



THE STATE OF SOLAR ENERGY
(AND WHY IT SHOULD MATTER TO YOU . . .)

MINNESOTA ASSOCIATION OF
COUNTY PLANNING & ZONING ADMINISTRATORS
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Today's Agenda

1. Welcome, Introductions
2. State of Solar Energy
3. "Solar Ready" Communities
4. Understanding Solar Resources
5. Solar Technologies
6. Statutory Context
7. Local Solar Best Practices



Our Mission . . .

Transforming the way we produce, distribute and consume energy to be both economically and environmentally sustainable.



Achieving our Mission by:

1. Developing better energy policy via consensus decision-making.
2. Working with communities to identify and implement local and regional sustainability priorities.
3. Providing local, state, and federal policy-makers with reliable analysis & decision tools.




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Sustainable Communities
Transforming the world through community action

1. Grow Solar Partnership
2. GreenStep Cities
3. Metro Clean Energy Resource Team (CERT)
4. Sustainability Planning and Technical Assistance

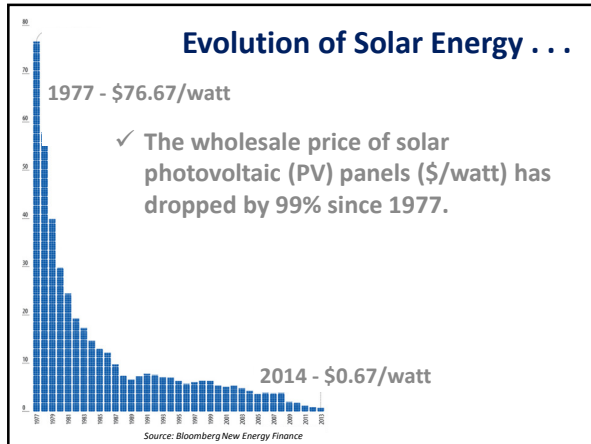


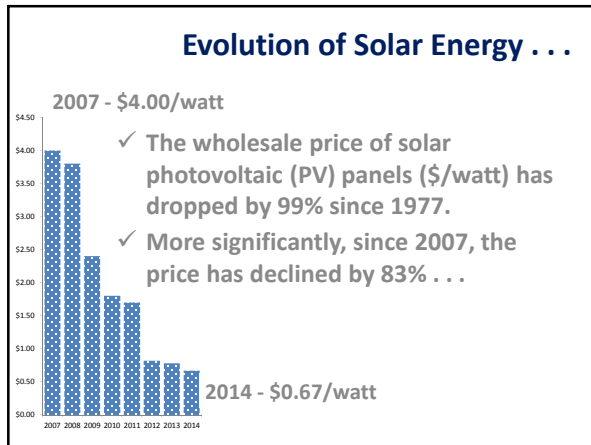
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State of Solar Energy

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Policy Drivers of Solar Development

Federal Investment Tax Credits:

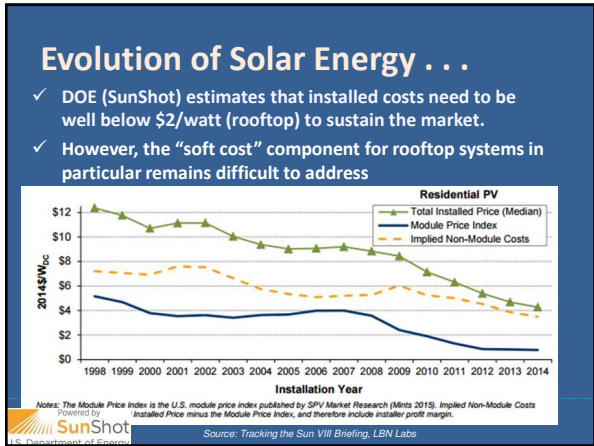
- 30% through 2016, 10% in 2017
- Accelerated Depreciation

2013 Policy:

- 1.5% Solar Energy Standard
- Xcel's Community Solar Garden Program
- Made in MN Solar Incentives
- Net Metering updates

1.5%
Solar by
2020:
400 MW

Total as
of 2014:
19 MW



If you remember one thing . . .

Solar energy development is local development

- ✓ Local government development oversight determines how, and whether, local solar resources are used

Photo credit: U.S. DOE SunShot

Photo credit: CR Planning

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Like all Development . . .

