

# Market Trends in Solar: A National and State Perspective

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# Introduction

- About SEIA
- Solar industry update and outlook
- Investment Tax Credit
- State Policy
  - Renewable Portfolio Standards
  - Distributed Generation & Net Metering
- Q & A

# About SEIA

- **U.S. National Trade Association for Solar Energy**
  - 1,000 member companies from across 50 states
  - Largest companies in the world as well as small installers
  - Since 1974
- **Our Mission: Build a strong solar industry to power America**
  - Goal of 10 GW of annual installations by 2016
- **Work with state chapters in 15 states**

# SEIA Policy Priorities: Federal & Trade

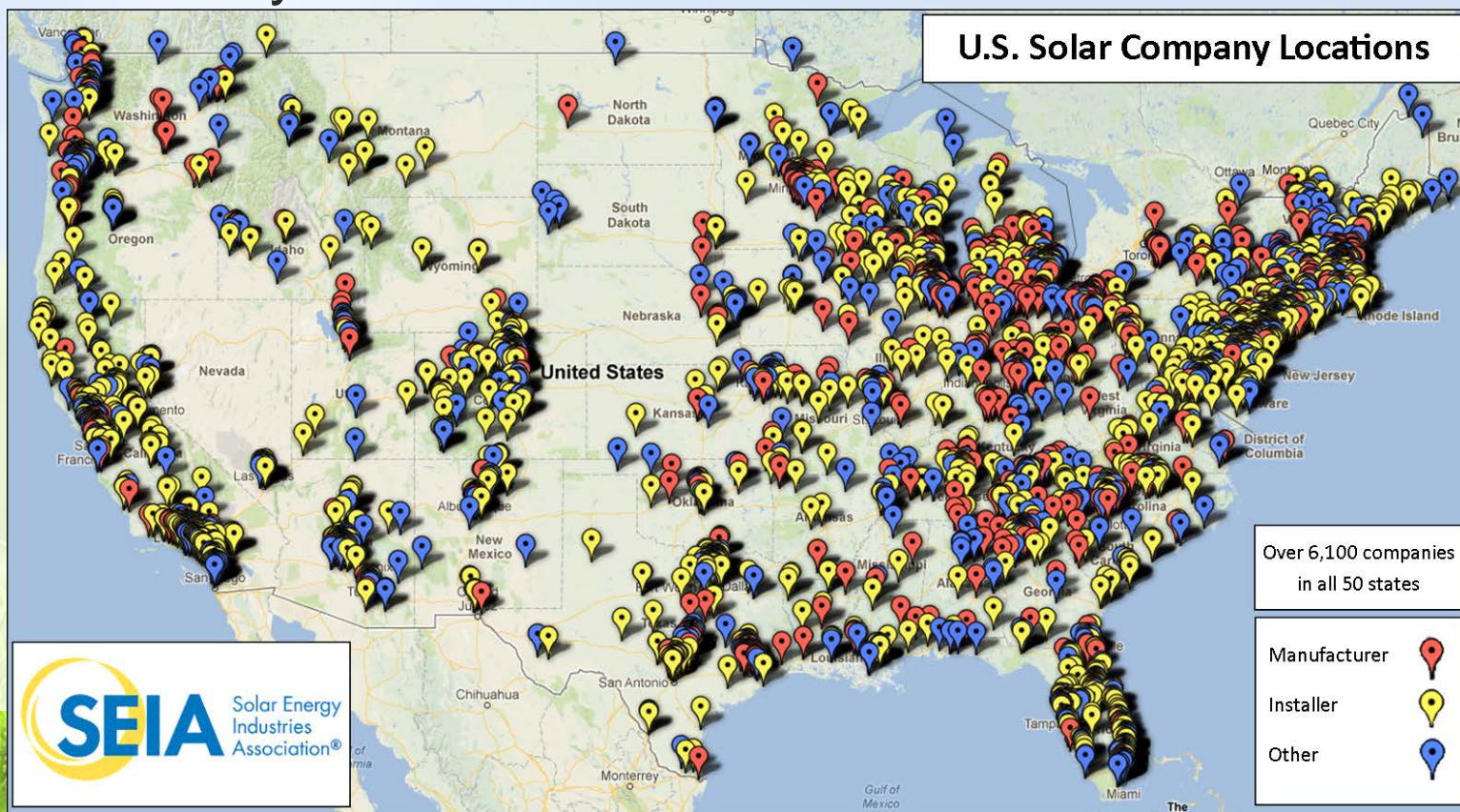
- **Investment Tax Credit**
  - Preserve and Extend at 30% Beyond 2016
  - Modify to include Commence Construction
- **Preserve MACRS**
- **Project Finance**
  - Increase tax equity pool through PWI authority and CRA
  - Expand MLPs to include renewable energy
- **Lead effort to resolve U.S.-China trade conflict**
- **Solar codes and safety standards**

# SEIA State Policy Priorities

- **Key states:**
  - CA, AZ, CO, NV, NY, MA, NJ & mid-Atlantic, TX, GA, NC & southeast
- **Renewable Portfolio Standards**
  - Defend and Expand; advocate for SHC
- **Defend and Expand policies to support DG**
  - NEM, rate design and incentives
  - Third party ownership; tax issues; Community Solar; etc
- **Grid Integration**
  - Outreach & education to key policymakers
  - Research and address key issues
- **Industry Leadership**
  - Drive new markets through EPA's Clean Power Plan
  - Heavy presence at NARUC to supplement state efforts

# Solar is an Economic Engine

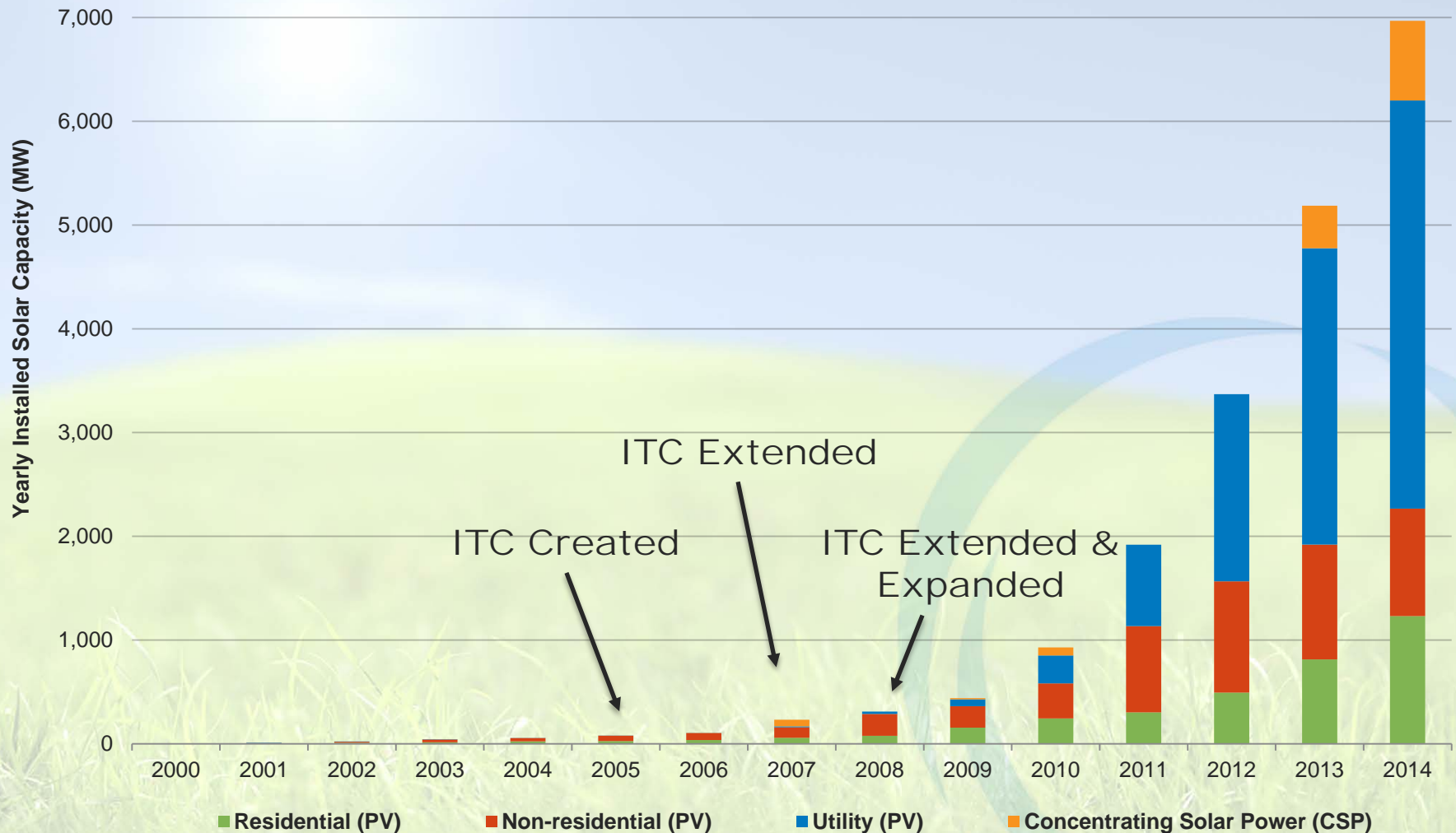
- Nearly 174,000 American workers in solar – more than double the number in 2009 – at 8,000 companies across the country



