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PUBLIC HEARING DRAFT

Statewide Greenhouse Gas Emissions Level: 1990 Baseline and 2020 Business As Usual Projection

Regulatory Authority: MGL Chapter 21N, Section 3

April 21, 2009

Introduction

In light of overwhelming scientific evidence that climate change is occurring as a result of human-created emissions of greenhouse gases (GHGs), and that these changes pose significant threats to public health and the environment, the Massachusetts Global Warming Solutions Act (GWSA)[1] was signed into law in August of 2008. The major requirements of this statute include:

- Establishment of statewide GHG emissions limits,
- Implementation of a plan to achieve these statewide GHG emissions limits, and
- Requirements for the mandatory reporting of GHG emissions by larger GHG emitting sources and retail sellers of electricity in the Commonwealth.

GHGs accumulate in the atmosphere and trap heat that would otherwise be radiated back into space. This "greenhouse effect" is the primary cause of global climate change. There are a number of gases that are considered GHGs. The most prevalent greenhouse gas is carbon dioxide (CO_2), which is emitted when fossil fuels are burned. Methane (CH_4), nitrous oxide (N_2O) and several other compounds primarily used as refrigerants are also GHGs of concern due to their potential to contribute to climate change.[2]

The GWSA established the Climate Protection and Green Economy Act in Massachusetts General Law [MGL chapter 21N, section 3, subsection (a)], which requires the Massachusetts Department of Environmental Protection (MassDEP) to, among other actions, *"… determine the statewide greenhouse gas emissions level in calendar year 1990 and reasonably project what the emissions level will be in calendar year 2020 if no measures are imposed to lower emissions other than those formally adopted and implemented as of January 1, 2009. This projection shall hereafter be referred to as the projected 2020 business as usual level."*

The GWSA also calls upon the Executive Office of Energy and Environmental Affairs (EOEEA), in consultation with other state agencies and the public, to set an economy-wide greenhouse gas (GHG) reduction target for Massachusetts of between 10 and 25% below 1990 levels by 2020, with targets for each decade after that, culminating in an 80% reduction by 2050. The 2020 target must be set by January 1, 2011, and must be accompanied by an economy-wide plan to achieve that target. The 1990 emissions baseline proposed here will be the baseline against which Massachusetts' future GHG emissions reductions targets will be planned and measured.

Section 14 of the GWSA further requires that the 1990 Baseline and 2020 Business as Usual (BAU) Projection be established by July 1, 2009.

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[1] See http://www.mass.gov/legis/laws/seslaw08/sl080298.htm

[2] Not all GHGs have the same heat-trapping capacity. For example, one ton of methane is equivalent to greater than 20 tons of CO_2 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 CO_2 has been developed. Emissions shown in this document utilize this standard, and are expressed in units of million metric tons of carbon dioxide equivalent (CO_2e).

- Part 1 of this document describes the proposed 1990 Baseline;
- Part 2 describes the Massachusetts 2020 BAU Projection; and
- Part 3 describes the sources of GHG emissions, data sources, and methodology used to determine the Massachusetts 1990 Baseline and the 2020 BAU Projection.

MassDEP is soliciting public comment on both the 1990 Baseline and the 2020 BAU Projection. In addition to general comments, specific issues and points on which MassDEP requests comments are noted within the text of this document.

In conjunction with EOEEA and the Department of Energy Resources (DOER), MassDEP will hold five public meetings to provide background on the GWSA and the Green Communities Act, and to discuss the methodology and proposed 1990 Baseline and 2020 BAU Projection. The schedule for these meetings is:

Boston -- April 29, 2009, 10-12AM,
Room A-1, Massachusetts State House; Boston, MA 02133
Lakeville -- May 4, 2009, 6-8PM
MassDEP Southeast Regional Office, 20 Riverside Drive; Lakeville, MA 02347
Worcester -- May 6, 2009, 6-8PM
MassDEP Central Regional Office, 627 Main Street; Worcester, MA 01608
Springfield -- May 11, 2009, 6-8PM
Springfield Public Library, Main Branch, 220 State Street; Springfield, MA 01103
Wilmington -- May 14, 2009, 6-8PM
MassDEP Northeast Regional Office, 205B Lowell Street; Wilmington, MA 01887

MassDEP will also hold a public hearing on May 19, 2009 at 10:00AM in Minihan Hall, the Hurley Building, 19 Staniford Street, Boston, MA. Comments may be presented orally or in writing. (Picture identification is required in order to enter the Hurley Building.)

