

Federal Greenhouse Gas Accounting and Reporting Guidance

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Contents

1.0	Introduction.....	1
1.1.	Purpose of this Guidance	1
1.1.1.	Distinguishing between Accounting/Reporting and Reduction Requirements	1
1.2.	GHG Accounting and Reporting under E.O. 13514.....	2
1.2.1.	Carbon Dioxide Equivalent Applied to E.O. 13514 GHGs	2
1.2.2.	Federal Statutory and Executive Order Requirements.....	4
1.2.3.	Opportunities, Limitations and Exemptions under E.O. 13514.....	4
1.2.4.	Federal GHG Accounting and Reporting Workgroup	5
1.2.5.	Electronic GHG Accounting and Reporting Capability (GHG Reporting Portal) .	5
1.2.6.	Relationship of the Guidance to Other GHG Reporting Requirements & Protocols	6
1.2.7.	The Public Sector GHG Accounting and Reporting Protocol	6
2.0	Setting Organizational and Operational Accounting Boundaries.....	7
2.1.	Organizational Boundaries.....	7
2.1.1.	Energy Bills	8
2.1.2.	Purchased Fuel	10
2.1.3.	All Other Activities.....	11
2.2.	Operational Boundaries: Scopes	11
2.2.1.	Scope 1	11
2.2.2.	Scope 2.....	12
2.2.3.	Scope 3.....	13
2.3.	<i>de minimis</i>	16
3.0	Sequestration and Emissions from Land Use, Agriculture, and Biogenic Sources	18
3.1.	Biofuel Combustion	18
3.2.	Biomass Combustion	19
3.3.	Emissions and Biological Sequestration from Land Management Techniques.....	19
3.4.	Enteric Fermentation.....	21
3.5.	Composting	21
3.6.	Manure Management	21
4.0	Renewable Energy and Carbon Offsets	23
4.1.	Renewable Electricity	23
4.1.1.	Renewable Electricity Generated On-Site	25

4.1.2.	On-Site Renewable Energy, Not Generating Electricity	25
4.1.3.	Third-Party Ownership of On-Site Systems	26
4.1.4.	Purchase of Electricity from Biomass Combustion	27
4.1.5.	Purchase of Electricity from Conversion of Landfill Gas	27
4.1.6.	Purchase of Electricity from Municipal Solid Waste Combustion.....	27
4.2.	Carbon Offsets	28
5.0	Reporting GHG Emissions	29
5.1.	Reporting Process	29
5.1.1.	Annual Date for Reporting.....	29
5.1.2.	Electronic GHG Accounting and Reporting Capability (GHG Reporting Portal)	29
5.1.3.	Reporting Approach.....	30
5.1.4.	Other GHG Calculation Tools	31
5.2.	Emission and Conversion Factors.....	32
5.3.	Base Year and Subsequent Year Inventories	33
5.3.1.	Recalculations	33
6.0	Verification and Validation of GHG Emissions	34
6.1.	FEMP Responsibilities.....	35
Appendix A: Summary of E.O. 13514 Sections Addressed in the Guidance.....		36
Appendix B: Definitions		38
Appendix C: Abbreviations		43

1.0 Introduction

On October 5, 2009, President Obama signed Executive Order (E.O.) 13514 (74 Federal Register 52117) to establish an integrated strategy toward sustainability in the Federal government and to make reduction of greenhouse gas (GHG) emissions a priority for Federal agencies. Among other provisions, E.O. 13514 requires agencies to “measure, report, and reduce their greenhouse gas emissions from direct and indirect activities.” Section 2 of E.O. 13514 establishes a timeline for Federal agencies to establish GHG reduction targets and report inventories. Appendix A summarizes the relationship between the GHG-related provisions of E.O. 13514 and the associated chapters of this Guidance.

Section 9 of E.O. 13514 directs the Department of Energy’s (DOE’s) Federal Energy Management Program (FEMP), in coordination with the Environmental Protection Agency (EPA), Department of Defense (DoD), General Services Administration (GSA), Department of the Interior (DOI), Department of Commerce (DOC), and other agencies as appropriate to develop recommended Federal GHG reporting and accounting procedures. Those recommendations are reflected in this Guidance document.

The Federal government seeks to continually improve both the quality of data and methods necessary for calculating GHG emissions. In accordance with E.O. 13514, additional requirements, methodologies and procedures will be included in revisions to this document and supporting documents to improve the Federal Government’s overall ability to accurately account for and report GHG emissions over time.

1.1. Purpose of this Guidance

This *Federal GHG Accounting and Reporting Guidance* (or Guidance) establishes requirements for Federal agencies in calculating and reporting GHG emissions associated with agency operations. This Guidance is accompanied by a separate *Technical Support Document for Federal GHG Accounting and Reporting* (TSD), which provides detailed information on inventory reporting requirements and calculation methodologies. Federal agencies are required to use this Guidance when reporting GHG emissions under E.O. 13514.

The Guidance is not designed for quantifying the reductions from individual GHG mitigation projects, nor does it include strategies for reducing GHG emissions.

1.1.1. Distinguishing between Reporting and Reduction Requirements

Section 2 of E.O. 13514 describes the requirement for Agencies to conduct and submit comprehensive inventories of GHG emissions (“reporting”), as well as the requirement to develop agency-wide targets for emissions reductions (“reduction”). These are two separate and discrete tasks. An inventory is an evolving assessment of emissions and sinks that improves over time as we gain more complete understanding of the methods, underlying processes, and activities taking place. A number of categories of emissions and sinks, both direct and indirect, are not included in this version of the Guidance but may be included in later versions as methods and data become available.

