



Best Practices in Planning and Zoning for Solar

March 22, 2022





Presenters

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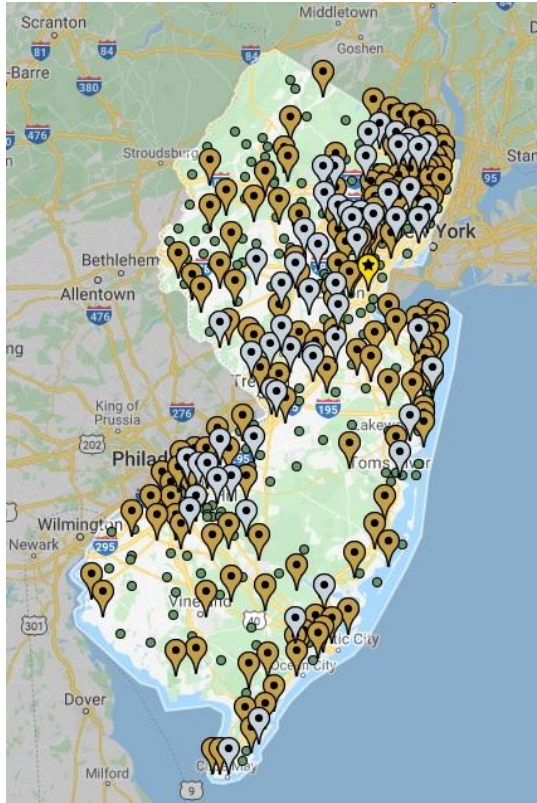
What is Sustainable Jersey?

- **Certification program** for municipalities and schools
- **Tools, resources, and guidance** to help municipalities and schools become more sustainable
- **Grants and funding** for municipalities and schools
- **Regional Hubs**

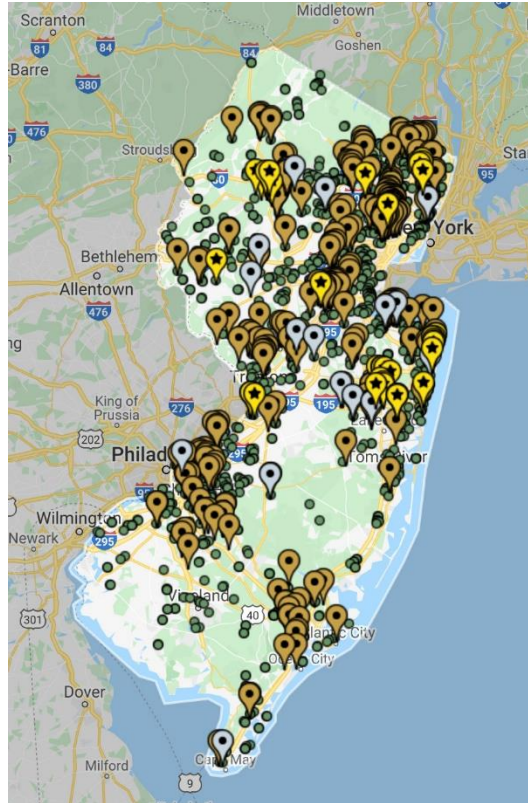




Program Participants



Municipal Program



Schools Program

Municipal Program

- 460 (81%) participating
- 219 Certified
 - 155 Bronze
 - 64 Silver

Schools Program

- 374 (54%) of school districts
- 1025 schools participating
- 335 schools certified
 - 292 Bronze
 - 43 Silver



Municipal Energy Actions

	Energy Efficiency	Renewable Energy	Alternative Fuel Vehicles
Municipal Operations	<ul style="list-style-type: none">• Energy Efficiency for Municipal Facilities• Energy Tracking and Management	<ul style="list-style-type: none">• On-Site Geothermal System• On-Site Solar System +10 pt storage/resilience + 5 pt solar thermal• On-Site Wind System• Buy Renewable Energy	<ul style="list-style-type: none">• Fleet Inventory• Purchase Alternative Fuel Vehicles• Meet Green Fleet Targets
Community Energy Use	<ul style="list-style-type: none">• Energy Assistance Outreach• Commercial Energy Efficiency Outreach• Residential Energy Efficiency Outreach	<ul style="list-style-type: none">• Make Your Town Solar Friendly• Municipally Supported Community Solar• Solar Outreach• Renewable Government Energy Aggregation (R-GEA)	<ul style="list-style-type: none">• Make Your Town Electric Vehicle (EV) Friendly• Public EV Chargers• Electric Vehicle Outreach



Make Your Town Solar Friendly

15 points

- Supportive Solar Zoning Ordinance
- Permitting Fee Ordinance with clear and favorable fees



15 points

- Streamline solar permitting processes and inspections
 - Post the permit requirements checklist online
 - Two additional activities:
 - Train first responders
 - Cross-train codes and permitting staff
 - Expedited permitting
 - Offer narrow inspection timeframe
 - Expedite or eliminate zoning review

Note: [Solsmart](#) Silver designation qualifies for 30 points for this action



SolSmart

- Points-based national designation program
- Solar planning, zoning, permitting, and outreach
- SolSmart Silver counts for Make Your Town Solar Friendly Action

Join Sustainable Jersey's SolSmart Cohort today!

To join, send email to:
czarnyz@tcnj.edu

For more information:
solsmart.org

Solar Statement to include

- Commitment to SolSmart certification
- Past solar achievement
- Solar goals
- Commitment to track solar metrics in your community



Image www.solsmart.org.



Municipally Supported Community Solar

15 points

- Municipality establishes criteria for community solar projects
- Municipality supports community solar project by acting as project ambassador or outreach partner

Or

- Municipality implements community solar education and outreach campaign

See [Community Solar: Sustainable Jersey How-to Guide](#) to learn more

For 10 additional points

- Municipality selects specific community solar projects to support
- And two of the following:
 - Serve as anchor subscriber
 - Serve as site host
 - Support workforce training program
 - Act as low- and moderate-income advocate
 - Act as residential energy efficiency advocate



Solar Outreach (Community-Led Solar Initiatives)

10 points

- Community-Led Solar Purchasing Program
 - Solarize campaign
 - Online Solar Marketplace
 - Solarize Program for Business
 - Employee Benefit Program
- For Additional 5 Points
 - Activities to Promote Solar
 - Municipal Incentives for Solar



Planning and Zoning for Solar Energy

**Sustainable Jersey
SolSmart Workshop
March 22, 2022**

**Brian Ross, AICP, LEED GA
Great Plains Institute**



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TRANSFORMING THE ENERGY SYSTEM TO BENEFIT THE ECONOMY AND ENVIRONMENT.

- INCREASE ENERGY EFFICIENCY AND PRODUCTIVITY
- DECARBONIZE ELECTRICITY PRODUCTION
- ELECTRIFY THE ECONOMY AND ADOPT ZERO- AND LOW-CARBON FUELS
- CAPTURE CARBON FOR BENEFICIAL USE AND PERMANENT STORAGE



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Agenda

1. What is SolSmart?
2. Why solar planning and zoning?
3. Principles of solar-ready communities
4. Solar Planning
5. Solar Zoning
 - a) Small-scale and Accessory Uses
 - b) Large-scale and Principal uses



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Photo credit: Flickr, NREL Pollinator

What is SolSmart?

SolSmart is a national designation and technical assistance program that helps local governments make it faster, easier, and more affordable for residents and businesses to go solar.

A SolSmart designation:

- Recognizes communities that have taken key steps to address local barriers to solar energy and foster the growth of mature local solar markets.
- Demonstrates that a community is “**open for solar business**,” making it attractive to solar companies and other business development.

SolSmart provides **targeted, no-cost technical assistance** to help communities address solar development and earn SolSmart designation.



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Acknowledgment and Disclaimer

Acknowledgment: This material is based upon work supported by the Department of Energy, Office of Energy Efficiency and Renewable Energy (EERE), under Award Number DE-EE0007155.

