



# Market Obstacles – RECs in the West

Issues and Obstacles Surrounding the  
Voluntary and Compliance REC Markets

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## Issues and Obstacles

- Demand Issues
- Supply Issues
- Convergence of the Markets
- Washington, Oregon and the WECC



## Demand Issues

- Compliance Market Demand
  - Example: New Jersey RPS
- Voluntary Market Demand
  - Why so difficult to assess?
- What conclusions can we develop from this?



# Example: New Jersey

Historical Retail Electricity Data used for 1990 through 2005

[http://www.eia.doe.gov/cneaf/electricity/epa/epa\\_sprdshts.html](http://www.eia.doe.gov/cneaf/electricity/epa/epa_sprdshts.html)

## PJM Load Growth Forecast

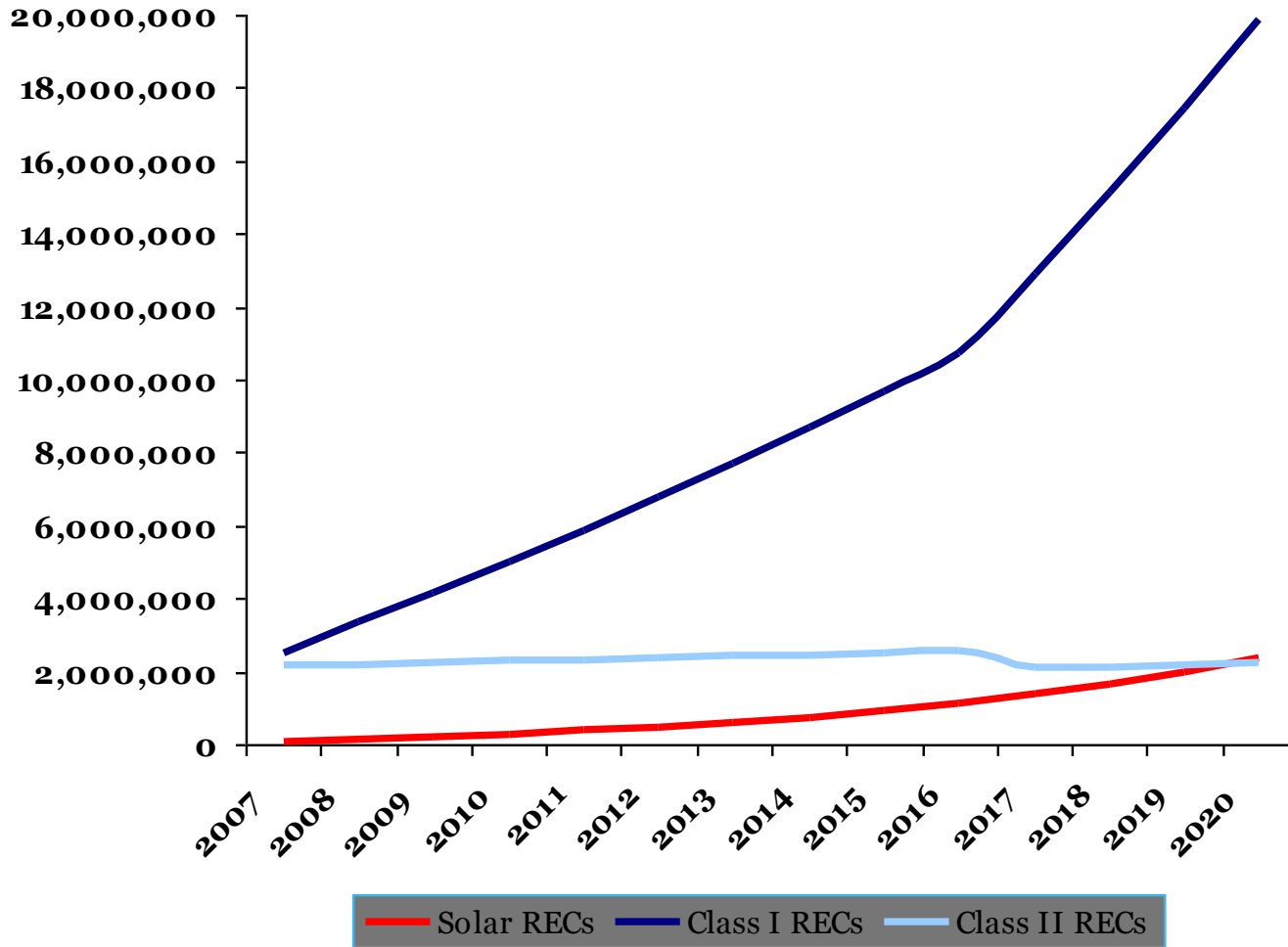
[www.pjm.com/contributions/news-releases/2007/20070116-2007-load-forecast-report.pdf](http://www.pjm.com/contributions/news-releases/2007/20070116-2007-load-forecast-report.pdf)