Additionally, some GHG sources and sinks are included in this Guidance but are not at present included in reduction targets. Setting emission reduction goals necessarily requires making pragmatic policy decisions about which sources and sinks should be included given the availability and quality of data from the inventory, and the maturity of accounting approaches that will accurately reflect the true environmental outcome of Federal agency efforts to reduce emissions.

1.2. GHG Accounting and Reporting under E.O. 13514

Under E.O. 13514, Federal agencies must establish and report a comprehensive inventory of FY 2010 absolute GHG emissions by January 31, 2011, to the CEQ Chair and OMB Director. Annually thereafter, each agency must report the inventory of the preceding fiscal year.

E.O. 13514 also requires agencies to establish and report percentage reduction targets for agency-wide reductions of scope 1, 2 and 3 GHG emissions relative to a fiscal year 2008 baseline. In order to establish a formal baseline for determining progress towards the reduction targets, Federal agencies must also report FY 2008 baseline data on January 31, 2011.¹ Federal agencies will improve and update data associated with their GHG inventory baselines over time as the Federal community continuously improves its ability to identify and account for these emissions.

Two general approaches (centralized and decentralized) are commonly used to develop a single inventory for an agency. This Guidance provides calculation and reporting methodologies applicable to either approach for compiling a GHG inventory. Regardless of the approach used to develop a GHG inventory, the data must be aggregated to the agency level for reporting.

The data required to develop an agency-wide inventory will likely be drawn from multiple levels throughout an agency's organizational structure. This Guidance has been developed to provide Federal agency users, whether representing facility-level activities or headquarters-level functions, with the necessary information to fulfill reporting requirements.

1.2.1. Carbon Dioxide Equivalent Applied to E.O. 13514 GHGs

The GHGs covered by E.O. 13514 and this Guidance are carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. These GHGs have varying heat-trapping abilities and atmospheric lifetimes as illustrated in Table 1.² To facilitate comparison among GHGs, a global warming potential (GWP) value is assigned to each GHG. GWP represents the heat-trapping impact of a GHG relative to carbon dioxide (CO₂), which has a GWP of 1.0, and functions as a warming "index." For instance, methane (CH₄) has a GWP of 21, so each metric ton of CH₄ emissions has 21 times the impact on global warming (over a 100-year time horizon) as one metric ton of CO₂ emissions.

To provide a single metric that embodies all GHGs, emissions are reported in metric tons of carbon dioxide equivalent (MT CO₂e). To calculate CO₂e, the mass of emissions of each GHG is multiplied by the appropriate GWP for that gas. Table 1 lists the GHGs covered under E.O.

¹ Agencies are not required to submit a FY 2009 comprehensive inventory, but they may do so at their discretion.

² GWP includes consideration of atmospheric lifetime for a given compound.

13514, their common sources, and their associated GWPs (more detailed information is located in Appendix D of the TSD).

For additional information about GWP values and associated lifetimes, see EPA's website at: <http://www.epa.gov/highgwp/scientific.html>.

Table 1: GHGs, Common Sources, and Global Warming Potentials

Greenhouse Gas	Common Sources/Uses	GWP*
Carbon dioxide (CO ₂)	Mobile and stationary combustion	1
Methane (CH ₄)	Coal mining, fuel combustion, landfills, wastewater treatment	21
Nitrous oxide (N ₂ O)	Fuel combustion, fertilizers	310
Hydrofluorocarbon gases (HFCs)	Refrigerants, fire suppressants, various manufacturing processes	12 – 11,700 [†]
Perfluorocarbon gases (PFCs)	Electrical equipment, various manufacturing processes, refrigerants, medicine	6,500 – 17,700 [†]
Sulfur hexafluoride (SF ₆)	Electrical equipment, various manufacturing processes, tracer in air modeling, medicine	23,900
<p>* 100-year Global Warming Potential. Source: “EPA Greenhouse Gas Mandatory Reporting Rule (MRR),” [74 Federal Register (FR) 56260]. See the TSD for additional information.</p> <p>† Many different individual gases constitute HFCs and PFCs, so there is a range of GWP values associated with each.</p>		

1.2.2. Federal Statutory and Executive Order Requirements

E.O. 13514 builds upon several existing Federal statutory and E.O. requirements related to energy and environmental management. Existing mandates include the National Energy Conservation Policy Act (NECPA) of 1978 (Pub. L. No. 95-619), the Energy Policy Act of 2005 (EPA 2005; Pub. L. No. 109-58), the Energy Independence and Security Act (EISA) of 2007 (Pub. L. No. 110-140), and E.O. 13423 of 2007 (72 FR 3919; January 24, 2007). These mandates have established various goals for energy management, renewable energy use, and other activities that may reduce GHG emissions, but none have specifically required comprehensive reporting of GHG emission inventories or establishment of targets for reduction of emissions.

This Guidance also considers the EPA Mandatory Reporting Rule (MRR), which requires reporting of GHG emissions from large sources and suppliers in the United States, and is intended to collect accurate and timely emissions data to inform future policy decisions. Where possible, this Guidance references calculation methodologies and emission factors in the EPA MRR. Although efforts have been made to streamline reporting requirements by adopting or referencing elements of the MRR, agencies should understand that the requirements of this Guidance are separate and distinct from those of the EPA MRR. For additional information on the MRR, see www.epa.gov/climatechange/emissions/ghgrulemaking.html.

