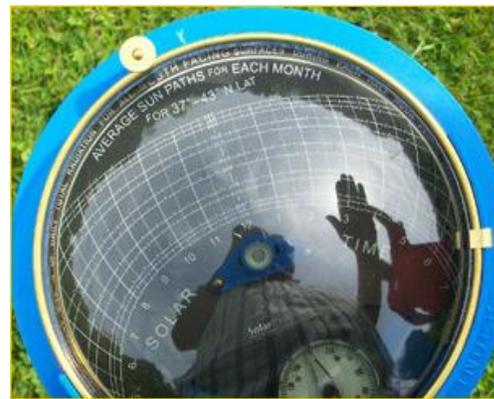


## Leasing Municipal and Private Property for Solar: Key Steps and Considerations

The domestic solar energy industry continues to grow at a staggering pace. In 2011, photovoltaic installations grew 109% over the previous year, bringing the current total of installed domestic capacity to almost 4,000 megawatts (MW) – enough solar energy to meet average demand from almost one million U.S. homes.<sup>i</sup> Such success has fueled explosive growth in employment as well, making the solar industry responsible for over 100,000 American jobs.<sup>ii</sup> The economic benefits of the precipitous rise of the solar industry, however, are not necessarily limited to businesses and employees in the solar supply chain. Innovative business models and policies have sparked project developer interest in leasing government or private property for solar farms, opening the door for local governments and property owners to share in the benefits of the solar industry’s growth. This brief explores the siting and legal factors one must consider in leasing their property for solar and provides readers with the general steps they can take to unlock this potentially lucrative new revenue stream.<sup>1</sup>



Site Assessment with a Solar Pathfinder  
 Photo courtesy of IMT Solar

### Site Selection

A key component of converting idle municipal or private property into a solar revenue generator is to conduct an assessment of these properties to determine their potential for solar development. Municipal entities with adequate in-house expertise can form committees to conduct assessments of multiple properties. Other local governments or private landowners with numerous properties should consider procuring the services of an engineering or planning consultant with solar siting experience, requesting that developers cover or reimburse these costs once lease agreements have been finalized.<sup>iii</sup> However, prospective lessors should be aware that, although a site may be perfect for solar in technical terms, policy or legal barriers may exist that prevent a developer from pursuing a lease. There are no guarantees that a deal will follow a site assessment, and local governments should make any related spending decisions with this in mind. Singular sites are typically assessed by the developer. The following list outlines some key site selection criteria that can be used to pre-screen the suitability of municipal, county, or private property for solar development.

#### Physical Characteristics

*Site Slope, Size, Shape, and Soil*

In general, photovoltaic (PV) solar energy projects are not viable on land with ground slope exceeding 10%.<sup>iv</sup>

Solar projects require an average of five acres of land for each megawatt of generation capacity.<sup>v</sup>

Sites should allow for PV systems with a generally southern orientation. Irregularly shaped parcels that preclude such an orientation are typically unacceptable.

<sup>1</sup> Readers from municipal government agencies can learn about additional potential revenue streams associated with solar in The Solar Foundation’s fact sheet, *Solar as a Revenue Generator for Local Governments*.

Ground mounted PV systems require firm, compacted soils for stability. Soft and loose soils should be avoided, as should excessively rocky soils, as these may make excavation and mounting difficult.<sup>vi</sup>

For rooftop systems, property owners should ensure roofs are structurally sound and will not require replacement in the next 15 years.<sup>vii</sup>

*Weathering and Local Climate*

Heavy rainfall or flash flooding can promote excessive erosion, posing a threat to the integrity of the system's foundation.<sup>viii</sup>

*Solar Irradiance*

A solar energy system's output increases with solar irradiance (the amount of solar energy falling on a square meter of land each day), making parcels with greater solar irradiance more desirable to developers. Tools such as the National Renewable Energy Laboratory's [PV Watts Viewer](#) can help users estimate a site's solar irradiance.<sup>ix</sup>

*Shading*

Excessive shading from vegetation or buildings can negatively impact a site's suitability for solar by reducing the system's exposure to sunlight. Visit the [Solar Pathfinder](#) site for more on the impact of shading.<sup>x</sup>

**Planning Concerns**

*Zoning and Permitting*

Check the local zoning code to see if solar energy systems are allowed as a primary or accessory use. Also review applicable standards such as setbacks and height to understand any parameters the project must meet. Requirements and fees for building and electrical permits vary by jurisdiction.<sup>xi</sup> Obtaining these permits is typically the responsibility of the developer.

*Future or Alternative Use*

Leases for solar sites typically tie up land for 15 to 20 years, impacting the potential for future use during this time period.