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SolSmart Actions

Increase transparency

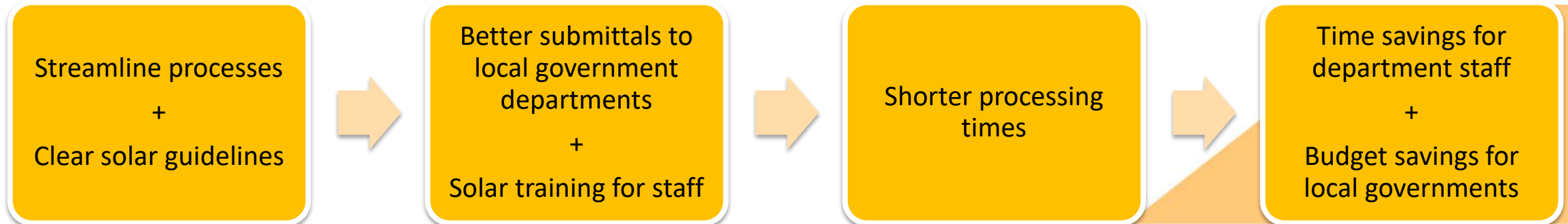
- Post a permitting checklist online
- Develop a solar landing page

Increase understanding

- Provide training on solar PV to staff working in permitting and inspection
- Train planning staff on planning and zoning best practices for solar PV

Reduce barriers

- Decrease permit turnaround time
- Codify that solar PV is a by-right accessory use in the zoning ordinance



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SolSmart – Technical Assistance for Communities



SolSmart helps communities navigate the unfamiliar ground of integrating solar land uses into local plans and regulation.

- **Best Practices.** SolSmart technical assistance providers work with elected officials, local government staff, and community members to help communities update processes (planning, zoning, and permitting) using established best practices
- **No Cost.** The technical assistance is funded by SolSmart, and there is no cost to the community
 - Communities must commit staff time to working toward SolSmart designation
 - Communities must demonstrate a commitment to achieving designation
- **Community Priorities.** Delivery of technical assistance can be tailored to fit the community needs



Technical Assistance Guides, Templates, and Resources



The SolSmart program has an extensive resource library to make the designation process as easy as possible for communities.

- ✓ The updated [program guide](#) walks through each credit of the SolSmart designation criteria. The program guide has links to templates and other resources directly relevant to each credit.
- ✓ More in-depth resources can be found on the [SolSmart Resources](#) page. Here you'll find webinars and issue briefs tagged with the specific criteria they address.
- ✓ Within the resources are several training webinars specific to the SolSmart credits. These are free and available to anyone.

The screenshot shows the SolSmart website's resource page for a webinar. The header includes the SolSmart logo, navigation links (HOW WE HELP, OUR DESIGNEES, RESOURCES, NEWS), a 'GET STARTED' button, and a search icon. The main heading is 'SOLSMART WEBINAR: PERMITTING & INSPECTION REFRESHER TRAINING' by SolSmart; Bill Brooks, P.E.; The Solar Foundation. Below this is a video player thumbnail for the webinar, dated 06/28/2020, with social media sharing icons (Facebook, Twitter, Google+, LinkedIn, Email). To the right of the video, the text 'Permitting and Inspection' is followed by a description: 'This SolSmart webinar served as a refresher on simplified solar permitting and inspection best practices for residential systems. The webinar provided attendees with a summary of procedures for reviewing permit applications, compliance documentation and requirements for system inspections. This refresher training was designed for communities who have already received P-8 or I-1 SolSmart credits.' Below this is a 'Related Criteria' section with two bullet points: 'PI-3: Train permitting staff on best practices for permitting solar PV and/or solar and storage systems. Training must have occurred in the past five years.' and 'PI-4: Train inspection staff on best practices for inspecting solar PV and/or solar and storage systems. Training must have occurred within the past five years. (Required for Silver)'. A 'VIEW RECORDED WEBINAR' button is located below the criteria. At the bottom of the page, there is a 'JOIN OUR MAILING LIST' field and a 'GET STARTED | CONTACT' link with social media icons.



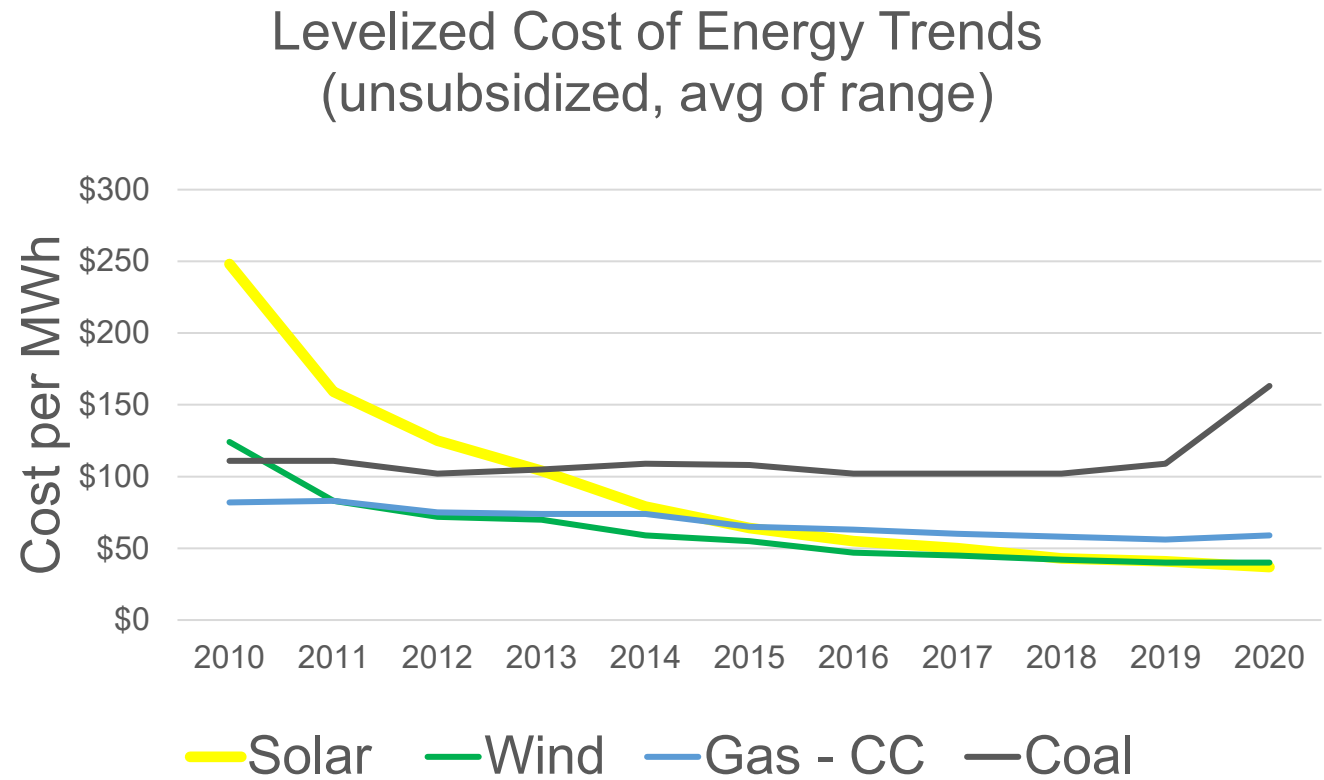
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Why? Cost...

1. Solar energy electric generation is already lower cost than fossil fuel generation.
2. With on-going cost decreases, solar energy is expected to be the cheapest form of wholesale electric energy generation, of any type, within the next few years.



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Photo credit: Brian Ross

Why? Markets

1. Large energy consumers are demanding inexpensive clean energy and are taking steps to acquire it.
2. Electric utilities are transitioning to lower cost renewable energy because new solar and wind are cheaper than the existing coal plants on their system.



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Photo credit: Brian Ross

Why? Resources...

1. Solar resources that can be economically developed can be found in every jurisdiction in New Jersey.
2. Every county and city will have property owners who will want to develop the valuable economic resources on their property.



