Permitting, Planning & Zoning Resources

Solar Powering Minnesota

March 7, 2014

Minnesota Solar Challenge

SOLAR POWERING MINNESOTA

from ideas to action

presented by:

mrea midwest renewable energy association

CLEAN ENERGY RESOURCE TEAMS

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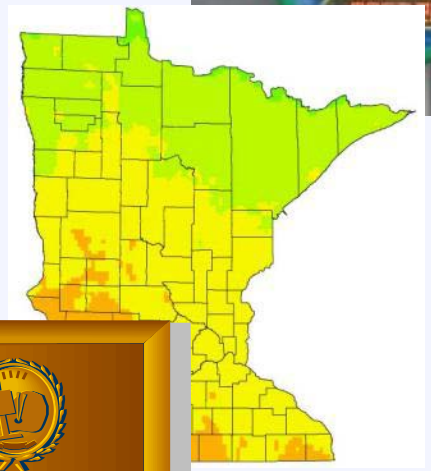
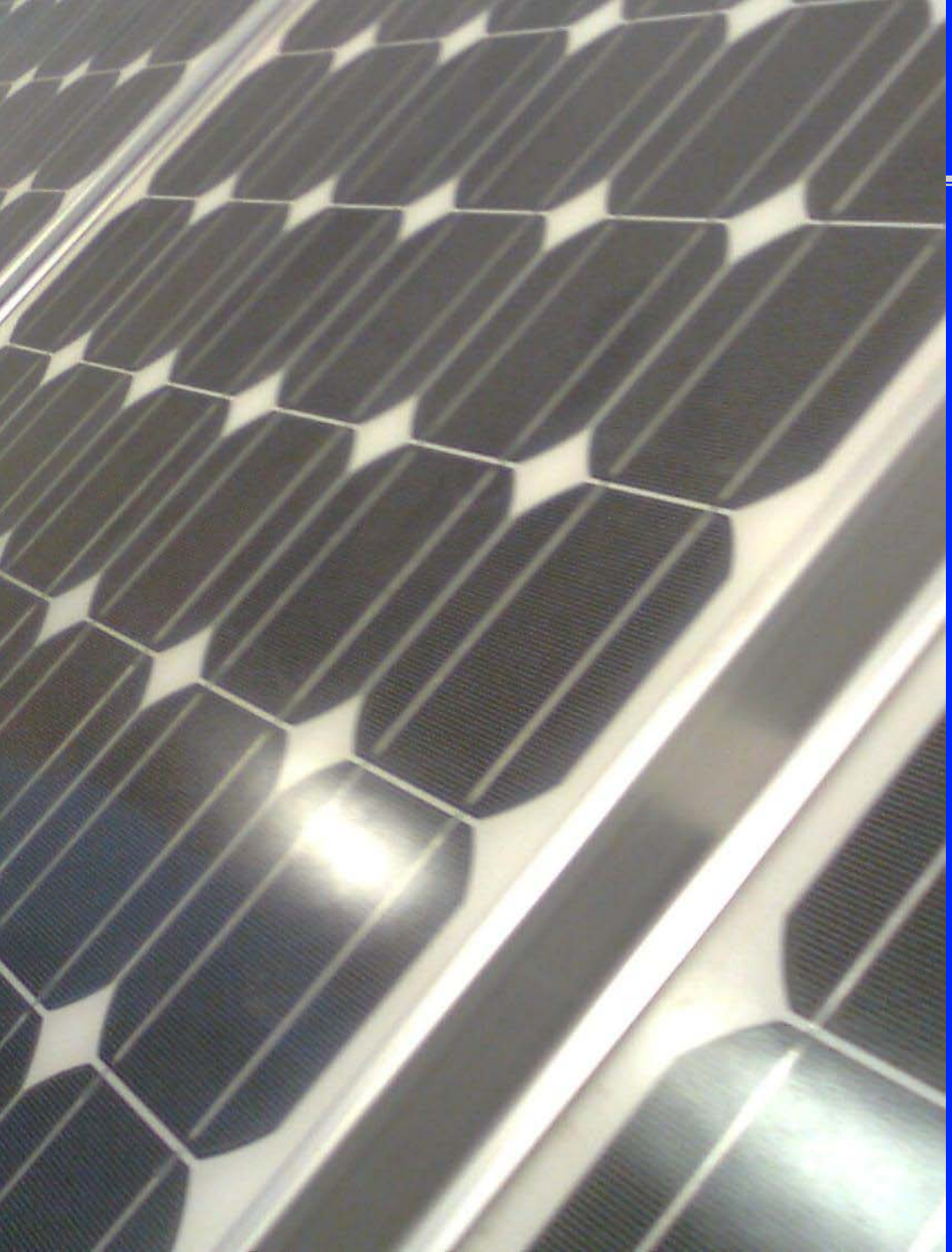
What we're saying . . .

1. Why local governments?
2. What are "solar resources"?
3. What are "solar-ready communities"?



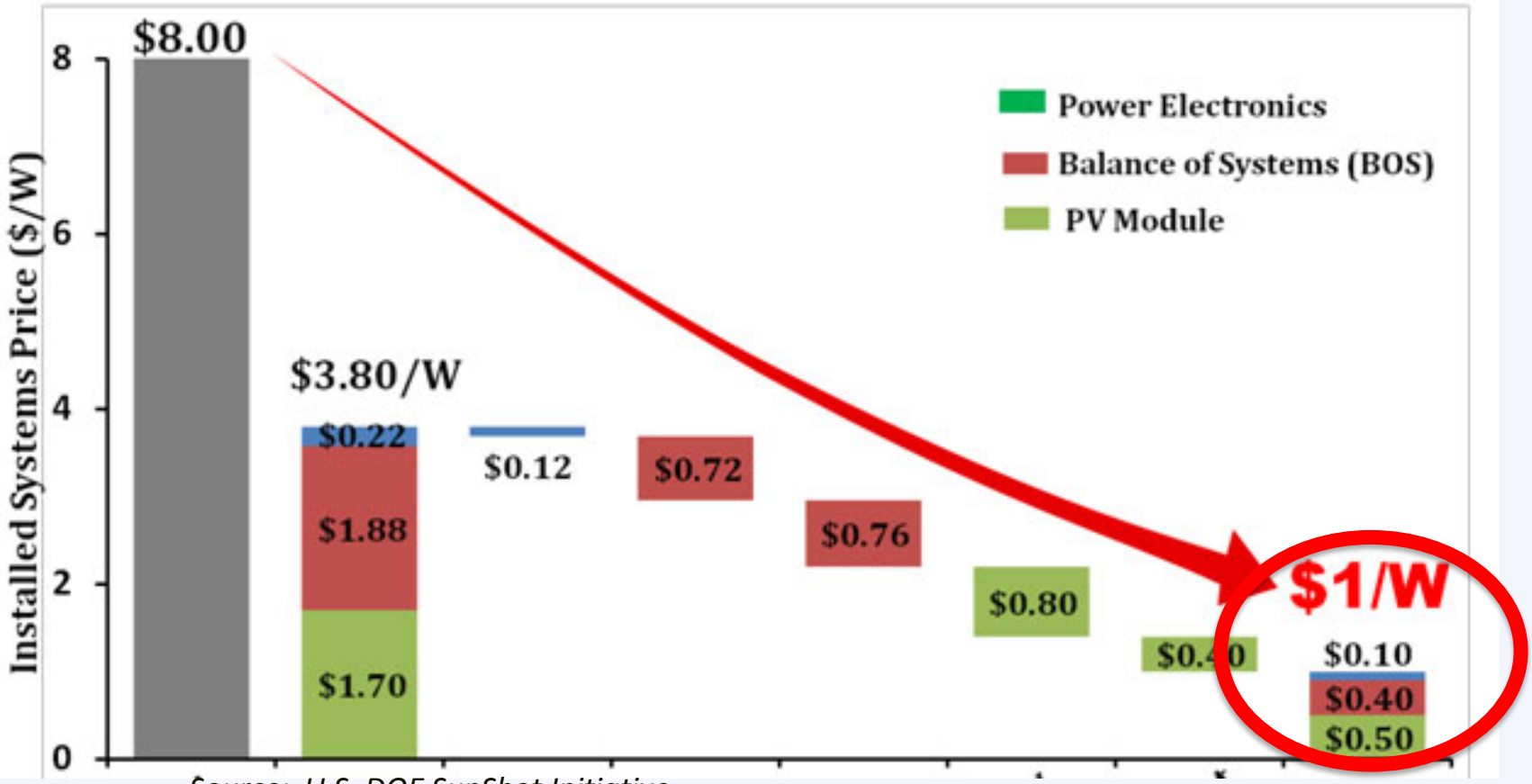


Why Local Governments?

