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REVISED MEPA GREENHOUSE GAS EMISSIONS POLICY AND PROTOCOL

Effective Date: May 5, 2010

APPLICABILITY AND PROCEDURES FOR FILING

A project is subject to this Greenhouse Gas (GHG) Emissions Policy and Protocol ("the Policy" or the "GHG Policy" hereinafter) if the project is required to prepare an Environmental Impact Report (EIR) in accordance with the Massachusetts Environmental Policy Act (MEPA), M.G.L. c. 30, ss. 61-62I and its implementing regulations at 301 CMR 11.00. This includes projects that receive a Waiver from the requirement to prepare an EIR in accordance with 301 CMR 11.11 (as described further below). This revised version of the GHG Policy applies to new projects that file an Environmental Notification Form (ENF) initiating MEPA review on or after the effective date of this revised Policy. Projects that filed an ENF prior to the effective date of this revised Policy shall be subject to the version of the Policy in effect at the time the ENF was filed.[1] The Secretary will review Notices of Project Change (NPC) filed pursuant to 301 CMR 11.10 for projects that filed an ENF prior to the effective date of the initial GHG Policy (November 1, 2007) on an individual basis to determine whether the project will be required to comply with the Policy.[2]

[1] Effective dates of prior versions of the Policy are: November 1, 2007; February 2008; and February 3, 2009.

[2] Although this will be a case-by-case determination by the Secretary, in making this determination the MEPA Office will consider factors such as: the nature of the overall project; whether the project changes represent a moderate or significant expansion of the original project; whether the project changes propose to add GHG-generating elements such as additional buildings or additional parking; and whether the proponent has already incorporated GHG emissions mitigation measures into its project proposal.

In response to the submission of an ENF for a project that is subject to the Policy pursuant to the paragraph above (i.e., it requires either a mandatory EIR or the Secretary requires the preparation of an EIR on a discretionary basis), the Secretary's Certificate on the ENF will include a scope item for the quantification of project-related GHG emissions. Proponents are not required to present a quantification or estimate of GHG emissions in the ENF, but are encouraged to do so. However, proponents for projects that are subject to the requirement to prepare a mandatory EIR should attempt to qualitatively identify sources and types of GHG emissions in the ENF filing.

For projects subject to this Policy where the proponent is seeking a Single EIR pursuant to 301 CMR 11.06(8) or a full Waiver pursuant to 301 CMR 11.11, the proponent should quantify emissions, analyze proposed mitigation, and submit this information in an Expanded Environmental Notification Form (EENF) in accordance with 301 CMR 11.05(7). The Secretary will make determinations as to whether to grant Single EIR or Waiver requests based in part on the adequacy of the GHG analysis. If the proponent is seeking a Phase One Waiver pursuant to 301 CMR 11.11(4), the EENF should contain the required GHG analysis if Phase One of the project will result in material GHG emissions itself (for example, if it involves the construction of a building or parking).

DE MINIMIS EXEMPTION

The MEPA Office acknowledges that some projects that require an EIR will have little or no GHG emissions, and this Policy shall not be applied to such projects. For any project that exceeds mandatory EIR thresholds at 301 CMR 11.03, the project proponent should specify in the ENF whether it believes that the project should be exempt pursuant to this de minimis exception. The Secretary will identify in the scoping Certificate whether a project requires a GHG analysis or whether it falls within this de minimis exception.

Examples of projects that may qualify for this de minimis exemption (subject to approval by the Secretary) include (but are not limited to) the following:

- Ecological restoration projects;
- Waterways dredging projects; and
- Dam repair or removal projects.

ROLE OF THE POLICY AND CONSULTATIONS WITH THE MEPA OFFICE

The intent of this Policy is to provide general guidance for the preparation of a GHG emissions analysis that will satisfy the requirements of MEPA. The Policy does not in any way supersede or alter the Secretary's requirements for analysis provided in any particular scoping Certificate. In addition, the Secretary retains the discretion to deviate from the procedures set forth in this Policy in the scoping Certificate.

It is strongly recommended that proponents consult with the MEPA Office prior to submission of an EIR to discuss the methodology and mitigation expectations for an individual project. The MEPA Office routinely conducts pre-filing meetings with project proponents to

discuss the required analysis of GHG emissions and can provide proponents with specific guidance concerning the methodologies and protocols outlined below.

EMISSIONS QUANTIFICATION PROTOCOL

General Guidance

The general requirement of this Policy is that the proponent quantify the potential annual GHG emissions from a proposed project according to the quantification protocol outlined below (or other protocols that are accepted on a case-by-case basis), and report the results of that analysis in the EIR. Emissions should be expressed in short tons (2,000 lbs) per year (tpy).[3] The MEPA Office will review the proponent's GHG submission with technical review assistance from the Department of Environmental Protection (MassDEP), the Department of Energy Resources (DOER), and the Massachusetts Department of Transportation (MassDOT).

