Solar-Ready Communities: The National SolSmart Program

Sponsored by the Southwestern Pennsylvania Commission, Water Resource Center

Water Resource Center
Southwestern Pennsylvania Commission

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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

- ✓ Pennsylvania's Energy Future and Community Planning
- ✓ What is SolSmart?
- ✓ Designation Structure, Program Details, Technical Assistance to Communities
- ✓ Community Planning and Zoning Examples

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Leaders at the Core of Better Communities

Photo credit: Brian

First, a Summary . . .

1. The transition to a clean energy system is accelerating.
2. In the future clean energy system, every community will be a host community.
3. Solar development, like all development, presents opportunities and potential risks.
4. **The National SolSmart Program** provides a pathway for host communities to enable solar development consistent with community priorities, resources, and development plans.

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Pennsylvania's Energy Future and Community Planning

Front Line Communities in the Clean Energy Transition

Transforming our energy system has community impacts

- **Looking backward…** Mitigate the impacts of transforming historic fossil fuel economies, resource areas, community infrastructure and culture as we move toward a clean energy future.

- **Looking forward –** Mitigate the impacts for the host communities for our new energy system, who also have established and valuable economies, resources, and cultures

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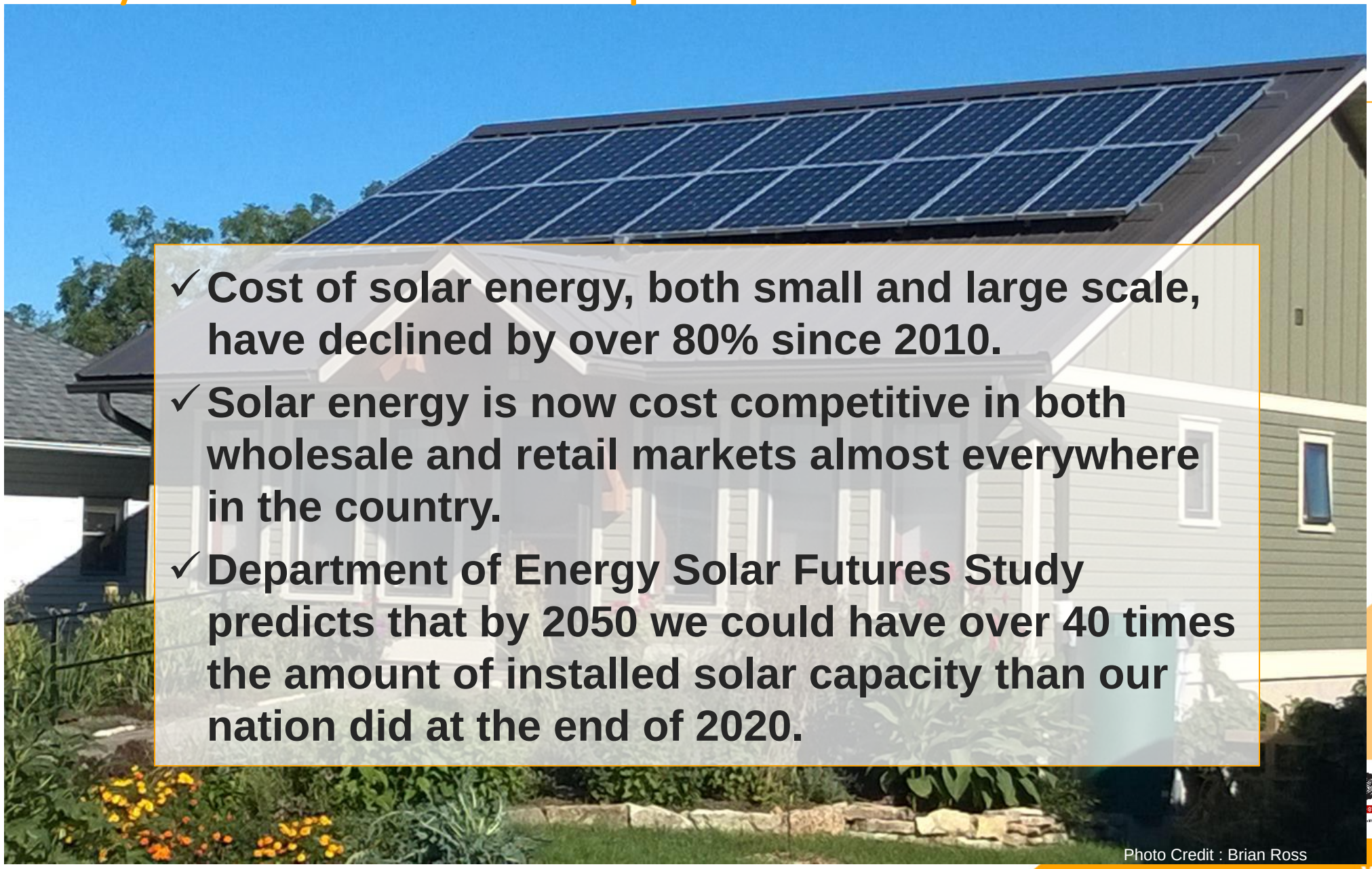
Why Plan for Solar Development?



