

# MassDEP GHG Reporting Program Summary Report For Retail Sellers of Electricity Emissions Year 2008

July 2012

The information below summarizes the 2008 greenhouse gas (GHG) emissions and megawatt hours of electricity sales reported to the Massachusetts Department of Environmental Protection (MassDEP) by the 66 retail sellers that sold electricity in Massachusetts during that year, as required by MassDEP regulation 310 CMR 7.71. Additional information about MassDEP's GHG program is available at <http://www.mass.gov/dep/air/climate/reporting.htm>; see particularly *Retail Seller of Electricity Reporting*. MassDEP will use the information presented here in considering future measures to reduce emissions from the electric sector. This was the first year of reporting under the regulation.

MassDEP requires retail sellers to report emissions that occur from the generation of the electricity that they sell. The GHGs emitted from power plant smokestacks during combustion of fuels to generate electricity are carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O). Biogenic and non-biogenic GHG emissions are reported separately. Biogenic GHG emissions are emissions of CO<sub>2</sub> that result from the combustion of biogenic (plant or animal) material, excluding fossil fuels. Non-biogenic GHG emissions include CO<sub>2</sub> released from the combustion of non-biogenic fuel, plus CH<sub>4</sub> and N<sub>2</sub>O released from the combustion of any fuel.

For 2008, the retail seller reporting process consisted of 4 steps:

- Step 1. MassDEP developed initial GHG emission factors in terms of pounds of non-biogenic and biogenic GHGs in carbon dioxide equivalents per megawatt hour (lb CO<sub>2</sub>e/MWh) based on all of the electricity consumed in Massachusetts.
- Step 2. Some retail sellers chose to report use of MWh from particular generating units, and any associated emissions.
- Step 3. MassDEP developed final GHG emission factors for the electricity consumed in Massachusetts that was not reported in Step 2, by removing the MWh and emissions reported in Step 2 from the initial emission factors developed in Step 1.
- Step 4. Retail sellers determined their GHG emissions by multiplying the final emission factors in Step 3 by the energy they sold that they did not report in Step 2, and then adding any emissions reported in Step 2.

The purpose of Step 2 is to allow retail sellers to document the use of clean energy. Because MWh associated with this clean energy are included in Step 1 but excluded in Step 3, the final emission factors are greater than the initial emission factors. For more details on the reporting process and development of GHG emission factors for electricity consumed in Massachusetts, see *Final 2008 Greenhouse Gas (GHG) Emission Factors to be used by Retail Sellers of Electricity Reporting under 310 CMR 7.71(9) "Reporting Requirements for Retail Sellers of Electricity"* (<http://www.mass.gov/dep/air/climate/rsefrtc.doc>).

## 2008 GHG Emission Factors

The following table shows the initial (Step 1) and final (Step 3) emission factors upon which retail seller GHG emissions are based. MassDEP recommends that anyone choosing to use emission factors presented in this document for purposes other than retail seller reporting should use the Initial (Step 1) GHG emission factors shown in Table 1, not the final (Step 3) emission factors. For an explanation of the

“Massachusetts-based” and “Regional-based” approaches, see *Draft 2008 Greenhouse Gas (GHG) Emission Factors to be used by Retail Sellers of Electricity Reporting under 310 CMR 7.71(9) “Reporting Requirements for Retail Sellers of Electricity”* (<http://www.mass.gov/dep/public/hearings/drseftsd.doc>).

Table 1. GHG Emission Factors for Electricity Consumed in Massachusetts in 2008, prior to and after accounting for particular generating units in Step 2 (lb CO<sub>2</sub>e/MWh)

	Massachusetts-based approach Non-Biogenic	Massachusetts-based approach Biogenic	Regional-based approach Non-Biogenic	Regional-based approach Biogenic
Initial (Step 1)	854	97	700	139
Final (Step 3)	871	98	708	141

### 2008 MWh Sold by Retail Sellers

66 Massachusetts retail sellers sold electricity in 2008. The 66 retail sellers were comprised of 4 electric utilities, 22 competitive suppliers, and 40 municipal electric departments or light boards.

