

Consumer Perspectives on Solar Energy



Nick Hylla, Executive Director
Midwest Renewable Energy Association





RE education and demonstration

- Custer, WI
- Milwaukee, WI
- Saint Paul, MN



- Founded in 1990
- 3000 members

- Provide the highest quality renewable energy education and training experiences available.



Photovoltaics (PV) – Solar Electricity



Solar Thermal (Hot Water and Space Heating)



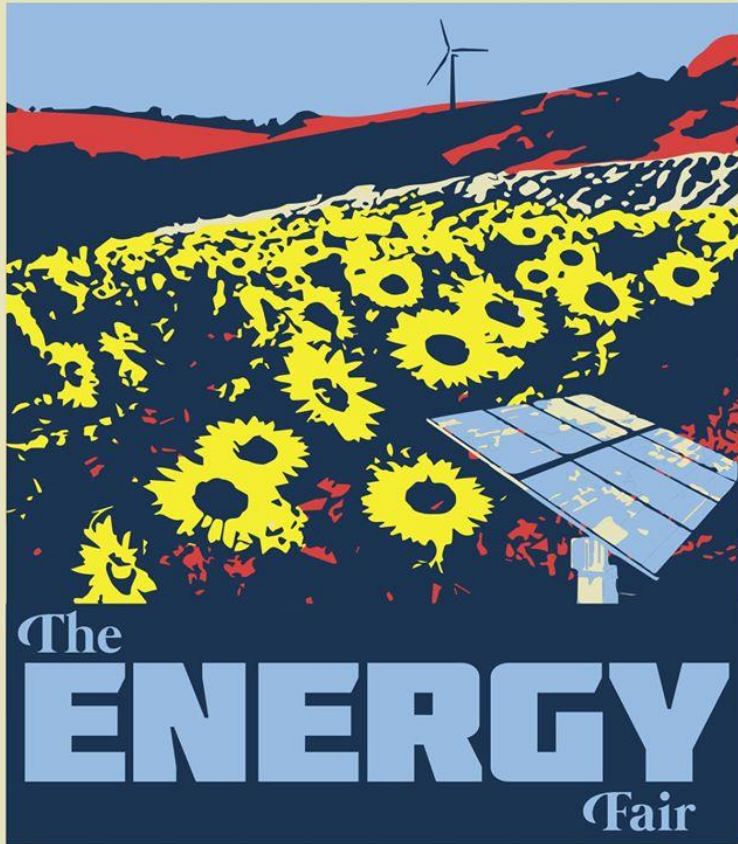
Small Wind Energy Systems



National Electric Code (NEC) Training

- Online, face-to-face, blended course formats
- 2015 – 74 renewable energy courses taught, 1260 students

Energy Fair (WI and MN)



• JUNE 17-19, 2016 •
CUSTER, WI
FRI/SAT 9AM-10PM | SUN 9AM-4PM
TheEnergyFair.org

- 250+ workshops
 - Renewables, efficiency, construction, farm and garden, activism, etc.
 - Professional CECs
- 13,000 attendees
 - Home and business owners
 - Non-profit stakeholders
 - Solar professional CECs
- WI and MN in 2017

Midwest Grow Solar Partnership

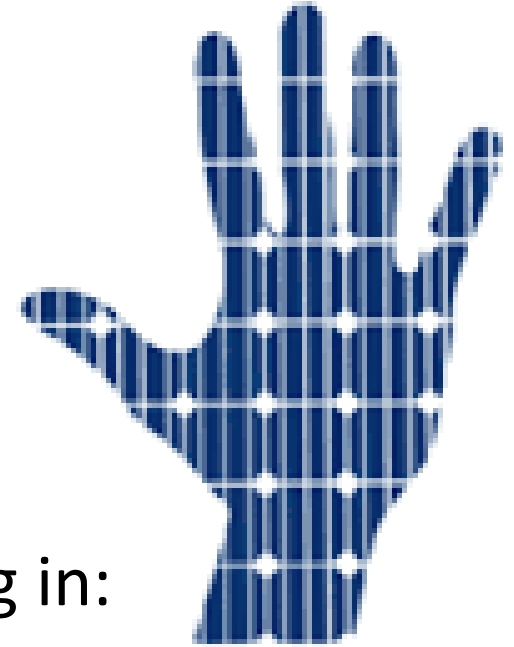


Coordinated effort among Midwest organizations and municipalities to build an open and advantageous solar market that provides long-term benefits to communities.



- **Technical Assistance**
- **Permitting and Planning**
- **Inspector Training**
- **Solar Power Hour**
- **State Conferences**
- **Growsolar.org**

SOLAR POWER HOUR



90 presentations to 2,200+ people resulting in:

- MKE Neighborhood (700+kW)
- Solar Urbana-Champagne (605kW)
- Solar Bloomington-Normal (429kW)
- Minnesota Power Pack (103kW)



Renewable Energy Site Assessor Directory

A program of the Midwest Renewable Energy Association

Site Assessor Directory Why have an Assessment?

Find out if renewable energy is right for your home or small business.

We'll help you find a trained, independent Site Assessor who can determine whether your property is suited for a Solar Photovoltaic, Solar Thermal, or Small Wind renewable energy system.

Enter your zip code:

Find an assessor with knowledge about the following technology. Check all that apply:

- Solar Photovoltaic
- Solar Thermal
- Small Wind

[Find a Site Assessor](#)