- ✓ **Cost of solar energy, both small and large scale, have declined by over 80% since 2010.**
- ✓ **Solar energy is now cost competitive in both wholesale and retail markets almost everywhere in the country.**
- ✓ **Department of Energy Solar Futures Study predicts that by 2050 we could have over 40 times the amount of installed solar capacity than our nation did at the end of 2020.**

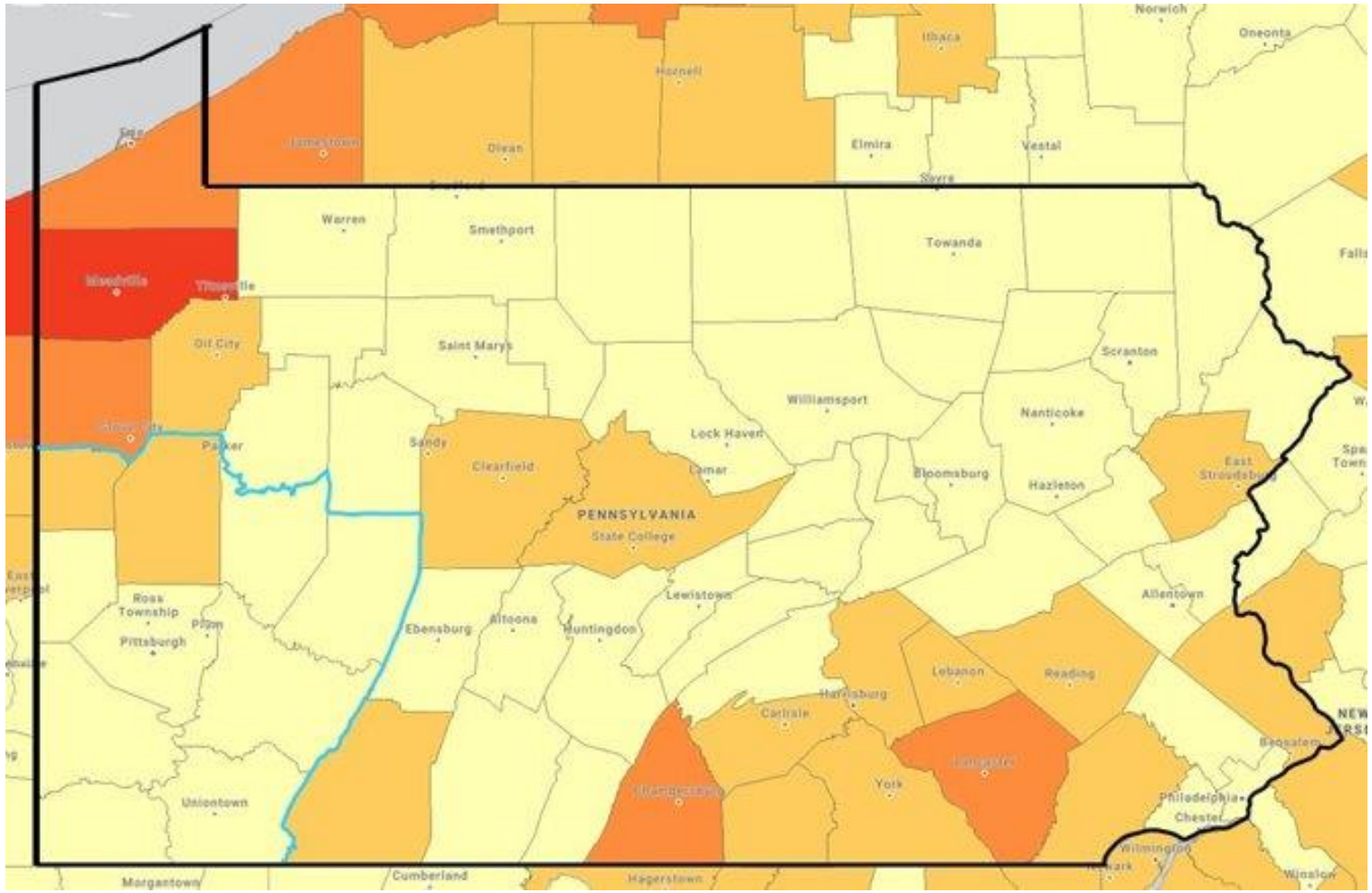
Photo Credit : Brian Ross

Rooftop Solar Potential

Every community in Pennsylvania has an economically viable rooftop solar “reserve.”

- ✓ Rooftop solar reserves are equivalent to 25-30% of total electric use in older, denser communities
- ✓ In suburban and rural communities the rooftop reserve is equivalent to 40-80% of community electric use

Large-Scale Solar Potential



Every community in Pennsylvania has an economically viable solar "reserve" for development. The total "solar energy reserve" for large-scale projects is over five times the total electric energy use in the state…