| Year | Total Retail Sales MWh NJ | % Growth |
|------|---------------------------|----------|
| 1990 | 62,856,687                |          |
| 1991 | 64,682,551                | 2.90%    |
| 1992 | 63,122,357                | -2.41%   |
| 1993 | 65,620,646                | 3.96%    |
| 1994 | 66,257,593                | 0.97%    |
| 1995 | 66,753,785                | 0.75%    |
| 1996 | 66,889,430                | 0.20%    |
| 1997 | 65,915,034                | -1.46%   |
| 1998 | 68,161,512                | 3.41%    |
| 1999 | 70,703,153                | 3.73%    |
| 2000 | 69,977,129                | -1.03%   |
| 2001 | 73,177,390                | 4.57%    |
| 2002 | 74,602,620                | 1.95%    |
| 2003 | 76,382,512                | 2.39%    |
| 2004 | 77,593,167                | 1.58%    |
| 2005 | 81,896,813                | 5.55%    |
| 2006 | 82,033,580                | 0.17%    |

| Year | Est. MWh*   | Avg%  |
|------|-------------|-------|
| 2007 | 85,682,445  | 2.01% |
| 2008 | 87,404,662  | 2.01% |
| 2009 | 89,161,496  | 2.01% |
| 2010 | 90,953,642  | 2.01% |
| 2011 | 92,781,810  | 2.01% |
| 2012 | 94,646,725  | 2.01% |
| 2013 | 96,549,124  | 2.01% |
| 2014 | 98,489,761  | 2.01% |
| 2015 | 100,469,405 | 2.01% |
| 2016 | 102,488,840 | 2.01% |
| 2017 | 104,548,866 | 2.01% |
| 2018 | 106,650,298 | 2.01% |
| 2019 | 108,793,969 | 2.01% |
| 2020 | 110,980,728 | 2.01% |

| Solar RECs |             | Class I RECs |                | Class II RECs |                 |
|------------|-------------|--------------|----------------|---------------|-----------------|
| RPS % Req  | SREC Demand | RPS % Req    | Class I Demand | RPS % Req     | Class II Demand |
| 0.0817%    | 70,003      | 2.924%       | 2,505,355      | 2.5%          | 2,142,061       |
| 0.160%     | 139,847     | 3.840%       | 3,356,339      | 2.5%          | 2,185,117       |
| 0.221%     | 197,047     | 4.685%       | 4,177,216      | 2.5%          | 2,229,037       |
| 0.305%     | 277,409     | 5.492%       | 4,995,174      | 2.5%          | 2,273,841       |
| 0.394%     | 365,560     | 6.320%       | 5,863,810      | 2.5%          | 2,319,545       |
| 0.497%     | 470,394     | 7.143%       | 6,760,616      | 2.5%          | 2,366,168       |
| 0.621%     | 599,570     | 7.977%       | 7,701,724      | 2.5%          | 2,413,728       |
| 0.765%     | 753,447     | 8.807%       | 8,673,993      | 2.5%          | 2,462,244       |
| 0.928%     | 932,356     | 9.649%       | 9,694,293      | 2.5%          | 2,511,735       |
| 1.118%     | 1,145,825   | 10.480%      | 10,740,830     | 2.5%          | 2,562,221       |
| 1.333%     | 1,393,636   | 12.320%      | 12,880,420     | 2.0%          | 2,090,977       |
| 1.572%     | 1,676,543   | 14.170%      | 15,112,347     | 2.0%          | 2,133,006       |
| 1.836%     | 1,997,457   | 16.020%      | 17,428,794     | 2.0%          | 2,175,879       |
| 2.120%     | 2,352,791   | 17.880%      | 19,843,354     | 2.0%          | 2,219,615       |