In the EIR, the proponent should calculate the project baseline in accordance with the protocol set forth below. The proponent should then also estimate emissions associated with the preferred alternative as well as outline and commit to a series of mitigation measures that will help to reduce GHG emissions from the proposed project. To demonstrate the efficacy of the mitigation, the proponent should measure emissions reductions and energy savings estimated to be achieved by the proponent's preferred alternative against the project baseline and also discuss the rationale and emissions reduction potential of measures that were not selected for the preferred alternative. In summary, this is a 3-step process, as further outlined below: (1) identify a project baseline; (2) calculate estimated GHG emissions from the project baseline condition; and (3) calculate estimated emissions reductions based on mitigation measures by comparing project alternatives to the baseline.

At the current time, the analysis will focus mainly on the primary GHG, carbon dioxide (CO_2). While there are other GHGs, CO_2 is the predominant contributor to global warming, and emissions can be calculated for CO_2 with readily accessible data. The analysis of other GHGs may be required for certain projects at the Secretary's discretion, such as methane emissions from landfills and wastewater treatment plants, emissions of hydrofluorocarbons and perfluorocarbons from the manufacturing, servicing and disposal of refrigeration and air conditioning equipment, and other GHGs emitted through various chemical and manufacturing processes. In these instances, the MEPA Office will provide guidance on quantification and analysis. In addition, the MEPA Office will continue to evaluate quantification models for the other major GHGs and the degree to which projects reviewed under MEPA emit these other gases in significant quantities, and may amend this Policy accordingly. In the meantime, proponents whose operations can be expected to cause significant emissions of GHGs other than CO_2 should identify in the ENF the nature of those emissions and whether there are readily available protocols for calculating them. If not, the proponent may still be expected to perform a qualitative analysis and identify reduction or mitigation measures. In many cases, the same

[3] A conversion to metric tons can easily be made from this number (1 short ton = 0.9072 metric tons), and the equivalent metric tons should also be provided if specifically requested in the scoping Certificate.

strategies that will reduce CO_2 emissions will also reduce other GHGs, although this may not be the case in every instance.

Categories of Emissions To Be Quantified

In order to satisfy MEPA's requirements to analyze potential environmental impacts of a proposed project, this Policy requires that proponents quantify the majority of potential GHG emissions associated with the project. Specifically, the Policy focuses on quantification of direct and indirect mobile and stationary source emissions associated primarily with energy consumption, vehicle trip generation, and consumption of large quantities of water or wastewater generation. The Policy does not currently require quantification of other emissions categories in every instance (such as emissions associated with waste generation, materials consumption, conversion of biomass associated with land clearing, or construction period emissions). However, the Secretary may, on a case-by-case basis, require estimation of these and other additional sources of GHG emissions for a particular project if the project in question is likely to result in significant emissions from one of these other categories.

1. Required Emissions Sources

The Secretary will require analysis of both "direct" GHG emissions (*e.g.*, stack and fugitive emissions from on-site combustion or industrial processes, and emissions from fleet vehicles operated by the project) and "indirect" emissions (*e.g.*, emissions from vehicle trips generated by the project and emissions from generating plants supplying electricity to the proposed operation). For a more detailed discussion of direct and indirect emissions, please visit the World Resources Institute/World Business Council for Sustainable Development's Greenhouse Gas Protocol Initiative website at www.ghgprotocol.org. This website provides a comprehensive discussion of direct vs. indirect emissions and a set of tools for quantifying GHG emissions.

With respect to stationary sources, "Direct Emissions" means the emissions from on-site stationary sources of the facility itself. Stationary sources typically emit GHGs by burning fossil fuels for heat, hot water, steam, on-site electricity generation, and other processes. Stationary sources include, but are not limited to, boilers, heaters, furnaces, incinerators, ovens, internal combustion engines (including emergency generators), combustion turbines, and any other equipment or machinery that combusts carbon bearing fuels or waste streams. See "Calculation Tool for Direct Emissions from Stationary Combustion Sources" available at the www.ghgprotocol.org website for more information on direct emissions from stationary sources. "Indirect Emissions" refer to GHG emissions caused by a project's consumption of energy generated offsite through the combustion of fossil fuels. Indirect emissions result from the purchase and consumption of electricity, heat (steam, hot water, etc.) or cooling provided from off-site sources such as the electrical utility or district heating or cooling systems.

Projects also generate GHG emissions through traffic generation and associated fuel combustion, referred to as mobile source emissions. Direct mobile source emissions are those emitted directly by vehicles operated as part of the project's operations. The proponent should determine whether the project will involve the ownership or operation of fleet vehicles to be

utilized directly by the project. Fleet vehicles should be generally defined as vehicles used on-site and may include: on-site mobile equipment such as forklifts, tractors, fueling trucks, maintenance and security vehicles; and/or other non-stationary equipment used on-site whose operation involves combustion of carbon containing fuels. However, a much more common and typically significant form of mobile source emissions are indirect emissions from external trips that are generated by the project—i.e., trips by third parties that are induced by the proposed project. Therefore, the Policy requires proponents to model the indirect emissions from transportation, including travel by employees, vendors, customers, and others in compliance with the methodology set forth below.

