Geothermal Energy Generation in Oil and Gas Settings: Renewable Energy Credits for the Gulf Coast States

Presented by Tim Smith
March 13, 2006
Overview of the Presentation

- Who is Element Markets?
- What is a REC?
- What markets exist for RECs?
- A look at Louisiana, Mississippi, Alabama, Oklahoma, and Texas markets
Who is Element Markets?

- Started in 2004 as an emission and renewable energy credit asset management company
- Element Markets wants to take on the role of being an asset manager with strategic partners in select markets
- We guide our clients in their decision-making process making us a “part of the team” vs. an outsourced brokerage or consulting function.
- We provide in-depth market due diligence, analysis, and trading strategies to maximize our clients revenue potential
- Our commercial experience and market intelligence is unmatched
- We focus on developing client relationships with developers and utilities
What is a REC and How Does It Work?

- REC = Renewable Energy Credit
- A renewable generator produces 2 products when it creates electricity:
  - System energy
  - REC
- A REC is a marketing right that allows the owner to virtually overlay it on his system energy to create renewable electricity
- One REC is equivalent to one MWhr of energy
- RECs work on a broader time frame and geography compared to system energy
A Few Notes About REC Markets

- Markets are very illiquid
  - Wide Bid/Offer Spread
  - This is a compliance purchase only and is not a hedged commodity
  - Few, if any, people speculate in REC markets
  - Compared to electricity, REC prices are relatively low
  - 2-3 trades in a week for a market is considered active
  - Little to no speculation

- Buyers generally don’t have the time or resources to give much thought to their purchase obligations

- Sellers often don’t have the time or resources to try to extract value from their renewable assets

- Few brokered deals are done

- Price discovery is very difficult to achieve

- Contracts, especially for voluntary REC markets, can be cumbersome and risky
Types of REC Markets

- **VOLUNTARY**
  - Demand driven by marketing
  - Rules are not clearly defined
  - Little regulation
  - Almost no liquidity
  - Purpose: To drive the development of new renewables
  - Size: Over 5 million MWhrs in 2005
  - Price: Less than $1/REC

- **MANDATORY (RPS)**
  - Driven by statute or regulation
  - Rules are clearly defined
  - Highly regulated
  - Slightly better liquidity
  - Purpose: To drive the development of new renewables
  - Size: Over 20 million MWhrs in 2005
  - Price: Average is over $3/REC
States with a RPS

Renewable Portfolio Standards

- **PA**: 18% by 2020
- **NJ**: 6.5% by 2008
- **CT**: 10% by 2010
- **MA**: 4% by 2009 + 1% annual increase
- **WI**: 2.2% by 2011
- **MN**: 1,125 MW wind by 2010
- **TX**: 5,880 MW by 2015
- **HI**: 20% by 2020
- **CA**: 20% by 2017
- **IA**: 105 MW
- **MD**: 30% by 2000
- **ME**: 30% by 2000
- **RI**: 15% by 2020
- **CT**: 10% by 2010
- **NV**: 20% by 2015
- **CO**: 10% by 2015
- **DC**: 11% by 2022
- **DE**: 10% by 2019
- **NM**: 10% by 2011
- **AZ**: 1.1% by 2007
- **NY**: 24% by 2013

*Minimum requirement and/or increased credit for solar
1 PA: 8% Tier I, 10% Tier II (includes non-renewable sources)

From: www.dsireusa.org
Voluntary Markets

- Includes Alabama, Louisiana, Mississippi and Oklahoma

- Voluntary markets are buyer’s markets
  - Can choose from a variety of resources
  - Can choose from anywhere in the country
  - Have flexibility in the age of the facility

- Prices are low

- Louisiana has the most advanced RPS discussions of these states
General Observations on RPS Markets

- No 2 RPS markets are alike
  - Geographic boundaries
  - Shelf life
  - Potential Resources
  - Classes or Tiers
  - Targets
  - Penalties

- Further changes are likely to occur
  - Connecticut
  - Texas

- Geothermal is universally recognized as a renewable generating resource
# RPS in Texas

<table>
<thead>
<tr>
<th>Tracking System</th>
<th>Unnamed, administered by ERCOT</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Classes</td>
<td>1</td>
</tr>
<tr>
<td>Unusual Resources</td>
<td>Solar Thermal</td>
</tr>
<tr>
<td>Geography</td>
<td>Anywhere in Texas</td>
</tr>
<tr>
<td>Credit Multipliers</td>
<td>No</td>
</tr>
<tr>
<td>Shelf Life</td>
<td>3 years</td>
</tr>
<tr>
<td>2006 Target</td>
<td>1.4%* (3.4 million MWhrs)</td>
</tr>
<tr>
<td>2011 Target</td>
<td>3.3%* (8.9 million MWhrs)</td>
</tr>
<tr>
<td>Current Pricing</td>
<td>$7.75</td>
</tr>
</tbody>
</table>

*Note: *MWhrs stands for megawatt-hours.
Method to Calculate of the State-wide RPS Requirement

- \( RPS = Q \times CCF \times 8760 \)
  - \( Q = \) Assumed capacity for the year
    - 2002-2003 = 400 MW
    - 2004-2005 = 850 MW
    - 2006-2007 = 1400 MW
    - 2008-2009 = 2392 MW
    - 2010-2011 = 3384 MW
    - 2012-2013 = 4376 MW
    - 2014-2015 = 5000 MW
  - \( CCF = \) Capacity conversion factor of wind
  - 8760 = Hours in a year
Setting the CCF

- The effective capacity factor of wind is at about 27%
  - Distribution congestion
  - Wholesale transmission congestion
- The CCF has been reduced to 27.6% from 35%
  - The change occurred in the second half of 2005
  - The adjustment will be made retroactive to 2004 requirements
- CCF is adjusted on a biannual basis to reflect actual capacity of REC-generating facilities since the inception of the program
- CCF for 2006-2007 will be 27.9% (set at the end of 2005)
Translating RPS Requirement to Usage

- In 2003, the total RPS requirement came to be about 1,226,400 MWhrs
- In 2004, the total RPS requirement came to be about 2,606,100 MWhrs
- RPS in 2003 amounted to slightly less than 0.6% of the load for a given competitive retail provider
- After adjustments due to the CCF, the total RPS requirement for 2005 will be around 1,600,000 MWhrs
Historical Pricing for TX RECs

- Prices for 2005 have gradually fallen from $14/REC to just under $8/REC
- Oversupply precipitated by CCF adjustment, retroactive to 2004
Closing

Contact Information
Tim Smith
VP of Renewable Energy Products
Element Markets LLC
1 Sugar Creek Center Blvd.
Suite 250
Sugar Land, TX  77478
Office: 281-207-7217
Fax: 281-207-7211
tsmith@elementmarkets.com

Thank you for your time and attention!
Any questions?