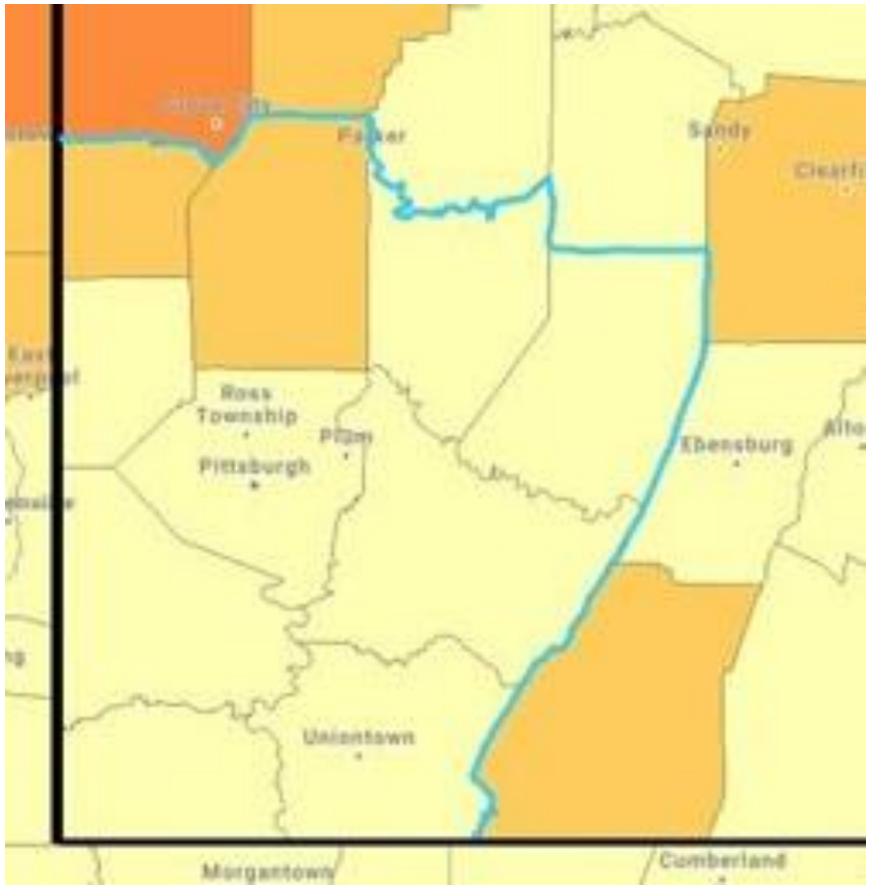
Potential GWhs

- 93,000 +
- 55,000 - 93,000
- 34,000 – 55,000
- 12,000 – 34,000
- 0 - 12,000

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

Land Used for Solar

Proportion of Land in Proposed and Existing Large-Scale Solar



Pennsylvania currently has 8,500 MW of proposed large-scale solar projects, or almost ten times the total solar installed in history (through 2021, 880MW).

Approximately 2,800 MW of solar projects are proposed within the SPC service area. This approximates 25,000 acres of land.

Even if all the proposed projects were built, most counties would have less than one half of one percent of land in solar development.

Land Used for Solar

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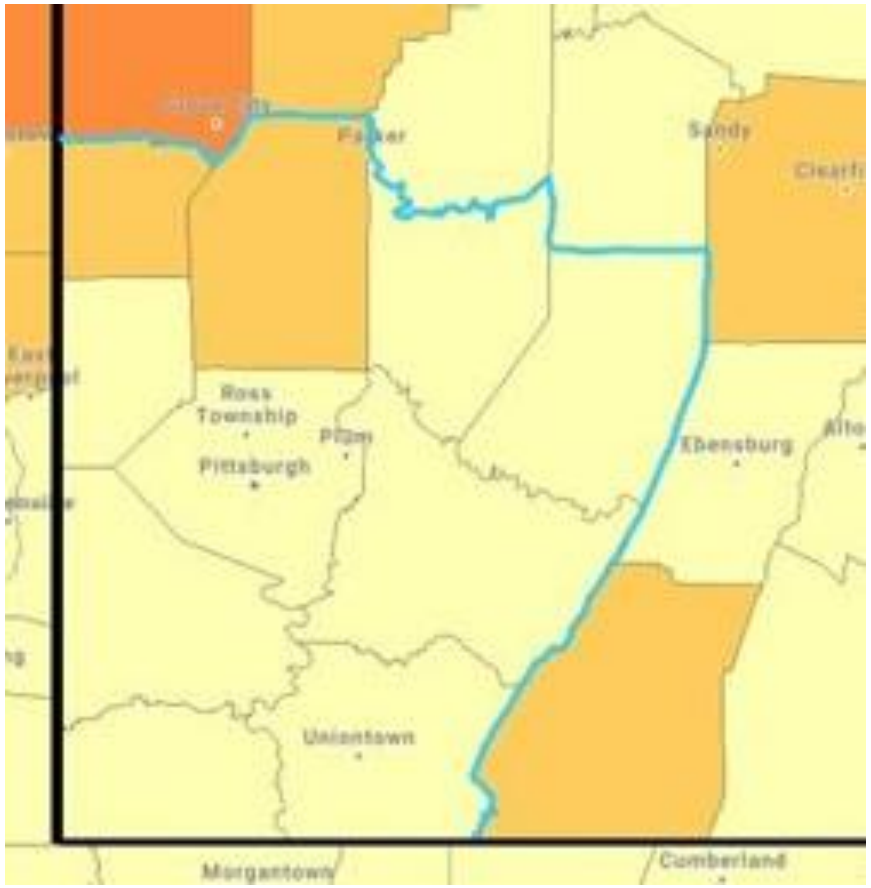

County	MW	Acres
Allegheny	240	1,918
Armstrong	271	2,164
Beaver	30	240
Butler	80	640
Fayette	192	1,539
Greene	295	2,358
Indiana	335	2,678
Lawrence	898	7,181
Washington	200	1,600
Westmoreland	278	2,224
Total	**2,818**	**22,542**

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What is SolSmart?

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 reduce soft costs and earn SolSmart designation.

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.

