

/Assessing Energy Use and Greenhouse Gas Emissions in Environmental Impact Statements

New York State Department of Environmental Conservation

DEC Policy

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I. Summary:

This document, *Guide for Assessing Energy Use and Greenhouse Gas Emissions in an Environmental Impact Statement*, provides instructions to DEC staff for reviewing an environmental impact statement (EIS) pursuant to the State Environmental Quality Review Act (SEQR) when the EIS includes a discussion of energy use or greenhouse gas (GHG) emissions. Other state and local agencies may choose to use relevant parts of this guide when serving as SEQR lead agency for a project subject to an EIS that includes a discussion of energy use or GHG emissions.

II. Policy:

This policy should be used by DEC staff in their review of an EIS when:

- DEC is the SEQR lead agency in a project review; and
- Energy use or GHG emissions have been identified as significant in a positive declaration or, as a result of scoping, are required to be discussed in an EIS.

This policy identifies the methods and boundaries for the assessment of energy use, GHG emissions, and mitigation measures for an EIS.

This policy does not create any new requirements under SEQR. It does not establish when the scope of an EIS should include energy use or GHG emissions, nor does it establish a threshold for the determination of significance under SEQR (i.e., when the lead agency must prepare or require the preparation of an EIS). Instead, the statutory and regulatory rules for making the significance determination should continue to be used. [*see* ECL §8-0109; NYCRR §617.7; SEQR Handbook, Chapter 4, Determining Significance, (www.dec.ny.gov/permits/6188.html)]

III. Purpose and Background:

Global climate change is one of the most important environmental challenges of our time. There is scientific consensus that human activity is increasing the concentration of GHGs in the atmosphere and that this, in turn, is leading to serious climate change. These climate changes will continue to affect the environment and natural resources of the State of New York.

SEQR was enacted to ensure that protection and enhancement of the environment, including human and community resources, would be given appropriate weight with social and economic considerations in determining public policy. In enacting SEQR, the State Legislature intended that state and local governments “conduct their affairs with an awareness that they are stewards of the air, water, land, and living resources, and that they have an obligation to protect the environment for the use and enjoyment of this and all future generations.” (6 NYCRR §617.1[b])

SEQR requires that lead agencies identify and assess actions for potential adverse environmental impacts. As state and local governments strive to meet this SEQR obligation, they will identify proposed projects that have potentially significant environmental impacts due, in part, to energy use and GHG emissions. Energy use and GHG emissions may either be among the issues identified as significant in a positive declaration, or included based on public scoping for an EIS.

Accordingly, the purpose of this Policy is to assist DEC staff in reviewing how energy use and GHG emissions are identified and analyzed in an EIS, so as to allow staff to meet DEC’s obligation under SEQR as well as to combat climate change and maximize energy efficiency. In addition to this Policy, project proponents are welcome to consult with the DEC early in the EIS process with respect to methodology for quantifying emissions.

IV. Responsibility:

This Policy will be available to DEC staff and the public via the DEC public website. The Office of Climate Change, the Commissioner’s Policy Office, the Office of General Counsel, and the Divisions of Air Resources and Environmental Permits will collaborate on any necessary updates and additions to this policy. The Office of Climate Change and the Division of Air Resources will share the responsibility for providing technical support to staff applying this Policy. When a proposed project involves an air pollution source requiring a permit or registration, the Division of Air Resources will provide technical support regarding GHG emissions from that source. When a proposed project does not involve an air permit, the Office of Climate Change will have primary responsibility for providing technical support.

V. Procedure:

In cases where DEC is the lead agency or an involved agency in a SEQR review, and energy or climate change impacts have been included in the EIS scope, staff should employ this Policy. Where DEC is an involved agency, DEC staff should advise the lead agency of any identified climate change or energy use impacts.

Assessing Energy Use and Greenhouse Gas Emissions in Environmental Impact Statements

Guidance for an EIS that Includes Greenhouse Gas Emissions

A. Purpose and Applicability

This document provides instructions to Department of Environmental Conservation (DEC) staff for preparing or reviewing an environmental impact statement (EIS) that includes a discussion of energy use or greenhouse gas (GHG) emissions.