1.2.3. Opportunities, Limitations and Exemptions under E.O. 13514

Agencies may elect to inventory more GHGs than those required by E.O. 13514. For example, they could consider nitrogen trifluoride (NF₃) or other fluorinated gases if they become more prevalent due to manufacturing changes or other factors. Similarly, although non-domestic sources are not required to be included in agency inventories, Section 17 of E.O. 13514

authorizes the head of an agency to include personnel, resources, and facilities that are not located within the United States in their reduction targets and/or comprehensive inventories.

Under E.O. 13514, Federal agencies must report a comprehensive inventory of absolute GHG emissions. It is important to recognize that while E.O. 13514 excludes certain sources of Federal GHG emissions from agency GHG emissions reduction targets, these exclusions do not apply to agency comprehensive GHG inventories. Whereas an agency's target may exclude "direct emissions from excluded vehicles and equipment and from electric power produced and sold commercially to other parties in the course of regular business," these sources are not excluded from the agency's inventory.

Section 18 of E.O. 13514 authorizes agency heads to exempt certain activities from the mandates in the E.O., including GHG reporting.

1.2.4. Federal GHG Accounting and Reporting Workgroup

Following the issuance of this Guidance, CEQ will convene a Federal GHG Accounting Workgroup to address issues that may arise in its implementation and ongoing development of procedures and guidance.

The GHG Workgroup's mission will be to:

- Serve as a forum for information exchange and promote agency implementation of this Guidance
- Develop GHG accounting and reporting guidance recommendations that foster the successful development of GHG inventories in the Federal sector
- Develop technical guidance and tools to support implementation of this Guidance
- Address inconsistencies between current data collection processes and those needed to support GHG accounting best practices.

The GHG Workgroup, which will convene in FY 2010, will provide recommendations to CEQ for additional revisions to this Guidance for FY 2011. The GHG Workgroup will coordinate closely with other E.O. 13514 working groups and relevant government programs as necessary. It will be led by DOE FEMP, and include participation from all Federal agencies. The GHG Workgroup will meet and form subcommittees, as necessary.³

1.2.5. Electronic GHG Accounting and Reporting Capability (GHG Reporting Portal)

In accordance with Section 9(b) of E.O. 13514, DOE FEMP, in coordination with other Federal agencies, is required to develop an electronic GHG accounting and reporting capability (GHG Reporting Portal) for agencies to use in reporting required GHG baseline and inventory information. Where possible, the GHG Reporting Portal will automatically calculate emissions, using methodologies contained in the TSD, from aggregated agency-level activity data otherwise

³ Examples of topics that could be addressed by subcommittee include scope 3 data collection; additional requirements for renewable energy purchases; vendor and contractor emissions (the group working on Section 13, E.O. 13514); organizational boundaries (including leased assets); and emissions and biological sequestration from land management techniques.

reported by the agency. This will limit the burden on reporting agencies and facilitate comparable and consistent inventories. The existence of the GHG Reporting Portal will not preclude agencies from using tools of their choosing to manage and maintain inventories. However, all final reporting must be accomplished through the GHG Reporting Portal. Chapter 5 of this Guidance and the TSD provide additional information about the GHG Reporting Portal.

1.2.6. Relationship of the Guidance to Other GHG Reporting Requirements & Protocols

State and Regional Programs

In addition to the requirements established under E.O. 13514 and the EPA MRR, some agency facilities may be subject to state-level GHG emissions reporting or reduction requirements. Several states have adopted legislation that requires GHG emissions reporting above specified thresholds, or they incorporate GHG reporting as part of permitting processes.

Some of the state-based GHG reporting requirements are also used in reporting for regional programs. For example, the Regional Greenhouse Gas Initiative (RGGI), a cooperative effort by ten states in the Northeast and Mid-Atlantic regions, utilizes individual state programs and regulations to function as a single regional compliance market for carbon emissions. Agencies are only impacted by the regional reporting requirements insofar as they lead to state-based reporting to which facilities may be subject.

International Reporting

In June 1992, the United States signed, and later ratified, the United Nations Framework Convention on Climate Change (UNFCCC). The provisions of UNFCCC, which entered into force on March 21, 1994, establish requirements for reporting national GHG inventories of emissions and removals. As a result, some Federal agencies provide information regarding GHG emissions that is incorporated into the Inventory of U.S. Greenhouse Gas Emissions and Sinks.

1.2.7. The Public Sector GHG Accounting and Reporting Protocol

While this Guidance is meant to be a stand-alone document that details procedures for Federal agencies to comply with Subsection 2(c), E.O. 13514, it follows the basic guidelines found in the *GHG Protocol for the U.S. Public Sector* (U.S. Public Sector Protocol, or PSP).⁴ The PSP is intended to offer flexibility to its public-sector users while establishing certain core principles and methodologies that ensure consistent, complete, and comparable inventories.

For the purposes of Federal GHG reporting and accounting established by E.O. 13514, this Guidance takes precedence over all other established GHG accounting protocols and standards.

⁴ The PSP was developed jointly by the Greenhouse Gas Protocol Initiative at the World Resources Institute (WRI) and Logistics Management Institute (LMI) through an inclusive stakeholder review process which included significant input from U.S. Federal agencies. For more information, go to www.ghgprotocol.org.

2.0 Setting Organizational and Operational Accounting Boundaries

Establishment of organizational and operational accounting boundaries is necessary to develop an agency-wide GHG inventory. Organizational boundaries define the operations, facilities, and sources that an agency controls. For example, depending on how they are applied, organizational boundaries determine whether the landlord or tenant is responsible for reporting emissions associated with the operation of a leased building. Once organizational boundaries are set, operational boundaries are used to categorize emissions resulting either directly or indirectly from agency activities. This chapter outlines how agencies must set their organizational and operational boundaries to ensure compliance with this Guidance.