- ✓ Solar development adds value to homes and businesses
- ✓ Solar development creates local economic opportunity
- ✓ Solar development productively uses local resources
- ✓ Solar development poses potential conflicts

Photo credit: U.S. DOE SunShot

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Solar Development is Development

Typical Local Government Roles in Development Activities

- ✓ **Regulator** – policy, zoning, permitting
- ✓ **Educator** – providing information to help people make informed decisions
- ✓ **Financier or Assembler** – EDA type role, providing financing tools, development preparation, assembly of resources for private sector investment
- ✓ **Developer** - HRA or public housing authority type role, owning and managing development for private sector use
- ✓ **Consumer** – developing solar for public sector use



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Making Your Community "Solar Ready"

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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

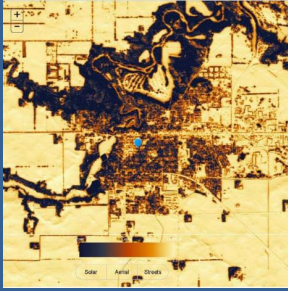


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Solar Ready Communities

A. Comprehensive Plans that:

- ✓ address solar resources,
- ✓ acknowledge solar development benefits, and
- ✓ guide decision-makers on optimizing opportunities when resources are in conflict.



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Solar Ready Communities

B. Development Regulations that:

- ✓ explicitly address solar development in its varied forms,
- ✓ create as-of-right installation opportunities, and
- ✓ sets clear and predictable standards for balancing solar resources with other resources.



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Solar Ready Communities

C. Permitting practices that:

- ✓ Reduce time spent on acquiring permits and conducting inspections
- ✓ Make the permit process transparent and predictable to both staff and applicants
- ✓ Ensure the permit process reflects industry best practices
- ✓ Establish a permit fee that appropriately covers local government review and inspection costs



Solar Ready Communities

D. Public Sector Investment in the community's solar resources to demonstrate viability, community commitment, technological elements.



Photo credit: Bruce Schnaak Photography, City of Saint Paul, City of Minneapolis

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Solar Ready Communities

E. Local Programs to remove or limit market barriers (lack of information, financing, workforce) that prevent capture of the economic, environmental, and social value of the community's solar resources.



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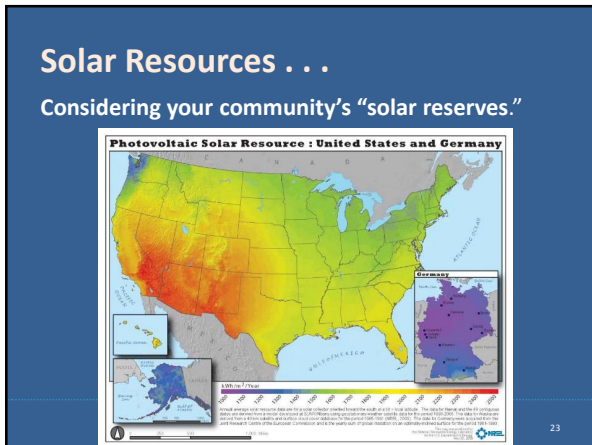
Local Government Toolkits

Planning, Zoning, Permitting



www.grow-solar.org/LocalGovToolkits

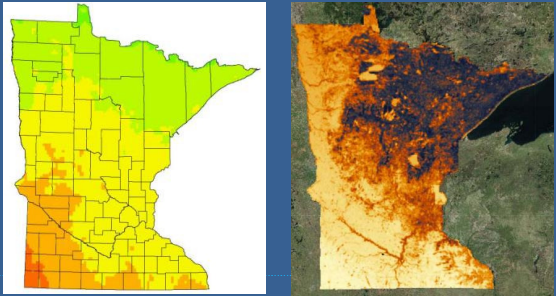







Solar Resources . . .

Considering your community's solar reserves.

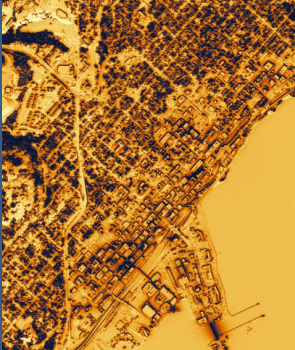


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Minnesota's Solar Resource Map



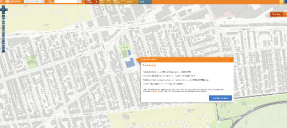
- Why map solar?
- Who's doing it?
- How can it be used?
- What's next?



