

RPS and Other Outstanding Draft Seventh Plan Issues

GRAC Webinar
2/26/15

Agenda

- Regional Portfolio Standard Analysis for the Draft Seventh Plan
 - Approach
 - Feedback on specific assumptions
 - Creating a narrative around the analysis
- Levelized Costs for new MT wind and ID solar cases
- RPM modeling input structure for generating resources

Draft Seventh Plan

RENEWABLE PORTFOLIO STANDARD ANALYSIS

Purpose/Objective of Council Analysis

Provide a high level analysis of state RPS standards, progress to-date, and remaining future procurement

- Regional Portfolio Model (RPM)
- AURORA – WECC-wide
- Individual state analysis

Purpose of Today's GRAC Discussion

- High level overview of Council's analysis
- Get feedback from the GRAC on:
 - Current status of RPS in each state – achievements to-date, plans for future compliance, potential legislation
 - Specific assumptions in analysis

Council RPS Analysis

Retail Electric Sales Forecast
(Obligated Utilities)

Summary of State Renewable Portfolio Standards

Inventory of Potentially Eligible Resources

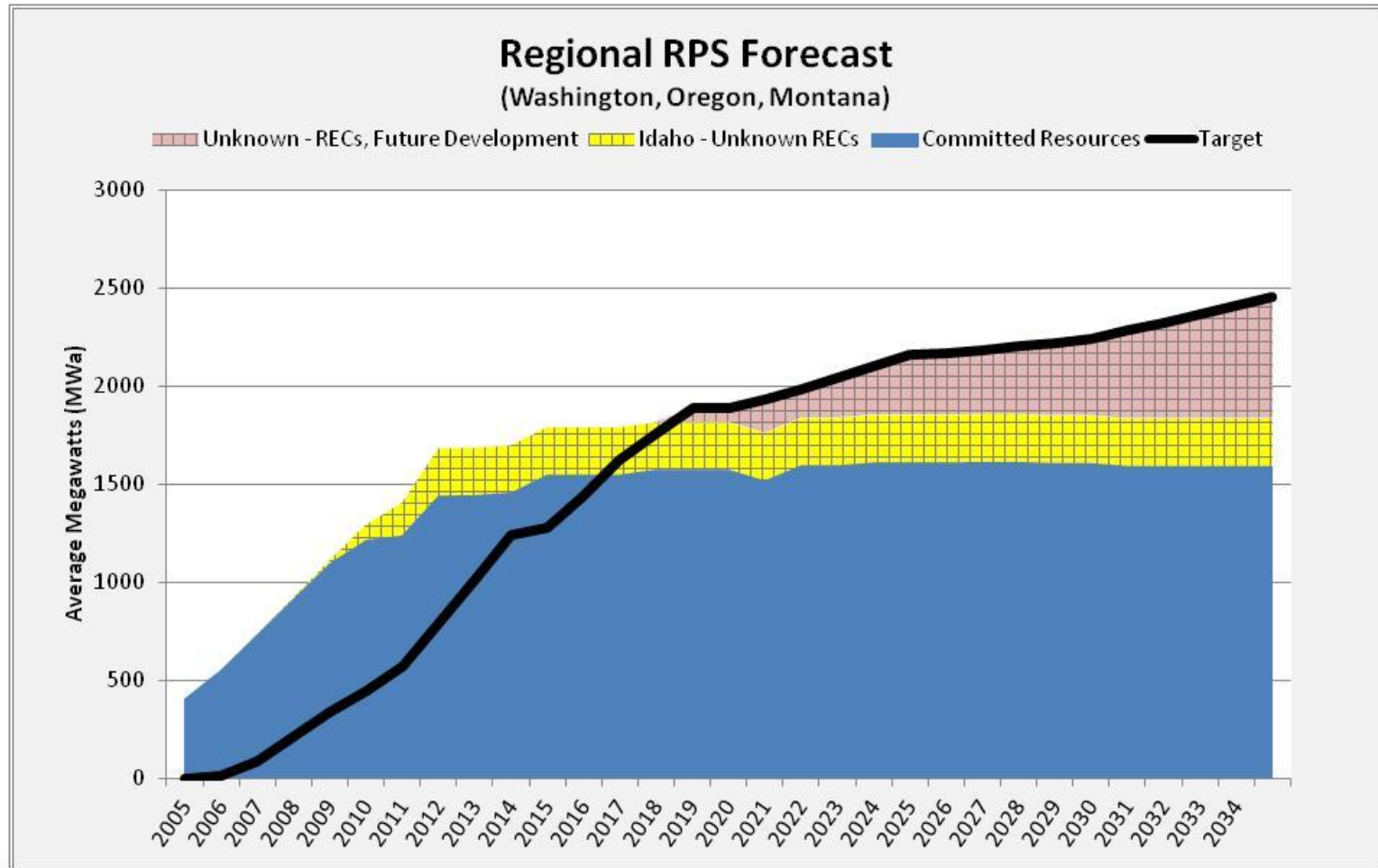
Estimate of Eligible Resources by State

Credit States w/ Surplus Resources for Banking

Requirements – **Procurements** = Future Generation (or RECs)
Needed to Meet RPS

How Is The Region Doing?

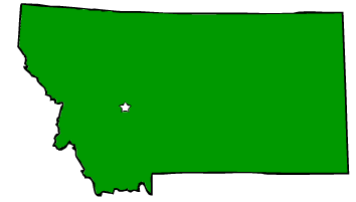
Current and Forecast RPS Needs



* This chart does not take into account the various banking provisions allowed by each state. This chart is from 2013 and will need to be updated for draft Seventh Plan

5% in 2008
10% in 2010
15% in 2015

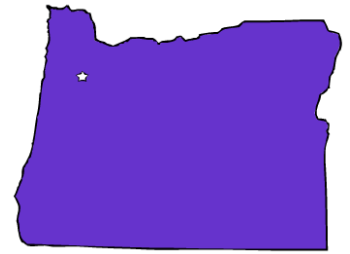
Montana



- Potential Legislation:
 - SB 114 – amend definition of eligible qualifying resources to include existing hydropower built prior to 2005
Outlook: Still alive; possible
 - HB 230 – repeal the CREP requirement
Outlook: Probably dead
- In 2013, utilities serving <50 customers were granted exemption from RPS compliance

5% in 2011
15% in 2015
20% in 2020