# Solar in America: Strong and Getting Stronger

Source: SEIA/GTM Research *U.S. Solar Market Insight Q4 2014*  
greentechmedia.com/research/ussmi

## Yearly U.S. Solar Installations



# 2014 State Performance

Figure 1.5 State Solar PV Installation Rankings, 2012-2014

State	Rank			Installations (MWdc)		
	2012	2013	2014	2012	2013	2014
California	1	1	1	1,046	2,621	3,549
North Carolina	6	3	2	124	335	397
Nevada	4	12	3	198	47	339
Massachusetts	5	4	4	134	240	308
Arizona	2	2	5	719	421	247
New Jersey	3	5	6	419	236	240
New York	10	9	7	63	72	147
Texas	12	8	8	51	75	129
Hawaii	7	6	9	109	144	107
New Mexico	18	13	10	24	45	88
Missouri	23	17	11			
Maryland	8	16	12			
Colorado	9	10	13			
Indiana	31	11	14			
Tennessee	14	19	15			
Georgia	22	7	16			
Connecticut	21	15	17			
Vermont	20	21	18			
Florida	17	18	19			
Ohio	16	20	20			

- 2014 was the largest year ever in terms of PV installations, up 30 percent over 2013 with 6,201 megawatts (MW) of solar PV installed.
- 2014 was the largest year ever for concentrating solar power, with 767 MW brought on-line.
- The United States now has 20 gigawatts (GW) of installed solar capacity – enough to power more than 4 million U.S. homes and reduce carbon emissions by 20 million metric tons a year

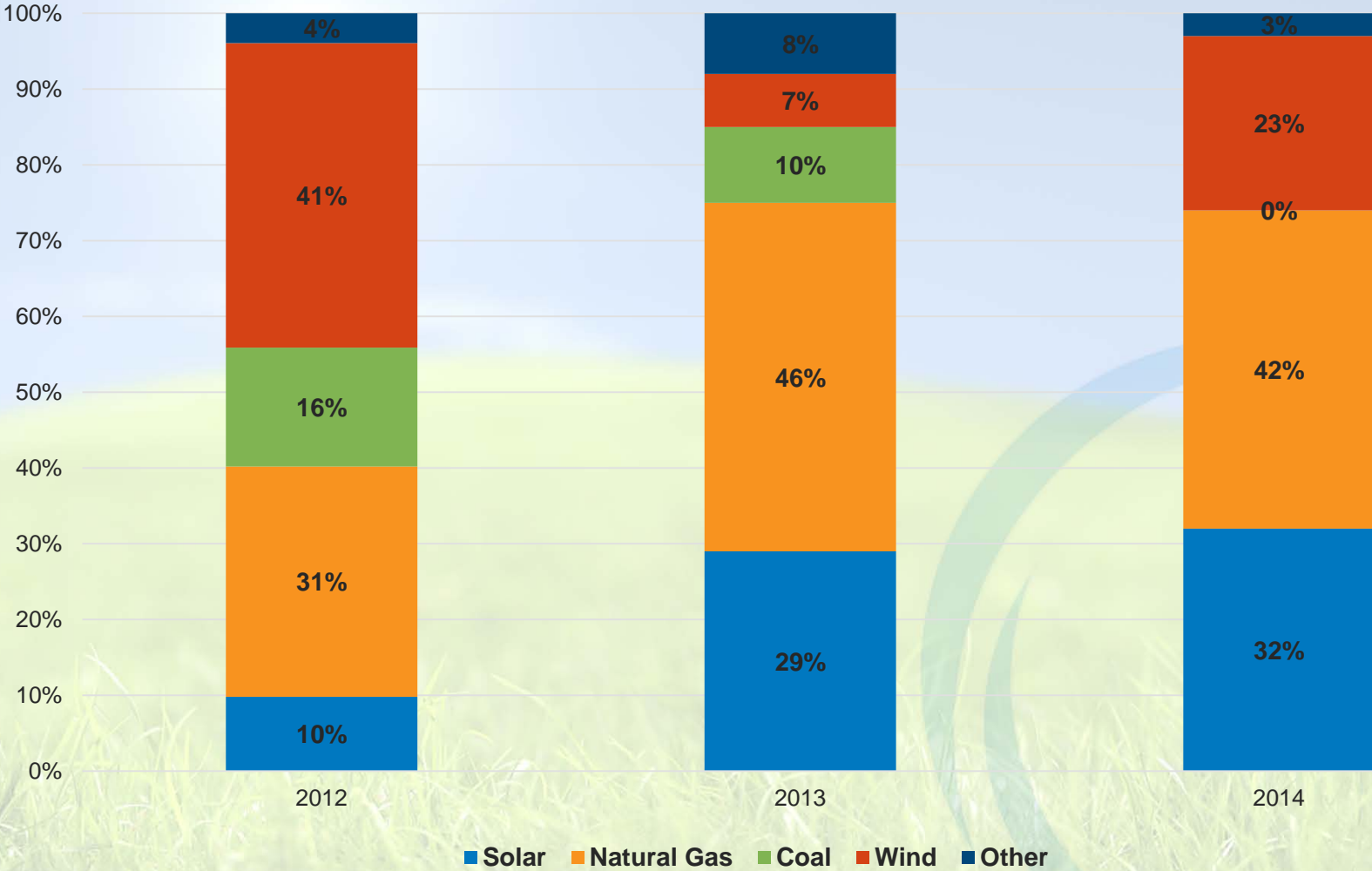
Source: Solar Market Insight Year in Review 2014



