



# Tapping the Resources: LFGE participation in Renewable Portfolio Standards

## SWANA's e-session

Presented by:

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Conservation Services Group

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## CSG's Clean Energy Markets team

- Initiated in 1998
- Manage all aspects of clients' electricity attributes portfolio
- Represent generation in NEPOOL, New York, PJM, and WECC
- Sell zero emissions green power product, ClimateSAVE<sup>SM</sup>



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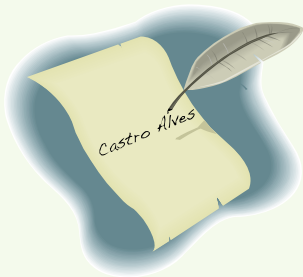
# Overview

- RECs: Underlying financial instrument
- Renewable Portfolio Standards
  - Where does LFGE Qualify?
  - Is it worth it (\$\$\$)?
- LFGE:
  - Challenges
  - Opportunities
- Current REC market





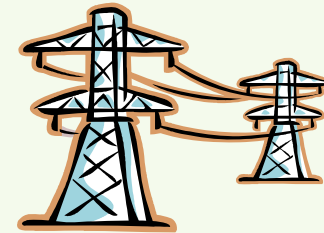
# Players in REC markets



Market authority



Renewable generator



LSE, Distribution Company, Utility or supplier



Liquidity provider  
(broker/banker)

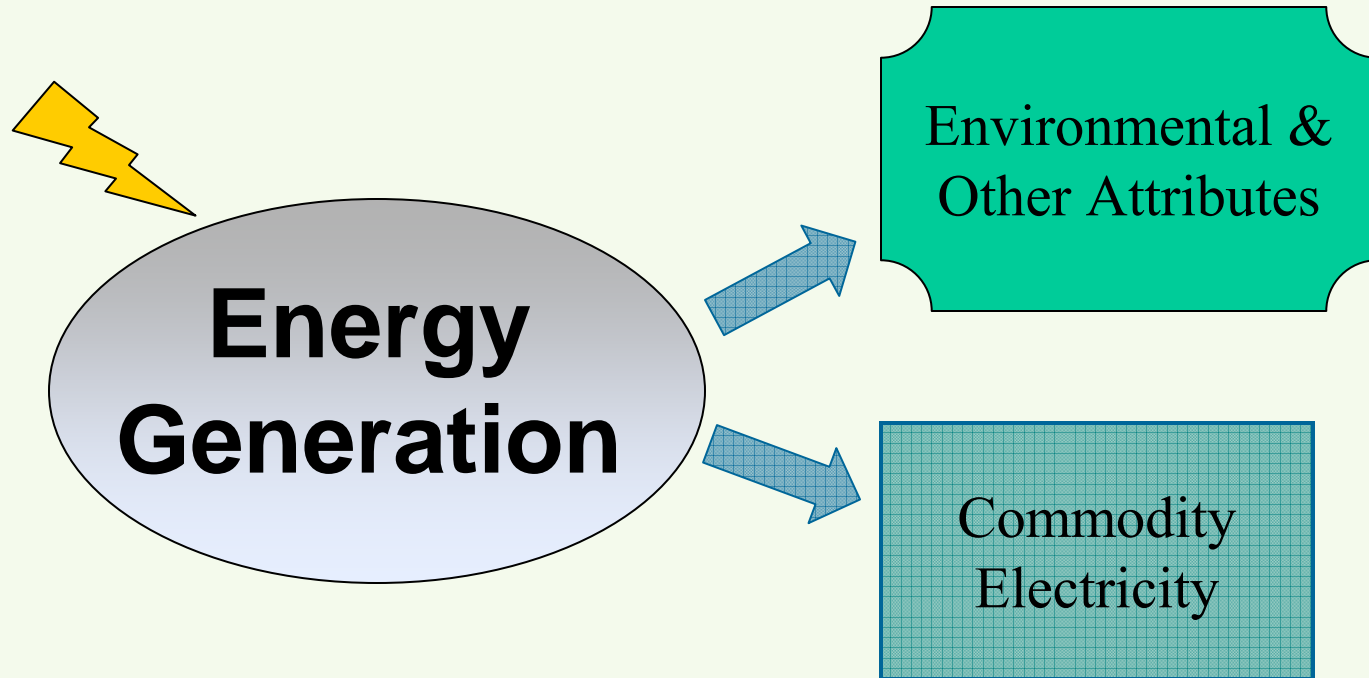


End user





# Unbundling attributes from energy





## What is a REC?

- A **Renewable Energy Certificate** is a tradable **certificate** of proof that one MWh of electricity has been generated by an eligible **renewable**-fueled source in a designated time period.
- Also called: Green Tags, Tradable Renewable Credit (TRC)