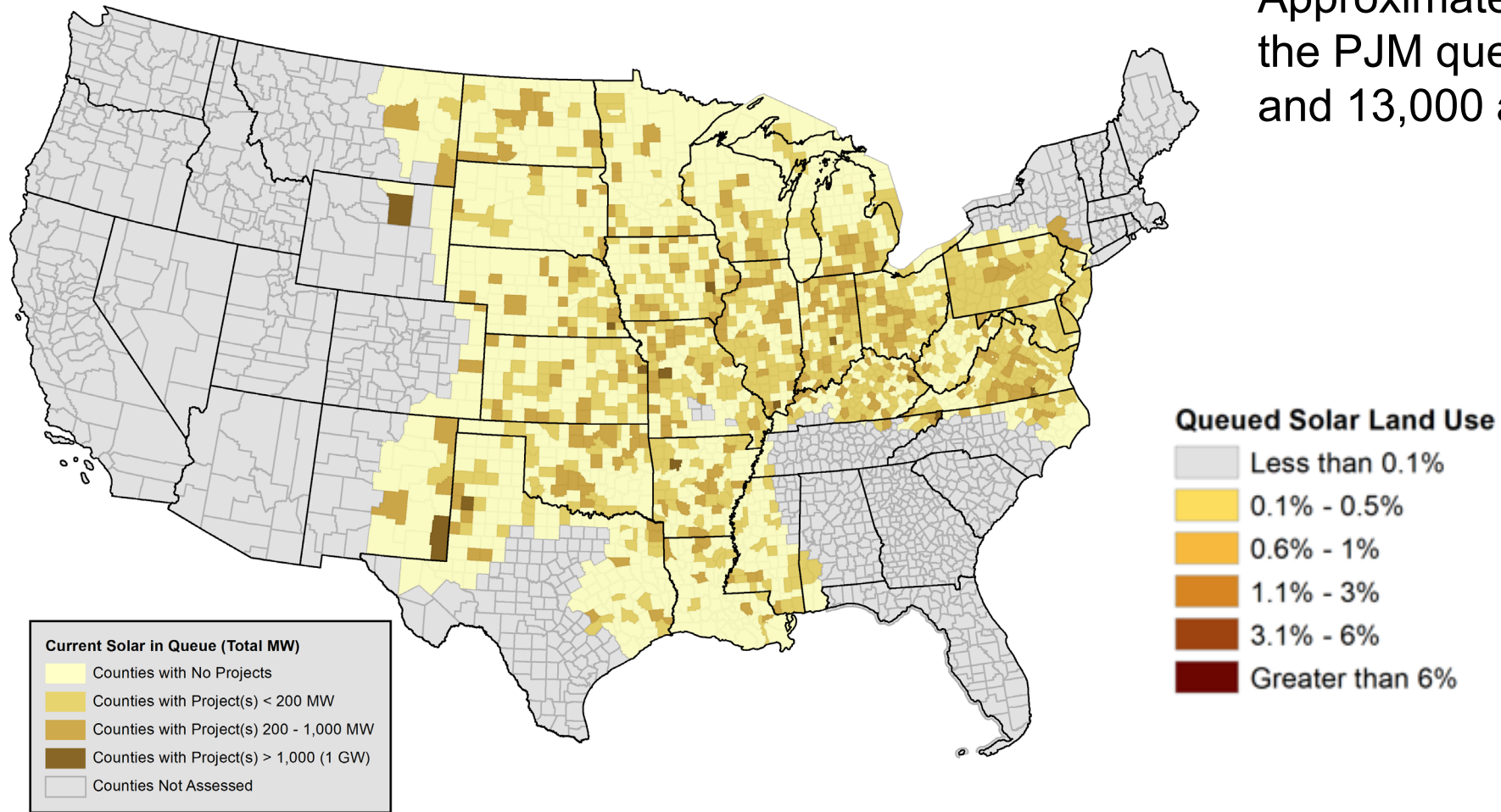
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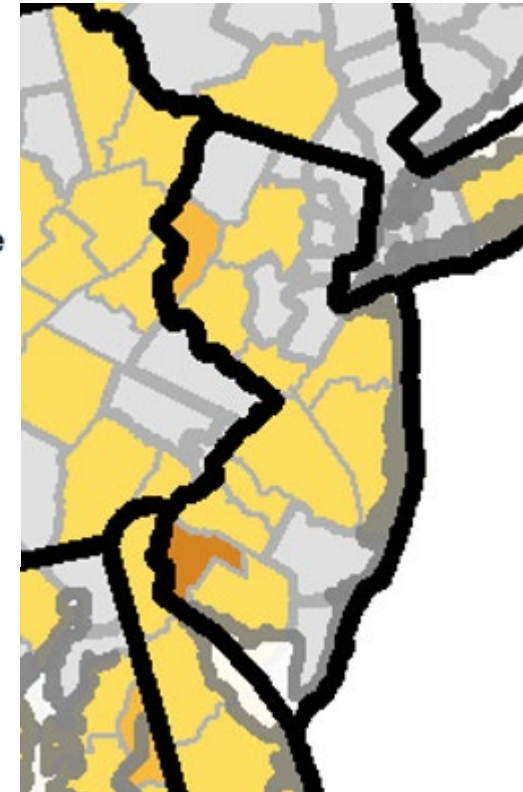
Photo credit: Brian Ross

Proposed Solar Projects



Map created by Jessi Wyatt, Great Plains Institute, 2021. Queue data for SPP, MISO, and PJM pulled April 6, 2021.
Note: queue data is frequently changing and this map reflects one snapshot in time.

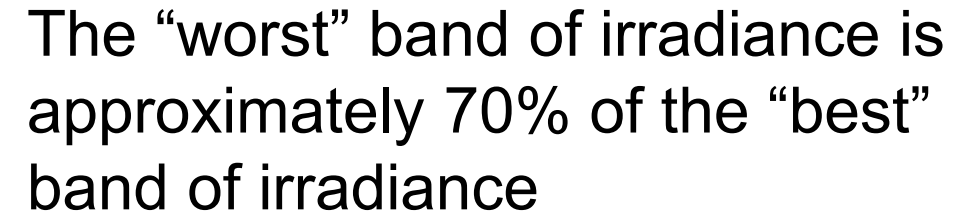
Approximately 1.6 GW of solar in the PJM queue (between 9,000 and 13,000 acres of land)



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Global Horizontal Solar Irradiance
National Solar Radiation Database Physical Solar Model

About the Data
This map provides the annual average daily global horizontal solar irradiance using 1980-2010 data (GHI v2) corrected to 0.56-degree latitude by 0.56-degree longitude intervals at 4 km (4 km).

Annual Average Daily Global Horizontal Solar Irradiance (kWh/m²/day)

5.75
5.50 to 5.75
5.25 to 5.50
5.00 to 5.25
4.75 to 5.00
4.50 to 4.75
4.25 to 4.50
4.00 to 4.25
< 4.00

A photograph of Governor Phil Murphy of New Jersey, wearing a dark suit and glasses, sitting at a desk and signing documents. Behind him are the United States flag and the New Jersey state flag. The text "Press Release" is overlaid on the left side of the image.

Press Release

Governor Murphy Signs Bills to Advance New Jersey's Clean Energy Future

07/9/2021

- ✓ Sets goals for 17 GW of solar by 2035 and 32 GW by 2050
- ✓ Grid Supply solar goal of 300 MW per year for five years
- ✓ Limits solar development on high quality farmland to 2.5% of total high-quality farmland or 5% of farmland in each county's Agricultural Development Area
- ✓ Creates dual-use (solar & agriculture) incentives
- ✓ Creates community solar (less than 5 MW) incentives

Source: State of New Jersey press release,
<https://www.nj.gov/governor/news/news/562021/20210709a.shtml>



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Principles for Solar Ready Communities

1. **Comprehensive Plans** that describe solar resources and encourage development
2. **Development Regulations** that explicitly address solar development in its varied forms
3. **Permitting Processes** that are predictable, transparent, and documented
4. **Public Sector Investment** in the community's solar resources
5. **Local Programs** to limit market barriers and enable private sector solar development



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Photo credit: Brian Ross

The background of the slide is a photograph of solar panels mounted on a structure, with yellow flowers in the foreground. The right side of the slide has a blue overlay containing text.

Principles for Solar-Ready Planning

- ✓ Identify and define solar resources,
- ✓ Acknowledge solar development benefits and desired co-benefits,
- ✓ Identify solar development opportunities and conflicts in the community,
- ✓ Set solar development targets or goals.



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Photo credit: Flickr, NREL Pollinator

Set Solar Development Targets



Like other forms of development, Plans should have targets or development goals for solar development

Hundreds of cities have set 100% clean or renewable energy goals . . .

What kind of targets make sense?

- ✓ A percentage of total electric energy use to be renewable
- ✓ A percentage of total electric energy use to be generated “in-boundary” (with solar energy)
- ✓ A target number of solar installations across the city
- ✓ A target capacity of installed solar within the city.