U.S. Department of Energy Rooftop Solar Challenge

Powered by SunShot
U.S. Department of Energy

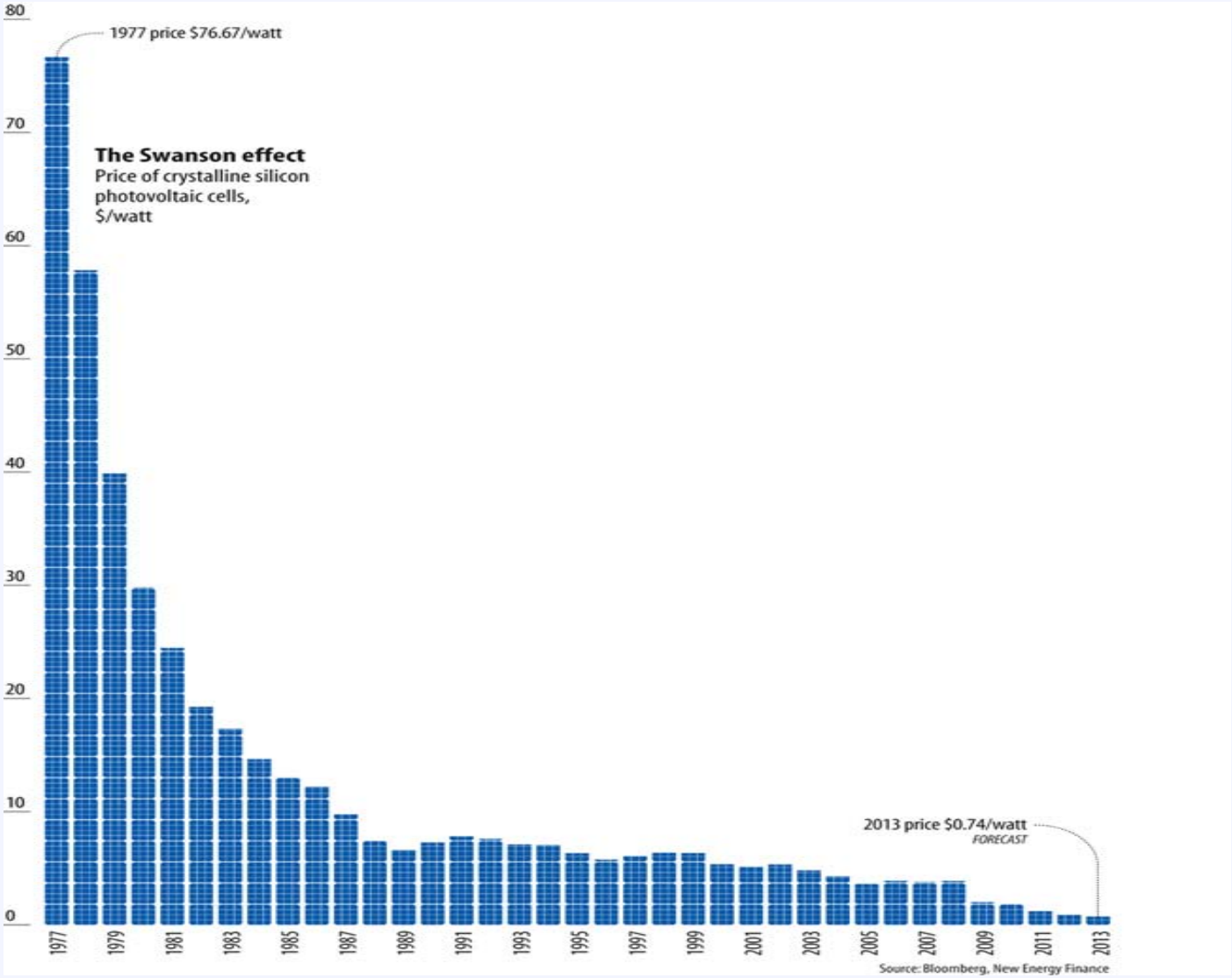
Creating a Self-Sustaining Solar Energy Market



Source: U.S. DOE SunShot Initiative

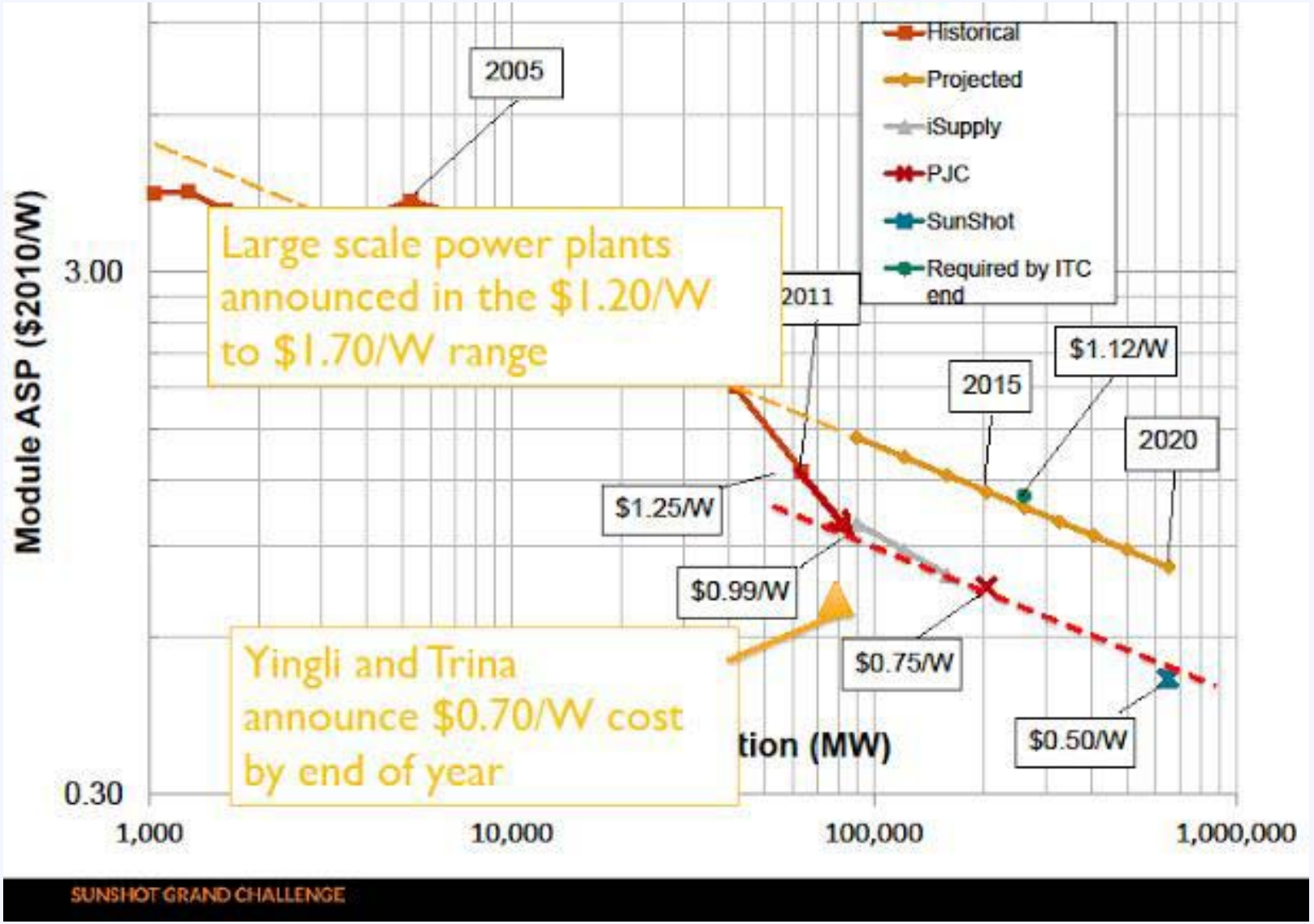
Powered by SunShot
U.S. Department of Energy

