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Webinar

Solar Planning and Zoning: From the Rooftop to the Solar Farm

February 27, 2018

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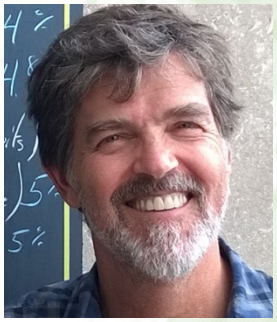
Today's Event

Solar Planning and Zoning: From the Rooftop to the Solar Farm

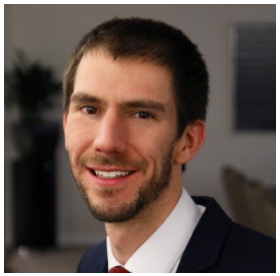


Brian Ross, AICP, LEED Green Associate

Senior Program Director, Great Plains Institute

Megan Day, AICP

Project Leader, National Renewable Energy Laboratory (NREL)



James Schroll

Project Manager, The Solar Foundation

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Planning for Solar

Brian Ross, AICP, LEED Green Associate

GREAT PLAINS INSTITUTE
Better Energy. Better World.

If you remember one thing . . .

Good plans enable good development

- ✓ Solar energy is an economically valuable local resource
- ✓ Valuable resources should benefit the owner and the community
- ✓ Local plans lay the policy foundation for development regulation and programs that enable capture of benefits, while minimizing risks

Photo credit: U.S. DOE SunShot

Why Energy in the Comprehensive Plan?

Comprehensive Plans define how local resources or assets are used or protected.

- ✓Natural resources
- ✓Development
- ✓Economic resources
- ✓Transportation infrastructure
- ✓Land

Why Energy in the Comprehensive Plan?

Comprehensive Plans provide direction in response to evolving markets and changing technologies.

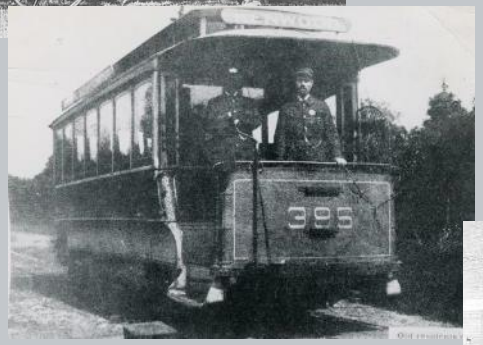


Photo credit: Minnesota Historic Society

Photo credit: Ford Motor Company

Photo credit: Google

Why Energy in the Comprehensive Plan?

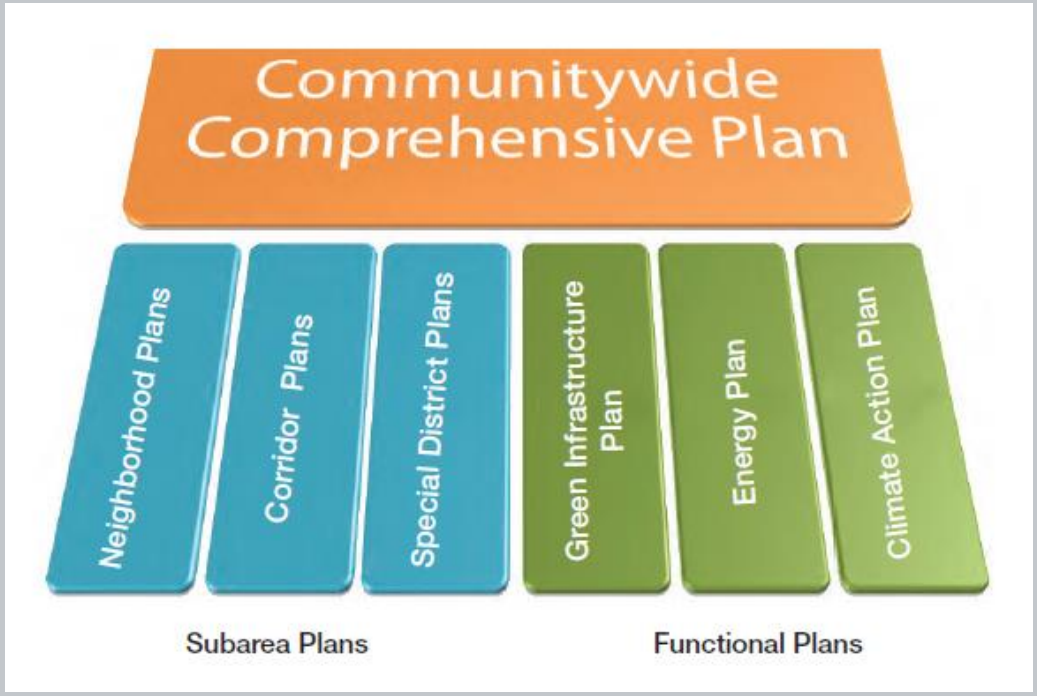
Planning for Solar Energy

American Planning Association/U.S. DOE

Why Energy in the Comprehensive Plan?

Planning for Solar Energy (PAS 575)

American Planning Association/U.S. DOE



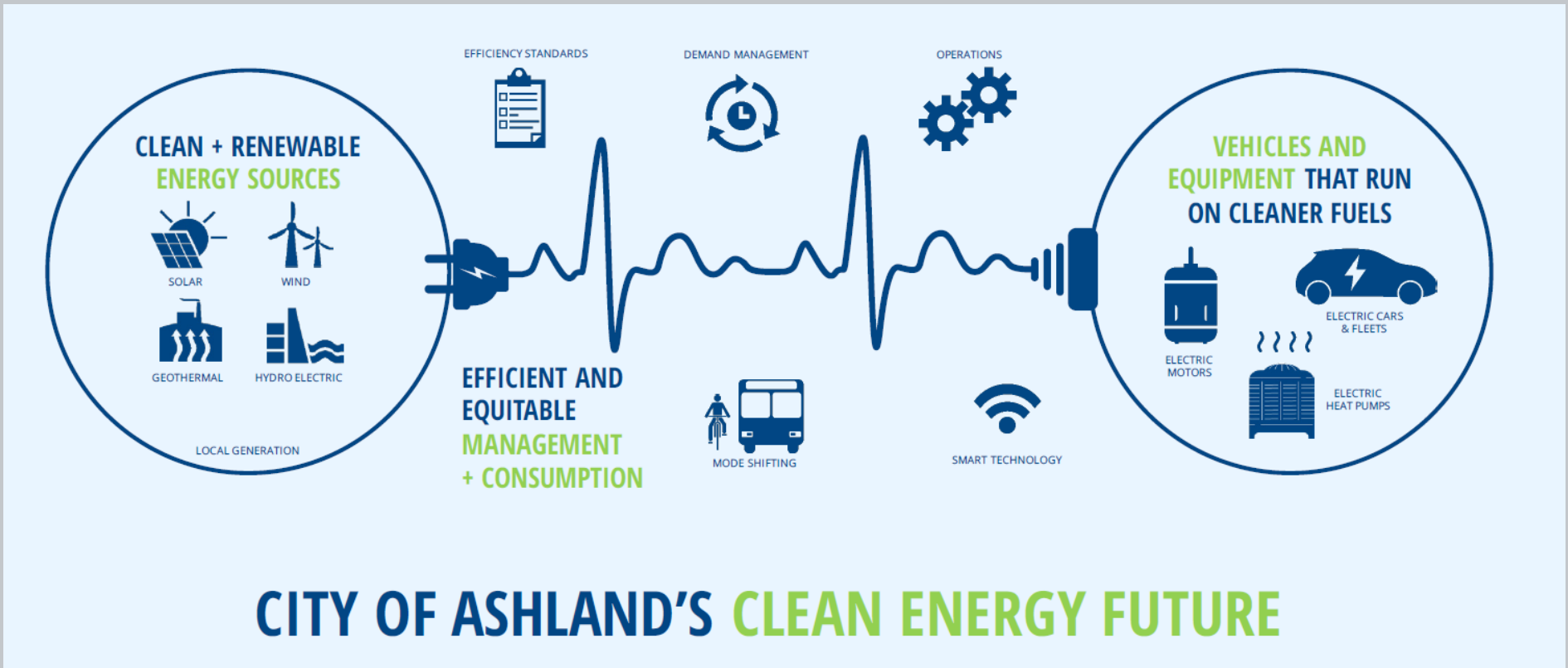
Local policy that guides development markets and development forms:

1. Comprehensive, Master, General Plans
2. Subarea or Specific Area Plans
3. Functional Plans

Why Energy in the Comprehensive Plan?

City of Ashland, OR

Climate and Energy Action Plan



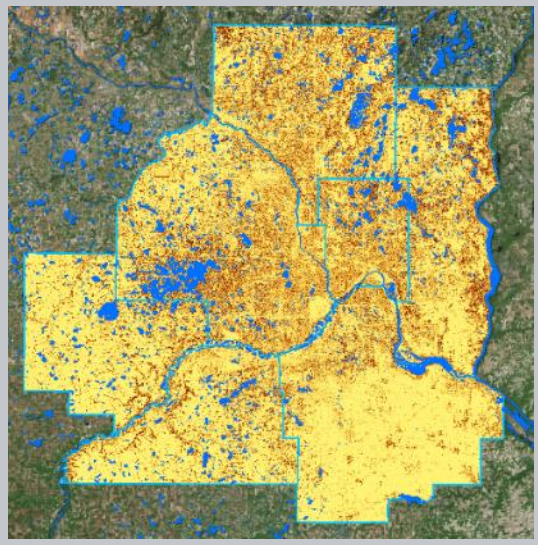
What are Your Energy "Reserves"?

- **Proved oil and gas reserves -** those quantities of oil and gas, which, by analysis of geoscience and engineering data, can be estimated with reasonable certainty to be economically producible– from a given date forward, from known reservoirs, and under existing economic conditions, operating methods, and government regulations.

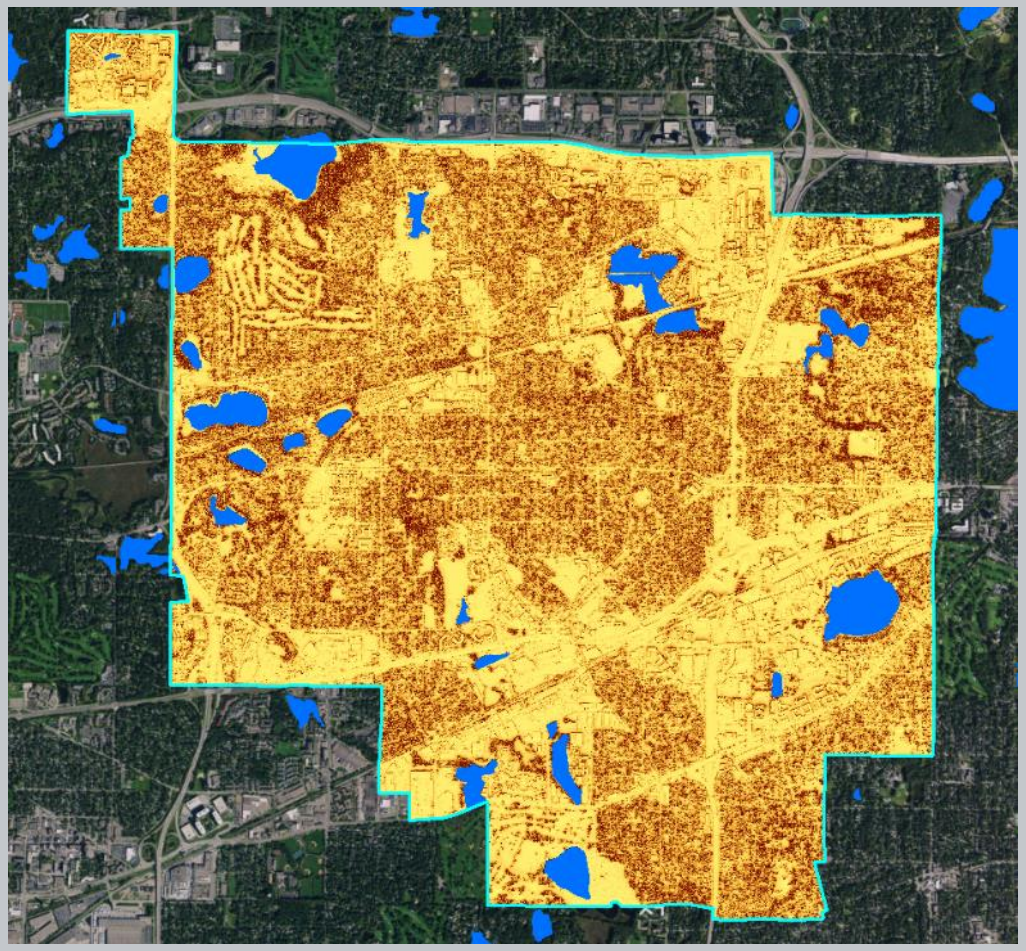
  (SEC definition of proved reserves)

What are Your Energy "Reserves"?

- ✓ **Proved solar reserves -** those quantities of solar energy, which, by analysis of atmospheric and land cover data, can be estimated with reasonable certainty to be economically producible–from a given date forward, from known access to direct sunlight, and under existing economic conditions, operating methods, and government regulations.