Global climate change is emerging as one of the most important environmental challenges of our time. There is scientific consensus that human activity is increasing the concentration of GHGs in the atmosphere and that this, in turn, is leading to serious climate changes. Climate change will continue to adversely affect the environment and natural resources of New York State, the nation, and the world. SEQR requires that lead agencies identify and assess adverse environmental impacts, and then mitigate or reduce such impacts to the extent they are found to be significant. Consistent with this requirement, SEQR can be used to identify and assess climate change impacts, as well as the steps to minimize the emissions of GHGs that cause climate change. Many measures that will minimize emissions of GHGs will also advance other long-established State policy goals, such as energy efficiency and conservation; the use of renewable energy technologies; waste reduction and recycling; and smart and sustainable economic growth. This policy is not the only state policy or initiative to promote these goals; instead, it furthers these goals by providing for consideration of energy conservation and GHG emissions within EIS reviews.

Given the importance of climate change impacts and SEQR's mandate to address adverse environmental impacts, in certain instances an EIS will be required to include a discussion of energy use or GHG emissions. This document has been prepared to provide guidance as to methods to assess and mitigate these impacts when preparing and reviewing an EIS. This policy should be used by DEC staff in their review of an EIS when:

- DEC is the lead agency in a project review; and
- Energy use or GHG emissions have been identified as significant in a positive declaration or required through scoping to be discussed in an EIS.

This policy does not create any new requirements under SEQR. It does not establish when the scope of an EIS should include energy use or GHG emissions, nor does it establish a threshold for the determination of significance under SEQR. Instead, the statutory and regulatory rules for making the significance determination (ECL §8-0109; NYCRR §617.7) should continue to be used.

B. Focus of this Guidance

This Policy focuses on how energy use and GHG emissions should be discussed in an EIS, but does not dictate whether or how climate change impacts, such as projected sea level rise, may be relevant to a proposed project. While impacts of climate change on a project may be important in some cases, this Policy is specifically focused on assessing and mitigating energy use and GHG emissions. Questions regarding how climate change may potentially affect a proposed project will need to be decided on a case-by-case basis.

There are six main GHGs: carbon dioxide (CO₂), nitrous oxide (N₂O), methane (CH₄), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆). Evaluation of the emissions of each of these GHGs could potentially be included in the scope of an EIS.

Emissions of CO₂ account for an estimated 89% of the total annual GHG emissions in New York State.¹ The overwhelming majority of these emissions — estimated at 250 million tons of CO₂ equivalent per year — result from fuel combustion. Overall, fuel combustion accounts for approximately 89% of total GHG emissions². (Nitrous oxide and methane also result from fuel combustion.) Additional GHG sources include electricity distribution (SF₆); refrigerant substitutes (HFCs); the management of municipal waste, municipal wastewater, and agriculture (CH₄ & N₂O); natural gas leakage (CH₄); and others.

This Policy for assessing energy use and GHG emissions in an EIS concentrates on:

- establishing the boundaries for the assessment;
- quantifying indirect and direct carbon dioxide (CO₂) emissions from the project;
- quantifying emissions from waste generation;
- quantifying methane emissions from landfills; and
- providing a menu of possible mitigation options.

For analysis of GHG sources other than CO₂ from combustion, CO₂ from waste, or methane from landfills, quantification methodology will be handled on a case-by-case basis through consultation between a project proponent, DEC as the lead agency, and involved agencies. Potential examples include methane emissions from 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 cases, where the DEC is the lead agency, staff should consult other established protocols for quantifying emissions, such as those listed in Section H.

The Greenhouse Gas Protocol jointly developed by the World Resources Institute and the World Business Council for Sustainable Development in 2004 (www.ghgprotocol.org) provides relevant information regarding indirect vs. direct emissions and potential GHG sources from a proposed project. In addition, the Climate Registry has also released a protocol for quantifying

¹ The New York State Energy Research and Development Authority periodically develops GHG inventories. Information included in this guidance was taken from the Draft New York State Greenhouse Gas Emissions and Trends (1990-2005) dated March 2007.

² NYSERDA's inventory accounts for the different global warming potentials of each of the GHGs and reports emissions of each GHG as million tons of CO₂ equivalents.

greenhouse gas emissions. The Climate Registry, of which New York State is a member, is a collaborative effort between states and other entities to develop and manage a common GHG emissions reporting system. The Registry's protocol is designed for existing enterprises rather than proposed projects, but it will provide some guidance regarding quantification methodology, especially for specific sources (e.g. industrial process emissions) not covered by this policy. The Climate Registry's protocol addresses organization-level emissions (e.g. corporate-wide), but will have sections relevant to facility-level emissions. The facility-level emissions section will be most helpful in the development of an EIS. For more information, contact the Climate Registry or see <http://www.theclimateregistry.org/>.

