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An Overview of the Renewable Energy Credit (REC) Markets

Prepared for

Prepared for the 2006 New Jersey Clean Energy Conference

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Evolution Markets Overview

- Evolution Markets LLC was founded in 2000
- Offices in New York – San Francisco – London – Bratislava – Prague – Calgary
- World's Largest Environmental Brokerage
  - More than 50 Brokers Worldwide
- More than $7.0 billion in energy and environmental transactions

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The Markets We Serve

- Environmental Markets
  - oRenewable Energy Credits
  - oGHG Credits/Allowances
  - oSO_2 Emissions Allowances
  - oNO_x Emissions Allowances
  - oEmissions Reduction Credits
  - oHouston/Galveston NO_x Allowances
  - oRECLAIM (Los Angeles NO_x and SO_x)
  - oWeather Derivatives
- Energy Markets
  - oOTC Physical Coal
  - oOTC Coal Derivatives
  - oGreen Power
  - oNatural Gas
  - oNuclear Fuels

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Evolution Markets Commitment to Renewable Markets

- RECs brokerage since 2002
- REC brokerage, green power contracts, financial services
- Compliance RECs (Northeast/Texas) from New York
- Voluntary RECs (Nationwide) and Western Compliance RECs from San Francisco
- Market's only Green-e approved broker
- Market's most honored brokerage

Environmental Finance MAGAZINE

Environmental Finance **Magazine Customer Survey**
Best Renewables Broker-North America (2005, 2004, 2003)

RISK MANAGEMENT • TRADING • FINANCE
energy risk

Energy Risk **Annual Rankings**
Best Broker-North America Environmental Markets (2004)

Energy Business
Silver Award Winner 2005
Renewable Energy

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Evolution Markets Experience and Expertise

- First RECs brokered in: Texas, Massachusetts, Connecticut, Maryland, District of Columbia, California

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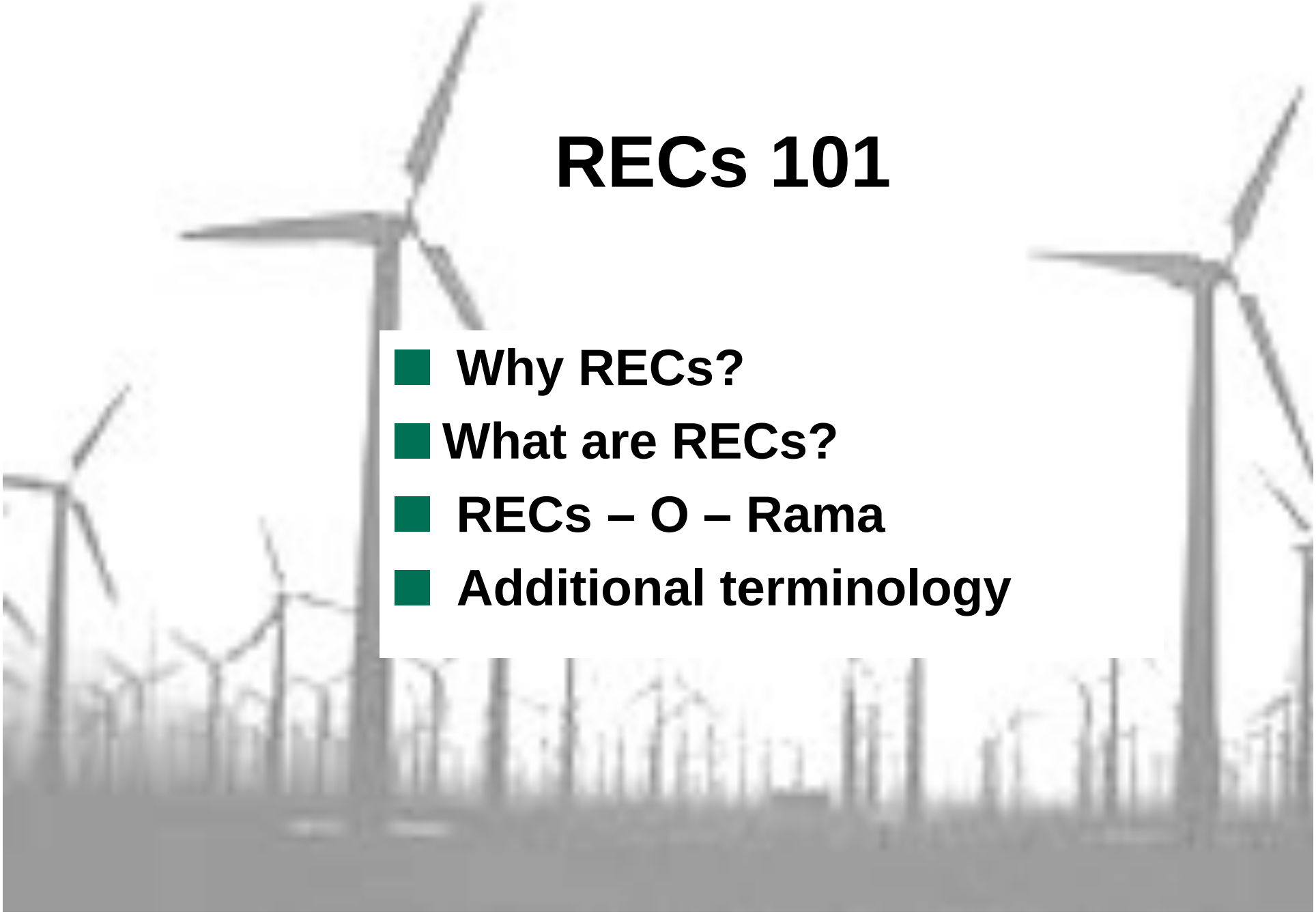