As solar energy projects can be very land intensive, decisions regarding land use should be made while considering other productive uses for the land. Parcels with high alternative use value (e.g., prime farmland) may not be ideal for solar development, while areas with little or no alternative use (e.g., previously contaminated lands, or "brownfields", and closed landfills) may be well-suited for solar projects. Idle roof space and the tops of parking garages or canopies present additional opportunities for solar. Additional permits may be required for facilities sited on brownfields or landfills.

**Infrastructure Concerns**

*Proximity to Grid Infrastructure*

Ensuring interconnection to the electrical grid is essential for project profitability, and therefore a key concern for developers, when the energy produced by the system is being exported to a utility under a power purchase agreement. In the case of utility-scale solar projects, proximity to an electrical substation may be preferable, as this may help reduce any technical issues associated with the solar energy system.

*Site Access*

Sites should have easily and reliably accessible roads to allow for vehicles carrying construction and maintenance supplies and equipment.

*Ensure Security*

Sites should provide adequate protection against theft and vandalism.

**Environmental Concerns**

*Impact on Natural and Cultural Resources*

Sites with high natural resource value (e.g., agricultural or forested lands) should be pursued only when the value of solar development exceeds the value of other uses. Work with local historical societies or similar groups to determine whether development is appropriate on sites with cultural or historical significance.

*Impact on Environment, Wildlife, and Habitat*

Environmentally sensitive areas and critical wildlife habitats often require additional review and permitting before development can take place. Potential site hosts should be mindful of any environmentally sensitive portions of their property and their potential for delaying or preventing project development.

## Local Government Leases

### *High Potential Sites*

In reading the site selection criteria above, one may conclude that few (if any) properties in a local government's real estate portfolio will be appropriate for hosting a solar energy system. Quite often, however, local governments find they have several sites with a high potential for solar development, including:

- Administrative Building Rooftops
- Wastewater Treatment Plants
- Municipal Airports
- School Rooftops or Grounds
- Fire and Police Station Rooftops
- Capped Landfills
- Convention and Civic Centers
- Remediated Brownfields
- Parking Garages or Lot Canopies
- City and County Parks

### *Evaluating Legal Obstacles*

Before undertaking any of the aforementioned or following activities, municipalities need to ensure that no legal obstacles exist that would hinder their ability to enter into solar lease agreements. Local government officials should seek legal advice from a qualified municipal or land use law attorney to determine what authority they possess to pursue solar leases, what state or other laws or regulations must be followed in the pursuit of these agreements, and any other specific considerations that may apply.

### *Requests for Proposals*

Once a municipality has a clear understanding of which sites under their control are appropriate for solar development, the next step is to solicit bids by issuing a Request for Proposal (RFP) for a developer who will develop, install, finance, interconnect, operate, and maintain the solar energy system and related equipment. In addition, developers should be responsible for identifying and negotiating a power purchase agreement with the entity that will buy the electricity produced by the system. In most cases, developers will also retain ownership of these systems over the term of the lease. These RFPs should be issued according to relevant state procurement processes. In addition to mandatory requirements, RFPs and any site leases eventually developed should contain the elements listed below.



Hickory Ridge Landfill in DeKalb County, Georgia  
Photo courtesy of HDR Engineering Inc.

- These documents should contain information on the term of the lease (typically 15-20 years), whether any term extensions will be offered, and when and how payments will be made. RFPs should require proposers to provide firm land lease price offers.
- Municipalities should provide potential developers with the site access required to perform site assessments and should ensure that successful proposers have the right to access the site to install, maintain, and operate a solar energy system. The city government should make it clear that it retains the right to access the site for purposes of monitoring or for any identified compatible uses.<sup>xii</sup>

- RFPs and leases should clearly state what is to become of the solar energy system at the end of the lease term. Municipalities should indicate whether or not they may wish to retain the option to purchase these systems. If not, documents should include language both instructing developers to remove the systems once the lease term has expired and requiring them to prove a financial assurance mechanism is in place to cover the costs of system removal and site decommissioning.<sup>xiii</sup>
- Developers should be responsible for obtaining any and all environmental, building, or electrical permits required, at no cost to the municipality. The same is true for any interconnection studies, approvals, permits, or agreements.<sup>xiv</sup>
- Proposals should include relevant technical design or project management documents. Examples include, but are not limited to, documents providing information on: system design and equipment specification; site plans for system layout; structural and mounting engineering studies; interconnection requirements; monitoring or control systems; proposed project schedule and milestones; site security plans; and, proof of insurance coverage.

