

# Design and Implementation Experience with State RPS Policies

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# Outline of Presentation

## □ Overview of RPS

## □ Experience in Other States

- Where has an RPS been implemented in the U.S.?
  - Why has the RPS become popular?
  - What impacts have the state RPS policies had so far?
  - What have been the key design elements of these policies?
  - What has the experience been in Texas, and elsewhere?
  - What pitfalls have been experienced, and what lessons learned?
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# Renewables Portfolio Standard

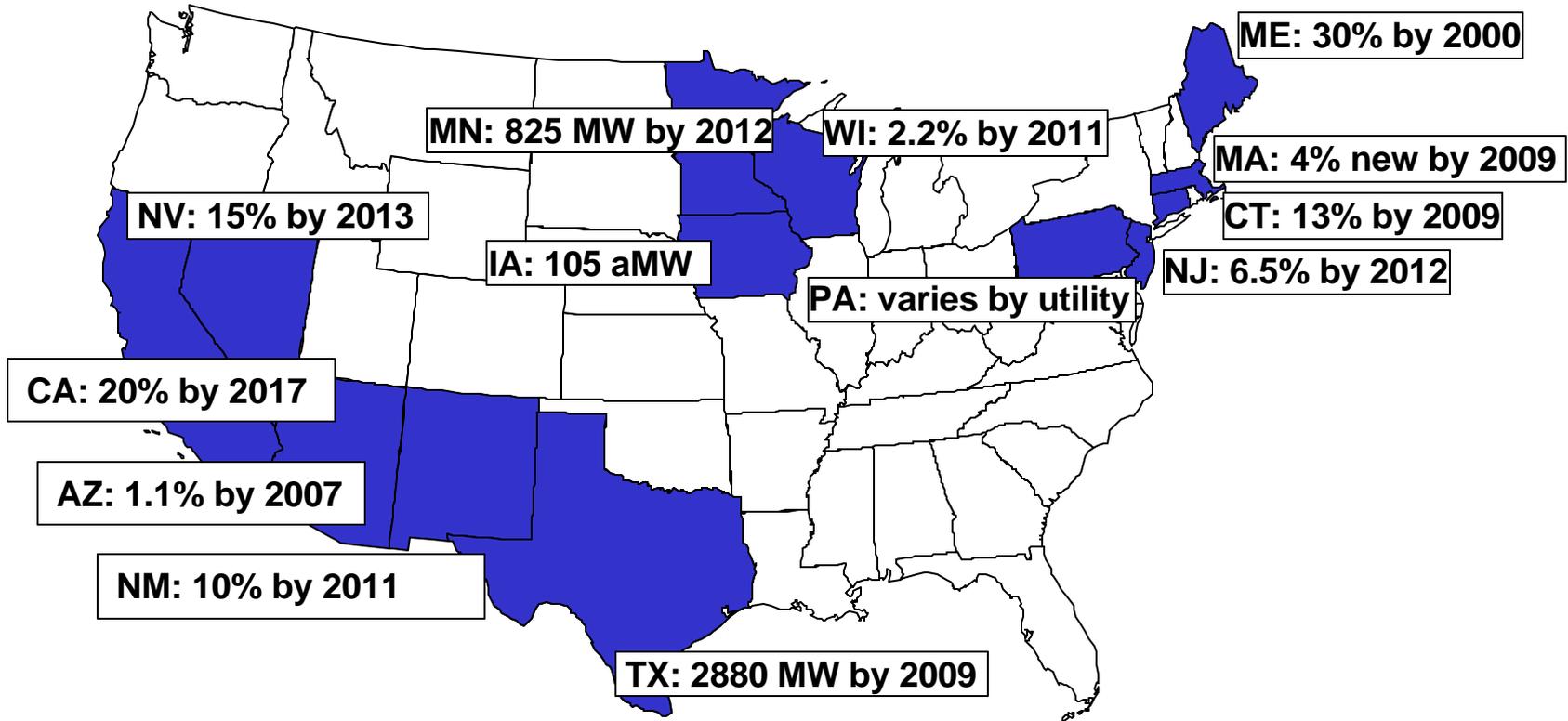
## WHAT IS IT???