Internships



Photovoltaic Site Assessment Certificate

A program of the  mrea
Midwest Renewable Energy Association



Site Assessor Internship

- ✓ Pre-screening
- ✓ Lead generation
- ✓ Site assessment



Photovoltaic Design and Sales Certificate

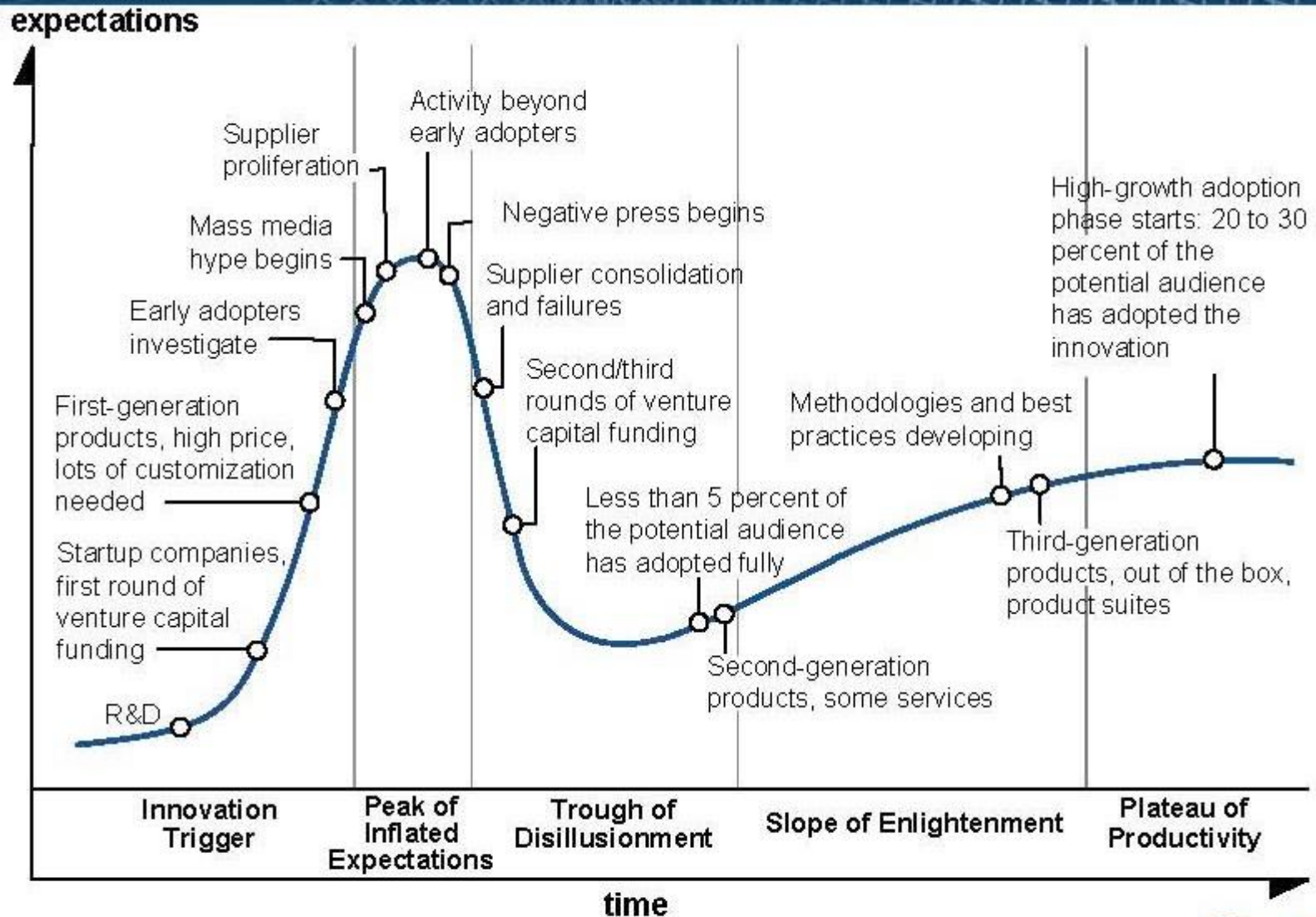
A program of the  mrea
Midwest Renewable Energy Association



Design and Sales Internship

- ✓ Site assessment
- ✓ Engineering/design
- ✓ Proposal development

Is Solar Mainstream Yet?



Is Solar Mainstream Yet?

•Critical Questions

- Is solar a primary source of new electricity generation?
- Is solar cost competitive?
- Is solar taken seriously by electric industry?
- Is solar bankable?

Solar PV Installations To Date

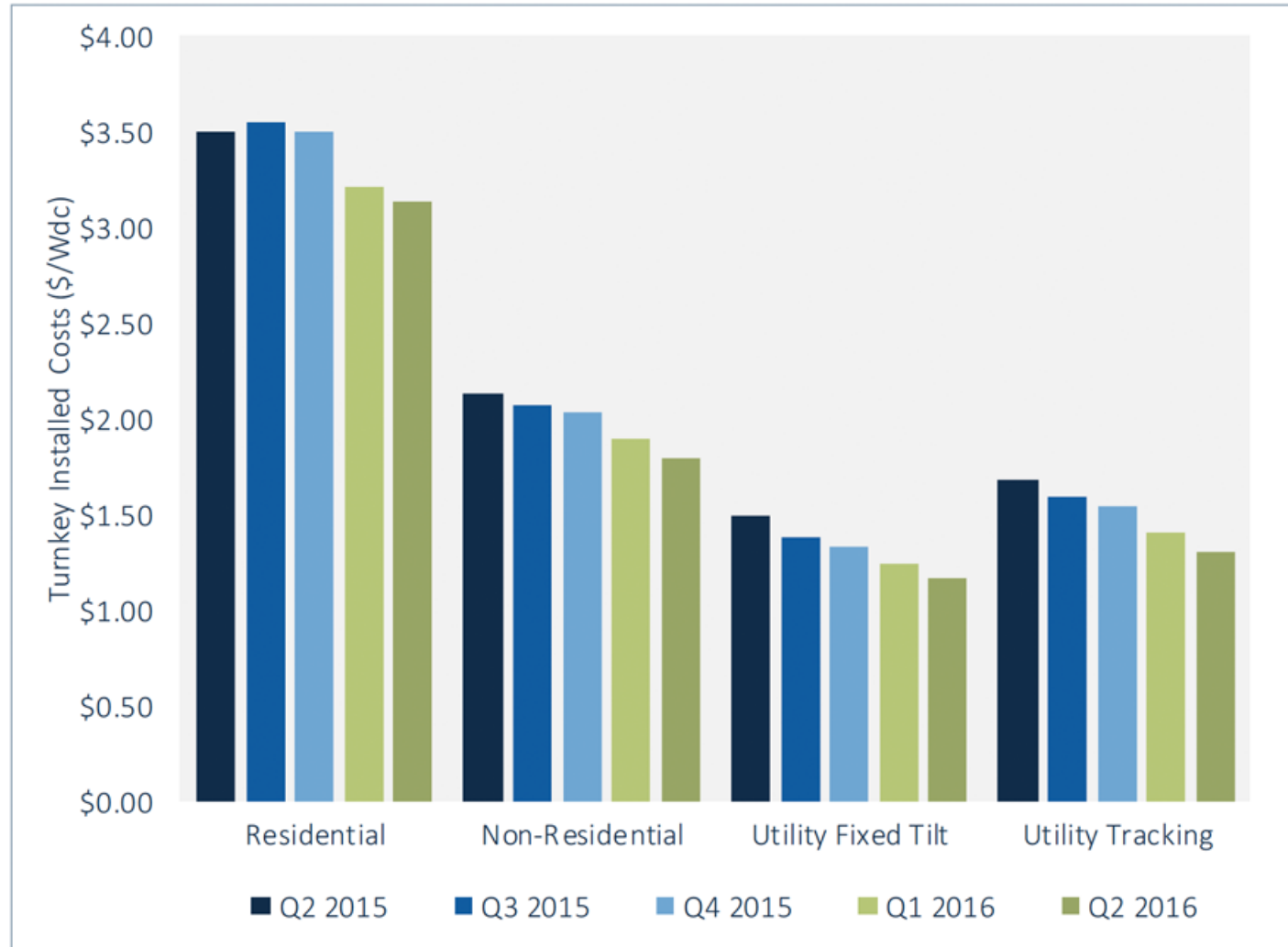
- Now over 31.6 GW of solar PV installed in US. Enough to power over 6 million homes
- Solar represented 30% of all new electric generating capacity brought on-line in the U.S. in 2015.
- 85% more PV will be installed in 2016 than 2015 with over 70% being utility scale PV.
- Though CA installs nearly 50% of US PV capacity, but that % is decreasing as other US markets grow.