# Compliance Market Demand New Jersey RPS



# Voluntary Market Demand

| Known Demands                 |           |
|-------------------------------|-----------|
|                               | MWh/year  |
| Intel                         | 1,302,040 |
| PepsiCo                       | 1,144,773 |
| US Airforce                   | 899,143   |
| Wells Fargo                   | 550,000   |
| Whole Foods                   | 509,104   |
| Johnson & Johnson             | 470,216   |
| Cisco                         | 378,000   |
| Unknown Demands               |           |
| Utility Green Power Programs  | ???       |
| New Companies                 | ???       |
| Change of Current Commitments | ???       |

# What conclusions can we draw from demand?

- Compliance Markets

- Demand based on load projections
- Very easy to predict

- Voluntary Markets

- Demand based on RFP's
- Can be sporadic and hard to predict going forward





## Supply Issues

- Voluntary Markets vs. Compliance Markets
  - Where to sell?
- Uncertainties affecting new development
- What conclusions can we develop from this?



## Compliance vs. Voluntary

- Where to sell?
  - Short answer – Higher priced market gets the REC
  - Example: Texas compliance vs. Voluntary
  - Example 2: Massachusetts compliance vs. Voluntary



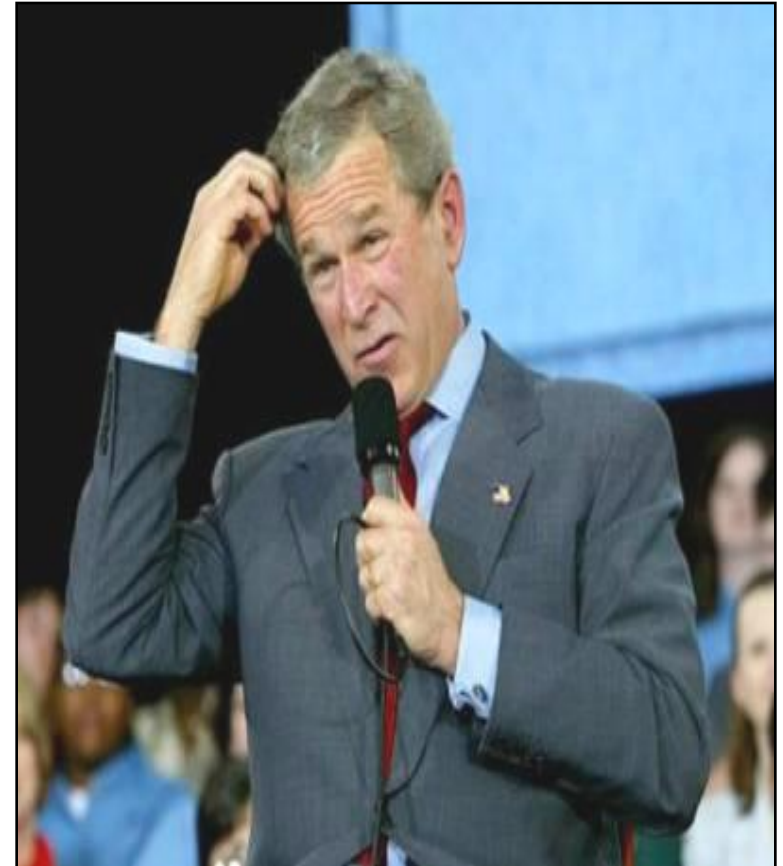
## Uncertainties of New Development

- **Legislative/Market Rules**
  - Very difficult to forecast or gauge
  - May change year to year
- **Tax/Government Subsidies**
  - Production Tax Credit (PTC)
  - State-specific Tax/Subsidy Programs
- **Transmission Constraints**
  - Location of resources can sometimes be inconvenient
  - Cost/Time/Approval of new transmission
- **Technology Constraints**
  - Renewable resources don't always fit load needs



