Geothermal Energy Utilization: REC Markets and Tax Credits

Presented by

Tim Smith

June 12, 2007

Overview of the Presentation

- About Element Markets
- What is a Renewable Energy Credit (REC)?
- REC markets
- Carbon credits
- Tax Credits and other subsidies

Element Markets LLC

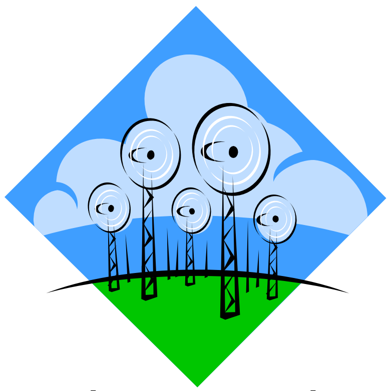
Who is Element Markets?

- Started in 2004 as an emission and renewable energy credit asset management company.
- Element Markets has four primary areas of focus
  - Renewable Energy Credits
  - Emission Credits
  - Renewable Project Development
  - New Technologies
- Element Markets employs a pool of analysts to provide market intelligence and organization of data.
- We work with investor-owned utilities, cooperatives, municipalities, project developers, industrial customers, institutions, and commercial accounts.
- Our commercial experience and market intelligence is unmatched.
- Wholesale market maker for RECs
  - Unique segment in the REC business
  - We purchase RECs from existing and new developments on a spot as well as a long-term (e.g. 10 years) basis

Element Markets LLC

What is a REC?

- A renewable generator produces two products when it creates electricity:



REC

System Power and other ancillaries

- A REC is a marketing right that allows the owner to virtually overlay it on its system energy to create Renewable Energy (a.k.a. Green Energy)
- RECs work on a broader time frame and geography compared to system energy
- One REC is equivalent to one MWhr of energy
- REC markets began around 1998

Element Markets LLC

How RECs differ from commodity electricity?

	ELECTRICITY	**REC**
Time to Consume	Instantaneous	Allocated after the fact
Geography	Must be delivered to a sink	Delivery can be as small as a state or as large as nationally
Online Date	N/A	Can make a difference
Shelf-Life	None	Anywhere from one to five years
Standards	Well-established standards (FERC, NERC, etc.)	Green-e is the recognized standard in voluntary markets, but it is not mandatory; states set their own standards
Resources Allowed	All	Wind, PV Solar, Geothermal, Landfill Gas and other forms of methane capture; in limited cases, certain types of biomass (including wood waste and black liquor), MSW, hydro

Element Markets LLC

What resources qualify?

- Undisputed
  - Wind
  - PV Solar
  - Landfill gas
  - Geothermal
  - Methane capture from animal and organic waste
  - Wood waste
    - Must involve sustainable forestry practices
    - Some areas impose emission requirements
- Not so clear
  - “Black liquor”
  - Municipal solid waste
  - Waste coal
  - Waste heat
  - Low-impact hydro
  - Small hydro (< 5 MW)
  - Solar thermal
  - Biodiesel
  - Fuel cells

Element Markets LLC

Types of REC Markets

- VOLUNTARY
  - Demand driven by end users and marketers
  - Rules are not clearly defined
  - One uniform standard (Green-e)
  - Little regulation
  - Almost no liquidity
  - Purpose: To drive the development of new renewables
  - Size: Over 10.0 million MWhrs in 2006
  - Average spot price > $1.75/REC

- MANDATORY (RPS)
  - Demand driven by statute or regulation
  - Rules are clearly defined by statute
  - Standards vary from state to state
  - Highly regulated
  - Slightly better liquidity
  - Purpose: To drive the development of new renewables
  - Size: Over 20 million MWhrs in 2006
  - Average spot price ~ $3.50/REC

Element Markets LLC

Element Markets LLC

Element Markets LLC

Tracking Systems

- Ones that apply to target states
  - Texas, administered by ERCOT
  - WREGIS, administered by WECC
- Benefits
  - Certificates are issued by an independent third party
  - Allows account holders to transfer or retire certificates
  - Reduces the risk of
    - Double claiming
    - Double counting
    - Double selling

Element Markets LLC

Carbon Markets

- Markets in the US are strictly voluntary
  - Chicago Climate Exchange is only exchange in the US
  - Bilateral voluntary market is significantly larger
  - No clear standards exist to determine what technology constitutes a carbon offset
- In voluntary REC markets, marketers usually claim their renewable purchases in terms of carbon reduced
- Most of the Northeast states have joined the Regional Greenhouse Gas Initiative (RGGI)
- California passed AB32 earlier this year
  - Several Western states and some provinces in Canada have verbally committed to joining California's initiative
- Neither of these programs will be in place prior to 2009
- Neither of these programs are currently contemplating the recognition of renewable generation as a source of carbon offsets
- Mandatory programs in Europe do not recognize renewable generation as carbon offsets
- Will there be a national carbon market in our future? If so, will it be cap and trade, or a carbon tax?

Element Markets LLC

Sources of Funding

- Production Tax Credit
  - Currently valid for new geothermal facilities brought online through 12/31/08
  - $10/MWh produced for the first ten years of commercial operation
  - The owner must have the tax appetite
  - The electricity must be sold to an "unrelated person"
  - Another benefit: The plant can be depreciated over five years
- Clean Renewable Energy Bonds
  - Available to public power entities
  - No interest on the bonds, and instead the lenders can claim tax credits
  - $800 million was available in 2006, and there were 709 applicants
  - Another $400 million is available in 2007
- Local grants, tax incentives, and other subsidies

Element Markets LLC

Contact Information

Tim Smith
VP of Renewable Energy Products
tsmith@elementmarkets.com

Element Markets LLC
One Sugar Creek Center Blvd.
Suite 250
Sugar Land, TX 77478
Office: 281-207-7200
Fax: 281-207-7211

Element Markets LLC