Solar Panel Price Drops

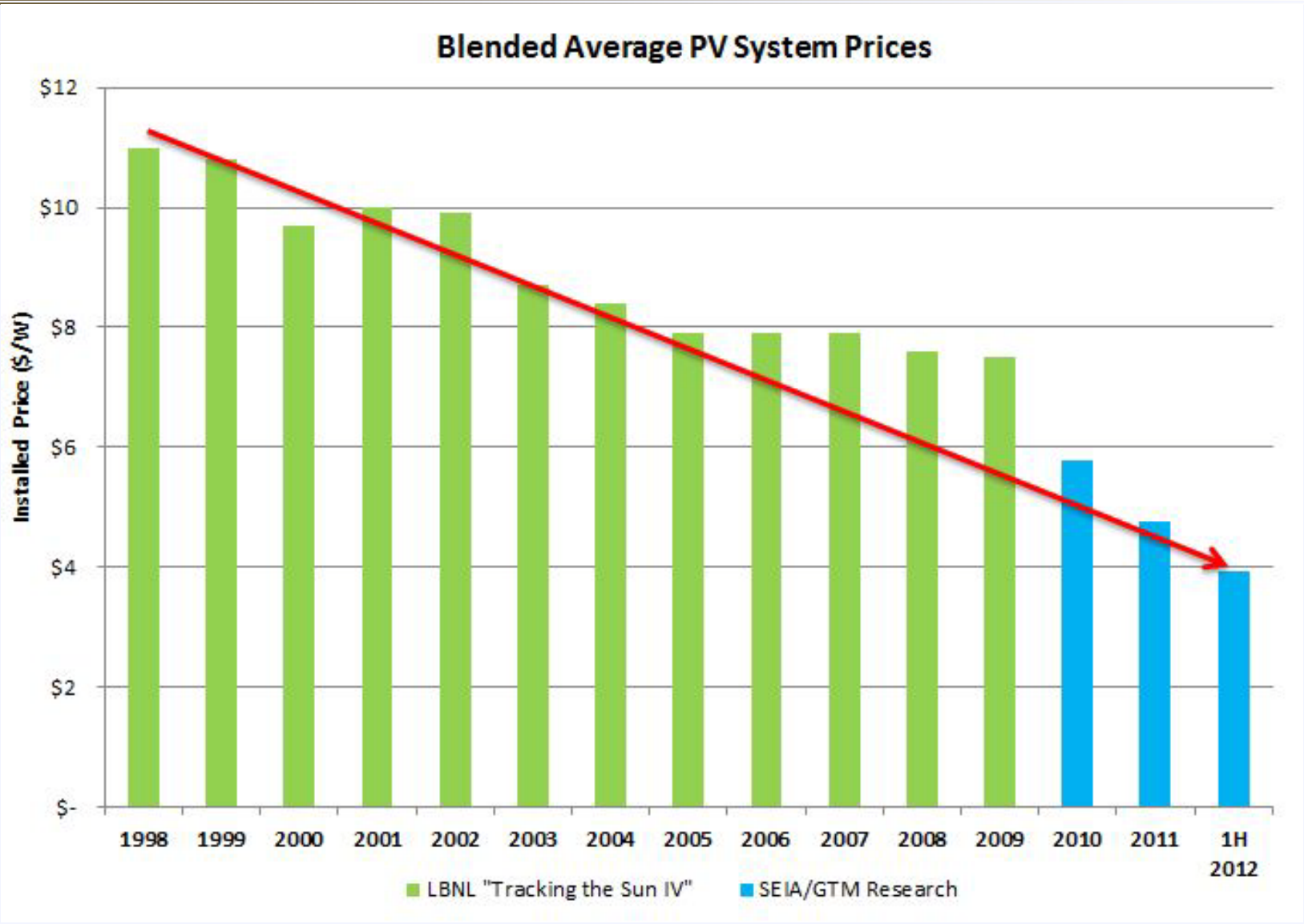


Source: Bloomberg New Energy Finance

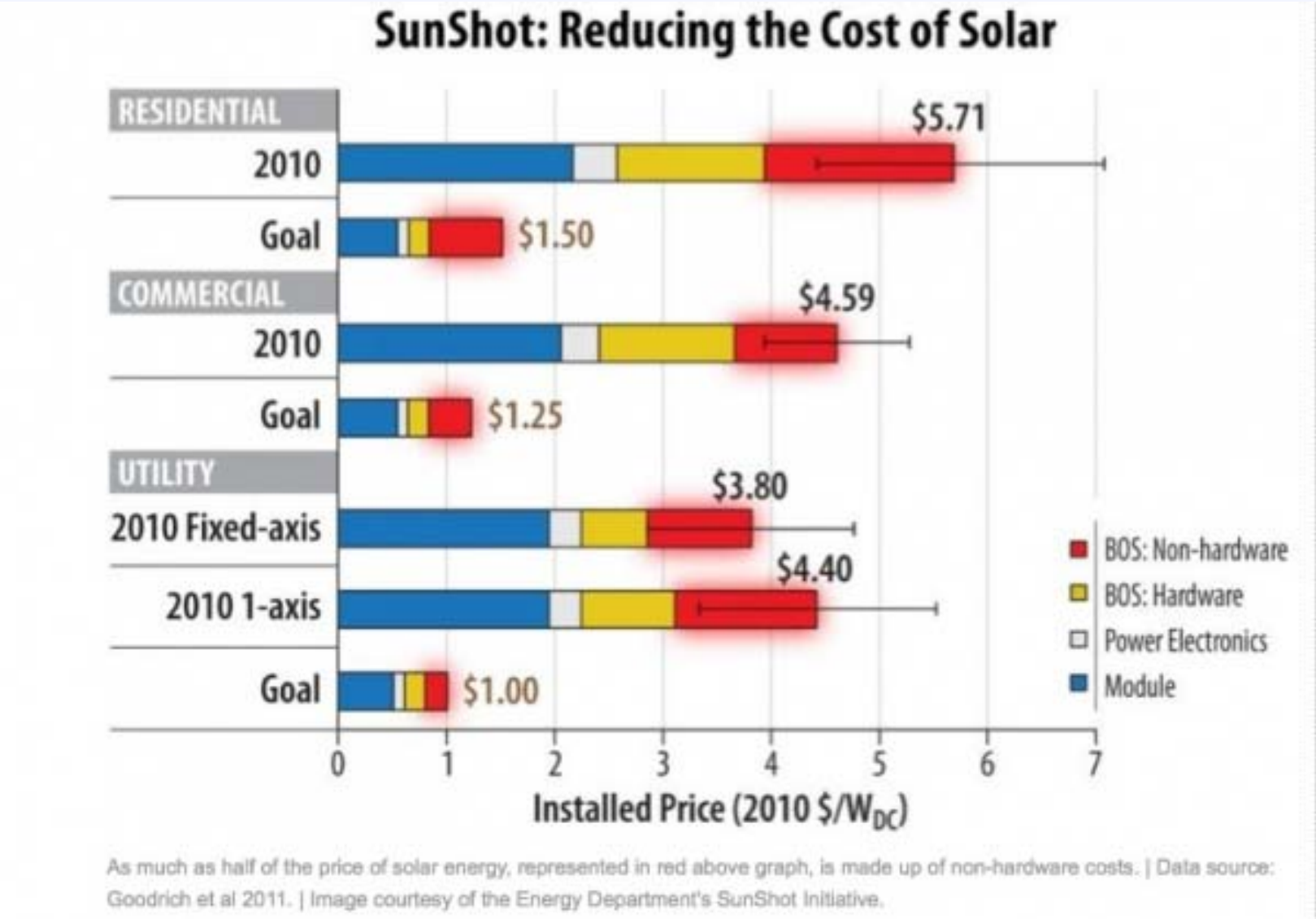
Logarithmic Volume, Costs



Downward Cost Trend

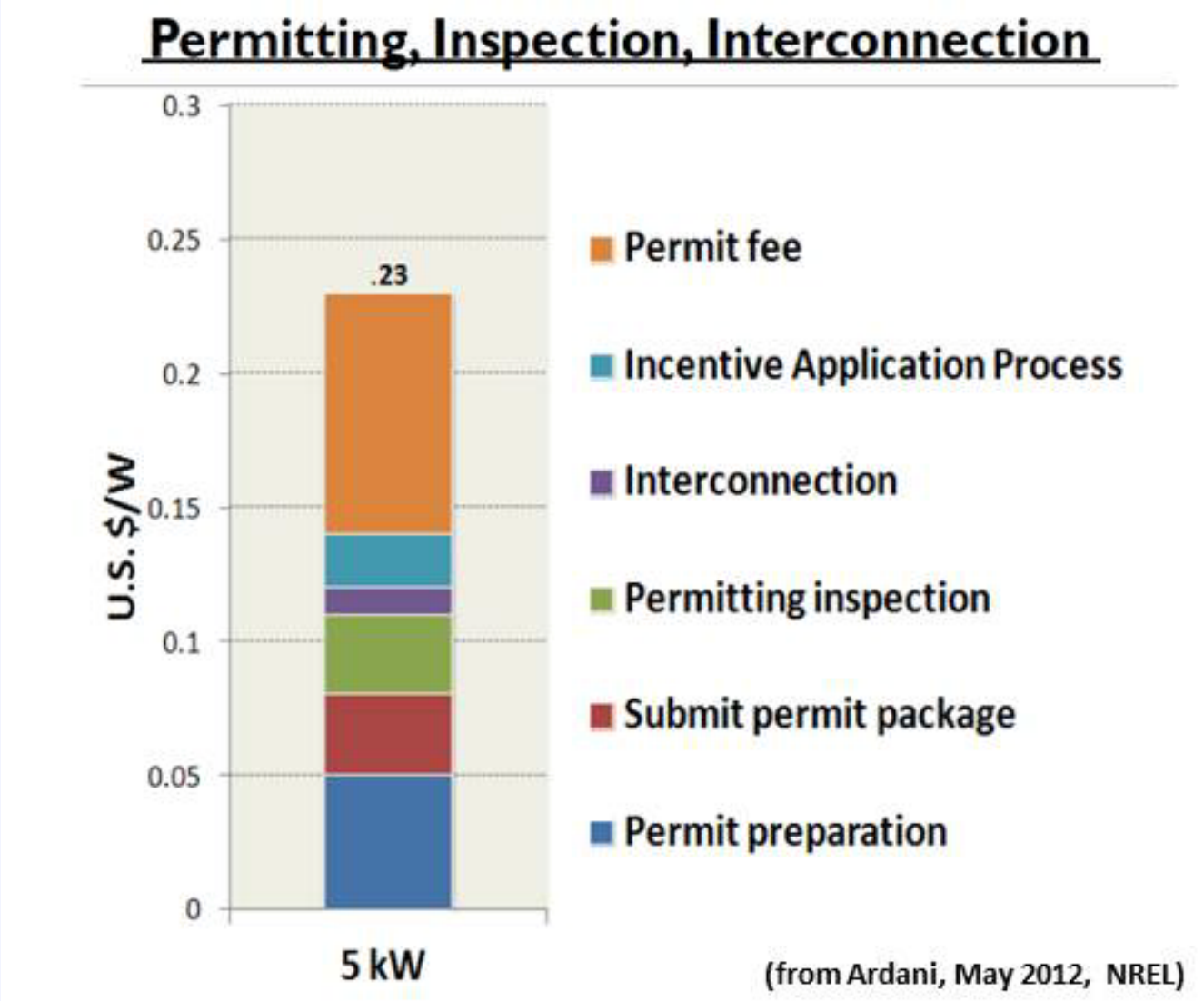


Focus on Cost Components

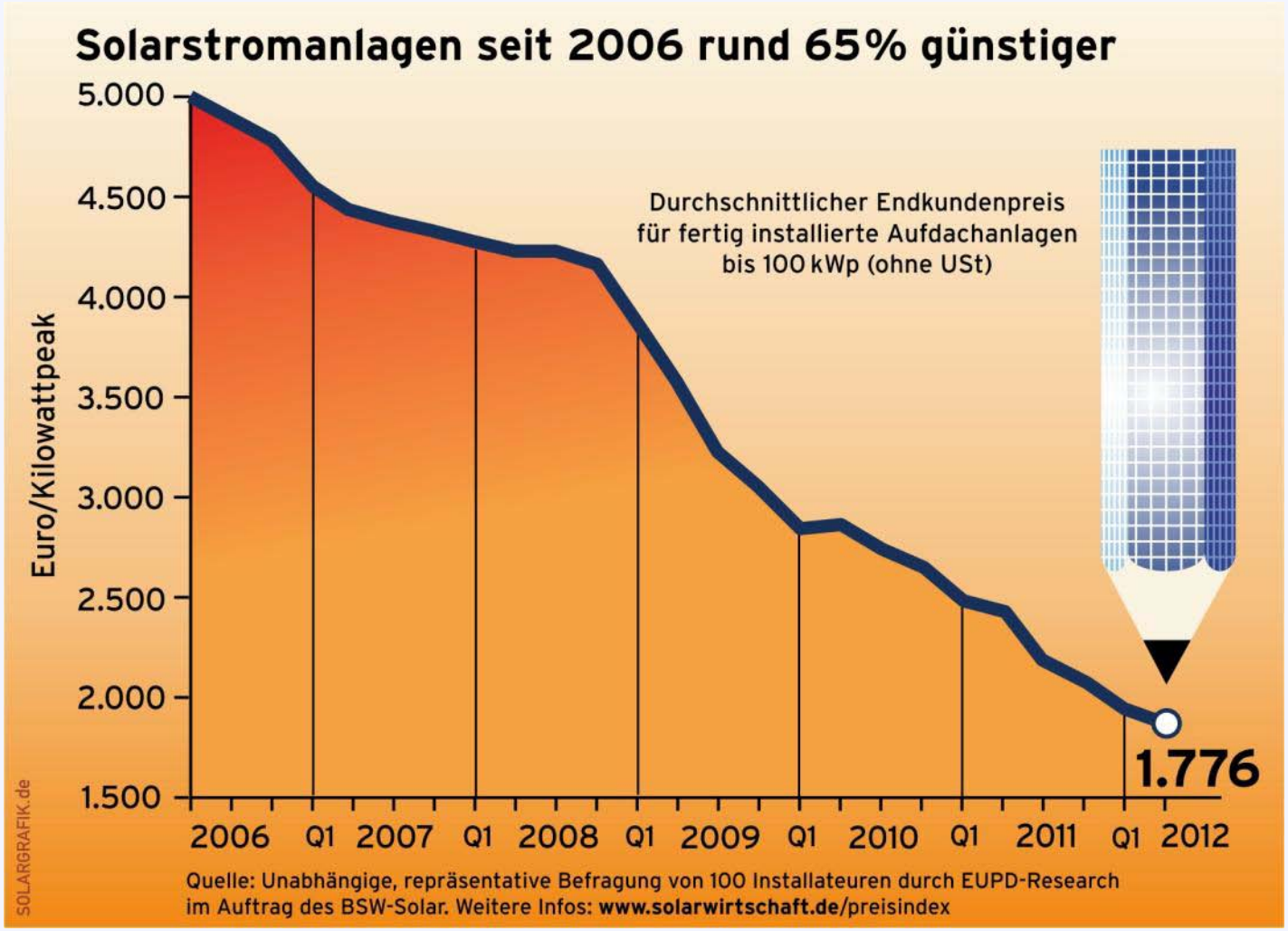


Source: U.S. DOE SunShot Initiative

Non-Structural Balance of System Costs



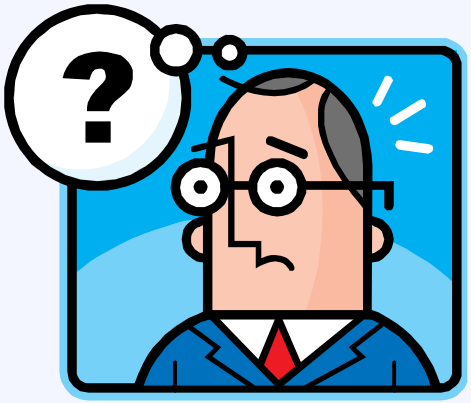
In German

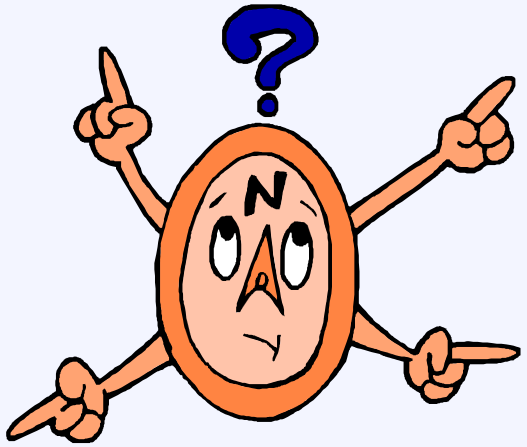


Source: http://www.goingecogreen.com/go-green-news/german-solar-installations-coming-in-at-2-24-per-watt-installed-us-at-4-44-2/

Minnesota Solar Challenge Initiative

So, is everyone clear on that?





If you remember just one thing . .

- **Local governments are a critical partner in the task of creating a self-sustaining solar energy market**

Okay, maybe one more thing . .

Minnesota Solar Challenge

Solar energy development is local development

- ✓Is investment in the community
- ✓Creates economic opportunity
- ✓Poses potential conflicts
- ✓Uses local resources

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Okay, maybe one more thing . .