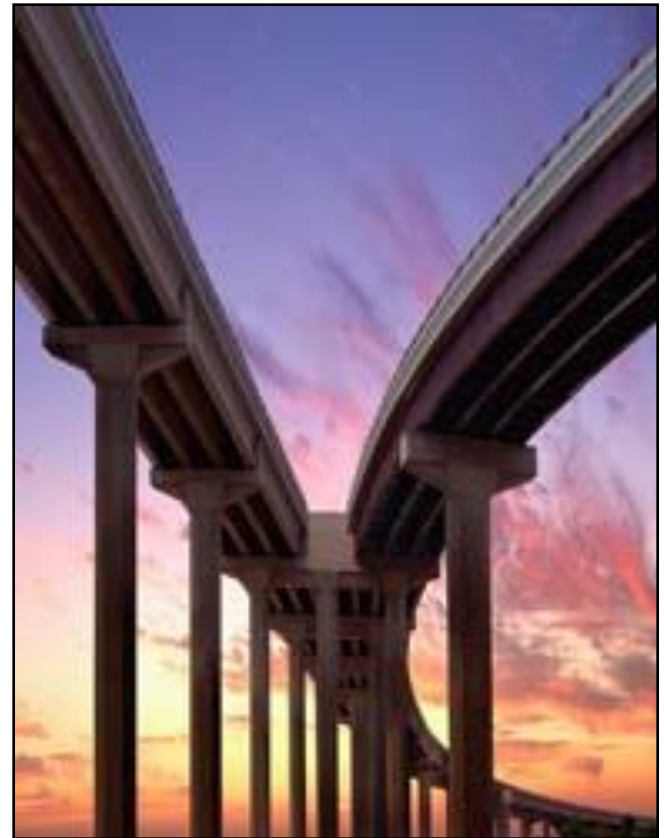
## What conclusions can we draw from supply?

- Where to sell between compliance and voluntary?
  - Higher market always gets the REC!
- Uncertainties of New Development
  - Tax certainty is key



## Convergence of Markets

- Supply and Demand still rule the market
  - A change in one will affect the other
- Example 1: PJM Voluntary Wind and NJ Class 1's
- Example 2: Dual-qualified REC's (compliance and voluntary)



# Pacific Northwest RPS Programs

- Where are we?
  - Oregon RPS and Washington RPS
- How will this affect the western markets?
  - Voluntary
  - Compliance



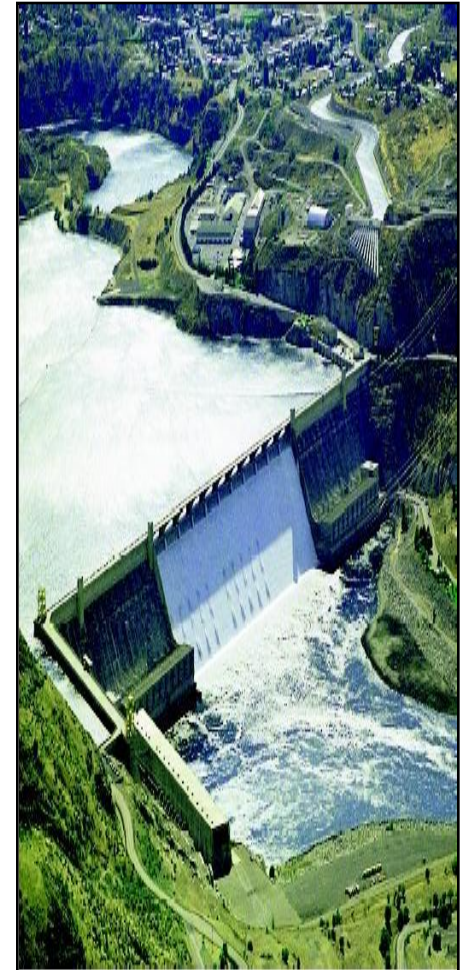
## Oregon RPS Summary

- RPS Mandate
  - Large utilities: 25% by 2025
  - Small utilities: 10% by 2025
  - Smallest utilities: 5% by 2025
- Eligible Resources
  - Solar Thermal Electric, Photovoltaics, Landfill Gas, Wind, Biomass, Hydroelectric, Geothermal Electric, Hydrogen, Anaerobic Digestion, Tidal Energy, Wave Energy, Ocean Thermal
- Commercial Online Date – January 1<sup>st</sup>, 1995
- Location – Resources located in WECC (Bundled within the U.S.)
- Banking - Unlimited
- Alternative Compliance Payment – \$50.00/MWh