SolSmart Actions

Increase transparency

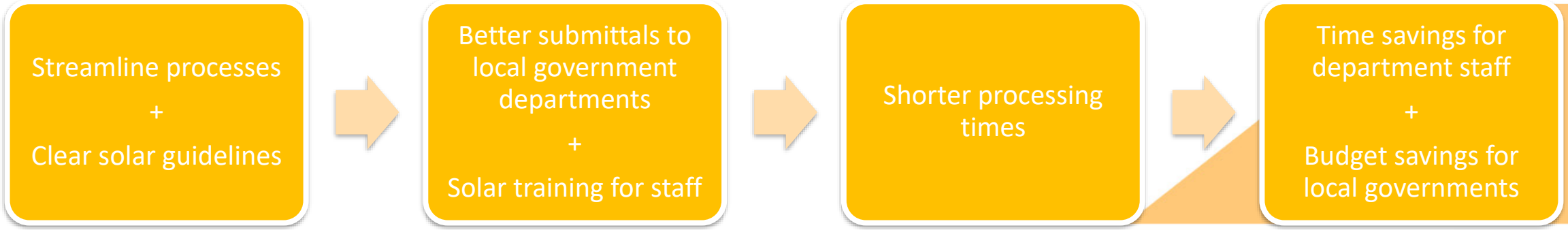
- Post a permitting checklist online
- Develop a solar landing page

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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Designation Structure, Program Details, Technical Assistance

Designation Structure

To receive designation, communities must complete the following:

Complete 3 prerequisites

20 points in Permitting & Inspection

20 points in Planning & Zoning

60 total points

Attain SolSmart Bronze and

Complete 3 additional prerequisites

100 total points

Attain SolSmart Silver and

Complete 2 additional prerequisites

200 total points

Core Competencies: Criteria and Designation

- 75 unique credits in 5 different categories that promote best practices to help local governments improve their solar markets
- Each credit has a corresponding point value ranging from 5 to 20
- Foundational Categories:
  - Permitting and Inspection
  - Planning and Zoning
- Special Focus Categories:
  - Government Operations
  - Community Engagement
  - Market Development

"The SolSmart program created a national benchmark for communities to reach and provided the guidance and resources to support adoption of best practices in solar policy."– Maurice Jones, City Manager, Charlottesville, Virginia

