents interpreted such a "hosting statement" to imply that the company used renewable energy to make its product. In this example, both the facility owner and the REC purchaser might be making public claims about their use of the same renewable energy. Such a situation illustrates a double claim on the REC, which does not comply with the *Green Guides*. Because of this broad interpretation of a claim on a REC to include true statements about hosting a generation facility, the revised *Green Guides* warn the industry that the FTC might bring actions against parties that have on-site renewable energy installations even if they are only making truthful claims about owning an on-site installation, unless they qualify or explain such a statement.

REC Regulation by State Public Utility Commissions

While the FTC's *Green Guides* create obligations on REC holders and traders, these obligations may clash with REC definitions from state public utility commissions. RECs, like other property types, may be characterized as a "bundle of sticks," with each stick representing a different environmental attribute (e.g., zero emissions energy, reduced carbon footprint, supporting local or distributed generation). However, the size and number of these "sticks" may differ depending on state definitions of renewable electricity and the corresponding environmental benefits. For example, some states consider RECs generated by large hydroelectric dams to be an eligible renewable resource that counts toward the states' RPS, while others do not. More importantly, some states such as Texas permit a utility to duplicate the bundle of sticks by selling a REC into the market while also generating a second REC on that megawatt-hour that counts toward the Texas RPS. Using the RECs from the same megawatt-hour for two such purposes is clearly double-counting, and may conflict with the *Green Guides* even if it adheres to Texas law.

Additionally, some public utility commissions require utilities to publicly report their generation sources of energy. Generation information differs from the power mix or supply information, which represents the power actually supplied to the customer, as opposed to the generation owned by the facility, which may be sold to other electric suppliers. Power supply information should account for REC sales and purchases. Nonetheless, some public utility commission reporting requirements confuse these different concepts, especially if the regulations were adopted prior to the existence of REC markets or if that state has no RPS (currently only 29 states and Washington, D.C., have an RPS, according to www.dsireusa.org). For example, the Minnesota Public Utilities Commission's October 2, 2001 order (Docket No. E, G-999/CI-00-1343) requires utilities to display a pie chart to consumers that includes the "generation sources" that a "utility uses to meet customer demand." Other states, such as Florida, have similar requirements for customer disclosure. (Fla. Admin. Code 25-6.093(3)(d) (1999)). These regulations mandate utilities to indicate the fuel types for their external power generation, which frequently differ from the mix of the power supplied to customers because utilities may be selling RECs outside of their service territory and then buying generation from wind facilities without purchasing the associated RECs. Accordingly, utilities may be required to disclose a higher renewable fuel mix than what they are actually contracting to deliver to their customers. In this way the utilities are making claims to renewable energy delivery even when they have sold or otherwise do not possess the RECs for that renewable energy. Such actions would arguably constitute double-counting—though because the FTC does not intend their *Green Guides* to challenge existing state laws and regulations, the conflict is only theoretical. Even so, such regulations, often enacted years before REC markets existed, can diminish the perceived value of RECs properly purchased, and inject uncertainty and confusion into the market.

REC Regulation by the CFTC?

The Commodity Futures Trading Commission recently considered whether to categorize RECs as "swaps" under the Dodd-Frank Act, a result that would have imposed substantial transactional costs associated with using exchanges for REC transactions. At issue was whether or not the forward delivery of RECs (a contract for RECs that will be generated in the future) is "physically settled," thus qualifying them for an exemption from the swap definition. The final determination was that environmental commodities such as RECs are "physically settled" when they are physically delivered through transfer of title in a contract, which is frequently represented in an electronic registry, and therefore not a swap to be regulated by the Dodd-Frank Act.

Conclusion

Although voluntary REC markets are still relatively small as compared to the entire electricity market in the United States, they have been exhibiting double-digit growth since 2000, and over 40 million MWh were reported in tracking systems in 2011 (see the National Renewable Energy Laboratory's Market Brief: Status of the Voluntary Renewable Energy Certificate Market). U.S. REC markets possess enormous potential to contribute to the renewable energy industry's bottom line while acting as a model for other nations as they transition towards a low-carbon electricity grid. However, the vitality of this market is dependent upon federal, state, and local regulators understanding the complex interplay between RECs and private claims, and how regulations should complement existing guidance on REC ownership and the environmental benefits they confer.

Robin Quarrier is Chief Counsel at the Center for Resource Solutions, a national nonprofit that creates policy and market solutions to advance sustainable energy and climate solutions. Robin also volunteers her time as president of the Board of the Women's Environmental Network.

John P. Rose is an associate at Connor, Fletcher & Hedenkamp LLP.

CONNECTICUT MICROGRID REFORMS MAY SIGNAL CHANGES IN OTHER STATES

Jeff Winmill

The term "microgrid" refers to a small-scale, low-voltage electrical distribution system that connects several loads to nearby distributed energy resources (DERs) and can operate as part of the main energy grid or in an intentional island mode. Among other things, microgrids provide users with a high degree of electric reliability, as was demonstrated by Princeton University, which was able to maintain electric power despite the blackouts caused by Hurricane Sandy. And yet microgrids—by and large—are restricted to only niche markets, including universities, military bases, and business parks.