# Compliance Market

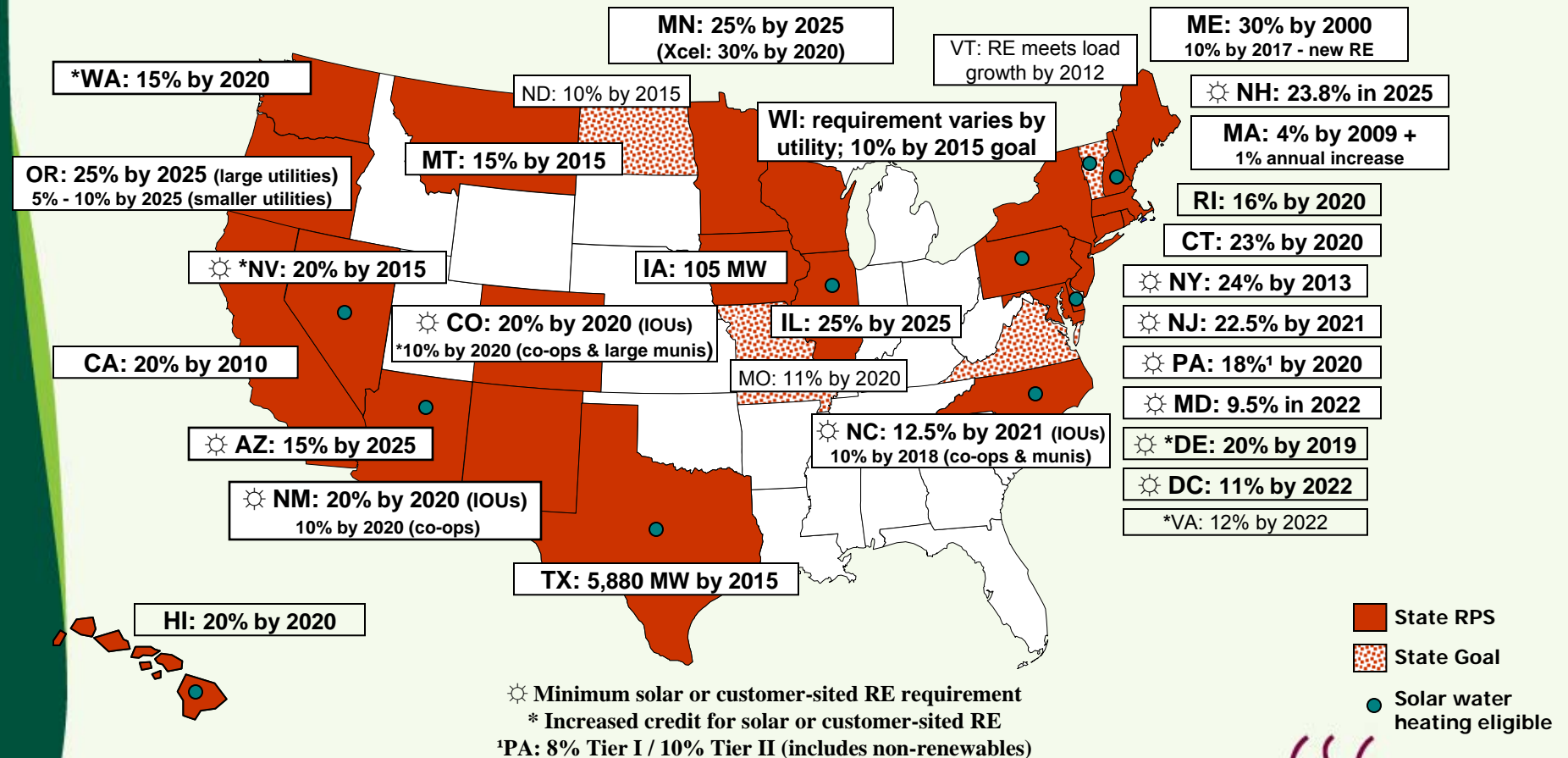
## Renewable Portfolio Standard

policy set by federal or state governments that a percentage of the electricity sold to retail customers must be derived from a renewable source.