Minnesota Solar Challenge

Solar energy development is local development

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

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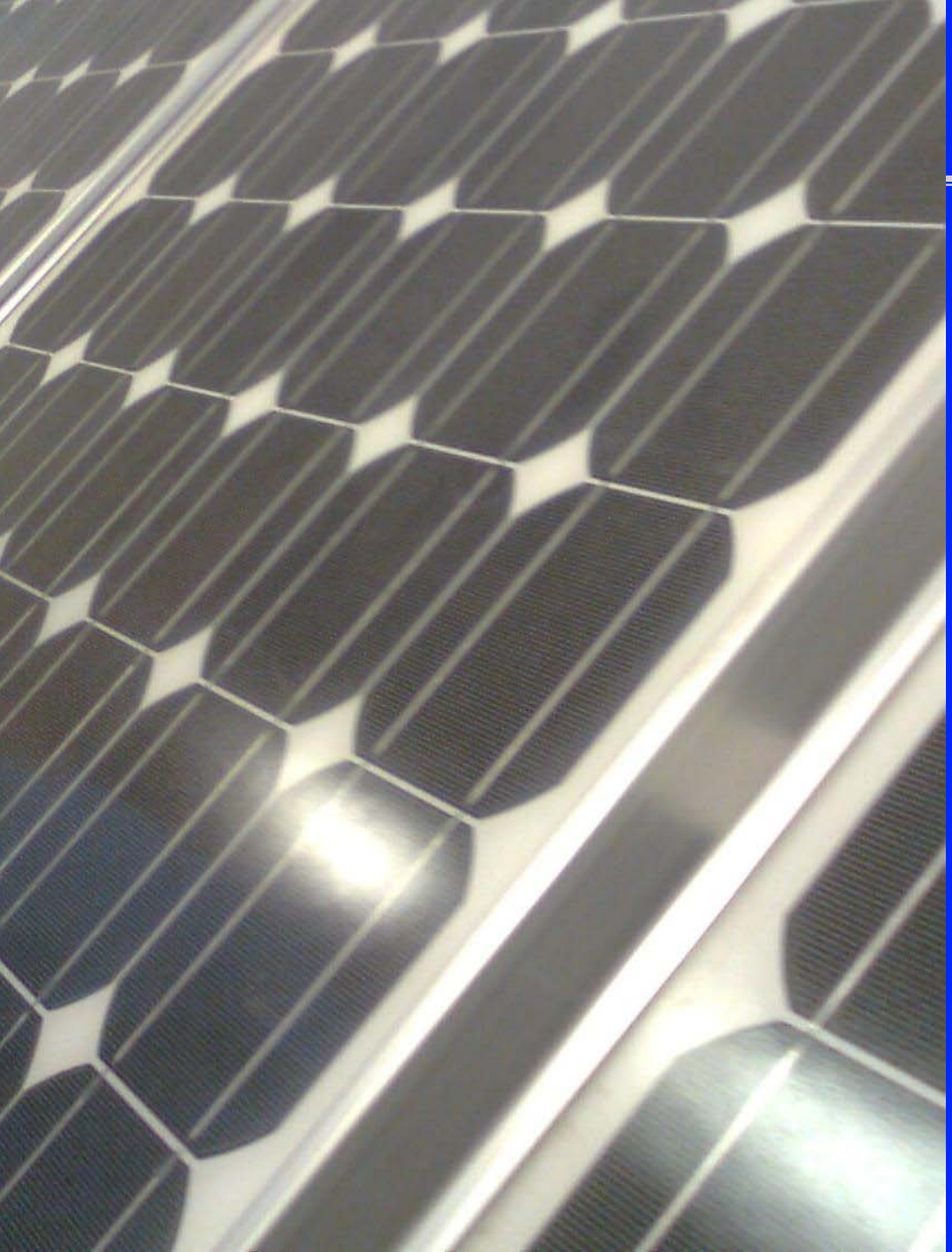
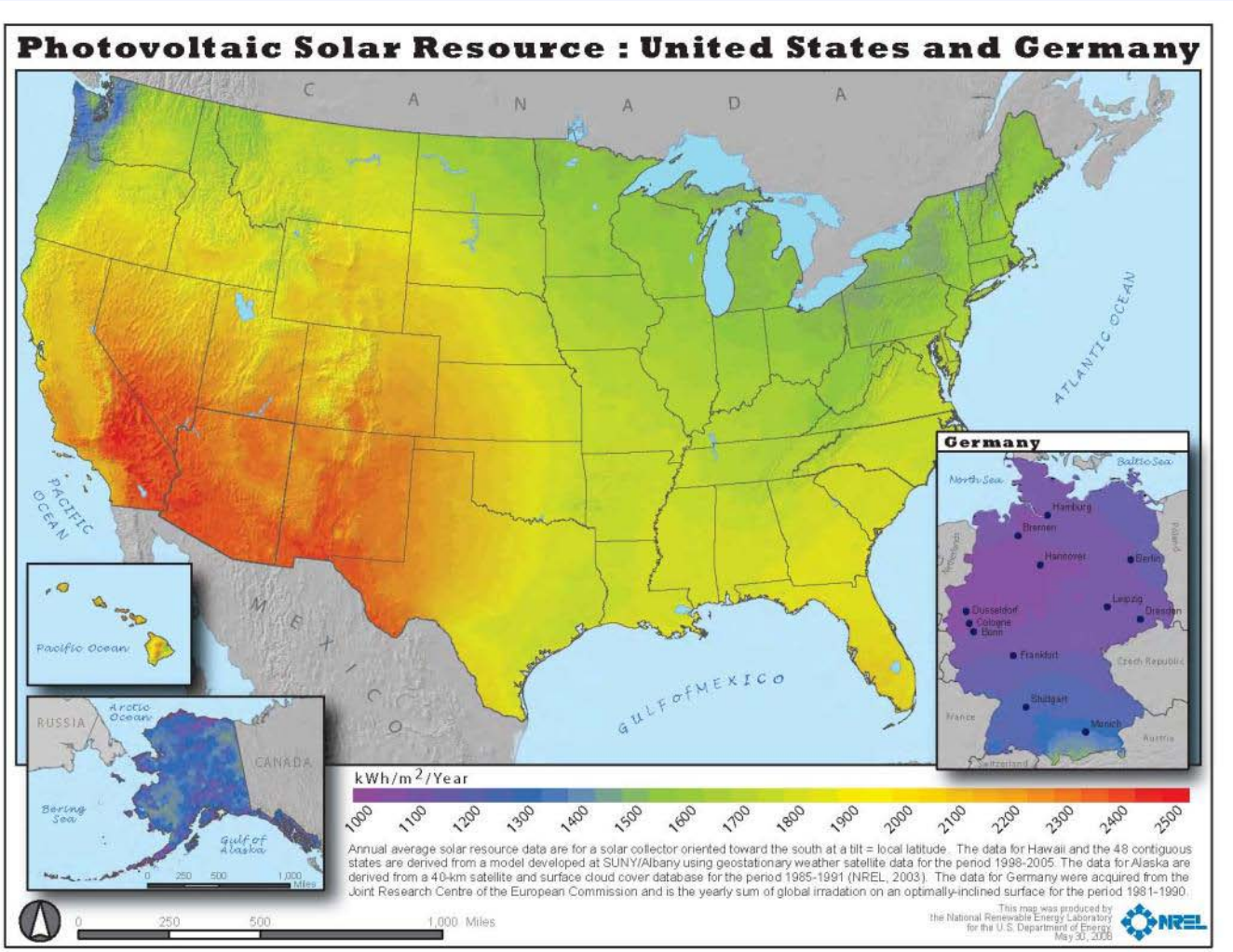


Understanding Solar Resources

Solar Resources . . .

Minnesota Solar Challenge

Considering your community's solar reserves.



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Solar Resources . . .

Minnesota Solar Challenge

The local landscape defines whether a given site has a solar resource

- ✓ Topography
- ✓ On-site obstructions
- ✓ Obstructions on adjacent land
- ✓ Future obstructions

An adequate solar resource location is unshaded for several hours every day (around solar noon), both now and well into the future.

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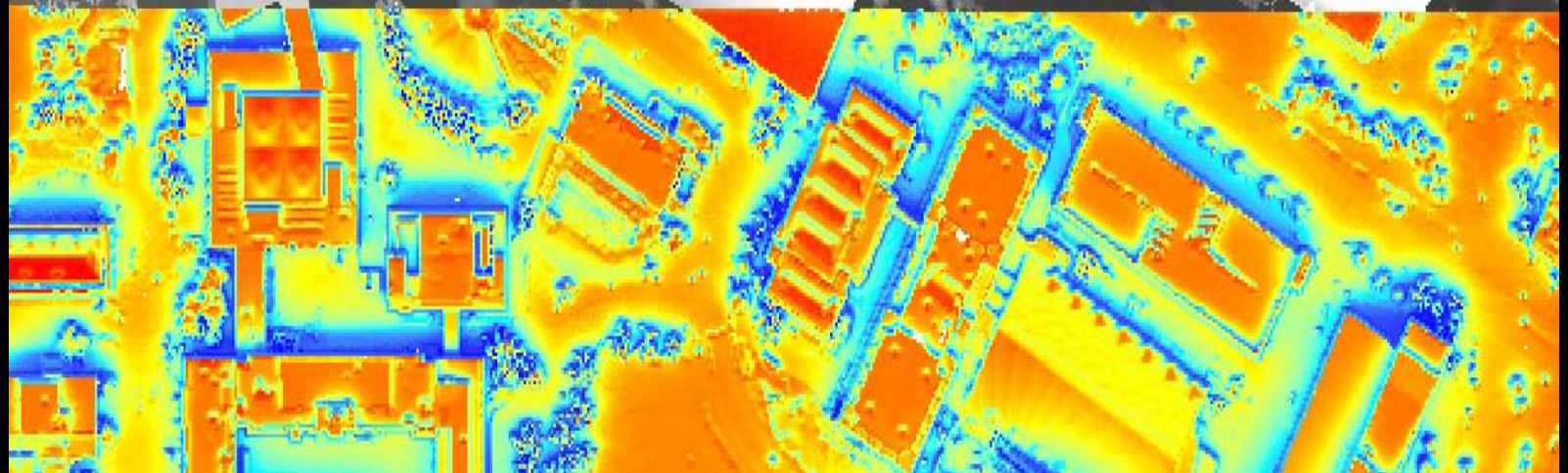
Mapping Solar Potential Using LiDAR and GIS