SEIA Solar Market Insight Report



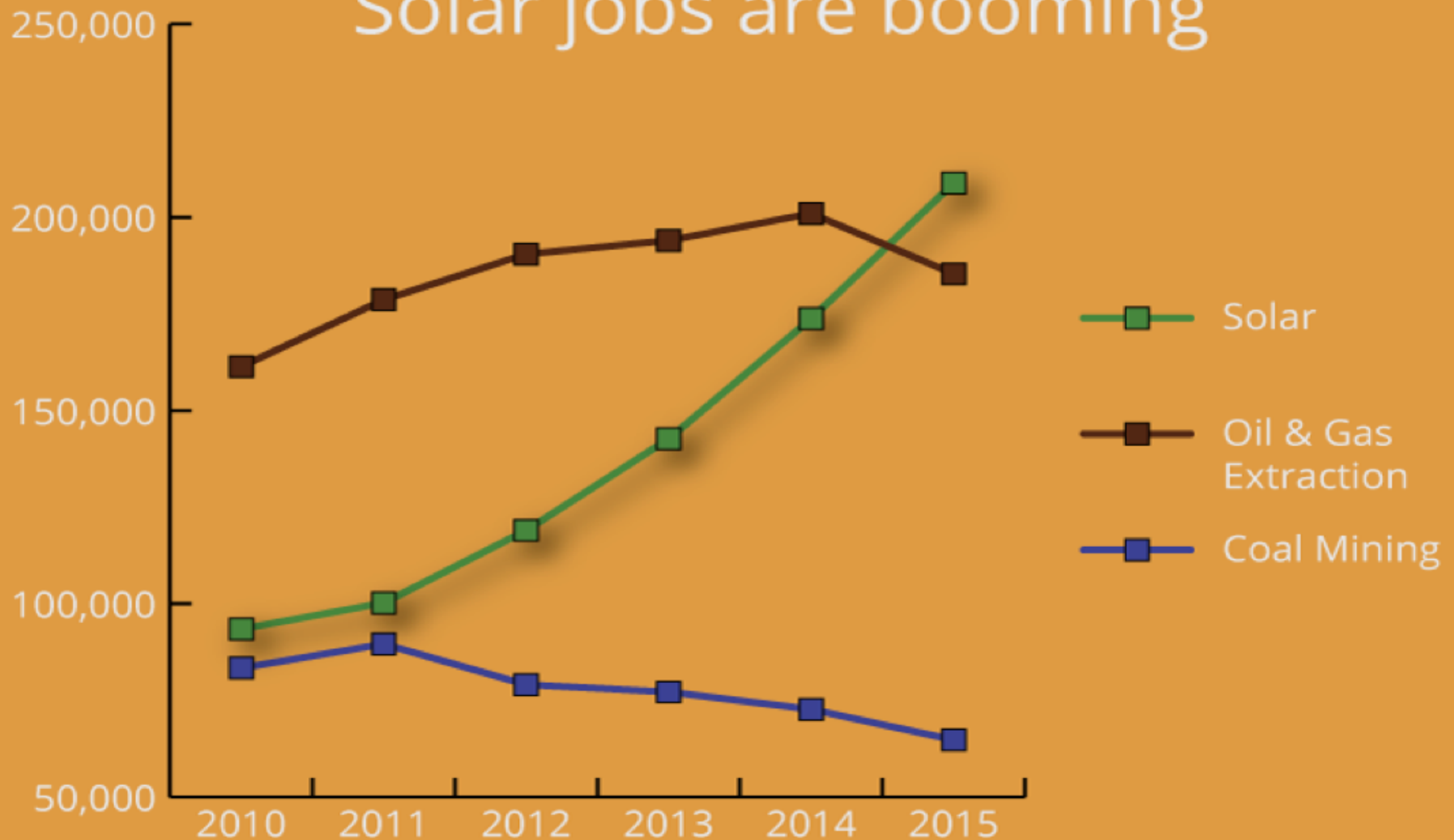
PV Market Trends: Installed Price

Figure 2.3 Modeled U.S. National Average System Costs by Market Segment, Q2 2015-Q2 2016



