



# **An Overview of the Renewable Energy Credit (REC) Markets**

Prepared for the Sixth Goddard Forum  
The Opportunities and Challenges of the PA RPS

Jan 30-31, 2006

State College, Pennsylvania

# About Evolution Markets

- Introductory energy broker with offices in New York, San Francisco, Houston, Calgary, London – Prague – Bratislava

- Markets served:

- Renewable Energy Credits and Green Energy
- SO<sub>2</sub> and NO<sub>x</sub> Emissions Allowances
- HGB NO<sub>x</sub> Allowances and RECLAIM RTCs
- Emission Reduction Credits (ERCs)
- GHG Reductions and EU CO<sub>2</sub> Allowances
- Weather Derivatives
- OTC Coal – domestic and international
- Natural Gas
- Nuclear Fuels

- Highest Volume Environmental Broker

- More than \$6.5 billion in brokered environmental transactions

## Environmental Finance

Voted “Best Broker: REC (US)” in 2003, 2004, and 2005

RISK MANAGEMENT • TRADING • FINANCE

**energy risk**

Named “House of the Year: Weather/Emissions” 2004  
 “Best European Emissions Broker” 2005

  
**evolution**  
 MARKETS LLC

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# RECs 101: Why RECs?

- Renewable energy has many benefits over traditional energy sources
- In many instances, the physical location of Renewable Energy Generation is not located within proximity to Renewable Energy Buyers
- By separating the Renewable attribute from the underlying electricity (RECs), Renewable Energy Buyers can support the growth of renewable energy regardless of physical location

# RECs 101: What are RECs?

- RECs represent the environmental, social, and other benefits of renewable energy generation
- 1MWH = 1 REC (Unless otherwise stated)
- By acknowledging a second commodity (in addition to the electricity itself) a product is created that can be purchased and sold without the same constraints of the power market
- In theory (if not always in practice) the additional revenue from REC sales gets renewable energy projects built

# RECs 101: RECs – O – Rama...

“Renewable Energy  
Credits” (RECs)

“Renewable Energy  
Certificates” (RECs)

“Green Tags”

“Tradable Renewable  
Certificates” (TRCs)

“Renewable Energy  
Attributes”