Set Solar Development Targets



Des Moines, IA

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Des Moines, Iowa, that the City of Des Moines updates its greenhouse gas emission goals to align with the IPCC recommendations and commits to a 45% reduction of greenhouse emissions from 2010 levels by 2030 and to reach net zero greenhouse gas emissions by 2050; and

BE IT FURTHER RESOLVED that the City of Des Moines commits to a **community-wide goal of achieving 100%, 24x7 electricity from carbon-free sources by 2030;** and

~~BE IT FURTHER RESOLVED that the City of Des Moines shall include these goals in future franchise agreements with MidAmerican and will negotiate a collaborative approach to achieving the energy goals with meaningful benchmarks and milestones between now and then.~~



Principles for Solar-Ready Zoning

- ✓ Explicitly recognize and address the different forms/uses of solar development,
- ✓ Create by-right installation opportunities,
- ✓ Set clear and predictable standards that balance solar resources and development with other resources and land uses,
- ✓ Enable capture of desired local co-benefits,
- ✓ Maintain consistency with regional best practices.



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Photo credit: Flickr, NREL Pollinator

Document Structure

- Scope
- Purpose
- Definitions
- Accessory Uses
- Principal Uses
- Conditions for Special Permits
- Solar Incentives



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Illinois Solar Model Ordinance



Photo by Katherine Chute

Prepared by Great Plains Institute



Iowa Solar Model Ordinance



Photo by Katherine Chute

Prepared by Great Plains Institute



Wisconsin Solar Model Ordinance



Photo by Katherine Chute

Prepared by Great Plains Institute



Minnesota Solar Model Ordinance



Photo by Katherine Chute

Prepared by Great Plains Institute



Model Solar Ordinance for Indiana local governments



Photo credit: Great Plains Institute

Prepared by Great Plains Institute with support
from Sunshot and the Energy Foundation

Definitions

Best practice: Define solar energy systems broadly. Differentiate based on system area (by square foot), not system capacity (kW) and rooftop versus ground-mounted systems.

Solar Energy System – A device, array of devices, or structural design feature, the purpose of which is to provide for generation or storage of electricity from sunlight, or the collection, storage and distribution of solar energy for space heating or cooling, daylight for interior lighting, or water heating.

Community-Scale Solar Energy System – A commercial solar energy system that converts sunlight into electricity for the primary purpose of serving electric demands off-site from the facility, either retail or wholesale. Community-scale systems are principal uses and projects typically cover less than 20 acres.

Solar Energy System, Large-Scale – A commercial solar energy system that converts sunlight into electricity for the primary purpose of wholesale sales of generated electricity. A large-scale solar energy system will have a project size greater than 20 acres and is the principal land use for the parcel(s) on which it is located.



Photo credit: Brian Ross, Great Plains Institute

Regulating impact, not electrons

Many communities try to regulate where electrons can flow, rather than the impacts of a solar energy system or the use of a roof or land.

Property Served: The solar energy system shall be designed to only provide energy for the property upon which it is located.

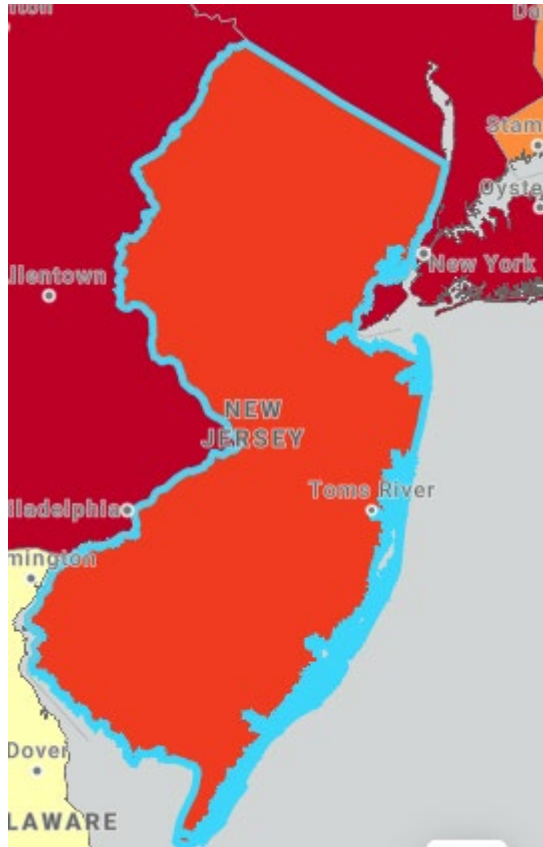
Size limited: The solar energy system shall not be sized to provide more than 100% of the on-site electric use.

This approach discourages energy efficiency, and prevents shared or community solar installations, primary use installations, and innovative utility business models, some of which are designed to extend solar benefits to low- and moderate-income households or locate PV on targeted feeders.

Small-scale and Accessory Use Solar



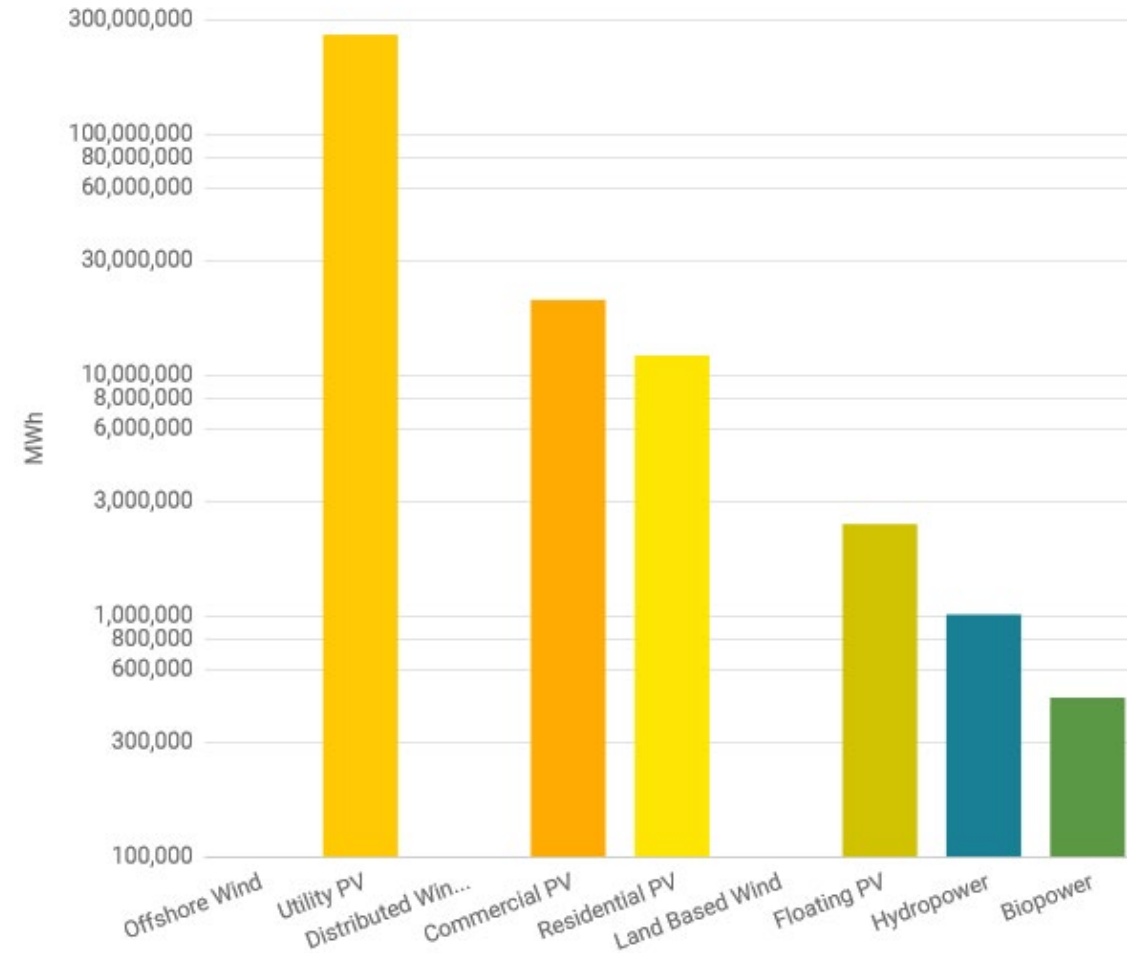
Rooftop Solar Potential



- ✓ Residential
12,095,370 MWh
- ✓ Commercial
20,597,980 MWh

National Renewable Energy Laboratory. "Commercial Rooftop PV," *State and Local Planning for Energy*, accessed 3/21/2022, <https://gds.nrel.gov/slope>.