The Department recognizes that accurate estimates of energy use and resulting GHG emissions may be complicated by the limitations of energy modeling tools, the variety of project-specific and site-specific characteristics, and the preliminary nature of project design at the point when an EIS is filed. Even within these limitations, an EIS must include consideration of potentially significant environmental impacts. Furthermore, as long as the relative levels of energy use and GHG emissions are compared with respect to project alternatives, and the outcome of the comparison is used in the decision-making process, an important goal will have been achieved even if the quantification of total annual GHG emissions is not precise. By ensuring energy usage and GHG emissions are considered early in project design, the public policy goals of combating climate change and maximizing energy efficiency are best served.

In addition to quantifying GHG emissions from a proposed project, some project EISs may also warrant an assessment of other impacts related to global warming. For example, some projects may involve removal of a significant carbon sink through deforestation. Others projects, such as proposed sub-surface exploration (e.g., natural gas production), may affect the future potential for geological sequestration of CO₂. In other cases, the project itself may be affected by projected impacts of global warming expected to result regardless of future global GHG emission scenarios, such as sea level rise. As mentioned above, this Policy is not directed to those cases, however, it is expected that DEC as the lead agency or other involved agencies would address those potential impacts in the EIS scoping phase on a case-by-case basis.

C. Boundaries of the GHG Assessment in an EIS

When GHG emissions are considered in an EIS, total annual emissions should be presented as short tons of carbon dioxide or, for other types of GHGs, as both short tons and as equivalent to short tons of CO₂ using the most up-to-date global warming potential factors as determined by the Intergovernmental Panel on Climate Change (IPCC) and published in the most recent *Assessment Report on Climate Change*.

In cases when GHGs are analyzed in an EIS, both direct and indirect GHG emissions should be assessed. Each of these categories includes both stationary and mobile sources.

- Direct GHG emissions will include both stack and fugitive emissions from combustion processes or industrial processes conducted on-site, and from fleet vehicles owned (or leased) and operated by the project proponent and associated with the project.

- Indirect GHG emissions will include emissions generated by energy plants (off-site) supplying energy used on the site of the proposed project during its operation, and from vehicle trips to or from the project site during its operation where vehicles are not owned or operated by the project proponent (i.e. freight deliveries, employee commuting, customer visits). Another source of indirect emissions is the generation, transportation, treatment, and disposal of wastes generated at the site. Waste generation is typically reported in an EIS, and should also be evaluated for its contributions to GHG emissions and included in the quantification of total annual emissions.

Both direct and indirect emissions should be quantified in an EIS, with some specific exceptions. For one, a *qualitative* discussion of the GHG emissions resulting from the construction phase, including the manufacture or transport of the construction materials, should be included in an EIS. This qualitative review can compare emissions attributed to design and construction choices and activities without quantifying the emissions. Useful resources for this comparison include the National Institute of Buildings and Technology's software Building for Environmental and Economic Sustainability (BEES) (<http://www.bfrl.nist.gov/oae/software/bees/>) and the Buildings Energy Data Book published by the U.S. Department of Energy (<http://buildingsdatabook.eren.doe.gov>) which is searchable for a variety of topics, including GHG/CO₂ emissions.

For projects where the construction phase or the extraction or production of materials or fuels are likely to be a significant fraction of total project emissions, DEC staff may include these categories during scoping for the EIS. In these cases, DEC and the project proponent would also need to address quantification methodology in the EIS scoping phase.

Project proponents should not be required to include the emissions (either qualitatively or quantitatively) from the use of products that will be produced or sold at the project site, except where the projects involve fuel production.

In the cases of (1) indirect GHG emissions from off-site energy generation and (2) indirect emissions from vehicle trips generated by the project, DEC staff may make a determination, based on a demonstration by a project proponent, that a project as designed has minimized emissions to the maximum extent practicable. In these situations, the EIS may include a qualitative discussion of emissions from these categories rather than a quantification of emissions.

C-1. Direct Emissions from Stationary Sources

Post-construction direct emissions from stationary sources typically result from combustion of fossil fuels for heat, hot water, steam generation, on-site generation of electricity, or industrial processes. This category can include (but is 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-containing fuels or waste streams.