25% in 2025

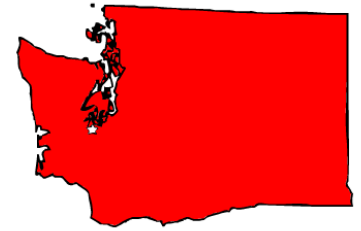
Oregon



- Potential Legislation: No significant RPS-related bills under consideration at this time

3% in 2012
9% in 2016
15% in 2020

Washington



- **Potential Legislation: Many RPS-related bills under consideration**
 - Providing incentives for carbon reduction investments (CRI) – e.g. certain EE measures, installation of PHEV chargers, energy storage
 - Addition of Federal incremental hydropower as an eligible renewable resource
 - Addition of small modular reactors (SMR) as an eligible renewable resource
 - Addition of EE above cost-effective threshold under Council’s methodologies as an eligible renewable resource

What about Idaho?



- While Idaho does not have an RPS, its Idaho Energy Plan encourages the development of cost-effective local renewable resources
- Significant renewable development in Idaho in recent years
 - ~ 950 MW wind installed in last 8 years
 - ~ 460 MW solar PV under ESA and scheduled to be built by end of 2016
- Where are the RECs going?
 - For PURPA qualifying facilities, REC ownership tends to be 50/50 split developer and utility

“ What Are Utilities Saying? ”

- Utility A: Philosophy is to aim for physical compliance but use RECs when needed to make up any shortfall
- Utility B: Short on physical compliance in near term, but long on overall energy → RECs seem to make the most sense for compliance
- Utility C: Long on RECs; banking and selling leftover RECs to California and others
- Utility D: Relying primarily on wind for physical compliance is a bit “daunting” and poses a potential problem for system reliability
 - Solar has similar challenges as a variable resource, but looking at it as an opportunity



Other Narratives?

- Keep utility anonymous, but really appreciate helping to fill out the analysis with real-world context
- Additional feedback on
 - Approach to RPS compliance
 - Compliance through 20xx?
 - Future plans to build new resources
 - Wind, solar, ??