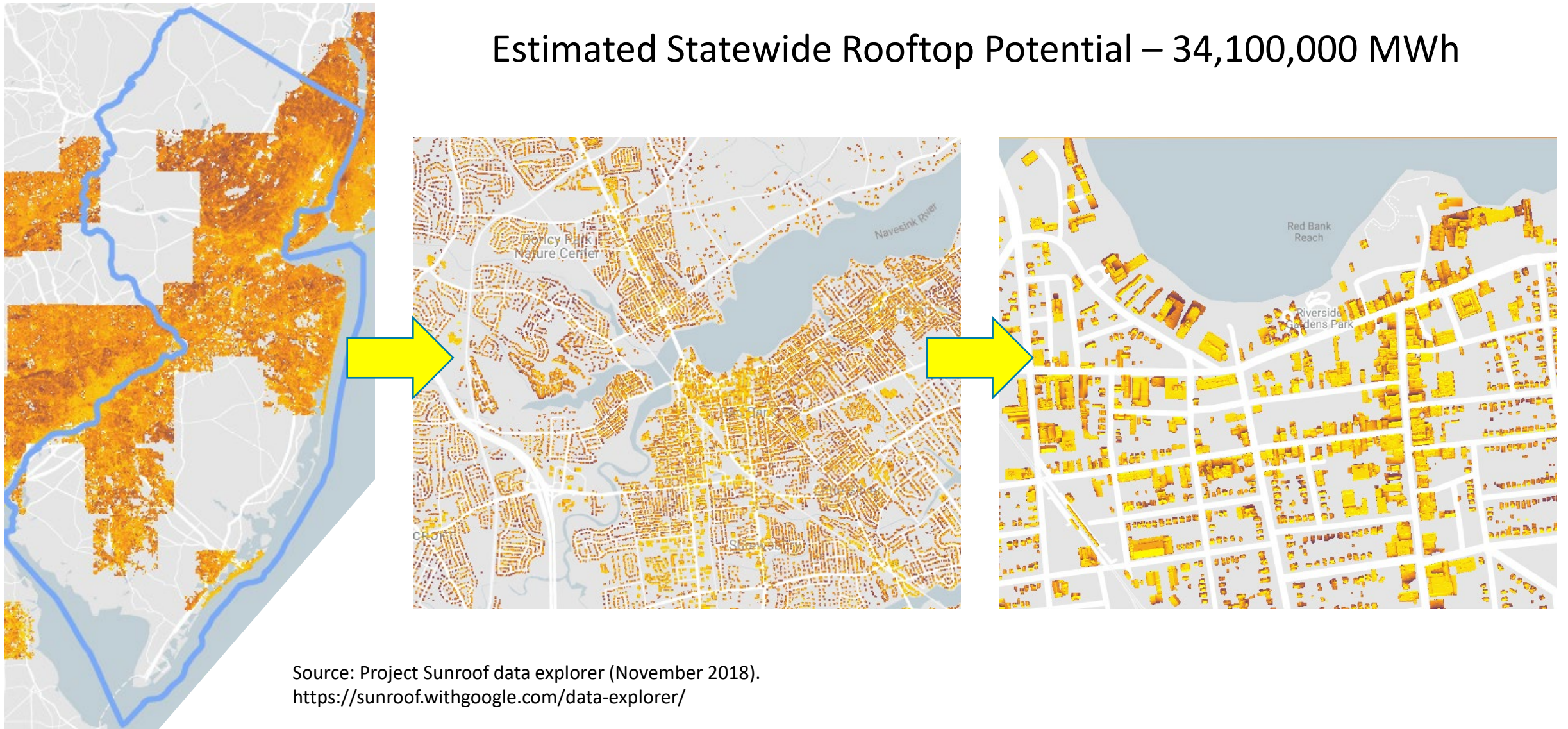
Technologies



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Estimated Statewide Rooftop Potential – 34,100,000 MWh



Source: Project Sunroof data explorer (November 2018).
<https://sunroof.withgoogle.com/data-explorer/>



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Zoning best practices for small-scale solar



Define terms	Include storage and solar hot water heating installations in the definition of “solar,” differentiate by systems by area and rooftop versus ground-mounted
By-right accessory use	Allow small rooftop and ground-mounted PV in all major zoning districts
Height	Allow rooftop solar an exemption from or allowance above building height restrictions
Accessory uses	Exempt solar from counting toward accessory uses maximum
Aesthetic requirements	<ul style="list-style-type: none"> • Exempt solar from rooftop equipment screening requirements • Allow PV installations to be seen from public roadways • Limit screening or aesthetic requirements to historic districts
Ground -mounted	<ul style="list-style-type: none"> • Include small ground-mounted systems as accessory structures • Require conditional use permit for principal use, ground-mounted systems
Lot coverage	Exempt ground-mounted solar from lot coverage restrictions that apply to buildings
Setbacks	Avoid applying principal building setbacks
Roof coverage	Address fire code setback requirements in coordination with fire officials
Glare	Glare studies not needed unless solar is on or adjacent to airport, in which case it will be regulated by FAA, not the local jurisdiction
Regulate based on impact/area	<ul style="list-style-type: none"> • Not capacity (kW) as efficiencies and technologies change over time • Not where energy is used (e.g. on-site) as it has no bearing on the impact

Height

Best practice: Exempt roof-mounted solar energy systems on flat roofs, similar to other function devices and equipment, from height calculations or allow systems to exceed the maximum height by a fixed amount (5 to 10 feet).

Model Ordinance Example

Height Standard for Rooftop Systems

For purposes for height measurement, solar energy systems other than building-integrated systems shall be given an equivalent exception to height standards as building-mounted mechanical devices or equipment.



Furniture factory in Gardner, Massachusetts, Photo: Bill Eager
NREL Image Library 00566

Setbacks

Best practice: Allow ground-mounted solar energy systems the ability to have a modest encroachment into the setback, similar to other mechanical systems.

Model Ordinance Example

Ground-mounted solar energy systems may not extend into the side-yard or rear setback when oriented at minimum design tilt, except as otherwise allowed for building mechanical systems.



Lot coverage, impervious surface

Best practice: Exempt ground-mounted systems from lot coverage/impervious surface calculations as long as the ground beneath the system is pervious (e.g. vegetated).

Model Ordinance Example

1. Ground-mounted systems shall be exempt from lot coverage or impervious surface standards if the soil under the collector is maintained in vegetation and not compacted.
2. Ground-mounted systems shall not count toward accessory structure limitations.
3. Solar carports in non-residential districts are exempt from lot coverage limitations.



Aesthetics

Best Practice:

- Exempt solar from rooftop equipment screening requirements
- Allow PV installations to be seen from public roadways
- Limit screening or aesthetic requirements to historic districts



Northeast Denver Housing Center's Whittier Affordable Housing Project
Source: NREL/DOE Image 19188

Model Ordinance Example

Solar energy systems in residential districts shall be designed to minimize visual impacts from the public right-of-way. . . to the extent that doing so does not affect the cost or efficacy of the system.

Roof-mounted systems on flat roofs that are visible from the nearest edge of the front right-of-way shall not be more than five feet above the finished roof and are exempt from any rooftop equipment or mechanical system screening.

Historic and Special-use Districts

Best practice: Provide guidance about how systems can be installed while still preserving historic character.

Model Ordinance Example

Historic Buildings - Solar energy systems on buildings within designated historic districts or on locally designated historic buildings (exclusive of State or Federal historic designation) must receive approval of the community Heritage Preservation Commission, consistent with the standards for solar energy systems on historically designated buildings published by the U.S. Department of Interior.



Place collectors to avoid obscuring significant features or adversely affecting the perception of the overall character of the property.

Source: Plano, TX Downtown Heritage Resource District Design Standards



West Windsor, NJ



What is required for a PV application?

Residential roof-mounted PV solar systems require the following Prior Approval(s) in West Windsor Township. Evidence of these approvals, in paper form, must be included with the Construction Permit Application for the proposed work.

ZONING APPROVAL - Contact the West Windsor Township Land Use Division for questions on the Zoning permit application process.

- Phone inquiries - **609-799-9448**
- Email inquiries – LandUse@WestWindsorTWP.com

Required Zoning Permit Application Documents

- Zoning Permit Application
- \$35 Application fee [check (made out to the "Township of West Windsor") or cash]
- (3) Copies of a Survey showing location of the rooftop panels
- (2) Sets of the Design Plans
- **HOA APPROVAL** – If the residence is under the purview of an HOA, the HOA's written approval of the proposed project must be submitted along with the Zoning Permit Application.