2.1. Organizational Boundaries

Agencies must report emissions associated with all activities that fall within their organizational boundaries, as defined by this Guidance. The specific categories of emissions to be inventoried include scope 1, scope 2, and specified scope 3 emissions and other emissions that may be voluntarily included in an agency's emissions inventory.

Agencies should recognize that while E.O. 13514 excludes certain sources of Federal GHG emissions from agency GHG emissions reduction targets, these exclusions do not apply to agency comprehensive GHG inventories. FEMP and Federal agencies must be able to clearly account for any differences between the FY 2008 base year and annual GHG inventories beginning with FY 2010.

For the FY 2008 base year, FY 2010 inventory, and subsequent annual inventories, agencies must include the following within their organizational boundaries:

- **The facility energy related to the operation of facilities for which the agency directly pays energy bills (see Chapter 2.1.1).**

The energy-related activity data required to calculate these emissions are currently reported to FEMP for compilation in the Annual Report on Federal Government Energy Management (or FEMP Energy Report). For the purpose of determining organizational boundaries, energy bills include electricity, hot/chilled water, and steam. They do not include wastewater, potable water, or garbage services.

- **The operation of mobile sources for which the agency purchases fuel (see Chapter 2.1.2).**

These mobile sources include Federal fleets, equipment, non-road vehicles, vessels, and aircraft. The activity data needed to calculate emissions from Federal fleets are reported in the FAST (Federal Automotive Statistical Tool) system, and the emissions from equipment, non-road vehicles, vessels, and aircraft are currently captured in the FEMP Energy Report.^{5, 6}

- **All other emissions from activities over which the agency has operational control (see Chapter 2.1.3).**

These include fugitive and process emissions as defined in Chapter 2.2.1. Data for these emissions are typically collected at the activity level. Specified scope 3 emissions associated with agency activities, but where the agency does not have full operational control, are described in Chapter 2.2.3.

2.1.1. Energy Bills

If an agency directly pays the energy bills for its leased space (i.e., the agency leases from GSA or a private landlord), then it must report the associated emissions. Reporting on leased buildings may pose some difficulty depending on the nature of the lease (e.g., whether it is partially or fully serviced). If an agency leases space from GSA, where GSA owns the facility, and the agency does not directly pay energy bills, GSA is responsible for reporting the emissions associated with those energy bills. For such leases with a private landlord, agencies may voluntarily report the emissions as scope 3.⁷ Therefore, if all agency space is leased in this manner and the agency does not pay any energy bills, the agency is not required to report any related energy emissions at this time.

If an agency has been delegated responsibility by GSA for operation and maintenance of occupied buildings, and thus directly pays the energy bills, the agency is required to report associated emissions for these buildings. This approach aligns with current FEMP energy reporting.

Federal agencies are responsible for reporting emissions associated with government-owned/contractor-operated (GOCO) facilities. Agencies that include GOCO energy data in their FEMP Energy Report must also include the associated emissions in their GHG inventory. For GOCO operations not currently reported in the FEMP Energy Report, agencies are responsible for identifying and reporting these emissions in their base year and FY 2010 GHG inventory and subsequent inventories.

⁵ For comprehensive inventories, some tactical fuel information may only be available in other databases that are outside of FAST and the FEMP Energy Report.

⁶ Federal fleet vehicles and low speed electric vehicles (LSEVs) are considered to be mobile sources. Electricity used in these vehicles is reported in the FAST system, and should not be included in facility energy use, but not all agencies have processes to separate the data. This is covered in more detail in Chapter 2.2.2.

⁷ Private landlords are not responsible for reporting GHG emissions under E.O. 13514. In the future, it is anticipated that Federal tenants will report GHG emissions from privately leased facilities, pursuant to methodologies developed by the Federal GHG Accounting Workgroup.

Agencies will be required to report all applicable scope 1, 2, and 3 emissions associated with leased space in future years. CEQ, OMB, DOE, GSA and other coordinating Federal agencies will determine appropriate methodologies to account for emissions associated with fully leased space, to include commercially leased space.⁸ Once methodologies are established, agencies may be required to report additional emissions for leased space in subsequent annual inventories.

GHG Reporting Relationship to Facility Energy Reporting

To the extent possible, this Guidance is consistent with the current approach in the FEMP Energy Report, in which an agency reports energy use that it directly purchases from utilities and other providers. However, E.O. 13514 exclusions allowable for GHG reduction targets, as in Chapter 1.2, are not the same as those allowable under FEMP’s “Guidelines Establishing Criteria for Excluding Buildings” from the energy intensity reduction goal (30-percent reduction in Btu/square foot in 2015 compared to 2003).⁹ The relationships between energy goal reporting exclusions and allowable GHG target exclusions are summarized in Table 2.¹⁰

Table 2: Building Exclusion Comparison

Type of building/structure as defined in FEMP’s “Guidelines Establishing Criteria for Excluding Buildings” for determining allowable EPA 2005 goal exclusions	May these activities be excluded from E.O. 13514 GHG reduction targets?
Buildings that are privately owned, but are collocated on Federal lands or military installations and are not leased by the government	Yes*
Buildings with fully serviced leases (where the private sector landlord is responsible for paying the energy bills)	Yes*
Structures, such as outside parking garages, that consume essentially only lighting energy, yet are classed as buildings	No
Federal ships that consume “Cold Iron Energy” (energy used to supply power and heat to ships docked in port) and airplanes or other vehicles that are supplied with utility-provided energy [†]	No [†]
Buildings in which energy usage is skewed significantly due to reasons such as buildings entering or leaving the inventory during the year; buildings down-scaled operationally to prepare for decontamination, decommissioning, and disposal; and buildings undergoing major renovation and/or major asbestos removal	No
Leased space where the Government may pay for some energy but not	No

⁸ Fully leased space refers to leasing arrangements where tenants are not directly responsible for utility bills.