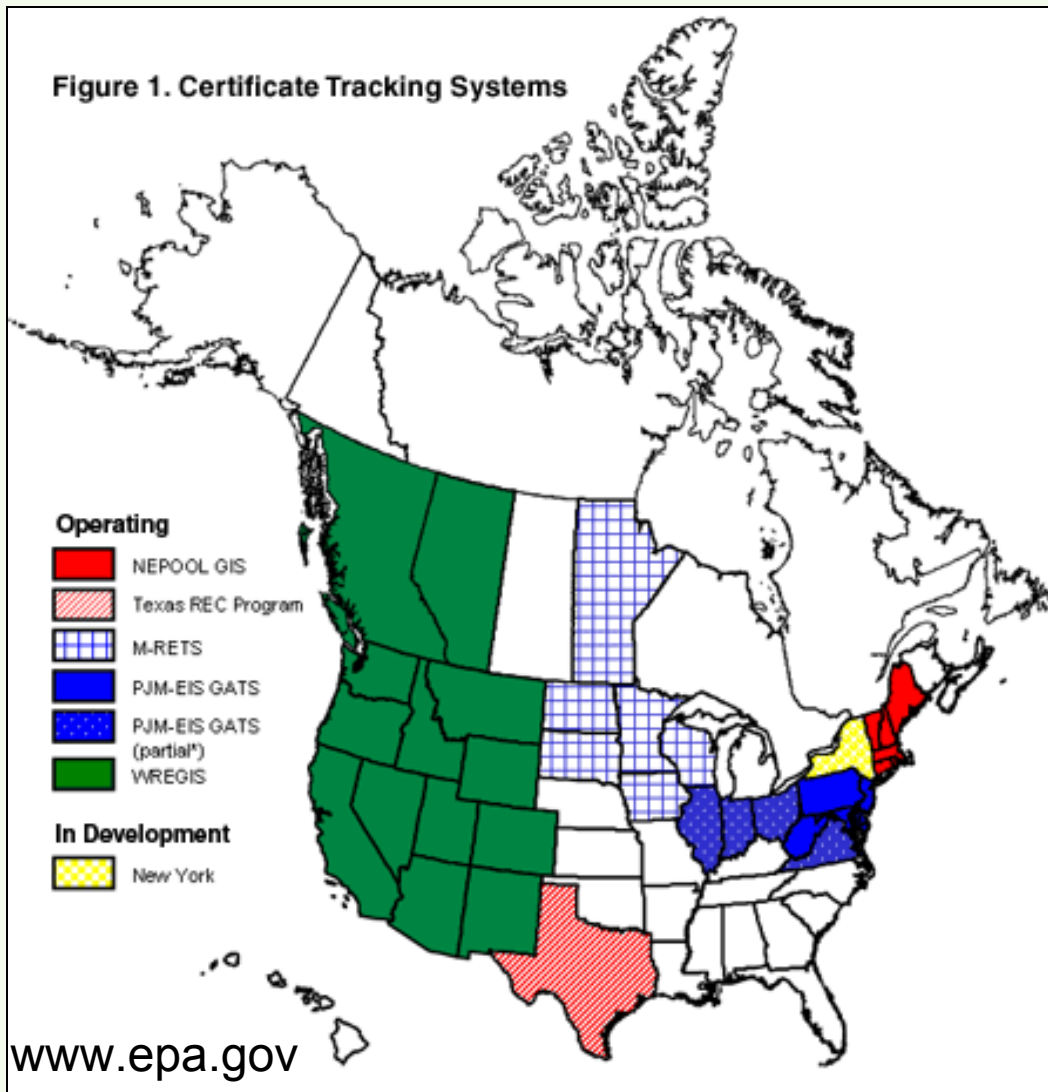
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# Renewables Portfolio Standards





**Figure 1. Certificate Tracking Systems**



# Renewable Energy Certificate Tracking Systems



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# To participate LFGE must meet these characteristics ...