Regional Portfolio Standards

ANALYTICAL ASSUMPTIONS

Banking Provisions

- Assume utilities will use banked RECs first, then RECs from current year's generation
 - Rather than current year's generation first, than banked RECs to make up shortfall

Idaho RECs

- How to allocate Idaho RECs (that are not specifically under PPAs w/ utilities obligated by RPS)?
 - ~950 MW wind capacity installed in Idaho
 - Future solar PV development - ~ 460 MW under ESA w/ IPC and scheduled to be built by end of 2016
- Assume % goes to PNW, WECC, ?
 - 50% to PNW?

Idaho Solar PV Development

- Of the ~460 MW under ESA with IPC, how much can we realistically expect will be built and installed by end of 2016?
 - 100%? 50%? 75%?

Future Achievement

- Sixth Power Plan assumed 95% achievement towards RPS targets
 - RPS was relatively new and compliance years were just starting
 - Uncertainty over cost cap provisions
- Recommendation for draft Seventh Plan is to assume 100% achievement

What is the current value of a REC?

- While not explicitly used in analysis, helpful information to have in the narrative
 - Regional vs. national? Location-specific?
 - \$1/MWh? \$10/MWh? Higher? Range?

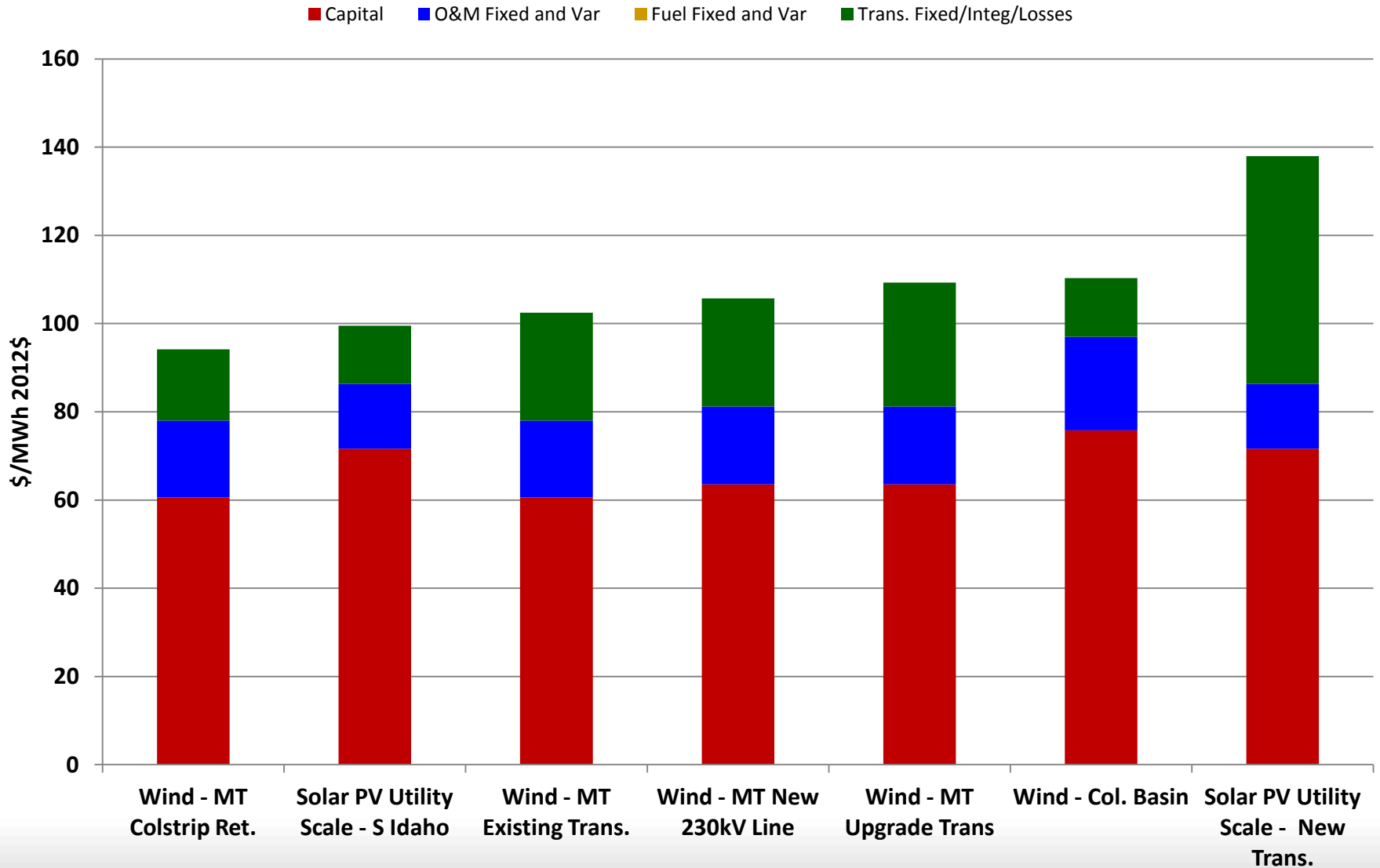
Definitions & LCOE

WIND AND SOLAR GENERATION

Wind and Solar Generation

| Name | Description | Block MW | First Available |
|-----------------------------------|---|----------|-----------------|
| Wind - MT Colstrip Ret. | Wind in MT to NW via Colstrip Retire | 700 | NA |
| Solar PV Utility Scale - S Idaho | Solar PV in S ID, serving ID load | 700 | 2016 |
| Wind - MT Existing Trans. | Wind in MT serving NW Load via NWES, BPA | 130 | 2015 |
| Wind - MT New 230kV Line | Wind in MT serving NW Load via NWES with new line and BPA | 200 | 2016 |
| Wind - MT Upgrade Trans | Wind in MT serving NW Load via upgrade to Path8/CTS | 900 | 2018 |
| Wind - Col. Basin | Wind in Columbia Basin | ~ 6500 | 2015 |
| Solar PV Utility Scale New Trans. | Solar PV in S ID serving load in NW via B2H | 850 | 2020 |

Levelized Cost of Energy - Wind & Solar Generating Resources In Service 2020