- Requirement on retail electric suppliers...
- to supply a minimum percentage or amount of their retail load...
- with eligible sources of renewable energy.

***Sometimes*** accompanied with a tradable renewable energy credit (REC) program to ease compliance

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# State Renewables Portfolio Standards and Purchase Mandates – 13 States



- Renewable energy “goals” established in Illinois, Minnesota, and Hawaii
  - RPS being considered in many other states, and national RPS has been discussed
  - RPS is applied in several other countries (Australia, UK, Belgium, Italy, etc.)
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# State RPS Program Context

- ❑ **Operating Experience:** experience with policy remains somewhat limited, and few states have >3 years experience
  - ❑ **Legislation vs. Regulation:** most RPS mandates established via legislation, with exceptions being AZ, NM, PA
  - ❑ **Regulated vs. Restructured:** more than half in restructured markets, but increasingly in monopoly markets as well
  - ❑ **RPS Application:** RPS typically applies to regulated IOUs and competitive ESPs; publicly-owned utilities often exempt
  - ❑ **Load Covered:** ~30% of U.S. load covered by a state RPS or RE purchase obligation
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# Why Has the RPS Become Popular?

- ❑ Move towards electricity restructuring
  - ❑ Efficient means of meeting RE targets
  - ❑ Incentives for cost minimization
  - ❑ Integrates RE into electricity supply decisions
  - ❑ Minimizes ongoing government intervention
  - ❑ Spreads costs evenly over targeted area
  - ❑ Can be used in regulated *and* restructured markets
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# State RPS Policies Are Driving New Renewable Energy Development

**2001 Wind Project Installation = 1,696 MW**

**In 2001**

1,136 MW of wind brought on line in a state with an RPS or at least in part due to an RPS in a nearby state

**TX RPS - 912 MW**

**MN Mandate - 54 MW**

**WI RPS - 30 MW (WI), 82 MW (IA)**

**NJ RPS - 24 MW (PA), 30 MW (NY)**

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# State RPS Policies Are Driving New Renewable Energy Development

- ❑ Arizona and Nevada RPS policies helping drive solar energy development (3 MW of solar in AZ, 50 MW solar-thermal electric in NV)
  - ❑ Geothermal development to meet the Nevada and California standards (97 MW in NV; CA still unclear)
  - ❑ Landfill gas and biomass also seeing some increased production based on RPS, especially in the Northeast
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# State RPS Policies Differ: There is No Single Way to Design an RPS!

- ❑ Structure of RPS
  - ❑ Standard levels
  - ❑ Resource eligibility
  - ❑ Treatment of existing plants
  - ❑ Tiers and bands
  - ❑ Start and end dates
  - ❑ Application of standards
  - ❑ Enforcement/penalties
  - ❑ Flexibility mechanisms
  - ❑ Renewable energy credit (REC) trading
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# State RPS Standards – Where Does NY Fit In?

- ❑ AZ: 1.1% in 2007, 60% solar (solar portion must be new)
  - ❑ CA: at least 1%/yr new, to 20% by 2017 (total 10% new)
  - ❑ CT: 13% by 2009 (5% Class I)
  - ❑ ME: 30% (all existing)
  - ❑ MA: 4% new in 2009, 1%/yr thereafter
  - ❑ NV: 15% by 2013 (10% new)
  - ❑ NJ: 6.5% by 2012 (4% Class I)
  - ❑ NM: 10% by 2011
  - ❑ PA: variable but low standards
  - ❑ TX: 2000 MW new by 2009 (~2.5% new)
  - ❑ WI: 2.2% by 2011 (1.4% new)
  - ❑ **NY: 25% by 2012 (8% new in 9 years) – among the most aggressive requirements, consistent with CA and NV**
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# The Most Important Lesson Learned to Date

An RPS Can Be A...