- Operation date
- Technology
- Fuel source
- Vintage
- Location
- Grid-tied
- Qualification





# Landfill Gas to Energy Projects

- Challenges
  - Operation date
  - Bundled power deals
  - Transmission lines





# Landfill Gas to Energy Projects

- Opportunities
  - Most RPS
  - Not intermittent
  - Greater capacity
  - Biomass concerns





# RPS Examples

	Goal	Date of Operation	Fuel	Location	2007 \$/REC
<b>TX</b>	500 MW (non-wind) by 2015	on or after Sep.1, 1999	LFG	Generated and metered in Texas	\$3-\$4
<b>CT</b>	20% by 2020	none	LFG (Class I)	CT, NEPOOL, or scheduled into NEPOOL	\$52
<b>NJ</b>	3.84% by 2008	Jan. 1, 2003 for imports	LFG (Class I)	NJ, or delivered into PJM	\$22
<b>NY</b>	24% by 2013	Jan. 1, 2003	LFG	New York, or delivered (monthly match)	~\$15



What role have LFGE projects played?



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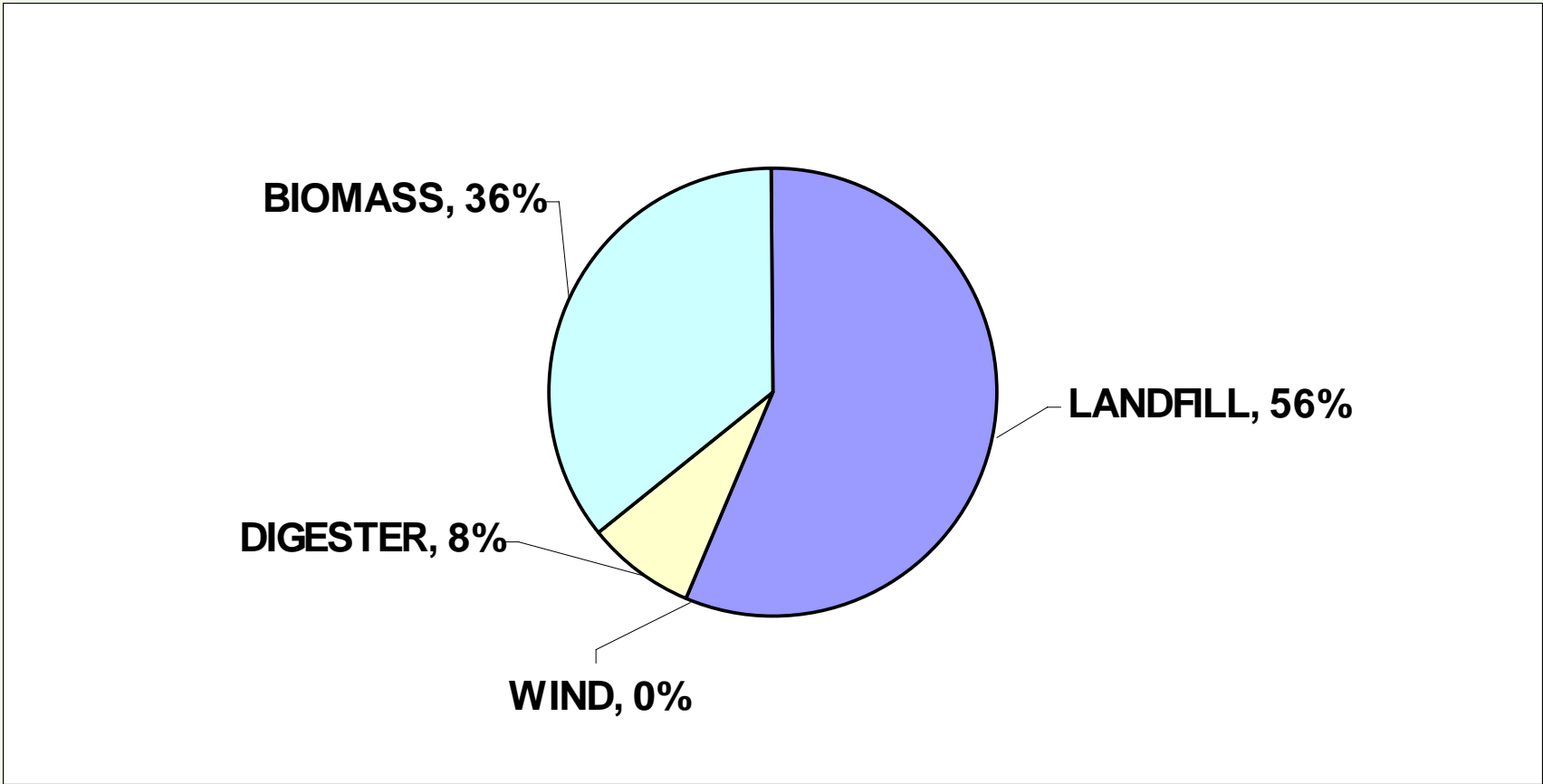
## Technologies Projected to Meet Northeast RPS Demand, by Technology and Snapshot Year Energy (GWh)