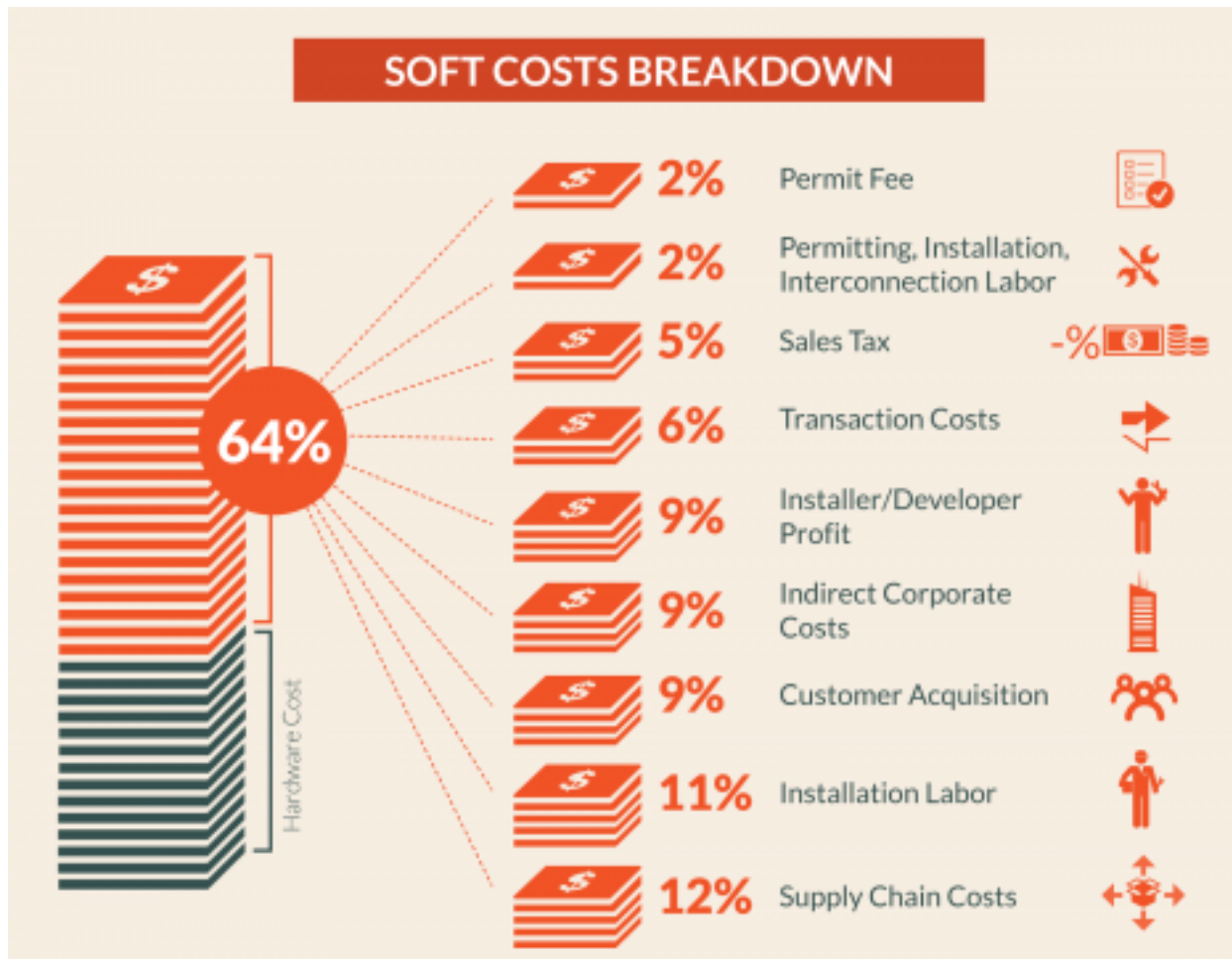
Note: Detailed information about national system prices by market segment and component is available in the full report.

Solar jobs are booming



All data is sourced from The Solar Foundation's National Solar Jobs Census and the Bureau of Labor Statistics. For more information, visit www.tsfcensus.org.