Written testimony must be submitted by email or mail by 5:00 PM on June 1, 2009. Comments may be submitted by email to climate.strategies@state.ma.us, or by mail to

Department of Environmental Protection
Bureau of Waste Prevention
One Winter Street, 6th Floor
Boston, MA 02108
Attn: Stacy DeGabriele

Questions concerning this document may be directed to Sue Ann Richardson, MassDEP at sue.ann.richardson@state.ma.us or 617.348.4098.

Following consideration of public comments received, MassDEP will publish a final 1990 Baseline and 2020 BAU Projection.

Part 1: Massachusetts 1990 GHG Emissions Baseline

What is the purpose of the 1990 Baseline? The GWSA calls for the Commonwealth to adopt GHG emissions limits for 2020, 2030, 2040, and 2050 that are expressed in terms of percent reductions relative to emissions in the year 1990. The emissions baseline proposed here will provide the emissions level or baseline against which these future limits will be set and against which progress in achieving reductions will be measured.

Using the data sources and methodology described in Part 3, MassDEP estimates that economy-wide GHG emissions in 1990 were 96 million metric tons of CO_2e ($MMTCO_2e$).

Table 1 below shows a breakdown of the GHG emission data by economic sector. The table provides summary data for the 1990 Baseline, and also includes, for historical perspective, GHG emissions data for the years 1995, 2000, and 2005 (the most recent year for which complete published data is available). The values shown in this table illustrate that gross emissions have been fairly consistent over that 15-year period.

Table 1: Massachusetts GHG emissions by sector for 1990, 1995, 2000, and 2005

Emissions (MMTCO2E)	1990	1995	2000	2005
Energy Total	**90**	**86**	**90**	**92**
CO_2 from Fossil Fuel Combustion	84	79	83	85
Residential CO_2	15	15	16	15
Commercial CO_2	8	9	7	7
Industrial CO_2	6	6	6	5
Transportation CO_2	29	28	32	34
Electric Generation CO_2	26	22	22	24
Electricity Imports CO_2, CH_4, N_2O	2.4	2.4	3.4	3.8
Other Gases Total	3.8	3.9	3.6	3.0
Stationary Combustion	0.4	0.4	0.4	0.3
Mobile Combustion	1.5	1.6	1.5	1.0
Natural Gas and Oil Systems	1.9	1.9	1.8	1.6
Industrial Processes	**0.6**	**1.3**	**2.3**	**2.9**
Agriculture	**0.3**	**0.3**	**0.2**	**0.2**
Waste	**5**	**4**	**3**	**3**
Gross Emissions	**96**	**91**	**95**	**98**

The spreadsheet in Appendix I contains the calculations upon which this Table and the figures in Part 2 are based.