Table 2. 2008 MWh Sold by Retail Sellers in MA

	Electric Utilities	Competitive Suppliers	Municipal Electric Departments or Light Boards	Total
MWh in DOER Annual Report and DPU Annual Returns	25,514,875	24,806,760 <sup>1</sup>	8,154,220 <sup>2</sup>	58,475,855

### 2008 MWh Reported from Particular Generating Units

For 2008, 2 electric utilities and 17 municipal electric departments or light boards (shown in the charts and Appendix 2 below) chose to report use of particular generating units in Step 2, totaling approximately 1.5 million MWh. The following tables show the amounts of non-emitting MWh from particular generating units that retail sellers chose to report for 2008, by fuel type and location of generator. No retail sellers reported MWh from particular emitting generating units. For each retail seller that chose to report use of particular generating units, Charts 1 and 2 show the MWh reported, and the % those MWh were of that retail seller’s 2008 electricity MWh sales. To illustrate trends, the retail sellers are presented in the charts in order of increasing percentage of reported non-emitting power.

Table 3. Non-Emitting 2008 Generation Reported by Retail Sellers by Fuel Type

Fuel Type	Hydro	Nuclear	PV	Wind	Total
MWh Reported	418,238	801,263	94	257,909	1,477,504
% of Total	28%	54%	<1%	17%	100%

Table 4. Non-Emitting 2008 Generation Reported by Retail Sellers by State or Province in which Generator is Located

Location of Generating Unit	MA	CT	ME	NH	NY	Quebec	PEI	Total
MWh Reported	253,532	313,238	12,192	488,558	235,427	168,185	6,372	1,477,504
% of Total	17%	21%	1%	33%	16%	11%	0.4%	100%

<sup>1</sup> Due to rounding, the total MWh reported to MassDEP by competitive suppliers was 1 MWh greater than the total MWh shown here from Massachusetts’ Renewable Energy Portfolio Standard *Annual RPS Compliance Report for 2008* by the Massachusetts Department of Energy Resources (DOER) (see Appendix Two in <http://www.mass.gov/eea/docs/doer/rps/rps-2008annual-rpt.pdf>).

<sup>2</sup> Due to confusion on which value was to be reported, the MWh reported to MassDEP by seven municipal electric departments and light boards was 3,853 MWh greater in total than the MWh shown here from the 2008 *Annual Returns* to the Massachusetts Department of Public Utilities (DPU).

Chart 1. 2008 Electricity Sales Reported as Non-Emitting by Retail Seller (MWh and % of sales)  
 (retail sellers not listed chose not to report non-emitting sales)