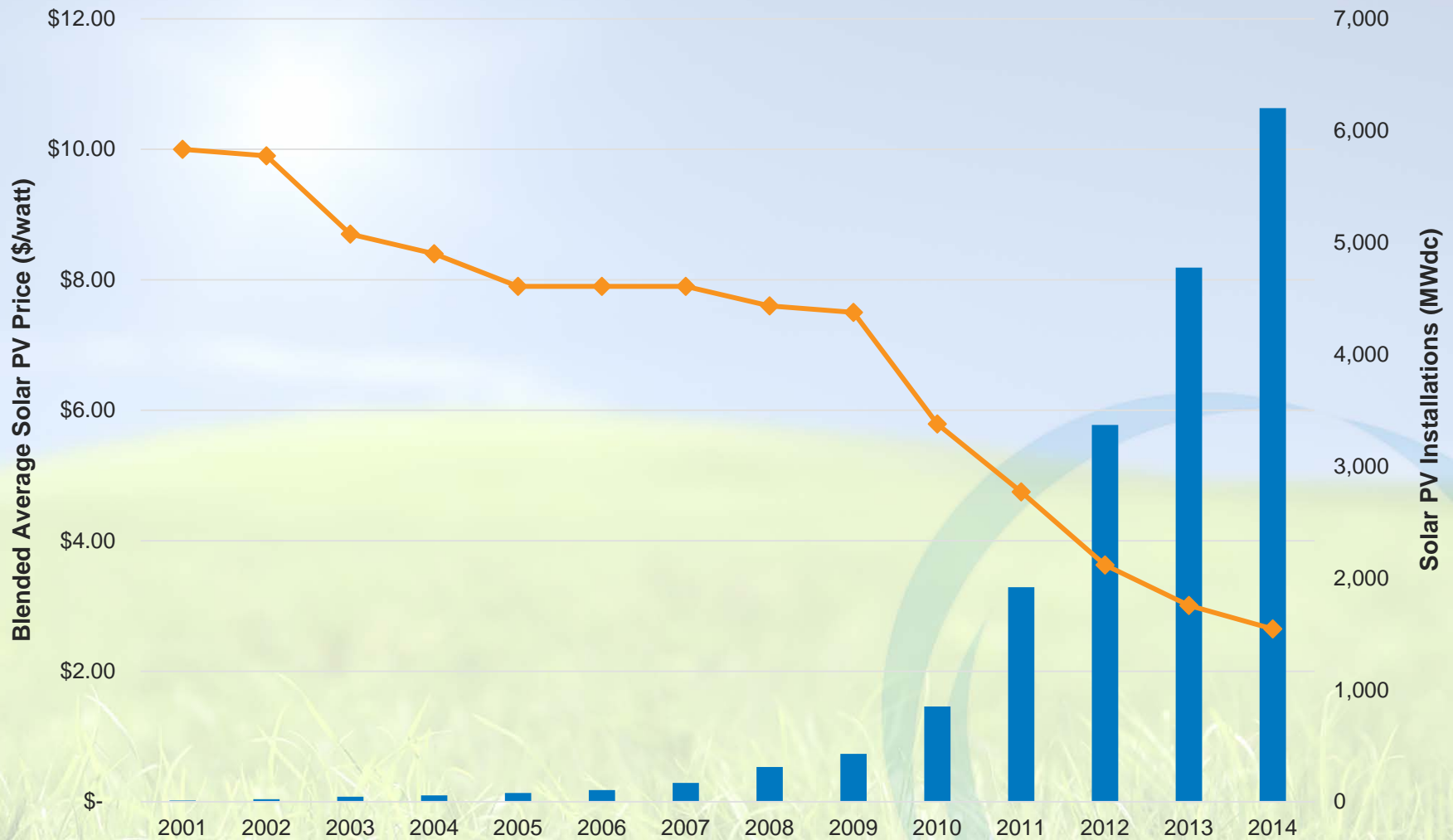
# 32% of Electric Capacity Installed in 2014 from Solar

Source: SEIA/GTM Research *U.S. Solar Market Insight Q4 2014*  
greentechmedia.com/research/ussmi

## New U.S. Generating Capacity by Fuel Type



# Growth in Solar led by Falling Prices



Source: SEIA/GTM Research *U.S. Solar Market Insight Q4 2014*  
greentechmedia.com/research/ussmi  
Lawrence Berkeley National Laboratory, *Tracking the Sun*

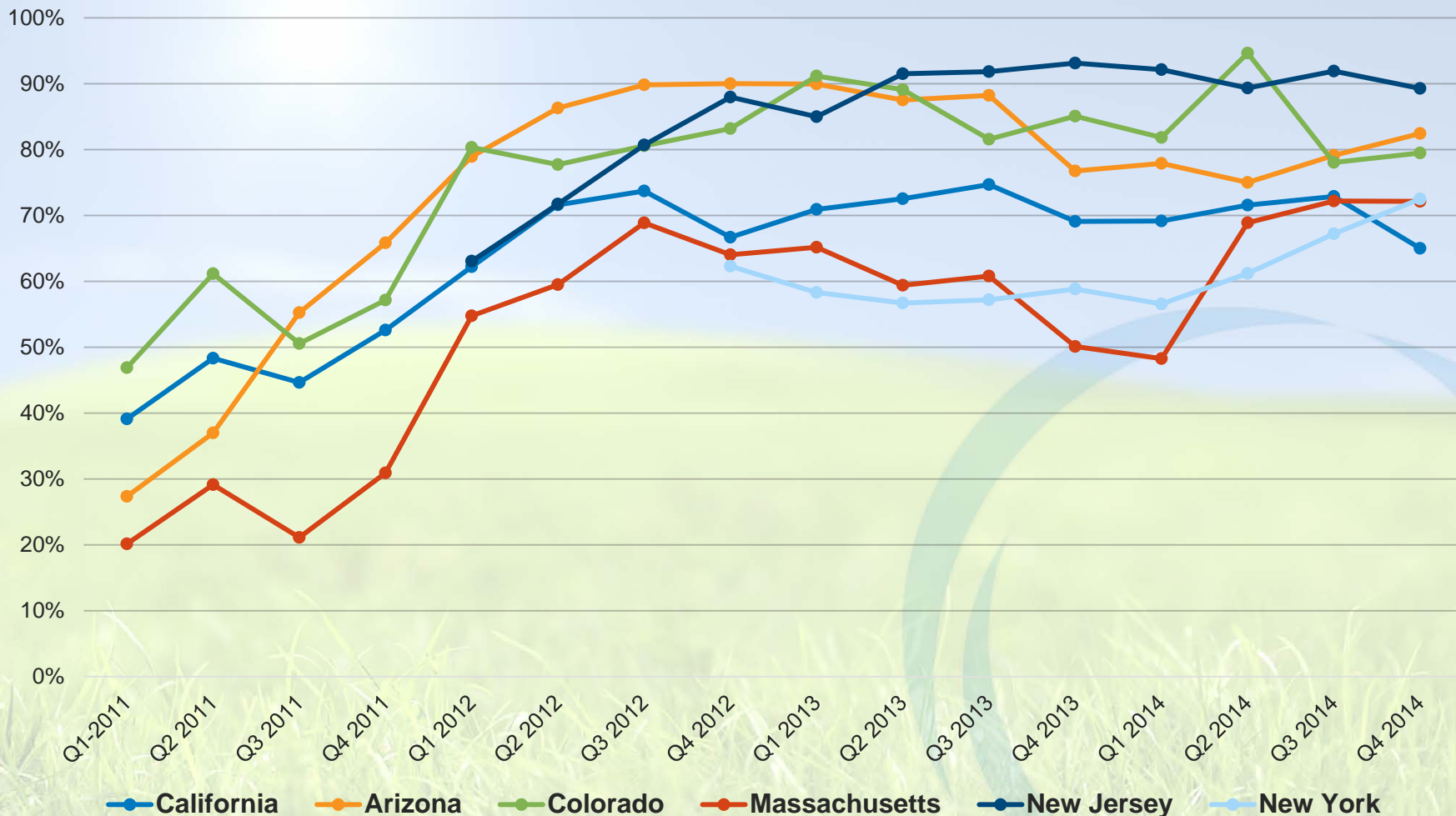
■ Solar PV Installations

◆ Solar PV Prices

# Third-Party Ownership plateaus, but with large market share

Source: SEIA/GTM Research U.S. Solar Market Insight Q4 2014  
greentechmedia.com/research/ussmi