**Elegant, cost effective,  
flexible policy to meet  
RE targets**

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**Poorly designed,  
ineffective, or costly way  
to meet RE targets**

**The legislative and regulatory  
design details matter!!!**

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# The Impacts of State RPS Policies: The Good, the Bad, and the Ugly

<b>Successful Outcomes</b>	<b>Mixed or Unclear Success</b>	<b>Unsuccessful Outcomes</b>
<input type="checkbox"/> Texas	<input type="checkbox"/> Arizona	<input type="checkbox"/> Connecticut
<input type="checkbox"/> Iowa	<input type="checkbox"/> California	<input type="checkbox"/> Maine
<input type="checkbox"/> Minnesota	<input type="checkbox"/> Massachusetts	<input type="checkbox"/> Pennsylvania
	<input type="checkbox"/> Nevada	
	<input type="checkbox"/> New Jersey	
	<input type="checkbox"/> New Mexico	
	<input type="checkbox"/> Wisconsin	

State RPS policies rated based on amount of new renewable energy development, full compliance with RPS, reasonable and stable costs, and recovery of prudently incurred compliance costs

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# Texas Was the First U.S. State to Get the Details Right

## **Specify the Mandate**

*(400 MW by 2003, 850 MW by 2005, 1400 MW by 2007, 2,000 MW by 2009; translated into energy-based targets starting in 2002 that increase to ~2.5% by 2009 and remain constant until 2019)*

## **Assign Responsibility**

*(electric retailers serving competitive markets)*

## **Enforce Performance**

*(large automatic penalties – 2x REC price or 5 cents/kWh)*

## **Track Compliance**

*(first state to use tradable RECs with flexibility in compliance)*

## **Manage the Details**

*(renewable resource eligibility, compliance flexibility, etc.)*

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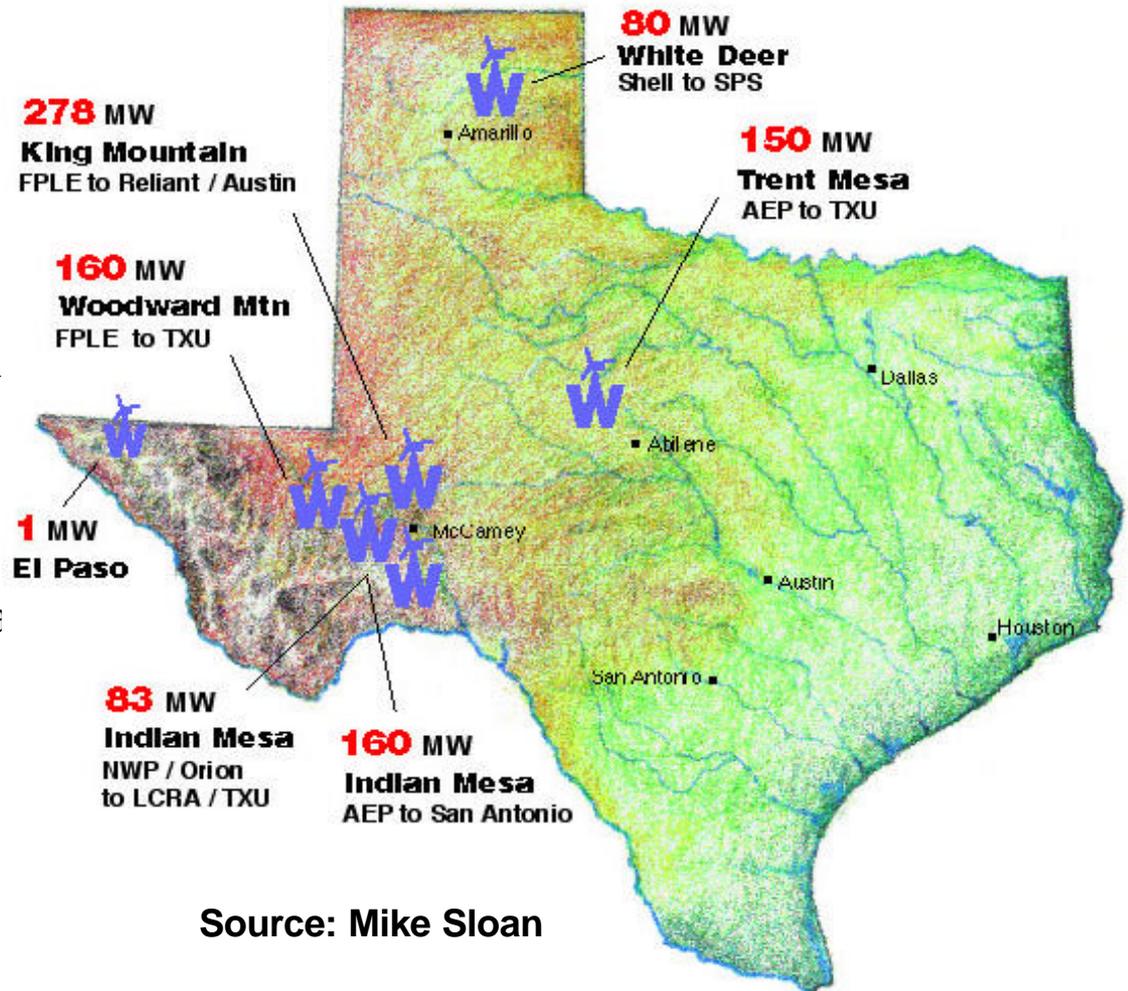
# Texas Completed its RPS Design Quickly, Leaving Time for Project Development in Advance of the First Obligation Date