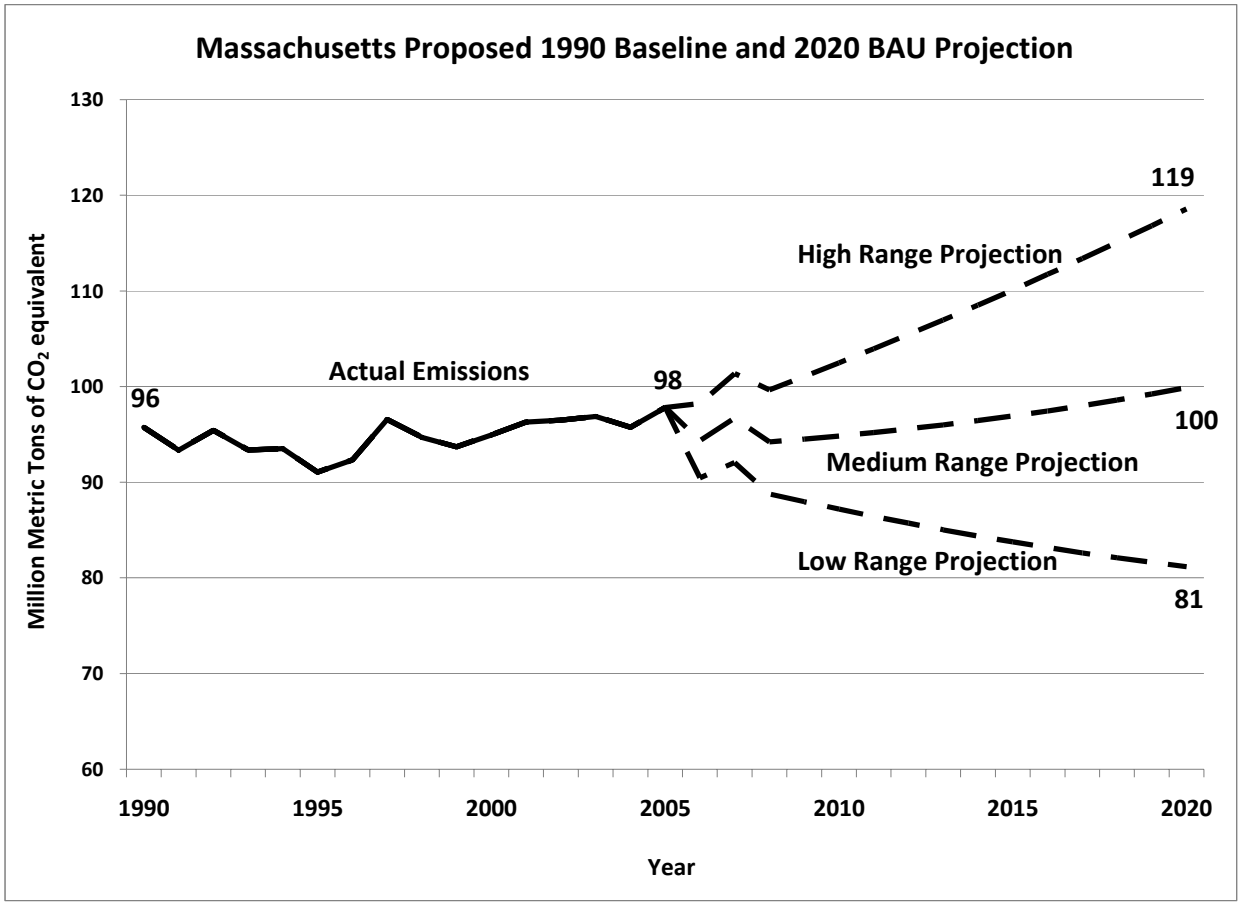
Part 2: Massachusetts 2020 Business as Usual GHG Emissions Projection

What is the purpose of the 2020 BAU Projection? This projection will allow MassDEP and stakeholders to estimate the magnitude of GHG reductions necessary to achieve the limit set for 2020 (10-25% below the 1990 Baseline). It provides a context to understand the emissions reductions achieved by implementing measures to reduce GHGs compared to what emissions would be if such measures were not implemented, i.e., business as usual.

The 2020 BAU Projection has been developed by extrapolating from historical emissions trends.[3] The projection, which estimates 2020 BAU emissions at 100 $MMTCO_2e$ and is labeled "medium range projection" on Figure 1, is based on a straightforward extrapolation of reliable historical data rather than on a complex model that attempts to predict what the future holds. Also shown on Figure 1, the "high" and "low range projections" reflect a reasonable range of uncertainty in emissions given the variability inherent in GHG drivers such as economic activity and fuel prices. These ranges are based on historical variability (one standard deviation) rather than on analysis of what factors might drive emissions higher or lower than the historical trend line, and by how much.

[3] The "kink" in the projected lines for the years 2006-2008 in Figure 1 results from the inclusion of actual data from the electricity sector for those years.