⁹ This guidance can be found at www.eere.energy.gov/femp/pdfs/exclusion_criteria.pdf.

¹⁰ It is important to recognize that while E.O. 13514 excludes certain sources of Federal GHG emissions from agency GHG emissions reduction targets, these exclusions do not apply to agency comprehensive GHG inventories. Whereas an agency’s target may exclude “direct emissions from excluded vehicles and equipment and from electric power produced and sold commercially to other parties in the course of regular business,” these sources are not excluded from the agency’s inventory.

all; the space comprises only part of a building (i.e., leased space where rent is net of utilities); or the expiration date of the lease limits the ability to undertake energy conservation measures	
Separately-metered energy-intensive loads that are driven by mission and operational requirements, not necessarily buildings, and not influenced by conventional building energy conservation measures	No
Federal buildings excluded from Energy Performance Requirements, where (1) energy requirements are impracticable; (2) all Federally required energy management reports have been completed and submitted; (3) agency has achieved compliance with all energy efficiency requirements; and (4) implementation of all practicable, life-cycle, cost-effective projects at the excluded buildings	No [‡]
<p>*Reporting for these building types is not required for an agency's comprehensive GHG inventory at this time. Reporting guidance on fully serviced leases will be developed for FY 2011 reporting.</p> <p>†Unless they are classified as excluded vehicles and equipment in E.O. 13514.</p> <p>‡Except where the finding of impracticability is based on performance of a national security function under Section 18, E.O. 13514.</p>	

2.1.2. Purchased Fuel

Agencies are responsible for including in their inventories the emissions from mobile sources associated with the operation of vehicles and equipment for which they purchase fuel.

GHG Reporting Relationship to Federal Automotive Statistical Tool (FAST) Reporting

Beginning with FY 2010, the majority of fleet fuel data required for calculating mobile combustion emissions is available in the FAST system. Tables 1-3 and 1-4 of the “Guidance for Federal Agencies on E.O. 13514 Section 12 – Federal Fleet Management” list the owned and contracted vehicles that agencies *may* consider exempt from covered fleets. These are the same allowable exclusions for an agency's GHG targets, except for non-road vehicles, which must be included (see below).

The data reported in FAST will be used to calculate GHG emissions using the methodologies outlined in the TSD. In addition, emissions from the following mobile combustion sources (currently captured in FEMP energy reporting, and not the FAST system), are subject to GHG reduction targets and should be reported in the agency's comprehensive inventory:

- Small equipment (e.g., lawnmowers) and non-road vehicles (e.g., agriculture equipment)
- Vessels and aircraft that are not considered excluded vehicles and equipment systems (e.g., research aircraft and non-tactical ships)

Agencies may track some fuel purchases separately from those covered in the FEMP energy or FAST system data. For comprehensive inventories, agencies should consult any such data systems to ensure all fuels are appropriately accounted for.

2.1.3. All Other Activities

For all other agency activities, agencies must use the operational control approach to determine their organizational boundaries. Agencies have operational control over an activity if they have operational responsibility for the activity or process and the authority to implement operating policies associated with the activity or process. Emissions include, but are not limited to, fugitive and process emission sources (as defined in Chapter 2.2.1). For fugitive and process emissions, the agency that pays for the purchase and maintenance of the emitting equipment must report the emissions. Specified scope 3 emissions in an agency's organizational boundary, where the agency does not have full operational control, are described in Chapter 2.2.3.

2.2. Operational Boundaries: Scopes

After agencies determine the operations that fall within their organizational boundaries, they categorize emissions sources as either direct (scope 1) or indirect (scope 2 or scope 3). The calculation methodologies for scope 1, 2, and 3 emissions are detailed in the TSD.

2.2.1. Scope 1

Agencies must report all direct GHG emissions from sources that are owned or controlled by the Federal agency within this scope. It is important to recognize that while E.O. 13514 excludes certain sources of Federal GHG emissions from agency GHG emissions reduction targets, these exclusions do not apply to agency comprehensive GHG inventories. Whereas an agency's target may exclude "direct emissions from excluded vehicles and equipment and from electric power produced and sold commercially to other parties in the course of regular business," these sources are not excluded from the agency's inventory.

Scope 1 emissions result primarily from the following types of activities:

- **Generation of electricity, heat, cooling, or steam:** Emissions that result from combustion of fuels in stationary sources (e.g., boilers, furnaces, turbines, and emergency generators), including CH₄ and N₂O emissions from biomass combusted for production of electricity, heat, cooling, or steam.
- **Mobile sources:** Emissions that result from the combustion of fuels in agency-controlled mobile combustion sources (e.g., automobiles, ships, and aircraft), including Federal fleet vehicles, such as GSA-leased, commercially leased, and agency-owned vehicles.¹¹ The emissions include CH₄ and N₂O emissions from biofuel combustion.
- **Fugitive emissions:** For the purpose of this Guidance, emissions that result from intentional or unintentional releases of GHGs from within the agency's organizational boundary (e.g., equipment leaks from joints, seals, packing, and gaskets; landfills and wastewater treatment plants; HFC emissions from the use of refrigeration and air conditioning equipment; methane leaks from gas transport; and SF₆ emissions from leaking electrical equipment; and CH₄ emissions from coal mines and venting).¹²

¹¹ Excluding rental vehicles.