To quantify energy use and direct emissions from stationary sources, the proponent will need to

reasonably estimate fuel usage from the proposed stationary sources included in project design. In the process of projecting fuel usage, project proponents should use energy modeling software. More information on software is provided below. In the case where GHGs are to be produced from activities other than the combustion of fuels, DEC staff can consult with established protocols (such as those listed in Section H of this document) to recommend methodologies to project proponents.

Expected fuel usage can then be used to estimate CO₂ emissions using published emission factors. For most fuel types, the Energy Information Administration (EIA) publishes appropriate emission factors in Fuel and Energy Source Codes and Coefficients (<http://www.eia.doe.gov/oiaf/1605/coefficients.html>). This document provides emission coefficients in pounds of CO₂ per unit volume or mass, as well as in pounds of CO₂ per million Btu. For fuel types not included in this document, staff should consult with the project proponent regarding another reliable and relevant information source.

For projects involving biomass combustion, all emissions should be assessed in the EIS but their source (biomass) should also be identified and explained.

Where the project will be required to obtain an air permit from the DEC, the methodology for projecting GHG emissions should be developed in consultation with staff in the DEC Division of Air Resources, to ensure consistency with air permit application procedures. In these instances, for example, DEC staff may use other emission coefficients that are more appropriate and accurate (e.g., from AP 42), or DEC staff may require a “maximum potential to emit” analysis to be consistent with projections for other air contaminants included in the permit application.

C-2. Direct Emissions from Non-Stationary Sources

Direct emissions from non-stationary sources should include fleet vehicles owned and operated by the project proponent and associated with the project. Fleet vehicles should be widely defined to include freight trucks, delivery trucks, on-site mobile equipment such as fork lifts, tractors, maintenance and security vehicles and other non-stationary equipment used on-site whose operation involves combustion of carbon containing fuels.

To quantify direct emissions from non-stationary sources, the project proponent should first estimate fuel usage, and then estimate CO₂ emissions based on coefficients published by the EIA, as above.

C-3. Indirect Emissions from Stationary Sources

Indirect emissions from stationary sources should include emissions generated by off-site energy plants supplying energy used on the site of the proposed project during its operation, such as the off-site production of electricity, heating, or cooling which will be used on-site. Most often this is electricity purchased through a utility.

Again, the first step is to estimate projected electricity demand for the project. Energy modeling software will be helpful in this regard. (For additional information on modeling see section E below.)

The proponent should then multiply total projected purchased electricity by an emissions factor to calculate the CO₂ emitted through the generation of electricity. Based on 2005-06 data, the statewide average emission factor is 850 pounds CO₂ per MWhr. Through the Environmental Disclosure Program administered by the New York State Public Service Commission, the emission factor of each load serving entity³ (LSE), which can be an investor-owned utility or an alternative power provider, is published as a percentage of the statewide average. Project proponents should consult with the most recent disclosure under this program, (which can be found at <http://www3.dps.state.ny.us/e/energylabel.nsf/>) and multiply the statewide average emission factor by the percentage published for the relevant LSE. In the near future, the DEC will be posting the most recent emissions factor for each LSE on its website in order to simplify this step in the process.

In some situations, a proposed project will involve the construction of building space intended for lease to commercial clients. Although the final electricity demand from occupancy will be outside the control of the project proponent, the proponent should quantify as much as practicable the projected emissions (or a range of likely emission levels), and describe those elements of building design or operation that are inside and outside of the project proponent's control.

C-4. Indirect Emissions from Mobile Sources

Indirect emissions from non-stationary sources include trips generated by vehicles that are associated with the proposed project but are not owned and operated by the project proponent. This would include trips of commuting employees, residents, suppliers/vendors, and customers/users of the project as well as the transportation of waste generated at the site. The most recent edition of Trip Generation, published by the Institute of Transportation Engineers, should be used to calculate the number of trips generated by the proposed project.

To quantify these indirect emissions, the first step is to estimate net new trips to be generated by the proposed project, as would typically be done in a trip generation analysis included in a project's traffic study. This should be presented separately for various relevant categories, e.g. commuting employees, residents, suppliers/vendors, customers/users, and waste transportation. New net trips should then be expressed as the annual vehicle-miles traveled (VMT) for each category, using reasonable assumptions about distances traveled, based on existing community patterns.