Figure 1: Massachusetts Baseline and Business as Usual (BAU) Projection of GHG emissions 1990-2020

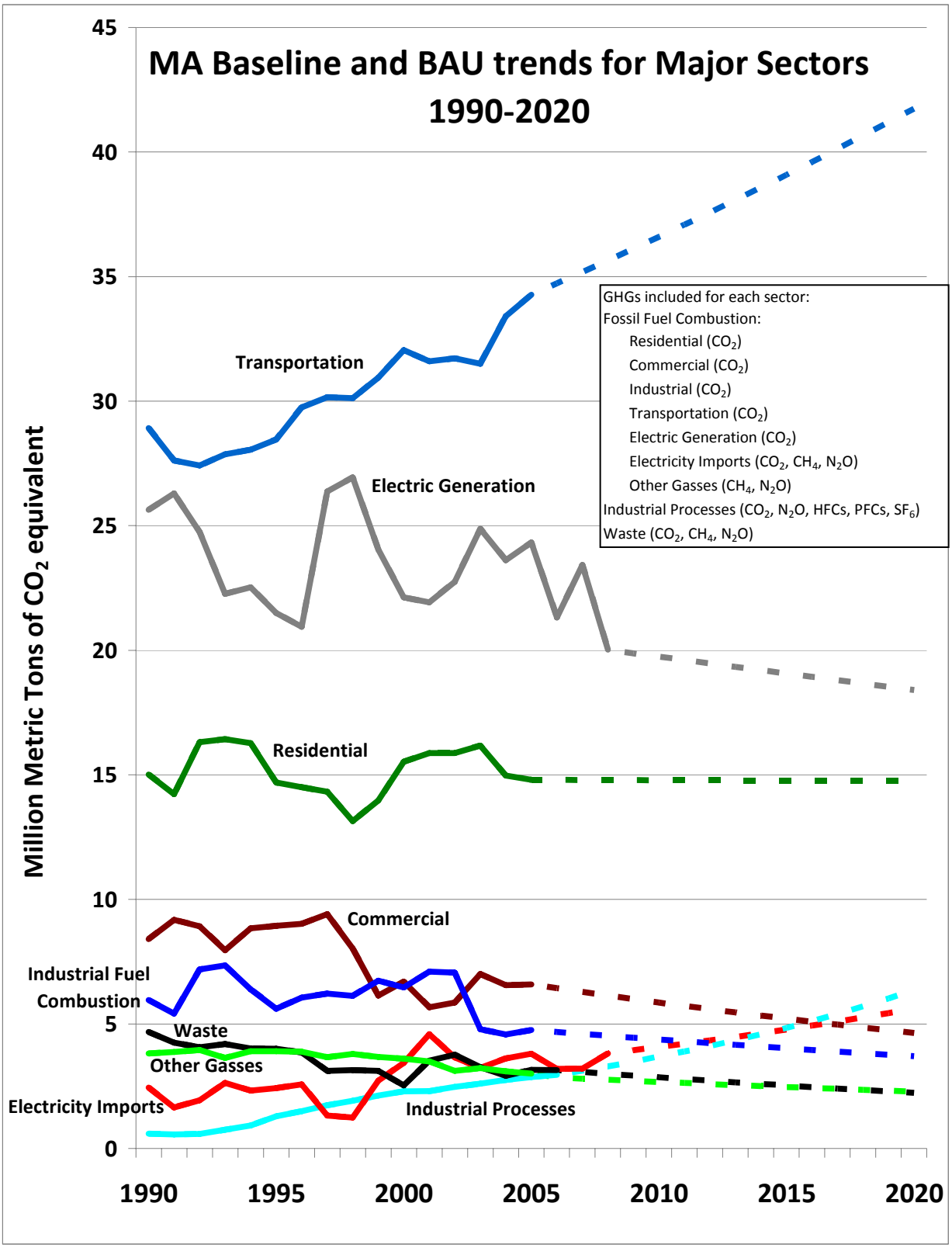


There are some changes in policy that were adopted prior to January 1, 2009 that are not reflected in this projection. For example, the Regional Greenhouse Gas Initiative (RGGI), the revised Federal Corporate Average Fuel Economy (CAFE) vehicle efficiency standard, and the Federal Renewable Fuel Standard (RFS) will each result in emissions reductions. However, the extent to which such programs will specifically reduce emissions in Massachusetts is not known, since the programs are federal or regional in scope. Although not included here, these programs will be factored into setting the 2020 emissions limit and developing the plan to achieve that limit. The Department seeks comment on this approach to projecting the BAU scenario and portraying uncertainty.