St. Louis Park, MN



Annual electricity consumed – 498 GWh
(Regional Indicators Initiative)

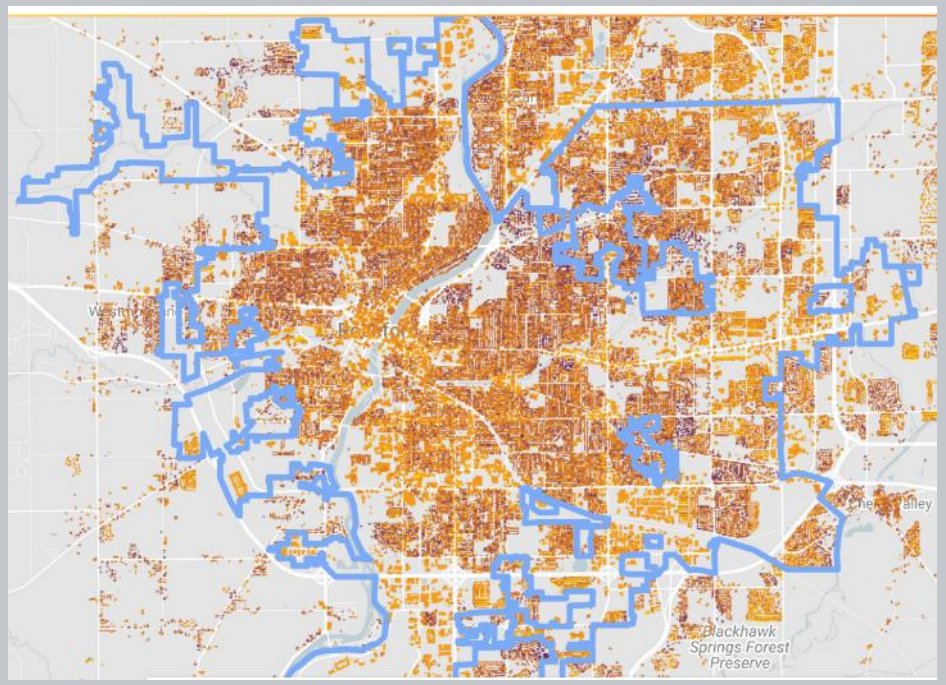
Gross reserves

- ✓ 1,217 GWh of electricity,
- ✓ Approximately 940 MW of generating capacity.

Rooftop reserves

- ✓ 216 GWh of electricity (43% of electric use)
- ✓ approximately 170 MW of generating capacity.

City of Rockford, IL

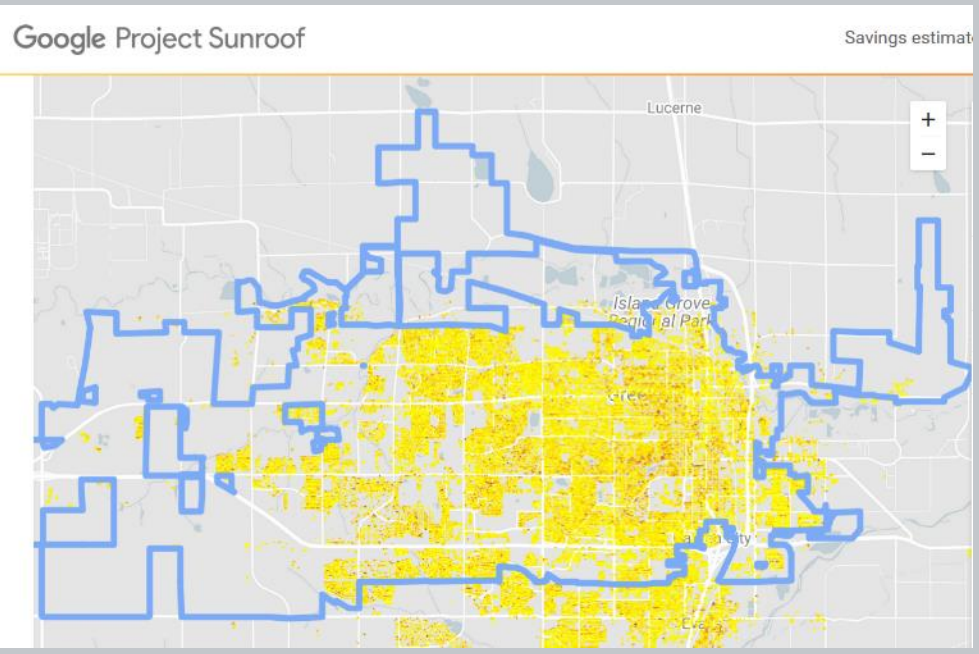


Rooftop reserves

- ✓ 1,200 GWh of electricity
- ✓ 80% of estimated electric use
- ✓ approximately 1,000 MW of generating capacity.
- ✓ Estimated 98% data coverage

Source: Project Sunroof data explorer (Sept 2017), State and Local Energy Data, NREL.

City of Greeley, CO

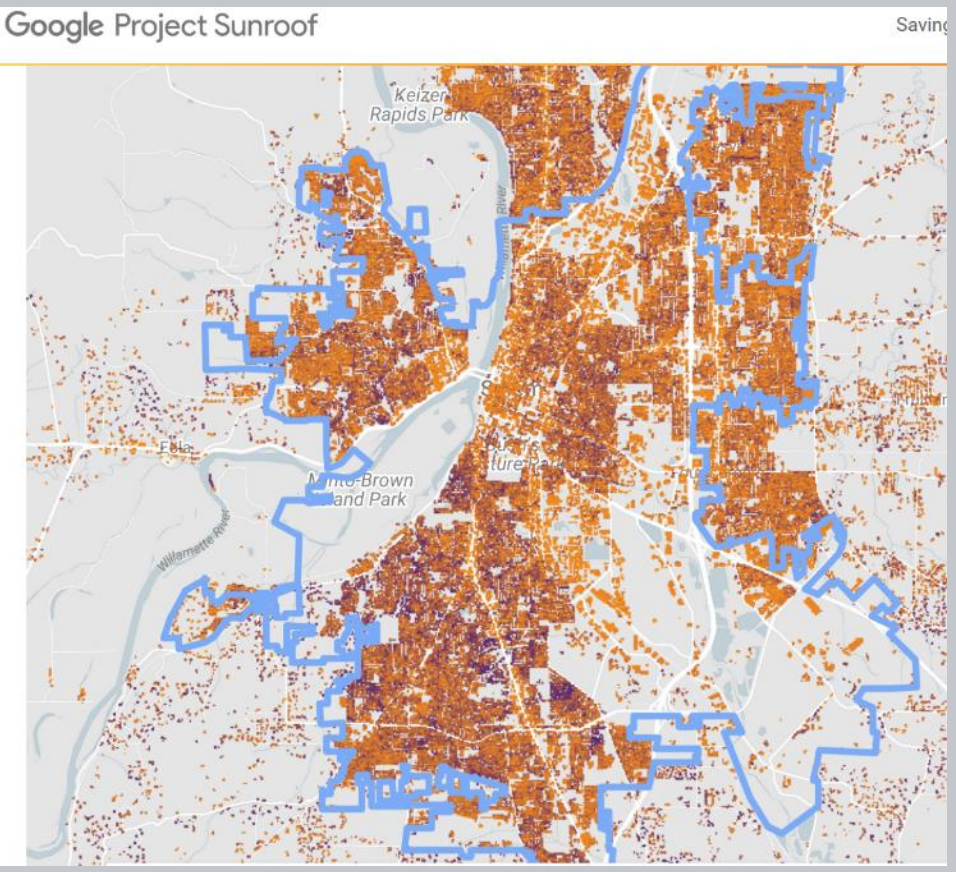


Rooftop reserves

- ✓ 631 GWh of electricity
- ✓ 78% of estimated electric use
- ✓ approximately 445 MW of generating capacity.
- ✓ Estimated 98% data coverage

Source: Project Sunroof data explorer (Feb 2017), State and Local Energy Data, NREL.

City of Salem, OR



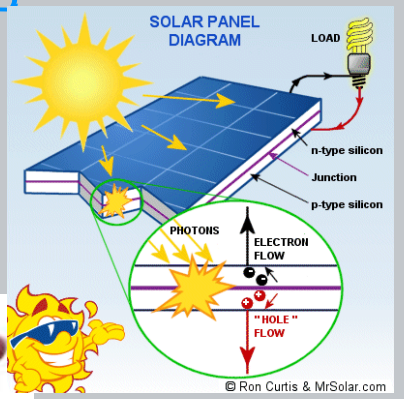
Rooftop reserves

- ✓ 1,100 GWh of electricity
- ✓ 71% of estimated electric use
- ✓ approximately 985 MW of generating capacity.
- ✓ Estimated 92% data coverage

Source: Project Sunroof data explorer (Feb 2017), State and Local Energy Data, NREL.

Five 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



Solar Ready Communities

Comprehensive Plans that:

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

Table 15: Median Installer Wages

	INSTALLATION	PROJECT DEVELOPMENT	INSTALLATION AND PROJECT DEVELOPMENT
Entry-Level Wage	$15.00	$16.22	$15.00
Mid-Level Wage	$20.00	$25.00	$21.00
Senior/Supervisor Wage	$30.00	$38.00	$30.00

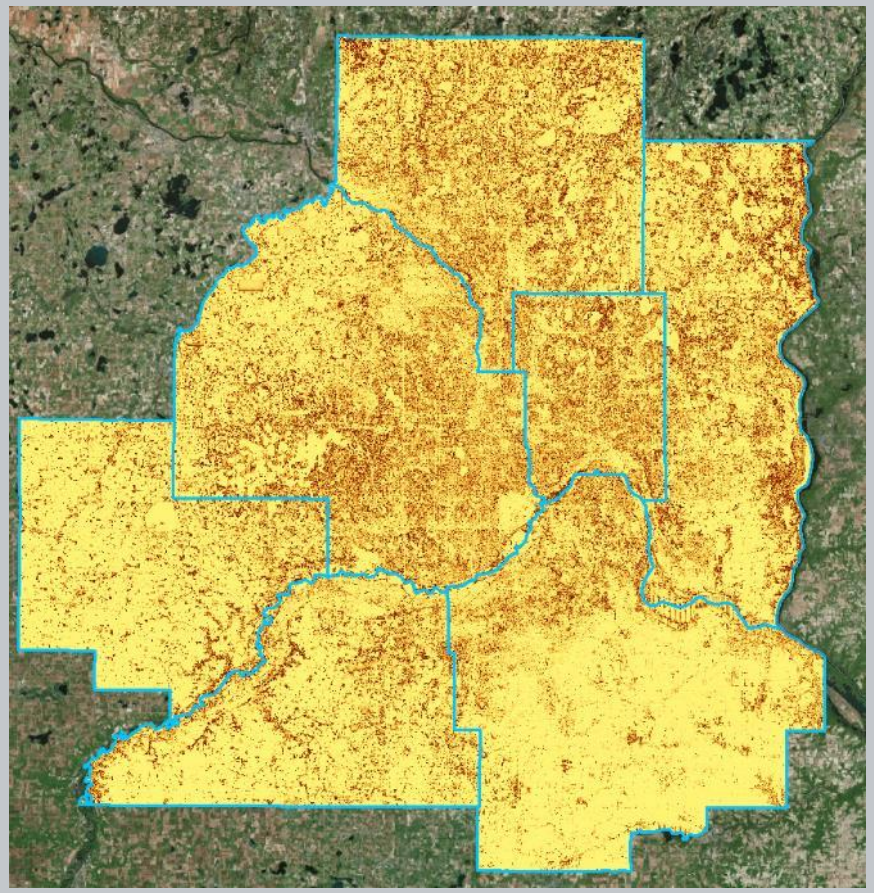
Source: 2017 Solar Jobs Census, Solar Foundation

Photo credit: Fresh Energy/Giving Tree

Solar Ready Communities

Comprehensive Plans that:

✓Identify and define solar resources



Seven-County Metropolitan Council Area

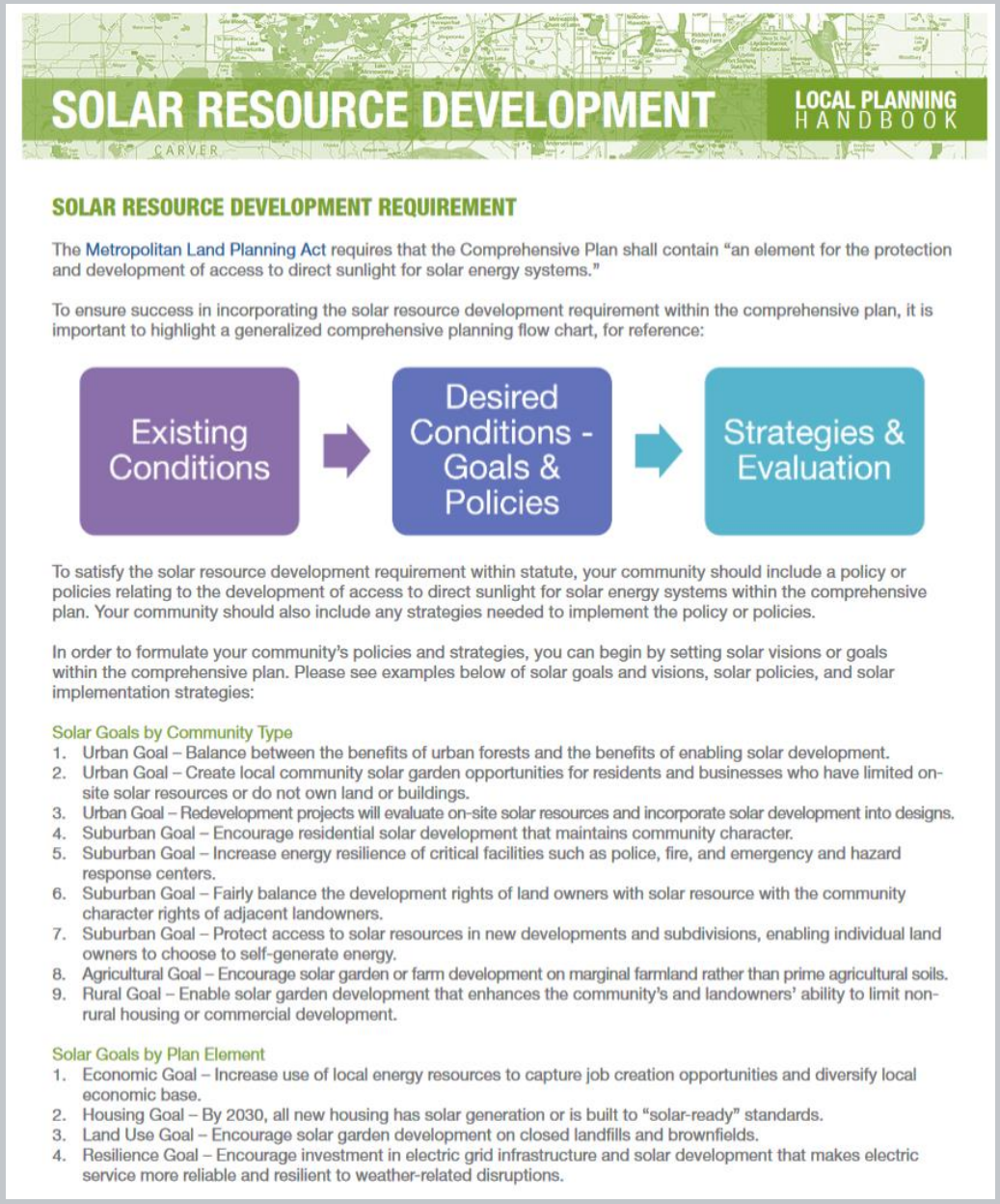
Minnesota – Metropolitan Area includes188 local governments now updating Comprehensive Plans. Each Plan will include:

1. A map of solar resources
2. Quantification of total and rooftop solar potential
3. Community goals that address the protection and development of solar resources.

https://metrocouncil.org/Handbook/Files/Resources/Fact-Sheet/RESILIENCE/Solar-Resource-Protection-Requirement.aspx

Protection, Development of Solar Resources

Metropolitan Council Local Planning Handbook guidance on setting goals for the protection and development of solar resources.



