

# Updates from Arizona and Massachusetts

State-Federal RPS Collaborative Webinar

Hosted by Clean Energy States Alliance

February 29, 2012



# State-Federal RPS Collaborative

- With funding from the Energy Foundation and the US Department of Energy, the Clean Energy States Alliance facilitates the **Collaborative**.
- Includes **state RPS administrators and regulators, federal agency representatives**, and other stakeholders.
- Advances dialogue and learning about RPS programs by **examining the challenges and potential solutions** for successful implementation of state RPS programs, including **identification of best practices**.
- To get the **monthly newsletter** and announcements of **upcoming events**, sign up for the listserv at:  
[www.cleanenergystates.org/projects/state-federal-rps-collaborative](http://www.cleanenergystates.org/projects/state-federal-rps-collaborative)

# Updates from Arizona and Massachusetts

## Presenters:

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[www.cleanenergystates.org](http://www.cleanenergystates.org)

# Contact Information

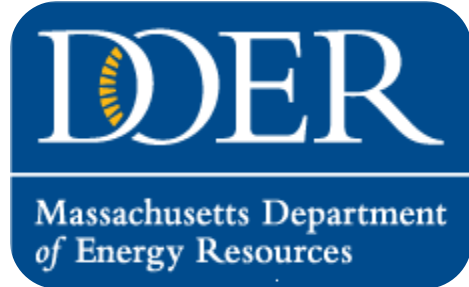
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# Massachusetts RPS: Changes & Challenges

**Howard B. Bernstein, Ph.D.**  
Program Manager  
Renewable & Alternative Energy  
Portfolio Standards (RPS & APS)

**February 29, 2012**

*States Advancing  
RPS Webinar  
February 29, 2012*

# DOER Mission

## *Creating a Cleaner Energy Future for the Commonwealth*

The Massachusetts Department of Energy Resources (DOER) develops and implements policies and programs aimed at ensuring the adequacy, security, diversity, and cost-effectiveness of the Commonwealth's energy supply within the context of creating a cleaner energy future. To that end, DOER strives to:

- Ensure deployment of all cost-effective energy efficiency
- Maximize development of clean energy resources
- Create and implement energy strategies to assure reliable supplies and improve the cost of clean energy relative to fossil-fuel based generation
- Support Massachusetts' clean energy companies and spur Massachusetts' clean energy employment

# MA Renewable Energy Framework

- **Patrick/Murray Administration Goals**
  - Solar: 250 MW installed by 2017 / Wind: 2000 MW installed by 2020
- **Renewable Energy Portfolio Standards (RPS/APS)**
  - Creates demand (Minimum Standard) and provides additional revenue (Renewable Energy Certificate) for qualified generation
  - Establishes an obligation of all Massachusetts Retail Electric Suppliers to provide a percent of their load with renewable energy generation
  - Strategy is to “green up” the ISO-NE grid. Generation from throughout New England and adjacent control areas are eligible
- **Green Communities Act of 2008**

Net Metering, Long Term Contracts, and utility owned solar PV
- **Mass. Clean Energy Center (MassCEC)**

Provides targeted funding programs to support development of renewable energy supply in Massachusetts.



# MA Renewable & Alternative Energy Portfolio Standards (RPS & APS)\*

	Sub-Class	Resources/ Technologies	Minimum Standard in 2011 & thereafter	ACP Rate (\$/MWh) 2011 & thereafter
as of 2009: <b>RPS Class I</b>  (2002-08 called "RPS")	Renewable Energy (post-1997 units)	Solar Elec, Wind, LFG, Biomass, Small Hydro, etc.	<u>6%</u> minus Solar Carve- Out Minimum Standard (increases 1% per year)	\$62.13 (rises annually with CPI)
	as of 2010: Solar Carve- Out (post-2007 units)	Solar PV; ≤ 6 MW per parcel; grid-connected; in MA	<u>0.1627%</u> (never lower) (increases are set annually by formula to grow the installed capacity to 400 MW)	\$550 (10-year forward schedule of <i>declining</i> rates)
as of 2009: <b>RPS Class II</b> (pre-1998 units)	Renewable Energy	same as Class I	<u>3.6%</u> (stays constant)	\$25.50 (rises annually with CPI)
	Waste Energy	MA Municipal Solid Waste Plants	<u>3.5%</u> (stays constant)	\$10.20 (rises annually with CPI)
as of 2009: <b>APS</b> (post-2007 units)	--	CHP (& several other non- renewably-fueled technologies)	<u>2%</u> (rises 0.5% per yr to 3.5% in 2014, rises 0.25% per yr thereafter)	\$20.40 (rises annually with CPI)