Zoning Permit Application forms may be found on the Township Website:

Website – www.WestWindsorNJ.org

- Select – Departments
- Select – Land Use Planning / Zoning
- Select – Zoning Forms



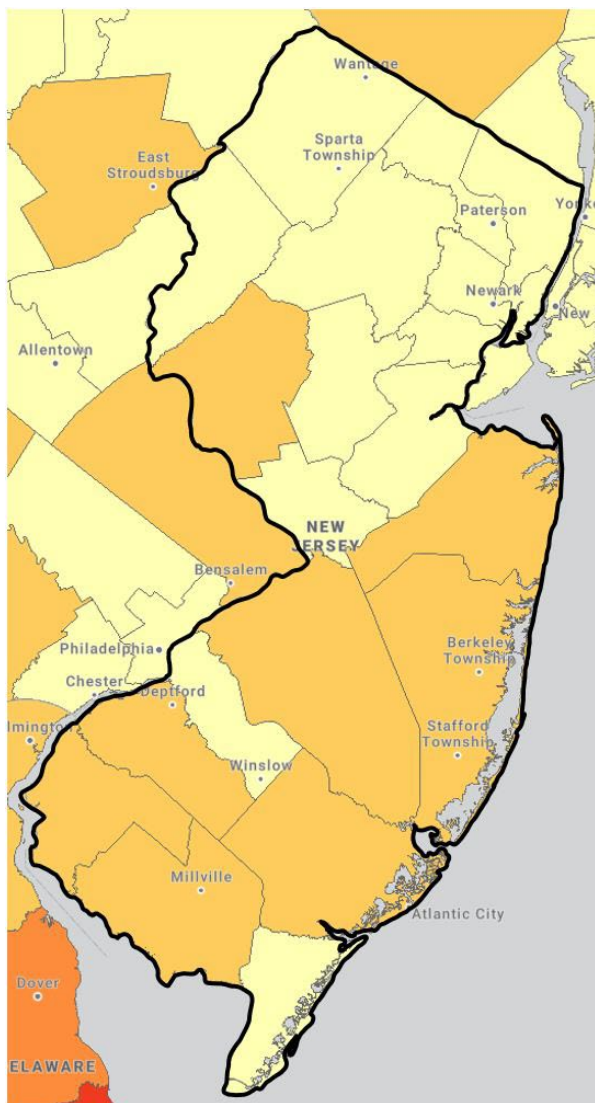
Large-Scale and Principal Use Solar



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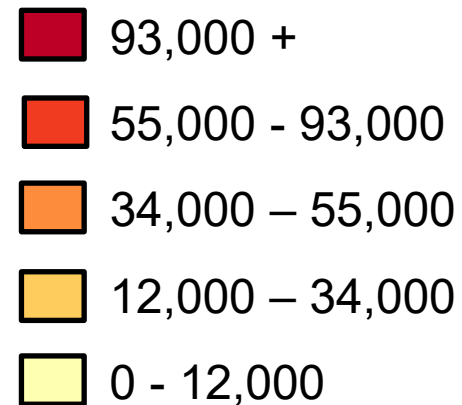




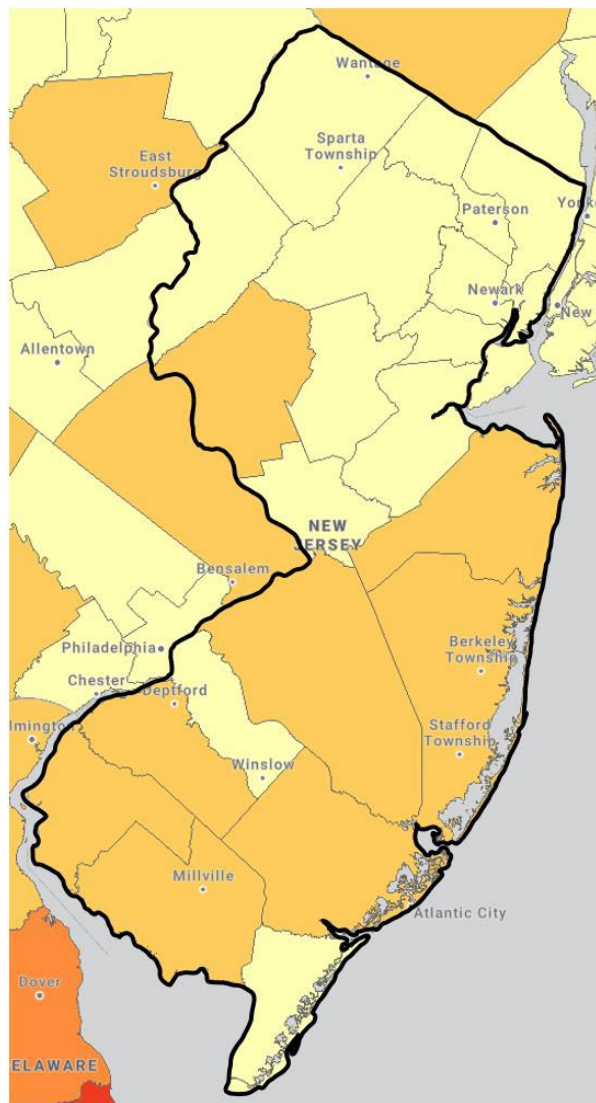
National Renewable Energy Laboratory. "Utility PV," *State and Local Planning for Energy*, accessed 3/15/2022, <https://gds.nrel.gov/slope>.

Every community in New Jersey has an economically viable solar “reserve” for development. The total “solar energy reserve” for large-scale projects is over three times the total electric energy use in the state...

Potential GWhs

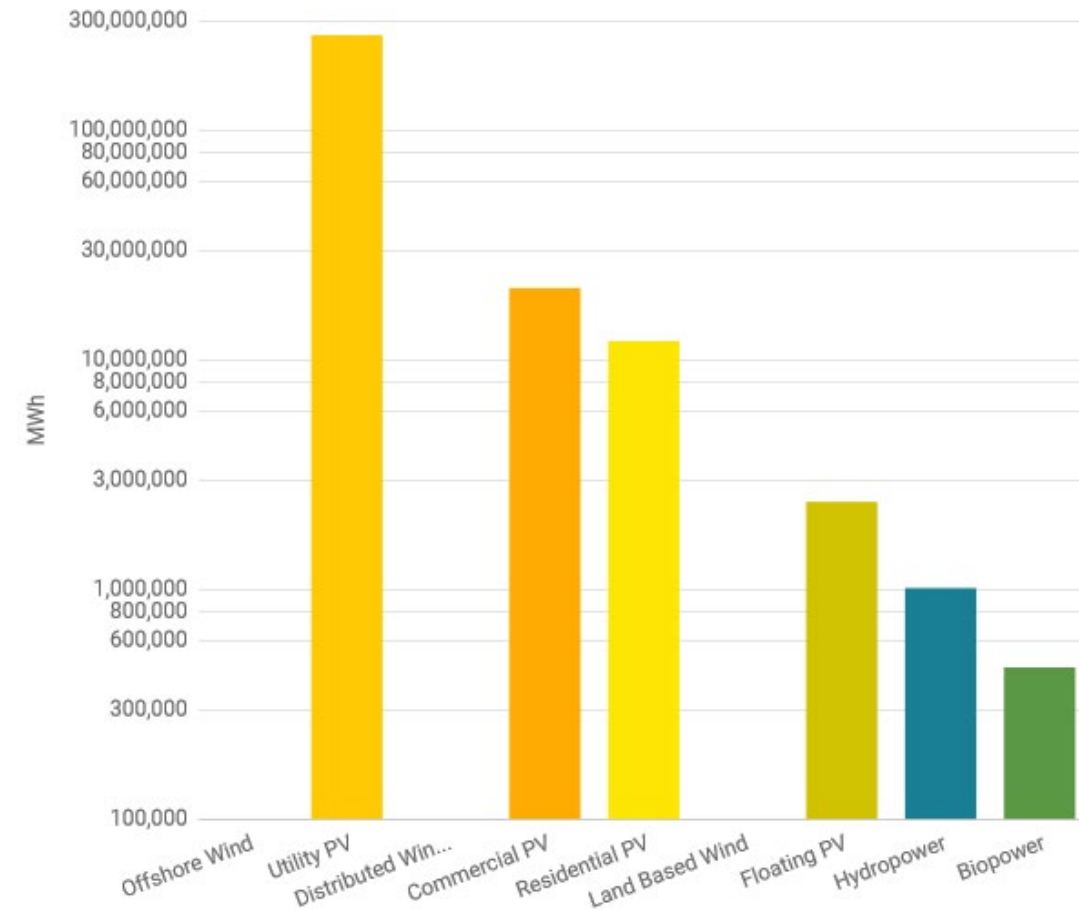


Large-Scale Solar Potential



- ✓ Utility-scale Potential 259,576,060 MWh
- ✓ Total annual electric use 80,558,497 MWh

Technologies



National Renewable Energy Laboratory. "Utility PV," *State and Local Planning for Energy*, accessed 3/15/2022, <https://gds.nrel.gov/slope>.