2. Optional Additional Emissions Sources

For most projects, estimating GHG emissions from the direct and indirect sources listed above will serve as a reasonably accurate estimate of the project's overall emissions. However, some projects will have sources of emissions not explicitly covered by these three categories (*e.g.*, a landfill that emits methane). On a case-by-case basis, the Secretary may require modeling of GHG emissions from sources other than the three categories covered by this Policy. EEA will advise the proponent of this requirement in the Certificate on the ENF or EENF. Projects potentially subject to this requirement include:

- Projects that may involve indirect emissions associated with the consumption of significant quantities of water or that will generate significant quantities of wastewater. Projects that will consume greater than 300,000 gallons per day (gpd) of water or generate greater than 300,000 gpd of wastewater will typically be considered to fall within this category.[4] To assist in calculation of potential GHG impacts associated with water and wastewater treatment, the MEPA office will provide, with the assistance of MassDEP, average energy use data for treatment facilities, and post these data on the MEPA website. These data will be updated from time to time based upon the introduction of updated data from statewide resources. At the proponent's discretion, actual data from project community treatment plants may be used in lieu of statewide average data to perform these calculations, so long as supporting documentation is included in the MEPA filing.
- Projects that may involve unusually large amounts of land alteration or clearing and forest conversion. Projects that will alter greater than 50 acres of land (the current review threshold for land alteration at a level that requires preparation of a mandatory EIR) may potentially be subject to this requirement.
- Projects that may involve generation of a large amount of construction-related trips. Examples of this type of project may include projects where significant amounts of soil need to be disposed of off-site through use of hauling trucks (*e.g.*, closure of a hazardous waste disposal site).

[4] Based upon data obtained to date under this Policy and data acquired by MassDEP, the indirect GHG emissions associated with this level of water consumption/wastewater generation would represent approximately 5% of the total emissions for a residential project and 10% of the total emissions for a commercial/office project.

It should be noted that although proponents will not be required to quantify these optional emissions categories in most cases, MEPA always requires proponents to mitigate impacts to the maximum extent feasible. Therefore, applicable mitigation measures related to these topics (e.g., water conservation, materials management, limiting land disturbance, etc.) will still need to be evaluated for feasibility in accordance with this Policy.

Quantifying Emissions

1. Establishing a Project Baseline

The proponent should establish a project baseline condition for each source of GHG emissions required to be quantified pursuant to this Policy as outlined above. The following list provides specific guidance for establishing a project baseline in the majority of circumstances. Projects that include categories of emissions other than those discussed herein should look to the MEPA Office for guidance in establishing a baseline for that particular component of the proposed project.

Building-Related Stationary Source Emissions:

The baseline for building-related stationary sources (electricity use, heating or cooling from offsite suppliers and on-site fuel consumption) assumes construction of the proposed buildings in compliance with the Massachusetts State Building Code. The proponent should be sure to use the most current version of the Massachusetts State Building Code (780 CMR) that is in effect at the time the ENF is filed. Proponents should also be aware that under the Green Communities Act (Section 55 of Chapter 169 of the Acts of 2008), the Board of Building Regulations and Standards (BBRS) must update the energy provisions of the state building code within one year of any revision to the International Energy Conservation Code (IECC). IECC updates occur every three years, and therefore the State Building Code will be updated at least every three years on a going-forward basis under current law. In order to address this changing baseline, the Secretary's Certificate on the ENF will reference the effective building code version at that particular time, which will be the baseline applicable to the project. This will be the project baseline for the life of the project and shall be the specified baseline for measuring stationary source emissions reductions in the Draft and Final EIRs (even if the State Building Code is updated during the pendency of the project). However, the Secretary may require an updated GHG analysis based upon an updated project baseline (updated State Building Code) if there are significant (multi-year) delays by the proponent in the preparation of the EIR documents. If a proponent is in doubt about the baseline building code applicable to the subject project it should contact the MEPA Office for clarification.

Process-Related Stationary Source Emissions:

For projects that will have significant stationary source GHG emissions associated with industrial processes (either direct emissions from fuel consumption or indirect emissions from electricity/energy consumption), distinct from emissions associated with project buildings, the proponent will need to establish a project baseline for the industrial component of the project by

estimating the amount of fuel or electricity to be consumed by the specific processes without any mitigation measures (sometimes referred to as the "business as usual" scenario). The intent of this calculation is to estimate emissions from GHG-intensive industrial processes such as power plants, energy-intensive manufacturing processes, or other industrial processes, in order to provide a better understanding of overall project emissions.

Emissions from Transportation:

The baseline condition for direct transportation-related emissions (emissions associated with operation of fleet vehicles) should be established by the proponent on a case-by-case basis by estimating the project's annual vehicle miles traveled (VMT) by fleet vehicles without imposition of any mitigation measures.