Adverse or ambiguous state laws are among the reasons microgrids are not more widely utilized. Some states, for example, may define a microgrid as a "public utility," thereby triggering substantial regulation by state public utility commissions. Other states and municipalities may grant exclusive franchise rights to electric distribution companies, thereby making independently owned microgrids illegal within those franchise areas. Moreover, existing utilities may perceive microgrids as a threat to their business model and may seek to block microgrid development. Utilities themselves may be reluctant to develop microgrids due to a lack of incentives or expertise.

Recently, however, in response to Hurricanes Irene and Sandy, the state of Connecticut adopted new laws and policies to reduce some of the barriers to microgrid development. One result of these reforms has been a first-of-its-kind microgrid project, which will connect buildings deemed important in an emergency—including a grocery store, a police station, and a gas station—across a public right-of-way.

As other states and communities seek to fortify their power service against extreme weather events, and cyber- and terrorist-threats, one solution may be the broader deployment of microgrids. This article discusses recent legal reforms in Connecticut aimed at enhancing microgrid development. Part I of this article discusses some of the unique features of microgrids, as well as their benefits and implications for the utility sector. Part II identifies some of the legal and regulatory barriers that have traditionally limited microgrids to only a few markets. And Part III describes how Connecticut's recent reforms seek to overcome these barriers.

Ultimately this article suggests that Connecticut's legal reforms may provide an effective template for other states and communities that seek to expand the use of microgrids.

I. Why Microgrids?

Distinguishable from backup generators, or on-site power plants that serve a single facility, microgrids connect several users to DERs and interconnect to the main grid at a point of common coupling. An important feature of microgrids is their use of "sectionalizing" switches or circuit breakers to quickly disconnect from the main grid and reattach, as needed. When in island mode, microgrids possess many of the same features of the main grid, including centralized monitoring and control systems, and an ability to balance loads internally. When in grid mode, a microgrid forms a single controllable entity and functions like any other end user.

A. Microgrid Configurations

Microgrids can be configured in a variety of ways, and can be classified according to several variables, including the number of end users, the number of real-estate parcels served by the microgrid, and whether the microgrid's wires and infrastructure will cross public streets. For example, on a college or business campus, a microgrid may serve only a single end user with multiple facilities, and may do so without crossing public streets. In contrast a microgrid that is part of a shopping center or apartment building will serve several unaffiliated end users within a single building. Moreover, in an urban setting, a microgrid may serve multiple, unaffiliated end users in multiple facilities, which are separated by public streets.

Additionally, microgrids can vary according to their ownership and business structure. Examples of these variations include:

- A distribution utility that owns a microgrid in parallel to its distribution facilities and charges customers a premium for the microgrid's added reliability benefits;
- A landlord that establishes a microgrid on private property and charges tenants as part of a lease agreement;
- Unaffiliated organizations or individuals that jointly establish a microgrid to meet their collective electricity and/or heating needs, with each participant being served under contract; and
- A non-utility that owns and manages a microgrid and markets electricity to unaffiliated end users.

Given this wide range of microgrid configurations, both developers and regulators my find the legal and regulatory environment for microgrids somewhat convoluted, particularly since few states have adopted specific laws or policies addressing microgrids. Nonetheless, the benefits and challenges associated with microgrids have prompted greater awareness of the need for states to adopt specific microgrid policies.

B. Benefits of Microgrids

The New York State Energy Research and Development Authority (NYSERDA) has identified four categories of benefits associated with microgrids: (1) reliability; (2) public safety; (3) economic; and (4) environmental. MICROGRIDS: AN ASSESSMENT OF THE VALUE, OPPORTUNITIES AND BARRIERS TO DEPLOYMENT IN NEW YORK STATE 69 (2010) (NYSERDA).

The reliability benefits of microgrids stem from their ability to insulate users from outages on the main grid. By switching to island mode, either automatically or on command, microgrids can protect users from cascading outages that might otherwise result in blackouts. Fewer outages and a more dependable power supply are important considerations for industrial and commercial enterprises, as well as for critical or strategically important facilities. The U.S. military, for example, is projected to increase its investment in microgrids by 375 percent between 2010 and 2020. *See* http://www.militarysmartgrids.com/benefits-attending-smart-grids-microgrids/.

Similarly, as demonstrated during Hurricanes Irene, Katrina, and Sandy, an ability to provide essential public services- when the power grid is down is an important public policy objective. The benefits of safe havens during emergencies, which may provide some of the only local sources of shelter, heat, power, refrigeration, and medical care, are difficult to quantify. Nevertheless, providing such safe havens during blackouts is the primary impetus behind Connecticut's recent microgrid reforms.