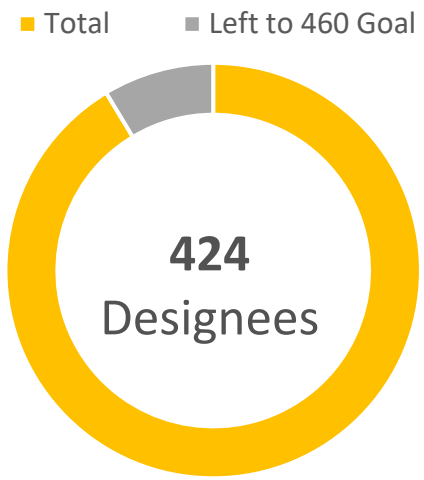
SolSmart by the Numbers

Connecticut

Gold	4
Silver	3
Bronze	2

Total

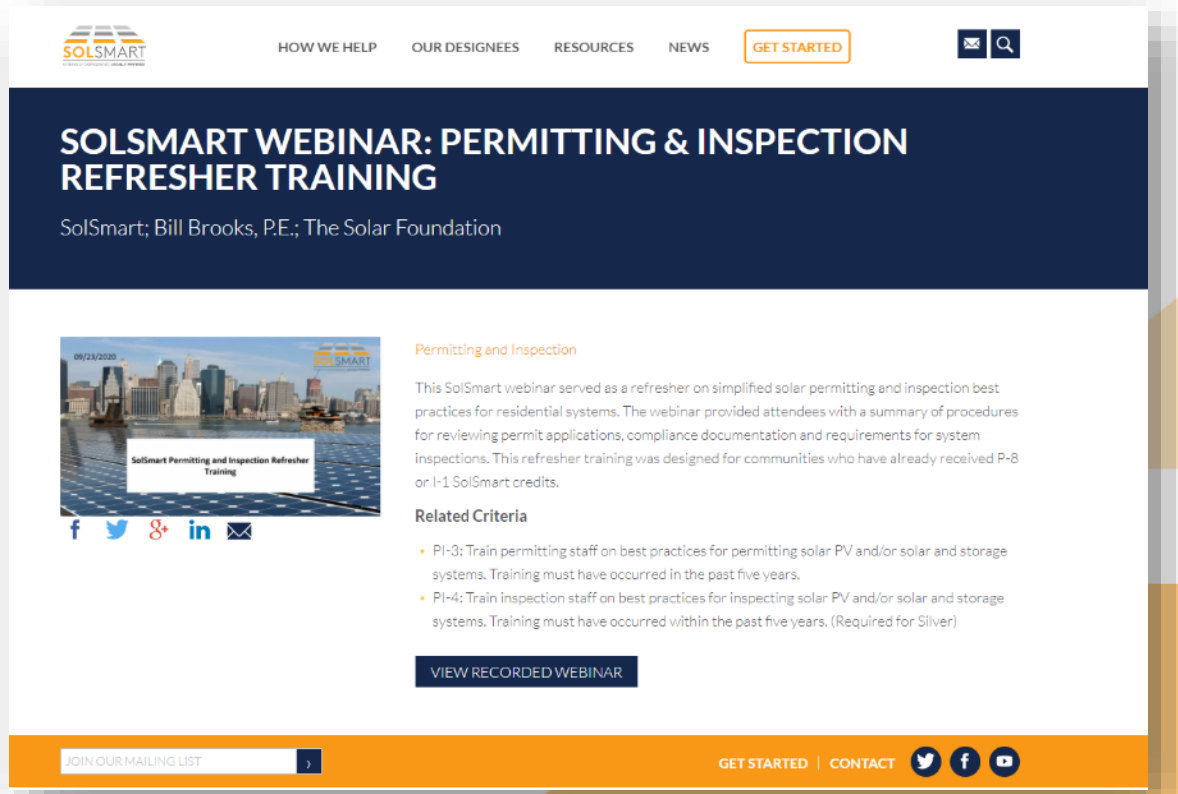
Gold	165
Silver	109
Bronze	150