RECs 101

- Why RECs?
- What are RECs?
- RECs – O – Rama
- Additional terminology

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!

Transactions 101

Transactions 101: How do RECs trade?

- One REC represents the attributes associated with one megawatt hour (MWh) of energy from a renewable source.
- RECs are assigned a “vintage” based on the year in which they were generated.
- RECs are quoted by resource type and/or the market eligibility.
- Examples:
  - “5,000 vintage RY 2006 New Jersey Class 1 RECs”
  - “10,000 vintage 2006 Massachusetts-eligible RECs”

Voluntary Market: Basics

- **Driven by environmental disclosure, consumer demand, corporate commitments, carbon claims**
- Voluntary market pricing has increased markedly in the past year → although prices are very low compared to the compliance markets and are expected to remain so.
- Voluntary buyers - generally less concerned about geographic location, but often have a preference for a specific resource type – usually wind.
- In 2005, total sales in the voluntary markets (Green-e sales as well as utility green pricing programs) were approximately 5 million MWh
- = roughly 570 MW of around-the-clock generation.

Voluntary Market: Pricing

price discretion based on resource type:

Solar: $30 - $50

Biomass/Low-impact Hydro: $1 - $3

Wind: $0.75 - $15

Landfill Gas: $1 - $3

Geothermal: $1-$10

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Compliance Markets: Basics

- **Created by Renewable Portfolio Standards (RPS)**
- The most salient feature of the compliance markets is that they differ considerably from state to state, → prices differ.
- Compliance buyers are generally indifferent to the type of resource that created the REC (insofar as it qualifies), but they are limited to a specific geographic region from where the REC can be sourced.
- Approximate total volumes required in the compliance markets in 2006 are as follows:
  - Texas: 3.4 million MWh
  - Massachusetts: 1.45 million MWh
  - Connecticut: 625.000 MWh
  - New Jersey: 1.5 million MWh