### Kingman, Arizona

The winter of 2011 saw the dedication of a 1.22 MW photovoltaic solar energy facility and education center located on the grounds of La Senita Elementary School. The school's role in the project is limited to providing the land for the system, which the developer, UniSource Energy Services (UES), will lease for \$10,000 a year for 20 years. Rather than pursuing a lease for solar development under its own initiative, the Kingman Unified School District was approached by UES representatives, who requested the school board lease the parcel.<sup>xv</sup>

For more information, visit: <https://www.uesaz.com/News/Newsroom/Release/index.php?idRec=326>

### Boulder City, Nevada

Earlier this year, the town of Boulder City, Nevada announced that it has been able to increase its revenue by half due to the lease payments it receives from the several solar projects sited on its land. Payments on contracts with terms between 20 and 50 years will provide the town with \$480 million (about \$12 million annually) in revenue over the life of these agreements. These payments provide the potential for the town to eliminate its debt and to provide it with a significant source of revenue for the foreseeable future.

For more details, visit: <http://cleantechnica.com/2012/02/08/solar-power-to-pay-nevada-citys-debt-government-costs-for-decades/>

## Leasing Private Property



Sprawling commercial rooftops, such as those associated with warehouses and shopping centers, along with idle tracts of private property with mid- to low-alternative use value offer excellent opportunities to provide landowners with an additional revenue stream from solar development. Sites should be assessed according to the criteria discussed previously, along with roof condition in the case of rooftop installations. Though property owners can pre-screen their own property, a comprehensive assessment will be conducted by the developer.

PV array atop the Pearl Full Goods Warehouse in San Antonio, Texas

Photo courtesy of Meridian Solar, Inc.

Because solar site leases are relatively new investment opportunities, property owners often experience some difficulty in identifying developers, and vice versa. This complication has given rise to firms that specialize in connecting developers to property owners. A particularly user-friendly example is the internet-based “SEGlet.” Property owners enter information about their land or rooftop into SEGlet’s website ([www.seglet.com](http://www.seglet.com)), which then obtains the site’s solar energy generation potential and relevant climate data. Solar developers can then search for records with characteristics that meet their needs and contact property owners to express their interest. A similar service, though not solely focused on solar, is offered by the online commercial real estate service “LoopNet” ([www.loopnet.com](http://www.loopnet.com)). By creating a free profile, owners can list their property and await contact from interested developers.

As with any investment with the duration and financial magnitude of a solar site lease, property owners should seek advice from a legal or land planning and appraisal firm before entering into any legally binding agreement.

### *Essential Lease Components*

Prior to seeking legal or land planning advice, there are a few elements property owners can look for in leases to ensure they are dealing with a reputable developer or reaping the full benefits of the deal.

<i>Lease Payments</i>	Lease payments are often in the form of a fixed dollar amount per acre of land leased. Land owners can maximize the revenue received by negotiating for a “power sale revenue” payment (in addition to the per acre payment), to be triggered when a certain percentage of developer revenue from power sales exceeds the per acre lease payment. <sup>xvi</sup>
<i>Option Payments</i>	Because revenue depends on a third party to purchase the electricity generated by the system, many lease agreements have developers making payments to the landowner only once a power purchase agreement has been negotiated. However, projects can typically tie up land for an initial period of a year or more while developers negotiate power purchase agreements and obtain interconnection authorization. Land owners should seek land option payments to ensure they receive revenue during this initial period. <sup>xvii</sup>
<i>Lease Escalators</i>	The cost of living rises over time, while many lease payments remain fixed. Because lease payments are made over a 15 or 20 year period, fixed payments can have a negative impact on the actual value of the lease in the long run. As such, property owners should look for clauses that discuss whether or not lease payments increase, or “escalate,” over time.
<i>Insurance</i>	Leases should state that developers will offer property owners insurance that adequately protects them in the event of injury or property damage. <sup>xviii</sup>
<i>System Removal and Site Decommissioning</i>	Lease agreements should include language indicating that the developer is responsible for removing the system at the end of the lease (and for ensuring they are financially capable of doing so) and for returning the land to its original state.
<i>Lease Term</i>	Given the long time scale of these commitments, property owners should be careful to evaluate all long term land use options and consider any consequences a lease may have for estate planning before entering into an agreement. <sup>xix</sup>
<i>Property Tax</i>	Property owners should seek advice on the property tax implications of hosting a solar energy system. Though many states offer property tax exemptions or special assessments for solar improvements, some property owners may find themselves responsible for additional tax liability. Property owners seeking additional revenue through solar site leases should ensure rent payments are not significantly or completely offset by property tax obligations. <sup>xx</sup>

This brief is supported by the following team of organizations: ICLEI-USA; International City/County Management Association (ICMA); Solar Electric Power Association (SEPA); Interstate Renewable Energy Council, Inc. (IREC); North Carolina Solar Center (NCSC); Meister Consultants Group, Inc. (MCG); The Solar Foundation (TSF); American Planning Association (APA); and National Association of Regional Councils (NARC).