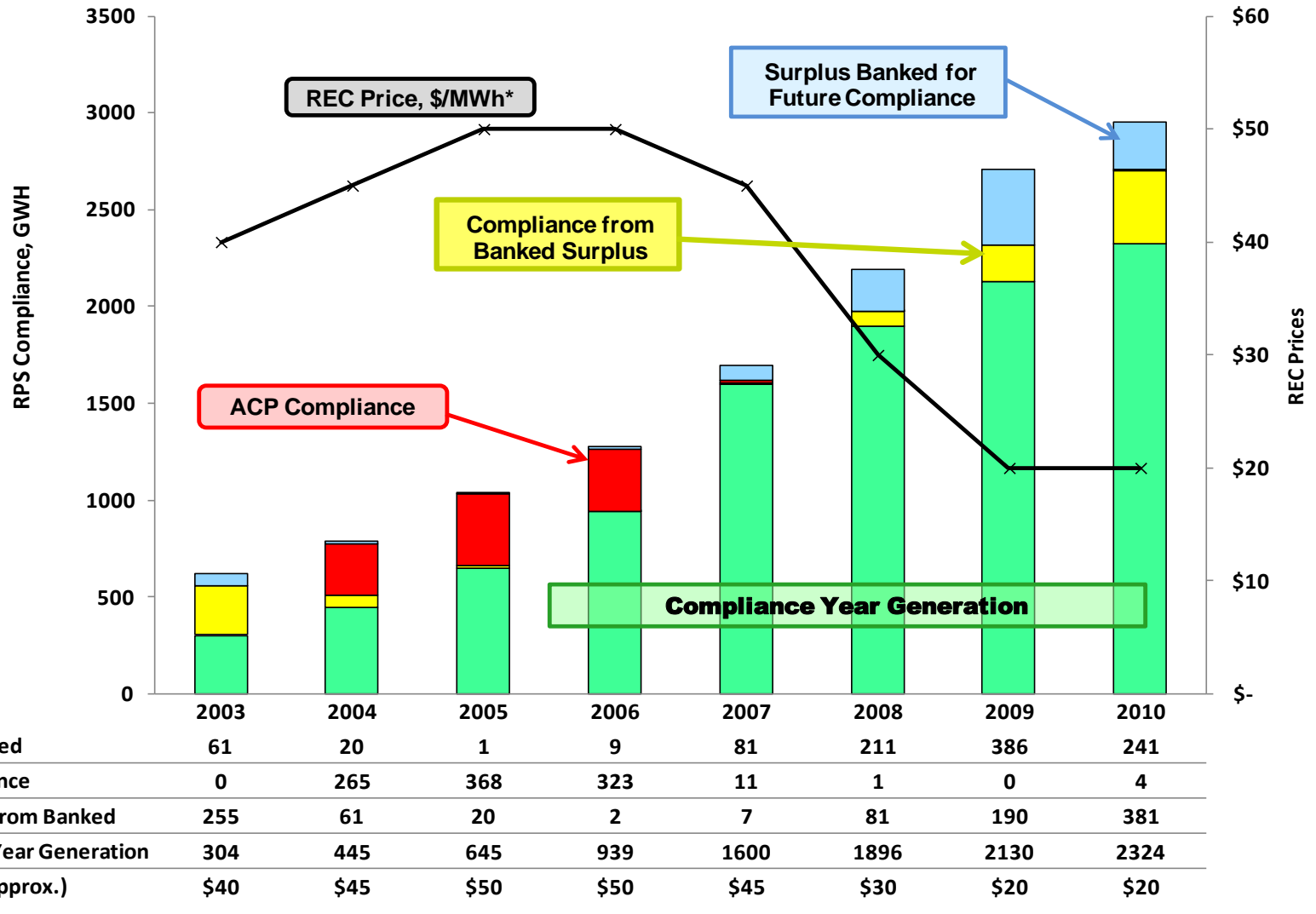
\*Visit the RPS/APS Homepage to find post-2011 Minimum Standards & ACP rates.



Massachusetts Department  
of Energy Resources



# RPS Class I Compliance & REC Prices



# Green Communities Act of 2008: Challenges & Benefits of Expansion

- **Class I expansion:**
  - Small, “low-impact” Hydro eligibility (& “Hydrokinetic”)
  - Behind-the-Meter everywhere in ISO New England, with “independent verification”
- **Developing a Solar Carve-Out:**
  - Innovative program design
  - Ramping up (successfully)
  - New developers, new aggregation models
- **Class II for pre-1997 Units:**  
challenge of supply projection with declining “exempt load”
- **APS:** challenges of CHP design, evaluation, & promotion; and of supply projection with declining “exempt load”