## Percentage of New Residential Installations Third-Party Owned



# Another Strong Year Expected in 2015

- Over 8.5 GW of solar installations in 2015
  - 8+ GW Photovoltaics
  - 117 MW Concentrating Solar Power
  - 18% growth over last year (30% growth in PV market)
  - A new installation every 2.5 minutes
- By years end, over 28 GW of solar in U.S.
  - Nearing 1 million cumulative solar installations
  - Enough solar in U.S. to power 5.5 million+ homes
  - Displace CO<sub>2</sub> equivalent to 8 coal power plants, emissions from 6.3 million vehicles

Source: SEIA/GTM Research U.S. Solar Market Insight Q3 2014  
[greentechmedia.com/research/ussmi](http://greentechmedia.com/research/ussmi)

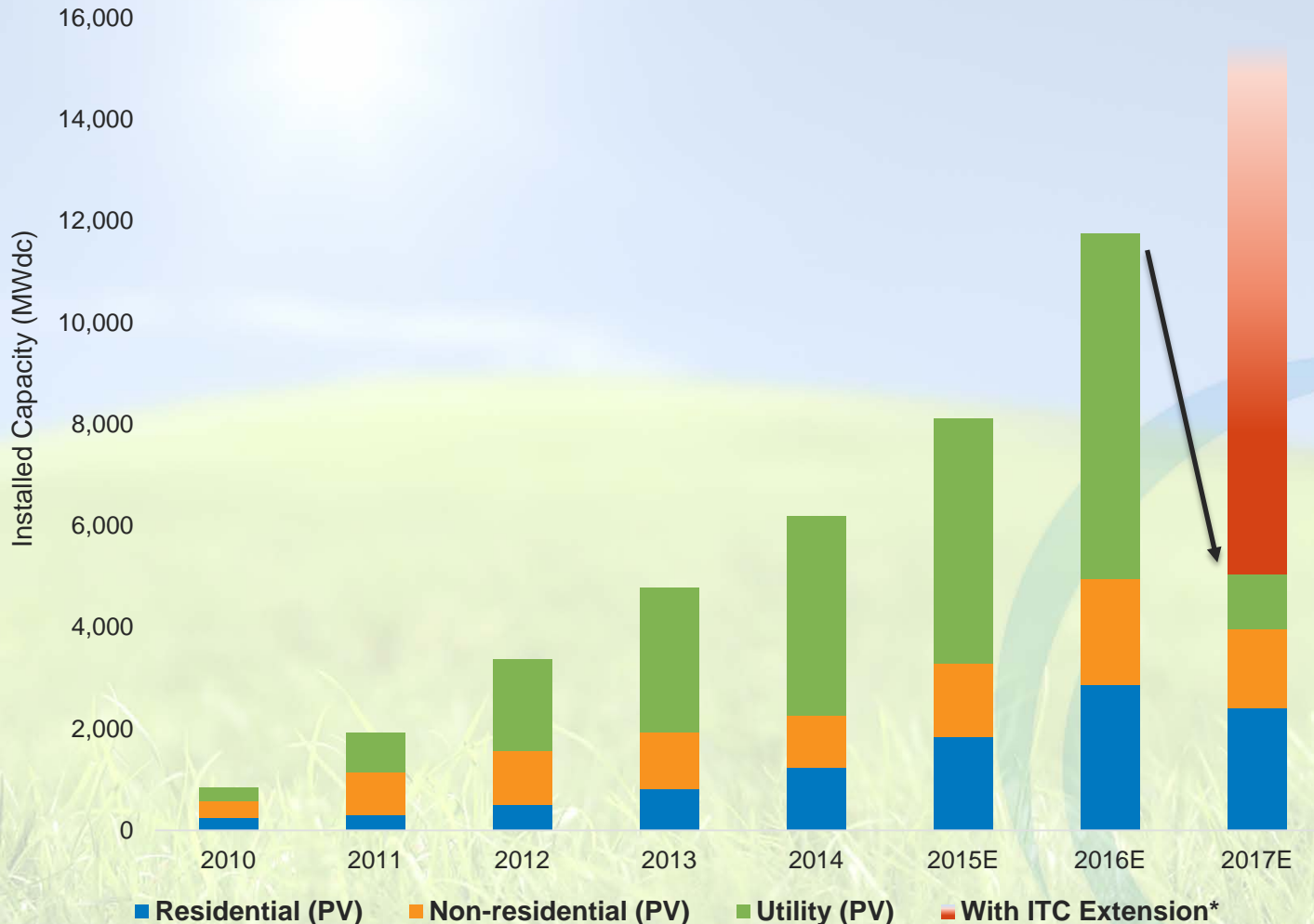
# Solar ITC Has Built The Solar Industry

- **Since passage of the ITC in 2006...**
  - Over 150,000 solar jobs added
  - More than 19.5 gigawatts of solar capacity installed
    - Representing nearly 97% of all solar capacity ever installed
  - Yearly solar installs have increased by a factor of 60
    - More solar was installed in a 1 week in 2014, than was installed in all of 2006
  - Solar has been added to 570,000 homes
  - Over \$66 billion has been invested in solar installations
  - 19 states have reached 100 MW in cumulative capacity
    - Only 1 state over 100 MW in 2006

# Potential Post-ITC Downturn

Source: SEIA/GTM Research *U.S. Solar Market Insight Q4 2014*  
greentechmedia.com/research/ussmi  
\*SEIA estimate

## Projected Yearly U.S. Solar Installations



# It Is Time To Take Action on the ITC

- **Support the Extension of the Investment Tax Credit**
- **Become a member of SEIA**
- **Join the ITC Coalition**
- **Get Politically Engaged**
  - National solar day of action
  - Get to know your Congressman
    - Ribbon cutting events
    - Office visits
- **Participate in our social media #GOSOLAR**

# Broad Public Support for Solar

- Gallup poll shows 91% of Americans want the U.S. to place more emphasis, or the same emphasis, on solar development.
- Solar was the only energy source to see an increase in support over the last two years.
- Solar received support from 70% of republicans, 83% of independents and 82% of democrats. No other energy source received more support across party lines.

## *Majority of Americans Want More Emphasis on Solar, Wind and Natural Gas*

Do you think that as a country, the United States should put more emphasis, less emphasis or about the same emphasis as it does now on producing domestic energy from each of the following sources -- [RANDOM ORDER]?

	<b>% More emphasis</b>	<b>% Less emphasis</b>	<b>% Same emphasis</b>
Solar power	79	9	12
Wind	70	14	14
Natural gas	55	12	32
Oil	41	30	27
Nuclear power	35	33	28
Coal	28	43	27

## *U.S. Should Place "More Emphasis" on Each Source of Domestic Energy Production, by Party ID*

Do you think that as a country, the United States should put more emphasis, less emphasis or about the same emphasis as it does now on producing domestic energy from each of the following sources -- ?