To convert annual VMT to CO₂ emissions, project proponents should utilize an appropriate CO₂ emissions factor such as those found in EPA MOBILE 6.2 (which is expressed as grams/mile) and convert it to tons per year by dividing by 907,185 grams/ton. This model does not take vehicle speeds into account at this time, although speed does influence total GHG emissions from VMT. In the future, when an EPA model that does account for speed is finalized and

³ The Long Island Power Authority is not subject to this requirement and thus does not appear on this DPS website. For projects on Long Island, DEC staff should recommend use of 1,250 lbs CO₂ per MWhr or updated factor provided by the Division of Air Resources.

available, staff may use that as well. Project proponents should provide the source for the emissions factors used to convert the VMT to CO₂ emissions.

C-5. Methane Emissions from Landfills

This section applies only to methane emissions from waste landfills.

Methane emissions from landfills are a small but significant portion of the total inventory of New York GHG emissions. There are discrete actions that can be taken to reduce methane emissions: recovery of organics from waste streams, enhanced landfill gas collection, flaring, and use of landfill gas for energy production. Each of these measures would help reduce total GHG emissions in the state.

To quantify likely methane emissions from a landfill, project proponents should utilize site specific data in conjunction with the U.S. EPA's *Climate Leaders Greenhouse Gas Inventory Protocol, Direct Emissions from Municipal Solid Waste Landfilling* module (October 2004). This protocol employs the current version of the LandGem model to estimate the GHG emissions from the entire landfill operation. Project proponents should use this protocol plus a list of site specific parameters. These specific parameters include: the volume of landfill gas collected; the percentage of methane in the landfill gas; the portion of the site that is served by a collection system and the portion not served by a collection system; the emissions of GHG from flaring or energy recovery systems; and if available, direct measurements of emissions from the landfill surface. Project proponents may seek approval from the Department for the use of other protocols, such as those adopted by the U.S. EPA's Climate Leaders Program.

In an EIS, project proponents should present information describing emissions related to the existing landfill operations as well as projected emissions from proposed portions of a landfill operation.

D. Estimating Emissions from Waste Generation

This section applies to all types of proposed projects that will generate waste. An EIS typically includes information on waste generation. Emissions from waste generation are considered to be indirect GHG emissions.

For those EISs that assess GHG emissions, the GHG emissions resulting from waste generation should also be presented. Project proponents should refer to one or more of the following three tools: (1) the U.S. EPA's Waste Reduction Model (WARM) web-based calculator and Excel spreadsheet (http://www.epa.gov/climatechange/wycd/waste/calculators/Warm_home.html); (2) the Northeast Recycling Council (NERC) Environmental Benefits Calculator (available at http://www.nerc.org/documents/environmental_benefits_calculator.html); or (3) the Municipal Solid Waste Decision Support Tool (MSW-DST) developed by the U.S. EPA's Office of Research and Development and Research Triangle Institute. These models will enable proponents to derive the GHG emissions implications of different levels of solid waste generation and differing solid waste management practices. Project proponents may seek approval from the Department for the use of alternative modeling tools.

E. Use of Energy Modeling Software to Estimate a Building's Energy Demand

To estimate projected energy usage, DEC staff should recommend that the project proponent use energy modeling software. Energy modeling uses computer-based tools to simulate the energy use of a building throughout a year of operation. Examples of models include EQUEST, Energy-10, Visual DOE, and DOE2.

Project proponents may use these or other comparable energy modeling tools that can appropriately estimate projected fuel usage and electricity demand. No model will predict energy demand with absolute accuracy, as a building may operate differently than the model or the building location's features can vary from assumptions used in a model. These models are still valuable for providing a general estimate of potential GHG emissions post-construction. More importantly, the models can be used to compare potential design options and their resulting energy use implications.

The EIS should clearly identify both the modeling tool utilized and the data input into the modeling tool. This data may include the building size, building location, type of heating, cooling, or ventilation, projected use patterns, and other design features.