¹² Note that "fugitive emissions," as defined in this Guidance, are not intended to coincide with other statutory uses of the term.

- **Process emissions:** Emissions that result from the manufacturing or processing of chemicals and materials and from laboratory activities.

In addition, in their FY 2008 base year and FY 2010 annual inventories, agencies may report types of scope 1 GHGs that are not specifically mentioned in E.O. 13514. For example, agencies may voluntarily report non-covered GHGs with high global warming potentials, such as NF₃.

Biomass and biofuel combustion result in GHG emissions of CO₂, CH₄, and N₂O. CH₄ and N₂O emissions resulting from combustion of biomass and biofuel are treated in the same manner as emissions of these gases from the combustion of fossil fuels. Combustion related CH₄ and N₂O are dependent on the combustion conditions, technology, and pollutant control policies, as well as fuel characteristics, rather than the ultimate source of the carbon in the fuel or connection to the carbon cycle.¹³ These CH₄ and N₂O emissions are required under scope 1 reporting, and are included in agency reduction targets.¹⁴

CO₂ emissions resulting from combustion of biomass and biofuel are known as biogenic emissions. Due to ongoing analysis, efforts to collect and synthesize data, and the development of accounting approaches that will appropriately reflect the true atmospheric impact of biogenic emissions, agencies are not required to include these emissions in their reduction targets under E.O. 13514 at this time, but agencies are required to inventory their biogenic GHG emissions. Part or all of the carbon in these fuels is derived from material that was fixed by biological sources on a relatively short timescale. Depending on the full emissions impact of biomass production and use, these emissions may or may not represent a net change in atmospheric carbon dioxide. This contrasts with carbon from fossil fuels, which was removed from the atmosphere millions of years ago.

Emissions resulting from manure management and enteric fermentation when the animals are owned by the Federal agency may be reported voluntarily in scope 1 at this time. See Chapter 3 for more information on biogenic sources and the TSD for information on reporting requirements, calculation methods, data sources, and example calculations for biomass and biofuels.

2.2.2. Scope 2

Agencies must account for and report indirect emissions associated with consumption of purchased or acquired electricity, steam, heating, or cooling as scope 2. These emissions are a consequence of activities that take place within the organizational boundaries of the reporting agency, but the releases physically occur at the facility where the electricity, steam, heating, and/or cooling is generated.

Emissions related to the electricity purchased for Federal fleet electric vehicles, including low speed electric vehicles (LSEVs), are scope 2 emissions. Current policies stipulate that the electricity used in these vehicles should be reported as part of alternative fuel use through the FAST system and should not be included in FEMP energy reporting. The GHG Reporting Portal

¹³ Revised 1996 IPCC Guidelines, Reference Manual, Section 1.1, Energy (<http://www.ipcc-nggip.iges.or.jp/public/gl/guidelin/ch1ref1.pdf>).

¹⁴ See Chapter 3 for details on GHG accounting for biomass and biofuel combustion.

will not double count this electricity. Agencies are responsible for tracking and maintaining energy use and resulting scope 1 and 2 GHG emissions associated with Federal fleet electric vehicles.

For the FY 2008 base year, FY 2010 inventory, and subsequent annual inventories, agencies must clearly identify and report scope 2 CO₂ emissions associated with the biogenic portion of biofuel and biomass combustion.¹⁵ These are known as biogenic carbon dioxide emissions.¹⁶ CH₄ and N₂O emissions resulting from combustion of biofuel and biomass are treated in the same manner as emissions of these gases from the combustion of fossil fuels. These CH₄ and N₂O emissions are required under scope 1 reporting, and are included in agency reduction targets.

Agencies that purchase electricity must report indirect emissions associated with transmission and distribution (T&D) losses in scope 2 only for the T&D operations they control. Emissions associated with T&D losses from purchased steam and chilled water are categorized as scope 2 emissions. Indirect T&D electricity losses (i.e., those associated with electricity purchased from a utility or provider not under the operational control of the agency) are required in scope 3 reporting (see Chapter 2.2.3).

2.2.3. Scope 3

Scope 3 includes all other indirect emissions not included in scope 2. Scope 3 emissions are a consequence of the agency's activities but are released from sources outside its organizational boundary.

Because efforts to account for scope 3 emissions are recent and accepted methods for calculating emissions are evolving, this Guidance utilizes a phased approach for the inclusion of scope 3 emissions in agency inventories. Initial efforts focus on accounting for scope 3 emission categories for which reliable and accessible data are available for estimating emissions, and for which more detailed calculation methodologies have been established. As a result, substantial fractions of the scope 3 emissions of many agencies will not initially be captured. The goal of this approach is to continually improve scope 3 data quality. Over time, new methodologies and procedures will be included in revisions to this document and the TSD to improve the Federal Government's ability to account for and report GHG emissions through the inventory process.

For the FY 2008 base year, FY 2010 inventory and subsequent annual inventories, agencies must also report emissions for those scope 3 categories where the agency quantified a baseline in their scope 3 reduction target. These scope 3 categories include:

¹⁵ Id.