**...they're all the same thing!**

**Nevada: 15% by 2013,  
solar 5% of annual**

**Minnesota: 19% by 2015\***

**New York:  
24% by 2013**

**Maine: 30%  
by 2000**

**Iowa: 2% by 1999**

**Wisconsin:  
2.2% by 2011**

**MA: 4%  
by 2009**

**RI: 16%  
by 2019**

**CT: 10% by 2010**

**NJ: 6.5% by 2008**

**Maryland:  
7.5% by 2019**

**Washington D.C:  
11% by 2022**

**Pennsylvania:  
8% by 2020**

**California:  
20% by 2017**

**Arizona: 1.1% by  
2007, 60% solar**

**New Mexico:  
10% by 2011**

**Texas:  
2.7% by 2009**

**Colorado: 10% by 2015**

**Hawaii: 20% by 2020**



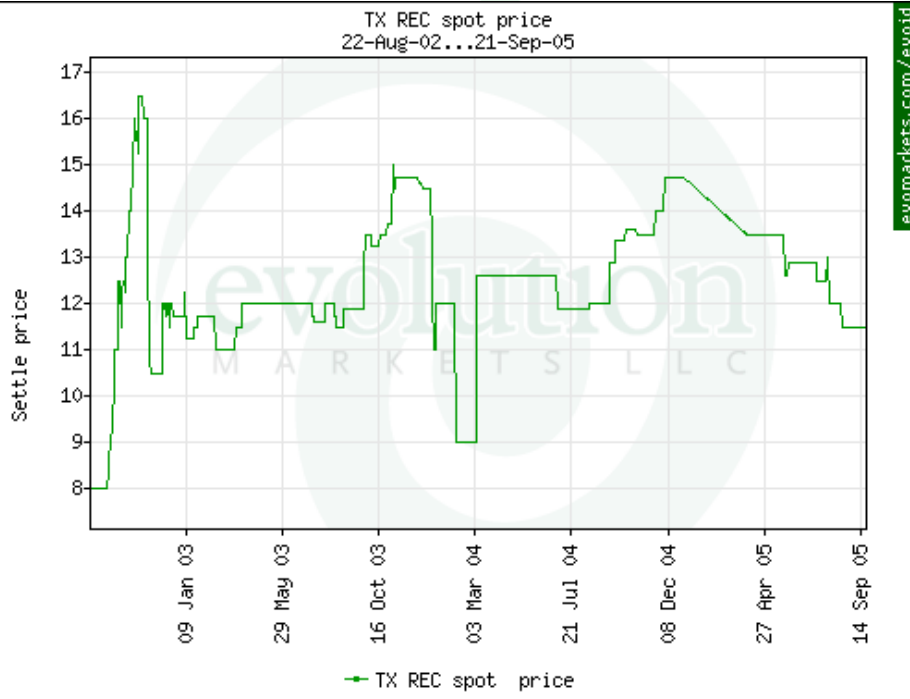
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Source: [www.ucsusa.org](http://www.ucsusa.org)



# Texas Snapshot

- First in nation to trade
- Uses GIS (Generation Information System) to track RECs
- Program success has been striking:
  - 850 MW mandated for 2004, but ~1200 MW already on line (~1100 MW is wind)
- Program success due in part to two key factors:
  - Certificates can be **traded at any time**
  - Certificates can be **banked for 3 years**
- Prices currently around \$8.00 for vintage 2005 RECs...on historic lows



# Texas: Market Outlook

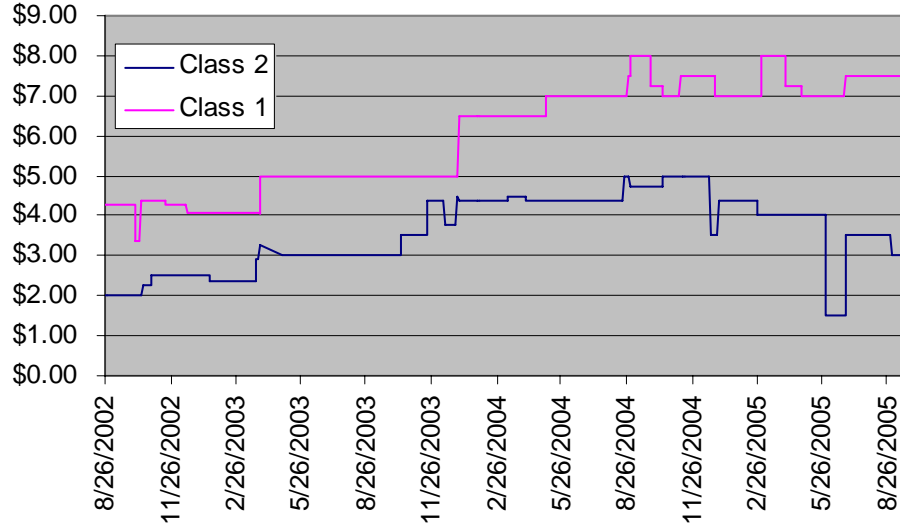
- Installed renewable capacity in Texas well exceeded the targets for 2002-2003 and 2004-2005.
- As a result, the market was/is over-supplied for 2002 - 2005 (2002 REC supply was almost twice the compliance need).
- There are a number of factors that have recently changed in TX
  - SB 20 – Capacity target of 5000MW by 2015
  - CCF recently lowered in 2005...Unsure for 2006-2007
  - Set Aside for generation source other than Wind
  - Vintage 2005 trades as low as \$8 (12/15/2005)