This material is based upon work supported by the U.S. Department of Energy under Award Number DE-EE0003525.

This brief was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe on privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

---

<sup>i</sup> Solar Energy Industries Association. 2012. *U.S. Solar Market Insight: 2011 Year-In-Review*. Executive Summary available at <http://seia.org/cs/research/>

<sup>ii</sup> The Solar Foundation. 2011. *The National Solar Jobs Census 2011*. Available at <http://thesolarfoundation.org/research/national-solar-jobs-census-2011>

<sup>iii</sup> Stoel Rives, LLP. 2011. *Lex Helius: The Law of Solar Energy*. Available at <http://www.stoel.com/webfiles/lawofsolarenergy.pdf>

<sup>iv</sup> Environmental Protection Agency and National Renewable Energy Laboratory. *Solar Decision Tree*. Available at

[http://www.epa.gov/oswercpa/docs/solar\\_decision\\_tree.pdf](http://www.epa.gov/oswercpa/docs/solar_decision_tree.pdf)

<sup>v</sup> Stoel Rives, LLP. 2011. *Lex Helius: The Law of Solar Energy*. Available at <http://www.stoel.com/webfiles/lawofsolarenergy.pdf>

<sup>vi</sup> Report of the Solar Siting Committee of Concord, MA. Available at [http://www.concordma.gov/pages/ConcordMA\\_Planning/Solar%20Siting%20Final%20\(10.12.2011\).pdf](http://www.concordma.gov/pages/ConcordMA_Planning/Solar%20Siting%20Final%20(10.12.2011).pdf)

<sup>vii</sup> Environmental Protection Agency and National Renewable Energy Laboratory. *Solar Decision Tree*. Available at

[http://www.epa.gov/oswercpa/docs/solar\\_decision\\_tree.pdf](http://www.epa.gov/oswercpa/docs/solar_decision_tree.pdf)

<sup>viii</sup> Pevafersa America. Available at <http://www.pevafersa-america.com/en/consumer/education/solar-farms.html>

<sup>ix</sup> National Renewable Energy Laboratory. *PV Watts Viewer*. Available at [http://mapserve3.nrel.gov/PVWatts\\_View/Viewer/index.html](http://mapserve3.nrel.gov/PVWatts_View/Viewer/index.html)

<sup>x</sup> <http://www.solarpathfinder.com/industry#i3>

<sup>xi</sup> U.S. Department of Energy. 2011. *Solar Powering Your Community: A Guide for Local Governments*. Available at

[http://www4.eere.energy.gov/solar/sunshot/resource\\_center/resources/solar\\_powering\\_your\\_community\\_guide\\_local\\_governments](http://www4.eere.energy.gov/solar/sunshot/resource_center/resources/solar_powering_your_community_guide_local_governments)

<sup>xii</sup> City of Torrington, Connecticut. Notice of Request for Proposals – Solar Photovoltaic System Installation. Available at

[http://www.torringtonct.org/Public\\_Documents/TorringtonCT\\_Bids/035B2796-000F8513.0/RFP%23SI~1.PDF](http://www.torringtonct.org/Public_Documents/TorringtonCT_Bids/035B2796-000F8513.0/RFP%23SI~1.PDF)

<sup>xiii</sup> *Ibid*

<sup>xiv</sup> Kopelman and Paige. Memorandum to Municipal Clients. Available online at <http://www.needhamma.gov/DocumentView.aspx?DID=3266>

<sup>xv</sup> Kingman Unified School District #20. Regular Governing Board Meeting. May 10, 2011. [http://www.kusd.org/board/5-10-11\\_Minutes.pdf](http://www.kusd.org/board/5-10-11_Minutes.pdf)

<sup>xvi</sup> Stoel Rives, LLP. 2011. *Lex Helius: The Law of Solar Energy*. Available at <http://www.stoel.com/webfiles/lawofsolarenergy.pdf>

<sup>xvii</sup> Personal Communication with Slater Anderson of LandVest ([www.landvest.com](http://www.landvest.com))

<sup>xviii</sup> DeSapio Law Office. <http://desapiolawoffice.com/2011/04/04/leasing-or-selling-your-property-to-a-solar-energy-company/>

<sup>xix</sup> Personal Communication with Slater Anderson of LandVest ([www.landvest.com](http://www.landvest.com))

<sup>xx</sup> Mintz Levin PC. 2011. *Rooftop Solar Leases*. Available at <http://www.mintz.com/newsletter/2011/Advisories/1357-0911-NA-cECT/web.htm>