SOLAR RESOURCE DEVELOPMENT

LOCAL PLANNING HANDBOOK

CARVER

SOLAR RESOURCE DEVELOPMENT REQUIREMENT

The Metropolitan Land Planning Act requires that the Comprehensive Plan shall contain "an element for the protection and development of access to direct sunlight for solar energy systems."

To ensure success in incorporating the solar resource development requirement within the comprehensive plan, it is important to highlight a generalized comprehensive planning flow chart, for reference:

To satisfy the solar resource development requirement within statute, your community should include a policy or policies relating to the development of access to direct sunlight for solar energy systems within the comprehensive plan. Your community should also include any strategies needed to implement the policy or policies.

In order to formulate your community's policies and strategies, you can begin by setting solar visions or goals within the comprehensive plan. Please see examples below of solar goals and visions, solar policies, and solar implementation strategies:

Solar Goals by Community Type

1. Urban Goal – Balance between the benefits of urban forests and the benefits of enabling solar development.
2. Urban Goal – Create local community solar garden opportunities for residents and businesses who have limited on-site solar resources or do not own land or buildings.
3. Urban Goal – Redevelopment projects will evaluate on-site solar resources and incorporate solar development into designs.
4. Suburban Goal – Encourage residential solar development that maintains community character.
5. Suburban Goal – Increase energy resilience of critical facilities such as police, fire, and emergency and hazard response centers.
6. Suburban Goal – Fairly balance the development rights of land owners with solar resource with the community character rights of adjacent landowners.
7. Suburban Goal – Protect access to solar resources in new developments and subdivisions, enabling individual land owners to choose to self-generate energy.
8. Agricultural Goal – Encourage solar garden or farm development on marginal farmland rather than prime agricultural soils.
9. Rural Goal – Enable solar garden development that enhances the community's and landowners' ability to limit non-rural housing or commercial development.

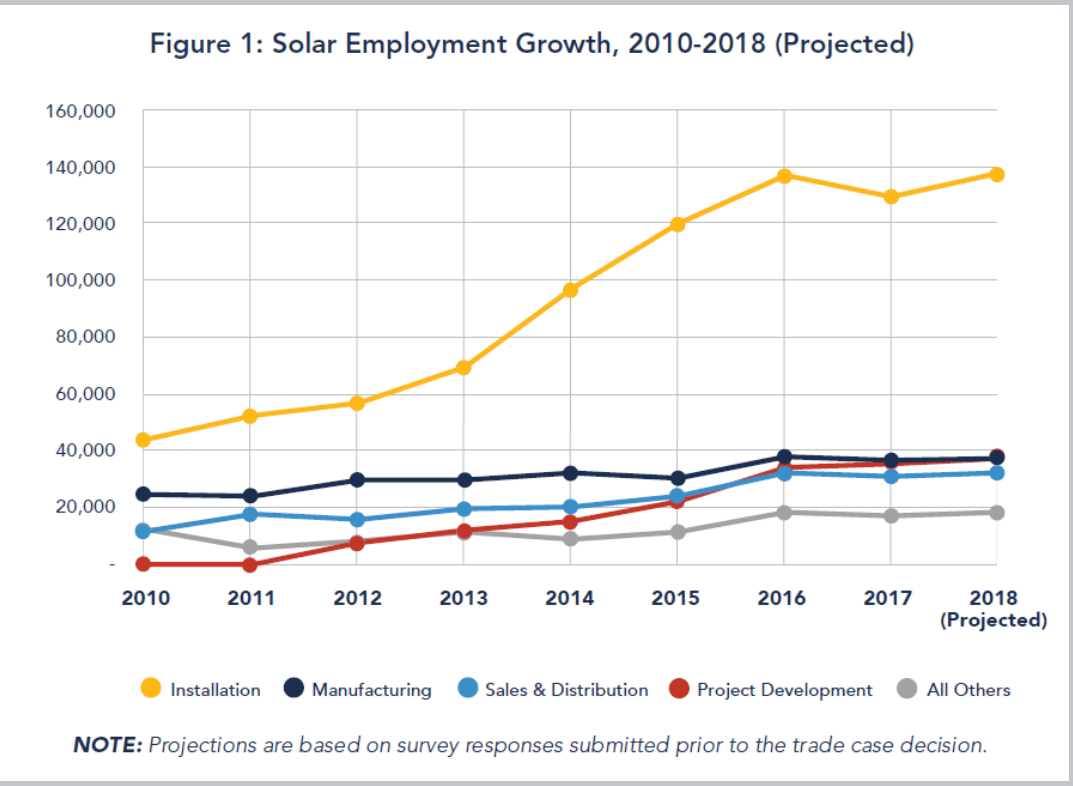
Solar Goals by Plan Element

1. Economic Goal – Increase use of local energy resources to capture job creation opportunities and diversify local economic base.
2. Housing Goal – By 2030, all new housing has solar generation or is built to "solar-ready" standards.
3. Land Use Goal – Encourage solar garden development on closed landfills and brownfields.
4. Resilience Goal – Encourage investment in electric grid infrastructure and solar development that makes electric service more reliable and resilient to weather-related disruptions.

Solar Ready Communities

Comprehensive Plans that:

- ✓Acknowledge solar development benefits and desired co-benefits



- ✓Job creation
- ✓New markets for local contractors
- ✓Diversity of income to land owners
- ✓Local resources/Import substitution

Source: 2017 Solar Jobs Census, Solar Foundation

Solar Ready Communities

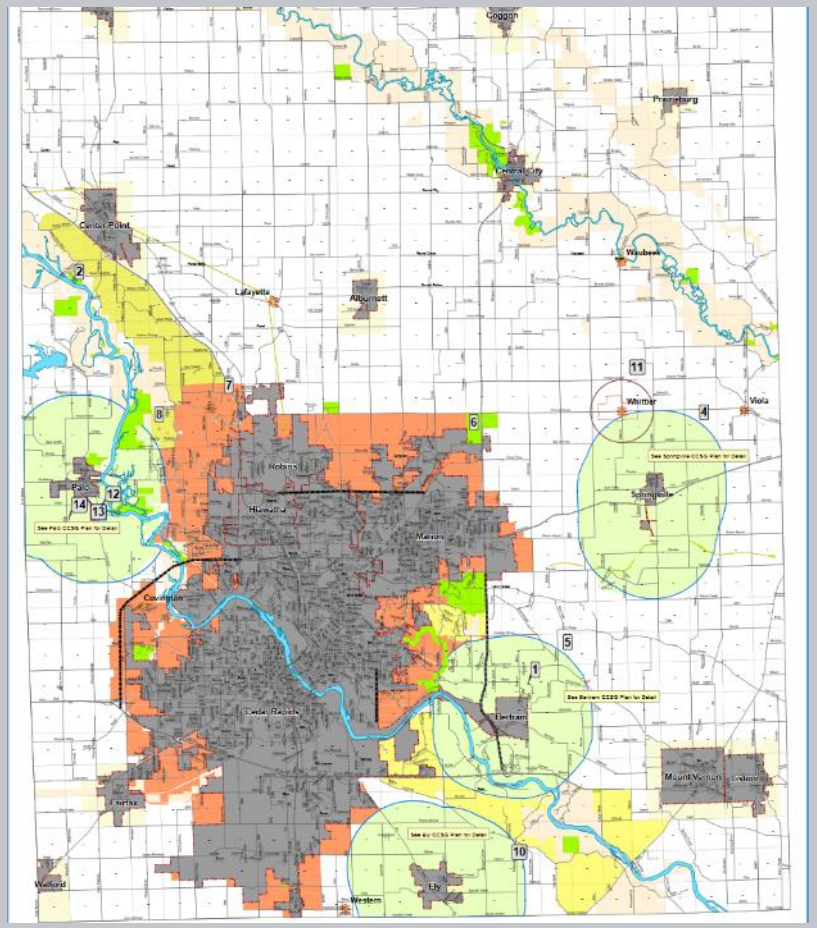
Linn County, Iowa (SolSmart Gold)

Economic Development

Goal 2: Seek opportunities to diversify and expand the local employment base by providing a supportive environment for existing and new businesses, as well as entrepreneurial activities.

Objective 2.6: Encourage and support renewable energy production, including all related support businesses.

Strategy: Through the use of policy and regulation, allow for wind, solar, biofuel, biomass, waste-to-energy, and geothermal energy production and related businesses, where appropriate.



Natural Resource Co-Benefits

Lessons learned from incorporating natural systems into development can be applied to solar development as well:

- ✓ **Habitat value** – Pollinator ground cover
- ✓ **Water quality protection** – replacing marginal cropland, creating buffers
- ✓ **Agricultural practices** – Apiaries, grazing, haying

Co-benefits can be realized, but, you have to plan for it . . .

Photo credit: Prairie Restorations

Solar Ready Communities

Comprehensive Plans that:

✓ Identify solar development opportunities and conflicts in the community.

Acknowledge perceived nuisances and potential conflicts with other resources or development goals;

- Agricultural practices
- Urban forests
- Historic resources
- Redevelopment and density
- Airports and other priority infrastructure
- Natural areas

Photo credit: Juwi Americas

Solar Ready Communities

Stearns County, MN (SolSmart Silver)

Environment and Natural Resources

Goal 2. Assure the reasonable and responsible use of natural resources, including land, surface and ground water, minerals, open space, wetlands, wildlife, and woodlands.

Objective 4. Encourage use of renewable energy systems, including wind energy and solar energy, which reduce the footprint of development on local and global natural systems.

Goal 3. Protect agricultural natural resources.

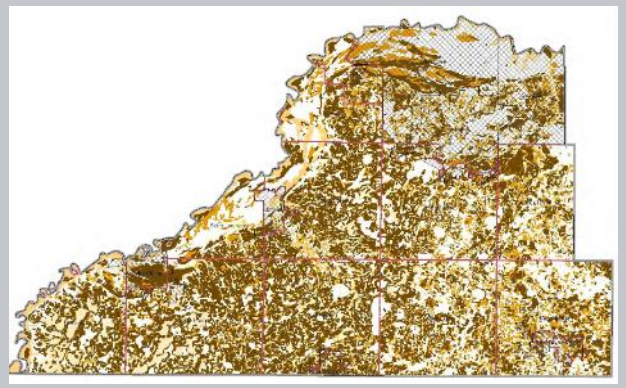
Objective 1. Protect agricultural soils and other agricultural resources by regulating non-agricultural land uses in areas with agricultural soils.

Objective 2. Encourage sustainable agricultural practices that protect agricultural soils and waters for future generations.

Land Use Conflicts and Opportunities - Agricultural Practices

Agricultural protection is designed to address different development-related risks:

- ✓ Loss of prime agricultural soils
- ✓ Loss of local productive capacity
- ✓ Fragmentation of land
- ✓ Secondary development impacts
- ✓ Nuisances impacting agricultural practices



Source: Scott County Prime Farmland Mapping Project, 2009

Solar Ready Communities

Comprehensive Plans that:

✓Set development targets

Town of Dartmouth, MA Master Plan ***(SolSmart Bronze)***

Goal Six: Promote energy efficiency in building design and support renewable energy . . .

6.2 Pursue incorporation of LEED certification/ green energy usage thresholds into future TIF agreements.

6.3 Promote energy efficiency and green energy usage in Site Plan Review. Consider incentives for meeting certain thresholds.

6.4 Review local regulations to identify obstacles to renewable energy sources and evaluate changes that could foster these alternatives in appropriate places and in appropriate forms.

6.5 Pursue all federal and state grants available to the Town for developing alternative energy sources to meet municipal needs.

6.6 Establish 10 and 20-year goals for renewable energy use by municipal buildings.

Photo credit: Dartmouth Solar ltd.

Solar Ready Communities

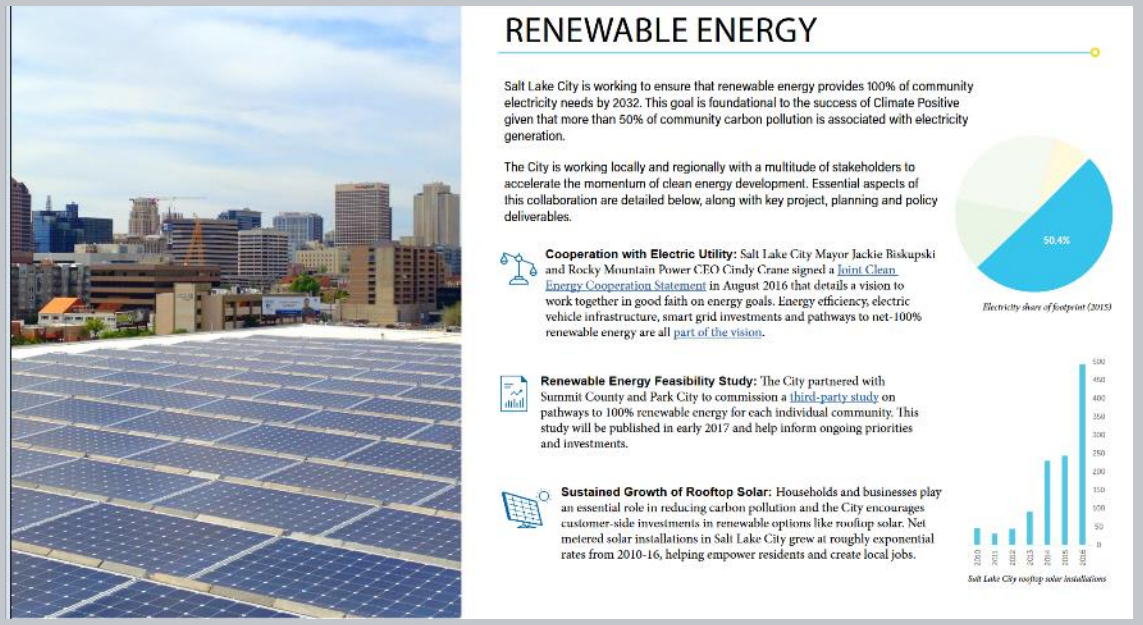
Comprehensive Plans that:

✓Set development targets

Salt Lake City, Climate Positive 2040 ***(SolSmart Bronze)***

Functional Plan

- ✓ 100% Community-wide renewable energy by 2032
- ✓ 50% renewable energy for municipal operations by 2020



Thank You!

