

REC Markets and Biomass Power Generation

Governor's Panel on Optimizing Wood Harvesting

Dec 11, 2008

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A REC...

IS

A product separate from power production

Sometimes requested by government

Sometimes chosen by customers

Costly to create

Sometimes valuable - sometimes not (\$50 to \$0.50)

A risky asset

A growth product

IS NOT

A windfall

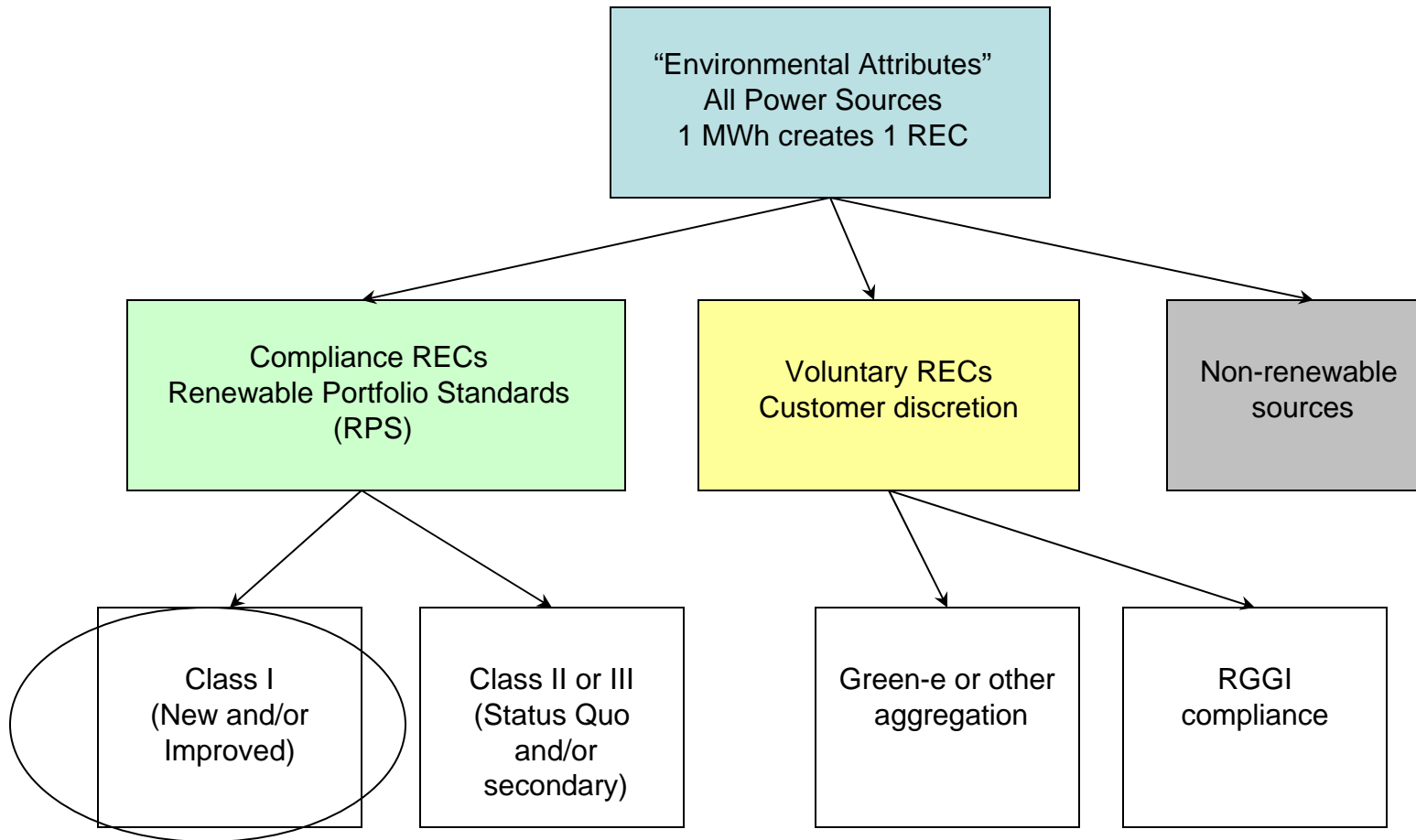
A subsidy

A CO2 credit

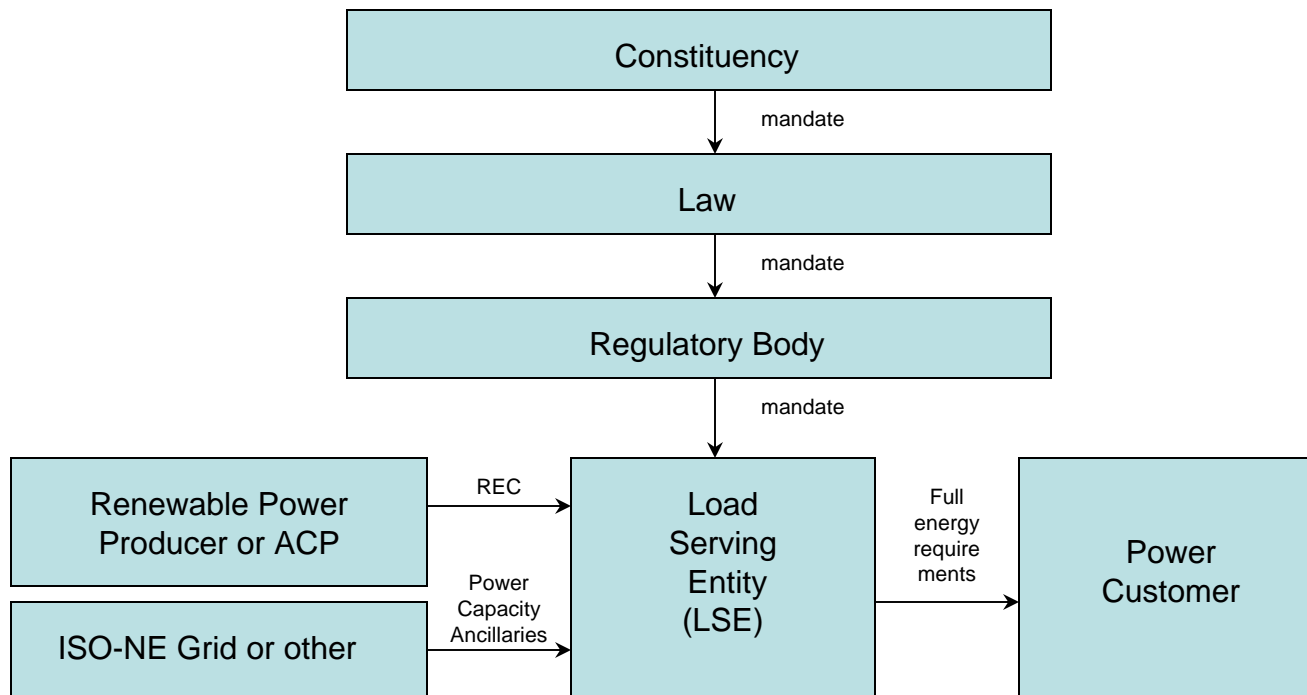
Tied to a power transaction

New (green tags in 1990s)