Microgrids provide economic value where the cost of producing power locally is less than the cost of purchasing equivalent power from the main grid. Any cost savings attributable to microgrids depend upon several variables, including (1) the price of the generating technology; (2) fuel prices; (3) existing fees or standby charges imposed by a local public utility; (4) net-metering opportunities; (5) available demand response programs; and (6) a user's ability to take advantage of energy market price fluctuations.

Finally, microgrids can provide environmental benefits by utilizing renewable fuel sources, such as photovoltaic panels, in combination with low-emission technologies, such as combined heat and power (CHP) and district energy systems, which may result in lower emissions of greenhouse gases (GHG) than electricity produced by central station power plants. Such GHG reductions can help users meet state and federal compliance obligations. Moreover, the use of renewable fuels by DERs within a microgrid may also provide a revenue stream in states with renewable energy credit trading programs.

C. Issues for Utilities

Despite these benefits, microgrids—like individual DERs and energy efficiency programs—can pose a threat to the traditional electric utility business model. Under the traditional model, utilities construct and operate large central station power plants and earn a regulated rate of return through the sale of electricity. By enabling customers to become wholly or partially energy self-sufficient, microgrids can deprive utilities of load and thereby impact a utility's profitability. Ultimately, utilities may fear that declining profitability may result in fewer investors in the utility sector, higher cost of capital, and perhaps fewer investments in the main energy grid. Moreover, while individual DERs may erode a utility's customer base, microgrids have the potential to do so at a greater scale through the aggregation of multiple DERs, customers, and facilities.

Although the loss of load attributable to DERs is less than 1 percent nationwide, the number of entities that will supply at least a portion of their own electricity needs is expected to increase. *See* Peter Kind, Disruptive Challenges: Financial Implications and Strategic Responses to a Changing Retail Electric Business 19 (Edison Electric Institute 2013). As such, in addition to other efforts, some utilities have begun exploring the potential of offering microgrid services themselves. *See, e.g.*, SDG&E's Borrego Springs Microgrid Demonstration Project. And while most of these projects are in their initial or planning stages, microgrids may present a business opportunity for utilities in the future.

II. Legal Barriers to Microgrid Development

Notwithstanding the benefits and challenges associated with microgrids, few microgrids exist outside of college campuses and military bases. One reason for this is "contradictory, unclear, or hostile" law at the state level. Sara Bronin, *Curbing Energy Sprawl with Microgrids*, 43(2) Conn. L. Rev. 566

(2010)**.** There are at least three state law barriers to microgrid development: (1) uncertainty resulting from the absence of laws or regulations specifically addressing microgrids; (2) regulation of microgrids as "public utilities" or "electric companies" by state public utility commissions; and (3) policies granting monopoly service territories to electric distribution companies. These three barriers, as well as Connecticut's efforts to overcome them, are discussed below.

A. Absence of Microgrid Laws

With the possible exception of Connecticut, no state has directly addressed microgrid in its laws or regulations. *Id.* In New York, for example, "the term 'microgrid' does not appear in the statutes or administrative rules governing the [New York] electric industry." NYSERDA at 9. This fact "significantly muddles the regulatory and policy environment for parties interested in developing microgrids. . . ." *Id.* Without *ex ante* laws and policies governing microgrids, developers are left to anticipate whether a microgrid can be built, how regulators will treat their projects, and what legal risks they may be exposed to. Such uncertainty "poses a large financial risk for entrepreneurs[, which] can swamp an investment decision." Douglas E. King, *The Regulatory Environment for Interconnected Electric Power Microgrids: Insights from State Regulatory Officials* 6 (Carnegie Mellon Univ. Working Paper CEIC-05-08, 2008).

B. Regulating Microgrids as Public Utilities

In the absence of specific laws and regulations governing microgrids, a microgrid may be found to be a "public utility" or "electric company" under a state's utility or public service laws. Such a designation triggers regulation by a state's public utility commission, and generally precludes entities from operating within the service territory of other utilities.

States commonly define a public utility as a company that sells power, or installs facilities in public streets. The state of Virginia, for example, defines a public utility as ". . . any company which owns or operates facilities . . . for the generation, transmission or distribution of electric energy for sale. . . ." Va. Code § 56-265.1(b) (2013). The only power generators excluded from this definition are those involved in "generating and distributing electric energy exclusively for [their] own consumption," *id.* § 56-265.1(b)(2), or companies operating a CHP facility that provides heat and power "to the tenants of a building or buildings located on a single tract of land undivided by any publicly maintained highway, street or road. . . ." *Id.* § 56-265.1(b)(3)(A).

As demonstrated by Virginia's definition of public utility, microgrids generally do not exist outside of campus settings because selling power across a public street generally subjects a microgrid to regulation by a state's public utilities commission. Such regulation can be detrimental to a microgrid project:

> where a microgrid is interpreted as a public utility it stands little chance of being permitted to operate especially within the service territory of another public utility. Even in these cases, the administrative and financial burden of being designated a public utility is likely to be prohibitive for microgrid owners.

King at 5.