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Zoning best practices for large-scale solar

Define Terms	<ul style="list-style-type: none"> • Define large-scale solar as a unique land use (not an industrial land use), • Include storage in the definition of large-scale solar • Distinguish between small and large systems by area as needed
Enable Development	Most large-scale solar will be a conditional or interim use in those districts where allowed, although small or community scale development can be a permitted use
Land Use, not Energy Use	Performance or design standards should focus on land use impacts and benefits, not on energy use or performance
Recognize land use differences	<ul style="list-style-type: none"> • Exempt PV panels from coverage limits • Exempt PV panels from impervious surface standards if ground cover is suitably pervious (see co-benefits below)
Capture Co-Benefits	<ul style="list-style-type: none"> • Enable habitat-friendly ground cover to be installed, established, and maintained • Enable co-location of agricultural uses (sometimes in place of ground cover) • Enable water quality (surface and ground water) improvements
Screening requirements	<ul style="list-style-type: none"> • Look to existing screening requirements as a guide, consistency across land uses • Limit screening to residential districts or existing uses • Balance screening against larger setbacks, both are not necessary
Setbacks	<ul style="list-style-type: none"> • Look to existing setback distances as a guide • Balance setbacks with screening requirements (more screening, less setback) • Measure setbacks from array edge
Glare	Glare studies only needed if adjacent to an airport. On-airport solar will be appropriately regulated by FAA
Decommissioning	Require decommissioning to a reasonable standard and financial risk

Siting Elements

Community-Scale Solar

- Fewer than 30 acres (5 MW)
- Permitted by-right in certain districts and through a conditional use permit in other non-residential districts

Large-Scale Solar

- Principal use solar over 30 acres
- Permitted through a conditional use permit in select districts, subject to Statutory limitations

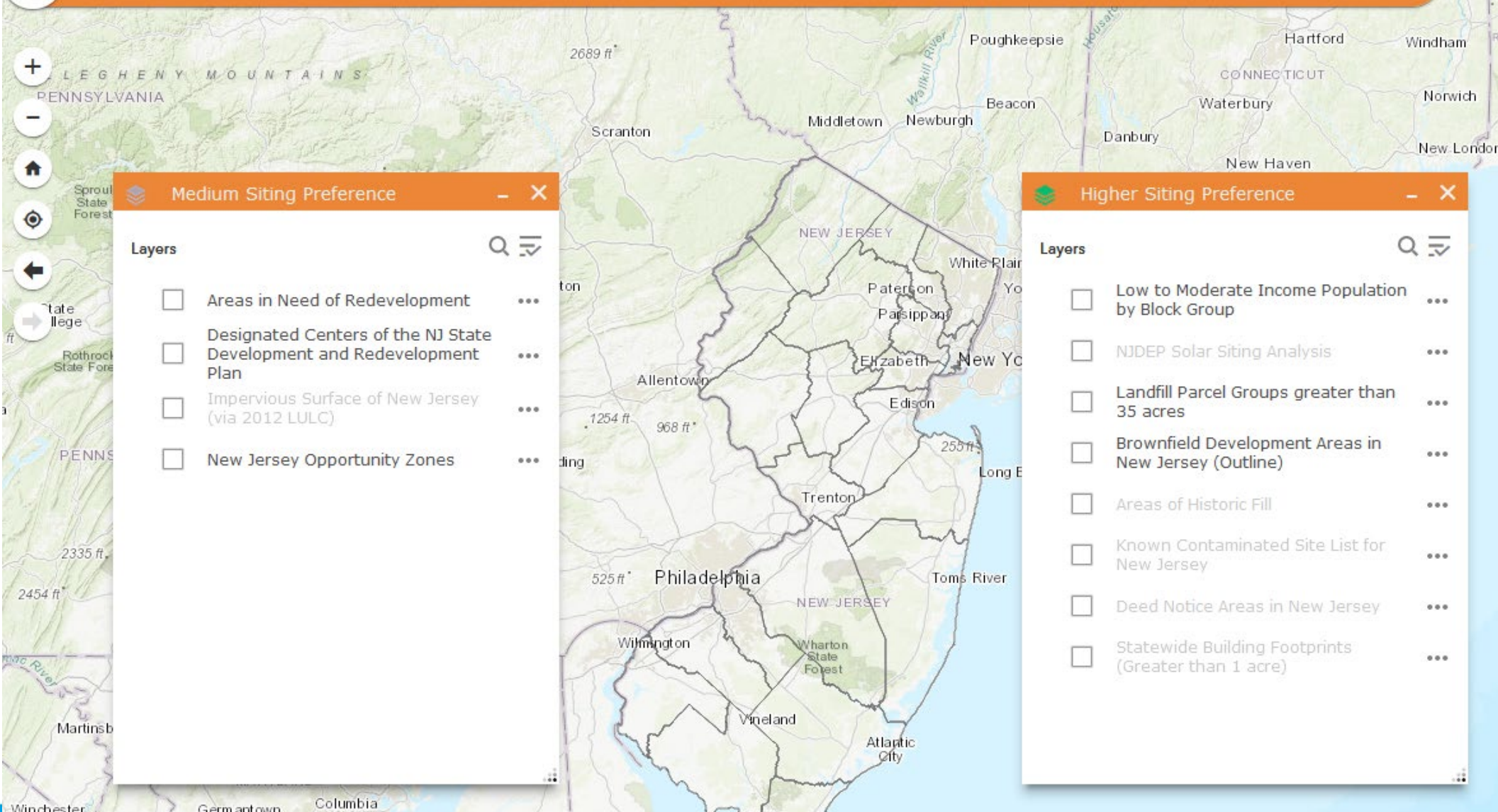


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Photo credit: Brian Ross



Source: New Jersey Bureau of Climate Change and Clean Energy
<https://njdep.maps.arcgis.com/apps/webappviewer/index.html?id=c3a9466eb7e54badbb41a90794bd0349>



Site Design Elements

- Setbacks
- Screening
- Ground cover and buffer areas
- Power and communication lines
- Fencing



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Photo credit: Brian Ross

Setbacks

- Property line
- Roadways
- Specific land uses, such as non-participating dwelling units
- Other features such as natural areas, commercial uses, recreation areas.



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Photo credit: Brian Ross

Setbacks

1. Property line setback from a non-participating landowner's property line must meet the established setback for buildings or structures in the district in which the system is located, except as otherwise determined in 1.a.5 below.
2. Roadway setback of 50 feet from the ROW of State highways and County and State Aid Highways (CSAHs), and 40 feet for other roads, except as otherwise determined in 1.a.5 below.
3. Housing unit setback of 150 feet from any existing dwelling unit of a non-participating landowner, except as otherwise determined in 1.a.5 below.
4. Setback distance should be measured from the edge of the solar energy system array, excluding security fencing, screening, or berm.
5. All setbacks can be reduced by 50%, except that unwaived setbacks cannot be less than 30 feet, if the array has a landscape buffer that screens the array at the setback point of measurement.

Appropriate Setbacks

The community should consider balancing set-back requirements and screening requirements for principal use solar. Since the primary impact to neighbors of large-scale solar is visual, screening becomes less useful, as the setbacks get larger (and vice versa). . . .

Excessive setbacks that are unique to solar land uses, or that are designed for land uses with health and safety or significant nuisance risks such as industrial uses or animal agriculture, are unjustified given the low level of risk or nuisance posed by the solar array.