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.



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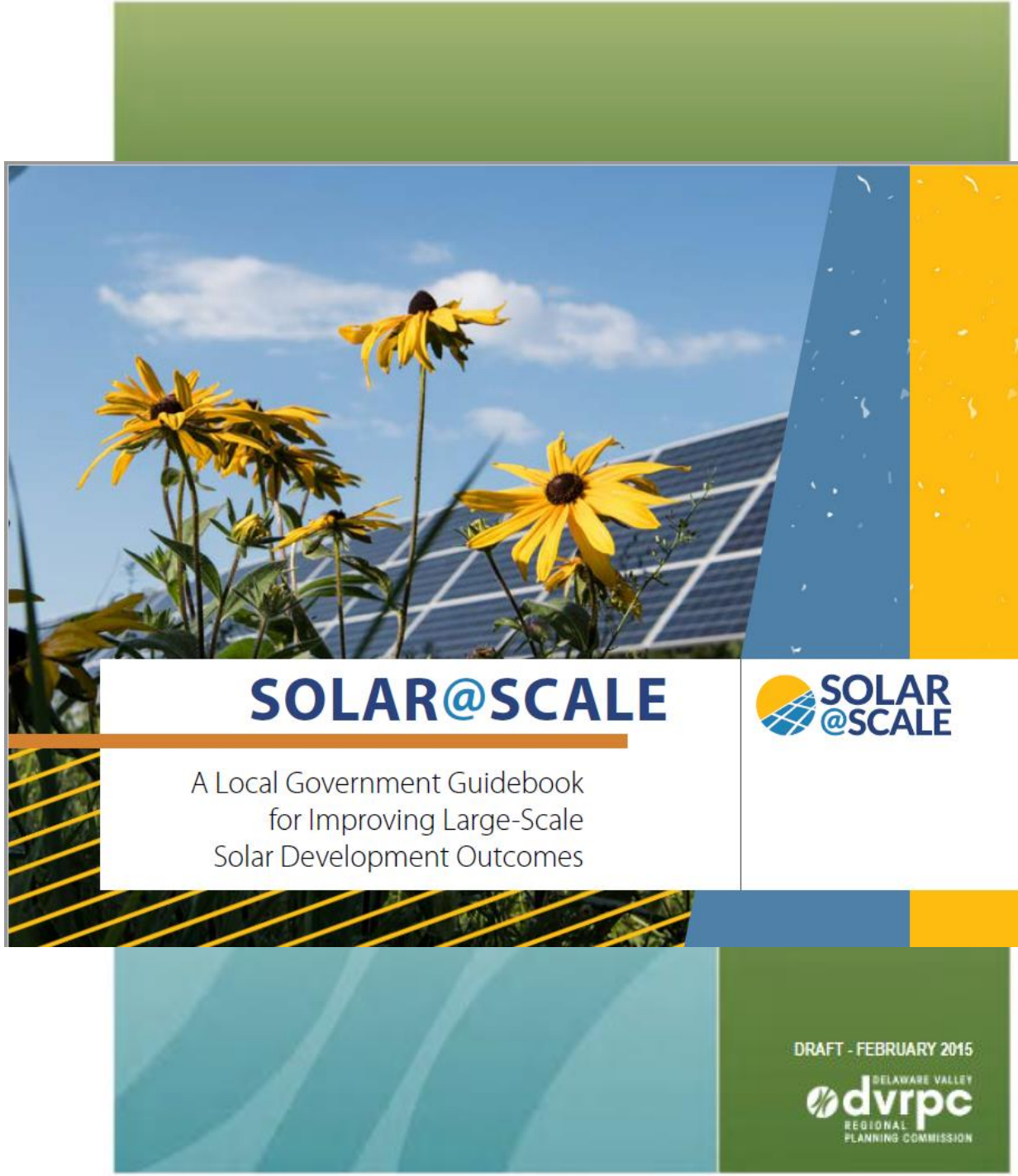
Best Practices and Community Planning Examples

