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EXECUTIVE BRIEF

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0 to 40 with the Stroke of a Pen: Connecticut's New and Improved Renewable Portfolio Standard

Connecticut recently modified its renewable portfolio standard (RPS). The changes had an immediate impact on offer prices for RECs, which rose from virtually nothing to \$40 soon after the program became law. Evolution Markets' **Anna Giovinetto** sizes up the program, clocks its speed, and scrutinizes its effect on the market.

The Connecticut General Assembly implemented major changes to the state's energy laws, which included strengthening Connecticut's renewable portfolio standard or RPS. In addition to expanding the scope of the entities covered by the RPS, the law also redefines what types of renewable resources are eligible. As a result, 2004 demand is expected to exceed supply by at least 50%.

The Connecticut Governor signed the legislation into law on June 26, 2003, and the renewable energy certificate (REC) trading market responded almost immediately. Offer prices for Connecticut RPS-eligible RECs shot from \$1 to \$40/MWh, and the first trades are in the offing.

The impact of the new legislation will reverberate beyond Connecticut's borders. In addition to creating competition for RECs that qualify under both the Mas-

sachusetts and Connecticut programs, the RPS could potentially influence renewable energy certificate prices in the New York and PJM markets as well. The rapid emergence of a market for Connecticut RPS-eligible certificates also underscores the value added by certificate-based tracking and registration systems.

Evolution Markets' chief REC broker, Anna Giovinetto, provides an overview of the Connecticut renewable energy law and how it will impact the balance of supply and demand. Readers unfamiliar with the US renewables markets may wish to refer to Executive Brief edition number 17 (October 31, 2002) for an overview of this topic.

Background

Connecticut is part of the six-state New England Power Pool (NEPOOL), which also includes Massachusetts, Maine, New Hampshire, Rhode Island, and Vermont. Environmental reporting in NEPOOL is supported by the Generation Information System (GIS, www.nepoolgis.com), an online platform that creates "certificates" for each MWh of electricity generated. Certificates are created on a quarterly basis, and can be transferred between market participants' accounts with the click of a mouse. Thanks in part to the GIS, certificates from eligible generation resources located in any NEPOOL state may be retired for compliance with the Connecticut Renewable Portfolio Standard (RPS).

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Connecticut's RPS Legislation

The recent modifications to Connecticut's energy laws included significant changes to the RPS. Specifically, the legislation (officially known as Public Acts 03-135 and 03-221) does the following:

1. Modifies the RPS schedule.
2. Redefines Class I and II renewable resources.
3. Mentions the possibility of importing renewable energy or renewable energy attributes from New York and the PJM (Pennsylvania - Jersey - Maryland) power pool.
4. Extends the RPS to apply to utilities.
5. Extends to utilities other environmental provisions that currently apply only to suppliers.
6. Explicitly bars utilities from owning power plants or other generation assets.
7. Sets non-compliance penalties.

In addition to revising provisions requiring electric utilities to provide service to customers who do not choose a competitive supplier (Standard Offer Service, or SOS), Public Act 03-135 also extends the requirement for SOS for three years (Transitional SOS, or TSOS) and increases the maximum rate that utilities can charge for SOS. The Connecticut Department of Public Utility Control (DPUC) is the agency charged with implementation of the RPS.

Regulatory overview: The Connecticut General Assembly passed Substitute Senate Bill 733 on May 27, 2003, and on June 26, 2003 Governor Rowland signed Public Act 03-135 into law. On July 9, 2003 the General Assembly passed Public Act 03-221, which modified some sections of Public Act 03-135. For the purposes of this summary, "the Connecticut RPS" will refer to Public Act 03-135, unless Public Act 03-221 modifies the section in question.

Modified RPS Schedule

As of January 1, 2004, the RPS requires load serving entities (LSEs) in Connecticut to purchase and retire a quantity of NEPOOL certificates from eligible Connecticut Class I and Class II resources equivalent to the following percentages of their portfolios:

RPS Implementation Schedule Under Public Act 03-135

Compliance Year	Class I (%)	Class I or II (%)
2004	1.0%	3.0%
2005	1.5%	3.0%
2006	2.0%	3.0%
2007	3.5%	3.0%
2008	5.0%	3.0%
2009	6.0%	3.0%
2010	7.0%	3.0%

For example, if an LSE had 1,000,000 MWh of load in Connecticut in 2004, it would need to purchase and retire 10,000 vintage 2004 NEPOOL certificates from eligible Connecticut Class I resources, and 30,000 vintage 2004 NEPOOL certificates from eligible Connecticut Class I or Class II resources (a total of 40,000 vintage 2004 NEPOOL certificates). If the LSE had the same load in 2005, it would need to purchase and retire 15,000 vintage 2005 NEPOOL certificates from eligible Connecticut Class I resources, and 30,000 vintage 2005 NEPOOL certificates from eligible Connecticut Class I or Class II resources (a total of 45,000 vintage 2005 certificates).