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Zoning for Solar

Megan Day, AICP
National Renewable Energy Laboratory

Solar and the Zoning Code

A conspicuous silence on the part of local policies, plans, and regulations on the topic of solar energy use constitutes a significant barrier to adoption and implementation of these technologies.

–American Planning Association Solar Briefing Papers

Best practices in zoning for solar

Definition	Include storage and solar hot water heating installations in the definition of “solar” or otherwise allow in the code
Height	Allow rooftop solar an exemption from or allowance above building height maximums
By-right accessory use	Allow small rooftop and ground-mounted solar in all major zoning districts
Accessory uses	Exempt solar from counting toward accessory uses maximum
Aesthetic requirements (e.g. screening)	• 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 mount solar from lot coverage restrictions that apply to buildings
Setbacks	Consider applying accessory structure setbacks rather than principle building setbacks
Roof coverage	Include 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 used (e.g. on-site) as it has no bearing on the impact

Definitions

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

Solar Energy System, Large-Scale: Active Solar Energy System that occupies more than 40,000 square feet of surface area.

Solar Energy System, Medium-Scale: Active Solar Energy System that occupies more than 1,750 but less than 40,000 square feet of surface area.

Solar Energy System, Small-Scale: An Active Solar Energy System that occupies 1,750 square feet of surface area or less.

Definitions

Denver, CO

Definitions

Solar Panel, Flush Mounted: A solar energy collection device mounted to the roof of a structure in such a manner that the device is not more than one foot above the roof surface to which it is attached, and mounted so that the device plane is in a plane which is parallel to the surface of the roof to which it is attached.

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

Cupertino, CA

a. A "Solar Energy System" means either of the following:

i. Any solar collector or other solar energy device whose primary purpose is to provide for the collection, storage, and distribution of solar energy for space heating, space cooling, electric generation, or water heating.

ii. Any structural design feature of a building, whose primary purpose is to provide for the collection, storage, and distribution of solar energy for electricity generation, space heating or cooling, or for water heating.

Regulating Solar Energy Use in Code

Adams County, Colorado
4-03-03-02-10 *SOLAR ENERGY SYSTEM*

1. *Property Served:* The solar energy system shall be designed to only provide energy for the property upon which it is located. However, excess energy may be sold as permitted by state and federal law.

Prevents shared or community solar installations and primary use

Regulate impacts, not use

One of 1,500 customer-sited PV systems owned by APS

Photo: Tom Tingle/The Republic
http://www.azcentral.com/story/money/business/consumer/2015/07/11/first-aps-owned-rooftop-solar-installed-phoenix/30002989/

Height

Adams County, CO height allowance

4-03-03-02-10 *SOLAR ENERGY SYSTEM*

2. *Maximum Height of Attached Panels:* Solar panels attached to a roof shall not exceed the maximum permitted height of the structure type by more than five (5) feet.

3. *Maximum Height of Detached Solar Panels:* Fifteen (15) feet.

Lafayette, CO rooftop height allowance

Sec. 26-14-8. - *Height* provisions.

(c) Maximum height for appurtenances. Except as may be permitted by sections 26-14-21 and 26-22.5-7 of this chapter, the maximum permitted height of stacks, vents, antennae, cooling towers, elevator bulkheads, *solar* panels, tanks, monuments, cupolas, domes, towers, spires and similar mechanical and nonhabitable structural appurtenances shall be no more than ten (10) feet above the highest point of the principal building on the property in question or ten (10) feet above the maximum permitted height in the zone district, whichever is less

Aesthetics

Maplewood, MN

AN ORDINANCE TO THE MAPLEWOOD MUNICIPAL CODE REGARDING RENEWABLE ENERGY SYSTEMS (Wind, Solar, Geothermal)

Section 4.c.4. Visibility

Solar energy systems (SES) shall be designed to blend into the architecture of the building or be screened from routine view from public right-of-ways other than alleys.

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

Solar in Historic and Special-Use Districts

More than 2,400 local jurisdictions have historic preservation ordinances. (www.nps.gov/nr/)

Breckenridge, CO

Within the Conservation District: Solar panels and solar devices are encouraged to be installed on a non-historic building or building addition and integrated into the building design.

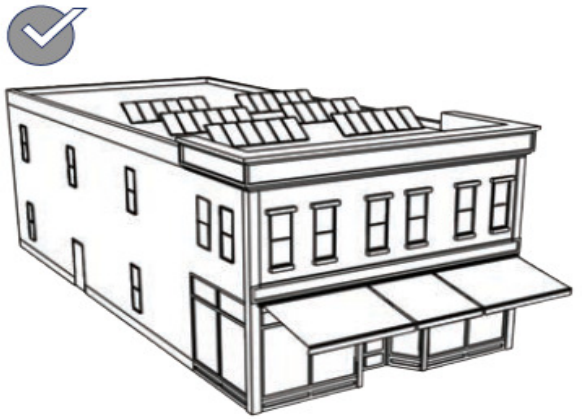
Provide clear guidance for solar in historic districts

Special Use and Historic Districts

Solar Collectors

3.70 Minimize adverse effects from solar collectors on the character of a historic building.

- Place collectors to avoid obscuring significant features or adversely affecting the perception of the overall character of the property.
- Size collector arrays to remain subordinate to the historic structure.
- Minimize visual impacts by locating collectors back from the front facade.
- Consider installing collectors on an addition or secondary structure where applicable.



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

Roof Coverage

Lafayette, CO
Section 611 is added to the International Fire Code to read as follows:

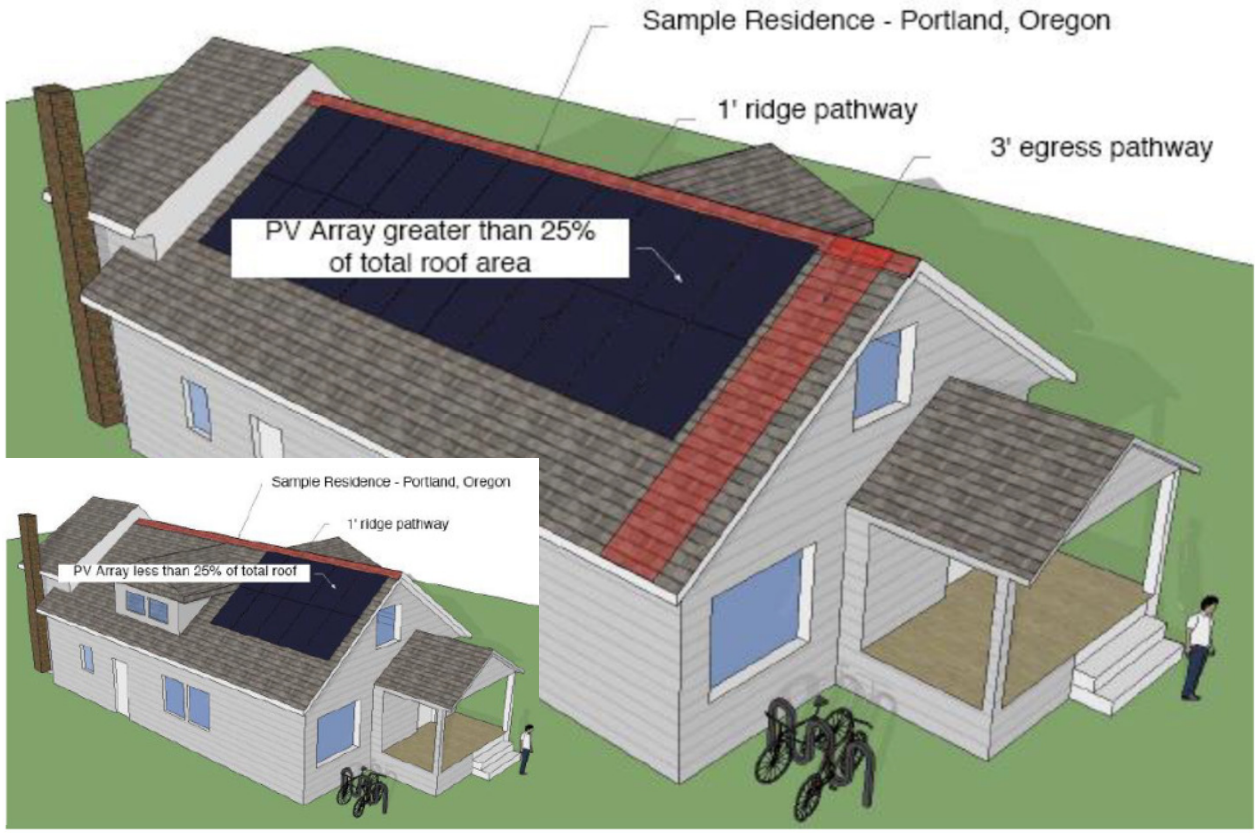
611 *Solar* Photovoltaic Installations.

611.1. Roof Clearances for Installation:

a) *Panels shall not be placed closer than 2'0" to the ridge of any roof.*
b) *Panels shall be placed no closer than 2'0" to the head wall at the top of any roof slope.*
c) *Panels shall be placed no closer than 18" from any roof valley.*
d) *Additional roof access may be required based on unique site conditions as determined by the Fire Department.*

Ensure fire safety with setbacks for rooftop installations in coordination with fire department

Roof Coverage



Source: 2010 Oregon Solar Installation Specialty Code and Commentary
https://www.oregon.gov/bcd/codes-stand/Documents/2010_OSISC_commentary.pdf

Solar Access

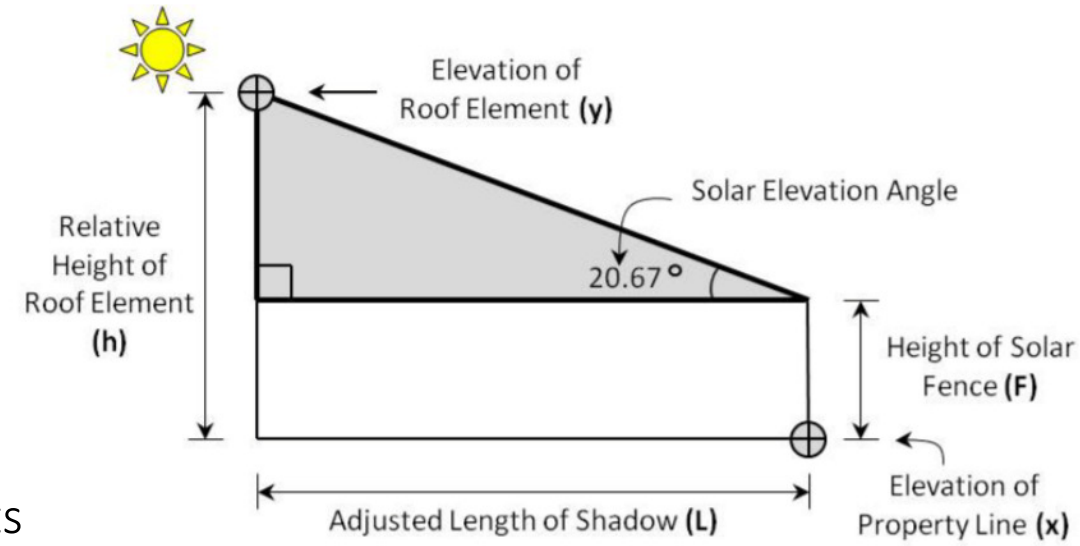


Figure 1: Section Along Shadow Length at 10 a.m. and 2 p.m.

Boulder, CO Solar Access Guide:
https://bouldercolorado.gov/plan-develop/solar-access-guide

Options:

1. Encourage private easements
2. Facilitate or trigger easements at solar building permit
3. Require review for potential shading of existing solar energy systems for adjacent building permits
4. Implement “solar fence” concept to regulate solar access for parcels – applies to vegetation and structures

Solar by-right

By defining solar energy systems and establishing clear development standards, small-scale solar energy systems may then be allowed as an accessory use, without special zoning review, in all major districts.

Example: Maricopa County, Arizona Zoning Ordinance Section 1206 –

"Renewable energy systems, other than utility-scale electrical generating stations, are allowed as an accessory use within any zoning district, subject to the provisions of Article 1206.3 [which list development standards for such systems]."

"Maricopa County Zoning Ordinance," *Maricopa County Planning and Development Department*, May 2017, Chapter 12, page 30, https://www.maricopa.gov/DocumentCenter/View/272.

Allow small rooftop and ground mount solar in all major zoning districts

Glare

Most solar farms use PV modules to generate electricity. PV modules use non-reflective glass and are designed to absorb rather than reflect the light that hits the panels in order to convert solar energy into electricity.

PV modules are generally less reflective than windows and are installed at numerous airports.