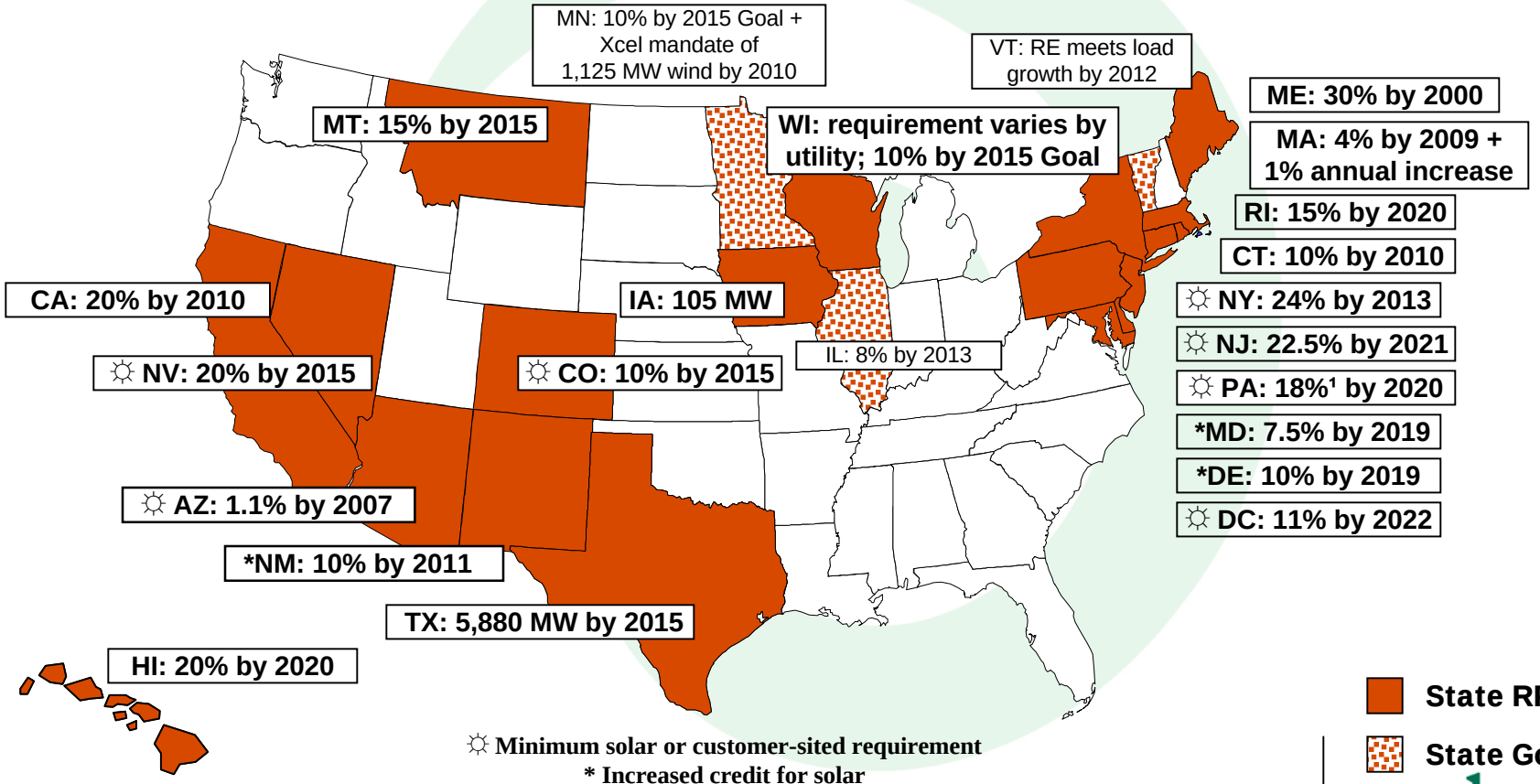
Compliance Markets: Pricing

- RPS vary, so do the markets they create…
- The impact of an RPS is a function of supply (eligible resources) and demand (percentage requirements), enforced by penalties…
  - Maine: 30% requirement, but 50% of supply qualifies → price ~$0.30
  - Massachusetts: 2% requirement ('05), but limited resources qualify, and $53 "alternative compliance payment" → prices $50+

DSIRE: www.dsireusa.org

May 2006

Renewables Portfolio Standards



☼ Minimum solar or customer-sited requirement
* Increased credit for solar
[1]PA: 8% Tier I, 10% Tier II (includes non-renewable sources)

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Compliance Markets: in Detail

PJM Snapshot

- NJ the most active compliance market
- MD RPS began calendar 2006
- PA has passed RPS – begins in RY 2007 (but not for everyone)
- DE and D.C. begin in calendar 2007

PJM Snapshot: New Jersey

- **NJ was the first compliance market in PJM**
  - **Runs on Reporting Year (Jun 1, 2006-May 31, 2007)**
  - **Retail Load determined by BGS Auction (February)**
  - **LSE's have a 3 month window to true-up compliance (Aug31)**
  - **Delivery of RECs into PJM GATS (simplified transactions)**
- **Due to current market conditions (oversupply) as compliance period rolls off prices drop as sellers get aggressive…this is expected to change in the next 2-5years (depending on supply)**

PJM Snapshot: New Jersey continued

- NJ BPU just approved (4/12/2006) extended RPS thru 2020 (20% by 2020)
- Alternative compliance Payment (ACP): $50 for Class I/II, $300 for Solar
  - Prices: Class I -- $7.00 - $8.00 ; Class II -- $1.50- $2.50; Solar -- $225-$250
  - Supply & Demand: forward picture very murky – Demand is set to increase dramatically over the next 3-5 years…Where will the supply come from ? Will PTC be extended ? Will Wind projects get built ?