	<b>Republicans</b>	<b>Independents</b>	<b>Democrats</b>
	<b>%</b>	<b>%</b>	<b>%</b>
Solar power	70	83	82
Wind	63	69	81
Natural gas	66	52	49
Oil	60	38	28
Nuclear power	47	34	24
Coal	40	24	22

March 5-8, 2015

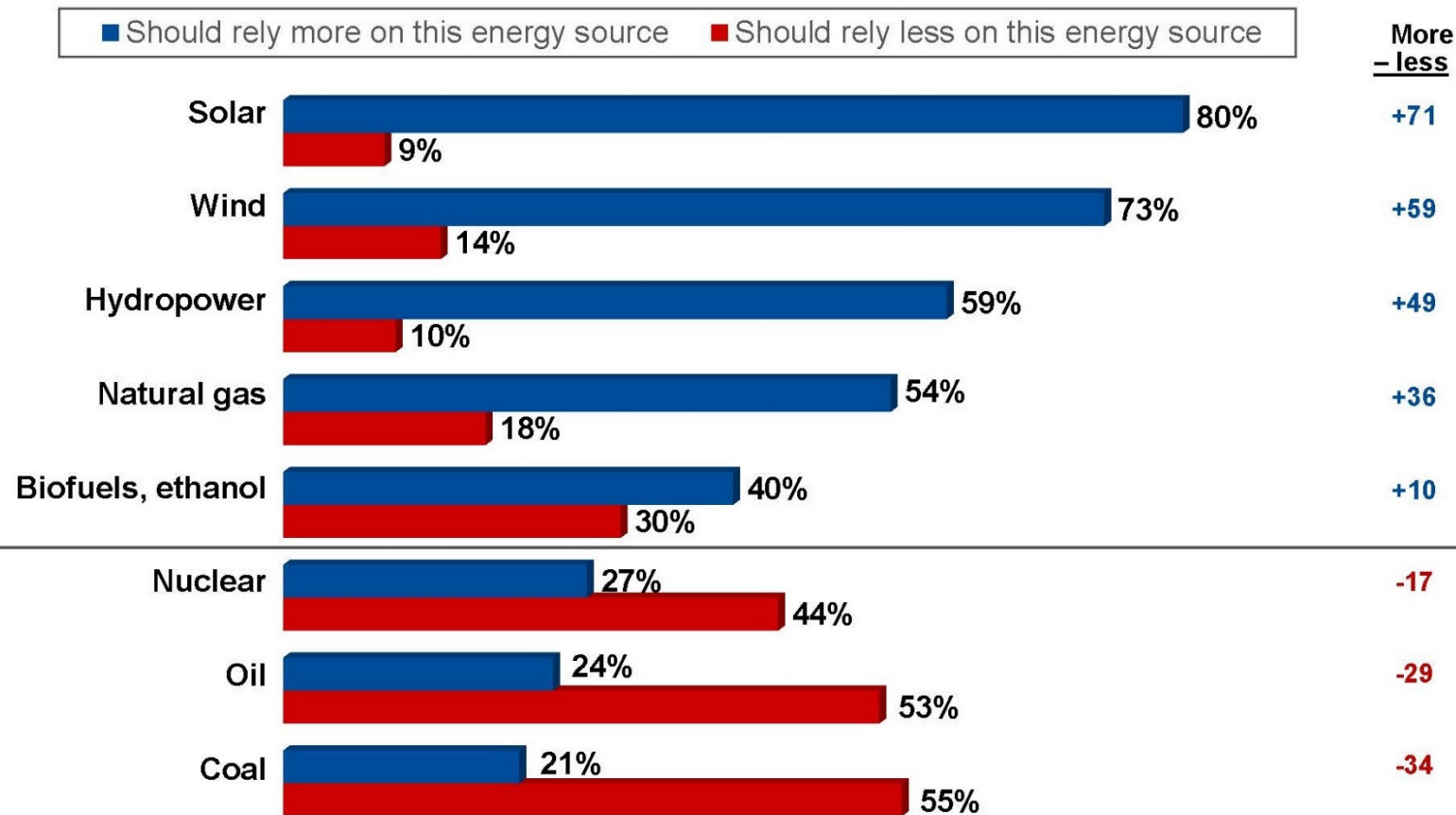
Access at: <http://tinyurl.com/p4r69ql>



# Broad Public Support for Solar

**Looking toward the future, voters want the US to rely more on renewable energy and less on oil and coal.**

*How much should the United States rely on this energy source in the next five years?*