Sun Edison PV array at the NWTC. *Photo by Dennis Schroeder, NREL 11249490*

Best Practice

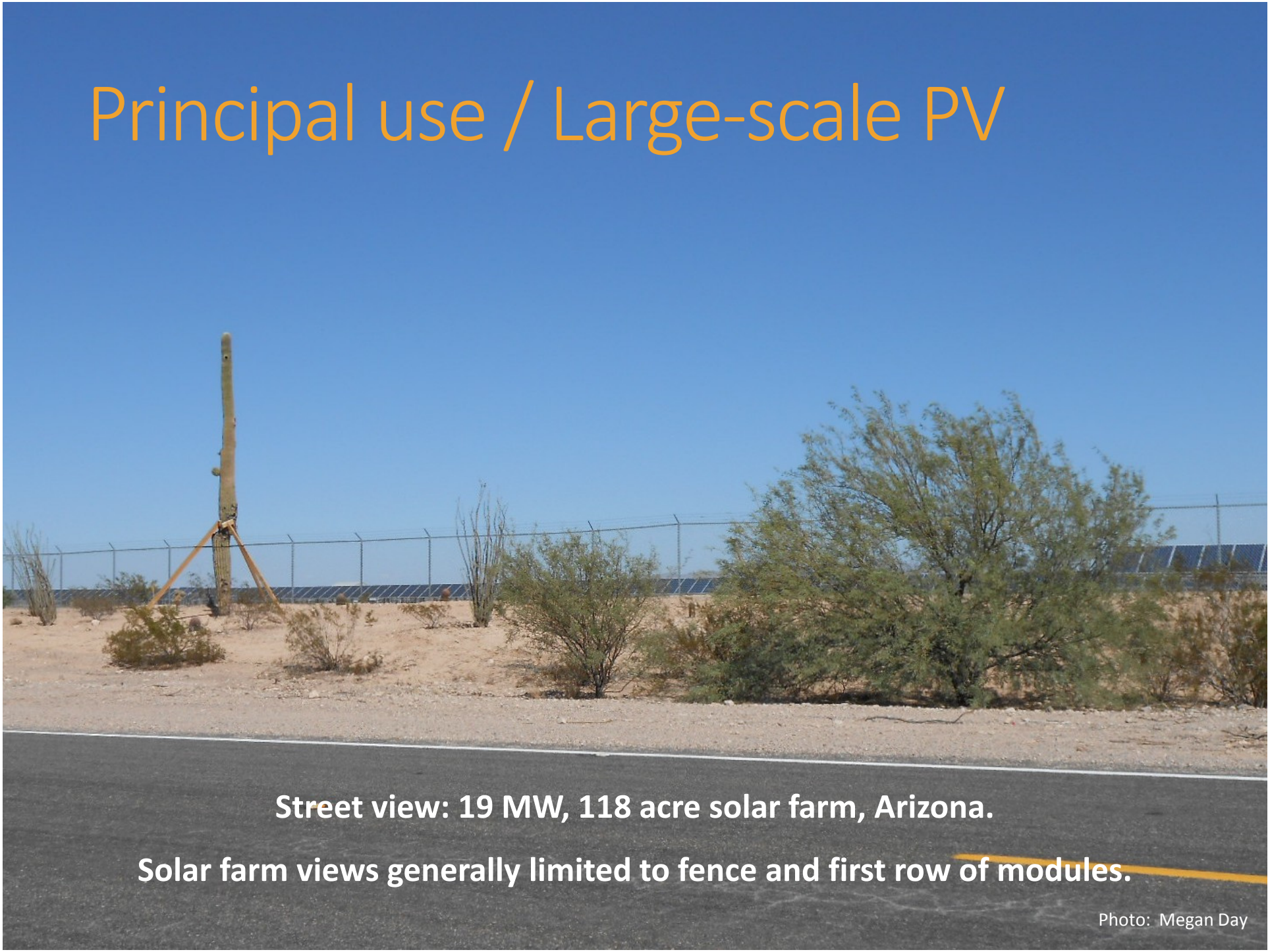
Do not require a glare study. Leave this to the FAA.

Principal use / Large-scale PV

Jacksonville Solar
15 MW – Jacksonville, FL

Photo: juwi solar

Principal use / Large-scale PV

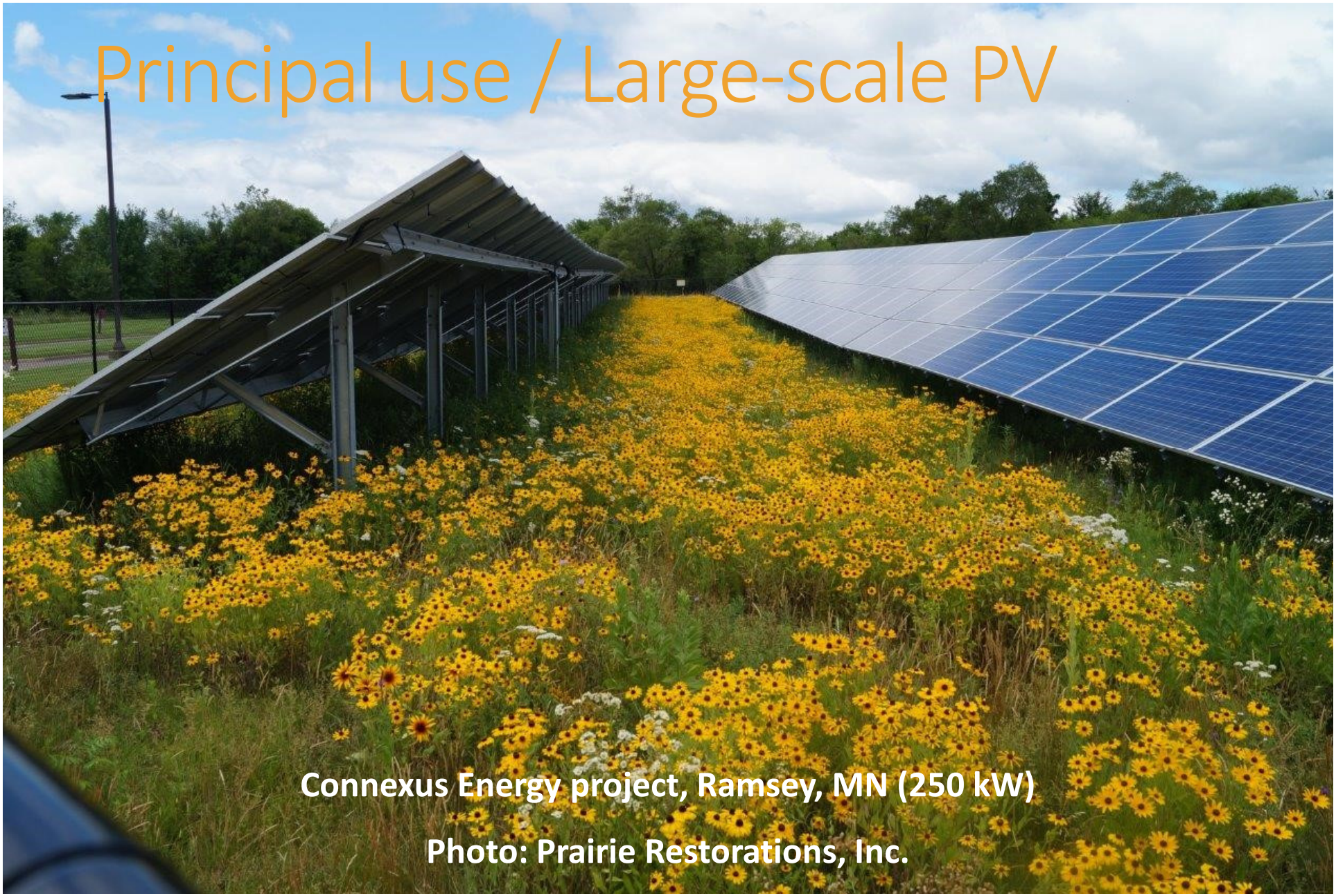


Street view: 19 MW, 118 acre solar farm, Arizona.

Solar farm views generally limited to fence and first row of modules.

Photo: Megan Day

Principal use / Large-scale PV



Connexus Energy project, Ramsey, MN (250 kW)

Photo: Prairie Restorations, Inc.

Primary use / Large-Scale PV

No glare	• Less reflective than water and windows and compatible with nearby residential, office, or aviation uses
Very low noise	• 45 decibels at 10 meters from the inverters, which is slightly less noise than a refrigerator makes
Safe	• Photovoltaic modules are enclosed in glass, carry a 25 year warranty, meet all applicable electrical and safety standards
Low voltage	• Far lower voltage than transmission lines – No EMF impacts

https://www.nrel.gov/tech_deployment/state_local_governments/blog/top-five-large-scale-solar-myths

Solar Farms ≠ Industrial Land Use

Industrial zoning and land use characteristics:

- Access to major transportation corridors, water, sewer = EXPENSIVE
- Often urban, smaller parcels = EXPENSIVE, too small
- Employment
- Nuisances (noise, traffic, pollution)

Tonopah/Arlington Area Plan:

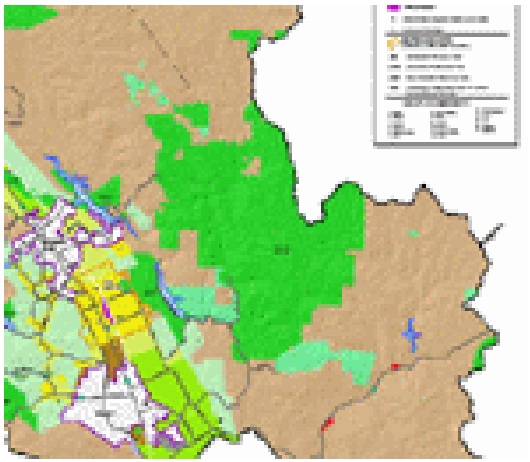
INDUSTRIAL: "major employment centers," Uses permitted in this category include warehousing, storage, distribution activities, and manufacturing

Requiring change of land use/zoning for solar amounts to spot zoning , "stranded" industrial zoned land

PV should not be restricted to Public Utilities zoning

PV farms ≠ traditional power plants. Do not need:

- Massive amounts of water for cooling
- On-site personnel
- Fuel delivery via rail, road, or pipeline



Solar Farms and Agriculture

Sunflowers for oil production grown under panels in Wisconsin

Solar Farms and Agriculture

Sheep grazing is a common vegetation management practice in North Carolina

Pollinator-Friendly Vegetation

State Policy

Minnesota standards for pollinator-friendly solar legislation – Statute 216B.1642

Maryland Department of Natural Resources – Solar Generation Facilities – Pollinator–Friendly Designation – SB1158

Local Policy

Linn County, IA – Amended the Development Code to require solar farms be planted with native grasses and wildflowers and prohibits application of insecticides.

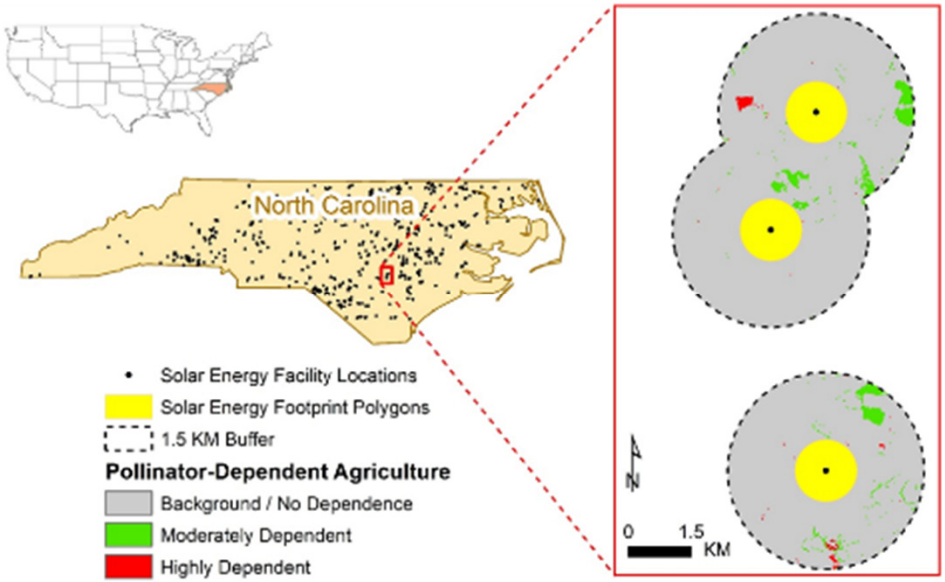
Stearns County, MN – Land Use and Zoning Ordinance requires solar farm ground cover meet above state statute

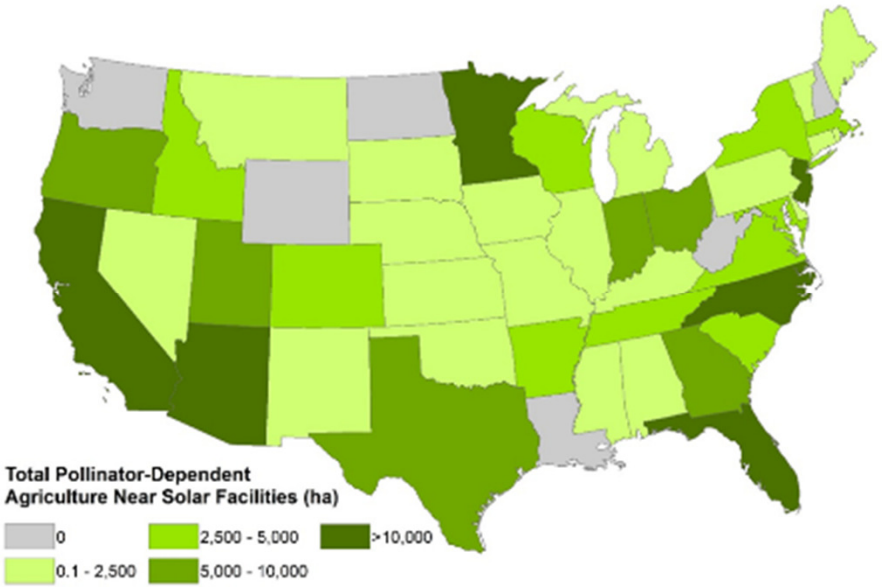
Photo: Prairie Restorations, Inc.