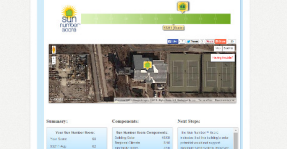
We weren't the first to do it




Mapdwell: All buildings in DC, Boston, more



NYC Solar Map: All buildings in the city

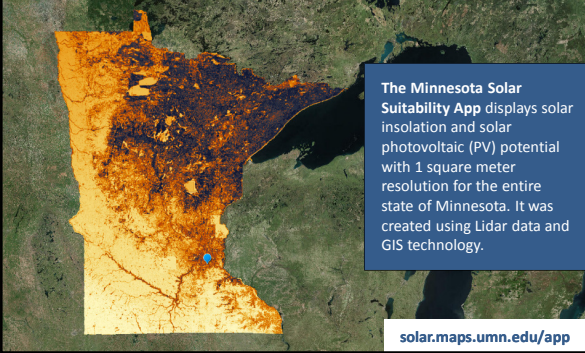



Sun Number: Single buildings in cities



Geostellar: Single buildings nationwide

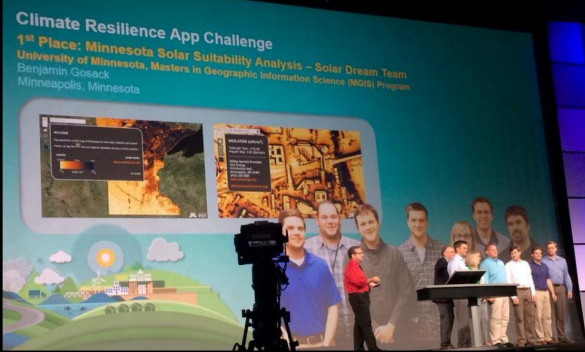

But we mapped an entire state



The Minnesota Solar Suitability App displays solar insolation and solar photovoltaic (PV) potential with 1 square meter resolution for the entire state of Minnesota. It was created using Lidar data and GIS technology.

solar.maps.umn.edu/app

And won an award for it



Climate Resilience App Challenge
1st Place: Minnesota Solar Suitability Analysis - Solar Dream Team
University of Minnesota, Masters in Geographic Information Science (GIS) Program
Benjamin Gosack
Minneapolis, Minnesota

Overview: IKEA Twin Cities



The app can be used on a computer, tablet, or phone at solar.maps.umn.edu/app.

Users put in their address to zoom into a particular area, then can click on a rooftop or any other area to see if it is a good location for solar.

solar.maps.umn.edu/app

Potential: IKEA Twin Cities

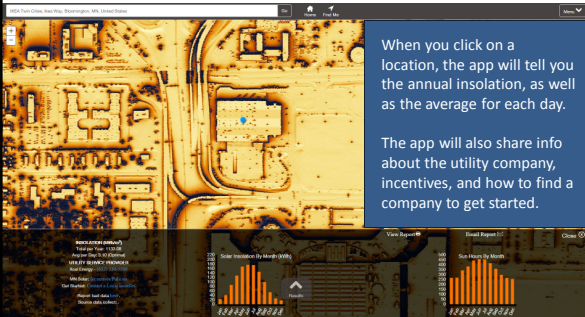


You can use the search bar to zoom in to your location and see the solar suitability of a particular building or other location.

solar.maps.umn.edu/app

CLEAR ENERGY RESOURCE TEAM

Potential: IKEA Twin Cities



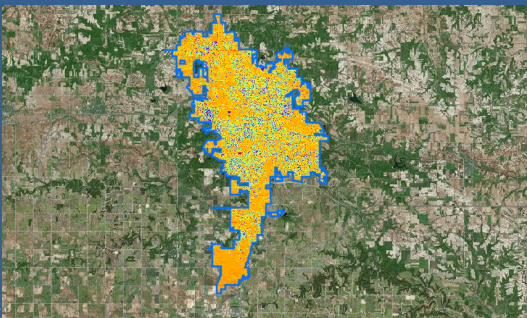
When you click on a location, the app will tell you the annual insolation, as well as the average for each day.