inputs

RPM MODELING

RPM Input Sample

| Name | Units | Data |
|---------------------------|---------------------|---------------------|
| Resource | Name | CCCT Adv 2 Dry Cool |
| Resource Size | MW | 425 |
| Planning Costs Level. | \$/kW-year (2012\$) | 5.98 |
| Construction Costs Level. | \$/kW-year (2012\$) | 125.61 |
| Fixed O&M Level. * | \$/kW-year (2012\$) | 52.65 |
| Variable O&M Level. | \$/MWh (2012\$) | 3.23 |
| Heat Rate | mmbtu/MWh | 6.704 |
| Fuel Type | Name | NatGasEast |
| Sub Region | Name | East |
| Available Year | Year | 2020 |

* Includes Plant O&M, Fixed Fuel Cost, Transm. Cost

Next Steps

- Staff currently working on generating resource inputs to RPM
- Will potentially have a GRAC meeting in April to discuss biomass, conventional geothermal, and draft Action Plan items

Background

What Are Renewable Portfolio Standards?

- Renewable portfolio standards (RPS) are regulatory mandates enacted by individual states to increase the development and generation of *eligible* renewable resources
 - RPS requires a certain percentage of electricity sales be met with renewable energy resources
- No Federal RPS in place

The Standards: Overview*

| | Montana | Oregon | Washington |
|----------------------------|--|--|---|
| Standard | 5% in 2008 10% in 2010 15% in 2015 | 5% in 2011 15% in 2015 20% in 2020 25% in 2025 | 3% in 2012 9% in 2016 15% in 2020 |
| Date of Adoption | 2005 Montana Renewable Power Production and Rural Economic Act | 2007 Oregon Renewable Energy Act | 2006 Ballot Initiative-937 |
| Sourcing Limits | Located in MT; or deliverable to MT | Located in WECC | Located in PNW; or delivering electricity into WA |
| Technology Minimums | -- | 20 MW-AC Solar PV by 2020 | -- |
| Banking | 2 years | Unlimited | 1 year |
| Credit Trading | Allowed | Allowed | Allowed |
| Multipliers | -- | Solar PV x 2 (if developed by 2016) | DG x 2; Union apprenticed labor x 1.2 |

* This table consolidates and simplifies at a high level many of the details, nuances, and unique qualities that make up each state's RPS