The baseline condition for indirect transportation-related emissions (trips generated on account of the project, discussed in more detail below) should be modeled on the Build Without Mitigation condition developed using the standard methodology outlined in the EEA/MassDOT Guidelines for EIR/EIS Traffic Impact Assessment, as outlined in further detail below.

2. Calculating Projected Baseline Emissions

Building-Related Stationary Source Emissions:

For projects involving construction of buildings, the proponent should use energy modeling software to quantify the energy use associated with a code-compliant building. The model should estimate both direct and indirect emissions. Energy modeling uses computer-based tools to simulate the energy use of a building throughout a year of operation. The following energy modeling software has been previously reviewed and approved for ease of use and usefulness of results for MEPA review: EQUEST, Energy-10, Visual DOE, and DOE2. All of these modeling tools are appropriate for the intended use. However, proponents may use other comparable energy modeling software to achieve the required results, provided that for commercial buildings the software has been approved by the United States Internal Revenue Service (IRS) for use in supporting deductions for costs associated with installation of energy conservation measures commercial buildings. A list of IRS-approved software can be found at: http://www1.eere.energy.gov/buildings/qualified_software.html

The MEPA Office recognizes that the IRS-approved models do not simulate energy use for certain specialized building types. In these cases another model may be used, although advance consultation with the MEPA Office is recommended. In addition, there may be versions of the tools listed by the IRS that are more current than the version listed on the above-referenced website. It is acceptable to use the latest version of IRS-listed software, even if that version is not expressly listed by the IRS.

No model will predict the energy usage of a building with one hundred percent accuracy, as there are many uncontrollable variables. For example, the building may not be built exactly as drawn; the occupants of the building may use the building differently than predicted; or the

climate may vary from that which was modeled. The value of the model is its ability to compare alternative mitigation strategies and show the resulting differences in energy use.

The EIR should identify the energy modeling tool and version used for the analysis and include a description of the building size and configuration, occupancy, envelope attributes, operation schedule, and building systems (e.g. HVAC and lighting, etc.). The EIR should identify the input and default values for the parameters listed above used in the energy simulation model for the project baseline to assist in the validation of modeling assumptions and estimated CO_2 reductions. To assist in review, the EIR should either include text file output data that list the input and default modeling parameters generated by the selected modeling software, program generated reports, or tabulation of all the input and default values necessary to verify modeling conclusions.

Once building-related energy consumption has been established through modeling, the results should be converted into GHG emissions. In order to quantify direct emissions, energy modeling software should be used to estimate fuel usage. These should be counted and reported as direct emissions. Once fuel usage is estimated, the proponent can derive the approximate CO_2 emissions by using a reliable data source that contains emission factors for CO_2 based on fuel type. For most fuel types, the Energy Information Administration Emissions Factor and Global Warming Potentials data provides the appropriate factors. This document can be found at http://www.eia.doe.gov/oiaf/1605/emission_factors.html. These emissions factors have been compiled in association with the Voluntary Reporting of Greenhouse Gases Program established by Section 1605(b) of the Energy Policy Act of 1992. For fuel types not covered in this document, the proponent should use another reliable data source in consultation with the MEPA Office.

To quantify indirect emissions, the proponent should then multiply total purchased electricity usage by an emissions factor that calculates the CO_2 emitted through the generation of electricity. The proponent should use the current ISO-New England Marginal Emissions Report, which provides CO_2 emission factors expressed as pounds of CO_2 per megawatt hour for a variety of stationary combustion sources. The ISO-NE Marginal Emissions Report for 2007 is available at: http://www.iso-ne.com/genrtion_resrcs/reports/emission/2007_mea_report.pdf. This report may be updated from time to time and proponents should check whether there is a more recent version at the time they are preparing their analysis. The ISO New England Report provides emissions factors for "average" and "marginal" emissions. The proponent should use the emissions factors for annual **average emissions**. Similar factors for existing district heating, cooling or cogeneration plants that will serve the project should be gathered from the plant operator.[5]

Process-Related Stationary Sources Emissions:

Proponents should follow a similar methodology to that specified above for converting building-related energy consumption into GHG emissions when determining process-related

[5] Proponents should identify the sources for these emission factors when outlining their total building-related emissions.

stationary source emissions. In order to quantify direct emissions, the proponent should estimate fuel consumption associated with industrial processes and then derive the approximate CO_2 emissions by using a reliable data source that contains emission factors for CO_2 based on fuel type. To quantify indirect emissions, the proponent should estimate the amount of electricity to be consumed by the industrial processes and then multiply total purchased electricity usage by an emissions factor that calculates the CO_2 emitted through the generation of electricity. The proponent should use the current ISO-NE Marginal Emissions Report, which provides CO_2 emission factors expressed as pounds of CO_2 per megawatt hour for a variety of stationary combustion sources. Once again the proponent should use the emissions factors for annual **average emissions**. Similar factors for existing district heating, cooling or cogeneration plants that will serve the project should be gathered from the plant operator.