# Wind, Solar, Hydropower: Changing Market Forces, etc.

- **Riding the market:**
  - Class I development & supply up, REC prices down
  - Obligation up, development slows, REC prices up
- **Finances:**
  - ARRA (Fed. Stimulus): big wave now receding
  - PTC & ITC: after helping, uncertainties loom
  - Long-term contracting still inadequate
  - Cost of competing, conventional power sources
  - “Soft” but serious costs of permitting, litigating, etc.
- **Local opposition to siting** (esp. wind turbines/farms)
- **Transmission & utility interconnection**
- **Globalization of materials, manufacturing**



# New Assistance, New Resources

- **Green Communities Program**  
in DOER, established by Green Communities Act of 2008
- **Clean Energy Results Program**  
MassDEP in collaboration with DOER
- **ACP Revenues (2010 ACP Spending Plan)**
- **PV on Closed Landfills Handbook** (under prep.)
- **SunShot Rooftop Solar Challenge** (DOE grant)
- **Wind Turbine Health Impact Study**  
by independent panel for MassDEP & Mass Dept of Public Health
- **US Dept of Interior (BOEM) opening new off-shore areas for wind farms**

# Contacts & Links

## DOER RPS-related contacts

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## Links

<http://www.mass.gov/doer> (DOER homepage)

<http://www.mass.gov/energy/rps> (RPS & APS homepage)

[RPS Annual Compliance Reports, 2003-2010](#)

**REC prices** for the graph on the fifth slide were based on graphs (roughly averaged for each year and rounded to the nearest \$5) in these sources:

<http://apps3.eere.energy.gov/greenpower/markets/certificates.shtml?page=5>

<http://apps3.eere.energy.gov/greenpower/pdfs/51904.pdf> (Fig. 4)

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# Arizona's Renewable Energy Standard and the AZ Corporation Commission



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# What is the Arizona Corporation Commission?

- Established upon statehood in 1912, as a Constitutional authority; a separate, popularly-elected branch of state government.
- Originally made up of 3 commissioners; expanded by popular vote to 5 commissioners in 2000.
- Arizona voters have protected the independence of the Commission--especially election of commissioners--from constitutional amendment on numerous occasions.
- The Commission has constitutional authority to regulate public utilities, corporate filings, securities, and railroad and pipeline safety.
- The commission regulates 16 electric utilities, 7 natural gas utilities and over 350 private water and sewer utilities.



# AZ's Electricity Mix

- Total in-state generation: 25,000 MW
- Total **in-state** consumption: 16,000 MW
  - 50% coal
  - ~28% natural gas
  - ~22% nuclear
  - **~2-3% solar**
    - 54 MW installed in 2010; about 100-200 MW in 2011
    - Total in-state solar: ~2-300 MW
    - 280 MW Concentrating Solar Power (CSP) project built by Abengoa to come online ~2014; molten salt storage will provide 6 hours of electricity after the sun goes down; parabolic trough design.

# Renewable Energy in Arizona

- Arizona implemented the Environmental Portfolio Standard for electric utilities in 2001; and in 2006 the Commission approved the Renewable Energy Standard – 15% by 2025.
- The RES rules went into effect on August 14, 2007.
- The Commission has been sued repeatedly over the past 5 years by the Goldwater Institute, which for some odd reason dislike solar and energy efficiency.
- The ACC is currently (2/29/12) in a constitutional crisis as Chairman Gary Pierce wants to cede the ACC's authority to the legislature. Both ACC attorneys and the legislature's attorneys have declared this unconstitutional.
- The chaos is making it harder for solar and efficiency.

# The RES: The Power of Distributed Generation

- Require regulated utilities to generate 15% of their energy from renewable resources by 2025.
- These rules do *not* have a dedicated solar set-aside, rather it has a specific set-aside for *distributed* generation.
- The RES allows utilities to use solar, wind, biomass, biogas, geothermal and other similar technologies to generate “clean” energy to power Arizona’s future.
- Big recent fight at the ACC with a 3-2 vote to allow a waiver and count burning trash as ‘clean’ energy, thus displacing solar or wind.

# Distributed Renewable Energy Requirement

2007 – 5%

2009 – 15%

2011 – 25%

After 2011 – 30%

Utilities to meet half of the requirement from commercial projects and half from residential projects.

# RES Percentage Requirement

Year	Requirement
2008	1.75 %
2009	2.00 %
2010	2.50 %
2011	3.00 %
2012	3.50 %
2013	4.00 %
2014	4.50 %
2015	5.00 %
2016	6.00 %

Year	Requirement
2017	7.00 %
2018	8.00 %
2019	9.00 %
2020	10.00 %
2021	11.00 %
2022	12.00 %
2023	13.00 %
2024	14.00 %
After 2024	15.00 %

# Performance Based Incentives

- Commercial customers who want to install solar on their buildings do not get an up-front lump sum payment from the utility; rather, they now qualify for Performance Based Incentives (“PBI”).
- Under PBI’s the utility will pay commercial customers based on the actual energy produced.
- PBI’s are not popular with the current Commission because payments are obligated 15-20 years out; so costs can increase rapidly.
- Residential customers use UFI’s (Up-front incentives) rather than PBIs.