The REC Family Tree



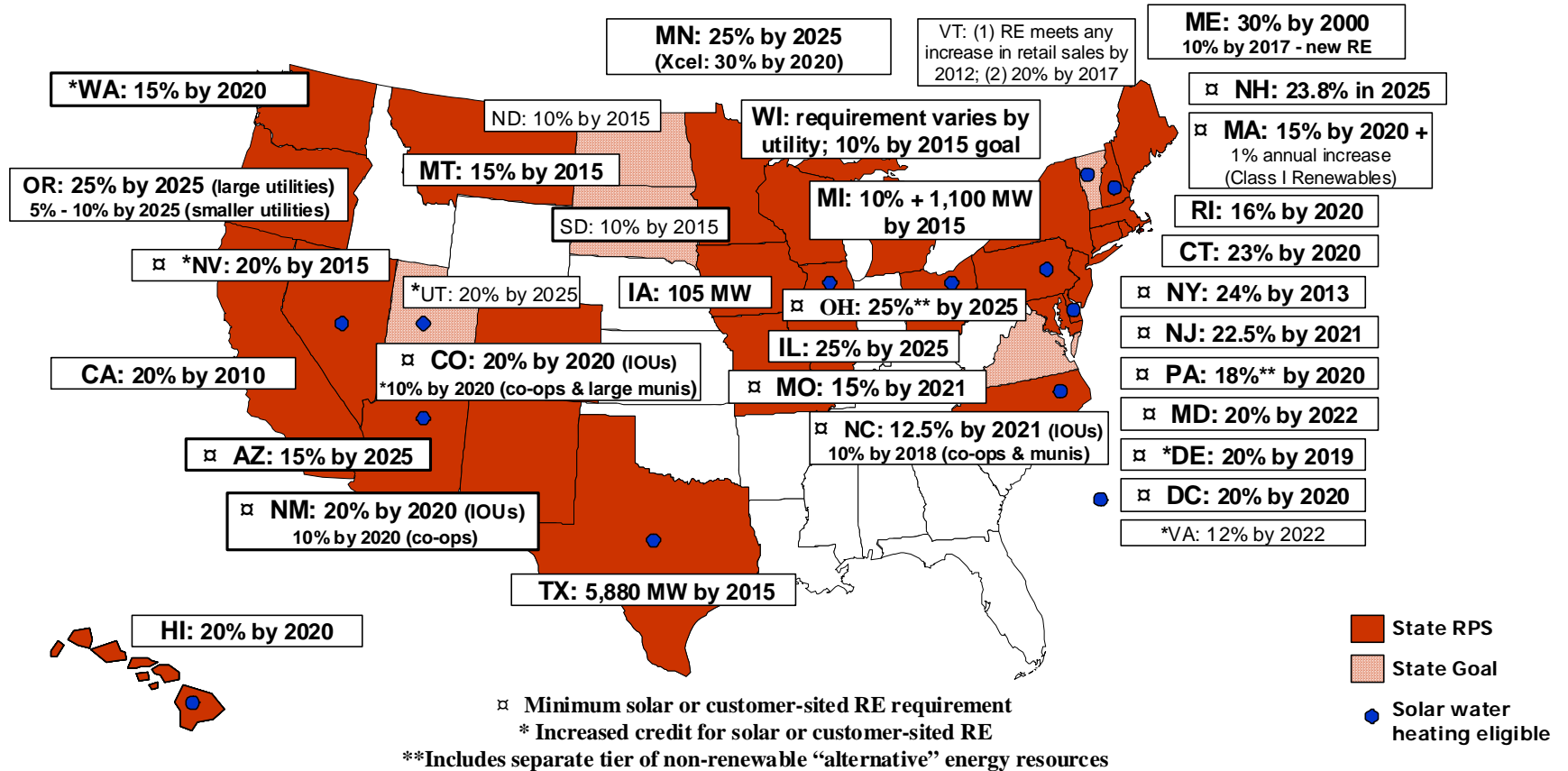
RPS



RPS Across the Nation

DSIRE: www.dsireusa.org

November 2008



Common Class I renewable sources: wind, solar, geothermal, biomass, wave, tidal, and landfill gas. Also sometimes included are small run-of-river hydro and fuel cell technology.