Indirect Emissions from Transportation:

The following steps should be taken to calculate a baseline for indirect transportation-related emissions from most proposed projects:

1. Estimate projected net new trips within the study area identified for the project traffic study or the "mesoscale" analysis (the analysis which is required to identify project-related increases in volatile organic compounds (VOCs) and nitrogen oxides (NOx) and used to demonstrate the consistency of the project with the Massachusetts State Implementation Plan (SIP)). Net new trips should be expressed in daily vehicle miles of travel (VMT) for weekday and weekend conditions. This estimate should be consistent with the trip generation analysis included in the project's traffic study. The analysis should provide a breakdown of customer, employee and truck trips.

2. Calculate annual VMT for the project's net new trips. Calculate VMT for employee, customer and truck trips separately.

(260 x weekday VMT) + (105 x weekend-day VMT) = annual VMT

3. Multiply annual VMT (miles/year) by the appropriate EPA MOBILE 6.2[6] CO_2 emission factor[7] (grams/mile) and divide by 907,185 grams/ton to obtain annual CO_2 emissions (tons/year).

[6]At the time of publication of this revised policy, MOBILE 6.2 is the appropriate approved model for estimating VMT. It is the understanding of the MEPA Office that U.S. EPA is developing a new model, entitled MOVES, which will allow for enhanced and more accurate CO_2 emissions modeling associated with vehicle trips. Upon approval of the MOVES model by U.S. EPA and MassDEP, it is anticipated that VMT will be estimated using the updated MOVES model in lieu MOBILE 6.2.

[7] MOBILE6.2 provides emission factors by vehicle type, ranging from 368.5 grams/mile for light-duty gasoline vehicles up to 1,633.1 grams/mile for the heaviest diesel trucks. These emission factors can be used for generating detailed trip by vehicle type data. If calculating total vehicle trips for a typical Project, the analysis should use the MOBILE6.2 average emission rate

Direct Emissions from Transportation (Fleet Vehicles):

The following steps should be taken to calculate a baseline for direct transportation-related emissions from proposed projects that involve the use of fleet vehicles at the proposed project site:

1. Estimate the projected net new trips associated with fleet vehicles owned and operated by the project proponent and associated with the project. The proponent should create realistic assumptions about the vehicle class, number of vehicles, vehicle speeds, and average number and distance of on-site trips for the various fleet vehicles and present them in the analysis.

2. Calculate annual VMT for the project fleet's net new trips. The analysis should clearly state assumptions regarding on-site operations (e.g., fleet vehicles may not operate on weekends, thereby reducing overall annual VMT). Proponents should use their discretion when estimating VMT, but generally should follow the same methodology as used for determining VMT associated with off-site traffic trips:

(260 x weekday VMT) + (105 x weekend-day VMT) = annual VMT

3. Multiply annual VMT (miles/year) by the appropriate EPA MOBILE 6.2 CO_2 emission factor (grams/mile) and divide by 907,185 grams/ton to obtain annual CO_2 emissions (tons/year).[8]

3. GHG Emissions Reductions—Comparison of Project Alternatives to Baseline

After, (1) identifying the appropriate baseline condition for each aspect of the project, and (2) calculating estimated GHG emissions associated with the baseline condition in accordance with the methodology outlined above, the proponent should calculate and compare GHG emissions associated with the preferred alternative and other mitigation measures. The Appendix to this Policy contains a partial, non-exhaustive list of mitigation measures to reduce GHG emissions. The Secretary's scoping Certificate will identify the specific mitigation measures and project alternatives that must be quantified by the proponent. Specifically, the proponent will be required to identify:

- Estimated GHG emissions reductions from the baseline condition associated with the preferred alternative, expressed in tons per year of CO_2 and as a percentage of total emissions; and
- Estimated GHG emissions reductions associated with any mitigation measures that are applicable to the project type but that were dismissed by the proponent and therefore not included in the proponent's preferred alternative, expressed in tons of CO_2 per year and as a percentage of total emissions.

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of 550.4 grams/mile, which is based on the most recent fleet mix by type for Massachusetts identified by MassDEP.

[8] See footnotes above concerning the use of EPA MOBILE 6.2.

To evaluate the impact of energy-efficiency measures designed to reduce building-related emissions, the proponent should utilize the same methodology as prescribed above for calculating emissions associated with the code-compliant baseline. The energy modeling used to estimate baseline energy use should also be used to estimate energy use associated with the preferred alternative, with the inputs changed to reflect upgrades in energy efficiency measures. The EIR should identify the input and default values used in the energy simulation model for the project alternatives to assist in the validation of modeling assumptions and estimated CO_2 reductions. Similar to the baseline alternative, the EIR should present data output files, program generated reports, or tabulation of modeling parameters to assist in meaningful project review. For those measures, such as Combined Heat and Power, which cannot readily be modeled by the selected approved modeling program, the proponent should provide a separate analysis which includes all of the relevant inputs and assumptions as required for an independent verification of the results. The results of any separate analyses should be included both in the narrative and in the tabulation of the overall results.