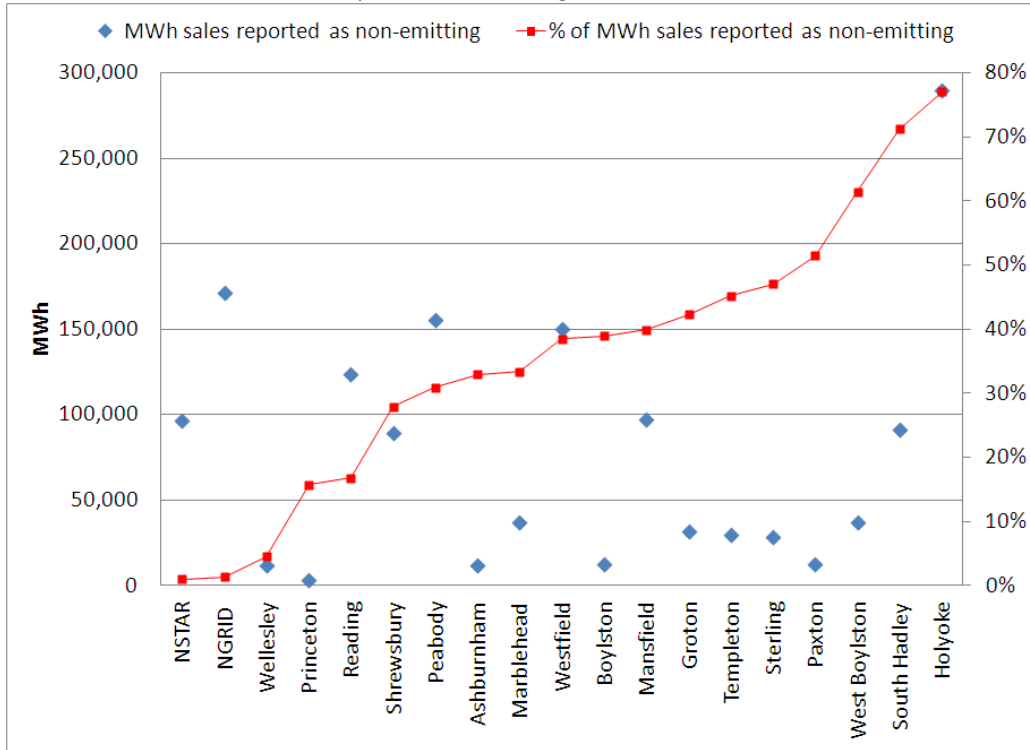
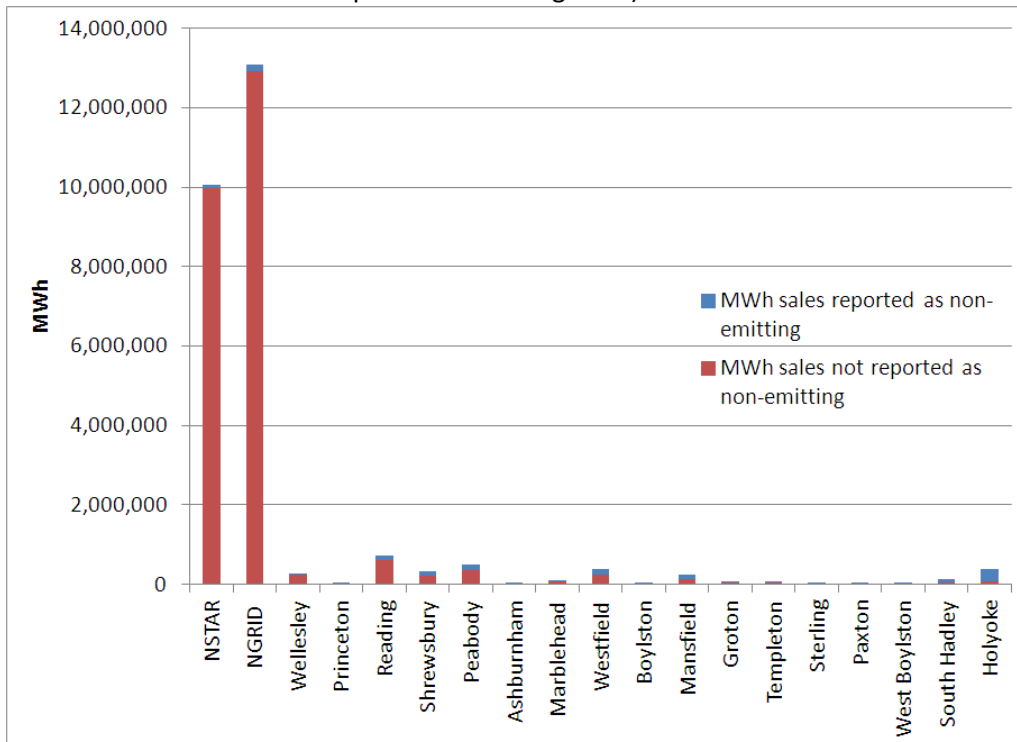


Chart 2. 2008 Electricity Sales by Retail Seller: Reported as Non-Emitting vs. Not Reported as Non-Emitting (MWh)  
 (retail sellers not listed chose not to report non-emitting sales)



**2008 Individual Retail Seller GHG Emissions**

See Appendix 1.

**2008 Individual Retail Seller GHG Emission Factors**

For each retail seller that submitted MWh from particular generating units in Step 2, “individual” GHG emission factors were determined. These factors represent individual GHG emission rates for each of these retail sellers based on their reported GHG emissions in Appendix 1 and their MWh of electricity sales. The greater the percentage of total MWh electricity sales reported as non-emitting MWh, the lower a retail seller’s individual emission factors. The individual emission factors are shown in Appendix 2.

## Appendix 1: 2008 Retail Seller GHG Emissions

Below are 2008 GHG emissions for each retail seller calculated by MassDEP based on:

- the final GHG emission factors from Step 4 above, and
- MWh reported to DOER by electric utilities and competitive suppliers and to DPU by municipal electric departments and light boards, less MWh from any particular generating units that a retail seller reported in Step 2.