F. Total GHG Emissions, Alternatives Analysis, & Mitigation Measures

Project proponents should present total projected GHG emissions as the sum of emissions from direct stationary sources, direct mobile sources, indirect stationary sources, indirect mobile sources, and waste generation. In many cases, these five categories (plus methane emissions from landfills, if relevant), will cover all the significant sources of GHG emissions associated with the proposed project. As discussed in the introduction, there may be other significant sources of GHGs associated with the project, and the methodology for quantifying these emissions should be developed in consultation between DEC staff as lead agency and the project proponent. When GHGs other than CO₂ are included in the scope of an EIS, emissions of these GHGs should be presented as total emissions and as equivalent to short tons of CO₂ using the most up-to-date global warming potential factors as determined by the Intergovernmental Panel on Climate Change (IPCC) and published in the most recent *Assessment Report on Climate Change*.

SEQR requires consideration of alternatives in an EIS. As with other potentially significant impacts addressed in an EIS, alternatives should be discussed with respect to the ability of each to reduce GHG emissions generated by the project, including a description and evaluation of the range of reasonable alternatives with respect to sites, technology, scale, design, or use. In an EIS, the project proponent should present total annual GHG emissions for the proposed action (including mitigation measures) and include a quantitative comparison to the total annual GHG emissions of the alternatives, where practicable. The proponent should explain which design alternatives were rejected, and the reasons for the rejection of any alternative. Where models do not allow reasonable quantitative analyses of alternatives, the EIS should still provide qualitative

comparisons of GHG emissions of various alternatives.

The EIS should also include a review and assessment of mitigation measures applicable to the proposed action, including calculations of the projected reduction in GHG emissions that would result from each mitigation measure. Where practicable, the EIS should also include a quantification of reductions in GHG emissions that would result from mitigation measures that were considered and rejected (i.e., not incorporated into the proposed action.) Where models do not allow reasonable quantitative analyses, the EIS should still provide qualitative comparisons of GHG emissions of various measures.

For building energy usage, energy modeling software can also be useful in designing mitigation measures or reviewing alternatives. A project proponent may also wish to use the Energy Star Target Finder to compare the projected building energy usage with average buildings of the same type, size, and location. This tool is provided by the Energy Star program and is available at <http://www.energystar.gov> under “Buildings and Plants” and “Tools and Resources Library”.⁴

For transportation emissions, transportation demand management (TDM) measures should be identified and assessed, using models available for estimating the potential emissions reductions for TDM measures, such as the U.S. Environmental Protection Agency COMMUTER model and the Work Trip Reduction Model.

For further general information regarding how alternatives and mitigation should be addressed in an EIS, consult *The SEQR Handbook* (New York State Department of Environmental Conservation, November 1992.) [*The SEQR Handbook* is undergoing revisions with revised parts being published on the web (See <http://www.dec.ny.gov/permits/47636.html>). At the time of this writing, revised sections on alternatives and mitigation are not yet available, though the DEC expects to publish these sections in the near future.]

In any EIS process, Findings must consider the relevant environmental impacts and the facts and conclusions included in the Final EIS, and must weigh and balance these environmental impacts with social, economic, and other considerations. DEC staff should use this approach to weigh the global warming implications of proposed projects, the alternatives analysis, and mitigation measures discussed in the EIS. In scoping the EIS, DEC staff should ensure that the discussion of alternatives and mitigation will support Findings by all other involved agencies, as well as DEC. In making Findings, it remains fundamental that the alternative to be selected or approved will avoid or minimize significant adverse environmental impacts to the maximum extent practicable. DEC staff should also incorporate mitigation measures identified in the Findings into the relevant DEC permits as permit conditions, to ensure that GHG-minimizing measures will be implemented and can be monitored and enforced.

G. Mitigation Measures

DEC staff should give priority and preference to on-site mitigation measures to reduce GHG

⁴ See http://www.energystar.gov/index.cfm?fuseaction=target_finder.&CFID=1267883&CFTOKEN=21024648

emissions, in the interest of influencing project design and maximizing the energy efficiency of new facilities. If a project proponent puts forward off-site mitigation measures, DEC staff should first consider the completeness of proposed on-site mitigation measures.

Below are examples of measures that can increase energy efficiency, reduce energy demand, and reduce GHG emissions from proposed projects. Not all of these measures will be practicable or feasible for all proposed projects. Instead, the listed measures are a menu of possible options, and are not intended to be exclusive. Notably, as a result of community and market interest in addressing climate change, many of these options are already in regular use, and have successfully been deployed by project proponents seeking to reduce energy use, energy costs, and GHG impacts. More detailed information on any of these options, and other potential measures, can be found via the resources listed below. When project proponents offer additional measures whose effectiveness can be documented, staff are encouraged to also include consideration of those measures in the EIS.