# Funding for the RES

- RES is funded by a tariff (surcharge).
- This year, maximum that an Arizona Public Service residential customer would pay is \$3.84/month.
- Unfortunately, clean energy in Arizona has become very political and there are not 3 votes to support solar.
- Recent amendment and 3-2 vote added surcharge to customers who have solar installed.
- REST plans for Arizona's regulated utilities (Arizona Public Service, Tucson Electric Power, Unisource and the 15 coops) change year-to-year.
- The mines keep looking for waivers. Arizona produces 60% of U.S. copper.



# Taking Advantage of Renewable Energy

- Individuals, businesses, schools, municipalities can all take advantage of RES funding from regulated utilities.
- Arizona has about **17,000 rooftops** with solar right now.
- The REST has been a very political battle, and since the utilities are way ahead of schedule, the current Commission allowed APS to cut funds for DG by almost half.
- *SolarCity* case in 2010 decided that onsite solar was not subject to regulation as a utility; huge decision.
- Rebates are currently at 60 cents/watt, and will be at 10 cents/watt soon. **Solar companies tell us they are leaving the state.**

# AZ RES: 15% by 2025 is lower than most Western states

- **Other states' RES:**

**NM 20% by 2020**

**CO 30% by 2020**

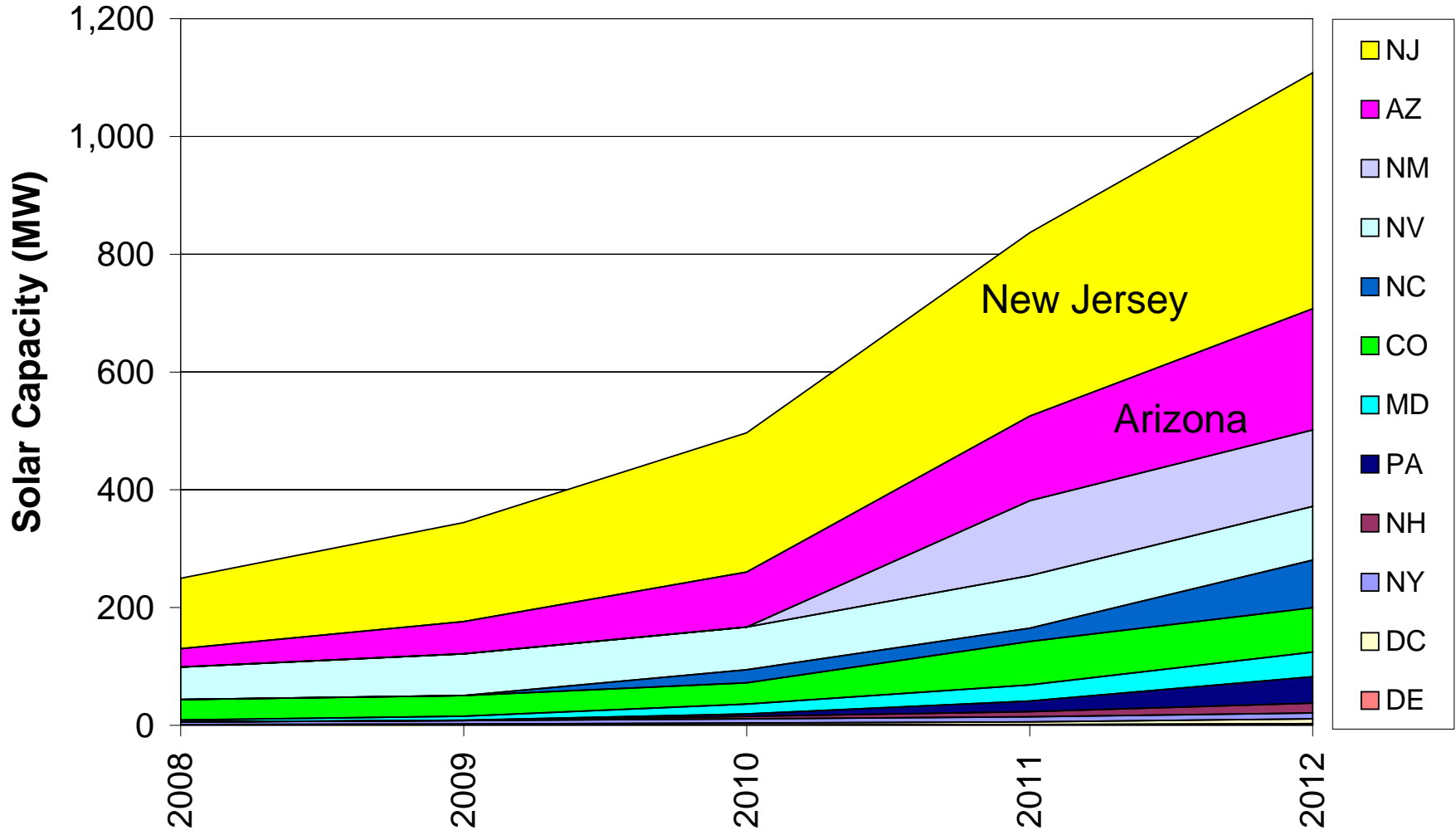
**NV 25% by 2025**

**CA 33% by 2020**

**OR 25% by 2025**

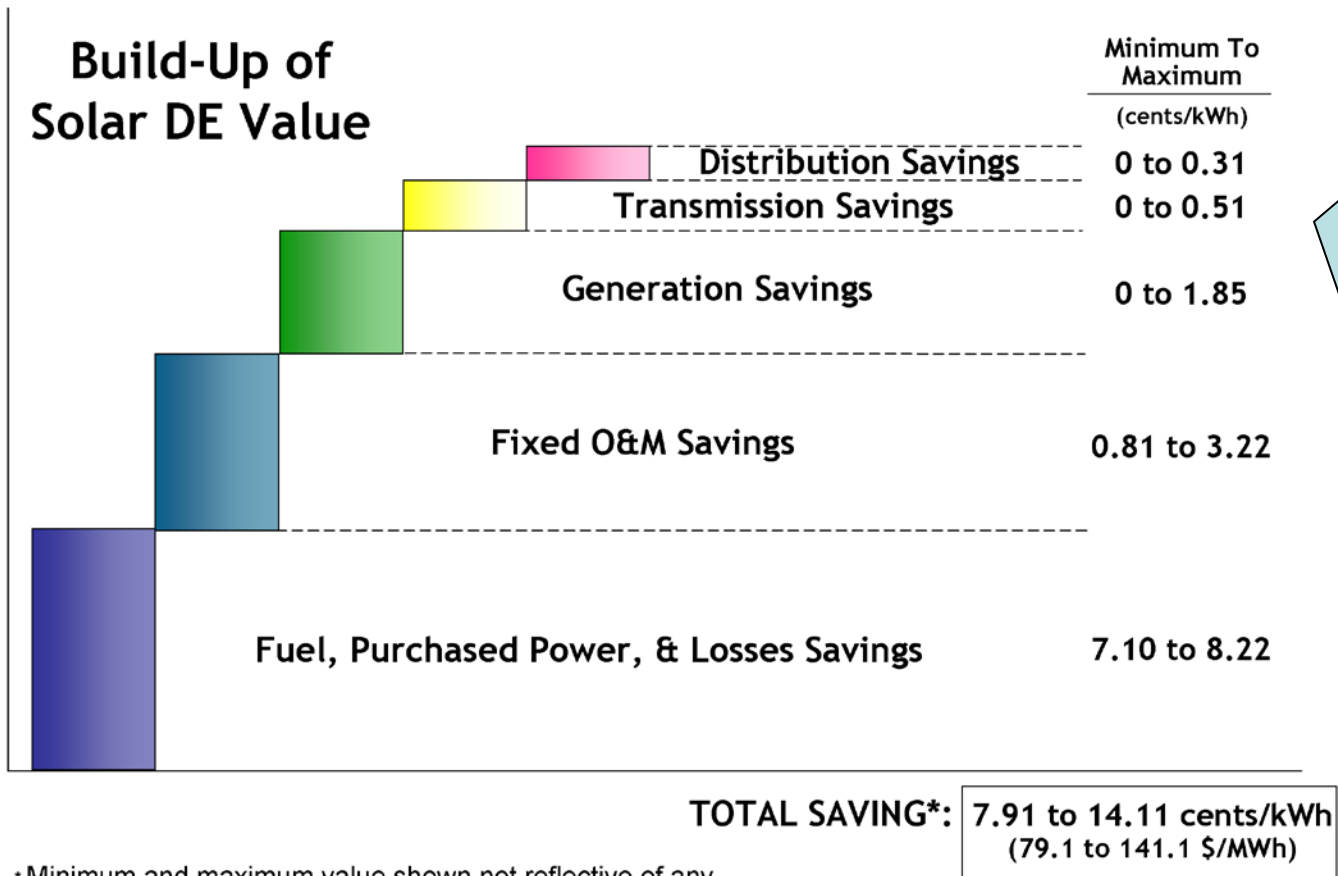


# Solar Market: Top 10 States



# APS' RW Beck Study on the Value Of Distributed Energy

## Operating Impacts and Valuation study



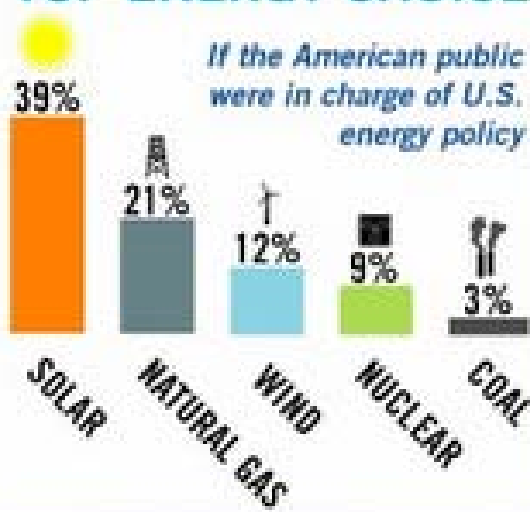
\* Minimum and maximum value shown not reflective of any specific scenario as evaluated in this Study

**RW Beck study says the value of distributed solar is 7.9 to 14.11 cents/kWh in avoided costs for fuel, transmission, line losses, etc.**