Energy (GWh)	2003	2006	2009	2012
Landfill methane	955	1,254	1,893	1,997
Biomass combustion	177	656	663	669
Fuel cells (CT only)	0	26	263	535
Generic PV. Etc.	0	5	11	22
Bio/gas co-fire	0	407	830	1,281
Bio/coal co-fire	0	93	432	1,191
Wind	0	765	1,492	2,580
<b>TOTAL</b>	<b>1,132</b>	<b>3,206</b>	<b>5,584</b>	<b>8,276</b>





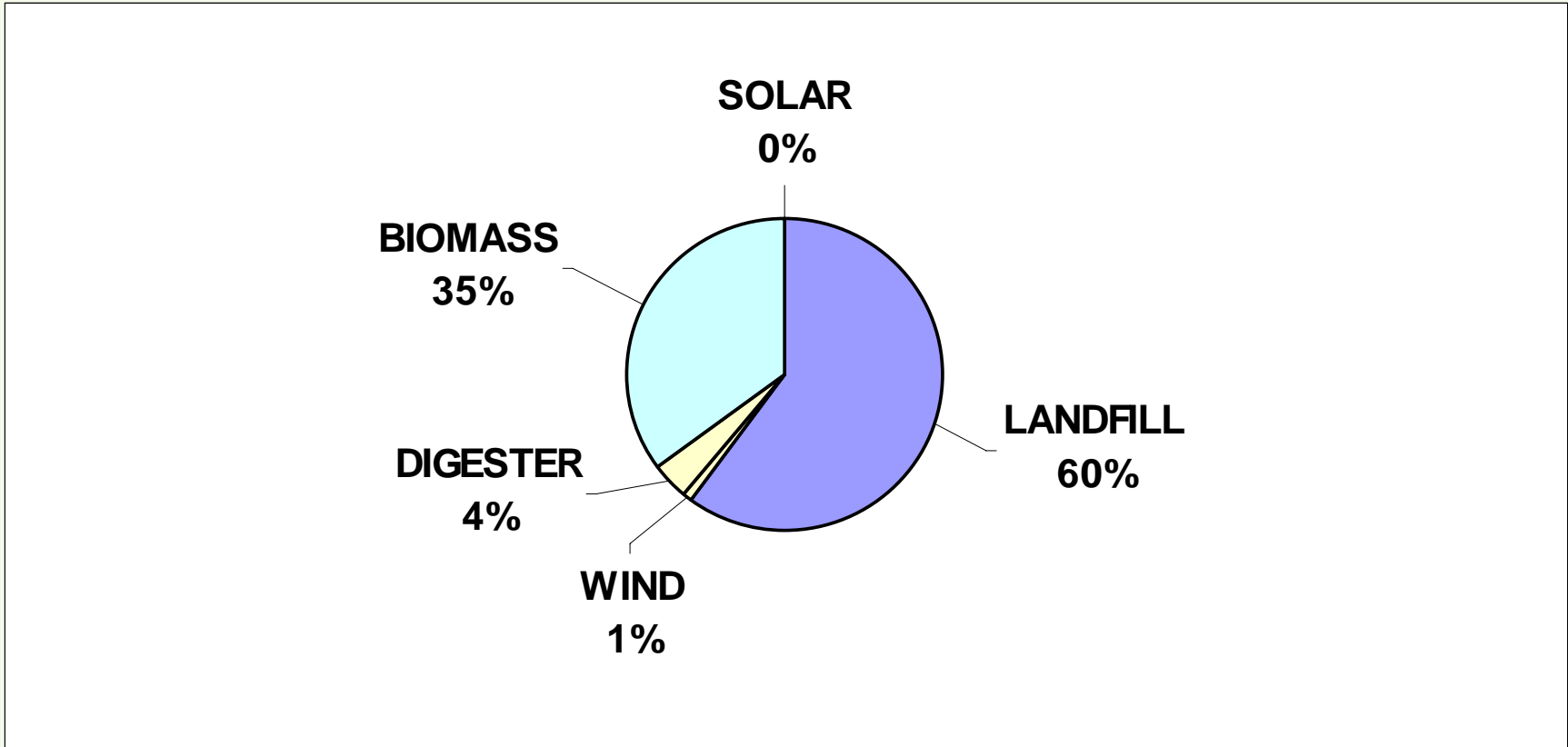
# 2003 MA RPS New Renewable Generation by Type