Table 5. 2008 MA Retail Seller GHG Emissions (Short Tons CO<sub>2</sub>e)

	Massachusetts-based approach Non-Biogenic	Massachusetts-based approach Biogenic	Regional-based approach Non-Biogenic	Regional-based approach Biogenic
<b>Electric Utilities</b>				
NGRID (Mass. and Nantucket Elec.)	11,252,198,152	1,266,033,776	9,146,448,096	1,821,538,392
NSTAR Electric Co.	8,680,321,546	976,660,748	7,055,875,608	1,405,195,566
NU (Western Mass. Electric Co.)	1,826,756,139	205,536,282	1,484,894,772	295,720,569
Unitil (Fitchburg Gas & Electric Co.)	230,921,262	25,981,956	187,706,376	37,382,202
<b>Competitive Suppliers</b>				
Consolidated Edison Solutions, Inc.	2,327,208,351	261,844,338	1,891,691,748	376,735,221
Constellation NewEnergy, Inc.	6,818,557,304	767,185,552	5,542,524,192	1,103,807,784
Direct Energy Business, LLC	1,688,696,542	190,002,596	1,372,671,816	273,371,082
Direct Energy Services, LLC	1,700,283,455	191,306,290	1,382,090,340	275,246,805
Dominion Retail, Inc.	927,244,825	104,328,350	753,719,100	150,105,075
Easy Energy of MA	193,362	21,756	157,176	31,302
Gexa Energy (now NextEra Energy)	95,138,459	10,704,442	77,334,132	15,401,289
Glacial Energy of Massachusetts, Inc	295,188,868	33,212,984	239,946,864	47,786,028
Hampshire Council of Governments	28,824,874	3,243,212	23,430,552	4,666,254
Harvard Dedicated Energy, Ltd.	233,772,916	26,302,808	190,024,368	37,843,836
Hess Corporation	1,265,519,450	142,389,100	1,028,688,600	204,865,950
Horizon Power and Light LLC	24,221,639	2,725,282	19,688,772	3,921,069
Integrus Energy Services, Inc.	502,107,983	56,494,354	408,142,884	81,282,693
Liberty Power Holdings	18,408,585	2,071,230	14,963,580	2,980,035
MXenergy Electric, Inc.	152,106,214	17,114,132	123,640,872	24,623,394
Pepco Energy Services, Inc.	298,777,388	33,616,744	242,863,824	48,366,948
Sempra Energy (now Noble Energy)	714,927,252	80,439,576	581,134,896	115,734,492
South Jersey Energy	1,332,630	149,940	1,083,240	215,730
Spark Energy, LP	19,054,867	2,143,946	15,488,916	3,084,657
Suez Energy Resources NA, Inc.	2,008,664,489	226,003,582	1,632,760,572	325,168,419
TransCanada Power Marketing Ltd.	2,485,456,857	279,649,566	2,020,325,436	402,352,947
WFM Intermediary NE Energy	1,002,521	112,798	814,908	162,291
<b>Municipal Electric Departments or Light Boards</b>				
Ashburnham Muni. Light Dept.	20,330,011	2,287,418	16,525,428	3,291,081
Belmont Municipal Light Dept.	114,660,182	12,900,916	93,202,536	18,561,522
Boylston Municipal Light Dept.	16,981,016	1,910,608	13,803,168	2,748,936
Braintree Electric Light Dept.	342,158,414	38,497,732	278,126,472	55,389,594
Chester Muni. Electric Light Dept.	5,024,799	565,362	4,084,452	813,429
Chicopee Electric Light Dept.	396,404,294	44,601,172	322,220,712	64,171,074
Concord Municipal Light Plant	165,186,021	18,585,798	134,272,908	26,740,791
Danvers Electric Division	294,231,639	33,105,282	239,168,772	47,631,069
Georgetown Municipal Light Dept.	47,461,661	5,340,118	38,579,628	7,683,231