# 2011 SOLAR BAROMETER



## SOLAR: TOP ENERGY CHOICE



## 82% SUPPORT FEDERAL SOLAR INCENTIVES



82% of INDEPENDENTS  
87% of DEMOCRATS  
71% of REPUBLICANS

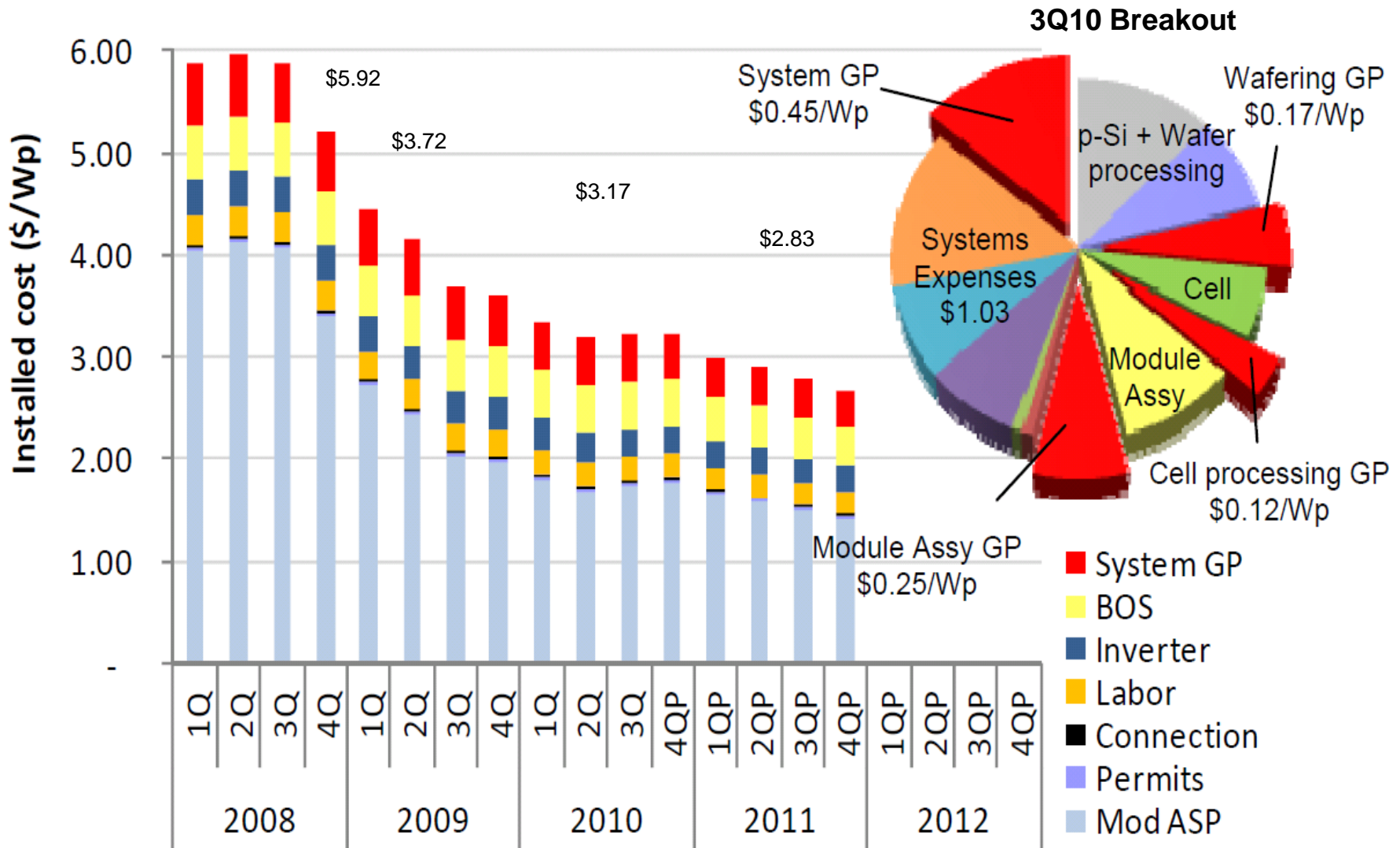
## 82% SUPPORT U.S. SOLAR MANUFACTURING

51% of INDEPENDENTS  
43% of DEMOCRATS  