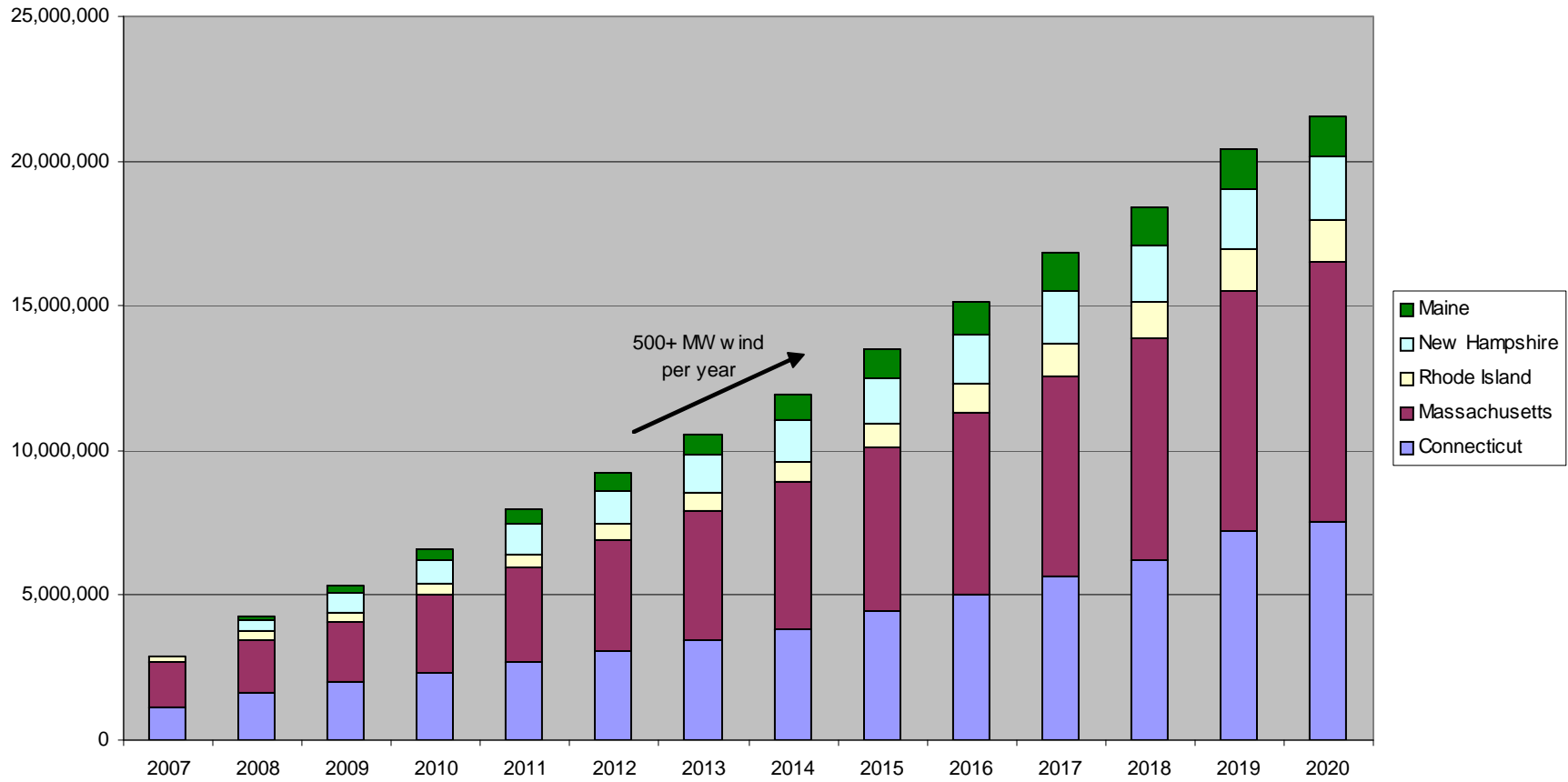
New England State RPS Summary

Table 8-3
Required RPS Percentages of Annual Electric Energy Use that Renewable Resources Must Provide for Load-Serving Entities

Year	CT Classes ^(a)			MA Class ^(b)	ME Classes ^(c)		RI Classes ^(d)		NH RPS Classes ^(e)			
	I	II	III	I	I	II	Existing	New	I	II	III	IV
2008	5.0	3% in all years	2.0	3.5	1.0	30% in all years	2.0	1.5	0.0	0.0	3.5	0.5
2009	6.0		3.0	4.0	2.0		2.0	2.0	0.5	0.0	4.5	1.0
2010	7.0		4.0	5.0	3.0		2.0	2.5	1.0	0.04	5.5	1.0
2011	8.0		4.0	6.0	4.0		2.0	3.5	2.0	0.08	6.5	1.0
2012	9.0		4.0	7.0	5.0		2.0	4.5	3.0	0.15	6.5	1.0
2013	10.0		4.0	8.0	6.0		2.0	5.5	4.0	0.2	6.5	1.0
2014	11.0		4.0	9.0	7.0		2.0	6.5	5.0	0.3	6.5	1.0
2015	12.5		4.0	10.0	8.0		2.0	8.0	6.0	0.3	6.5	1.0
2016	14.0		4.0	11.0	9.0		2.0	9.5	7.0	0.3	6.5	1.0
2017	15.5		4.0	12.0	10.0		2.0	11.0	8.0	0.3	6.5	1.0
2018	17.0		4.0	13.0	10.0		2.0	12.5	9.0	0.3	6.5	1.0
2019	19.5	4.0	14.0	10.0	2.0	14.0	10.0	0.3	6.5	1.0		
2020	20.0	4.0	15.0	10.0	2.0	14.0	11.0	0.3	6.5	1.0		
Use Generator Information System renewable energy certificates?	Yes			Yes	Yes		Yes		Yes			
Purchase of Renewable Energy Certificates (RECs) from outside ISO New England allowed? ^(f)	Yes, from adjacent areas, with confirmation of delivery of energy from the renewable energy source			Yes, from adjacent areas, with confirmation of delivery of energy	Yes, from adjacent areas		Yes, from adjacent areas		Yes, from adjacent areas, with confirmation of delivery of energy from the renewable energy source			