C. Service Territories

Even where not impeded by the prospect of regulation as a public utility, microgrids may face challenges from electric distribution companies that are awarded franchise rights by a city, town, or municipality or state. Such franchises are typically granted for a number of years and provide the franchisee with the exclusive right to cross public streets and distribute electricity within a geographic area. The policy rationale behind franchise rights is to avoid duplicative infrastructure, and to insulate distribution companies from competition so they can provide reliable service at reasonable rates. However, franchise rights can also provide a means by which electric distribution companies can block microgrids. A microgrid, for example:

> will likely face significant and probably insurmountable barriers to implementation . . . if it is located within the service territory of franchise area of an existing utility. Not only is it likely that regulatory authorities will be inclined to protect the incumbent distribution utility, but also the utility itself is likely to defend its franchise rights in court. . . .

NYSERDA at 23.

III. Developments in Connecticut

In an effort to protect its citizens from future blackouts, Connecticut has enacted legal reforms to address some of the barriers to microgrids that are discussed above. Additionally, in July 2013, Connecticut provided $18 million to nine pilot projects around the state, and in January 2014 Connecticut issued a second request for proposals to award an additional $30 million in grants and loans for microgrid projects.

These efforts may provide a template for other states that seek to expand the use of microgrids.

A. The Storm Act

In response to the blackouts caused by Hurricane Irene in 2011, the Connecticut General Assembly enacted P.A. 12-148, An Act Enhancing Emergency Preparedness (Storm Act), which defined the term "microgrid" as:

> [A] group of interconnected loads and distributed energy resources within clearly defined electrical boundaries that acts as a single controllable entity with respect to the grid and that connects and disconnects from such grid to enable it to operate in both grid-connected or island mode.

Id. § 7(a)(5).

The Storm Act required Connecticut's Department of Energy and Environmental Protection (DEEP) to conduct a competitive "microgrid grant and loan program" in order to provide up to 65 megawatts of DERs to critical facilities. Critical facilities in the Storm Act include everything from hospitals and police stations to grocery stores and gas stations. *Id.* § 7(a)(2). Participation in the pilot program was open to a broad array of entities, including electric distribution utilities, municipalities, investor-owned utilities, municipal electrical utilities, energy improvement districts and private entities. *Id.* § 7(b).

Spurred further by Hurricane Sandy, in July 2013 DEEP awarded a total of $18 million to nine separate projects. Ranging in size from 50 kW to 5 MW, the selected projects include a variety of generation technologies, including CHP plants and fuel cells. Developed by both private and municipal entities, the selected microgrid projects will provide power to, among others, a senior center, a cell tower, and fire and police departments. One of the selected projects, located in Hartford, Connecticut, was awarded $2 million to develop a microgrid connecting a CHP generator with a school, senior center, library, supermarket, and gas station. Notably, the Hartford Project requires the crossing of a public street in order to connect the different loads.

B. The Energy Act

A few days before the pilot program awards were announced, Connecticut enacted Public Act No. 13-298, An Act Concerning Implementation of Connecticut's Comprehensive Energy Strategy and Various Revisions to the Energy Statutes (2013) (Energy Act), which accomplished two important, closely related objectives. First, it excluded from the definition of "electric company" any "municipality, state or federal governmental entity" that owns, operates, or leases a municipal microgrid facility. *Id.* § 38(H). In Connecticut, an entity's status as an "electric company" subjects it to general utility regulation by the Public Utilities Regulatory Authority (PURA), which includes licensing requirements and economic regulation. *See* Conn. Gen. Stat. § 16-1 et seq. (2013).

Second, the Energy Act required Connecticut's PURA to:

> [A]uthorize any municipality or state or federal governmental entity that owns, operates or leases any . . . generation source under five

> megawatts, to independently distribute electricity . . . across a public highway or street, provided . . . any such source is connected to a municipal microgrid.

Id. § 39. Under Connecticut law, franchisees are protected from unauthorized competition. *See City of Groton v. Yankee Gas Services Col.*, 244 Conn. 675 (1993). And where a franchisee has been granted an exclusive franchise right, the franchisee can file an injunction to prevent infringement. *Id.* at 681, citing *New England Railroad Co. v. Central Railway*, 79 Conn. 47, 55 (1897).

The reforms in the Energy Act would generally enable specific microgrids to function without being subject to traditional economic regulation, and occupy public streets without violating another utility's franchise rights. However, as indicated above, these reforms are not open-ended. Only "municipal" microgrids may take advantage of these reforms: i.e., microgrids that include at least one governmental facility. Moreover, the Energy Act establishes a size threshold of 5 MW, and only applies to microgrids that serve two or more "critical facilities," as defined in the Storm Act. Thus, while providing important protections for qualifying microgrids, the Energy Act is unlikely to foster an overabundance of new microgrid projects.

IV. Conclusion

Connecticut has taken novel steps to encourage microgrid development. In addition to providing financial assistance to microgrid developers, Connecticut has adopted a legal and regulatory framework for microgrids that (1) defines microgrids as a matter of state law; (2) authorizes municipal microgrids to function across public streets; and (3) excludes municipal microgrids from definition as an "electric company."