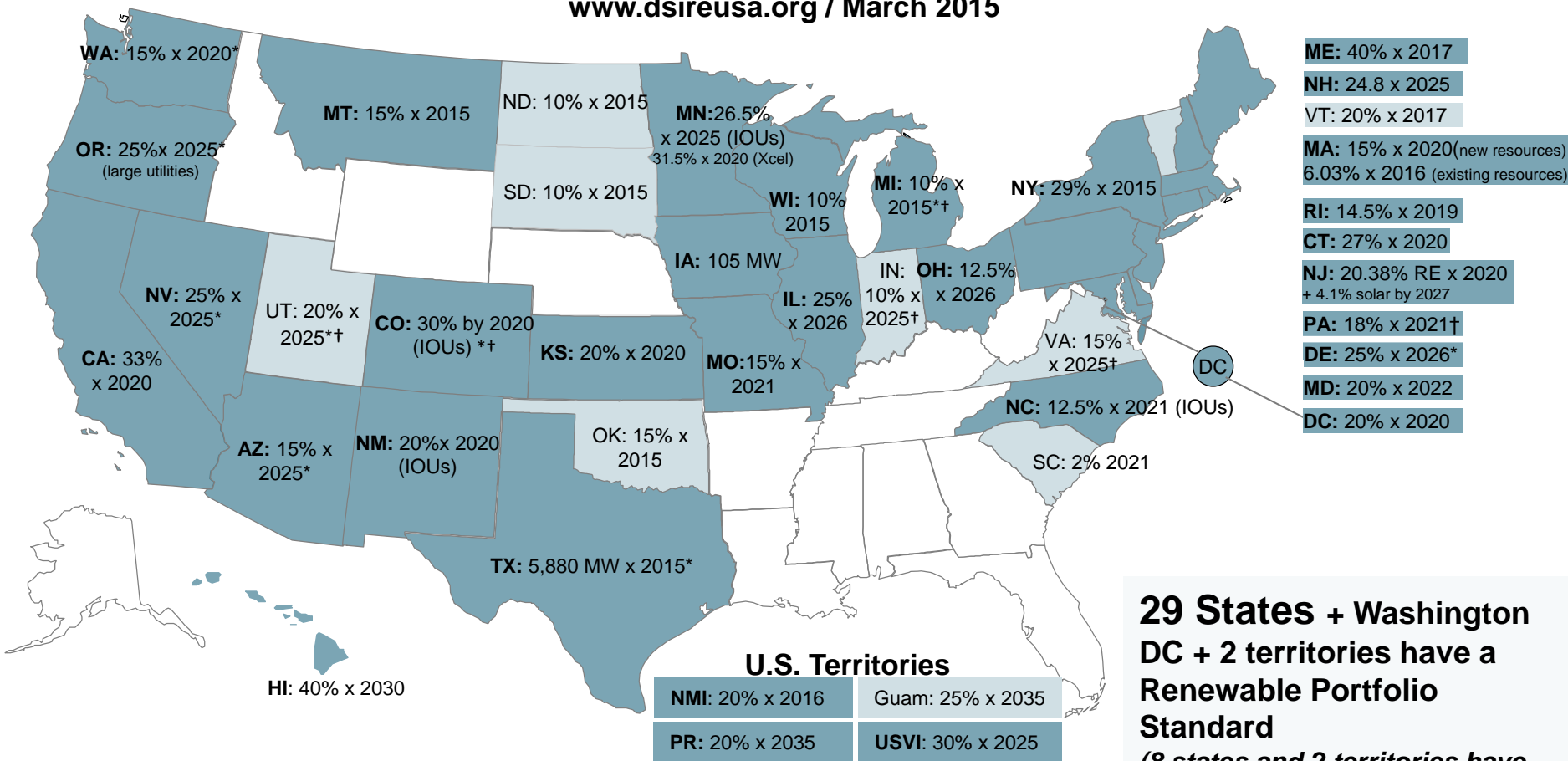


# Why are Renewable Policies Popular?

- **RPS and NEM support in-state economic development (manufacturing, construction & installation)**
  - Local solar projects mean local jobs
  - There are now more solar workers in CA than utility company workers!
- **Solar power is a hedge against future energy prices and price volatility**
  - Utility-scale solar systems are cost-competitive with coal and natural gas
  - Rooftop systems save ratepayers money on utility bills and make bills more predictable
- **Solar power produces system benefits**
  - Utility-scale solar plants produce power on or near peak demand periods
  - Rooftop systems generate power at or close to the consumers who use it, allowing utilities to avoid or defer investments in grid infrastructure
- **NEM is easily understood by customers who want to use their property to produce their own energy**
- **Local air benefits**
  - No air pollution
  - GHG-free

# Renewable Portfolio Standard Policies

[www.dsireusa.org](http://www.dsireusa.org) / March 2015



**29 States + Washington DC + 2 territories have a Renewable Portfolio Standard**  
*(8 states and 2 territories have renewable portfolio goals)*

Renewable portfolio standard  
 Renewable portfolio goal  
\* Extra credit for solar or customer-sited renewables  
† Includes non-renewable alternative resources

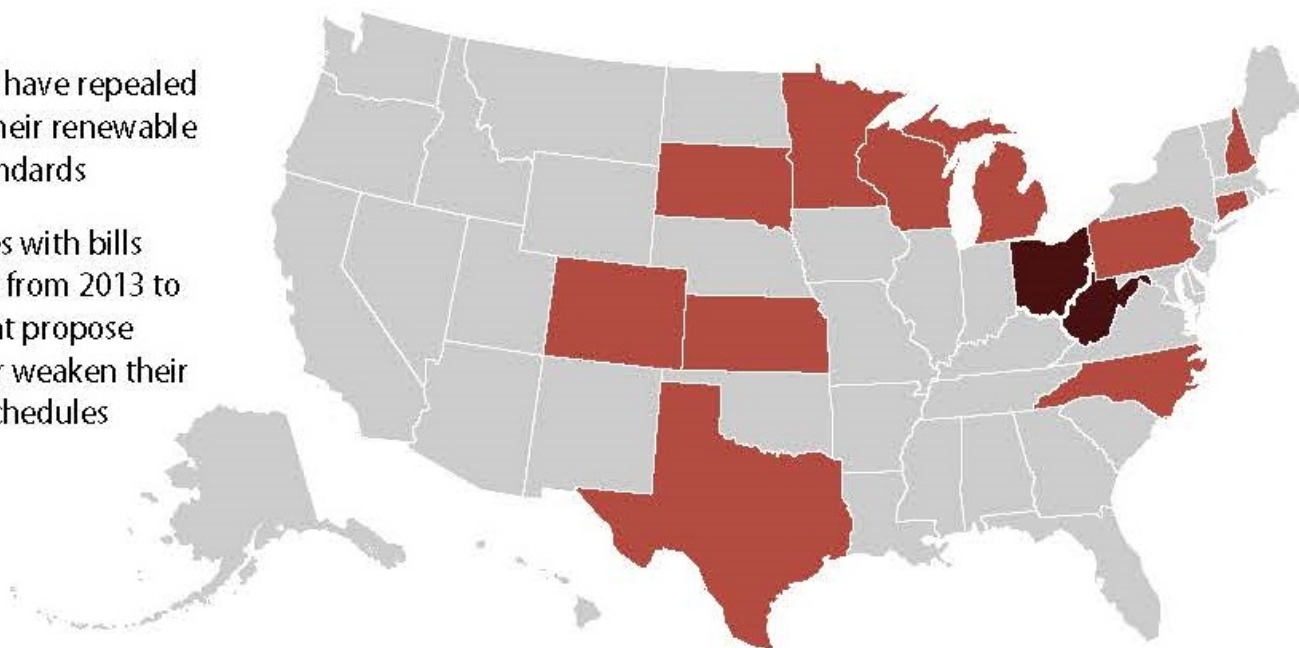
# State RPS – threats since 2013

FIGURE 1

## Battles over state-level renewable energy standards

Selected efforts to repeal or weaken ramp-up schedules for renewable energy

- States that have repealed or frozen their renewable energy standards
- Other states with bills introduced from 2013 to present that propose to repeal or weaken their ramp-up schedules



- 13 states have considered repeal or weakening RPS (Source: Center for American Progress report, March 2015)
- Ohio RPS frozen; WV RPS repealed (but included clean coal and old tires)
- Colorado and NC bills to weaken RPS defeated in 2015
- Texas bill to weaken RPS passed state Senate in April
- Kansas bill to make RPS voluntary agreed to by AWEA May 2015

# RPS Opportunities

## Six states are considering increasing their RPS in 2015

- Six states – CA, MI, NY, MN, IL and VT – are seriously debating an increase in their RPS this year.
- **Michigan:** The RPS has been met at a lower cost than predicted – the allowed surcharge went down to \$0 in one case and \$.43 in another. Gov. Snyder's proposal emphasizes more renewable energy and lawmakers are deliberating a proposal to increase the RPS to 20 percent.
- **Minnesota:** state Senate is deliberating an RES of to 40 percent by 2030. This proposal, introduced by Governor Dayton's administration, is included in the Senate Energy omnibus bill
- **California:** Governor Brown set a goal of 50 percent renewable energy by 2030 in his 2015 inaugural address. Bills are moving in both the Assembly and the Senate to meet this goal by raising the RPS to 50 percent by 2030.
- **New York:** The state is currently exploring how to improve and reauthorize NY's administratively-established RPS after it expires in 2015, in the context of a Large Scale Renewables track in NY's Reforming the Energy Vision proceeding. An Options Paper on Large Scale Renewables is due June 1.
- **Vermont:** HB 40 would repeal the current voluntary RPS program, known as the Sustainably Priced Energy Enterprise Development Program, and establish a new mandatory RPS, called the Renewable Energy Standard and Energy Transformation (RESET) Program, based on tradable RECs.
- **Illinois:** Three bills have been proposed that put forth competing visions for how to fix Illinois' underperforming RPS.