¹⁶ Due to ongoing analysis, efforts to collect and synthesize data, and the development of accounting approaches that will appropriately reflect the true atmospheric impact of biogenic carbon dioxide emissions, agencies are not required to include these emissions in their reduction targets under E.O. 13514 at this time, but agencies are required to inventory their biogenic carbon dioxide GHG emissions. Part or all of the carbon in these fuels is derived from material that was fixed by biological sources on a relatively short timescale. Depending on the full emissions impact of biomass production and use, these emissions may or may not represent a net change in atmospheric carbon dioxide. This contrasts with carbon from fossil fuels, which was removed from the atmosphere millions of years ago.

- Federal employee business air travel
- Federal employee business ground travel
- Federal employee commuting
- Contracted solid waste disposal (i.e., municipal solid waste that is sent to a landfill not owned or operated by the agency)
- Contracted wastewater treatment (i.e., municipal wastewater that is sent to a wastewater treatment plant not owned or operated by the agency)
- T&D losses associated with purchased electricity

The TSD provides the calculation methodologies for each of these emission categories.

Agencies will improve and update data associated with their scope 3 inventory baselines over time as the Federal community continuously improves its ability to identify and account for these emissions. In addition, as data quality and methodologies improve and emerge, further guidance that specifically addresses scope 3 may be provided.

Agencies may voluntarily report additional scope 3 emissions resulting from unique activities that do not currently have a methodology in the TSD. Voluntary reporting refers to the reporting of emissions that do not currently have a specified calculation methodology in the TSD, or are not otherwise identified as required for reporting purposes in this Guidance. Agencies may report emissions for these voluntary items, but must clearly identify them and provide documentation for calculation methods used in the submission of the agency's inventory. Some examples of such activities associated with land management agencies include emissions associated with the following:

- Visitors to Federal sites (e.g., National Parks, medical centers, national cemeteries, etc.)
- Third-party oil, gas, and coal mine leasing activities
- Enteric fermentation, when releases occur from livestock not owned by an agency but occur on Federal land
- Manure management systems when the systems exist on Federal land, but are operated by others

To the extent possible, when agencies report voluntary scope 3 emissions, they should use methodologies that are commonly accepted and can be replicated. This approach promotes consistent calculations that may be of use for emission categories that become required reporting in future years. If an agency reports emissions in a category where no commonly accepted methodology is available, it must document and submit the calculation methodologies used as part of its annual inventory. Once an agency reports voluntary scope 3 categories, it must adjust the agency baseline and continue to report emissions in that category.

When determining whether or not to include optional scope 3 categories in their annual inventories, agencies should consider the following:

- Whether the emissions associated with the category are large enough to warrant measurement and tracking (see Chapter 2.3 regarding *de minimis* emissions for more information)

- Feasibility and cost of collecting the required data
- Level of influence that an agency may have in reducing associated emissions
- Estimated cost of measuring and making reductions.

Over time, new methodologies will be included in revisions to this document and the TSD to improve the Federal Government’s ability to account for and report emissions within the inventory process. For example, while lifecycle emissions associated with the production of biofuels (and other alternative fuels such as hydrogen) are not currently measured in scope 3, agencies should keep in mind that these emissions will be considered in scope 3 at a future date.

Examples of areas to be added over time include emissions from the following:

- Operations associated with fully leased space¹⁷
- Vendors, contractors, tenants, concessionaires, and supply chain
- Production of fuels (biofuels, gasoline, hydrogen, etc.) used to operate internal combustion vehicles

For subsequent annual inventories, agencies will continue to report scope 3 emissions categories required for FY 2010 and may also be required to report additional scope 3 categories.

As additional scope 3 categories are included in future year’s accounting and reporting, agencies may be required to adjust their base year and annual inventories. This process is discussed in more detail in Chapter 5.3.

Other Vendor and Contractor Emissions

Vendor and contractor emissions are those associated with the services, materials, and products that an agency purchases, and are a category of scope 3 emissions. Agencies are not required to report emissions related to their vendors and contractors at this time, but future inventories will include vendor and contractor emissions to the greatest extent feasible.¹⁸

Agencies engaged in complex property management arrangements must also determine operational boundaries for accounting purposes. Table 3 shows how agencies are to account for emissions that result from activities that occur on or with property managed through various arrangements.

Table 3: Emissions from Agency Property Arrangements

Type of arrangement	Definition	Applicable Scopes
Permit	The agency confers a permit to a private party for the use of government land	Scope 3 (currently voluntary)
Outgrant	An easement, lease, or license granted by the agency to a non-	Scope 3 (currently

¹⁷ Fully leased space refers to leasing arrangements where tenants are not directly responsible for utility bills.

¹⁸ Agencies should note that outsourcing activities, such as IT services and data centers, is not a useful GHG reduction strategy because outsourcing may result in greater scope 3 emissions. See Chapter 5 for further details.

	federal entity for either temporary or permanent use	voluntary)
Grant	The agency confers a grant permanently authorizing the use of a given right-of-way to a third party; grants usually involve a single payment for the land or transfer of land use rights	Scope 3 (currently voluntary)
Withdrawal from Public Use	The agency receives a permit to use land of another government agency for up to 20 years administratively, as long as the intended use does not involve destruction of the land (e.g., military uses, dams)	Scopes 1 and 2
Public-Private Partnership	Partnerships in which the agency and a private entity contribute various amounts of real property, financial capital, and/or borrowing ability for the purpose of establishing operating capacity	Varies [†]
Government remediation of private sites	The government may be responsible for the energy use associated with environmental remediation of private sites	Scope 3 (currently voluntary)
[†] Reporting of scopes depends on the agreements made between the partners, and varies from agreement to agreement. Agencies determine which scope to report, if any, based on whether or not they purchase energy or exercise operational control for the partnership.		