While greater utilization of microgrids is likely to be a source of debate within the electrical industry for some time, policy makers in other states should consider Connecticut's reforms for several reasons. First, from a public safety perspective, the benefits of allowing microgrids to function amidst neighborhoods and cities—rather than exclusively on campuses or military bases—are clear. This is particularly true in urban areas prone to extreme storms. And Connecticut's reforms will facilitate uses of microgrids closer to population centers.

Second, as discussed above, Connecticut's reforms are narrowly tailored to encouraging microgrids that maximize public safety benefits. As such, utilities will continue to maintain their monopoly in all but a few circumstances. And finally, Connecticut's reforms provide an opportunity for utilities themselves to enter into the microgrid business. The Storm Act authorizes utilities to participate in the grant and loan program, and DEEP has specified that utilities may be involved in the ownership and operation of both the "high side" of microgrids (poles and wires) as well as the "low side" (generators and controls and load management). DEEP FAQ at A31, Dec. 23, 2013.

Jeff Winmill is an associate at Van Ness Feldman, LLP, in Washington, D.C.

SOLAR ACCESS RIGHTS AND TREE RIGHTS ARE COMPATIBLE

Dan Staley

Solar power generation is growing rapidly across the developed world as manufacturing costs plummet and new business models lower barriers to entry. Solar power is projected to provide about 7 percent of the world's electricity by 2020 (D. Gauntlett & M. Lawrence, *Solar PV Market Forecasts*, 2013 (http://www.navigantresearch.com/wp-assets/uploads/2013/07/MD-SMF-13-Executive-Summary.pdf. Accessed Dec. 22, 2013). A major energy company recently acknowledged the falling cost of solar by applying in Colorado for an expansion of peak generating capacity using solar power rather than natural gas or coal. Soon it will be normal to see rooftop photovoltaic (PV) panels throughout the urban forest, and preventing tree-solar conflicts will be an important public policy goal. This article describes the issues surrounding the coexistence of solar power and urban trees, and briefly outlines several policy strategies to help avoid tree-solar conflicts.

Background

For millennia, societies have protected the right to heat and light from the sun through government and legal systems. For example, the ancient Greeks and Chinese used strict land planning to orient the built environment to receive sunlight. Spanish colonies were required to orient streets to local winds and sunlight via the "Laws of the Indies." Although much of American land-use law has its origins in British common law that protects the "right to light," the right to light is not secured in the United States due to legal decisions in the 1950s (*see, e.g.*, *Fontainebleau Hotel Corp. v. Forty-five Twenty-five, Inc.*, 114 So. 2d 357 (Fla. Dist. Ct. App. 1959)). Thus there is no coherent legal basis affirming solar rights, and this situation has created a hodgepodge of local statutes with widely varying efficacy. Local jurisdictions are currently laboring to enable solar access and preserve trees without an effective national template, as evidenced by the differences between local ordinances in places like Boulder, Colorado, where a complex three-dimensional "fence" is used for access, and Berkeley, California, where state restrictions and policies must be balanced with local demands for tree preservation.

The use of trees in cities also has a long history. Today, we use trees not only for aesthetic purposes, but because large, healthy trees cool the surrounding environment and shade building envelopes, reducing energy use at no net cost. Extensive urban tree canopy can cool the surrounding area by three-to-eight degrees Fahrenheit (H. Akbari, M. Pomerantz & H. Taha, *Cool Surfaces and Shade Trees to Reduce Energy Use and Improve Air Quality in Urban Areas*, 70(3) Solar Energy 295–310 (2001)). Just one large tree casting shade on a residential building can reduce cooling energy consumption by 5–15 percent (R. Pandit & D.N. Laband, *A Hedonic Analysis of the Impact of Tree Shade on Summertime Residential Energy Consumption*, 36(2) Aboriculture & Urb. Forestry 73–80 (2009)). Tree shade prolongs street resurfacing cycles, reducing revenue requirements for infrastructure. Tree canopy also filters air pollutants—a recent study found a correlation between areas in the Midwest that lost trees to an insect pest and increased incidents of cardiopulmonary illness in those areas (G.H. Donovan et al., *The Relationship Between Trees and Human Health: Evidence from the Spread of the Emerald Ash Borer*, 44(2) Am. J. Preventive Med. 139–45 (2013)). Trees also increase property values and rents in residential and commercial areas. Cities without trees would be much less desirable places to live.

Solar Rights and Tree Rights

Currently many communities are looking to codify solar rights, and the lack of coherent protection in law creates an opportunity for professionals to help craft solar policy and design to protect both rooftop solar and trees. The typical solar industry practice to avoid tree-solar power conflicts is generally to exclude *all* trees from a defined area to prevent impeding the solar access zone (SAZ). The main reason for this "exclusion zone" is to avoid any shading of solar panels, as a small amount of shade can affect performance. On many older PV panel designs, as little as 5 percent shading on a panel can decrease performance (A. Woyte, J. Nijs et al., *Partial Shadowing of Photovoltaic Arrays with Different System Configurations: Literature Review and Field Test Results*, 74(3) SOLAR ENERGY 217–33 (2003)). New PV panel designs use technology to mitigate shading impacts, albeit at additional cost.