## Washington RPS Summary

- RPS Mandate
  - 3% percent of its load by 1/1/2012
  - 9% of its load by 1/1/2016
  - 15% of its load by 1/1/2020
- Eligible Resources
  - Water, wind, solar energy, geothermal energy, landfill gas, wave, ocean, or tidal power, gas from sewage treatment facilities, biodiesel fuel (must meet specified standards), and biomass energy based on animal waste or solid organic fuels from wood, forest, or field residues, or dedicated energy crops.
- Commercial Online Date – April 1<sup>st</sup>, 1999
- Location – Resources located in Pacific Northwest (WA, OR, ID)
- Alternative Compliance Payment - \$50.00/MWh (adjusted annually for inflation)



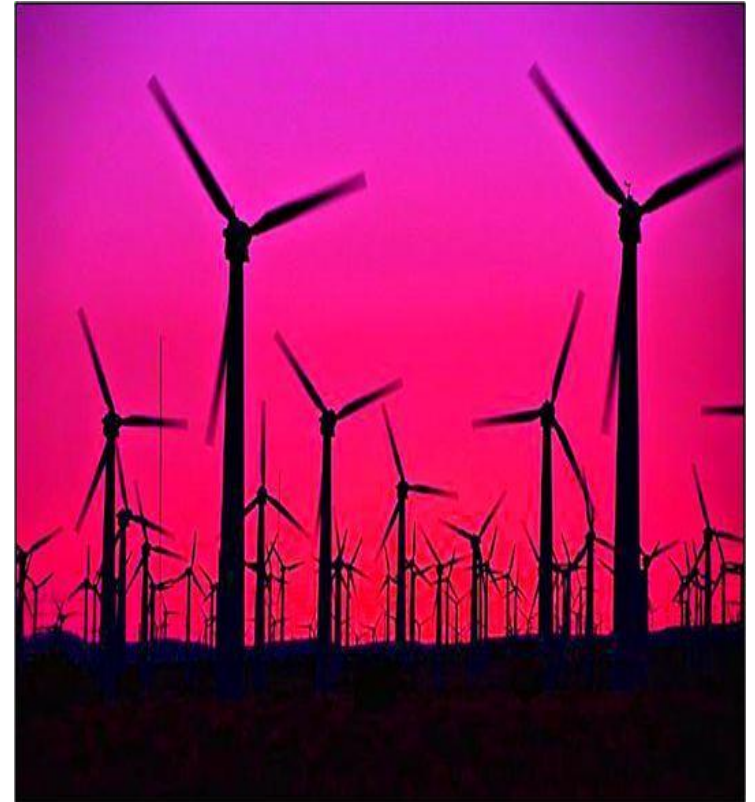


## Washington and Oregon RPS effects

- What effect will there be on existing markets?
  - Voluntary - Little effect will be felt – WECC and Pacific Northwest REC prices generally higher than average market
  - Compliance - Washington and Oregon will have to compete with California for resources when their RPS programs start up

## California RPS

- RPS Mandate – 20% by the end of 2010
  - Goal of 33% by end of 2020
- Eligible Resources
  - Solar Thermal Electric, Photovoltaics, Landfill Gas, Wind, Biomass, Geothermal Electric, Municipal Solid Waste, Anaerobic Digestion, Small Hydroelectric, Tidal Energy, Wave Energy, Ocean Thermal, Biodiesel, Fuel Cells using Renewable Fuels
- Strict Delivery Requirements
- Currently do not accept “unbundled” RECs
- Alternative Compliance Payment - \$50/MWh
- Banking – 2 Year Banking (in latest proposed decision)



# California

- California Participants

- Sectors

- Investor Owned Utilities
    - Energy Service Providers
    - Public Owned Utilities

- Regulatory agencies

- California Energy Commission
    - California Public Utility Commission

- What effect will there be on existing markets?

- Voluntary
    - Compliance



## Conclusion

- **Obstacles**
  - Demand - Voluntary hard to predict
  - Supply – Legislation uncertainty is key obstacle
- **All eyes on California and the WECC**



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