The app will also share info about the utility company, incentives, and how to find a company to get started.

solar.maps.umn.edu/app

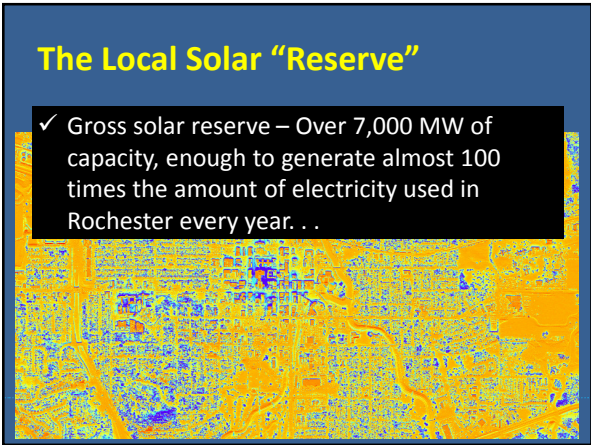
CLEAR ENERGY RESOURCE TEAM

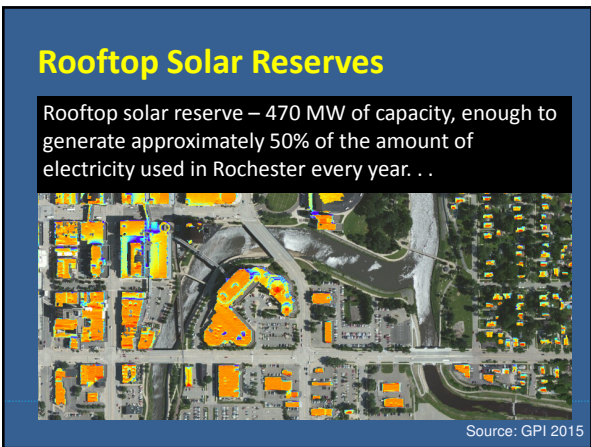
Thinking about your Solar "Reserve"



Source: GPI 2015









Solar Technologies

Solar development is not one thing . . .

1. **Roof-mounted systems.** Capturing the rooftop solar resource on buildings as small as a garage and as big as a convention center.
2. **Ground-mounted accessory systems.** Free-standing systems on a pole or a rack in the yard.
3. **Building-integrated systems.** Systems built into a building component, such as a shingle, an awning, or a gazebo.
4. **Solar farms.** Ground-mounted systems that are the principal use and cover 5 – 500 acres.

Photo Credit: Able Energy

Photo Credit: Powerfully Green

Solar Technologies

✓ **Rooftop Solar PV systems**

Photo credit: CR Planning

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Solar Technologies



Photo credit: Eric Hansen/SolarFlow

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Solar Technologies

✓ Building Integrated PV



Photo credit: CR Planning

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Solar Technologies

✓ Ground mount accessory structures



Photo credit: CR Planning

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Solar Technologies

- ✓ Rooftop solar thermal



Photo credit: CR Planning

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Solar Technologies

- ✓ Solar Air/Transpired Air

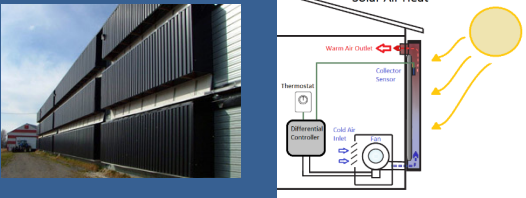


Photo credit: Solar Wall, <http://solarwall.com/en/products/uses-and-applications/agriculture.php>

Photo credit: RREAL, <http://www.rreal.org/wp-content/uploads/2010/03/Air-heat-Diagram-21.png>

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Solar Technologies

- ✓ Large Scale commercial rooftop



Photo credit: Meet Minneapolis

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Solar Technologies

- ✓ Pole-mounted (fixed or tracking) solar farm



Photo credit: VTD/Eric Blokland, <http://vtdigger.org/2011/07/28/vermont-solar-farm/>

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Solar Technologies

- ✓ Ground-mount/racked systems



Photo credit: CR Planning

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Solar Technologies

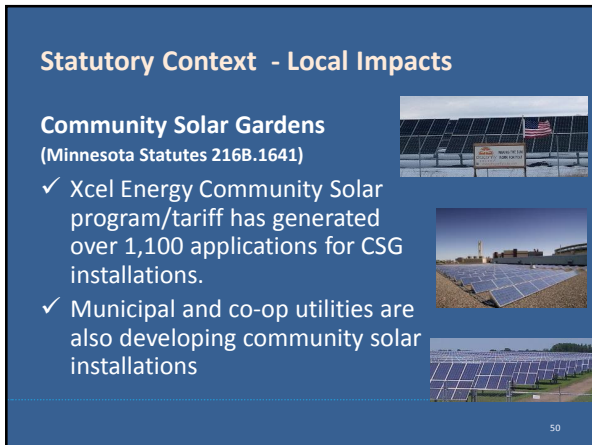
- ✓ Utility-Scale Solar Farm (67 MW, California)