Definition of Renewable Resources

Under the new RPS, the definitions of eligible Class I and Class II resources are as follows:

Class I

Public Act 03-135 expands the definition of Class I resources beyond wind, methane gas from landfills, fuel cells and solar PV to include ocean thermal power, wave or tidal power, and some hydropower and biomass. To be eligible as a Class I resource, hydropower facilities must have begun operation on or after July 1, 2003, have a capacity less than or equal to 5 MW, be "run-of-river" and not cause an appreciable change in the river's flow.

Public Act 03-221 modifies the definition of eligible biomass to the following:

“...a biomass facility, including, but not limited to, a biomass gasification plant that utilizes land clearing debris, tree stumps or other biomass that regenerates or the use of which will not result in a depletion of resources, provided such biomass is cultivated and harvested in a sustainable manner and the average emission rate for such facility is equal to or less than 0.075 pounds of nitrogen oxides per million BTU of heat input for the previous calendar quarter...”

Public Act 03-221 also expands the definition of Class I resources to include biomass facilities with a capacity of less than five hundred kilowatts and distributed generation from an eligible Class I energy source.

Class II

Under Public Act 03-135, hydropower facilities that meet the criteria for Class I but began operation before July 1, 2003 are eligible, as are trash-to-energy (also known as municipal solid waste) facilities. Biomass facilities that meet the criteria for Class I resources but have NOx emissions less than or equal to 0.2 pounds of NOx per MMBtu are eligible for Class II.**

Geographic Location and “Imports”

Under the GIS Operating Rules it is theoretically possible to import energy from renewable generation sources in adjacent power pools (e.g., New York) and have RPS-eligible certificates created for the renewable attributes. However, to date no RPS-driven imports have occurred. This is primarily because under the GIS Operating Rules, any imports must be delivered in ‘real time’ with hourly matching, which thus far has presented a daunting obstacle (especially for wind generators in upstate New York). The intermittent nature of wind generation makes it difficult to schedule, which exposes the wind generator (or other importer) to price risk in the event that they have to purchase spot market energy to cover any shortfall in wind generation.

The DPUC may also decide to accept attributes for energy that is not delivered to NEPOOL. If so, it seems likely that the DPUC will set some sort of threshold requirements; Sec. 7. Section 16-245 (a) (2) of Public Act 03-135 reads as follows:

*“An electric supplier or electric distribution company may satisfy the requirements of this subsection by
(A) purchasing Class I or Class II renewable energy sources within the jurisdiction of the regional independent system operator, or within the*

Summary of Class I and Class II Resources

	Class I	Class II
Wind	No restrictions	No restrictions
Landfill gas to energy	No restrictions	No restrictions
Fuel cells	No restrictions	No restrictions
Solar PV	No restrictions	No restrictions
Ocean thermal, wave or tidal power	No restrictions	No restrictions
Hydro	<ul style="list-style-type: none"> ■ Began operation after 7/1/2003 ■ ≤ 5 MW ■ Run-of-river/no effect on stream flow 	<ul style="list-style-type: none"> ■ Began operation before 7/1/2003 ■ ≤ 5 MW ■ Run-of-river/no effect on stream flow
Biomass (fuel must be cultivated and harvested in a sustainable manner)	<ul style="list-style-type: none"> ■ NOx emissions ≤ 0.075 lbs per MMBtu in the previous calendar quarter; or ■ Facilities with a capacity < 500 kW 	<ul style="list-style-type: none"> ■ NOx emissions ≤ 0.2 lbs per MMBtu in the previous calendar quarter **(see note below)
Distributed generation	No restrictions if from an eligible Class I energy source	No restrictions
Trash-to-energy	Not eligible	No restrictions

**** Note:** There is a lack of clarity on the definition of Class II biomass. Whereas Public Act 03-135 had an in-service date of July 1, 1998 as one of the criteria that distinguished Class I biomass from Class II biomass, Public Act 03-221 removed this in-service date from the Class I definition. However, Public Act 03-221 doesn’t mention any corresponding changes to the definition of Class II renewable energy resources. As such, the definition of Class II biomass says that eligible facilities “began operation before July 1, 1998” and have NOx emission less than or equal to 0.2 pounds per MMBtu for the previous calendar quarter.

jurisdiction of New York, Pennsylvania, New Jersey, Maryland, and Delaware, provided the department determines such states have a renewable portfolio standard that is comparable to this section; or

(B) by participating in a renewable energy trading program within said jurisdictions as approved by the Department of Public Utility Control.”