Customer Knowledge is Critical



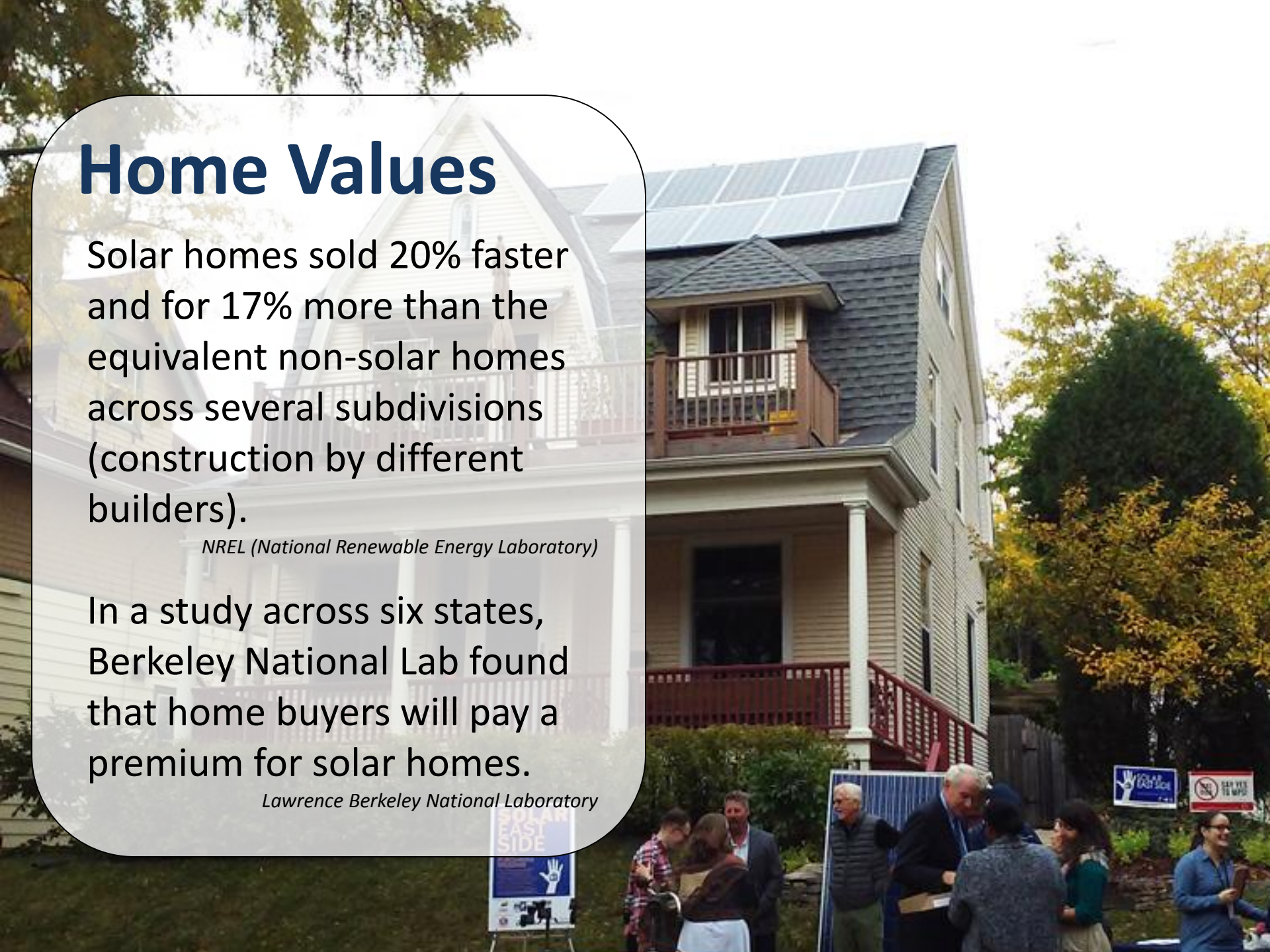
Home Values

Solar homes sold 20% faster and for 17% more than the equivalent non-solar homes across several subdivisions (construction by different builders).

NREL (National Renewable Energy Laboratory)

In a study across six states, Berkeley National Lab found that home buyers will pay a premium for solar homes.

Lawrence Berkeley National Laboratory



Midwest PV Market Characteristics

- 3% of national installed capacity
- Of that, only 2% is residential
- Fastest growing market (%) in the US
- Moderate to high utility rates with good time-of-use rates
- Diverse utility, policy, and approvals landscape
- Increasingly aggressive utility position against DG
- Diverse small business landscape with significant manufacturing and distribution
- Low understanding of the applications/returns of solar in residential and commercial space

The National View

- **82%** believe that solar should receive the same support as the fossil fuel industry
- The same percentage believes the government should support domestic solar manufacturing
- Democrats (**94%**) and Republicans (**80%**) agree that developing solar energy is important

1 Week Post Election...

- **76%** of voters surveyed believe the U.S. should put more emphasis on solar energy production
- More than two-thirds of voters surveyed support state renewable portfolio standards and utility energy efficiency programs
- **75%** of Trump voters support "action to accelerate the deployment and use of clean energy" -- including solar, wind, energy efficiency, and community renewable projects

Source: <http://www.jsonline.com/story/money/business/energy/2016/11/30/survey-finds-conservative-and-gop-support-clean-energy/94684372>, UMA Solar using SEIA Fact Sheet <http://www.seia.org/news/poll-reports-94-americans-say-its-important-us-develop-use-solar-energy>
<https://www.greentechmedia.com/articles/read/new-survey-shows-renewable-energy-polls-ridiculously-well-among-trump-voter>

AMERICA loves SOLAR

© 2017, UMA Solar

9 out of 10 Americans think it's important for the U.S. to develop and use solar power. **89%**

8 out of 10 Americans believe that solar energy should receive the same support as fossil fuel industries and that the government should support solar manufacturing. **82%**

Solar is the fastest growing energy sector in the U.S.

By 2014:

- Solar power will likely be the largest source of new electric capacity in the United States.
- Some analysts predict that the U.S. will become the world's largest solar market.

© 2013, UMA Solar

Solar is non-partisan.

94% **80%**

Democrats (94%) and Republicans (80%) agree that developing solar energy is important.

© 2013, UMA Solar

Solar influences consumers.

Over half (51%) of Americans surveyed would be more likely to purchase something if they knew it was made with solar energy.

Solar is America's top energy choice.

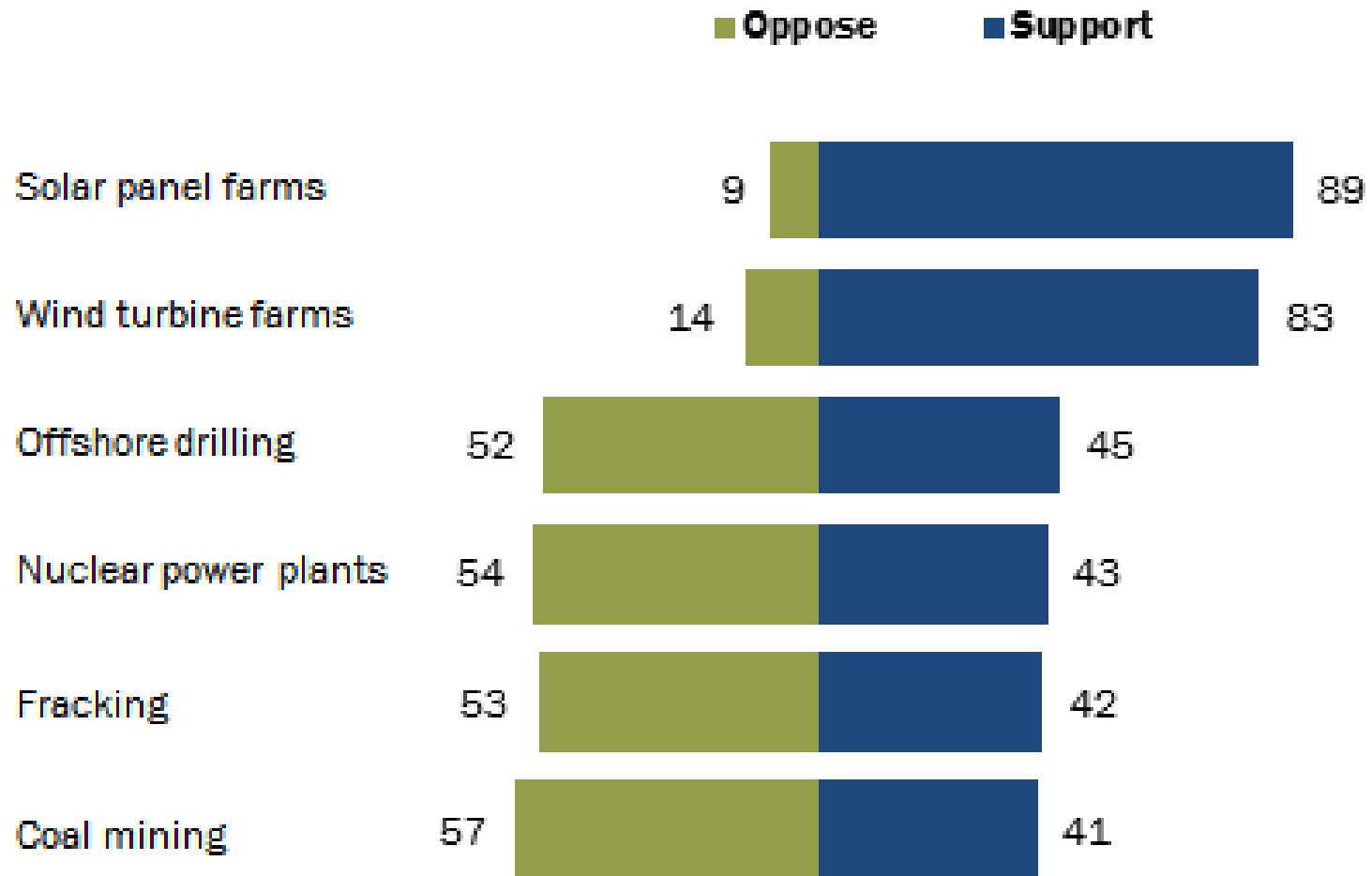
Choose to provide more standards for solar energy than to other energy sources if they were in charge of the U.S. Energy Policy.