Graduate Research Project
University of Minnesota – MGIS Program

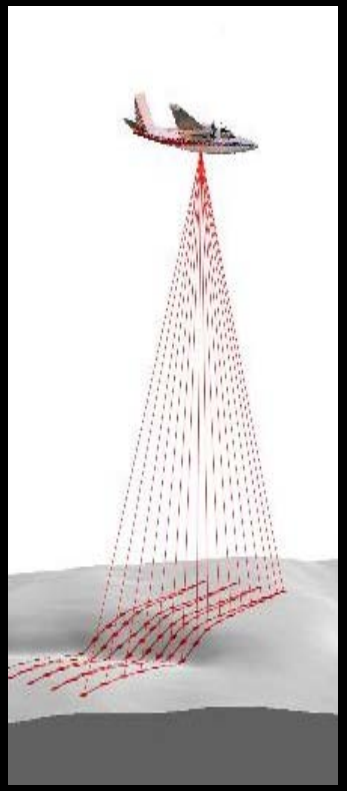


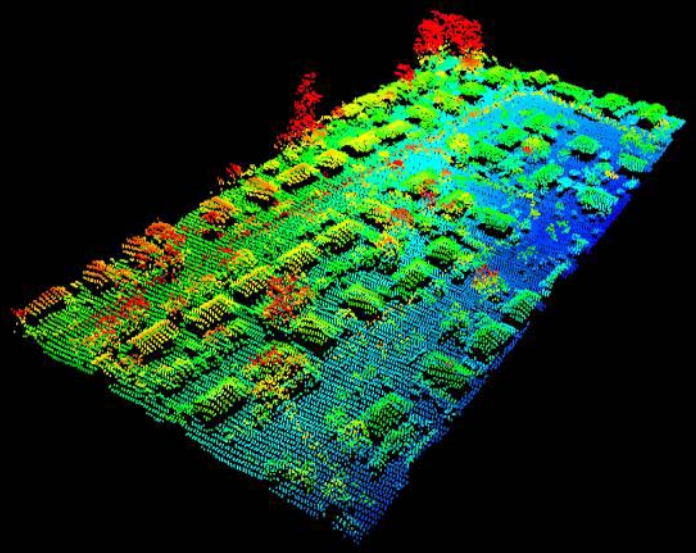
Project Outline

- Goals
  - Map statewide solar potential
  - Free public distribution of maps, data, methodology, and findings
- Resources
  - Geographic Information Systems (GIS)
  - LiDAR data
  - MN Supercomputing Institute
  - Advice from stakeholders and experts

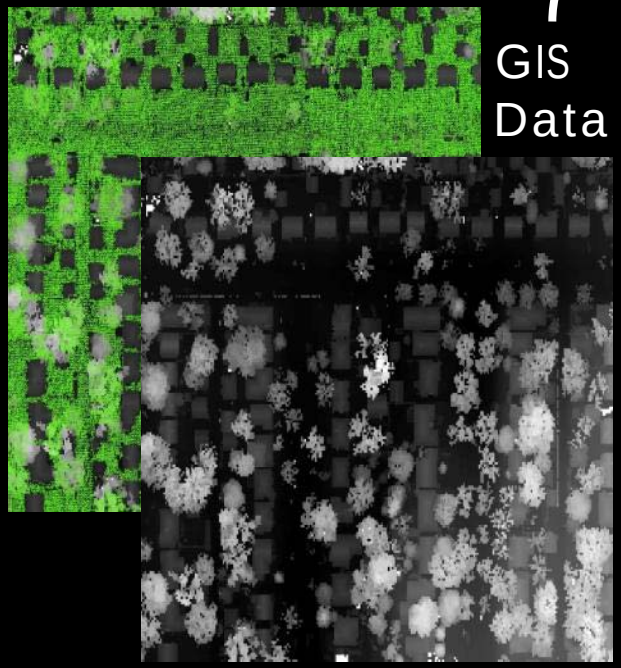
What is LiDAR?

