

MassDEP
Bureau of Waste Prevention

**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”**

Regulatory Authority:
M.G.L. Chapter 111, Sections 142A through 142E
and Chapter 21N, Section 2(a)

July 2010

Introduction

This document and the attached spreadsheet explain:

- the regulations requiring retail sellers of electricity to report greenhouse gas (GHG) emissions;
- the draft 2008 emission factors (EFs);
- the data sources and methodology used to calculate the draft EFs;
- the deadlines for public comment and retail seller submittals; and
- the process to be used to determine final EFs.

The posting of this document and the attached spreadsheet on the website of the Massachusetts Department of Environmental Protection (MassDEP) triggers a 30 day public comment period, ending at 5 pm on August 23, 2010. By that deadline, any person may comment on the methodologies, data sources or calculations used to determine the draft EFs.

In addition, any retail seller choosing to take advantage of the optional regulatory provisions allowing retail sellers to account for the ownership and/or use of particular generation sources during 2008 must submit the relevant information using BWP AQ 31 “Optional Greenhouse Gas Emissions Reporting Form for Retail Sellers of Electricity” by 5 pm on August 23, 2010. Please see Form AQ 31 and its instructions for more details. This is the only opportunity for retail sellers to submit the optional information for emissions associated with electricity sold in 2008.

Comments or Form AQ 31 submittals must be sent to Sue Ann Richardson at sue.ann.richardson@state.ma.us or MassDEP, One Winter Street, Boston, MA 02108 by the 5 pm August 23, 2010 deadline.

Background

The Massachusetts Global Warming Solutions Act (GWSA) requires “reporting of greenhouse gas emissions from generation sources producing all electricity consumed, including transmission and distribution line losses from electricity generated within the commonwealth or imported from outside the commonwealth; provided, however, that this requirement shall apply to all retail sellers of electricity, including electric utilities, municipal electric departments and municipal light boards...”¹

This requirement is implemented through chapter 310 of the Code of Massachusetts Regulations (CMR), subsection 7.71(9) “Reporting Requirements for Retail Sellers of Electricity,”² which requires each retail seller of electricity to annually report to MassDEP its megawatt hours sold, and associated GHG emissions released in the course of generating that electricity.

“Retail Seller” means a competitive supplier licensed by the Department of Public Utilities or, as each is defined in Massachusetts General Law (MGL) chapter 164A §1, an electric utility, municipal electric department or municipal light board.

The GHGs emitted from power plant smokestacks during combustion of fuels to generate electricity are carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O). The regulation requires retail sellers to report biogenic and non-biogenic GHG emissions separately. Biogenic GHG emissions means emissions of CO₂ that result from the combustion of biogenic (plant or animal) material, excluding fossil fuels. Non-biogenic GHG emissions include CO₂ released from the combustion of non-biogenic fuel, plus CH₄ and N₂O released from the combustion of any fuel.

¹ See M.G.L. Chapter 21N, Section 2(a)(5) at <http://www.mass.gov/legis/laws/seslaw08/sl080298.htm>.

² <http://www.mass.gov/dep/air/laws/regulati.htm#771>

Determining Annual GHG Emissions

Retail seller GHG emissions are to be determined by multiplying:

- Final EFs supplied by MassDEP each year for biogenic and non-biogenic GHG emissions (pounds carbon dioxide equivalents³ per megawatt hour, or lb CO₂e/MWh), by
- Annual electricity consumed by customers in a particular calendar year, increased to account for the portion of electricity lost during transmission and distribution (“line losses”) (megawatt hours, or MWh).

Later sections of this document explain how draft 2008 EFs were calculated. MassDEP seeks public comment on the methodologies, data sources or calculations used to determine the draft 2008 EFs. Once final 2008 EFs have been determined, they will be used by retail sellers to determine 2008 GHG emissions as described in this section.