Pollinator-Friendly Vegetation

Agricultural Benefits of Pollinator Habitat at Utility-Scale Solar Facilities

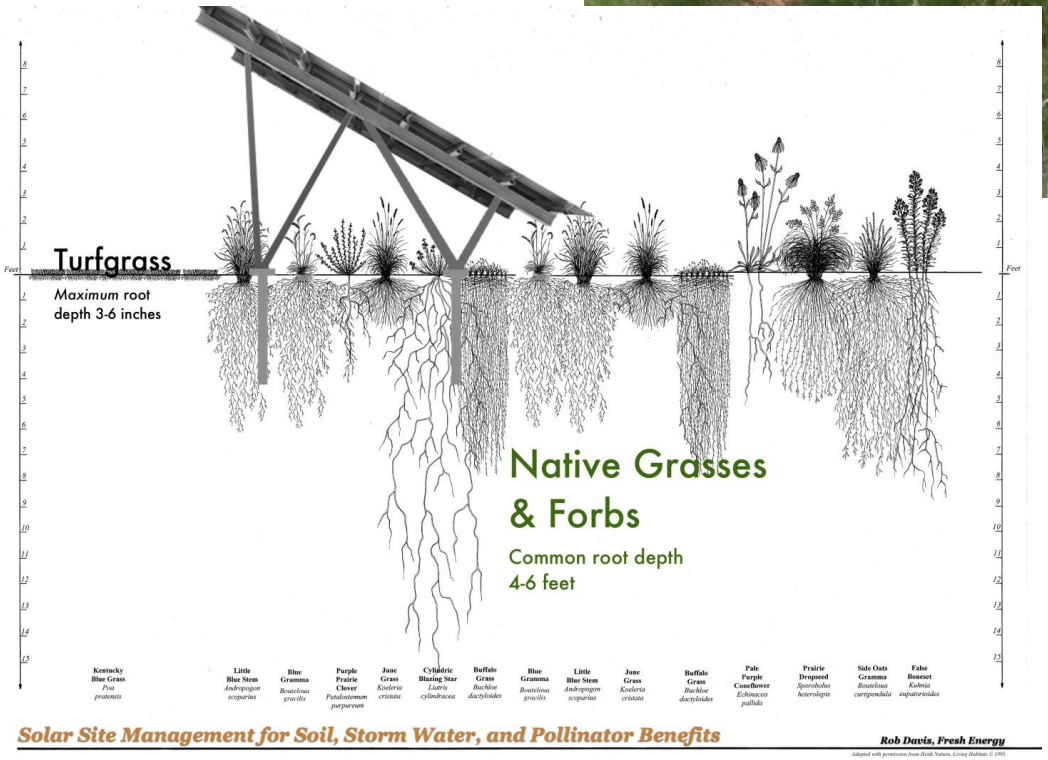
Preliminary research conducted by Argonne National Laboratory in conjunction with the NREL InSPIRE project identified over 3,500 km^2 of agricultural land near existing and planned utility-scale solar energy facilities that may benefit from insect pollinators.





From research conducted at Argonne National Laboratory. Currently In publication review. Do not cite or quote.

Low-Impact Solar Development



NREL's National Wind Technology Center's solar installation where native grasses and revegetation techniques were tested. https://www.nrel.gov/docs/fy17osti/66218.pdf

Lot Coverage, Impervious Surface

Zoning codes and development regulations can limit **lot coverage** on large lots to as little as 10%.

Impervious surface calculations – Ensure ground mount modules are not considered impervious as long as there is pervious surface beneath them (e.g. grass)

Best Practice

Exempt principal use solar from lot coverage requirements.

Walton EMC Cooperative Solar

Special Development Sites (e.g. brownfields)

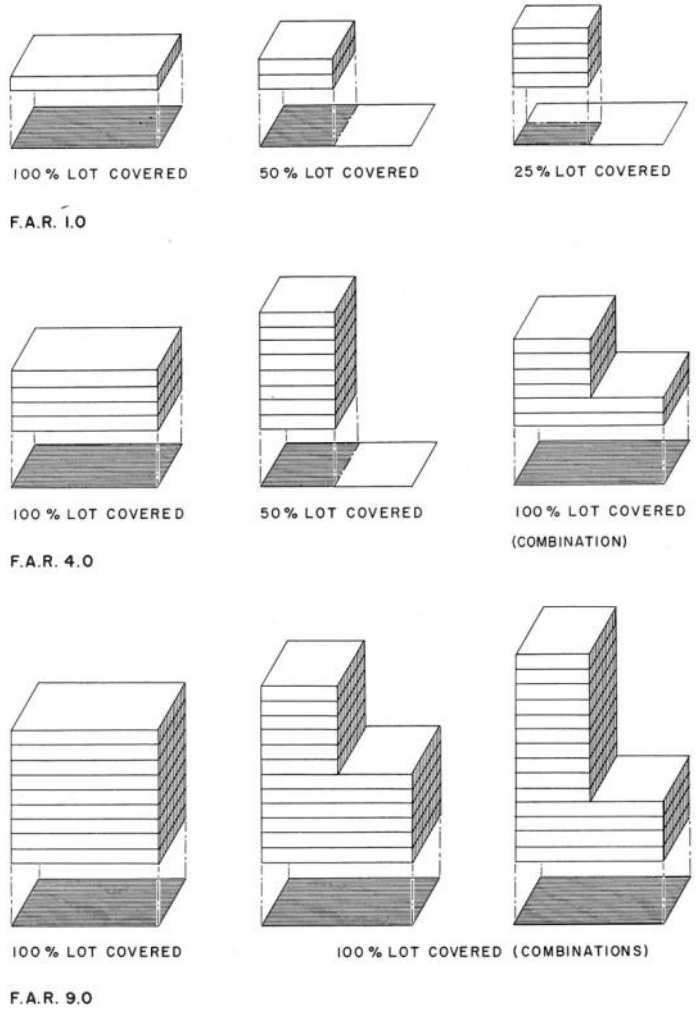
- Offer expedited review as long as project meets certain standards
- Provide exemptions from lot coverage/impervious surface requirements

SolSmart criteria: Encourage or incentivize solar PV development on parking lots, vacant lots, landfills, buffer lands, brownfields, airport safety zones, and non-building structures

Shaffer Landfill, Billerica, MA, Urban Green Technologies
https://www.high-profile.com/wp-content/uploads/2015/04/Shaffer-Landfill_PV-aerial.jpg

Opportunities for Encouraging Solar in Zoning Code

- PUD/special district conditions or options
  - *Installed PV*
  - *Solar ready construction*
  - *Higher efficiency building requirements/zero net energy*
- Zoning incentives – for integration solar energy system receive:
  - *Bonus FAR up to a certain cap (e.g. .20) above base density in a district*
  - *Height bonus*
  - *Reducing parking requirements*



American Planning Association,
https://planning-org-uploaded-media.s3.amazonaws.com/legacy_resources/pas/at60/img/111figure01.jpg

Resources and Research

Local Solar Resources

Google Project Sunroof for cities
https://www.google.com/get/sunroof/data-explorer/

ESTIMATED SOLAR INSTALLATION POTENTIAL

Overall

Total estimated size and solar electricity production of viable roofs for Denver, CO

Roofs	Roofs
63%	111K

Roof space	Capacity	Electricity
151M	2.1K	3M
sq ft	MW DC	MWh AC per yr

apps1.eere.energy.gov/sled/#/

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

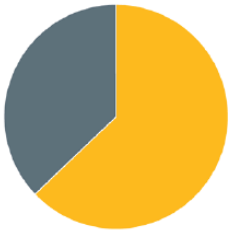
State & Local Energy Data

Toolbox: Learn about community energy actions

Explore how communities have implemented energy policies. Find resources to take action today.

Browse Energy Actions

Small Building Rooftop PV Potential, Denver CO

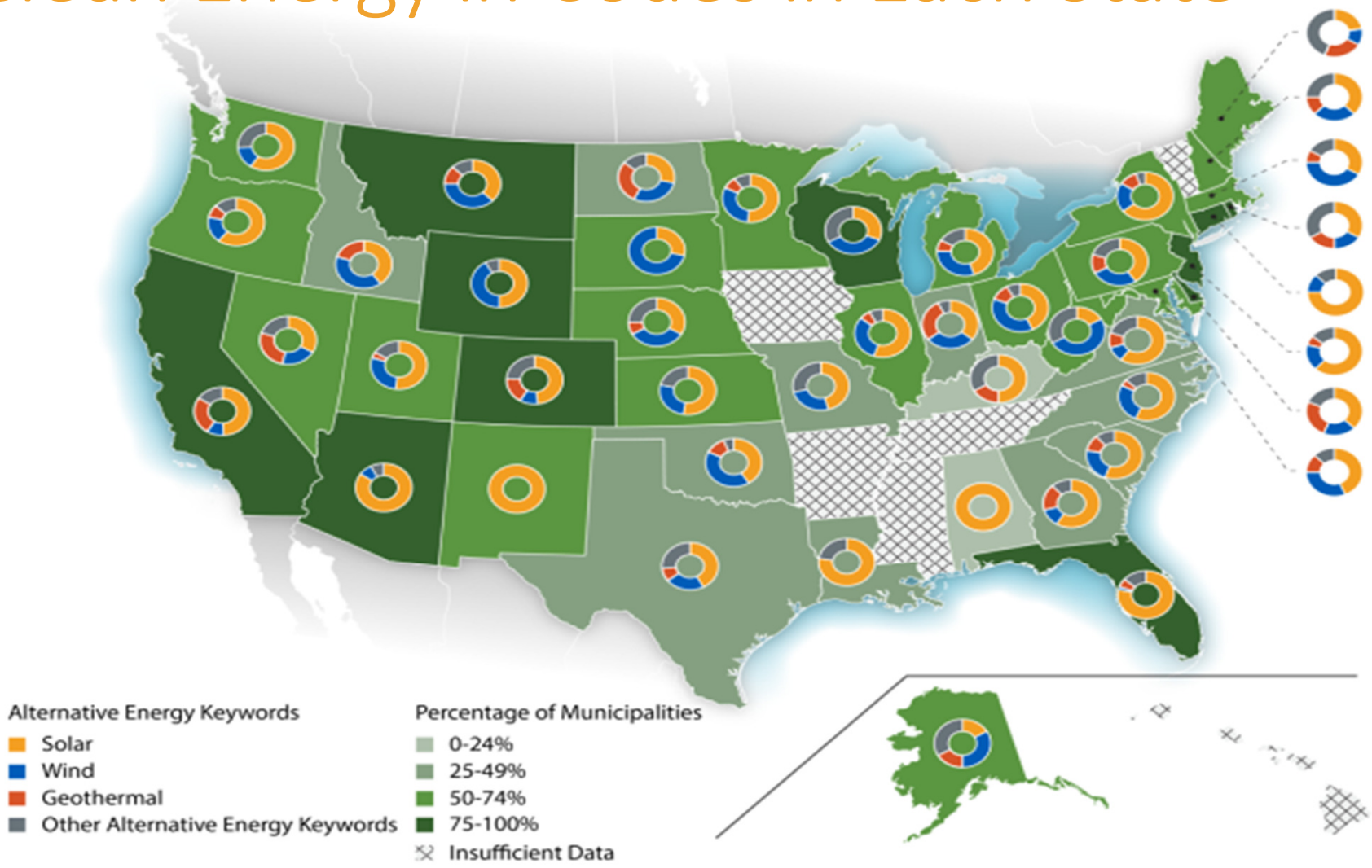


Suitable Small Buildings
108,500 buildings

Unsuitable Small Buildings
64,000 buildings

Suitable area	5,000,000 m2
Capacity potential	700,000 kW
Energy generation potential	1,000,000 MWh

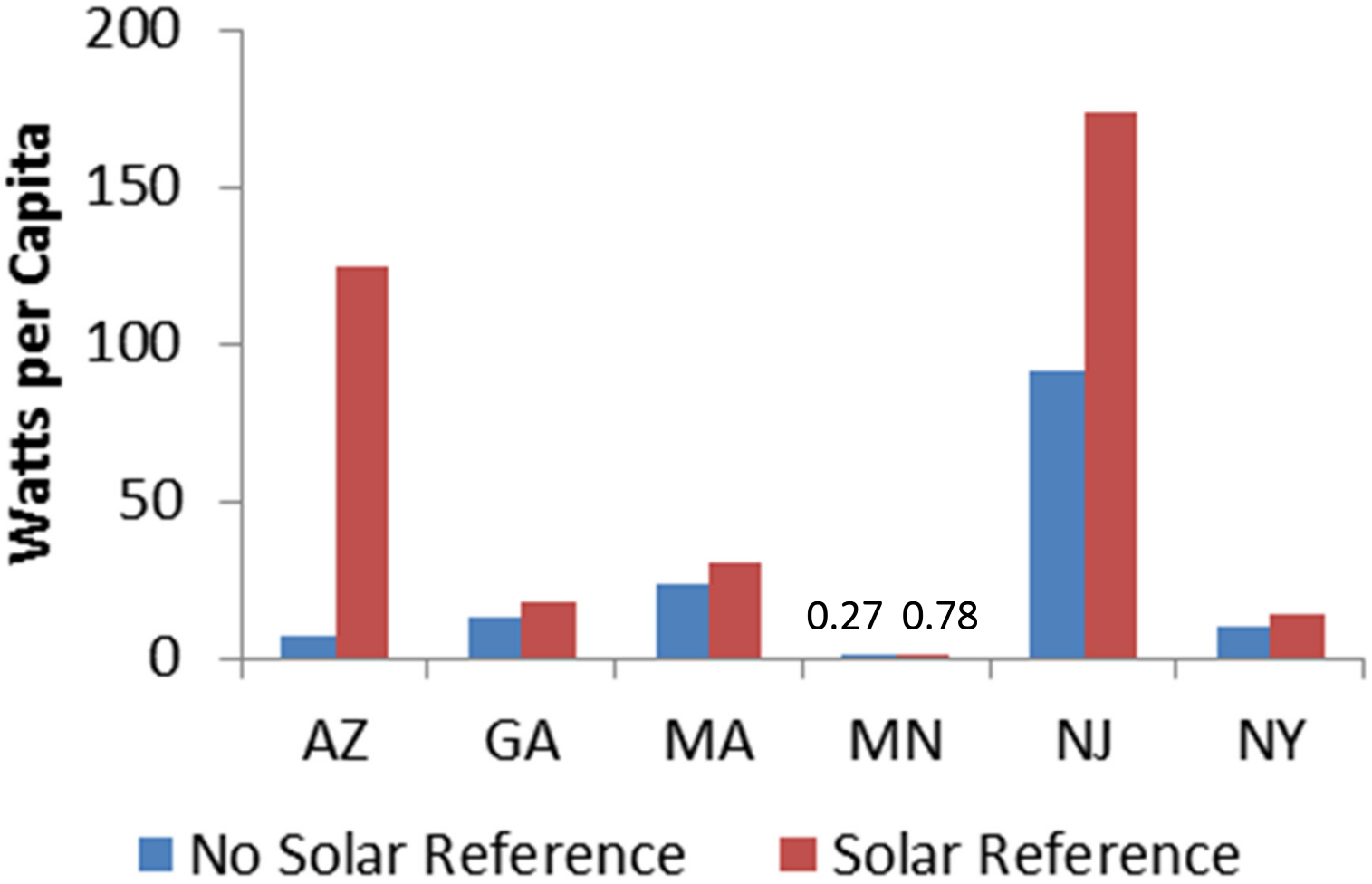
Proportion of Municipalities Referencing Clean Energy in Codes in Each State



Powered by SunShot
U.S. Department of Energy

Cook, et all. 2016. *Clean Energy in City Codes: A Baseline Analysis of Municipal Codification across the U.S.* NREL-66120. National Renewable Energy Laboratory (NREL), Golden, CO (US). http://www.nrel.gov/docs/fy17osti/66120.pdf

Municipal PV Deployment Correlated with Solar References in Code



Powered by SunShot
U.S. Department of Energy

Cook et al. 2016. *Clean Energy in City Codes: A Baseline Analysis of Municipal Codification across the U.S.* NREL-66120. National Renewable Energy Laboratory (NREL), Golden, CO (US).
http://www.nrel.gov/docs/fy17osti/66120.pdf

Photo: Prairie Restorations, Inc.