<input type="checkbox"/> <b>RPS Legislation</b>	<b>May 1999</b>
<input type="checkbox"/> <b>RPS Rulemaking Begins</b>	<b>June 1999</b>
<input type="checkbox"/> <b>RPS Rulemaking Ends</b>	<b>December 1999</b>
<input type="checkbox"/> <b>REC System Established</b>	<b>July 2001</b>
<input type="checkbox"/> <b>RPS Begins</b>	<b>January 2002</b>
<input type="checkbox"/> <b>RPS Ends</b>	<b>January 2020</b>

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# The Texas RPS: A Success Story

- Propelled state to largest market for wind in US
- 912 MW of wind installed in 2001, easily exceeding 400 MW target in 2002
- 2660 MW of additional wind has applied for grid expansion
- Hundreds of MW planned in 2003



# Texas Installed More Wind in 2001 Than the Entire U.S. Had Installed in Any Previous Year

## New Wind Power Installed in 2001

	Nation	New MW	Policy
#1	Germany	2640 MW	Feed-in tariff
#2	Spain	933 MW	Feed-in tariff
<b>#3</b>	<b>Texas</b>	<b>912 MW</b>	<b>RPS w/ REC's</b>
#4	Rest of U.S.	775 MW	mixed
#5	Italy	308 MW	Feed-in tariff

Source: Mike Sloan

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# An RPS Can Create Long-Term, Bankable Contracts for RE Generators

**An RPS Based Only on the Concept of a Spot-Market for RECs is Ludicrous... Renewable Generators and Financiers Need Stable Revenue Flows!!!**

- ❑ Nearly all wind development in Texas has been solicited by the large, credit-worthy retail suppliers and has been purchased under long-term (>10 year) contracts that bundle electricity and RECs
  - ❑ These large retail suppliers sell excess RECs to smaller, less credit-worthy suppliers that are less able to predict their requirements
  - ❑ Result: (1) long-term contracts – 10-25 year; (2) low cost – 3 cents/kWh; (3) incentives and penalties to ensure project performance
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# Other States Are Also Employing an RPS to Good Effect for Wind, LFG, Geothermal, and other Low-Cost RE Techs

<b>Nevada</b>	<b>Standard:</b> one of nation's most aggressive RPS, 5% in 2003 to 15% in 2013; 5% must be met with solar power <b>Results:</b> 277 MW of wind, geothermal, and solar contracts
<b>New Jersey</b>	<b>Standard:</b> 2-tier RPS; tier 1 starts in 2001 at 0.5%, grows to 4% <b>Results:</b> LFG and wind power developed <i>in part</i> to meet RPS
<b>Wisconsin</b>	<b>Standard:</b> RPS begins at 0.5% in 2001, rising to 2.2% by 2011 <b>Results:</b> ~100 MW of RE (wind and bio) on line

***Minnesota and Iowa purchase mandates in monopoly markets have also both led to wind development***

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# California's RPS/SBC Combination Could Deliver One of the Most Attractive RE Markets in Upcoming Years