- Light Detection and Ranging
- Accurate 3D models of the landscape

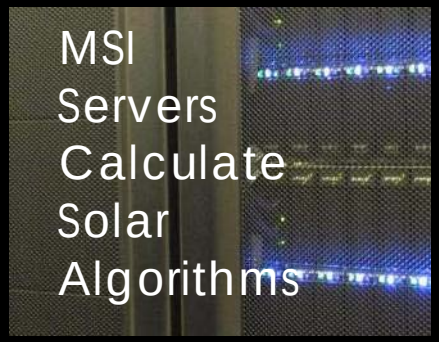




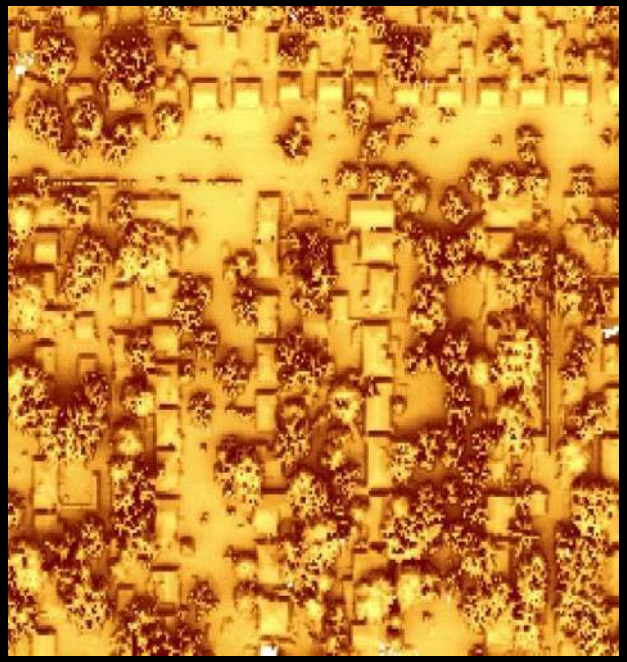
Solar Analysis



GIS Data

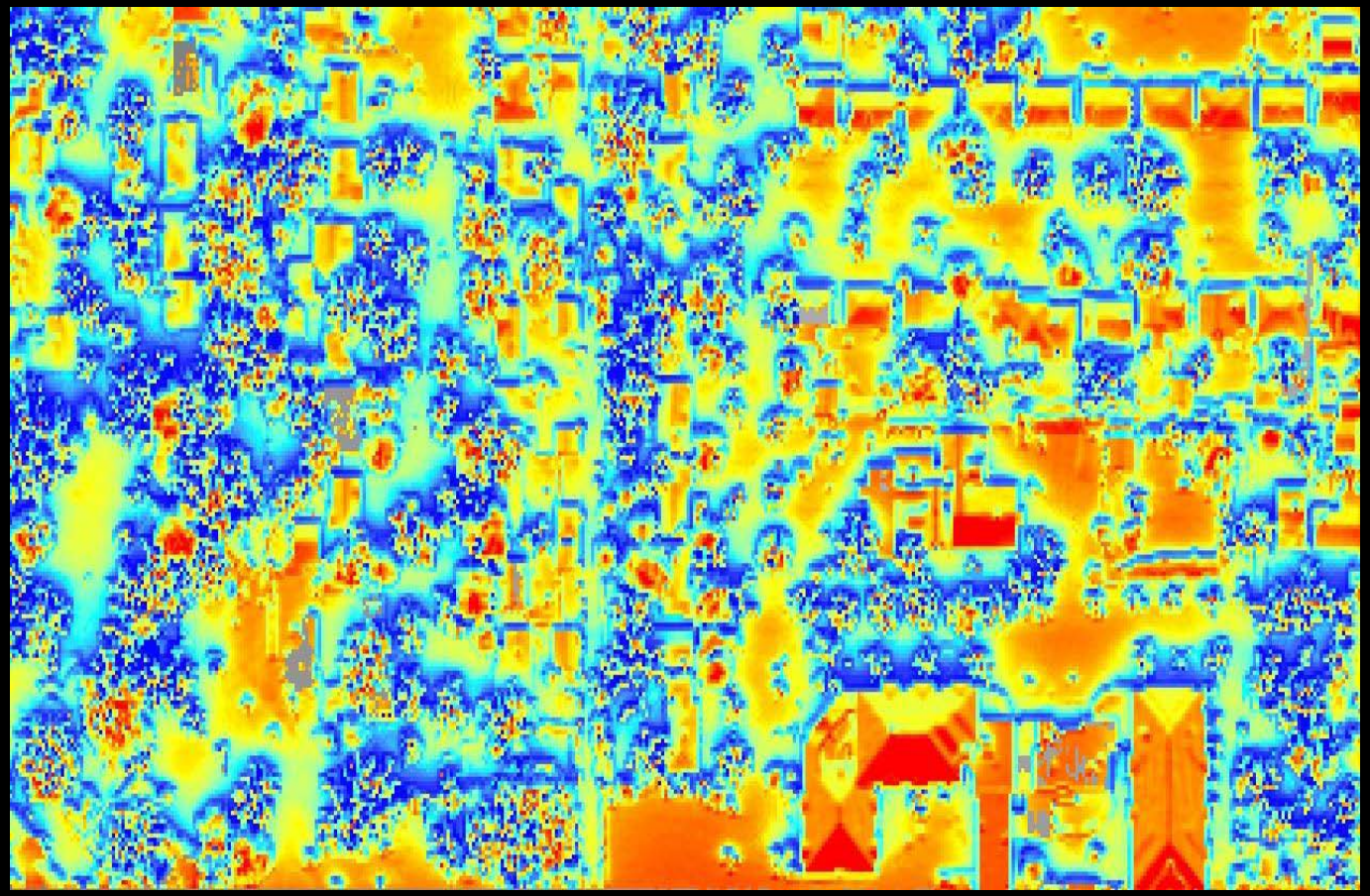


Solar Potential Map

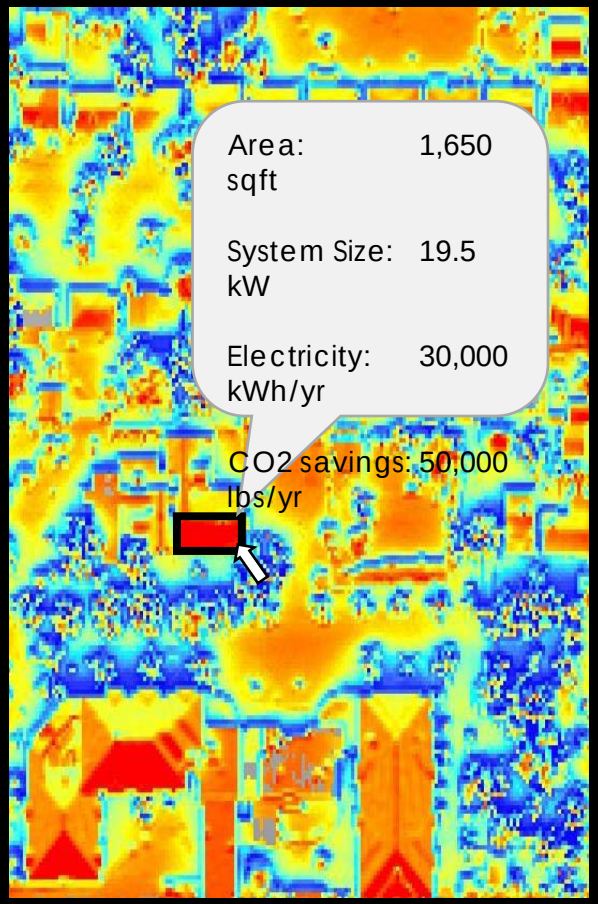


The Map

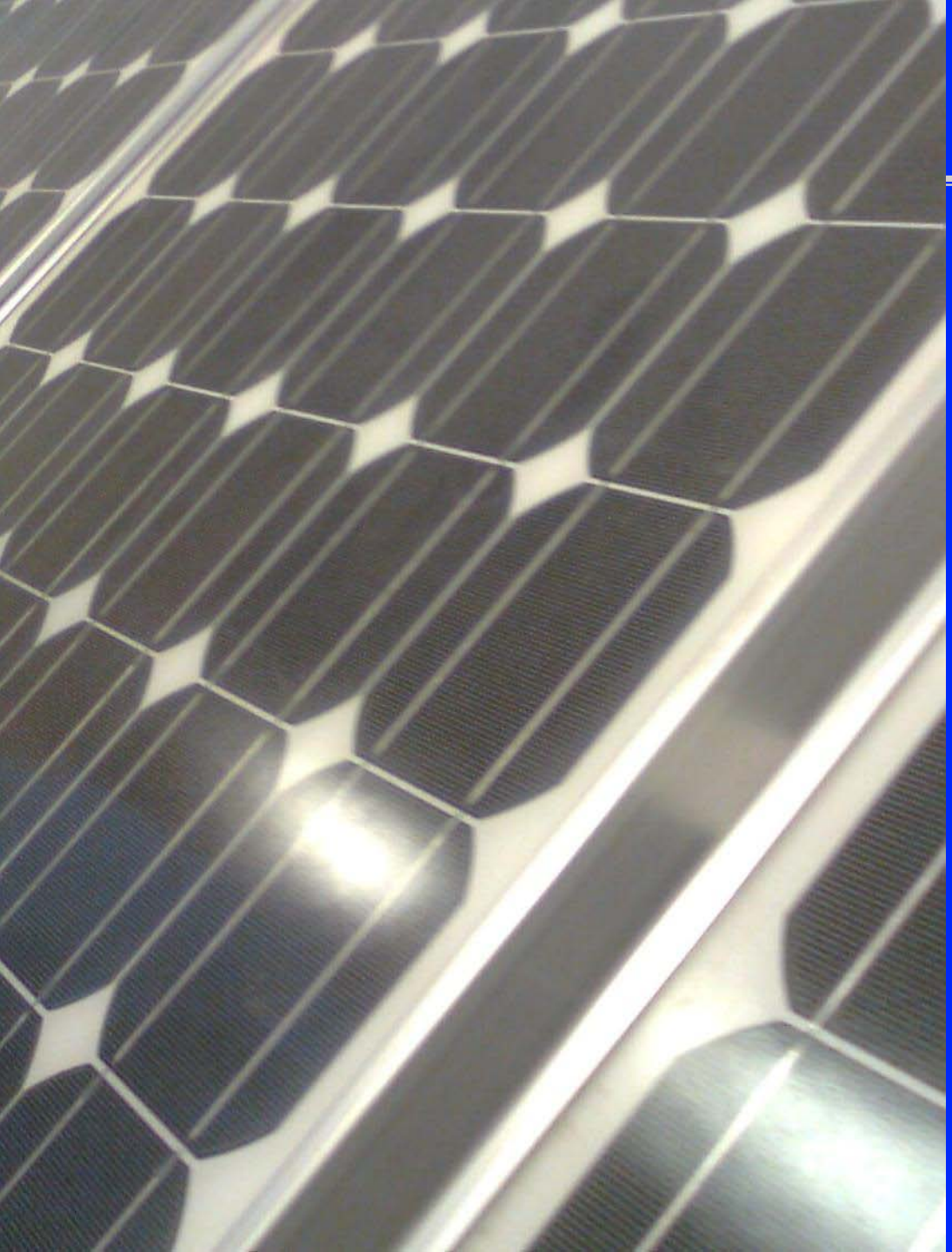
- Shows solar insolation everywhere
- Accounts for tree shading
- 1-meter accuracy



The Map – Possible Applications



1. Use building outlines to determine each property's solar suitability.
2. Set custom criteria to select most ideal properties for solar installation.
3. Determine neighborhoods with largest percentage of properties suitable for solar installations.
4. Target efforts to encourage solar installations for particular cities, neighborhoods, and businesses



What are "Solar Ready" Communities?

Conclusions . . .

Minnesota Solar Challenge

What are "Solar Ready" Communities?

1. **Comprehensive Plans** that acknowledge and address solar resources and development
2. **Development Regulations** that explicitly address solar development in its varied forms
3. **Permitting Processes** that are predictable and clear
4. **Public Sector Investment** in the community's solar resources

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Solar Ready Communities

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1. Comprehensive Plans that address solar resources and acknowledge solar development benefits and opportunities in the community.