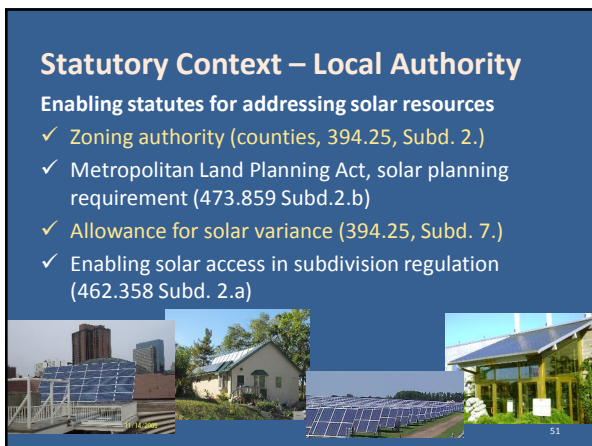


Photo credit: 8minuteenergy, PV Magazine, Nov 2014

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Statutory Context – Local Authority

Enabling statutes for addressing solar resources

- ✓ Enabling solar easements (500.30 Subd. 3.)
- ✓ Power Plant Siting (Minnesota Statutes 216E.01-.05)
- ✓ Solar Property Tax exemption and Production Tax (Minn. Stat. § 272.02, subd. 24)




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Solar Statutes affecting local governments

394.25, Subd. 2. Districts set by zoning ordinances.

Official controls may be applied to . . . protection and encouragement of access to direct sunlight for solar energy systems as defined in section 216C.06, subdivision 17 . . .




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Solar Statutes affecting local governments

Metropolitan Land Planning Act

- ✓ Subd. 2. Land use plan. (b) A land use plan shall contain a protection element, as appropriate, for historic sites, the matters listed in the water management plan required by section 103B.235, and an element for protection and development of access to direct sunlight for solar energy systems.



Solar Statutes
affecting local governments

394.25, Subd. 7. Variances; practical difficulties.

✓ The board of adjustment shall have the exclusive power to order the issuance of variances from the requirements of any official control including restrictions placed on nonconformities. Variances shall only be permitted when they are in harmony with the general purposes and intent of the official control and when the variances are consistent with the comprehensive plan. . . **Practical difficulties include, but are not limited to, inadequate access to direct sunlight for solar energy systems. . .**

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Solar Statutes
affecting local governments

Solar and Wind Easements

Minnesota Stat. 500.30 Subd. 3. allows the purchase and holding of easements protecting access to solar and wind energy.

Required Contents - Any deed, will, or other instrument that creates a solar or wind easement shall include, but the contents are not limited to:

- a) *A description of the real property subject to the easement and a description of the real property benefiting from the solar or wind easement; and*
- b) *For solar easements, a description of the vertical and horizontal angles, expressed in degrees and measured from the site of the solar energy system, at which the solar easement extends over the real property subject to the easement. . .*

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Solar Statutes
affecting local governments

Power Plant Siting Act
(Minnesota Statutes 216E.01-.05)

216E.021 Solar Energy Size Determination.

The alternating current nameplate capacity of one solar energy generating system must be combined with the alternating current nameplate capacity of any other solar energy generating system that:

- (1) is constructed within the same 12-month period as the solar energy generating system; and
- (2) exhibits characteristics of being a single development, including but not limited to ownership structure, an umbrella sales arrangement, shared interconnection, revenue sharing arrangements, and common debt or equity financing.

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Solar Statutes
affecting local governments

Power Plant Siting Act (Minnesota Statutes 216E.01-.05)

Subdivision 1. Local review.
(a) Notwithstanding the requirements of sections 216E.03 and 216E.04, an applicant who seeks a site or route permit for one of the projects identified in this section shall have the option of applying to those local units of government that have jurisdiction over the site or route for approval to build the project. . . .

Subd. 2. Applicable projects.
Applicants may seek approval from local units of government to construct the following projects:
(1) large electric power generating plants with a capacity of less than 80 megawatts. . . .

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Solar Statutes
affecting local governments

Property Taxes, Solar Energy Generating Systems
Personal property consisting of solar energy generating systems, as defined in the newly-enacted Solar Energy Production Tax, is exempt.

- ✓ Principal uses (solar farms or gardens) - the land on which the system is located shall be classified as class 3a property.
- ✓ Accessory uses - the solar energy system is disregarded for purposes of classification.