Thank you!

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SolSmart.org

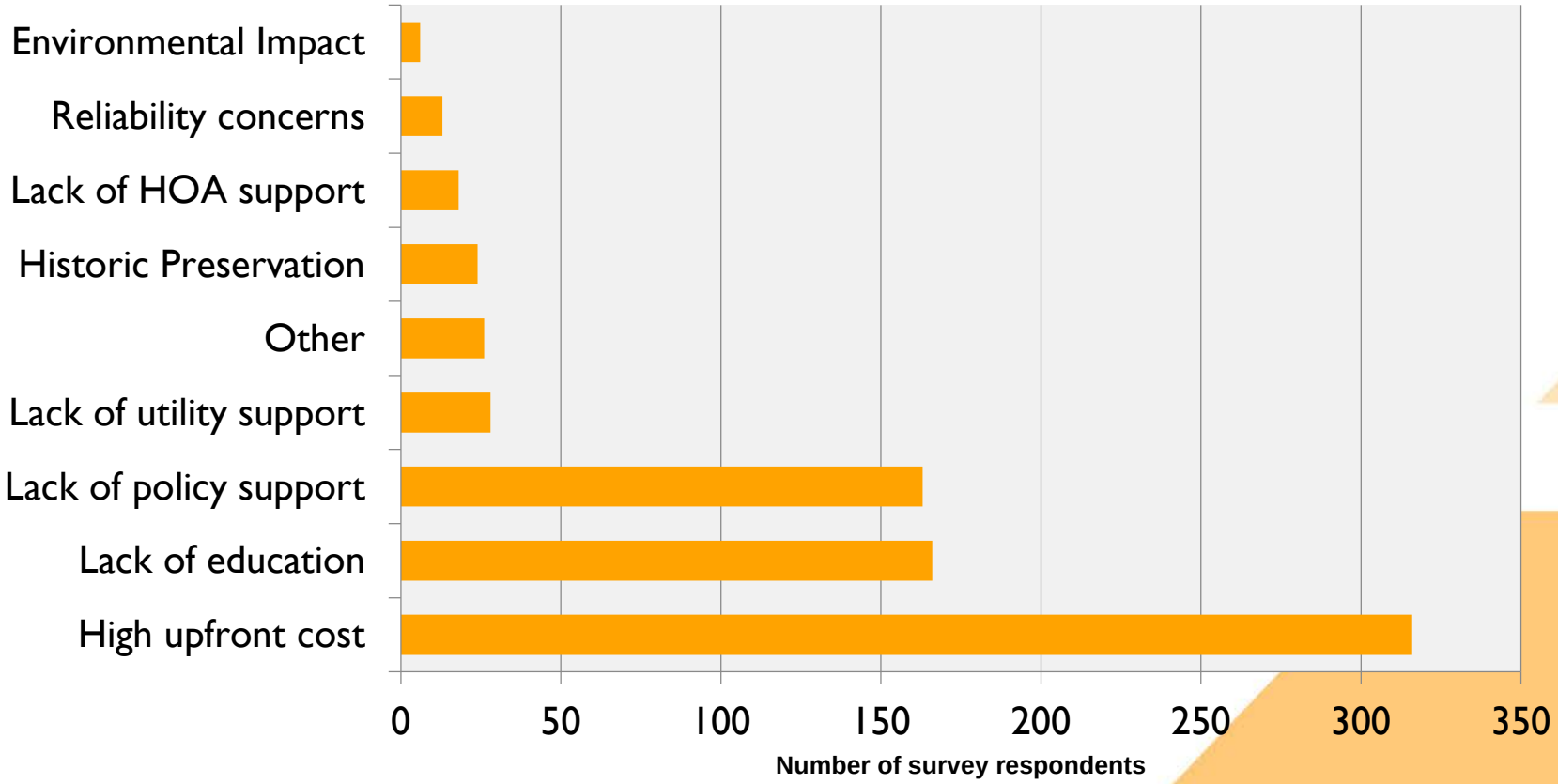
From the Rooftop to the Solar Farm:

SolSmart and solar planning and zoning

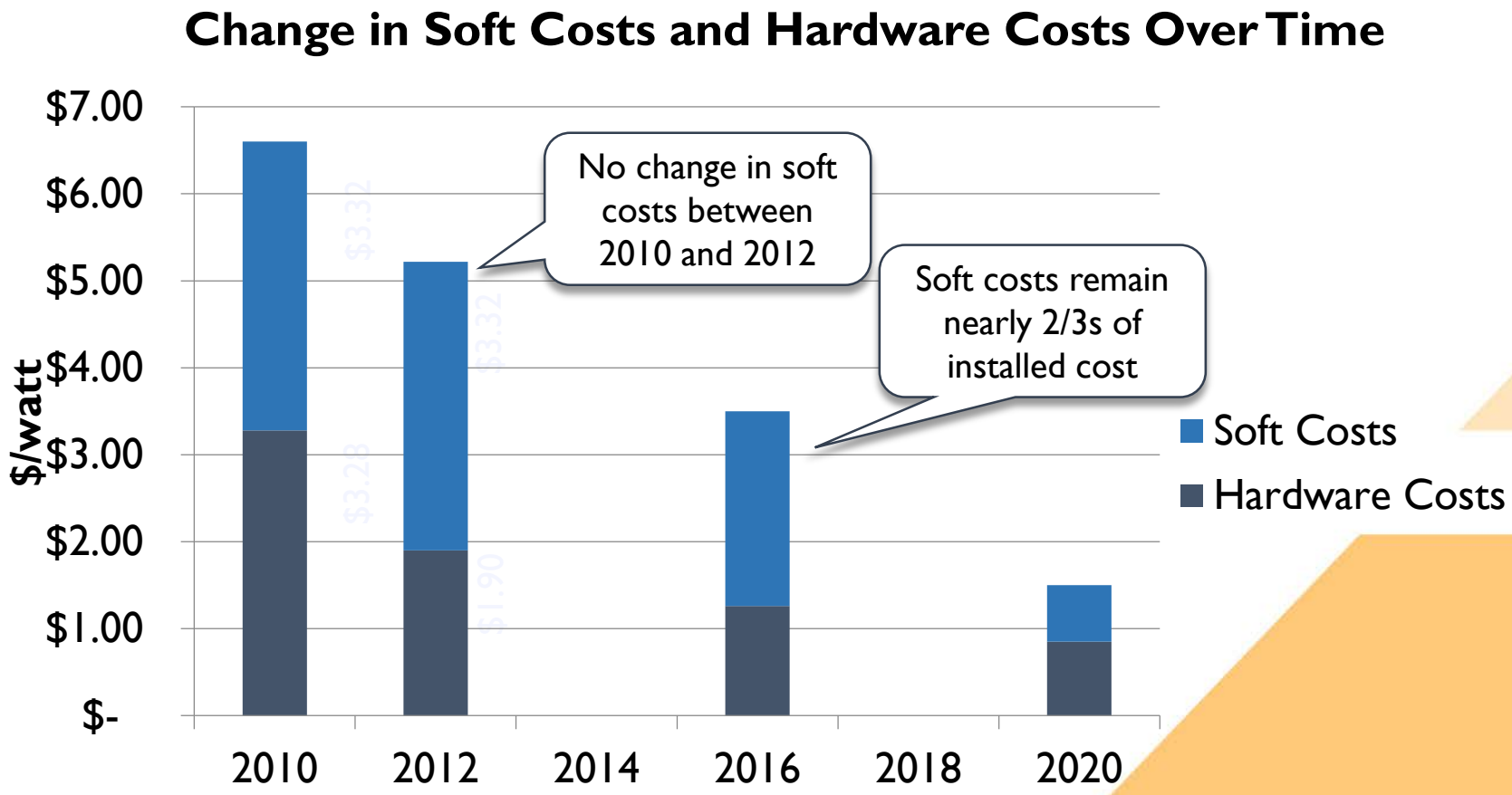
James Schroll
Project Manager, The Solar Foundation

February 27, 2017

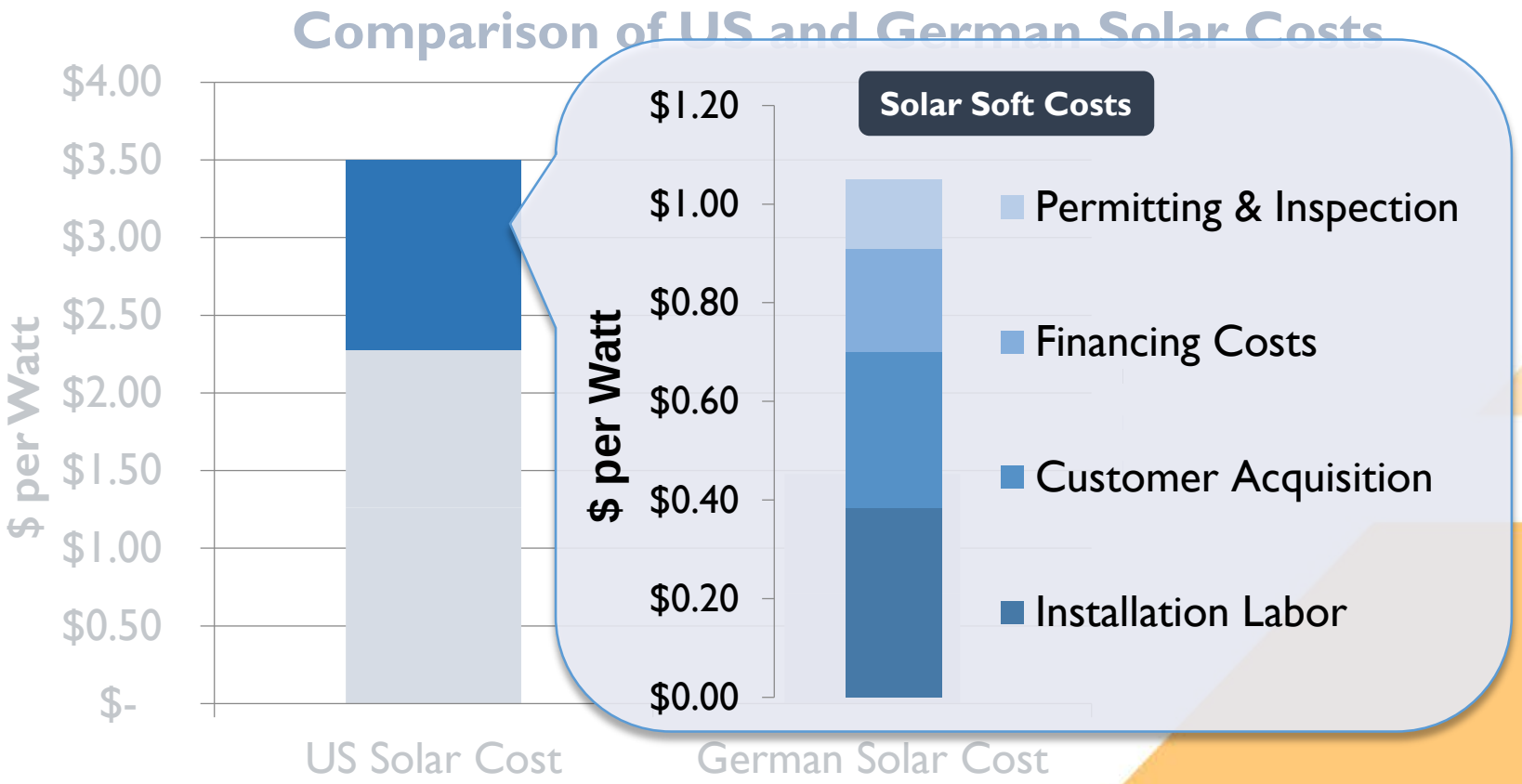
Common Barriers to Solar



The Cost of Solar in the US



The Cost of Solar in the US

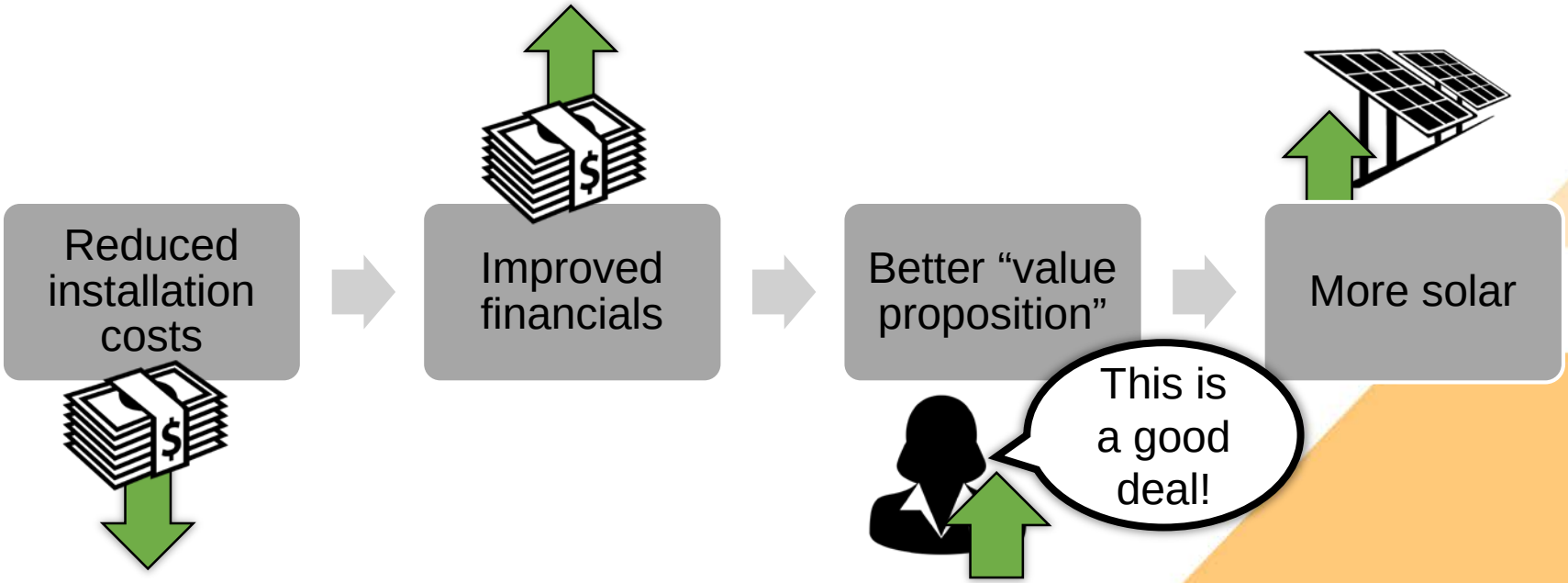


Source: NREL (http://www.nrel.gov/docs/fy14osti/60412.pdf)

LBNL (http://emp.lbl.gov/sites/all/files/lbnl-6350e.pdf)(http://www1.eere.energy.gov/solar/pdfs/sunshot_webinar_20130226.pdf)

Benefits of Reducing Soft Costs

Streamlining local regulatory processes can reduce the cost of a typical system by **$2,500**. Onerous permitting procedures, for instance, can add **$700** to the installed cost.