© 2012, UMA Solar

- Solar
- Natural Gas
- Wind
- Nuclear
- Coal
- None of These

Strong public support for expanding solar power

% of U.S. adults who say they favor or oppose expanding each energy source



Source: <http://www.pewresearch.org/fact-tank/2016/10/05/americans-strongly-favor-expanding-solar-power-to-help-address-costs-and-environmental-concerns/>

POLITICO

Polls Show Energy Doesn't Spark America's Interest

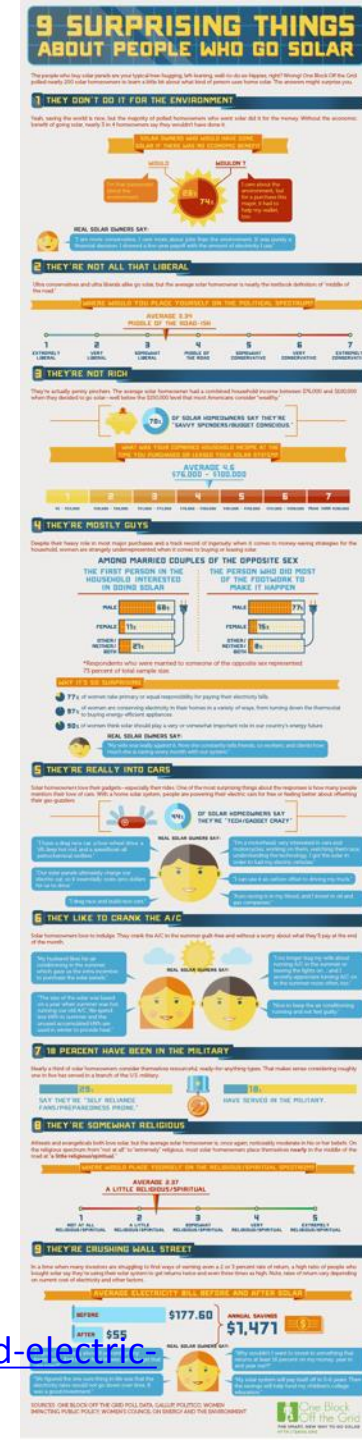
“A recent poll by the University of Texas at Austin found that only 14 percent of Americans said they read, see or hear about energy issues daily, down from 21 percent a year ago. In September, a Pew Research Center survey found that only 48 percent knew U.S. energy production has been up in recent years, and only 34 percent attributed that mainly to more oil and natural gas production.

The lack of public engagement doesn't shock people in the energy industry.”

The Residential PV Consumer

- 50% of residential solar sales are referrals
- Fewer than 22% of all consumers claim to have a fairly complete understanding of solar PV
- 74% purchase for financial reasons
- 70% rate themselves as budget conscious
- Middle income (\$76K - \$100K annual)
- Men are the primary motivator of the purchase in 77% of households
- 44% tech/gadget savvy
- 50% of PV or EV owners have both
- 29% “preparedness prone”
- 18% former military
- U.S. consumers are increasingly shopping around to find the best deal

Source: <http://solarindustrymag.com/consumer-study-explores-link-between-solar-and-electric-vehicles> GTM, One Block Off the Grid <http://1bog.org/>