In implementing the basic approach of reporting GHG emissions based on multiplying EFs by the MWh consumed by a retail seller’s customers, MassDEP requires that retail sellers rely on existing sources of MWh data. In particular, retail sellers subject to the Massachusetts Department of Energy Resources’ (DOER) Renewable Portfolio Standard (RPS) regulations at 225 CMR 14.00 and 15.00 are required to use the same MWh for their compliance with RPS for reporting their GHG emissions. This value is already reviewed by DOER, and it makes sense for retail sellers and MassDEP to rely on the efforts of suppliers and DOER to verify this value, and not duplicate that work. Similarly, Massachusetts electric departments and light boards, while not subject to RPS, are required to report the MWh consumed by their customers in an “annual return” to the Massachusetts Department of Public Utilities (DPU).⁴ MassDEP requires these retail sellers to use the MWh they report in their “annual return” on page 57, line 15 to calculate their reported GHG emissions. Line losses are included in the MWh reported to DOER for the RPS and to DPU for the annual return, and use of these MWh sources therefore complies with GWSA’s requirement that GHG reporting by electricity sellers include “transmission and distribution line losses.”

As explained further in BWP AQ 31 “Optional Greenhouse Gas Emissions Reporting Form for Retail Sellers of Electricity” and its instructions,⁵ a number of adjustments to the basic approach are allowed in order to account for the ownership and/or use⁶ of particular generation sources by certain retail sellers. MassDEP has attempted to keep this adjustment process simple in order to encourage providing credit to electric sellers for their clean electricity purchases. Allowing individual retail sellers to make adjustments in their GHG reporting affects the EFs representing the remaining MWh consumed in Massachusetts. Specifically, once individual retail sellers “take credit” for non- or low-emitting MWh, EFs must be

³ Not all GHGs have the same heat-trapping capacity. For example, one pound of methane is equivalent to greater than 20 pounds of CO₂ with respect to their heat trapping potentials. To account for these differences, a standard relating the heat trapping potential of each GHG to an equivalent quantity of CO₂ over a given time horizon, has been developed. Emissions shown in this document utilize this standard, and are expressed in units of pounds of carbon dioxide equivalent (CO₂e).

⁴ Annual Return Form AC-19 for municipalities can be found at <http://www.mass.gov/?pageID=eoeesubtopic&L=5&L0=Home&L1=Energy%2c+Utilities+%26+Clean+Technologies&L2=Electric+Power&L3=Electric+Tariffs%2c+Applications+and+Forms&L4=Applications+and+Forms&sid=Eoeea>.

⁵ Also see “Background Information and Technical Support Document for Proposed Amendments to 310 CMR 7.71 Mandatory Reporting of Greenhouse Gas Emissions to a Regional Registry” March 26, 2009, at <http://www.mass.gov/dep/service/regulations/ghgratsd.doc>.

⁶ For example, if a retail seller owns a hydroelectric plant and supplies the MWh from that plant to its customers, it may choose to submit BWP AQ 31 “Optional Greenhouse Gas Emissions Reporting Form for Retail Sellers of Electricity” to take credit for the non-emitting hydroelectric power, rather than multiplying those MWh by the final EFs.

recalculated based on the emissions of the remaining MWh consumed in Massachusetts, to ensure accuracy and avoid double counting. The final EFs to be used by retail sellers for the remaining MWh will likely increase, since presumably most retail sellers choosing to make adjustments will make that effort only for electricity with lower EFs than the overall Massachusetts EFs, effectively removing clean MWh from the calculation of the final EFs for the remaining MWh consumed in Massachusetts. Thus, submittals of BWP AQ 31 “Optional Greenhouse Gas Emissions Reporting Form for Retail Sellers of Electricity” will be used for two purposes: to allow an individual retail seller to account for ownership and/or use of particular generation sources, and to modify the annual EFs used by retail sellers to report annual GHG emissions associated with MWh that are not reported on Form AQ 31.

Reporting Annual GHG Emissions

The annual GHG report shall be submitted to MassDEP by each retail seller on BWP AQ 32, “Mandatory Greenhouse Gas Emissions Reporting Form for Retail Sellers of Electricity.” The report shall include a spreadsheet provided by MassDEP showing the calculations required under 310 CMR 7.71(9)(c). Since the EFs change annually as the quantity and sources of electricity imported into and generated within Massachusetts change, an updated Form AQ 32 will be posted each year on the MassDEP website when final EFs have been determined.

