



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

Presented by Tim Smith

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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

Goal



Element Markets LLC

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

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



Method to Calculate of the State-wide RPS Requirement

$$\ddagger \text{ RPS} = \text{Q} * \text{CCF} * 8760$$

„ 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



Closing

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‡ Thank you for your time and attention!

‡ Any questions?