MassDEP and the EOEEA agencies intend to use the 2020 BAU Projection to provide context for upcoming discussions on the level of the 2020 GHG emissions limit and the strategies that will be included in the plan to reach that limit.

Figure 2 provides a breakdown of 1990 Baseline and 2020 BAU Projections by major sector. These data demonstrate how the sectors making up the overall Massachusetts inventory may be projected to 2020. However, the caveats noted above, along with the caveats about data quality in Part 3, also apply to each sector.

Figure 2: Massachusetts Baseline and Business as Usual (BAU) Projection of GHG emissions 1990-2020 by sector



Part 3: GHG Emission Sources, Data Sources and Methodology

The goals for emissions reductions in GHGs established by the GWSA are framed as percent reductions from 1990 levels. Establishing a baseline level of 1990 emissions is critical for the Commonwealth's ability to measure progress toward meeting the goals of the statute. This section describes the sources of GHG emissions, the information available upon which to base the 1990 estimate, and the methodology that MassDEP has used to develop a 1990 Baseline and a 2020 BAU Projection.

1. Sources of GHG emissions:

Combustion of Fossil Fuels: GHGs are emitted by all sectors of our economy. The biggest contribution to CO_2 emissions is from burning fossil fuels: for heat, transportation, and electricity generation. Fossil fuel combustion also generates CH_4 and N_2O. Residential, Commercial, Industrial, Transportation and Electric Generation are the sectors in which fossil fuels are combusted.

Industrial Processes: The United States (US) Environmental Protection Agency (EPA) has identified 14 specific industrial processes that emit significant quantities of GHGs through their operations across the country: Cement Production, Lime Manufacture, Limestone and Dolomite Use, Soda Ash Manufacture and Consumption, Iron and Steel Production, Ammonia Manufacture, Nitric Acid Production, Adipic Acid Production, Aluminum Production, Hydrochlorofluorocarbon (HCFC)-22 Production, Consumption of Substitutes for Ozone-Depleting Substances (ODS), Semiconductor Manufacture, Electric Power Transmission and Distribution, and Magnesium Production and Processing. Please note that not all of these industrial processes are conducted in Massachusetts.

Agriculture: The US EPA has identified several agricultural processes that are important GHG sources across the country: enteric fermentation (fermentation in the intestines of certain animals such as cows and sheep), manure management, management of plant residues retained in soil, legume cultivation, agricultural fertilizer use, rice cultivation, and burning agricultural residues. As with the industrial sources identified above, some of these activities are not found in Massachusetts or are at such de minimus levels that their contribution to GHGs in the Commonwealth is negligible if any (e.g., rice cultivation).

Waste Management: The US EPA has identified several waste management activities that produce significant GHG emissions: municipal solid waste combustion, landfill methane generation, and wastewater disposal and treatment. All of these are found in Massachusetts.

2. Data Sources and Methodology for Developing the Proposed Massachusetts 1990 Baseline and 2020 BAU Projection:

State and federal air pollution control programs have traditionally estimated air emissions of a wide variety of pollutants by applying pollutant-specific emission factors to measures of activities conducted by industrial sectors. The US EPA has developed a State GHG Inventory Tool (SGIT) which employs this methodology to estimate GHG emissions from sectors of

concern in each state, based on the activities in key sectors in the state's economy. Gases included in the inventory are: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFC), perfluorocarbons (PFC) and sulfur hexafluoride (SF_6).

The SGIT was used to estimate emissions from 1990 through 2005. Therefore, it was the basis for both the 1990 Baseline and the historical data from which the 2020 BAU medium range Projection was extrapolated. This section discusses data issues related to the SGIT.

The SGIT default data set provides a basis for estimating and reporting annual GHG emissions by sector. For example, one large sector is CO_2 emissions from fossil fuel electrical generation plants in Massachusetts. The EPA SGIT methodology uses Massachusetts electric generator fuel use data to calculate the electricity sector emissions from fuel combustion; SGIT draws this data from the US Department of Energy's Energy Information Administration (EIA). MassDEP used SGIT's 1990 estimates of GHG emissions from fossil fuel electrical generation and other sectors to derive the 1990 Baseline for Massachusetts.