Pennsylvania Resources

- ✓ Renewable Energy Ordinance Framework: Solar PV (Delaware Valley Regional Planning Commission)
- ✓ PennFuture Model Solar Model Ordinance (PennFuture, Western PA Rooftop Solar Challenge)
- ✓ New National APA Resource: *Solar@Scale: A Local Government Guidebook for Improving Large-Scale Solar Development Outcomes*
  https://planning.org/publications/document/9222548/



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	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	• 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	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

Zoning best practices for large-scale solar

Define Terms	• 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	• 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	• 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	• 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	• 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

Large-Scale Siting Elements

Community-Scale Solar

- Define by size, not capacity (typically less than 20 acres)
- Permitted by-right in certain districts and through a conditional use permit in other, typically non-residential, districts
- Prioritize co-benefit locations

Large-Scale Solar

- Define by size, not capacity (typically over 20 acres)
- Permitted through a conditional use permit in agricultural districts, or in a special overlay district
- Prioritize areas near supporting infrastructure

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Photo credit: Brian

Large-Scale Site Design Elements

Design elements to meet community priorities, minimize nuisances, and integrate with other land uses

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

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Photo credit: Brian

Site Design for Co-Benefits

Ground Cover and Buffer Areas

1. Large-scale removal of mature trees on the site is discouraged…
2. The applicant shall submit a vegetative management plan prepared by a qualified professional or reviewed and approved by a natural resource agency or authority …
3. Soils shall be planted and maintained in perennial vegetation for the full operational life of the project, to prevent erosion, manage run off and build soil. . .
4. Vegetative cover should include a mix of perennial grasses and wildflowers that will preferably result in a short stature prairie with a diversity of forbs or flowering plants that bloom throughout the growing season . . .

Stormwater and Water Quality Standards

Perennial grasses and wildflowers planted under the panels, between arrays, and in setback or buffer areas will substantially mitigate the stormwater risks associated with solar arrays and result in less runoff than typically seen from many types of agriculture.

Establishing and maintaining perennial ground cover can have important co-benefits to the community or the property owner. The ground cover standards in Section A.3. will mitigate many stormwater risks, although soil type and slope can still affect the need for additional stormwater mitigation.