	Massachusetts-based approach Non-Biogenic	Massachusetts-based approach Biogenic	Regional-based approach Non-Biogenic	Regional-based approach Biogenic
Groton Electric Light Dept.	37,488,711	4,218,018	30,473,028	6,068,781
Groveland Municipal Light Dept.	33,509,983	3,770,354	27,238,884	5,424,693
Hingham Municipal Lighting Plant	169,743,093	19,098,534	137,977,164	27,478,503
Holden Municipal Light Dept.	94,461,692	10,628,296	76,784,016	15,291,732
Holyoke Gas & Electric Dept.	75,238,722	8,465,436	61,158,456	12,179,862
Hudson Light & Power Dept.	359,338,889	40,430,782	292,091,772	58,170,819
Hull Municipal Lighting Plant	48,349,210	5,439,980	39,301,080	7,826,910
Ipswich Municipal Light Dept.	105,494,649	11,869,662	85,752,252	17,077,779
Littleton Electric Light & Water	227,517,394	25,598,972	184,939,512	36,831,174
Mansfield Municipal Electric Dept.	127,280,972	14,320,936	103,461,456	20,604,612
Marblehead Municipal Light Dept.	64,009,790	7,202,020	52,030,920	10,362,090
Merrimac Muni. Light & Water	26,670,891	3,000,858	21,679,668	4,317,561
Middleborough Gas & Elec. Dept.	229,518,952	25,824,176	186,566,496	37,155,192
Middleton Muni. Electric Dept.	90,253,891	10,154,858	73,363,668	14,610,561
North Attleboro Electric Dept.	213,671,107	24,041,066	173,684,436	34,589,697
Norwood Municipal Light Dept.	304,550,376	34,266,288	247,556,448	49,301,496
Paxton Municipal Light Dept.	10,094,019	1,135,722	8,205,012	1,634,049
Peabody Municipal Light Plant	303,872,738	34,190,044	247,005,624	49,191,798
Princeton Municipal Light Dept.	13,413,400	1,509,200	10,903,200	2,171,400
Reading Municipal Light Dept.	533,692,185	60,048,030	433,816,380	86,395,635
Rowley Municipal Lighting Plant	38,863,149	4,372,662	31,590,252	6,291,279
Russell Municipal Light Dept.	4,510,909	507,542	3,666,732	730,239
Shrewsbury Electric & Cable Ops.	201,106,061	22,627,318	163,470,828	32,555,631
South Hadley Electric Light Dept.	32,132,932	3,615,416	26,119,536	5,201,772
Sterling Municipal Light Dept.	27,592,409	3,104,542	22,428,732	4,466,739
Taunton Municipal Lighting Plant	631,577,778	71,061,564	513,383,544	102,241,638
Templeton Muni. Light & Water	31,310,708	3,522,904	25,451,184	5,068,668
Wakefield Muni. Gas & Light	170,523,509	19,186,342	138,611,532	27,604,839
Wellesley Municipal Light Plant	210,698,384	23,706,592	171,268,032	34,108,464
West Boylston Muni. Light. Plant	20,114,003	2,263,114	16,349,844	3,256,113
Westfield Gas & Electric	209,640,119	23,587,522	170,407,812	33,937,149
<b>2008 RETAIL SELLER TOTAL GHGs</b>	<b>49,645,564,592</b>	<b>5,585,838,496</b>	<b>40,354,833,216</b>	<b>8,036,767,632</b>

## Appendix 2: Individual 2008 Retail Seller Emissions Factors resulting from Optional Submittals

Below are the 2008 GHG emission factors for each retail seller that chose to report use of non-emitting MWh from particular generating units.

Table 6. Individual 2008 Retail Seller Emissions Factors (lbs CO<sub>2</sub>e/MWh)

	MWh reported as non-emitting	Massachusetts-based emission factors (lbs CO <sub>2</sub> e/MWh)		Regional-based emission factors (lbs CO <sub>2</sub> e/MWh)		% of sales reported as non-emitting MWh
		Non-Biogenic	Biogenic	Non-Biogenic	Biogenic	
<b>Electric Utilities</b>						
NGRID (Mass. and Nantucket Elec.)	171,072	860	97	699	139	1.3%
NSTAR Electric Co.	96,734	863	97	701	140	1.0%
<b>Municipal Electric Departments or Light Boards</b>						
Ashburnham Muni. Light Dept.	11,466	584	66	475	95	32.9%
Boylston Municipal Light Dept.	12,435	532	60	432	86	38.9%
Groton Electric Light Dept.	31,529	503	57	409	81	42.3%
Holyoke Gas & Electric Dept.	289,406	200	23	163	32	77.0%
Mansfield Municipal Electric Dept.	96,925	524	59	426	85	39.9%
Marblehead Municipal Light Dept	36,711	581	65	472	94	33.3%
Paxton Municipal Light Dept.	12,295	423	48	344	68	51.5%
Peabody Municipal Light Plant	155,615	602	68	490	98	30.8%
Princeton Municipal Light Dept.	2,861	735	83	597	119	15.7%
Reading Municipal Light Dept.	123,699	725	82	589	117	16.8%
Shrewsbury Electric & Cable Ops.	89,222	628	71	511	102	27.9%
South Hadley Electric Light Dept.	91,303	251	28	204	41	71.2%
Sterling Municipal Light Dept.	28,173	461	52	375	75	47.1%
Templeton Muni. Light & Water	29,583	478	54	388	77	45.1%
Wellesley Municipal Light Plant	11,468	832	94	676	135	4.5%
West Boylston Muni. Light. Plant	36,712	336	38	273	54	61.4%
Westfield Gas & Electric	150,295	536	60	436	87	38.4%