The solar industry prefers exclusion because in general it does not have the expertise to determine the growth rate and mature size of a plant. The difficulty for the layperson to imagine future tree growth and shading makes it logical to enact an "all or nothing" solution. This exclusion of any tree in the SAZ foregoes the many benefits that well-sited small- or medium-statured trees can provide. It is possible to eliminate an all-or-nothing solution by using good policy, planning, and design for tree selection and siting.

Trees have differential growth rates and ultimate sizes that vary by species, climate zone, planting site, care, and a host of other factors. But careful attention to species and placement—information routinely considered by tree professionals—can alleviate much of the guesswork involved. Professionals who shape the built environment with plants are able to assist in the design of SAZs to preserve solar rights and to allow for healthy tree growth. SAZs can be formalized in municipal code, enforced via covenant, required as design standards, offered as an option by developers, secured as an easement, shared as educational material, or provided as a service for private property owners.

Mandated or informal SAZs can mitigate the conflict between solar rights and tree rights. The continued growth of rooftop solar collection will soon require acknowledgment of the necessity of planning for the coexistence of rooftop solar and trees near buildings. This coexistence may soon be tested in California, where beginning in 2014, certain new construction must have a so-called solar-ready roof (Cal. Code tit. 24, § 110.10 (a) and (b)). The new code is silent on trees as obstruction, and the California Solar Shade Control Act has opted to make enforcement of the act a civil matter (Cal. Code Pub. Res. § 25983 (2007), amended 2009 by Cal. Code Pub. Res.§ 25983), which creates potential policy conflict by mandating clearance but no provision for resolution by police power. This conflict opens the door for disparate local policy and planning solutions. So-called solar subdivisions have recently popped up in some cities in California—how will tree conflicts be mitigated in a few years when normal tree growth impinges on a rooftop collector under the current law? Policies as outlined below can mitigate potential tree-solar conflicts.

Compatibility Strategies

Trees and rooftop solar collectors can be compatible provided some paradigms are changed. Currently, only about 25 percent of residential roofs in the United States are suitable to collect solar energy (P. Denholm & R. Margolis, *Supply Curves for Rooftop Solar PV-Generated Electricity for the United States*, 2008, NREL/TP-6A0-44073, National Renewable Energy Laboratory); reasons for this low percentage include poor roof or building orientation, shading by adjacent buildings, and poor tree placement. So few solar-suitable urban roofs make urban solar power that much more valuable.

Recent studies have demonstrated that maximum energy benefits are derived from trees coincidentally sited outside of solar envelopes or SAZs (D.C. Staley, *Urban Forests and Solar Power Generation: Partners in Urban Heat Island Mitigation*, 8(3) INT. J. LOW-CARBON TECH., 9 pp.), which makes reasons for policy changes regarding siting of public or private large-statured trees empirically justifiable.

Crafting parcel-scale formal SAZs or "solar safe zones" for energy generation or solar gain depends on proper species selection and siting, lot width, and building height. Small-statured trees are required in zones adjacent to buildings. More distant zones have fewer species restrictions. Urban SAZs also may need to conform to local law requiring a time period for clearance; in such cases, jurisdictions may choose to create a parcel-specific SAZ that depends on solar azimuth corresponding to local time, or lot width-specific restrictive areas corresponding to a ratio of lot size or building frontage.

Crafting street-scale SAZs—similar in concept to utility easements or front setbacks—depends on street orientation. A street-scale SAZ would restrict species selection on one side of the street to maintain solar access on that side of the street. In the case of north-south running streets, a choice must be made for which side of the street receives the solar energy. Street-scale SAZs can be implemented as overlay zoning, by-right, or as a more restrictive easement in the right of way. Street-scale SAZs may prove useful in post-disaster scenarios where a number of trees in an area suffer sudden mortality, such as by weather disasters (tornado, ice storm) or by pest (Dutch elm disease, emerald ash borer). Using an entire side of a street may help alleviate market demand for "solar gardens" in cities having little inexpensive contiguous land to dedicate to utility-scale solar generation.

Whether enforcement of SAZs is carried out via ordinance or in civil court is a matter for communities to decide. What is important, however, is that the rapid growth of urban solar energy collection is likely to conflict with urban trees. The benefits of both solar and trees are too important to deal with when trees have grown large and their loss is considerable. It is up to us to look forward to a future with solar and trees working together, and then work backward to craft policy to ensure such a vision begins today. Urban solar power and urban forests are too important to ignore their impending conflict until it is too late.

Dan Staley*'s* undergraduate education was in urban forestry at UC Davis, and his graduate education was in urban planning and urban ecology at the University of Washington. He has a small consultancy in Colorado, specializing in green infrastructure. His manual on trees and rooftop solar is due in winter 2014.