Solar with native or perennial ground cover can provide multiple water quality benefits when converting from most agricultural crop uses. Both groundwater (limiting nitrate contamination) and surface waters (reducing phosphorus and sediment loading) can benefit if the system is appropriately designed.

Site Design for Co-Benefits

Agricultural Protection - Solar farms must comply with site assessment or soil identification standards that are intended to identify 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 CUP that allows the site to be returned to agriculture at the end of life of the solar installation.

c) Placing agricultural conservation easements on an equivalent number of prime soil acres adjacent to or surrounding the project site.

d) Locating the project in a wellhead protection area**.**

Agricultural Protection

If the community has ordinances that protect agricultural soils, this provision applies those same standards to solar development. Communities should understand, however, that solar farms do not pose the same level or type of risk to agricultural practices as does housing or commercial development. Solar farms can be considered an interim use that can be easily turned back to agriculture at the end of the solar farm's life (usually 25 years.)

The Co-Benefit Approach to Solar Development

If you restore watershed functions, diversify agriculture, enhance habitat, or protect drinking water supplies… Does it matter that it's a solar farm?

Field tests at the InSPIRE test site in Minnesota, *Photo Credit: Dennis Schroeder NREL Flickr InSPIRE Minnesota Album*

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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

1. Use Solar-Specific Best Practices, Standards

Example… Clarify final stabilization standards to accommodate the longer establishment time for native or deep-rooted vegetation. Include vegetative stabilization under arrays, standard for decompaction of soils, creation of plan for establishment and maintenance of deep-rooted and native ground cover.

2. Encourage Optimal Water Quality Outcomes

Example … Develop and apply standards for quantifying full water quality benefits that create value for exceeding design storm minimums or improvement from existing land use for those AHJs that have a water quality trading program.

3. Create Cross-Jurisdictional Consistency.

Example …. Provide training for local officials on the scientific foundation for solar-specific standards, model ordinances that directly address lot coverage and science-based standards, statewide guidance documents for different permits

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

Photo from Great Plains Institute by Katharine Chute

Interim Best Practices

For Solar Projects

1. **Practice site design for disconnection**. Incorporate infiltration areas into array layout and design.
2. **Take a green infrastructure approach.** Maximize use of native and deep-rooted naturalized vegetation in a diverse mix of vegetative cover.
3. **Use low-impact development (LID)** construction techniques, mitigate for soil compaction.
4. **Design array to sustain vegetative cover** and infiltration. Use array design to allow self sustaining vegetation cover under and between arrays.
5. **Adopt solar-specific mitigation of runoff** under special (more challenging) site conditions.
6. **Look beyond the design storm. I**nclude estimates of stormwater infiltration capacity in excess of AHJ minimum standards for design storms.

Morris, MN- SolSmart Silver

Completed Planning and Zoning Actions

- Accessory Use Solar PV is explicitly allowed by-right in all major zones
- Small ground-mounted solar PV is allowed as an accessory use in:
  - Single and Family Residence District
  - Multiple Family Residence District
  - Neighborhood Commercial District
- Zoning ordinance exempts small ground-mounted solar PV from accessory use restrictions including
  - “Ground-mount systems shall be exempt from impervious surface calculations if the soil under the collector is not compacted and maintained in vegetation”
- Zoning ordinance establishes clear regulatory pathway for primary use solar (solar farms and gardens)

Linn County, IA - SolSmart Gold

Linn County was an early designee, and has achieved Gold status:

- ✓ Adopted one of the first solar farm ordinances in the Midwest
- ✓ Enabled by-right accessory use solar development in all districts
- ✓ Co-sponsored successful “solarize” program to lower the cost of residential installations
- ✓ Solar farm ordinance captures local co-benefits from solar development and ensure environmentally friendly design, including:
  - habitat-friendly ground cover,
  - water quality protections, and
  - establishing management partnership with the site owner for the life of the project.

Photo Credit: Joseph Walz, Stearns County Solar Website

Becoming a SolSmart Community

- Contact the Great Plains Institute (Emma Parkson, eparkson@gpisd.net), or
- the Interstate Renewable Energy Council (TheresaP@IRECusa.org), or
- Visit the SolSmart website at: www.SolSmart.org

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Thank You!

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