The spreadsheet to be provided by MassDEP as part of BWP AQ 32, “Mandatory Greenhouse Gas Emissions Reporting Form for Retail Sellers of Electricity,” simplifies reporting for retail sellers. All retail sellers must report the total MWh they report to DOER (for competitive suppliers and electric utilities) or to DPU (for municipal electric departments and municipal light boards). Retail sellers who choose the simplest reporting approach (not adjusting for ownership and/or use of particular generation sources), need only enter the total MWh, and the spreadsheet will calculate the associated GHG emissions, with no further information required (note that the spreadsheet will calculate Massachusetts-based and Regional GHG emissions as explained further in the “Methodology and Data Sources” section of this document). Two optional types of information may be submitted (which must match any information submitted on Form AQ 31):

- Retail sellers making adjustments for the use of non-emitting MWh, must enter the non-emitting MWh, and the spreadsheet will calculate the total GHG emissions.
- Retail sellers making adjustments for the use of emitting MWh, must enter the emitting MWh, and the GHG emissions associated with the emitting MWh, and the spreadsheet will calculate the total GHG emissions.

Initial and Annual Reporting Years

The regulation states that there will be an “initial” reporting year for retail sellers and then regular “annual” reporting will begin with GHG emissions released in 2010. Please note that reporting by retail sellers is not required for GHG emissions released in years between the initial year and 2010.

Regulatory provision 310 CMR 7.71(9)(b)1. indicates that the initial year for which emissions would be reported by retail sellers would be “2005, 2006, or 2007, as determined by the Department.” Since the time that provision was proposed on March 26, 2009, MassDEP has found that the data necessary to calculate draft EFs for the year 2008 are available. In the interest of having the most recent possible data available, the draft EFs presented here therefore relate to electricity consumed in 2008, which will be the initial reporting year.

Regulatory provision 310 CMR 7.71(9)(b)2. indicates that the first annual report from retail sellers will be for calendar year 2010 emissions released in the course of generating electricity consumed in 2010, with an annual report due every year thereafter.

Draft 2008 EFs

Table 1 contains the draft GHG EFs on which MassDEP is seeking public comment. The spreadsheet in Appendix A contains the data and calculations described below and used to calculate the draft EFs.

Table 1. Draft GHG Emission Factors for Electricity Consumed in Massachusetts in 2008

lb CO ₂ e/MWh	Massachusetts-based approach	Regional approach
Non-Biogenic	855	718
Biogenic	97	142

Methodology and Data Sources

A number of steps were followed to calculate the four draft EFs presented in Table 1. Emissions released while generating electricity in each New England state and New York were determined as specified in steps 1 and 2 below, using available power plant data. Emissions released while generating electricity in New Brunswick and Quebec were determined as specified in step 3 below.

1. *Part 75 CO₂ emissions.* For certain units that reported CO₂ emissions in 2008 under federal regulation 40 Code of Federal Regulations (CFR) Part 75, CO₂ emissions reported under Part 75 were used. Part 75 does not require separate reporting of CO₂ emissions by type of energy produced (steam vs. electricity) or fuel used (biogenic vs. non-biogenic). Therefore, CO₂ emissions reported under Part 75 by units co-generating steam and electricity or firing biogenic and non-biogenic fuels could not be used for this effort to determine electricity EFs for biogenic and non-biogenic fuels. CH₄ and N₂O emissions released during the generation of electricity by Part 75 units were determined as in step 2 below. In 2008 there were net electricity exports from New England to New York, and therefore there was no need to assess New York Part 75 CO₂ emissions; such analysis would be necessary in a year in which there were net exports of electricity from New York to New England, to account for emissions associated with imported electricity.

2. *GHG emissions other than Part 75.* State level emissions of: CH₄ and N₂O; CO₂ for Part 75 units not included in step 1 above; and CO₂ for non-Part 75 units, were determined by multiplying fuel-specific heat input by fuel- and pollutant-specific EFs (note that these fuel- and pollutant-specific EFs are distinct from the draft GHG EFs in Table 1).

Heat input (in millions of British thermal units per year, or mmBtu) was obtained from the United States Department of Energy's Energy Information Administration's (EIA's) "Power Plant Operations" Form 923⁷ on which certain facilities report the heat input used to make electricity. Final 2008 heat input data became available on EIA's website on March 8, 2010.