# 2004 MA RPS

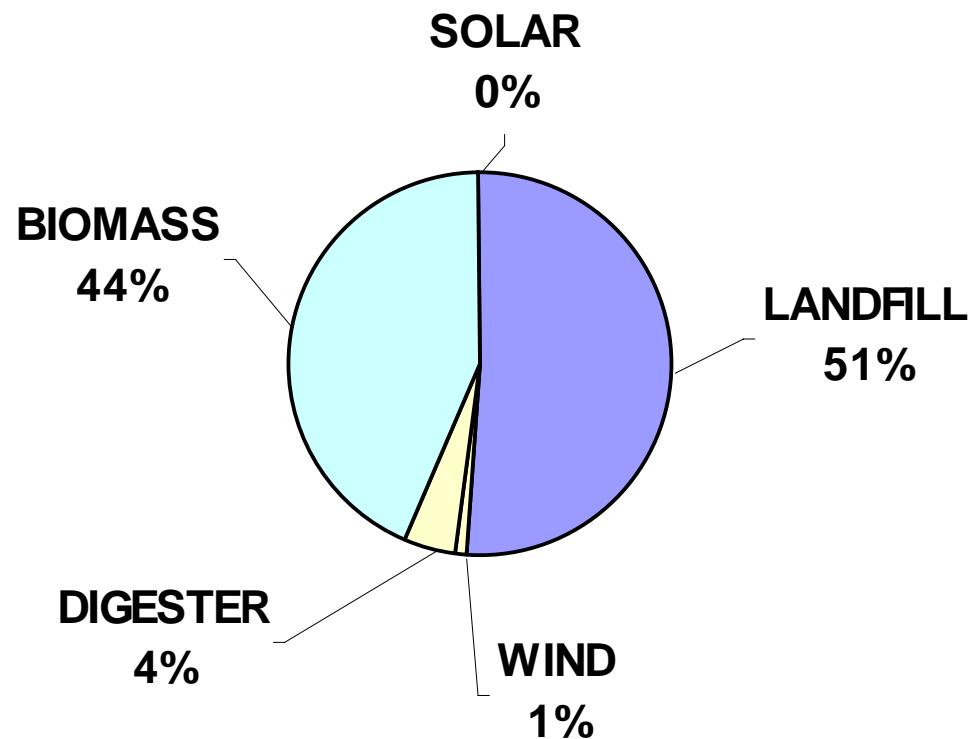
## New Renewable Generation by Type





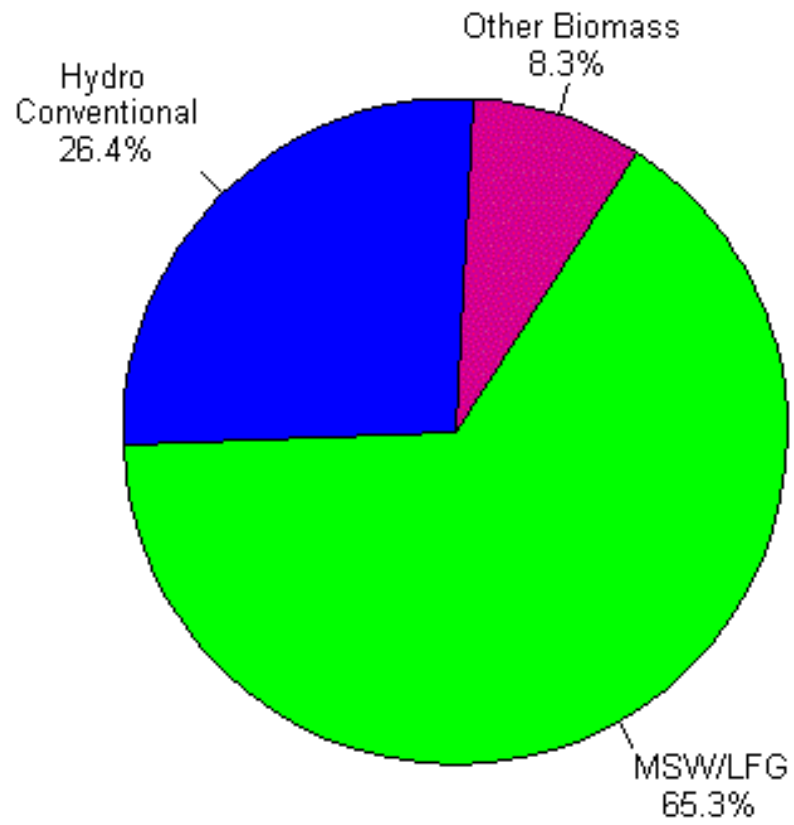
# 2005 MA RPS

## New Renewable Generation by Type





# 2003 CT RPS, Renewable