## PJM Snapshot

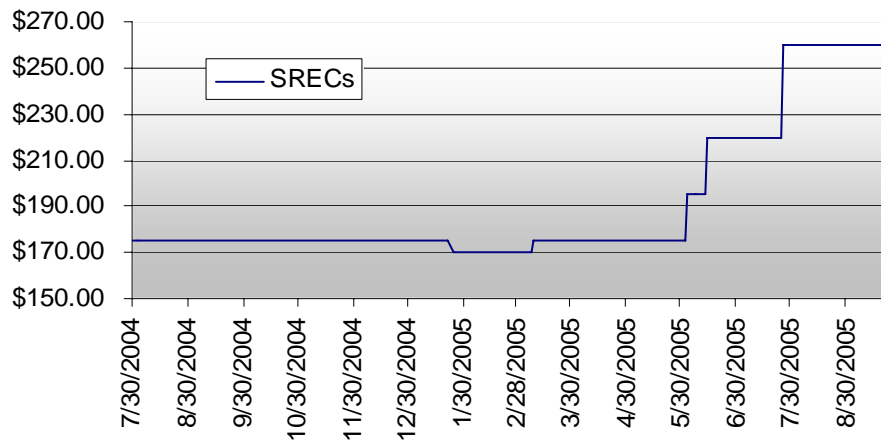
- NJ currently the only active compliance market
- MD has passed RPS – begins in 2006
- PA has passed RPS – begins in 2007 (but not for everyone)

# PJM Snapshot: New Jersey



## NJ was the first compliance market in PJM

- Began 2002, new RPS rules went into effect June 1, 2004
- Relatively aggressive target (2.5% by 2008)
- Alternative compliance: \$50 for Class I/II, \$300 for Solar
- Prices: Class I -- \$7.00; Class II -- \$3.00; Solar -- \$175 - \$200
- NJ RPS expected to be extended through 2020 with a goal of 20%
- Supply & Demand: forward picture very murky – demand could increase with other state RPS, but supply will increase as PJM expands.





## PJM Snapshot: Maryland

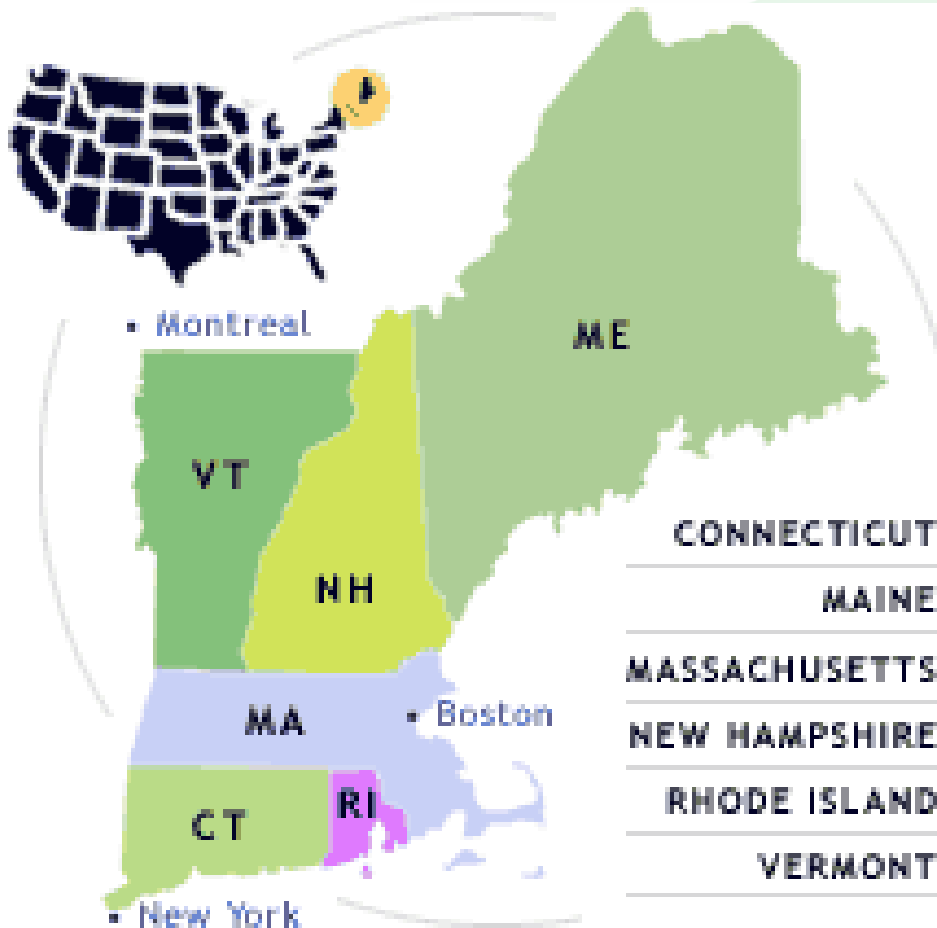
- MD will be the second compliance market in PJM
  - RPS passed in May 2004, 2006 will be first compliance year.
  - RPS target (Tier I): 7.5% by 2014.
  - Alternative Compliance: Tier I - \$20; Tier II - \$15/MWh.
  - Prices: only one Tier I trade has occurred, price was ~\$3.00.
  - Supply & Demand: supply will depend on geographic eligibility – some regulatory uncertainty.