In addition to the EPA SGIT CO_2 emissions from fossil fuel combustion from 1990 to 2005 that have been published,[4] CO_2 emissions from fossil fuel combustion used to generate electricity were calculated using the same methodology for 2006-2008, as the needed raw data are now available. Preliminary 2006 SGIT estimates for Mobile Combustion (CH_4 and N_2O only, not CO_2), Industrial Processes, Agriculture and Waste sectors were also incorporated in the 2020 BAU Projection. It is anticipated that final 2006 EPA SGIT data will be published in June 2009, prior to the finalization of the 2020 BAU Projection. All available 2006 EPA SGIT data will be used to modify the 2020 BAU Projection before it is published.

The EPA SGIT default values were used except where better state level data were available for the natural gas transmission and distribution sectors[5]; however, the changes involve relatively minor aspects of the Massachusetts economy that constitute a small portion of total emissions, resulting in a change of less than 2% in the overall level of GHG emissions.

The EPA SGIT dataset does not provide data for certain categories of activities in Massachusetts. This is typically the case where categories of activities such as oil refining do not occur in the state, or where they occur at such *de minimus* levels (such as rice cultivation) that their emissions are negligible as a sector. For other categories of activities, the activity occurs in Massachusetts, but EPA SGIT does not contain complete data (e.g., lime and limestone production for certain years). The activities that may or do occur in Massachusetts for which EPA SGIT does not contain data include the following:

- **Industrial Processes:** Production of lime for 1990-1992 and 2001-2006, and of limestone for 1990-1993,
- **Agriculture:** Retention of plant residues in soil, legume cultivation, agricultural fertilizer use, rice cultivation, and agricultural residue burning, and
- **Wastewater**: Production of industrial wastewater from fruit, vegetable, red meat, and

[4] http://www.epa.gov/climatechange/emissions/downloads/CO2FFC_2005.pdf

[5] See the U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration "Distribution, Transmission, and Liquid Annual Data" at http://phmsa.dot.gov/pipeline/library/data-stats

poultry processing, pulp and paper manufacturing; and use of biosolids as fertilizer vs. other disposal methods.

Due to the absence of data on these activities in Massachusetts, these activities are not included in either the 1990 Baseline or the 2020 BAU Projection. Although the GHG emissions from these activities are not insignificant to estimating Massachusetts' total emissions, they are believed to be relatively small sources of emissions. Nevertheless, the absence of these data introduces some uncertainty to the 1990 Baseline and MassDEP welcomes suggestions for how this uncertainty is best addressed.

3. Estimating CO_2 emissions from imported electricity generation:

It is important to recognize that 20-25% of the Commonwealth's electricity is imported from power plants located in other states and in Canada. EPA's SGIT methodology does not account for emissions attributable to imported electricity. To estimate the CO_2 emissions associated with net imports of electricity produced outside the Commonwealth, MassDEP supplemented the SGIT data with data from the New England Independent System Operator (ISO-NE), EIA, Environment Canada and other sources.

In order to account for the net electricity imports into Massachusetts from other New England states and import areas, as required by statute,[6] Massachusetts-specific generation and load data were utilized to develop an imported emissions estimate. The ISO-NE, which manages the New England electricity grid, maintains generation and load megawatt hour data for each New England state. ISO-NE generation data is not available prior to 2000, however, so EIA generation data for each New England state is used for 1990-1999[7]. Data on electricity imported to New England from the adjacent New York, New Brunswick and Quebec control areas are only available from ISO-NE beginning with 2000, so 1990-1999 megawatt hours and associated emissions were estimated based on other data from ISO-New England and EIA.

The emissions due to Massachusetts' imported electricity were determined by apportioning to Massachusetts a share of any excess generation (and associated emissions) from each New England state that generates more electricity than it uses. Thus, the proposed 1990 Baseline includes a share of the emissions associated with each electricity-exporting state's total exported electricity, as calculated from the EPA SGIT estimate of each state's CO_2 emissions from fossil

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[6] 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."