Examples of threshold requirements might include:

1. A certificate tracking system similar to the NEPOOL GIS: This would ensure against double counting, but none of the states listed are likely to be supported by such a system before 2005 at the earliest. The NY ISO is able to track attributes through “conversion transactions”, but at present the New York Public Service Commission does not permit “unbundled” attributes from New York generation to be sold to an end user outside the state (the sale of attributes bundled with electricity delivered outside the state is acceptable).
2. A reciprocal arrangement: For instance, the DPUC might examine whether or not the state in question would accept “exports” from generation resources located in Connecticut.

Given these potential limitations, it is unclear that any generation resources outside NEPOOL will qualify in 2004, and possibly 2005 as well, for reasons summarized in the table below:

State-Level Initiatives			
	RPS	Certificate tracking system	Reciprocity
New York	Under development; possibly in place by 2005?	Under consideration, possibly in place by 2005?	Under discussion; strong arguments for and against
New Jersey	Yes	Under consideration in PJM, possibly in place by	Not currently permitted
Pennsylvania	No	2005?	n/a
Maryland	No		n/a
Delaware	No		n/a

Extension of RPS to Utilities

Public Act 03-135 requires utilities to comply with the revised RPS schedule starting January 1, 2004. Beyond this, the Act requires that by July 1, 2007 each utility (Connecticut Light and Power and United Illuminating) must file one or more long-term contracts with the DPUC for Class I projects that have received funding from the state's Clean Energy Fund, at a price not to exceed the DPUC's estimate of wholesale costs plus up to 5.5 cents per kWh. The two utilities must contract for 100 MW of power between them. The costs of the contracts and the utilities' administrative costs are recoverable from ratepayers if (1) the contracts run for enough time to fund the projects (at least 10 years), and (2) the projects began operation on or after July 1, 2003. The power obtained under these contracts will count toward the utilities' Class I requirements.

Other Changes

Transitional Standard Offer Service (TSOS) 2004 to 2007

Public Act 03-135 also addresses the future of SOS. The Act modifies the requirement that utilities provide default service to such customers after the SOS requirement ends. It provides incentives for utilities to procure power for TSOS in a way that mitigates rapid changes in electricity prices.

Service Starting in 2007 for Customers Who Do Not Choose a Supplier (Standard Service)

Prior to Public Act 03-135, SOS was scheduled to “sunset” as of January 1, 2004, after which point the utilities were to only provide default service to customers who did not choose a supplier or were unable to maintain service with a supplier. Under Public Act 03-135, this schedule has been amended. Now TSOS will sunset January 1, 2007; after this date utilities are to provide default service to all residential customers and small and medium-sized business customers, and "last resort" service to larger customers. For both types of service, the utility is entitled to recover its actual net costs of procuring power and providing service, as long as it mitigates this cost for customers it no longer serves.

Alternatives to Transitional Standard Offer Service and Standard Service

Under Public Act 03-135, the DPUC can require the utilities to offer an alternative to transitional SOS through a competitive supplier or suppliers before January 1, 2007, and an alternative to SOS thereafter. The alternative can include an option that exceeds the amount of renewables mandated under the RPS, or that uses strategies or technologies to reduce the overall consumption of electricity.

Net Metering

Prior to Public Act 03-135, the utilities were required to provide a credit to their residential customers who generated electricity from a Class I renewable resource or any type of hydropower. In effect, the utilities had to run a customer's electric meter backward for the power produced using these resources ("net metering"). Public Act 03-135 extends this requirement to the utilities in their provision of transitional standard offer, standard offer, and backup services. Public Act 03-135 exempts net-metered customers who generate power from a unit with a capacity of up to 10 kW from the pre-Public Act 03-135 requirement that net-metered customers pay two charges (competitive transition assessment and systems benefits charge) based on the power they consumed, without receiving deductions for any electricity they produced.

Renewable Energy Investment Fund

Connecticut Innovations Incorporated (CII) administers the Renewable Energy Investment Fund, which is funded by a charge on electric bills. The Act expands the types of projects CII can invest in to include hydrogen production and conversion technologies.

Penalties for Noncompliance

Under Public Act 03-135 the penalty for failure to meet RPS is 5.5 cents per kWh, or \$55 for each Connecticut Class I/II eligible NEPOOL certificate an LSE fails to obtain. 2004 vintage Connecticut RPS-eligible certificates are already on offer in the market for prices ranging from \$40 to \$45. Buy-side interest is developing, but LSEs' certificate needs will depend on their success in bidding for tranches of the utilities' load, which will take place this fall.