## PJM Snapshot: Pennsylvania

- PA has the newest compliance market in PJM
  - RPS passed in November 2004, 2007 will be first compliance year (but several utilities exempt until 2009-2010)
  - RPS target: 18% by 2021.
  - Alternative Compliance Payment: \$45/MWh (Tiers I & II)
  - Prices: too early to tell, but likely to follow NJ REC prices?
  - Supply & Demand: RPS rules not final. Qualifying generation resources likely to be located anywhere in PJM service territory or deliver into PJM grid.

# NEPOOL Snapshot



- Uses GIS system
- Three states have RPS:
  - Massachusetts
  - Connecticut
  - Maine
- Maine RPS is relatively lax, prices are quite low
- Massachusetts and Connecticut have very aggressive RPS
  - MA & CT likely to be undersupplied for the next few years; changes in CT's "import" rules could change this
  - certificate prices highest in country
  - disconnect between developers' and buyers' time horizons



## MA Snapshot

- 2004, 2005 REC supply is almost “sold out”
- “Imports” from NY providing much-needed breathing room
- 2006 supply picture looks a little better, but also likely to be tight...(Recent ruling against Low-emission Biomass)
- 2005 prices have gone as high as \$52.80 (against a \$53.19 alternative compliance payment)
- 2006 ACP expected to be between \$55.50 - \$56.00, 2006 has already traded \$53.25



## CT Snapshot

- RPS passed June, 2003 - rules finalized October, 2004
- 2005 CT Class 1 market was short until the upgrading of older Biomass facilities that qualified for CT RPS
- Prices were trading between \$35-\$40 (as of 7/15/05) and by end of 2005 markets was “no bid” @ \$2.50
- Energy Independence Act ruled against “Mail In” RECs until 2010
- 2006 CT Class 1 market trading between \$6.75 and \$7.75...market expected to be quite oversupplied again
- Regulatory uncertainty has prevented term trading from happening

# NEPOOL : Resource Mix

- The RECs sold in the MA and CT compliance markets are almost exclusively from landfill gas, biogas and biomass.
- Biomass is likely to dominate the compliance RECs market for the next few years, primarily because of:
  - the relative ease/low cost of retrofitting existing facilities.
  - relatively plentiful fuel supply (whereas wind resources are generally not good).
- Although wind is an eligible resource, there are no major wind projects operating in NEPOOL at present. In terms of wind, the proposed 420 MW Cape Wind project is by far the biggest potential source within NEPOOL.
- However, New York state has excellent wind resources, and while exporting to NEPOOL involves additional cost and some technical obstacles, many developers are considering this option.

# Financing with RECs: Challenges and Solutions



# Challenges of REC Financing

- Term
- Liquidity
- Regulatory Uncertainty
- Credit
- Firm/Unit Contingent

# Voted Top Renewables Broker – North America

## *12/05 Environmental Finance Customer Survey*

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