Fuel-specific EFs (in pounds of CO₂, CH₄ and N₂O emitted per mmBtu combusted, or lb/mmBtu) came from a variety of sources. Best practice is to use the most geographically specific emissions or fuel-specific EFs available. Thus, unit-specific CO₂ emissions were used where available (as detailed in step 1 above). National fuel-specific EFs obtained from the EIA⁸ were used where unit-specific emissions were not available, and international fuel-specific EFs were used where unit-specific emissions or national EFs were not available. International EFs were obtained from the Intergovernmental Panel on Climate Change.⁹ The attached Appendix A spreadsheet documents the source and values of unit-specific, national or international CO₂, CH₄ and N₂O emissions and EFs for each fuel for each state.

⁷ Form available at http://www.eia.doe.gov/cneaf/electricity/2008forms/consolidate_923.html and summarized data submitted available at http://www.eia.doe.gov/cneaf/electricity/page/eia906_920.html

⁸ *Electric Power Annual 2008*, U.S. Energy Information Administration, Released: January 21, 2010. See Table A3 "Carbon Dioxide Uncontrolled Emission Factors" at <http://www.eia.doe.gov/cneaf/electricity/epa/epax1filea3.xls>

⁹ *2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 2: Energy* at http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_2_Ch2_Stationary_Combustion.pdf. See Chapter 2: *Stationary*

Multiplying heat inputs by fuel-specific EFs resulted in total non-Part 75 CO₂, CH₄ and N₂O emissions released while generating electricity, per fuel and per state. The CO₂ emissions released from the combustion of biogenic fuels were summed per state, for use in calculating the biogenic EFs in the Table 1. Separately, the CO₂ emissions released from the combustion of non-biogenic fuel, plus the CH₄ and N₂O emissions released from the combustion of any fuel, plus the Part 75 non-biogenic CO₂ emissions available for certain units, were summed per state, for use in calculating the non-biogenic EFs in Table 1.

3. *New Brunswick and Quebec emissions.* Canadian non-biogenic GHG emissions released during the generation of electricity were obtained for each province from an Environment Canada report.¹⁰ Canadian biogenic CO₂ emissions released during the generation of electricity were calculated by multiplying:

- the MWh of electricity generated from wood combustion obtained from Statistics Canada,¹¹
- the same fuel-specific EF used in step 2 above, and
- an average heat rate.¹²

4. *Accounting for emissions from Massachusetts' imports of electricity.*

The amount of electricity generated each year by power plants located inside of Massachusetts is 75-80% of the amount of electricity consumed in Massachusetts. The remaining 20-25% of electricity is generated outside of Massachusetts and imported from power plants located in other states and in Canada. Thus, the GHG emissions from the power plants located in Massachusetts do not represent the total GHG emissions associated with consumption of electricity in Massachusetts. As required by statute,¹³ MassDEP requires reporting that reflects all the GHG emissions associated with generation of the electricity consumed in the state.

Calculating the draft and final EFs requires electric-generating sector GHG emissions data in each of the six New England states and in each of the electricity grid control areas adjacent¹⁴ to New England that may send power to New England, determined as described in steps 1 to 3 above. In addition to state- and province-level GHG emissions, one approach to calculating the EFs requires the MWh of electricity generated and consumed in each New England state, and imported from adjacent control areas, which is

Combustion, Table 2.2 “Default emission factors for stationary combustion in the energy industries (kg of greenhouse gas per TJ on a net calorific basis).”

¹⁰ *National Inventory Report 1990–2008: Greenhouse Gas Sources and Sinks in Canada*, Environment Canada, April 15, 2010 at

http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/5270.php.

See Table A13-5 “Electricity Generation and GHG Emission Details for New Brunswick” and Table A13-6 “Electricity Generation and GHG Emission Details for Quebec.”

¹¹ *Table 127-0006 - Electricity generated from fuels, by electric utility thermal plants, annual (megawatt hour)*, Statistics Canada, CANSIM (database). http://cansim2.statcan.gc.ca/cgi-win/cnsmcgi.exe?Lang=E&CNSM-Fi=CII/CII_1-eng.htm (accessed: May 5, 2010).

¹² In the absence of province-specific heat rates, the average heat rate of wood-fired New England and New York electric generating units in 2008 (as determined from EIA Form 923 data) was used.