Building Design and Operation Measures

- Design an energy efficient building envelop to reduce cooling/heating requirements
- Install high-efficiency HVAC systems
- Construct green roofs
- Eliminate or reduce use of refrigerants in HVAC systems
- Use high-albedo roofing materials
- Maximize interior daylighting
- Reduce energy demand using peak shaving or load shifting strategies
- Incorporate window glazing to optimize daylighting, heat loss and solar heat gain
- Incorporate super insulation to minimize heat loss
- Incorporate motion sensors and lighting and climate control
- Use efficient, directed exterior lighting
- Use water conserving fixtures that exceed building code requirements
- Re-use gray water and/or collect and re-use rainwater
- Provide for storage and collection of recyclables (including paper, corrugated cardboard, glass, plastic and metals) in building design
- 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 locally produced and/or certified in accordance with the Sustainable Forestry Initiative or the Forestry Stewardship Council's Principles and Criteria
- Conduct 3rd party building commissioning to ensure energy performance (e.g. LEED)
- Track energy performance of building and develop strategy to maintain efficiency
- Provide construction and design guidelines to facilitate sustainable design for build-out by tenants

Efficiency or Mitigation Measures for On-site GHG Sources

- Use energy efficient boilers, heaters, furnaces, incinerators, or generators
- Use process design efficiency for industrial process sources
- Incorporate co-firing of biomass or use of bio-fuels
- Collect biogas and use for power generation

- Use biodiesel or bioheat for heating fuel or in vehicles/equipment
- Incorporate on-site renewable energy sources into project, such as wind or solar
- Incorporate combined heat and power (CHP) technologies
- Pursue carbon collection, capture, and reuse or sequestration

Site Selection and Design Measures

- Provide access to public transportation
- Minimize energy use through building orientation
- Select brownfields or greyfields for redevelopment to minimize vegetation/forest loss
- Incorporate mixed-use design to promote short commutes for employment and shopping
- Provide permanent protection for open space on the project site
- Manage forested areas for carbon sequestration
- Select site with potential for carbon sequestration (for large CO₂ generators)
- Conserve and restore natural areas on-site
- Minimize building footprint
- Design project to support alternative transportation (walking and bicycling)
- Use low impact development for stormwater design
- Design water efficient landscaping

Transportation Measures

- Locate new buildings in or near areas designated for transit-oriented development (TOD)
- Incorporate TOD principles in employee and customer activity patterns
- Purchase alternative fuel and/or fuel efficient vehicles for fleet, including the range of maintenance and operation vehicles used on-site.
- Incorporate idling reduction policies
- 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
- Develop or support multi-use paths to and through site
- Size parking capacity to meet, but not exceed, local parking requirements and, where possible, seek reductions in parking supply through special permits or waivers
- Pursue opportunities to minimize parking supply through shared 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 ride sharing transit information
- Subsidize transit passes
- Provide for the use of pre-tax dollars for non-single occupancy vehicle 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

- Traffic signalization and coordination to improve traffic flow and support pedestrian and bicycle safety

Waste Reduction or Management Measures

- For landfills, recover organics from waste streams, enhance landfill gas collection, use flaring, or use landfill gas for energy production
- Utilize composting
- Promote and facilitate recycling
- Incorporate internal environmental accounting practices to promote waste reduction

As mentioned above, staff should give preference to on-site mitigation measures. If, in special circumstances, off-site mitigation measures are to be pursued, DEC staff should seek to ensure that these measures result in real, additional, and verifiable GHG emissions reductions, and that the mitigation measures are enforceable and permanent.

H. Other Sources of Information

The following resources can be referenced by staff for further information:

GHG Quantification Protocols and Guidance

- The World Business Council for Sustainable Development and the World Resources Institute (WBCSD/WRI) have a joint program to provide numerous calculator tools and guidance documents to assist in the development of GHG inventories. Their flagship tool is the *Greenhouse Gas Protocol, A Corporate Accounting and Reporting Standard* (revised edition). While this and other tools are geared towards existing enterprises rather than proposed projects (e.g., those that would be undergoing SEQR review), some of the tools could be helpful to DEC staff. For example, the “Sector Toolsets” could be helpful for certain case-by-case determinations of appropriate methodology for industrial GHG emissions not covered by this Policy. Materials can be found at www.ghgprotocol.org.
- The Climate Registry is a nonprofit collaboration among North American states, provinces, territories and Native Sovereign Nations that sets standards to calculate and report greenhouse gas emissions. New York State joined the Climate Registry in May 2007. As with the WBCSD/WRI tools described above, the Climate Registry focuses on existing enterprises rather than proposed facilities. The Climate Registry does have developed protocols, though, that can provide guidance to DEC staff. At the time of this writing, the Climate Registry had four protocols: general, electric power sector, local government operations, and oil and gas exploration and production. See www.theclimateregistry.org. Further, the California Climate Action Registry also has developed a *General Reporting Protocol* to provide guidance for businesses and others to participate in California’s voluntary greenhouse gas registry. At the time of this writing, the most recent version of the General Reporting Protocol is 3.1, and four sectoral protocols were available: cement, local government operations, power/utility, and forest sector. See www.climateregistry.org.

- U.S. Environmental Protection Agency has a Climate Leaders Program which is a voluntary industry-government partnership where companies complete a corporate-wide inventory of their greenhouse gas emissions. For this program, EPA provides a *Greenhouse Gas Inventory Guidance* that may be helpful to DEC staff. Climate Leaders also provides some cross-sector guidance (e.g., stationary combustion, purchase of electricity and steam, mobile combustion, and use of refrigeration and air conditioning), as well as some sector-specific guidance (e.g. municipal solid waste landfilling, manufacturing of refrigeration and air conditioning equipment, and iron and steel production). See www.epa.gov/climateleaders/ or contact U.S. EPA for documents.
- In contrast to the last three resources summarized above, the Association of Environmental Professionals in California has a publication specifically related to assessing GHG emissions in the environmental review context which was published in 2007. See *Alternative Approaches to Analyzing Greenhouse Gas Emissions and Global Climate Change in CEQA Documents* (June 29, 2007, Association of Environmental Professionals)
- Another two publications with direct relevance to environmental review are: (1) California Air Pollution Control Officers Association, “CEQA & Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act.” January, 2008. and (2) The California Governor’s Office of Planning and Research, “Technical Advisory: CEQA and Climate Change: Addressing Climate Change Through California Environmental Quality Act (CEQA) Review.” June 19, 2008.
- The International Organization for Standardization (ISO) has two standards that are relevant to GHG inventories and may prove helpful to DEC staff: (1) *Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals* (14064-1) and (2) *Specification with Guidance at the Project Level for Quantification, Monitoring, and Reporting of Greenhouse Gas Emissions Reductions or Removal Enhancements* (14064-2). Contact ISO or see www.iso.org.

Measures to Mitigate GHG Emissions

- New York State Energy Research and Development Authority www.NYSERDA.org provides extensive information on energy efficient building design and construction, efficient energy generation and renewable energy technologies, federal and state incentive programs, Energy Star programs, and other initiatives to encourage the use of low-carbon technologies in a variety of sectors. NYSERDA’s webpage has numerous useful links to other resources regarding energy efficiency and renewable energy/
- There are 13 Metropolitan Planning Organizations in New York State that could provide information regarding local transportation plans and issues, which may be relevant to transportation related impacts or mitigation measures. To locate each of these organizations, you can contact the Association of New York State Metropolitan Planning Organizations (www.nysmpos.org).

- The New York State Department of Transportation has a training power point presentation on Smart Growth & Transportation designed to provide municipal planning and supervisory board members with a general understanding of Smart Growth and its relationship to transportation. DOT also has published two Smart Growth checklists: (1) Smart Growth Checklist for Municipal Land Use Planning and (2) Smart Growth Checklist for Proposed Development Projects. At this time of this writing, all three documents were available online at <https://www.nysdot.gov/portal/page/portal/programs/smart-planning/products>.
- In 2009, the Department launched *Climate Smart Communities*, an effort to educate and engage municipalities in climate change mitigation and adaptation planning. Outreach materials for this program may also be helpful to staff in the review of mitigation measures. See <http://www.dec.ny.gov/energy/50845.html>

Additional Information on SEQR

- For more general guidance on SEQR, consult with the NYCRR Part 617 as well as the *The SEQR Handbook* (New York State Department of Environmental Conservation, November 1992). Updated chapters can be found at <http://www.dec.ny.gov/public/6188.html>