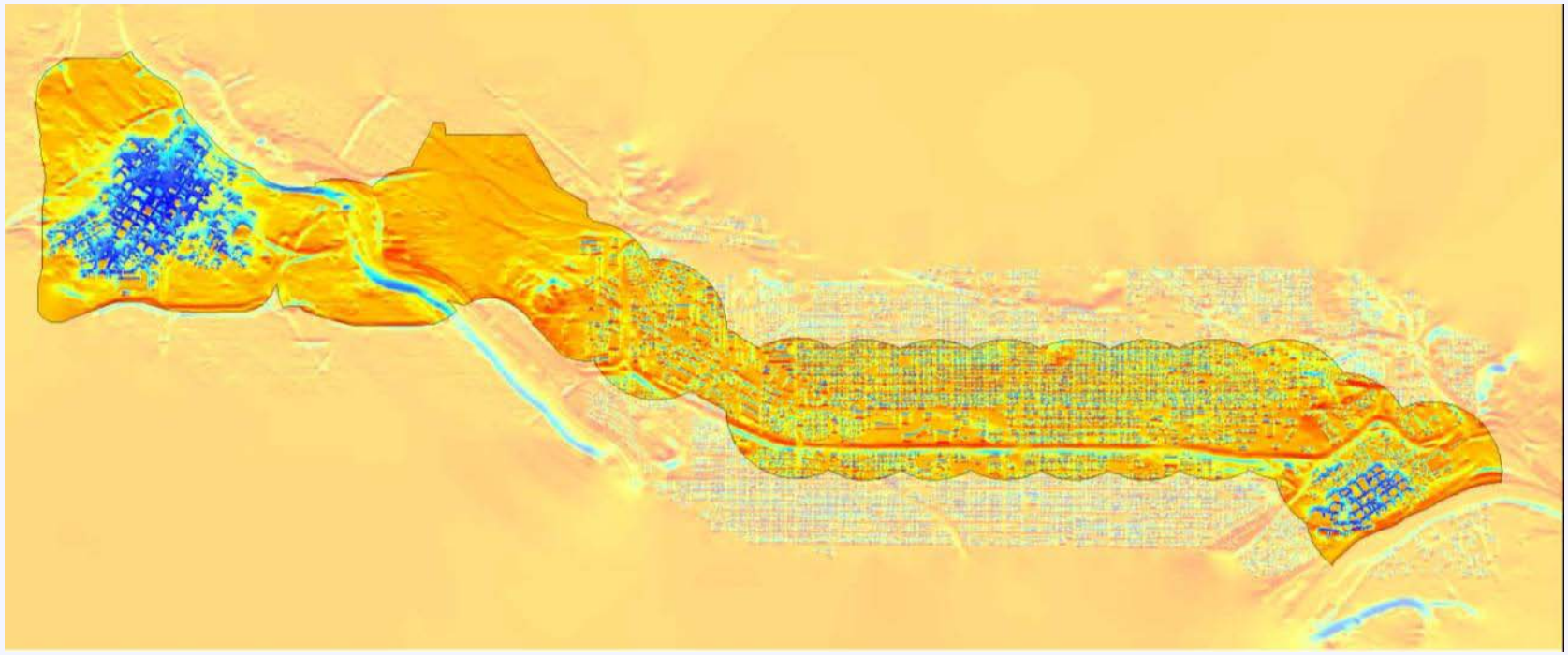

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Photo Credit: CR Planning

Planning Best Practices

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.**



Planning Best Practices

Policy 6.3: Encourage sustainable design practices in the planning, construction and operations of new developments, large additions and building renovations.

- 6.3.4 Encourage developments to utilize renewable energy sources, including solar, wind, geothermal, hydro, and biomass.

City of Minneapolis



Planning Best Practice

- Goal A, Objective 4; Increase the use of agricultural land for agricultural technology uses such as for the production of biodiesel fuels, ethanol production, wind and solar electricity production, and similar uses.

Morrison County, MN

Solar Ready Communities

2. Development Regulations that:

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

Basic Solar Energy Zoning

Minnesota Solar Challenge

Do your basic zoning tools - uses, setbacks, heights, coverage – create barriers for home and business owners to capture solar resources?

- ✓ **Uses -** Are accessory solar land uses allowed?
- ✓ **Dimensional standards -** What exceptions does your ordinance allow for height and setback standards?
- ✓ **Coverage -** Is a ground-mount solar energy system the same as a shed or garage?

- ✓ **Does your ordinance define an "as-of-right" installation?**

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Advanced Solar Zoning

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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 -** municipal utility, historic preservation, etc.

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Solar as Principal Use

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Solar farms, and gardens, and plants . . .

- ✓ **Generally not a listed permitted use** – If not listed, then it's not permitted . . .
- ✓ **Which districts?** Do you want solar farms competing for land in industrial or commercial districts? Agricultural districts?
- ✓ **Conflicts and nuisances?** Agricultural protection (soils, fragmentation), airports, natural resource areas, urban reserves
- ✓ **Solar farms as "interim" use** – brownfields, aggregate reserves, closed landfills

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Incentives and Requirements

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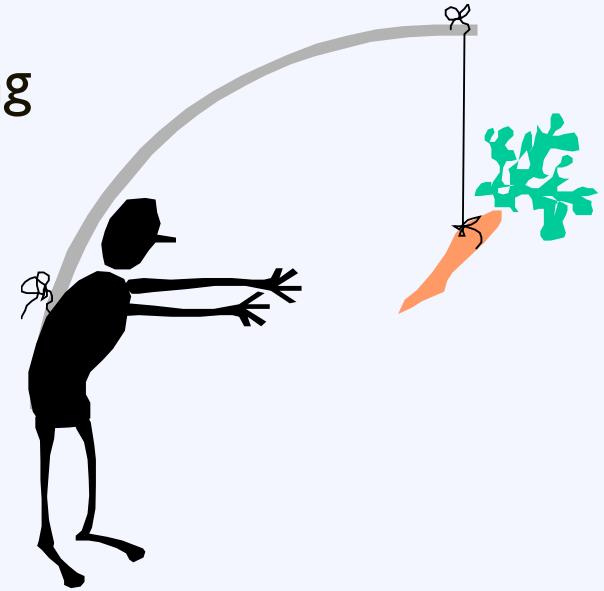
Does your development regulation use incentives?

- ✓ **Density bonus** for solar development
- ✓ **Protect solar resources** when subdividing
- ✓ **Financial incentives** in fee structure
- ✓ **Planned Unit Development** conditions
- ✓ **"Solar ready" construction**



The community has an long-term interest in sustainable infrastructure – housing, transportation, energy systems

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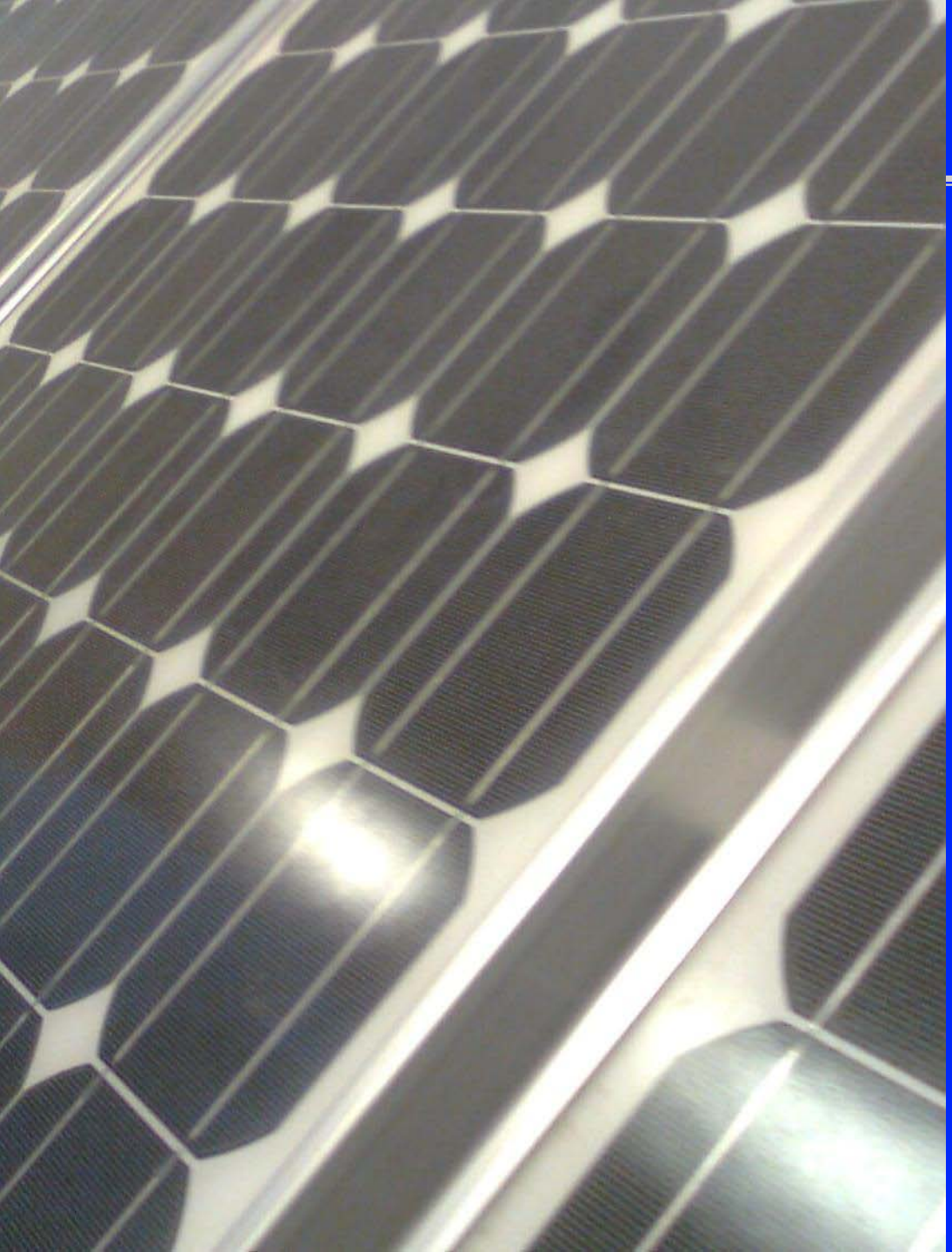

Thank You!

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