¹³ From GWSA, ““Statewide greenhouse gas emissions”, the total annual emissions of greenhouse gases in the commonwealth, including all emissions of greenhouse gases from the generation of electricity delivered to and consumed in the commonwealth, accounting for transmission and distribution line losses, whether the electricity is generated in the commonwealth or imported; provided, however, that statewide greenhouse gas emissions shall be expressed in tons of carbon dioxide equivalents.”

¹⁴ The control areas adjacent to New England that could send power to New England are New York, Quebec and New Brunswick.

available from the region's independent system operator, ISO New England, which manages the New England electricity grid.¹⁵

There are a variety of methods that can be used to estimate the emissions due to Massachusetts' consumption of electricity, including emissions associated with electricity generated out-of-state. MassDEP believes it is appropriate to consider GHG emissions associated with electricity consumption in state-specific and regional contexts, since, due to the linked, regional nature of the New England electricity grid, electricity generated in a state is not necessarily consumed in that state, even if that state is a net importer of electricity.

Therefore, Table 1 and the Appendix A spreadsheet present two sets of draft biogenic and non-biogenic EFs to account for emissions associated with electricity consumed in Massachusetts. The first "Massachusetts-based" set of EFs assumes that all electricity generated in Massachusetts is used in Massachusetts. Thus, these EFs are based on all emissions from Massachusetts power plants, plus a portion of emissions from power plants in the other New England states that generate more electricity than they use in a given year and in the adjacent control areas (New York, New Brunswick, Quebec) in years that New England receives net imports of electricity from those control areas.

Under this "Massachusetts-based" approach, emissions due to Massachusetts' consumption of imported electricity were determined by apportioning to Massachusetts a share¹⁶ of any excess generation (and associated emissions) from each New England state that generates more electricity than it uses. Thus, the Massachusetts-based draft EFs include a share of the emissions associated with each electricity-exporting state's exported electricity, as calculated from emissions as discussed in steps 1, 2 and 3 above. Similarly, the approach apportions to Massachusetts a percentage of the megawatt hours of losses (and associated emissions) due to pumped hydro¹⁷ and of the net annual imports into the ISO New England grid from the New York, New Brunswick and Quebec grids.

The second "Regional" set of EFs is based on the fraction of New England electricity (in MWh) that is consumed in Massachusetts. Massachusetts is then assumed to be responsible for that same fraction of the GHGs emitted while generating that electricity. Thus, these EFs are based on the total of New England GHG emissions from electricity generation plus GHG emissions associated with electricity imported from the adjacent control areas (New York, New Brunswick, Quebec) in years that New England receives net imports of electricity from those control areas; this total is multiplied by the ratio of Massachusetts to New England electricity consumption.

¹⁵ Electric sector GHG emissions determined as described in steps 1 and 2 include the entire state of Maine, while ISO New England load for Maine in the attached spreadsheet does not include the part of Maine supplied by the Northern Maine Independent System Administrator (NMISA). Northern Maine load and generation data were obtained from NMISA to estimate the ISO New England and NMISA fractions of Maine's total generation, to prorate Maine's electric sector GHG emissions.

¹⁶ Generally, the emissions associated with electricity from exporting states are assigned proportionately to importing states. For example, in 2008, MA, CT and NY all generated less electricity than they used (and New England sent electricity to NY), while ME, NH, RI, VT, New Brunswick and Quebec generated more electricity than they used (and New Brunswick and Quebec sent electricity to New England). Massachusetts' MWh needs were 69% of the sum of MWh needed by MA and CT and MWh sent to New York from New England. Therefore, 69% of the excess generation (and associated emissions) from ME, NH, RI, VT, New Brunswick and Quebec were apportioned to MA.

¹⁷ The megawatt hours of losses associated with pumped hydro were obtained from ISO-NE. The megawatt hours of losses associated with pumped hydro were apportioned to each New England state according to that state's fraction of total New England load.

Table 2 below summarizes the information found on each tab of the spreadsheet in Appendix A used to calculate draft EFs.