Solar is Contagious: Example Connecticut

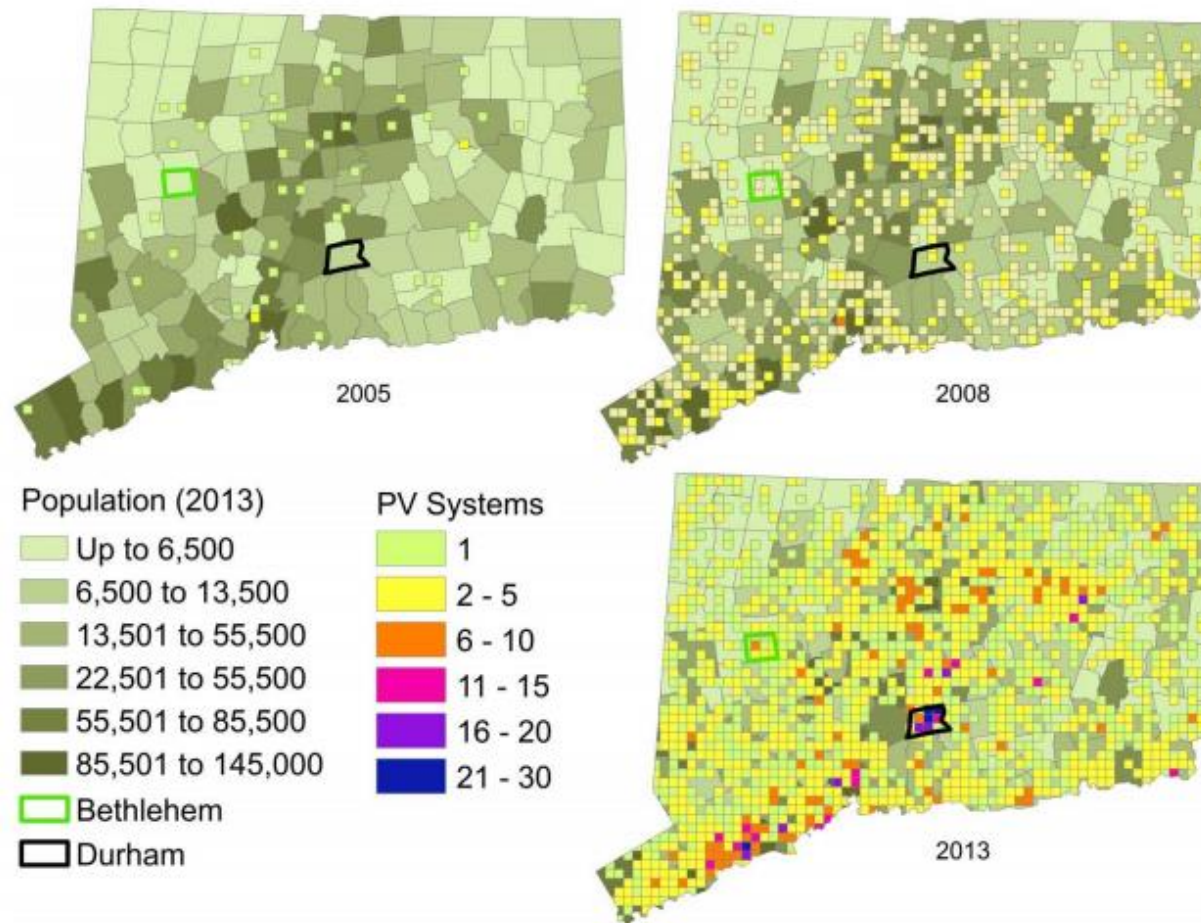


Figure 6. The spatial pattern of adoption does not simply follow the population distribution; even at early stages of adoption solar PV systems diffuse from small- and medium-sized centers.

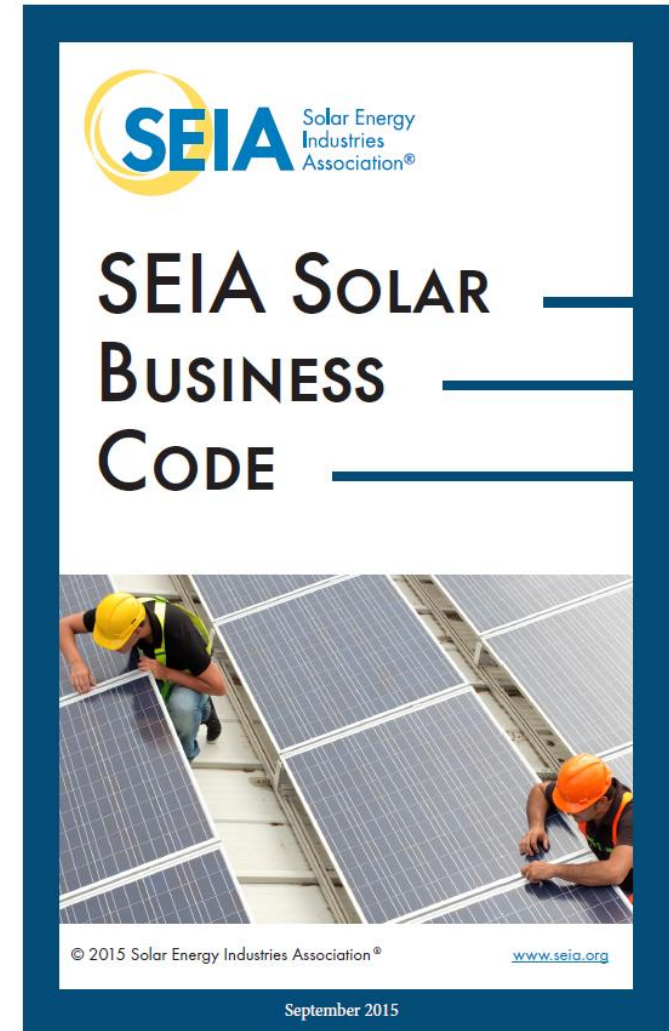
Consumer Protection Issues

Federal laws

- Federal Trade Commission Act (UDAAP) (FTC)
- Truth-in-Lending Act (FTC/CFPB)
- Equal Credit Opportunity Act (FTC/CFPB/DOJ)
- Consumer Leasing Act (FTC)
- Dodd-Frank Wall Street Reform and Consumer Protection Act (UDAAP) (CFPB)
- Magnuson-Moss Warranty Act (FTC)
- Fair Credit Reporting Act (FTC/CFPB)
- Fair Debt Collection Practices Act (FTC/CFPB)
- Electronic Funds Transfer Act (FTC)
- Gramm-Leach-Bliley Act (FTC/CFPB)
- FCC Telemarketing Rules and the Telephone Consumer Protection Act (FCC/FTC/CFPB)
- CAN-SPAM Act (FTC)
- Servicemembers Civil Relief Act

State laws

- State unfair trade practices and licensing statutes
- Other state consumer protection laws (e.g. warranties, door-to-door sales, telemarketing)



1. PV Sales Proposals

- Assumed Energy Escalation Rate
- Over-sizing Array
- Misleading state, utility, and tax benefit calculations