BE-AWARE OF THE DARK SIDE OF TREES

K. K. DuVivier

Everyone loves puppies, and everyone loves trees. But just as we had to learn to curb and clean up after our dogs, we now need to learn to become responsible tree owners.

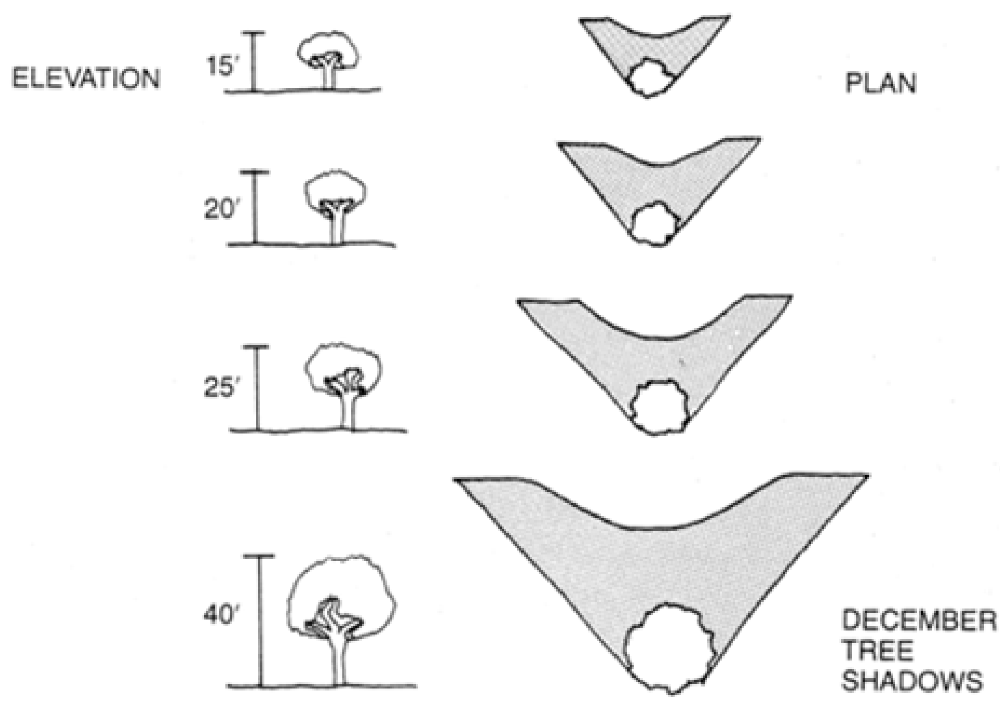
Many of today's well-intentioned tree-planting programs ignore the dark side of trees that threaten green energy solutions such as urban gardens, buildings with passive solar designs, solar hot water, and solar-generated electricity systems.

A winter limb shadow from a deciduous tree can reduce electricity production from a standard crystalline silica photovoltaic panel *30-fold* according to a 2009 study by the National Renewable Energy Laboratory. Over the course of a year, a tree shading the roof of a house can cause the loss of *ten times* the electricity generation it might save in air conditioning. Many tree varieties promoted by planting programs mature at heights that can interfere with green energy systems two and three lots to the north.

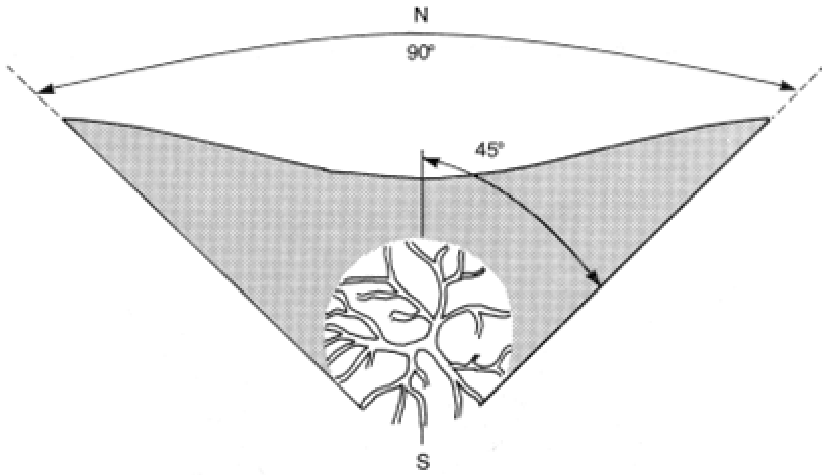
Be aware of the dark side of any tree you plant—both the planting location and the shade footprint. Otherwise, any carbon-capture gains from the new trees may be offset by the increased fossil-fuel burned to replace the clean solar energy lost.