Table 2. Information presented on each tab of the Appendix A spreadsheet to calculate 2008 Emission Factors

Tab	Contents
1 “Form 923 Generation and Fuel Data”	2008 heat input by unit and fuel from EIA Form 923 totaled by state and fuel type and used to calculate GHG emissions on Tab 5
2 “EPA Part 75 data”	2008 CO ₂ emissions data from EPA for Part 75 units (used in place of calculating CO ₂ from EIA fuel data on Tab 1) included on Tab 5
3 “Electric Power Annual Table A3”	EIA’s CO ₂ EFs by fuel type used where available to calculate CO ₂ emissions on Tab 5
4 “IPCC Guidelines Table 2.2”	IPCC GHG EFs by fuel type used to calculate CO ₂ emissions where EIA factors were not available and to calculate CH ₄ and N ₂ O emissions on Tab 5
5 “Calculating CO ₂ e”	Calculation of CO ₂ e emissions from CO ₂ , CH ₄ and N ₂ O by state and Canadian province used to calculate the draft EFs on Tab 7
6 “ISO load-generation-imports”	2008 Generation and Load data from ISO New England used to calculate the draft EFs on Tab 7
7 “draft Emission Factors”	Calculation of draft Massachusetts-Based and Regional Biogenic and Non-Biogenic EFs for 2008

Deadlines

In order to finalize the annual biogenic and non-biogenic EFs, the regulation at 310 CMR 7.71(9)(b)3. requires MassDEP to:

- a. post draft annual EFs, including methodologies and data sources, on its website for public comment for 30 days and notify retail sellers of the posting and of the deadline for submittal of public comment; and,
- b. post final annual EFs, including methodologies and data sources, on its website and notify retail sellers of the posting.

This document and the attached spreadsheet have been posted as part of complying with step “a” of these requirements. MassDEP has also sent notice of the posting of the draft EFs to the most recent e-mail address it has for each retail seller. If you are a retail seller and you did not receive this information directly from MassDEP, please provide your contact information to Sue Ann Richardson at sue.ann.richardon@state.ma.us.

The deadlines for submitting public comment on the draft EFs and for retail sellers to submit Form AQ 31 and Form AQ 32 are summarized in Table 3 below. Retail sellers choosing to submit the optional information on the ownership and/or use of particular generation sources can find BWP AQ 31, “Optional Greenhouse Gas Emissions Reporting Form for Retail Sellers of Electricity” on the MassDEP website at <http://www.mass.gov/dep/air/approvals/aqforms.htm#ghg>. Public comment and optional retail seller submittals are to be submitted as specified in the Introduction above.

Note that certain deadlines for future annual submittals are different than the deadlines that apply for emissions released in 2008.

Table 3. Deadlines associated with retail seller GHG reporting

Year MWh generated and emissions released	Draft EFs public comment deadline	Optional Form AQ 31 submittal deadline	Mandatory Form AQ 32 submittal deadline
2008	5 pm on August 23, 2010 (i.e., 30 days after draft EFs are posted on MassDEP's website)	5 pm on August 23, 2010 (i.e., 30 days after draft EFs are posted on MassDEP's website)	30 days after final EFs are posted on MassDEP's website
2009	Not required	Not required	Not required
2010 and beyond	30 days after draft EFs are posted on MassDEP's website	July 1 after the calendar year in which the MWh were generated. For 2010 generation, this deadline is July 1, 2011.	The first day of the next month that is a full calendar month after MassDEP posts the final annual EFs on its website. For 2010 emissions, this deadline will likely be in spring 2012.

Determining final EFs

MassDEP solicits comments on the methodology, data sources and calculations used to produce the draft 2008 EFs.

In determining the final 2008 EFs, MassDEP will consider comments received on the methodology, data sources and calculations used to produce the draft EFs. In addition, MassDEP will consider BWP AQ 31 forms that are submitted by retail sellers, to account for the ownership and/or use of particular generation sources by particular retail sellers. After determining the final EFs, MassDEP will post the final 2008 EFs, including methodologies and data sources, on its website and notify retail sellers of the posting. All retail sellers must report 2008 GHG emissions by submitting BWP AQ 32, "Mandatory Greenhouse Gas Emissions Reporting Form for Retail Sellers of Electricity," within 30 days after the final EFs are posted on MassDEP's website. Form AQ 32 will be posted on the MassDEP website at the same time as the final EFs.

Appendix A.