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Screening

- Use existing screening standards as your benchmark
- Consider the screening circumstances
- What is the relationship between screening and setbacks?
- Avoid arbitrary standards



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Photo credit: Brian Ross

Screening

1. A landscape plan shall be submitted that identifies the type and extent of proposed buffer and screening. Vegetation or another type of buffer can be proposed.
2. Screening shall be consistent with Model Community's screening ordinance or standards typically applied for other land uses requiring screening.
3. Screening shall not be required along highways or roadways, except as provided in 4. below, or along property lines within the same zoning district, except where the adjoining lot has an existing residential.
4. Model Community may require screening where it determines there is a clear community interest in maintaining a viewshed.

Screening

The community should consider limiting screening of community- or large-scale solar to where there is a visual impact from an existing use, such as adjacent residential districts or uses. Screening standards should be consistent for solar with other land uses that have screening requirements. Solar energy systems may not need to be screened from adjacent lots if those lots are in agricultural use, are non-residential, or have low-intensity commercial use.



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Ground Cover

- Visual impacts
- Water quality (surface and groundwater)
- Soil health
- Habitat
- Carbon sequestration



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Photo credit: Brian Ross

Site Design for Co-Benefits

Ben Ross

Importance of Ground Cover

Establishing and maintaining regionally appropriate ground cover creates important co-benefits to the community and the property owner. Grasses can be harvested for forage and wildflowers and blooming plants can create pollinator and bird habitat, and maintaining the site in vegetation will build soils that can be turned back into agriculture at the end of the solar farm's life.

If appropriately established, these ground cover standards also likely reduce maintenance costs and limit the need for chemical weed management, which also improves water quality outcomes.

Ground Cover and Buffer Areas

- Pollinator- or habitat-friendly ground cover must be **planted, established, and maintained** for the life of the solar project.
- **Tie the ground cover requirement** to pollinator-friendly vegetative ground cover standards have been developed for many states, designed for appropriate eco-systems, soils, and habitat.
- Allow or encourage **co-location of agricultural uses**, provided the ground cover standards are managed.
- Exempt pollinator-friendly compliant sites from **post-construction stormwater management controls**

Stormwater Standards

Solar panels not included in certain calculations relative to approval of subdivisions, site plans.

- An ordinance requiring approval by the planning board of either subdivisions or site plans, or both, shall not include solar panels in any calculation of impervious surface or impervious cover. As used in this section, "solar panel" means an elevated panel or plate, or a canopy or array thereof, that captures and converts solar radiation to produce power, and includes flat plate, focusing solar collectors, or photovoltaic solar cells and excludes the base or foundation or the panel, plate, canopy, or array.
- Source: State of New Jersey's Municipal Land Use Law 40:55D-38. I:



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Photo credit: Brian Ross

PV-SMaRT Project

National study to identify post-construction stormwater management solar best practices.

1. Measure and model infiltration and runoff under a variety of real world conditions in five states across the country.
2. Evaluate current stormwater and water quality standards for solar
3. Create solar-specific compliance pathways for water quality regulation



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Photo credit: Jenna Greene, GPI

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September 2021

Photovoltaic Stormwater Management
Research and Testing (PV-SMaRT)
Barriers and Best Practices



<https://www.betterenergy.org/wp-content/uploads/2021/10/PV-SMaRT-Barriers-and-Best-Practices.pdf>

<https://www.nrel.gov/solar/market-research-analysis/pv-smart.html>

Photo from Great Plains Institute by Katharine Chute

Interim Best Practices For Regulators

Create green infrastructure best practices for solar projects, recognizing conditions that maximize water quality performance and provide co-benefits after meeting required mitigation for post-construction design storms. . .

Create co-benefit value by quantifying water quality benefits that exceed design storm minimums or improve water quality outcomes from existing land use. Alternatively, a quantified benefit can be incorporated into a value-added component to the energy off-taker, as with renewable energy credits.

Other Principal Use Elements

- Interaction with other land uses, resource priorities
 - ✓ Airports
 - ✓ Water quality
 - ✓ Natural systems
 - ✓ Agriculture
 - ✓ Growth management
- Other codes and standards
- Decommissioning



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Photo credit: Flickr, NREL Pollinator

Site Design for Co-Benefits

Agricultural Protection

The agricultural protection section applies only to those communities that have adopted agricultural protection standards in their development regulations that apply to multiple types of development. In those instances, this provision applies those same standards to solar development. The ordinance language is written for a community that requires assessment of soils, but not necessarily protection of those soils. Communities should carefully evaluate to what degree solar development should be subject to the community's agricultural protection standards.

- **Agricultural Protection** – Large- and community-scale solar projects must comply with model community's site assessment standards for identifying agricultural soils. Model Community may require mitigation for use of prime soils for solar array placement, including the following:
 - a) Demonstrating co-location of agricultural uses (agrivoltaics) on the project site.
 - b) Using an interim use or time-limited Conditional Use Permit (CUP) that allows the site to be returned to agriculture at the end of life of the solar installation.
 - c) Locating the project in a wellhead protection area for the purpose of removing agricultural uses from high risk recharge areas.
 - d) Using pollinator-friendly ground cover, as defined in Section III.

A grid supply solar facility or net metered solar facility greater than five MW in size shall not be sited on:

- 1) land preserved under the Green Acres Program;
- 2) land located within the preservation area of the pinelands area;
- 3) land designated as forest area in the pinelands comprehensive management plan;
- 4) land designated as freshwater wetlands or coastal wetlands;
- 5) lands located within the Highlands preservation area;
- 6) forested lands . . .; or
- 7) prime agricultural soils and soils of Statewide importance, which are located in Agricultural Development Areas, in excess of the Statewide threshold of 2.5 percent of such soils . . .



Conditions for Special Permits, Solar Incentives

- Planned Unit Development or other flexible regulation
- Solar-ready or solar-actual as a condition for special use permits
- Solar access protections or solar easements
- Linking economic development assistance to desired solar outcomes



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THANK YOU

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- SolSmart Silver counts for Make Your Town Solar Friendly Action

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**For more information:
solsmart.org**

Solar Statement to include

- Commitment to SolSmart certification
- Past solar achievement
- Solar goals
- Commitment to track solar metrics in your community



Image www.solsmart.org.



Online Solar Permitting Tool



- Developed by National Renewable Energy Laboratory (NREL)
- Free for municipalities
- Automated plan review, code compliance check
- Online fee payment
- Can reduce permitting time by 5-10 days

solarapp.nrel.gov/

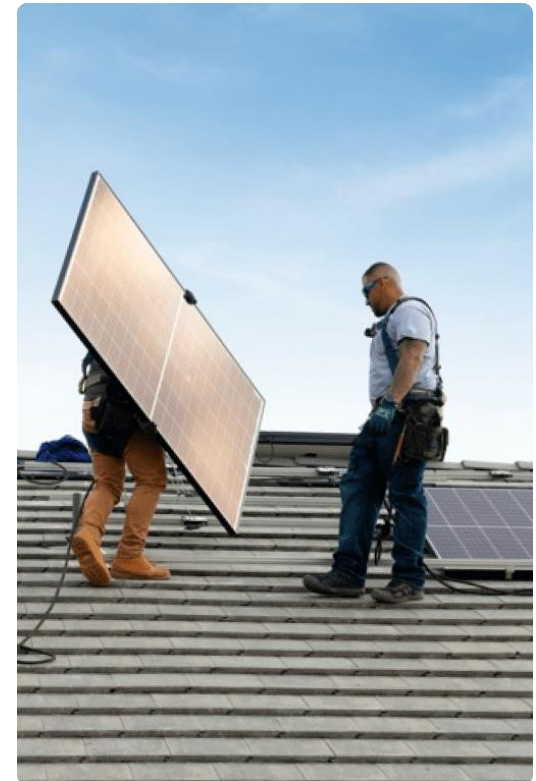


Image from NREL. solarapp.nrel.gov



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Questions?

Contact Brandon Rothrock at
rothrocb@tcnj.edu





Upcoming Webinars

- **A World of Difference: Green Infrastructure Resources for Your Town**
 - March 22, 2022, 5:30 pm to 7:00 pm
- **Preparing for the Statewide Single-Use Plastic Ban**
 - March 23, 2022, 7:00 PM to 8:00 PM
- **What's New in 2022? Program Updates Webinar**
 - March 28, 2022, 12:00 PM to 1:30 PM
- **Accelerating the Electric Vehicle Transition with Outreach in Your Community**
 - April 5, 2022, 1:00 – 2:30pm



Madison Ride and Drive

Source: Madison's Make Your Town EV Friendly Submission



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Thank You!

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