Electricity Generation Market Share





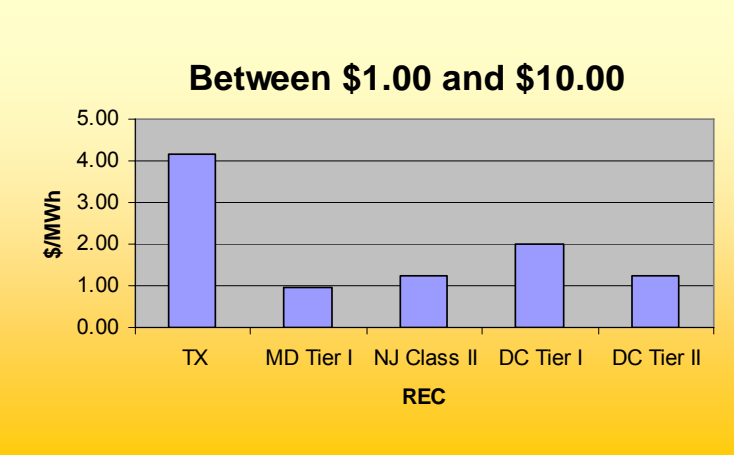
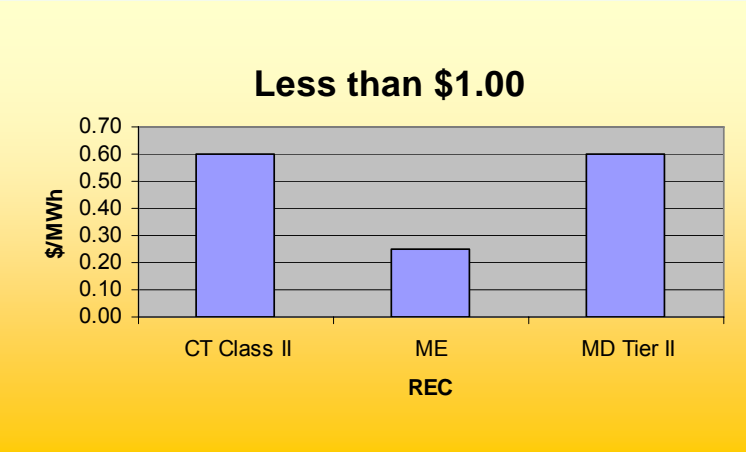
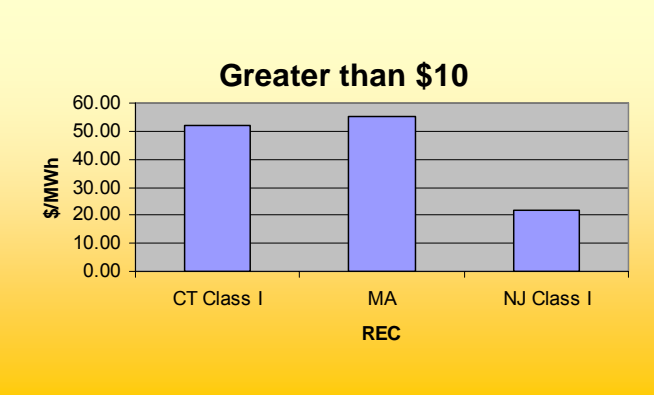
# A Landfill Gas to Energy Project is the workhorse!