- ❑ New law requires the IOUs and competitive suppliers to increase RE purchases at least 1%/year until they reach 20%
  - ❑ Equates to ~2900 aMW of renewables (or 8000 MW of wind)
  - ❑ Utilities must only procure RE to the extent that sufficient SBC funds are available to cover the **above-market** costs, and to the extent that the utilities are creditworthy
  - ❑ Key issue is determination of “baseline” price that utilities will pay: stay tuned for CPUC decision
  - ❑ Utilities contracting for RE – wind, biomass, biogas, geothermal
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# RPS Policies Can Be Designed to Encourage RE Diversity

- ❑ **AZ:** 60% of RPS must be met with solar: has resulted in vibrant market for utility-scale solar, ~3 MW so far
  - ❑ **NV:** 5% of RPS must be met with solar (50 MW solar-thermal electric contract approved)
  - ❑ **NM:** Extra-credit multipliers for solar (3) and geothermal (2) relative to wind and hydro (1)
  - ❑ **MN:** Purchase requirement on Xcel required wind and biomass installation
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# RPS Design Requirements

- ❑ Strong political support and regulatory commitment that is expected to continue into the future
  - ❑ Clear and well-thought-out RE eligibility rules
  - ❑ Predictable long-term targets that ensure new RE supply
  - ❑ Standards that are achievable given siting challenges and other practical constraints
  - ❑ Credible and automatic enforcement – penalties must exceed cost of compliance
  - ❑ Applied to electricity suppliers that are credit-worthy and are in a position to enter into long-term contracts
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# Major Design Pitfalls: Lessons Learned

## ❑ **Design Complexity**

- ❑ RPS policies should be as simple as possible, and minimize unnecessary regulatory burdens
- ❑ *Example:* California's RPS gives substantial ongoing responsibilities to CPUC, increasing complexity

## ❑ **Narrow Applicability**

- ❑ An RPS that is applied un-equally to suppliers will limit the impact of the RPS, create competitive supplier entry barriers, and create political vulnerability
  - ❑ *Example:* CT exempts POLR service (>90% of load); PA applies only to certain competitive POLR suppliers
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# Major Design Pitfalls: Lessons Learned

## ❑ **Poorly Balanced Supply-Demand Condition**

- ❑ RPS will not protect or increase RE supply if supply-demand balance is not carefully managed; at the same time, an RPS that is too aggressive may result in supply constraints and high costs
- ❑ *Example:* ME RPS ineffective due to considerable oversupply of eligible resources (CT, NJ, PA have similar though less severe problems); MA and NV arguably gave too little time to develop new resources, while some states may have overly aggressive targets

## ❑ **Insufficient Duration and Stability of Targets**

- ❑ Standards must be durable and stable, or else makes financing difficult, raises costs, creates paralysis
  - ❑ *Example:* AZ and ME standards unclear after 2003 and 2005, respectively; in other cases, fate of RPS after a certain date is unspecified (e.g., PA)
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# Major Design Pitfalls: Lessons Learned

## ❑ **Insufficient Enforcement**

- ❑ May result in non-compliance, investment risk increases
- ❑ *Example:* AZ RPS has no penalties; in other cases enforcement is vague: CT, ME, MN, NV, NJ, NM, PA

## ❑ **Lack of Contracting Standards and Cost Recovery Mechanisms for Utilities and POLR**

- ❑ Contracting standards and cost recovery mechanisms are often required for utilities and regulated POLRs to ensure that long-term contracts are made available to RE projects and to minimize risk
  - ❑ *Example:* In MA, few suppliers are making long-term commitments; same thing may occur in NJ and other states
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# The Bottom Line

- ❑ RPS policies are a principal form of support for large-scale RE, and additional states are considering RPS policies
- ❑ Experience can be very positive if policy is designed well and if state context is supportive
- ❑ A basic RPS will not meet all of the needs of the renewable energy industry
- ❑ Design is challenging, and must be done with great care... one significant mistake can doom the policy
- ❑ Experience in other states can help point the way for a well-designed RPS in NY