Summary of Energy-wise Urban Tree-Planting Guidelines

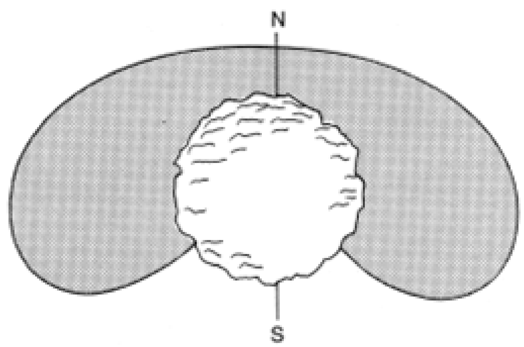
- **Pay attention to every planted tree's shade footprint.**



- **Even deciduous trees can block critical sun in the winter, so avoid planting any trees close to the south side of your house.**

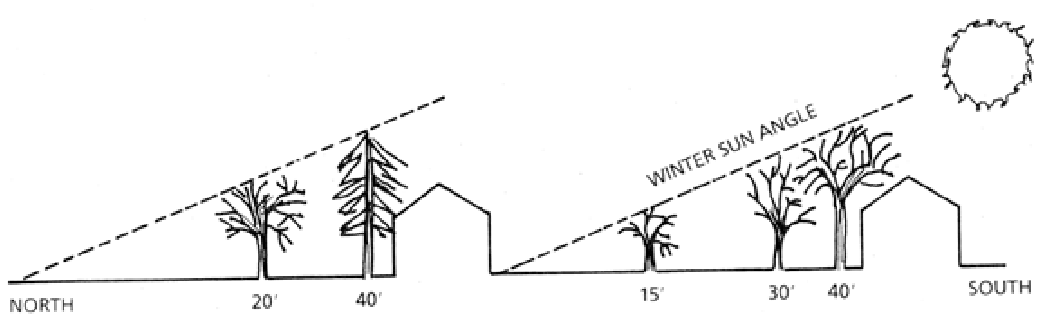


WINTER SHADOW PATTERN



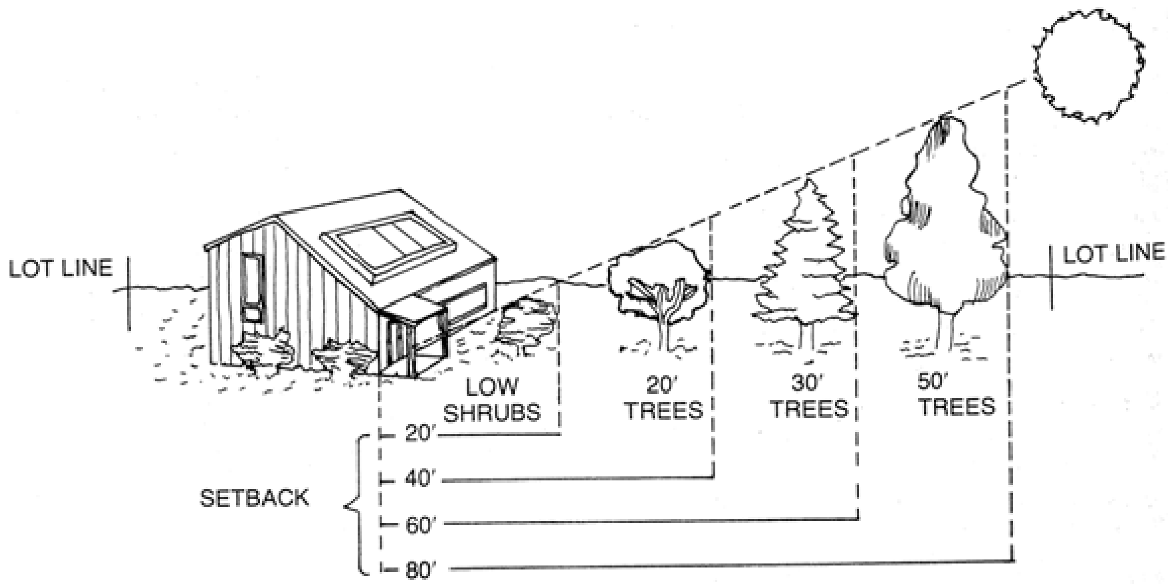
SUMMER SHADOW PATTERN

- **For trees to the north of your lot, show consideration for how your tree's mature**



A typical planting scheme to allow solar access to south walls. Site tall trees carefully.

- **Taller maturing trees need much more setback to avoid negatively impacting lots to the north. (A tree that matures at 20 feet should be set back 40 feet from the property line, and a tree that matures at 50 feet will need at least an 80-foot setback. Many urban lots are only 50 feet wide in the N-S axis.)**



Text by Professor K. K. DuVivier, University of Denver, author of *The Renewable Energy Reader* (http://www.RenewableEnergyReader.com). All graphics are illustrations by Dava Lurie from Martin Jaffe & Duncan Erley, *Protecting Solar Access for Residential Development*, U.S. Department of Housing (1979) or Duncan Erley & Martin Jaffe, *Site Planning for Solar Access*, U.S. Department of Housing (1979).