### Mayor: Why My Texas Town Ditched Fossil Fuel

Dale Ross | March 27, 2015



**IDEAS** Dale Ross is the mayor of Georgetown, Texas.

**100% renewable energy made good business sense**

Georgetown is a city of 54,000 just north of Austin known for beautiful Victorian-era architecture around our historic courthouse square. Founded in 1848, we are



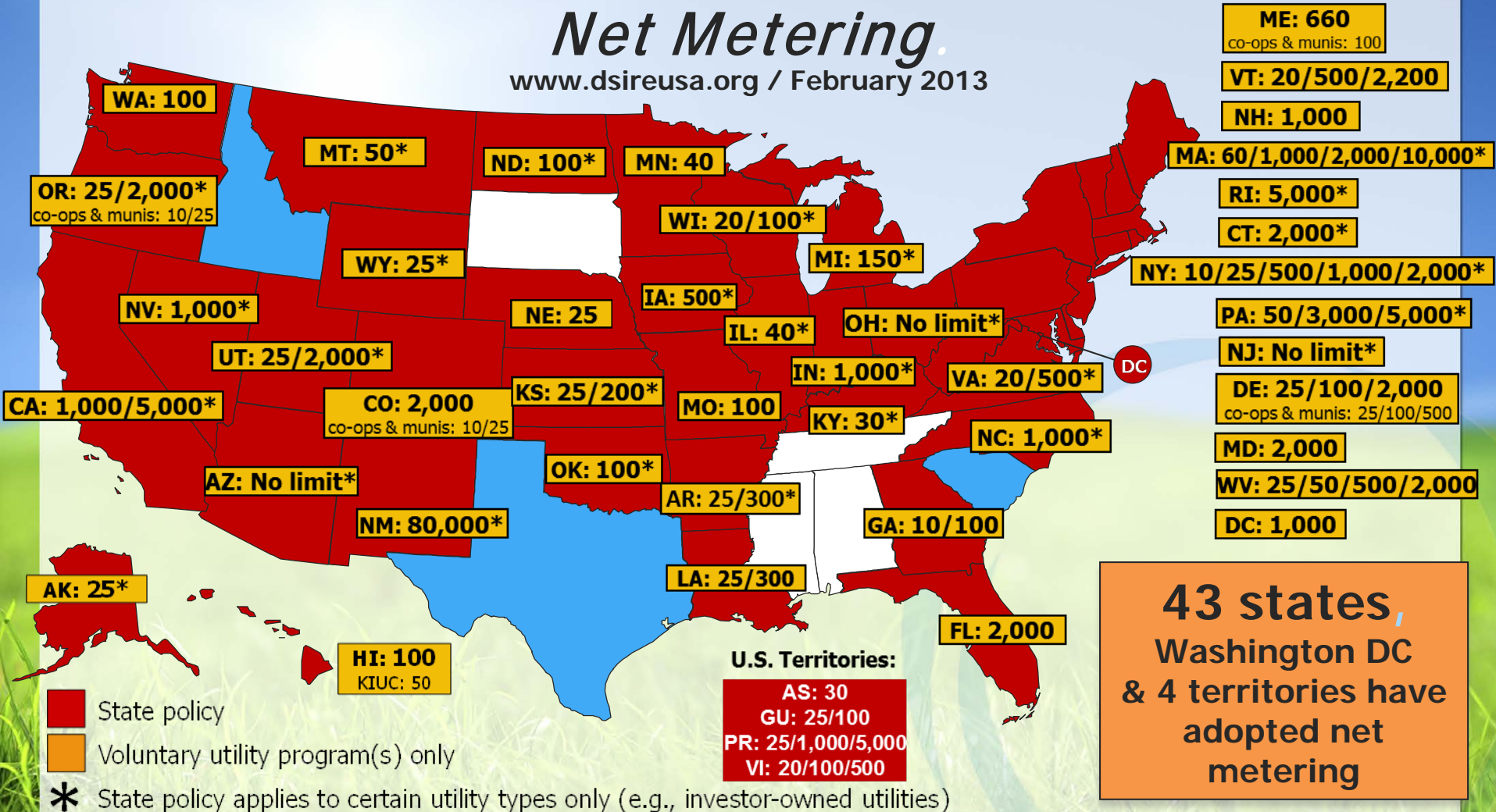
Wind Turbines at Sunrise

Getty Images

# Net Metering is available in 44 states

## Net Metering

www.dsireusa.org / February 2013



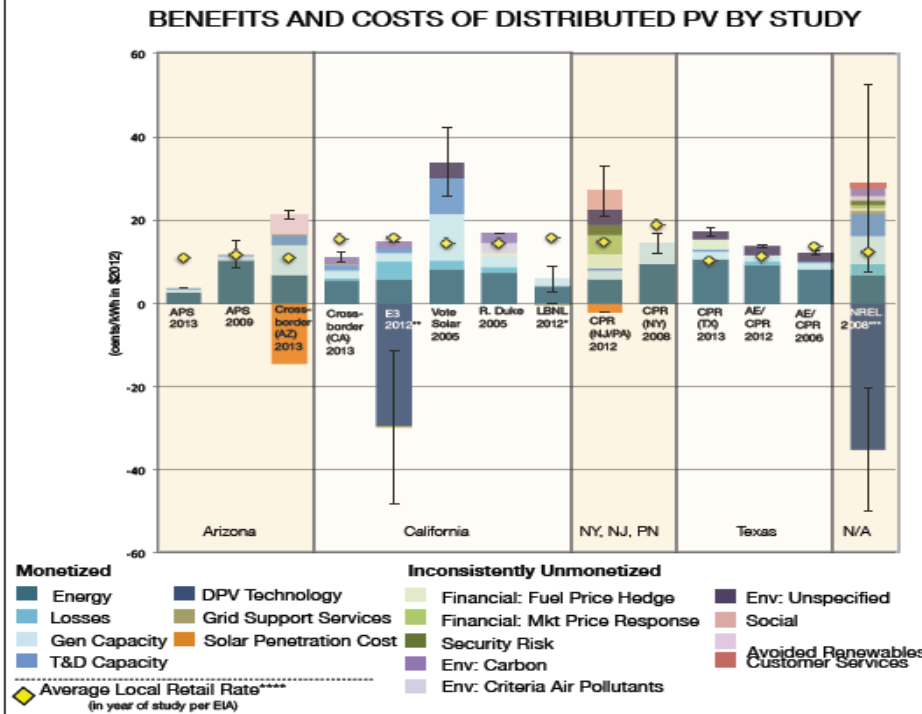
**43 states,  
Washington DC  
& 4 territories have  
adopted net  
metering**

Note: Numbers indicate individual system capacity limit in kilowatts. Some limits vary by customer type, technology and/or application. Other limits might also apply. This map generally does not address statutory changes until administrative rules have been adopted to implement such changes.

# Results of NEM Cost Benefit studies vary

- Rocky Mountain Institute evaluated 15 studies completed between 2005 and 2013
- These studies reflect a significant range of estimated DG value, depending on input assumptions