31% of REPUBLICANS } THINK IT IS EXTREMELY IMPORTANT



The Solar Barometer is a nationally representative survey conducted annually by independent polling firm Kelton Research.

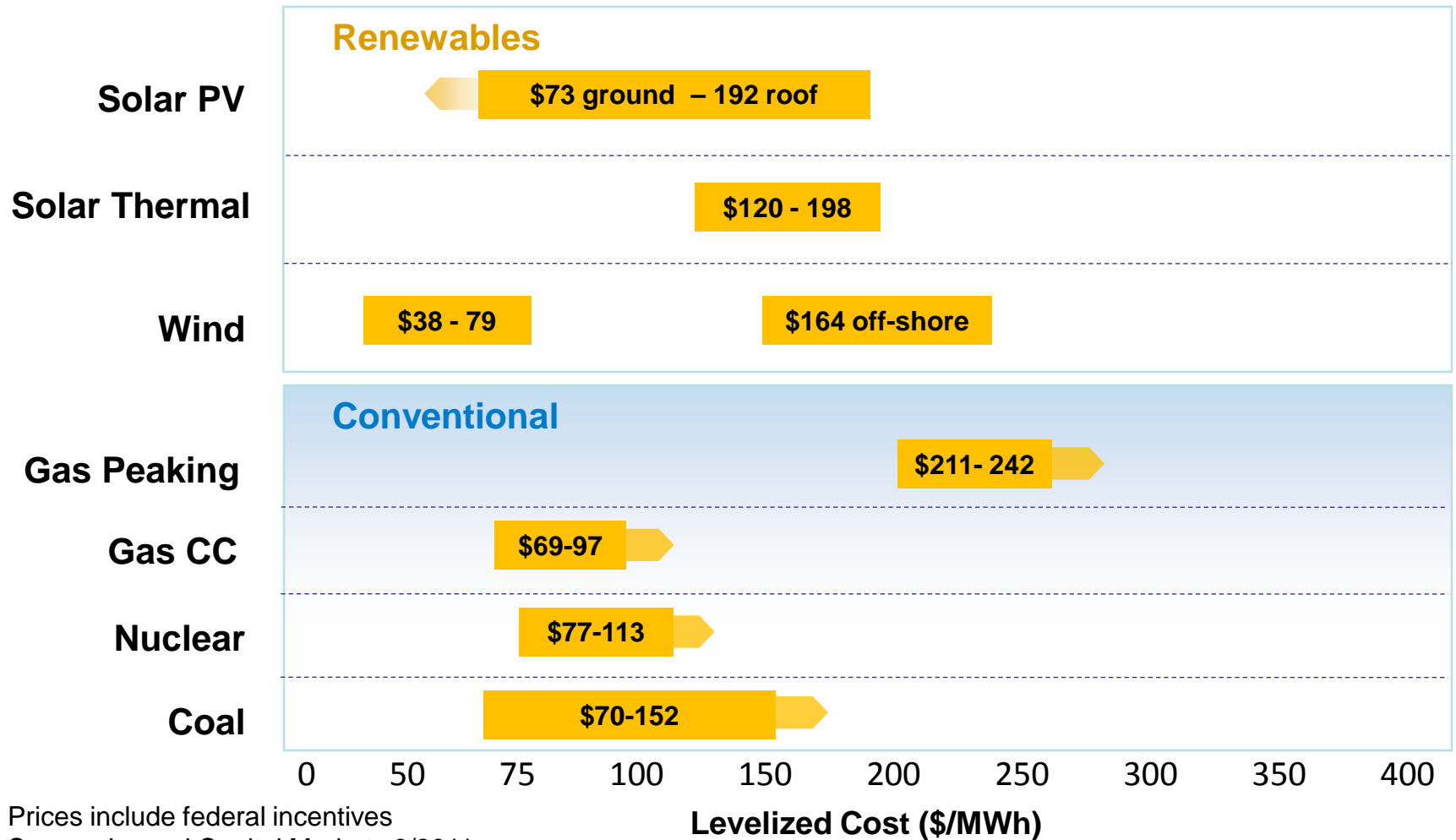
# Installed System Price per Watt, 2008-2011



