Overview of Voluntary Renewable Energy Markets

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State-Federal RPS Collaborative National Summit on RPS

Washington, D.C.

December 3, 2012
Compliance and Voluntary Sectors Comprise Large Portion of Renewable Generation; Compliance Obligations are Increasing

RPS market for new renewables surpassed 60 million MWh in 2011. It will likely grow to over 150 million MWh by 2015.

Notes: New renewables defined based on state-specific distinctions between new vs. existing or on the year in which the RPS was enacted. Some compliance renewables may come from small-hydro facilities. Compliance figures assume that RPSs are met using renewables (not through an alternative compliance payment).

Sources: LBNL 2012, NREL 2012, EIA 2012
Key Components of Voluntary Market

• Three primary ways to purchase voluntary green power:
  o Utility green pricing program
  o Competitive market
  o Unbundled REC market

• Most customers in the voluntary market are residential; most sales are to non-residential

• The voluntary market is separate from the compliance market, though RE generators may participate in both markets.
Preventing Double Counting Ensures Market Credibility

• State RPS rules prohibit using a REC for compliance that is also sold or claimed in a voluntary market

• Center for Resource Solutions’ Green-e Energy program prohibits double counting of RECs

• The Federal Trade Commission’s newly released *Green Guides* clarify that it is deceptive to make a renewable claim without owning the RECs
The overall voluntary market continues to exhibit strong growth.

Sources: CRS 2012, EIA 2012, EPA 2012, REC Tracking Systems
Data Sources and Limitations

• **U.S EPA’s Green Power Partnership**
  - Provided data on magnitude of purchases by its corporate, institutional, and government partners. More than 1,300 U.S. organizations; most of large purchasers.

• **Center for Resource Solutions’ Green-e Energy retail sales**
  - Reports certified sales; represented 65% of total voluntary market in 2010.

• **U.S. Energy Information Administration (EIA)**
  - Collects data from utilities and marketers in two ways:
    - Annual data (2011 not released yet)
    - Monthly data (sample of respondents, 2011 data available)

• **Regional REC tracking systems**
  - Publically available data on voluntary RECs issued; some tracking systems report retired RECs as well.
Unbundled REC Market is Largest Voluntary Sector

Annual green power sales (millions of MWh)

- Utility Green Pricing
- Competitive Markets
- Unbundled REC Markets


Graph shows the increase in annual green power sales from 2006 to 2010, with the largest sales in 2010.
Green Pricing Programs are Active in 50 States

Leading states often have multiple utilities actively engaging their customers to participate in green power programs.

Source: EIA, 2012. Note: Incorporates EIA reporting entities only.
Some Utilities Post Annual Green Power Sales Increases

Within the EIA 826 sample, some programs saw declines between 2010 and 2011, while a number posted minor increases.

Source: EIA, 2012. Note: The EIA 826 dataset is not a comprehensive list of utilities, rather a selection of industry respondents.
Sample of Green Power Customers per Utility

Total customer participation for the 20 largest programs grew by 6.5% in 2011, to a total of 487,895 customers.

Source: EIA, 2012. Note: The EIA 826 dataset is not a comprehensive list of utilities, rather a selection of industry respondents.
The average participation rate for the largest 20 programs in terms of green power customers in 2011 was 2.9%, ranging from 0.5% to 9.8%, while the average participation rate for all programs reported in the 826 in 2011 was 0.9%.

Source: EIA, 2012. Note: The EIA 826 dataset is not a comprehensive list of utilities, rather a selection of industry respondents.
2011 Saw New Institutions Purchasing and Increased Purchases by Others (1/2011 to 6/2012)

New to Top 50

- Microsoft
- City of Austin
- NYSE Euronext
- The City of Philadelphia
- McDonald's
- Citi

Increased Purchase

- Lowe's
- Sprint
- Department of Energy
- Hilton Worldwide
- Lockheed Martin
- Walmart
- BD
Customer Numbers Continue to Surge, Led by Competitive Market

**Competitive market participation increased by 45% in 2011. Participation in utility green pricing programs increased slightly. REC market participation tripled but remained smallest market in terms of customer participation.**
Case Study: Voluntary Retirements Continue to Outpace Compliance Retirements in Texas

ERCOT’s voluntary market has exceeded the compliance market for multiple years.

Voluntary REC Prices Continue to Decline

Voluntary REC prices continue to decline from previous levels.

Source: Spectron Group, 2012.
Compliance REC prices have risen sharply over the past year in New England states.

Source: Spectron Group, 2012.
## Community Solar Continues to Take Off; Mix of Voluntary and Compliance

<table>
<thead>
<tr>
<th>Utility/Provider</th>
<th>Program Name</th>
<th>Program Size (kW)</th>
<th>Program Start Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>UniSource Energy Services (AZ)</td>
<td>Bright Arizona Community Solar</td>
<td>1,720</td>
<td>2012</td>
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<tr>
<td>San Miguel Power Association/Clean Energy Collective (CO)</td>
<td>SMPA Community Solar</td>
<td>1,000</td>
<td>2012</td>
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<td>Colorado Springs (CO)</td>
<td>Community Solar Garden Facility Incentive Program</td>
<td>500</td>
<td>2012</td>
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<tr>
<td>Poudre Valley REA/Clean Energy Collective (CO)</td>
<td>Community Solar</td>
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<td>2012</td>
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<td>Olympia (WA)</td>
<td>Olympia WA, SunSlice Deal</td>
<td>75</td>
<td>2012</td>
</tr>
<tr>
<td>United Power (CO)</td>
<td>Sol Partners Coop. Solar Farm</td>
<td>10</td>
<td>2012</td>
</tr>
</tbody>
</table>

*REC*s from community solar projects are often used for compliance mandates.
Community solar is a popular niche and appears poised for continued strong growth. It is important to note however that the installed capacity is still quite small (≈ 10 MW).
Voluntary Market Highlights

• 2011 voluntary sales grew on the order of 20% (EPA-GPP 22%, Green-e 19%)
• New large companies undertaking purchases: Microsoft, McDonalds, Coca-Cola
• Dodd-Frank did not consider RECs to be swaps; averting concerns about REC markets
• ERCOT remains largest voluntary market, at ≈20 million MWh, by significant share
• Voluntary REC prices remain low, under $1/MWh
• Mixed participation among utility programs, some losing customers, others showing gains
• Community solar a small but bright spot, most new programs
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