## SUMMARY OF DPV BENEFITS AND COSTS



### INSIGHTS

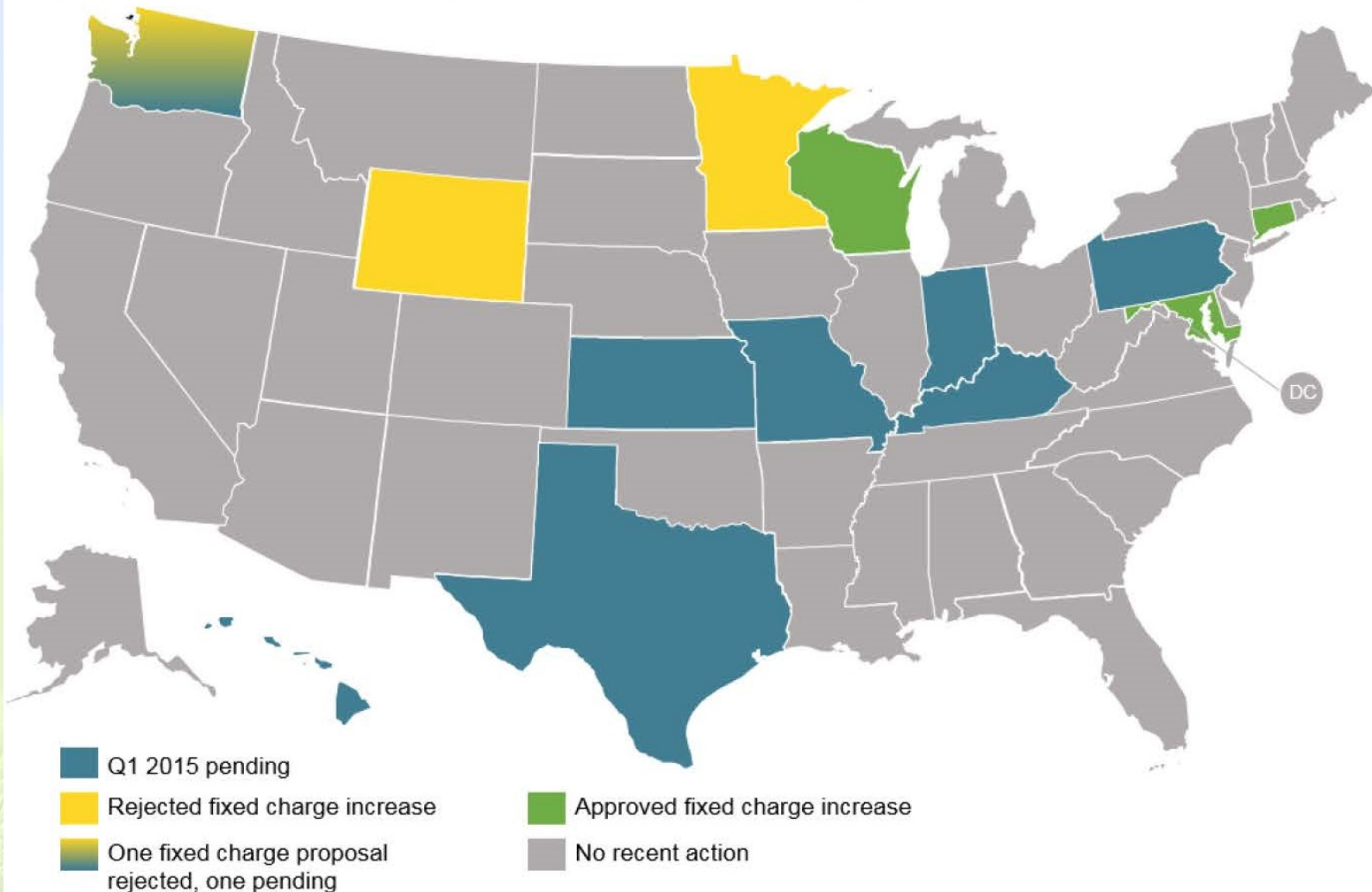
- No study comprehensively evaluated the benefits and costs of DPV, although many acknowledge additional sources of benefit or cost and many agree on the broad categories of benefit and cost.
- There is a significant range of estimated value across studies, driven primarily by differences in local context, input assumptions, and methodological approaches.
- Because of these differences, comparing results across studies can be informative, but should be done with the understanding that results must be normalized for context, assumptions, or methodology.
- While detailed methodological differences abound, there is some agreement on overall approach to estimating energy and capacity value. There is significantly less agreement on overall approach to estimating grid support services and currently unmonetized values including financial and security risk, environment, and social value.

\* The LBNL study only gives the net value for ancillary services  
 \*\* E3's DPV technology cost includes LOOE + interconnection cost  
 \*\*\* The Navigant study is a meta-analysis, not a research study  
 \*\*\*\* Average retail rate is included for reference; it is not necessarily appropriate to compare the average retail rate to total benefits presented without also reflecting costs (i.e., net value) and any material differences within rate designs (i.e., not average).

Source: "A REVIEW OF SOLAR PV BENEFIT & COST STUDIES", 7/22/13, Electricity Innovation Lab (eLab)

# Threats - Distributed Generation

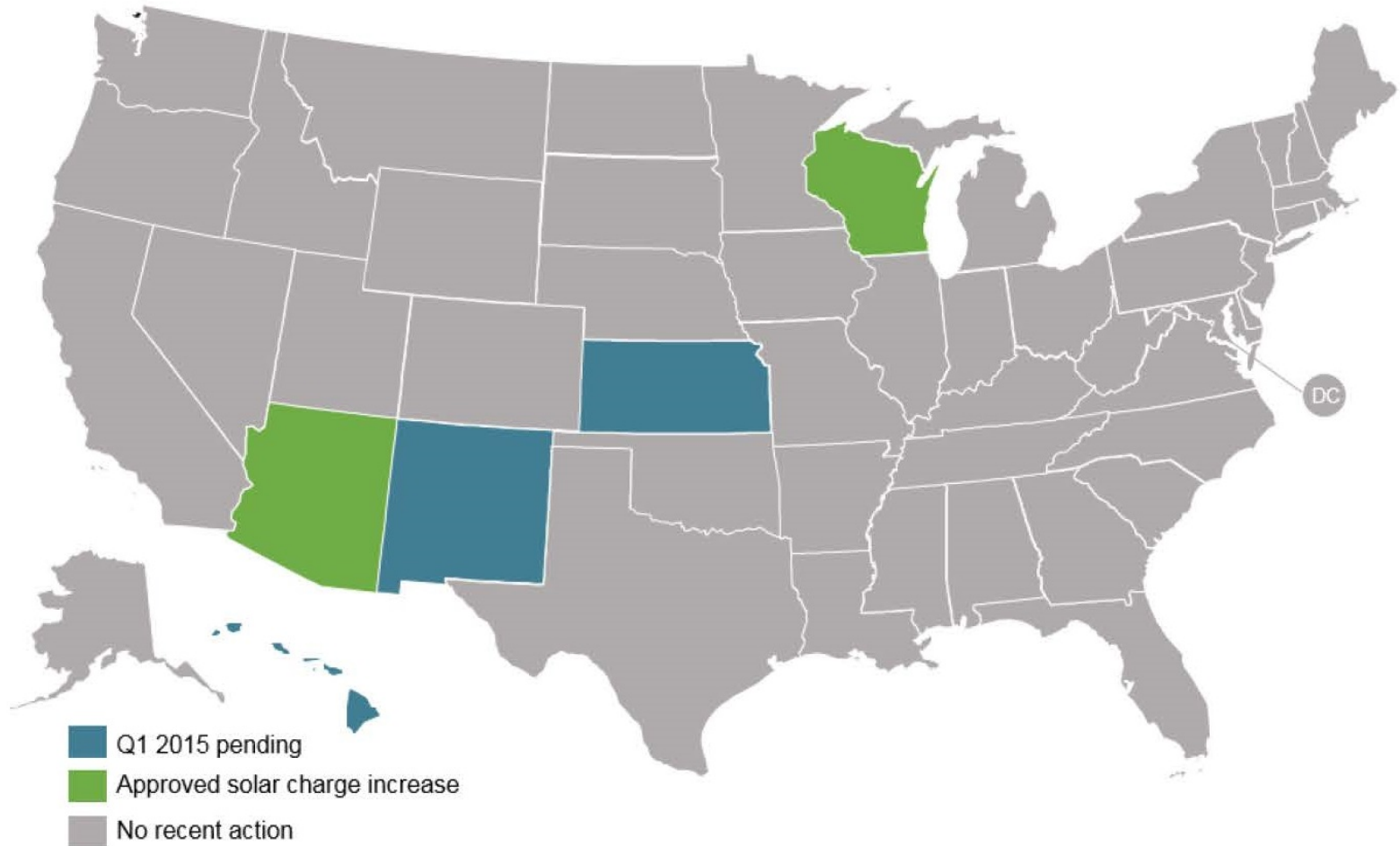
Figure 4. Action on Residential Fixed Charge Increases (Q4 2014 - Q1 2015)





# Threats - Distributed Generation

Figure 5. Action on Residential Solar/DG Charges (Q4 2014 - Q1 2015)



# Q&A

- Questions?