To evaluate the impact of transportation mitigation, recent research indicates that an accurate range of trip reductions associated with Transportation Demand Management (TDM) measures can be identified. Two models are recommended for generating reasonable estimates of trip reductions associated with TDM programs. These include the US Environmental Protection Agency (EPA) COMMUTER model and the Work Trip Reduction Model. In addition, Congestion Mitigation and Air Quality (CMAQ) worksheets, available from MassDOT, can be used to calculate the benefits of specific transit measures, multi-use (bicycle/pedestrian) paths, and commuter parking facilities.

Emissions reductions attributable to other specific mitigation measures not associated with energy-efficiency or TDM measures should also be calculated by the proponent. For example, the proponent should calculate emissions reductions associated with upgrading the efficiency of industrial processes (by calculating reduced fuel or electricity consumption). A similar calculation should be presented for mitigation of direct mobile source emissions from fleet vehicles based on, for example, use of alternative fuel vehicles. Emissions reductions associated with any on-site renewable energy generation (such as from solar, geothermal or wind) should also be included as credit toward reducing overall emissions from the project. As indicated above, emissions reductions associated with all applicable mitigation measures should be calculated whenever feasible.

When identifying those measures that have been selected for the preferred alternative and those mitigation measures that have not been adopted, the proponent should explain which alternative measures were rejected, and the reasons for rejecting them. This alternatives analysis should clearly demonstrate consistency with the objectives of MEPA review, one of which is to document the means by which the proponent plans to avoid, minimize or mitigate Damage to the Environment to the maximum extent feasible. Proponents should therefore fully explain their rationale for concluding that any particular mitigation measure is infeasible. The proponent should also fully explain any trade-offs inherent in the evaluation of GHG reduction measures, such as increased impacts on some resources to avoid impacts to other resources.

PROJECT CHANGES

As with any other environmental impact that the MEPA Office considers, if the project changes after the issuance of a Certificate on a Final EIR such that there is a significant increase in GHG emissions, the proponent may be required to file a NPC pursuant to 301 CMR 11.10. The proponent should consult with the MEPA Office to determine whether a NPC would be required for a particular project change.

OFFSETS

The MEPA Office recognizes that under certain circumstances, it may not be feasible to implement all of the alternatives described in the EIR. While it is the MEPA Office's policy to encourage proponents to avoid or minimize GHG emissions on-site, MEPA will also be receptive to proposals to mitigate such emissions through off-site measures when avoidance or minimization strategies are not feasible. However, direct mitigation should be prioritized over off-site measures. If offsets are proposed, the proponent should endeavor to select offsets that have local or regional benefits. Examples include funding energy-efficiency upgrades of municipal buildings in the project's host community, or funding fuel-efficiency upgrades for municipal vehicles. The MEPA Office will seek the assistance of other agencies to determine whether such offsets are real, additional, verifiable, permanent, and enforceable in accordance with state law and Policy. If a proponent proposes offsets consisting of monetary contributions, the proponent will be required to verify that the funds are directly responsible for GHG emissions reductions.

OPT-OUT PROVISION

The Secretary will consider, on a case-by-case basis, allowing proponents that commit in advance to exceptional GHG-reduction measures to opt out of the quantification analysis. The rationale for the opt-out provision is that if a proponent commits to such extraordinary measures, there is less reason for quantification and exploration of alternatives. A proponent seeking to opt out should present the request in the ENF and the MEPA Office will respond to the request in the Certificate on the ENF or Expanded ENF. The Secretary's scope may require either an abbreviated GHG emissions analysis designed to document the proponent's emissions reductions claims or allow the proponent to opt-out of emissions analysis altogether, depending on the circumstances of the particular project.

Examples of projects that may qualify for this opt-out provision (subject to approval by the Secretary) include (but are not limited to) the following:

- A project that consists solely of generation of renewable energy (e.g., a wind farm or large-scale solar installation);
- A zero net energy project;
- A commercial or residential development project that incorporates renewable technologies at a sufficient scale to significantly reduce overall GHG emissions associated with the project.

SELF-CERTIFICATIONS OF MITIGATION COMMITMENTS AND SECTION 61 FINDINGS

After conducting the GHG emissions analysis in accordance with the protocol specified above, the EIR should also specifically and clearly identify which GHG emissions reductions measures that the proponent will adopt as part of its preferred alternative, and those measures should be specifically listed as mitigation measures for the proposed project.

In order to ensure that all GHG emissions reduction measures adopted by the proponent as the preferred alternative are actually constructed or performed by the proponent, the Secretary will require proponents to provide a self-certification to the MEPA Office indicating that all of the required mitigation measures, or their equivalent, have been completed. Specifically, the Secretary will require, as a condition of a Certificate approving a Final or Single EIR or a Final Record of Decision granting a Waiver, that the proponent provide a certification to the MEPA Office signed by an appropriate professional (e.g., engineer, architect, general contractor) indicating that the all of the mitigation measures adopted by the proponent as the preferred alternative have been incorporated into the project. Alternatively, the proponent may certify that equivalent emissions reduction measures that collectively are designed to reduce GHG emissions by the same percentage as the measures outlined in the EIR, based on the same modeling assumptions, have been adopted. The certification should be supported by as-built plans. For those measures that are operational in nature (i.e. TDM, recycling) the proponent should provide an updated plan identifying the measures, the schedule for implementation and how progress towards achieving the measures will be obtained.