[7] EIA generation (at http://www.eia.doe.gov/cneaf/electricity/epa/generation_state.xls) and EPA SGIT CO_2 emissions from fossil fuel combustion (at http://www.epa.gov/climatechange/emissions/downloads/CO2FFC_2005.pdf) include the entire state of Maine, while ISO-NE load (at http://www.iso-ne.com/trans/celt/fsct_detail/2009/_isone_2009_forecast_data_rev2.xls tab 8 column I) for Maine 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 for 2000-2008; the 2000-2008 average was used to estimate 1990-1999 NMISA generation as a portion of Maine's total generation, to pro-rate Maine's SGIT CO_2 emissions from fossil fuel combustion. We have requested northern Maine load data from other parties that may have data from prior to NMISA's creation in 1999, in order to refine this calculation.

fuel combustion, and from estimating methane and nitrous oxide emissions associated with the exported electricity using emission factors from US EPA's eGRID 2007 database.[8] Similarly, the 1990 Baseline apportions to Massachusetts a percentage of the megawatt hours of losses (and associated emissions) due to pumped hydro[9] and of the net annual imports into the ISO-NE grid from the New York, New Brunswick and Quebec grids.[10] New York emissions are based on the EPA SGIT estimate of New York's CO_2 emissions from fossil fuel combustion[11], and on 2005 methane and nitrous oxide emission factors from EPA's eGRID2007 database[12]. Emissions from the Canadian Provinces were calculated using Environment Canada's National Inventory Report.[13]

4. Other Methodological Issues:

Several potentially significant sources of GHGs are not included in the Massachusetts historical baseline and BAU projections due primarily to the difficulty in quantifying emissions in these sectors. These include both GHG emissions and GHG sequestration from embodied emissions and emissions related to changes in land uses and forestry:

- Traditional emissions inventories (including the SGIT) and projections are based on the production of emissions in a geographic area. But emissions generated by the manufacture of products elsewhere and transportation of these products into Massachusetts (and thus "embodied" in these products) are potentially significant, and in the future could be tracked and projected as well. This adjustment becomes more important as manufacturing shifts from Massachusetts to other states and nations (some of which produce significantly more carbon emissions per unit of output than does the production of these goods in Massachusetts). From 1990 to 2005, net imports (imports minus exports) of manufactured products to Massachusetts rose from $9 to $25 billion (in constant $1997), becoming equivalent to 41% of our output of manufactured goods. While some academic studies have

[8] http://www.epa.gov/cleanenergy/documents/egridzips/eGRID2007V1_1_year05_SummaryTables.pdf

[9] The megawatt hours of losses associated with pumped hydro were found in NEPOOL and ISO-NE Annual Reports at http://www.iso-ne.com/aboutiso/fin/annl_reports/1990/ for 1990 to 1999 and at http://www.iso-ne.com/nwsiss/grid_mkts/enrgy_srcs/index-p1.html, with corrections from ISO-NE, for 2000-2008. New England CO_2 emissions associated with pumped hydro equal the sum of New England state SGIT CO_2 emissions from fossil fuel combustion (at http://www.epa.gov/climatechange/emissions/downloads/CO2FFC_2005.pdf) multiplied by the fraction that pumping is of New England load. Massachusetts CO_2 emissions associated with pumped hydro equal New England CO_2 emissions multiplied by the fraction that Massachusetts load is of New England load. Methane and nitrous oxide emissions associated with pumped hydro are based on US EPA's eGRID2007 New England-specific emission factors for 2005.

[10] The megawatt hours associated with net imports to New England from New York, New Brunswick and Quebec in 1990 to 1999 were set equal to pumping (see footnote 9) plus the ISO-NE load (at http://www.iso-ne.com/trans/celt/fsct_detail/2009/isone_2009_forecast_data_rev.xls tab 8 column I) minus adjusted EIA generation (from http://www.eia.doe.gov/cneaf/electricity/epa/generation_state.xls).

[11] New York CO_2 emissions are based on New York SGIT CO_2 emissions from fossil fuel combustion (at http://www.epa.gov/climatechange/emissions/downloads/CO2FFC_2005.pdf) for 1990-2005, and using the same methodology for 2006-2008.