- (a) All Connecticut Class I technologies except landfill gas and fuel cells can be used to meet Class II requirements. For Class III, CHP facilities can be used to offset generation on the grid with the more efficient on-site use of fuel.
- (b) The MA Department of Energy Resources (MA DOER) has yet to determine the specific percentage requirements for Class II resources, which would add to the MA's RPS Class I requirements shown on the table. Also, the provision for DOER to review the annual 1% growth in RPS requirements has been rescinded in the 2008 energy bill (S. 2768; <http://www.env-ne.org/public/resources/pdf/S2540-08.pdf>).
- (c) The 30% requirement refers to electric energy delivered to LSEs.
- (d) Existing resources can make up no more than 2.0% of the total.
- (e) Class I increases an additional 1% per year from 2015 through 2025. Classes II to IV remain at the same percentages from 2015 through 2025.
- (f) A Renewable Energy Certificate represents the environmental attributes of 1 MWh of electricity from a certified renewable generation source for a specific state's RPS. Providers of renewable energy are credited with RECs, which usually are sold or traded separately from the electric energy commodity.

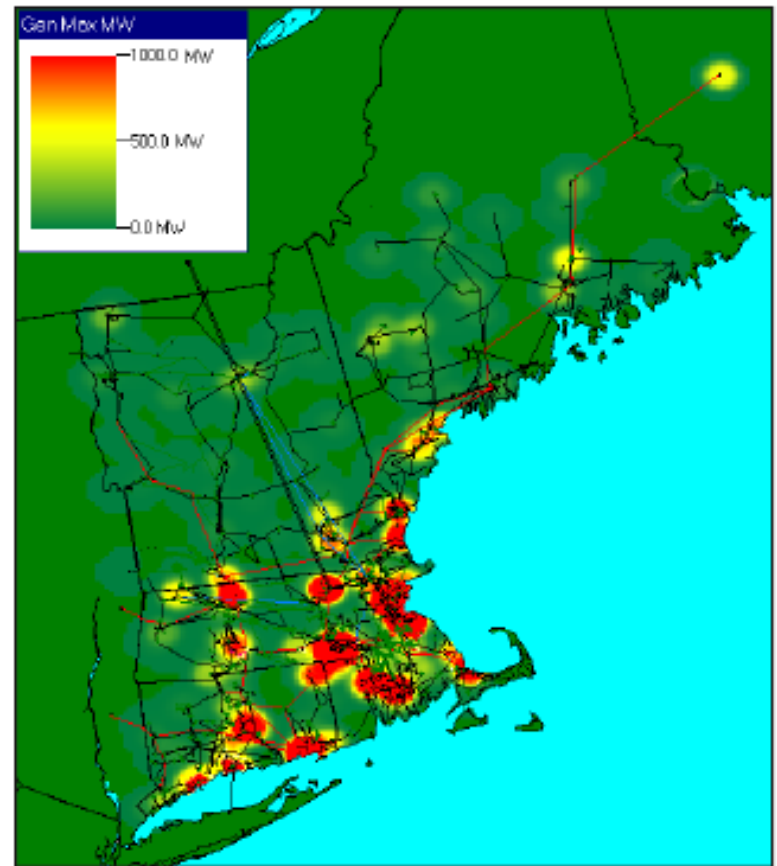
New England Summary continued



Note CT and MA comprise 75% of demand

Geography

- Deliverability rules
 - All 5 RPS states require energy delivered into ISO-NE (ME also allows NMISA)
 - Quebec, NB, NY power can qualify if power is delivered
- Behind the meter
 - Philosophical differences
 - RI and NH = in-state only
 - MA and CT = all ISO-NE territory
 - ME = ?
- Bottom line
 - Biomass behind-the-meter in Maine can qualify for RECs in MA and CT, and maybe ME



Class I Standards

- New England RPS restrict biomass eligibility through 3 criteria
 - “New” or increased standard
 - Start up date
 - Incremental generation
 - Incremental capacity
 - Fuel standard
 - Harvested in sustainable manner
 - Eligible fuel list
 - Technology standard
 - Emissions
 - Investment to materially improve efficiency

Biomass and RPS

	ME	CT	MA	NH	RI
% req. 2009	2%	6%	4%	0.50%	2%
% req. 2020	10%	20%	15%	11%	14%
Biomass tech standard	New: no Existing: refurbishment to significantly increase efficiency	NOx emission limit	NOx and PM emission limits	NOx and PM emission limits	no
Biomass “new” standard	yes, with tech standard for existing and incremental existing	no	yes, incremental existing allowed	yes, incremental existing allowed	yes, incremental existing allowed
Biomass fuel standard	none	cultivated and harvested in a sustainable manner	eligible biomass as listed by regulations	eligible biomass as listed by regulations	eligible biomass as listed by regulations
Behind-the-meter allowed?	pending	yes, all ISO-NE	yes, all ISO-NE	NH only	RI only