For those projects that are proposed to be constructed in phases over time, the proponent should discuss with the MEPA Office a phasing plan for supplying the required certifications.

In compliance with the general requirement, the EIR should contain draft Section 61 Findings for any state Agencies that will take Agency Action of the project, and these Section 61 Findings should contain the requirement that the proponent submit the self-certification described above to the MEPA Office upon completion of the project (or in accordance with a project-specific phasing plan). The Section 61 Findings shall be incorporated into state Agency land transfers, financial assistance documents, and/or permits as appropriate for the project in question.

EFFECTIVE DATE

The Secretary will require compliance with the provisions of this Policy for all projects that are subject to the Policy for which ENFs and EENFs are submitted after April 30, 2010 (and noticed for public review in the May 5, 2010 edition of the *Environmental Monitor*). Projects that filed an ENF or EENF prior to that date will be subject to the particular provisions of the Scoping Certificate issued for the project. The Secretary will review NPCs filed pursuant to 301 CMR 11.10 for projects that filed an ENF prior to the effective date of the initial GHG Policy (November 1, 2007) on an individual basis to determine whether the project will be required to comply with the Policy.

The MEPA Office will periodically revisit and review the Policy as necessary.

APPENDIX – SUGGESTED MITIGATION MEASURES

Note: This is not an exhaustive list and the Secretary retains the discretion to require analysis of any and all potential mitigation measures for a particular project, whether or not listed below. This is intended to be a resource for all project proponents subject to the Policy, not a mandatory list of measures that must be modeled for every project. It is not limited to measures that can be analyzed with energy modeling software and includes some measures whose GHG reduction benefits may be indirect or difficult to quantify. This list is also not limited to any particular project type and therefore certain measures may be inapplicable to any given project. In general, proponents should make a reasonable effort to quantify the benefits of mitigation measures applicable to the project type and identified in the Secretary's scoping Certificate using available tools and resources.

Siting, Site Design, and Development:

- Develop project consistent with Commonwealth of Massachusetts Sustainable Development Principles to integrate transportation and land use (http://www.mass.gov/Agov3/docs/smart_growth/patrick-principles.pdf)
- Locate new buildings in or near areas designated for transit-oriented development (TOD) and, where possible, incorporate TOD principles in employee and customer activity patterns
- Demonstrate new tree planting
- Minimize building footprint
- Design project to support alternative transportation to site including transit, walking, and bicycling
- Size parking capacity to meet, but not exceed, local parking requirements and, where possible, seek reductions in parking supply through special permits or waivers
- Minimize energy use through proper building orientation and use of appropriate landscaping (e.g. trees for shading parking lots or southern facing facades)
- Develop or support multi-use paths to and through site

Building Design, Construction, and Operation:

Note: Use design-quality building performance simulation software to parametrically model and integrate energy conservation elements to the extent feasible.

BUILDING ENVELOPE

- Improve building envelope through higher R-value insulation in walls, roof, and if appropriate, basement walls and ceiling
- Maximize the thermal mass of walls, roofs and floor to provide thermal damping
- Conduct inspection and comprehensive air sealing of building envelope to minimize air leakage
- Install lower U-value windows to improve envelope performance
- Incorporate window glazing to balance and optimize daylighting, heat loss and solar heat gain performance
- Design roofs at a minimum to be solar-ready

- Construct green roofs to reduce heat load on roof, further insulate, and retain/filter rainwater
- Evaluate use of high-albedo roofing materials to reduce heat absorption
- Maximize interior daylighting through floor plates, and use of skylights, celestories and light wells
- Consider a Net Zero building design
- Participate in Energy Star for New Homes or LEED for Homes

BUILDING MECHANICAL SYSTEMS AND LIGHTING

- Prevent over-sizing of HVAC or other equipment by sizing only after efficiency measures have been incorporated to reduce HVAC, lighting and other electrical loads
- Install high-efficiency HVAC systems and premium efficiency motors
- Eliminate or reduce use of refrigerants in HVAC systems
- Use demand control ventilation
- Use energy efficient boilers, heaters, furnaces, incinerators, or generators
- Use ground source heat pumps
- Include heat recovery ventilation units (with regenerative desiccant beds)
- Seal and leak-check all supply air ductwork
- Incorporate motion sensors into lighting, daylighting, and climate controls
- Use efficient, directed exterior lighting, such as LED technology
- Install high efficiency lighting, including CFLs and LED technology as appropriate
- Install energy efficient elevators and escalators
- Provide automated energy management control system with the capacity to:
    - Adjust and maintain set points and schedules
    - Indicate alarms and problems
    - Provide information on trends and operating history
    - Operate mechanical and lighting systems to minimize overall energy usage