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# Compliance Markets Nov. 2007





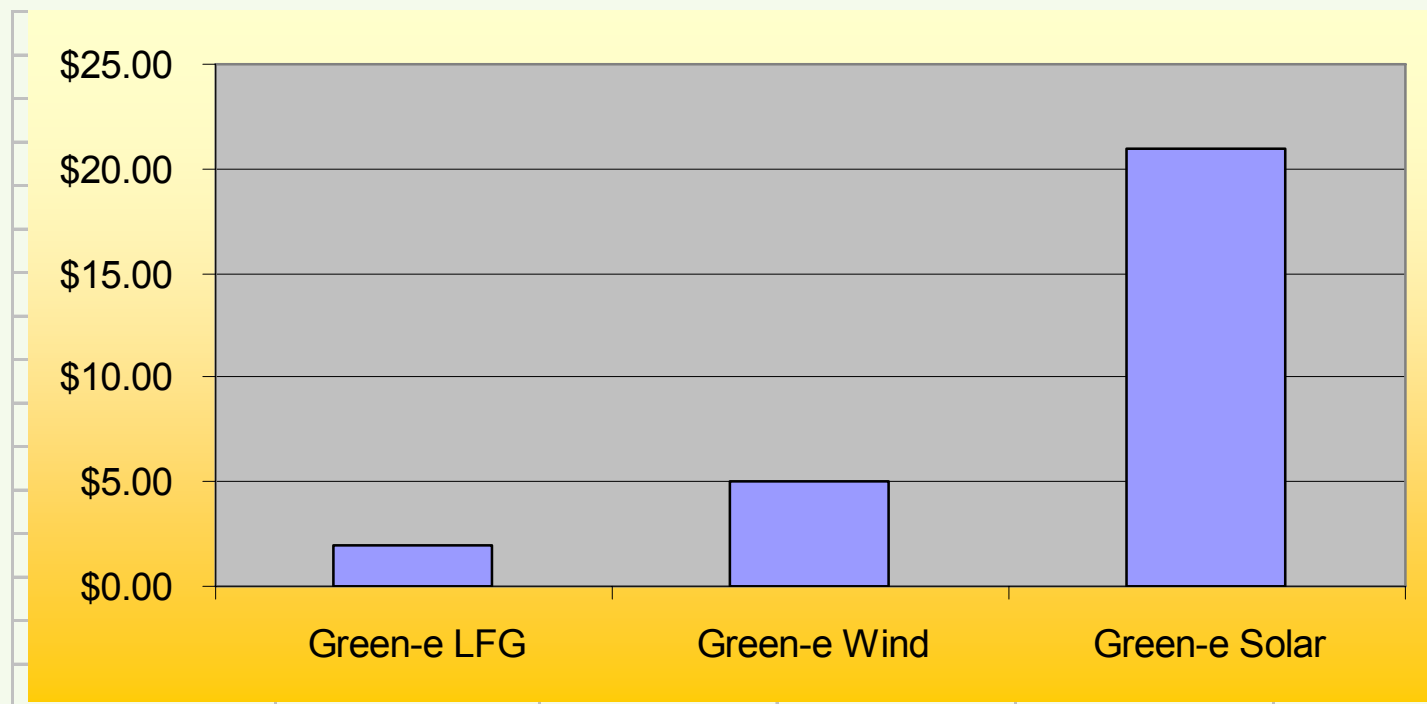
# Voluntary markets

- Who are the buyers?
- Is there money to be made?





# Voluntary Markets Nov. 2007





# Current REC Market trends

- Market volatility
- Low liquidity
- Thin Market
- Regulatory uncertainty





# Conclusion

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