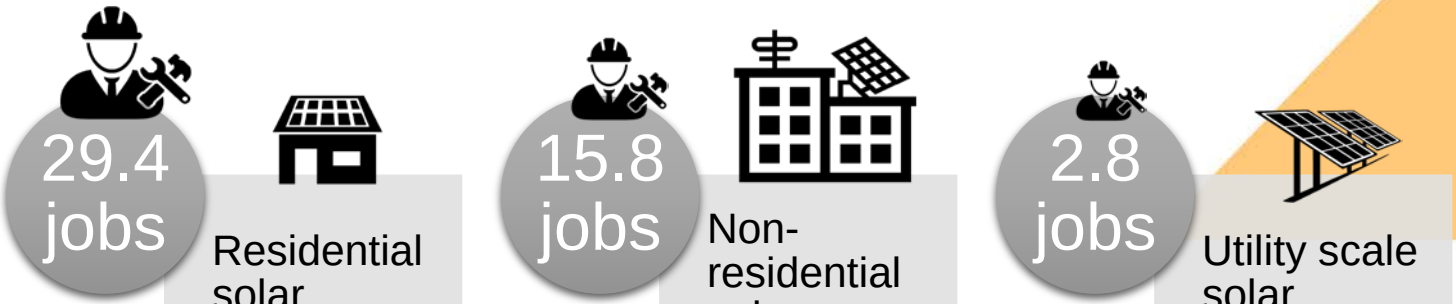
Benefits of Reducing Soft Costs

Support American businesses

- 8,601 U.S. businesses comprise the solar value chain. All but a handful are small businesses.
- Installers avoid multiple jurisdictions in their service areas based on onerous permitting.

Create American jobs

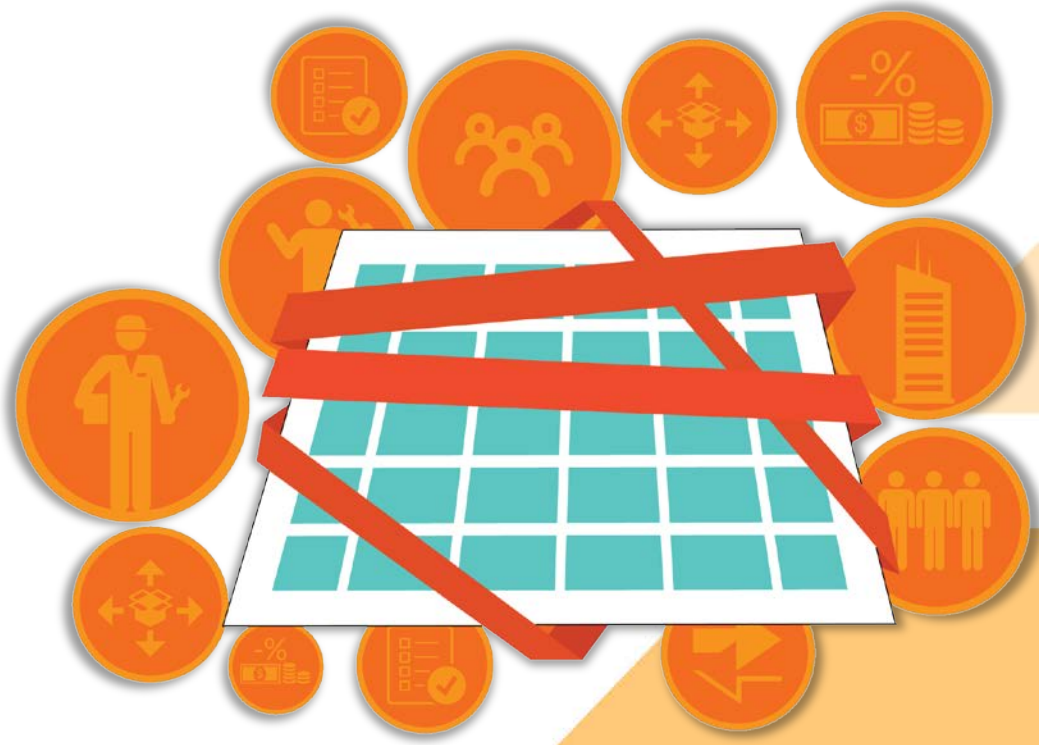
- There are over **250,271 solar workers** in the U.S.
- Solar jobs have increased by 168% since 2010.



Sources: Clean Power Finance (Spruce); The Solar Foundation

Takeaways

1. Soft costs often comprise a larger share of total installed cost than hardware and they slow solar market growth.
2. Soft costs can artificially shrink the number of places where solar is financially viable, thereby denying communities the economic benefits related to solar.
3. **Local governments have a key role to play in reducing barriers.**



SolSmart Goals & Overview

- To make it **faster**, **easier**, and more **affordable** for more Americans to choose solar energy, SolSmart will **recognize at least 300 U.S. local governments** with a nationally prestigious solar designation.

Designation

- Earn Bronze, Silver, or Gold designation based on solar-related actions.
- Demonstrate that the community is "**open for solar business**," making it more attractive to solar industries.

Technical Assistance

- Communities can receive no-cost technical assistance in 8 solar-related categories.
- Solar experts will help review local processes, expand solar markets, and earn designation.

The SolSmart Team

SolSmart Program

TA Delivery

The SOLAR FOUNDATION

NREL NATIONAL RENEWABLE ENERGY LABORATORY

MEISTER CONSULTANTS GROUP

RAP

EPRI ELECTRIC POWER RESEARCH INSTITUTE

BROOKS ENGINEERING

TA Pipeline

NACo NATIONAL ASSOCIATION of COUNTIES

NATIONAL LEAGUE of CITIES

SEIA Solar Energy Industries Association®

Designation Program Expertise

ICMA

NATIONAL CIVIC LEAGUE

Home Innovation RESEARCH LABS

Solar Outreach Experience

MEISTER CONSULTANTS GROUP

The SOLAR FOUNDATION

Criteria Advisory Committee

SolSmart Criteria

Designation and technical assistance is tied to these eight categories and their associated actions:

Foundational Categories	Special Focus Categories
Permitting	Solar Rights
Planning, Zoning, and Development Regulations	Inspection
	Construction Codes
	Community Engagement
	Utility Engagement
	Market Development & Finance
Innovative Actions	

Don't have jurisdiction?

- The "modified pathway" to SolSmart designation is for counties that do not have jurisdiction over permitting, planning and zoning, and/or inspection processes.
- Focused on convening and collaborating with local governments within the county on those aspects, while implementing best practices in areas the county does control.

No-Cost Technical Assistance

- All communities pursuing SolSmart designation are **eligible for no-cost technical assistance** from national solar experts.
- **TA providers have decades** of combined experience in solar energy, along with **thousands of hours of previous TA provision** to municipal governments.
- On average, a community can expect **100 hours** of technical assistance.

SolSmart Advisors

- **Program-funded temporary staff** to help communities achieve designation.
- Advisors **evaluate existing local government standards**, **processes**, and **apply industry-leading best practices** that move a community toward designation.
- SolSmart Advisors assist communities through **engagements lasting up to six months.**
- Equates to **hundreds of hours** of in-person technical assistance for communities receiving an Advisor.

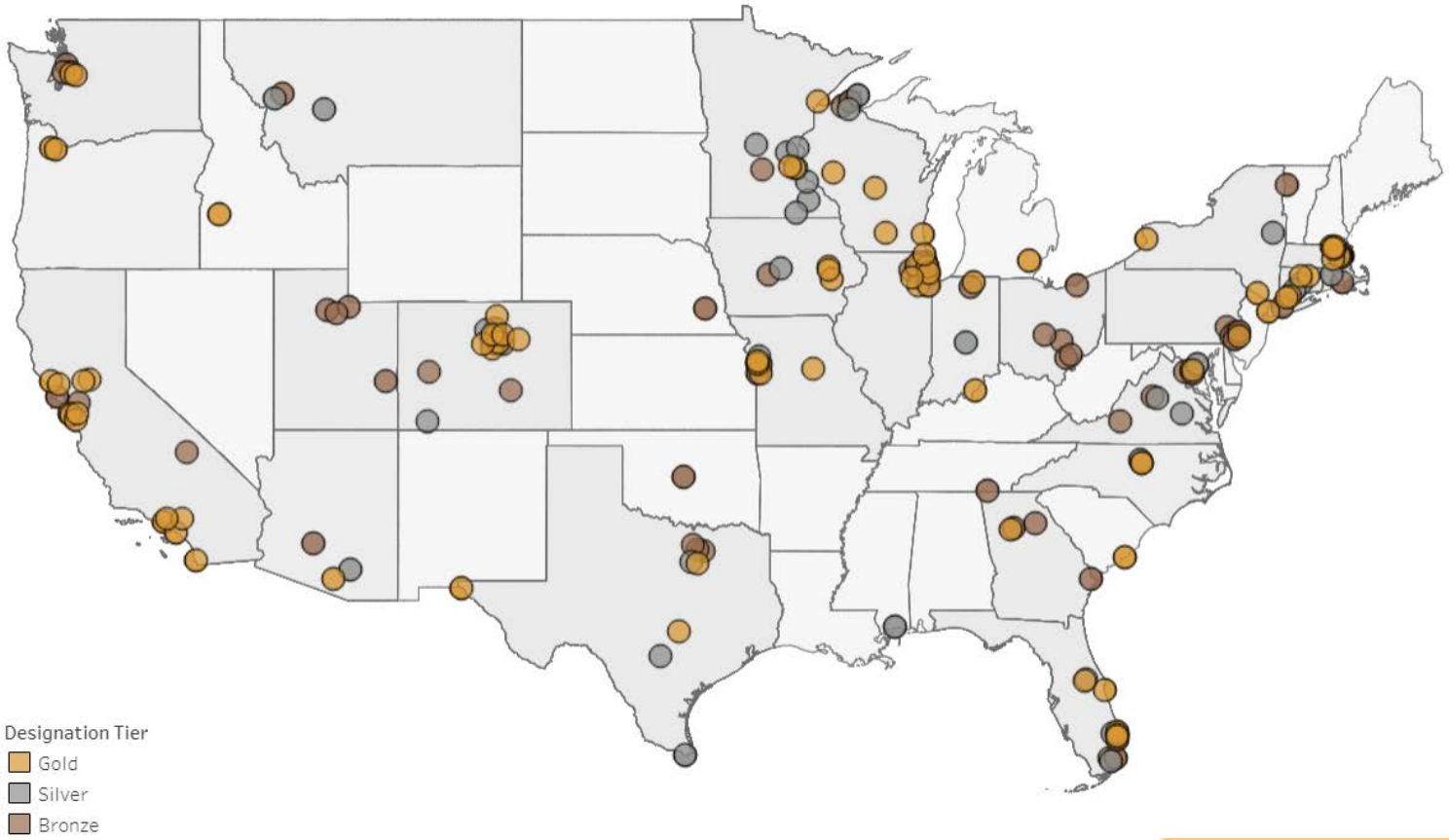
Planning & Zoning TA

- ❑ Review zoning ordinance for barriers to solar.
- ❑ Assist with amendments to zoning ordinance.
- ❑ Review existing plans & develop solar goals.
- ❑ Provide clear guidance for solar PV in historic districts.
- ❑ Develop incentives for solar PV on parking lots or other under-utilized properties.
- ❑ Establish a regulatory pathway for primary use solar PV.
- ❑ Clarify regulations for small ground-mounted solar PV.

Solar Powering Your Community

- The U.S. Dept. of Energy funded the development of “Solar Powering Your Community: A Guide for Local Governments” in 2011 through the Solar Market Transformation
- SolSmart is updating the guidebook, which will include a section on planning and zoning.
- The guidebook should be completed in the Spring 2018.

SolSmart Participants



- ❑ 230+ participating AHJs
- ❑ 188 current designees
- ❑ Designees in 35 states
- ❑ Over 64 million Americans

Will County, IL

- Will County joined SolSmart in June 2016.
- Since joining SolSmart, program staff have assisted Will County staff with:
  - Determining their path to designation.
  - Reviewing the county zoning code, specifically as it pertains to solar as a primary use.
  - Developing a checklist to make the solar permitting process more transparent.
  - Identifying appropriate documentation to receive points. Will County entered the program having already attained several criteria.
- Will County earned Gold SolSmart designation.

Charlottesville, VA

- Charlottesville joined SolSmart in 2015.
- Since joining SolSmart, program staff have assisted Charlottesville staff with:
  - Amending the City's zoning ordinance.
  - Cross-training permitting and inspection staff in solar PV best practices.
  - Training fire and safety staff on solar PV best practices.
  - Identifying appropriate documentation to receive points. Charlottesville entered the program having already attained several criteria.
- Charlottesville earned Silver SolSmart designation.

Q & A

James Schroll

Project Manager, SolSmart
Technical Assistance Provider
The Solar Foundation
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Q&A

The webinar recording and presentation slides will be posted at sustainableplanning.net

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Facebook/Twitter: APASCD
Email: APASCD@gmail.com

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