[12] New York methane and nitrous oxide emissions are based on 2005 New York factors from eGRID2007 (at http://www.epa.gov/cleanenergy/documents/egridzips/eGRID2007V1_1_year05_SummaryTables.pdf).

[13] The 1990-2006 New Brunswick and Quebec GHG emissions are based on the National Inventory Report by Environment Canada (at http://www.ec.gc.ca/pdb/ghg/inventory_report/2006_report/ta9_5_eng.cfm and http://www.ec.gc.ca/pdb/ghg/inventory_report/2006_report/ta9_6_eng.cfm).

started to quantify embodied emissions (see Weber and Matthews[14]) there is still great uncertainty in such estimates. Further analysis is needed in this area; therefore, embodied emissions were not included in the 1990 Baseline or 2020 BAU Projection.

- As land is developed, trees and vegetation (which sequester carbon) are replaced by buildings, roads, etc. These changes in land use affect the total quantity of CO_2 locked up in natural ecosystems as a normal part of the carbon cycle. While changes in the extent of development could be important in an overall inventory of GHG emissions, there are few reliable estimates of land use changes on which to base either historic emissions or future projections. The EPA methodology for assessing emissions impacts of land use changes has not been consistent over time, making temporal comparisons difficult. In addition, the emissions factors appropriate for different types of vegetative cover are the subject of much ongoing research, with new factors frequently published. MassDEP believes it is important to further investigate how land use changes affect associated emissions, but that it is not appropriate to quantify them in this baseline or BAU projection at this time.

  Thus, the 1990 Baseline and 2020 BAU Projection use estimates of gross emissions (which do not account for carbon sequestration in forests, oceans and lakes, and soils) rather than net emissions due to a great deal of uncertainty around historical data on GHG sinks (the storage of carbon in natural environments such as forests).

5. Methodological Issues with the 2020 BAU Projection:

Technology change will inevitably affect future GHG emissions, with potentially dramatic results. The effects of technology change have not been explicitly modeled, though past changes are implicitly reflected in the historical emissions numbers. While it may be unrealistic to project increases in GHG emissions given the proliferation of GHG mitigation technologies today, on the other hand it is important not to assume that the pace of technological innovation will change significantly and/or will necessarily result in significantly lower emissions.

Bioenergy is renewable energy derived from biological sources such as wood and plant-based ethanol. Bioenergy introduces uncertainty into the GHG inventory because the long-term emissions from the biological processes and associated land use changes are not well understood. Recently, there has been a surge of interest in bioenergy, including biomass heat and electricity generation and transportation biofuels such as ethanol and biodiesel. GHG emissions from these sources could become a source of substantial uncertainty in future GHG inventories. In addition to the difficulty of estimating emissions from land use changes, bioenergy introduces a challenging problem of system boundaries. For instance, if Massachusetts use of bioenergy impacts another state's land use change emissions, it is unclear which state takes responsibility for those emissions. This problem is compounded by indirect land use change emissions from crop-based biofuels, which result when higher food and feed prices incentivize land conversion. While the importance of accounting for these emissions is a matter of much debate, they indicate

[14] "Embodied Environmental Emissions in U.S. International Trade," 1997-2004," Christopher L. Weber and H. Scott Matthews, Environmental Science & Technology, 2007; "CO2 Embodied in International Trade with Implications for Global Climate Policy," Glen P. Peters and Edgar G. Hertwich, Environmental Science and Technology, Vol. 42, No. 5, 2008.

the challenge of including bioenergy emissions in a GHG inventory.

Another approach to a BAU projection would be to base it on the projections of CO_2 emissions from fossil fuel combustion in the U.S. Department of Energy's Energy Information Administration (EIA) Annual Energy Outlook (AEO). The AEO projects U.S. energy demand and the resulting CO_2 emissions to 2020. However, the AEO provides only regional and national emissions projections, which complicates the development of a Massachusetts-specific projection. MassDEP believes that, in light of the recent volatility in fuel prices and the economic business cycle, it is more prudent to rely on the statistical projection of historic data used in this proposed BAU projection rather than to presume to predict economic dynamics with any precision.

Comments

MassDEP solicits comments on all of the issues raised above and suggestions on how they might be addressed in the 1990 Baseline and 2020 BAU Projection.