2. PV Contract for Purchase

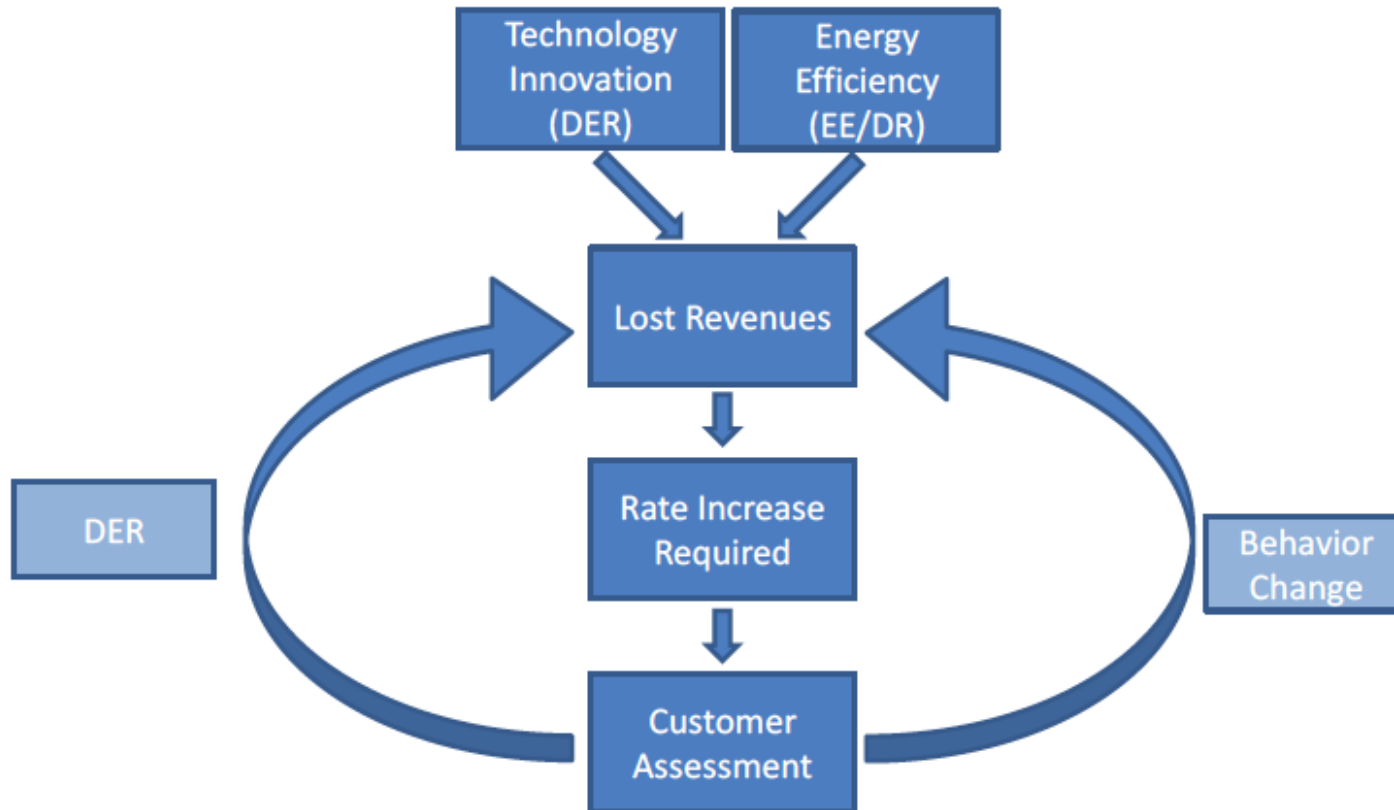
- Added Fees
- 5-year Labor Guarantee (recommended)
- Module Warranty Insurance (recommended)
- For PPAs: Escalators, Penalties, FMV calculations

3. PV Installation

- Inverter issues
- Roof structural integration and penetration

The Utility “Death Spiral”

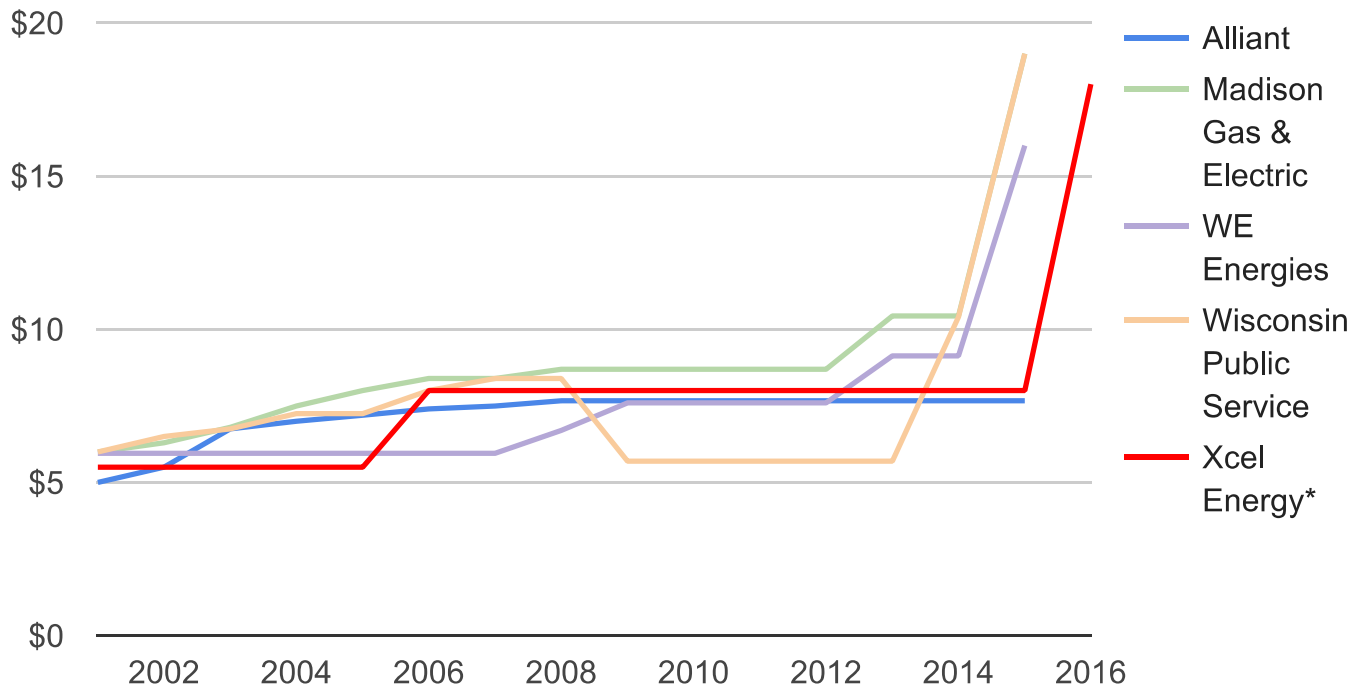
Exhibit 3
Vicious Cycle from Disruptive Forces



Source: Edison Electric Institute. January 2013. Disruptive Challenges: Financial Implications and Strategic Responses to a Changing Retail Electric Business.

In Wisconsin, The “Fix is In”

Meter fees on the rise: Wisconsin utilities charging more regardless of use



**proposed change for 2016*

1. Energy Markets

- Electricity Demand
- Wholesale Prices
- Retail Prices

2. Energy Policy

- Net Metering
- Rate Restructuring
- PURPA
- Regulatory Capture

3. PV Industry

- State and Federal Policy
- Electrification and Energy Storage

Questions?

Nick Hylla
Executive Director, MREA
715-592-6595 x107
nickh@midwestrenew.org



**Midwest Renewable
Energy Association**

www.midwestrenew.org