Eligible Resources*

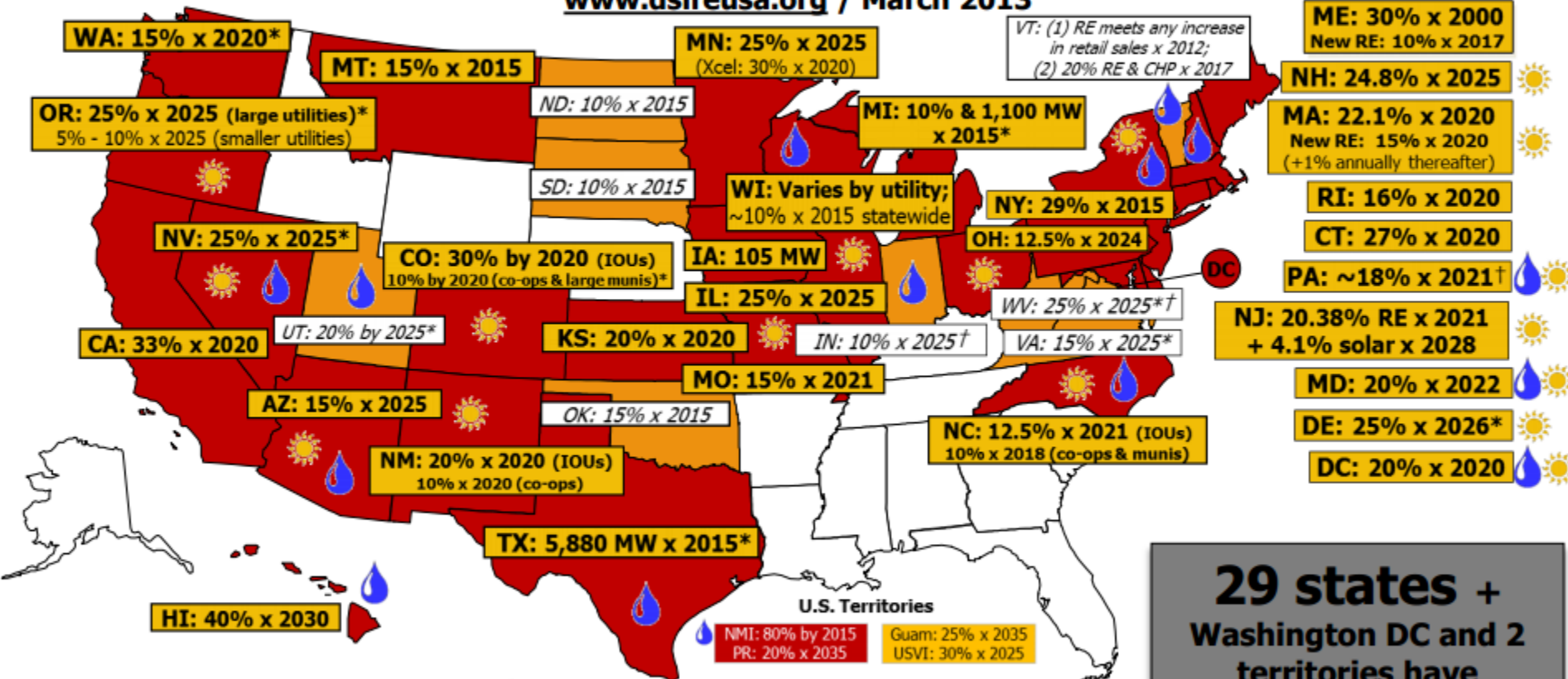
| | Montana | Oregon | Washington |
|-------------------------------|---------|--------|------------|
| Anaerobic Digestion | X | X | X |
| Biodiesel | | | X |
| Biomass | X | X | X |
| Compressed Air Energy Storage | X | | |
| Fuel Cells | X | | |
| Geothermal | X | X | X |
| Hydroelectric | X | X | X |
| Hydrogen | | X | |
| Landfill Gas | X | X | X |
| Municipal Solid Waste | | X | |
| Ocean Thermal | | X | X |
| Solar Photovoltaics | X | X | X |
| Solar Thermal | X | X | X |
| Tidal Energy | | X | X |
| Wave Energy | | X | X |
| Wind | X | X | X |

* This table consolidates and simplifies at a high level many of the resource requirements for eligibility. E.g. vintage requirements and energy limits.



Renewable Portfolio Standard Policies

www.dsireusa.org / March 2013



- Renewable portfolio standard
- Renewable portfolio goal
- Solar water heating eligible
- Minimum solar or customer-sited requirement
- Extra credit for solar or customer-sited renewables
- Includes non-renewable alternative resources

29 states + Washington DC and 2 territories have Renewable Portfolio Standards
(8 states and 2 territories have renewable portfolio goals)