PJM Snapshot: New Jersey continued

- **Long Term deals becoming commonplace in NJ and all Renewable Energy Credit mkts**
  - **(3,5, and 10 year deals in both Class 1 and SRECs)**
- **As regulatory policy has become more certain the Forward Curve has begun to develop**
- **SREC market has great potential…**
  - **Rebate Issues continue to be a stumbling block**
  - **Regulatory uncertainty (% requirements and no rebates)**
  - **Developers and installers want to negotiate their own contract and are not aware of available creative structures**

New Jersey REC Demand Forecast

Year	Solar		Class I		Class II	
	RPS	MWh	RPS	MWh	RPS	MWh
2006/2007*	0.0393%	32,095	2.037%	1,663,541	2.50%	2,041,656
2007/2008	0.0817%	67,869	2.924%	2,428,993	2.50%	2,076,772
2008/2009	0.1600%	135,200	3.840%	3,244,789	2.50%	2,112,493
2009/2010	0.2210%	189,956	4.685%	4,026,903	2.50%	2,148,828
2010/2011	0.305%	266,666	5.492%	4,801,738	2.50%	2,185,788
2011/2012	0.394%	350,405	6.320%	5,620,712	2.50%	2,223,383
2012/2013	0.497%	449,611	7.143%	6,461,916	2.50%	2,261,625
2013/2014	0.621%	571,450	7.977%	7,340,516	2.50%	2,300,525
2014/2015	0.765%	716,069	8.807%	8,243,684	2.50%	2,340,094
2015/2016	0.928%	883,584	9.649%	9,187,175	2.50%	2,380,344
2016/2017	1.118%	1,082,799	10.485%	10,154,873	2.50%	2,421,286
2017/2018	1.333%	1,313,235	12.325%	12,142,254	2.50%	2,462,932
2018/2019	1.572%	1,575,329	14.175%	14,205,019	2.50%	2,505,294
2019/2020	1.836%	1,871,534	16.029%	16,339,228	2.50%	2,548,385
2020/2021	2.120%	2,198,201	17.880%	18,539,541	2.50%	2,592,218

* Based on a 2003 baseline and using a growth rate extrapolated from EIA data

PJM Snapshot: Maryland

- MD will be the second compliance market in PJM
  - o RPS passed in May 2004, 2006 will be first compliance year.
  - o RPS target (Tier I): 7.5% by 2014.
  - o Alternative Compliance: Tier I - $20; Tier II - $15/MWh.
  - o Prices: Tier 1 $1.00-$2.00 Tier 2 $0.50 - $1.50
  - o Supply & Demand: Market is Oversupplied due to MD allowing wide geographic availability and 3-yr bankability

PJM Snapshot: Pennsylvania

- PA has the newest compliance market in PJM
  - o RPS passed in November 2004, 2007 will be first compliance year (but several utilities exempt until 2009-2010)
  - o Regs are still not final (delivery issues are the biggest)
  - o RPS target: 18% by 2021.
  - o Alternative Compliance Payment: $45/MWh (Tiers I & II)
  - o Prices: too early to tell, but likely to follow NJ REC prices?
  - o 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
  - RI will have an RPS in 2007
- Maine RPS is relatively lax, prices are quite low
- Massachusetts and Connecticut have very aggressive RPS

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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

EVOLUTION MARKETS LLC

10 Bank Street – 4th Floor

White Plains, NY 10606

914-323-0255 Tel

914-328-3701 Fax

EVOLUTION MARKETS LLC

425 Market Street, Suite 2200

San Francisco, CA 94105

415-955-0561 Tel

415-955-2612 Fax

Andrew Kolchins – Director, Renewable Energy Markets

akolchins@evomarkets.com