Source

# PV Power Plants Are Cost Competitive Today

## 2012 LCOE by Resource \$/MWh: 2010 USD



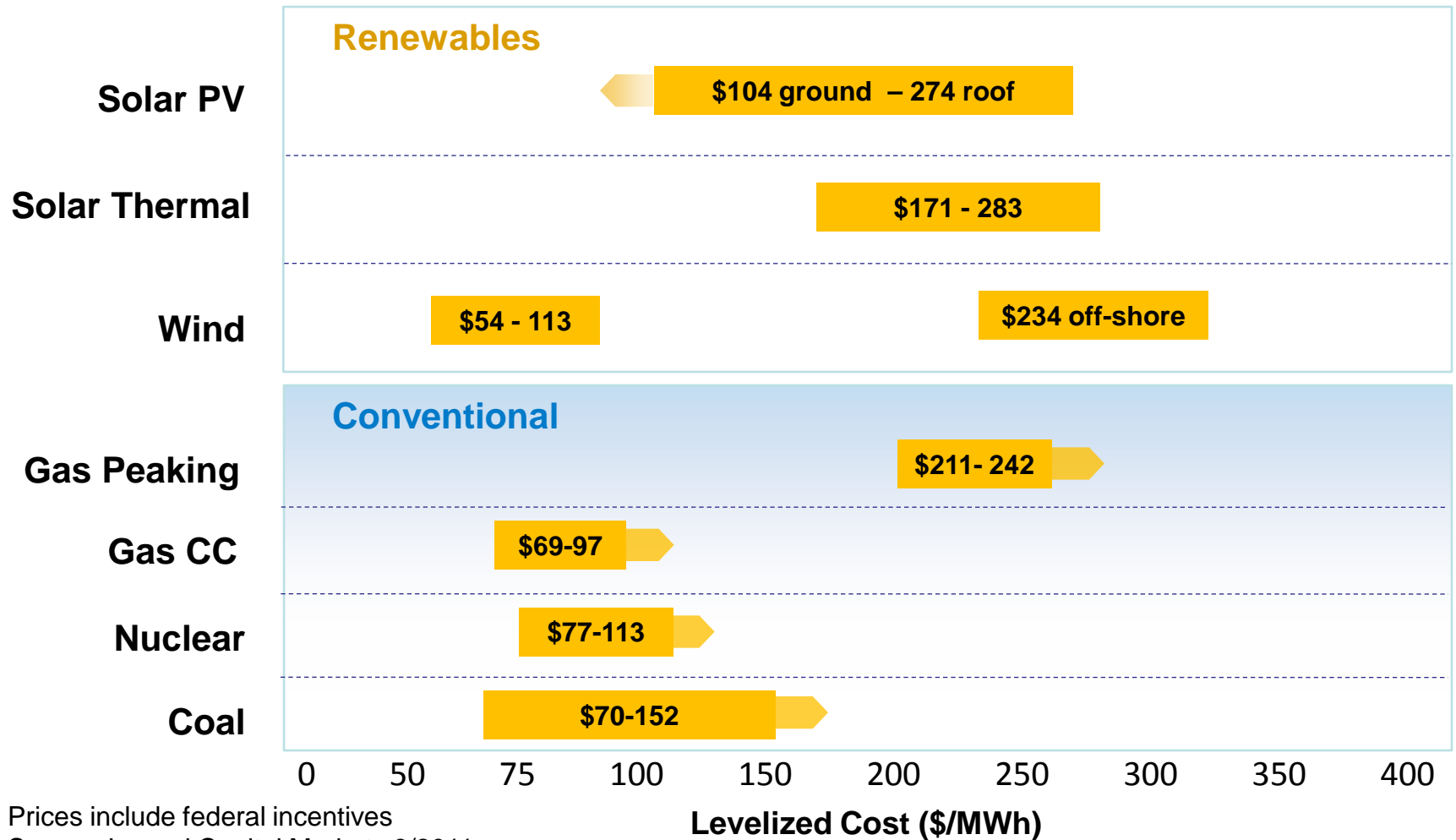
Prices include federal incentives

Source: Lazard Capital Markets 6/2011



# Not as Pretty Without ITC

## 2012 LCOE by Resource \$/MWh: 2010 USD



Prices include federal incentives

Source: Lazard Capital Markets 6/2011

# Thank you!



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