(Minn. Stat. § 272.02, subd. 24)

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Solar Statutes
affecting local governments

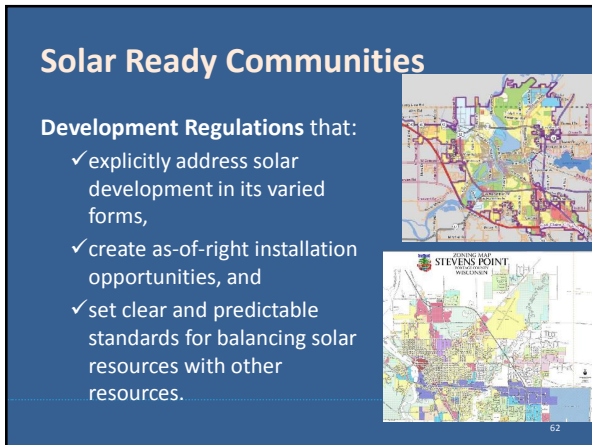
Solar energy production tax

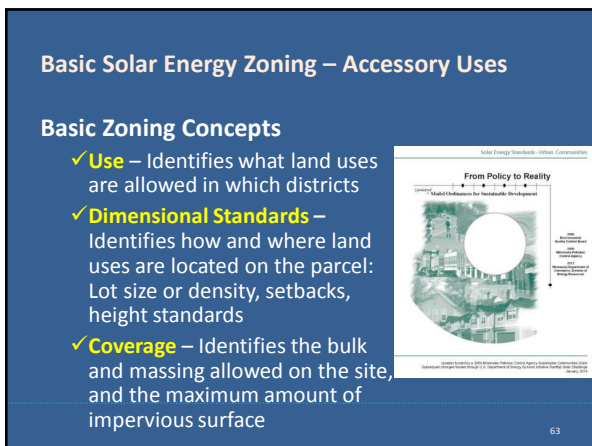
- ✓ The new production tax only applies to solar energy generating systems with a capacity exceeding one megawatt alternating current and establishes a tax rate of \$1.20 per megawatt hour.
- ✓ The production tax is paid to the county in which the system is located, with 80 percent of the revenue distributed to the county and the remaining 20 percent to cities and townships.

(Minn. Stat. § 272.0295)

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Basic Solar Energy Zoning – Principal Uses

Do your basic zoning tools set clear standards for solar farm or garden development?

- ✓ **Use** - Are principal solar land uses allowed? Are clear land use priorities set in districts, overlays?
- ✓ **Submittal requirements** – What information do you need from solar farm developers?
- ✓ **Coverage** – How does your ordinance consider solar collector surfaces in coverage or impervious surface ratios?

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Advanced Solar Zoning

Does your zoning use advanced regulatory concepts that can affect solar development?

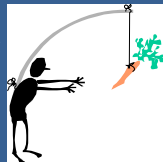
- ✓ **Design standards** - Are community aesthetic or character standards part of local regulations?
- ✓ **Solar easements or cross-property protection** - Does local regulation protect the long-term solar resource when someone makes a long-term investment in solar infrastructure?
- ✓ **Home Owners Associations**– Does the community have an interest in ensuring solar development rights in common interest communities?
- ✓ **Integrating with other processes** – agricultural protection, municipal utility, historic preservation, etc.

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Incentives and Requirements

Does your development regulation use incentives?

- ✓ **Density bonus** for solar development
- ✓ **Protect solar resources** when subdividing
- ✓ **Identify preferred areas** for solar farms
- ✓ **Financial incentives** in fee structure
- ✓ **Planned Unit Development** conditions
- ✓ **“Solar ready”** construction



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Grow Solar Toolkit

- ✓ Solar accessory uses, by type
- ✓ Solar principal uses
- ✓ Regulatory incentives

Minnesota

The slide contains a detailed list of 10 items related to solar energy, including:

1. Solar Energy System with Tracking System
2. Coverage: Grid or building-mounted solar energy on farm, residential, institutional systems and solar for agriculture and aquaculture
3. Approval of Solar Energy System
4. Approval of Solar Energy System
5. Solar Energy System with Tracking System
6. Solar Energy System with Tracking System
7. Solar Energy System with Tracking System
8. Solar Energy System with Tracking System
9. Solar Energy System with Tracking System
10. Solar Energy System with Tracking System

Additional text on the slide includes: "The purpose of this toolkit is to provide local government officials with information on solar energy systems and the regulatory process. The toolkit is intended to be used as a reference tool for local government officials and is not intended to be used as a substitute for legal advice." and "The toolkit is intended to be used as a reference tool for local government officials and is not intended to be used as a substitute for legal advice.".

THANK YOU!

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