DISTRIBUTED GENERATION (ON-SITE)

- Incorporate appropriate on-site renewable energy systems into project including solar PV (both first and third-party ownership models should be evaluated), solar thermal, wind, low-impact hydro, geothermal, biomass (including pellets), and bio-gas strategies
- Incorporate combined heat and power (CHP) technologies where sufficient year-round thermal demand exists

WATER CONSERVATION

- Install efficient water fixtures that exceed building code requirements such as waterless urinals, dual flush toilets, low-flow faucets and showerheads, sensor faucets
- Re-use gray water and/or collect and re-use rainwater for landscaping and other non-potable uses
- Where outdoor watering is necessary, install water sensors to prevent unnecessary watering
- Plant only native species that need minimal watering and/or use xeriscaping
- Develop a water management plan
- Consider participation in U.S. EPA's WaterSense Program

MATERIALS

- Re-use building materials and products
- Use building materials with recycled content
- Use building materials that are extracted and/or manufactured within the region
- Use rapidly renewable building materials
- Use wood that is certified in accordance with the Forestry Stewardship Council's Principles and Criteria
- Use low-VOC adhesives, sealants, paints, carpets, and wood

ENERGY INFORMATION (Data Acquisition)

- Track energy performance of building and develop strategy to maintain efficiency
- Install sub-meters on all floors and/or departments and/or for each specific tenant space
- Provide energy information systems to promote energy awareness to occupants
- Conduct 3rd party building commissioning to ensure energy performance

ONGOING OPERATIONS

- Design for waste reduction (i.e. provide for storage and collection of recyclables (including paper, corrugated cardboard, glass, plastic, and metals) in building design
- Provide construction and design guidelines and energy efficiency consulting services to facilitate sustainable design for build-out by tenants
- Purchase and install Energy Star-rated appliances that are the lowest energy rating
- Reduce energy demand using peak shaving or load shifting strategies – if applicable, enroll in demand response program with ISO-New England
- Conduct or provide incentives for annual audits of energy consumption for tenants
- Create and implement a tenant manual identifying GHG-reducing operations and practices
- Purchase 'green power'

Water Treatment Plants:

- Size piping systems to minimize pressure loss
- Design pumping, blower, filtration and associated control systems to achieve overall efficiency
- Select high efficiency equipment including pumps, blowers, and motors
- Where significant amounts of methane are produced as by-products of anaerobic digestion, evaluate feasibility of use as fuel for heating or for a CHP system
- Consider installing on-site renewable energy systems

Other Industrial Process Systems and/or Facilities:

- Evaluate process alternatives and select the least energy intensive option
- Evaluate use of carbon neutral fuels such as biomass, landfill gas, digester gas, or liquid renewable fuels as the energy source for the process
- Evaluate feasibility of the application of CHP technology
- Specify and procure most efficient equipment
- Design power generating systems to minimize parasitic losses
- Include heat recovery and cascading of process thermal exhaust streams

- Include sufficient metering and controls for real-time monitoring and optimization of the process operations

Construction Period Emissions:

- Participate in MassDEP's Clean Air Construction Initiative
- Implement a construction waste management plan
- Implement and enforce no-idling policies
- Incentivize use of public transportation, car/vanpools, for construction workers to reduce vehicle trips

Mobile Source Emissions:

- Purchase alternative fuel and/or fuel efficient vehicles for fleet, including maintenance or operation vehicles on-site
- Join or form a Transportation Management Association
- Provide new transit service or support extension/expansion of existing transit (buses, trains, shuttles, water transportation)
- Support expansion of parking at Park-n-Ride Lots and/or transit stations
- Pursue opportunities to minimize parking supply through shared parking or banked parking
- Develop a parking management program to minimize parking requirements such as parking cash-out, parking charges, preferential carpool or vanpool parking, limiting parking available to employees
- Develop and implement a Marketing/Information Program that includes posting and distribution of ridesharing/transit information
- Designate or hire a transportation manager
- Provide free or subsidize transit passes
- Use of pre-tax dollars for non-single occupancy vehicle (sov) commuting costs
- Reduce employee trips during peak periods through alternative work schedules, telecommuting and/or flex-time
- Provide a guaranteed ride home program
- Provide on-site amenities such as banks, dry cleaning, food service, childcare
- Provide bicycle storage and showers/changing rooms
- Roadway Improvements to improve traffic flow and reduce vehicle congestion
- Traffic Signalization and coordination to improve traffic flow and support pedestrian and bicycle safety
- Make on- and off-site improvements to reduce VMT including sidewalks, paths, traffic signals, bus shelters, lighting and landscaping
- Implement idle reduction policies
- Provide preferred parking for fuel-efficient vehicles
- Provide electric vehicle charging infrastructure
- Participate in U.S. EPA's SmartWay Transport Partnership
- Accommodate and promote use of car-sharing (i.e. Zipcar)