Banking and "Deficit" Banking

The Connecticut RPS does not contain provisions for the banking of certificates. However, it does permit LSEs to make up a deficiency in meeting their Class I or Class II certificate needs one year with equivalent certificates generated in the first three months of the next year (a practice also known as "deficit" banking). However, certificates retired for deficit banking purposes cannot be counted toward an LSE's compliance needs for more than one year (no double counting).

Example: Deficit banking for an LSE with a shortfall of 3,000 Connecticut Class I eligible NEPOOL certificates

	LSE's CT Class I compliance need	Deficit (Surplus)	Total certificates retired
Year one	10,000	3,000	7,000
Year two	10,000	(3,000)	13,000*

*(3,000 from Q1, 10,000 from any Q)

Analysis: Looking Ahead

The implementation of the Connecticut RPS will have a dramatic effect on certificate prices for some types of renewable energy in NEPOOL, and possibly in the New York and PJM markets as well.

As outlined in the tables in the Appendix, the total demand for Connecticut RPS eligible certificates in 2004 is expected to be approximately 300,000 MWh for Class I and 900,000 MWh for Class II. While supply for Class II is expected to be plentiful, the Class I supply picture is much more constrained. As a result, many LSEs may have no alternative but to pay the non-compliance penalty of 5.5 cents per kWh for up to 1% of their load.

While the demand for certificates to comply with the Connecticut (and Massachusetts) RPS creates an incentive for the construction of new renewable generation, the rate at which additional capacity will come on line remains to be seen. As discussed above, imports could be one possible source of additional supply, but further development and clarification of the rules regarding imports is necessary.

Appendix

2004 estimated supply and demand for Connecticut Class I and II certificates; all figures are in MWh. Figures for generation in Q1 – Q4 2002 are from the NEPOOL GIS

Generation Statistics for 2002:					
CT Class I Eligible, by Fuel Type	Q1 2002	Q2 2002	Q3 2002	Q4 2002	TOTAL (rounded)
Solar Photovoltaic*	6	6	49	8	70
Wind	4,039	2,993	2,051	3,855	13,000
Landfill gas	57,029	72,504	70,014	82,729	282,000
Digester gas**			5,833	5,467	11,300
Other eligible biomass (NOx emissions \leq 0.075 lbs per MMBtu)	0	0	0	0	0
Eligible hydro***	0	0	0	0	0

*It is assumed that solar tags will be sold in the voluntary market; the same may also be true for some wind generation.

**Public Act 03-135 does not explicitly list digester gas as an eligible resource.

***Note that there are currently no hydro electric resources eligible for Class I (=online after 7/1/2003).

2004 Class I Supply and Demand Based on Generation Statistics for 2002:			
CT Class I Eligible, by Fuel Type	Estimated Total Supply (NEPOOL)	Estimated Certificates Retired for Compliance w/MA RPS†	Estimated Certificates Available for Compliance w/CT RPS††
Wind	13,000	3,000	10,000
Landfill gas	282,000	130,000	152,000
Total Class I Supply			162,000
Estimated CT Demand			300,000
Estimated Shortfall			~(138,000)

† For the purpose of this example, it is assumed that certificates that are eligible under both the MA and CT RPS will be retired for compliance with the MA RPS.

†† Note that only certificates from landfill facilities in service after 1/1/98 are eligible for compliance under the MA RPS.

2004 Class II Supply and Demand Based on Generation Statistics for 2002:					
CLASS II by Fuel Type	Q1 2002	Q2 2002	Q3 2002	Q4 2002	TOTAL
VERY ROUGH estimate of hydro <= 5 MW; "run-of-river" status unknown					3,500,000
Trash-to-energy/Municipal solid waste	716,111	893,056	900,080	966,587	3,475,834
Total Class II Supply?					~7,000,000
Estimated Class II Demand					900,000
Estimated Surplus					~6,100,000

Resources

Text of Substitute Senate Bill 733:

<http://www.cga.state.ct.us/2003/tob/s/2003SB-00733-R05-SB.htm>

<http://www.cga.state.ct.us/2003/TOB/s/pdf/2003SB-00733-R05-SB.pdf>

The legislature's summary of the bill is posted at:

<http://www.cga.state.ct.us/2003/sba/2003SB-00733-R01-BA.htm>

Public Act 03-135:

<http://www.cga.state.ct.us/2003/act/Pa/2003PA-00135-R00SB-00733-PA.htm>

Public Act 03-221:

<http://www.cga.state.ct.us/2003/act/Pa/2003PA-00221-R00HB-06428-PA.htm>

Connecticut Department of Utility Control:

<http://www.state.ct.us/dpuc/index.html>

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Evolution Markets publishes the Executive Brief to inform market participants and encourage discussion on important issues confronting the energy and environmental markets. We encourage your feedback on the issues presented here and your input on future editions of the Executive Brief.