2.3. *de minimis*

In emissions accounting, *de minimis* refers to a minimum emissions accounting threshold below which reporting is not required. For Federal agency GHG inventories, and for the purposes of this Guidance, no *de minimis* reporting threshold exists for required emission categories, as described in Chapter 2.2.

Agencies should use the following approach to address small or trace quantities of emissions for which full accounting may be particularly difficult or costly:

1. Identify emission sources that cannot be calculated using the default calculation procedures provided in the TSD because the requisite data are not available, or are too difficult or costly to obtain.
2. Refer to the TSD for alternative data sources and calculation methodologies. Alternatives are provided for several emission sources.
3. If the TSD does not contain alternative data sources for the emission source in question, agencies may develop their own alternative calculation methodology. The rationale and methodology for these calculations must be thoroughly documented through an agency's GHG reporting (see Chapter 5).

If alternative data sources are not available in the TSD, and an agency cannot develop an acceptable alternative calculation methodology, the agency must explicitly detail and report its rationale for excluding the emission source¹⁹.

In all cases, Federal agencies must ensure that all methods, procedures, and tools utilized in completing a GHG report are transparently detailed in their qualitative reporting statements.

¹⁹ For example, an agency might consider excluding equipment having installed charge sizes less than 50 pounds such as household refrigeration, small appliances, or small sealed electrical devices containing SF₆ so as to harmonize with similar record keeping requirements under 40 C.F.R. 82.166 (j) and (k).

3.0 Sequestration and Emissions from Land Use, Agriculture, and Biogenic Sources

This chapter describes accounting requirements and references appropriate methodologies for several categories of emissions from biological sources that may result from agency land use, agricultural practices, and other biogenic sources. It also addresses the treatment of biological sequestration of emissions.

For the purpose of this Guidance, two categories of biogenic emissions are required to be reported: biofuel combustion and biomass combustion. Biofuels are liquid or gaseous fuels containing biologically derived substances combusted to generate energy. Examples include biodiesel and ethanol blended fuels.²⁰ Biomass is solid biological matter diverted for use as a fuel, such as wood and grass pellets.

The TSD provides information on reporting requirements, calculation methods, data sources, and example calculations for biofuels and biomass.

This chapter also includes a discussion of biological sequestration and land management. Because consistent methods have not been appropriately adapted for small-scale reporting, agencies are not currently required to report on biological sequestration at this time. Emissions from wildfire management and prescribed burning may be voluntarily reported. Future revisions to this Guidance will incorporate recommendations from a Federal workgroup tasked with developing methodologies for measuring the carbon fluxes and biological sequestration that take place on Federal lands as a result of land management practices.

Finally, this chapter also discusses the reporting of emissions from agricultural management activities, including enteric fermentation, manure management, and composting. Reporting on these categories is not currently required. Agencies may report emissions for these voluntary items, but must clearly identify them and provide documentation for calculation methods used in the submission of the agency's inventory.

3.1. Biofuel Combustion

Biofuels are liquid or gas fuels created partially or wholly from plant or animal matter. Biomass and biofuel combustion result in GHG emissions of CO₂, CH₄, and N₂O. For the FY 2008 base year, FY 2010, and subsequent annual inventories, agencies must clearly identify and report CO₂ emissions associated with the biogenic portion of biofuel and biomass combustion. These emissions are known as biogenic emissions, and must be reported within the appropriate scope in which they occur and must be categorized as biogenic. Due to ongoing analysis, efforts to collect and synthesize data, and the development of accounting approaches that will appropriately reflect the true atmospheric impact of biogenic emissions, agencies are not required to include these emissions in their reduction targets under E.O. 13514 at this time, but agencies are required to inventory their biogenic GHG emissions. Part or all of the carbon in these fuels is derived from material that was fixed by biological sources on a relatively short

²⁰ Biogases yielded from landfills are not explicitly discussed in this chapter, although they may be considered a biofuel.

timescale. Depending on the full emissions impact of biomass production and use, these emissions may or may not represent a net change in atmospheric carbon dioxide. This contrasts with carbon from fossil fuels, which was removed from the atmosphere millions of years ago.

CH₄ and N₂O emissions resulting from combustion of biomass and biofuel are treated in the same manner as emissions of these gases from the combustion of fossil fuels. Combustion related CH₄ and N₂O are dependent on the combustion conditions, technology, and pollutant control policies, as well as fuel characteristics, rather than the ultimate source of the carbon in the fuel or connection to the carbon cycle.²¹ Agencies are required to report CH₄ and N₂O emissions under the appropriate scope. All GHGs from the fossil fuel portion of biofuel blends must be reported within the appropriate scope. These CH₄ and N₂O emissions are included in agency reduction targets.²²

3.2. Biomass Combustion

Biomass combustion refers to the burning of solid plant material to produce energy. It is differentiated from biofuels because it is in solid form and is usually burned in stationary facilities, such as boilers, backup generators, or incinerators. In these cases, the biomass fuel is usually wood or wood waste, but may also include grass pellets or other agricultural plant (vegetative) materials. For the FY 2008 base year, FY 2010, and subsequent annual inventories, agencies must clearly identify and report CO₂ emissions associated with the biogenic portion of biofuel and biomass combustion within the appropriate scope and categorized as biogenic. These are known as biogenic emissions.²³ As in the case of biofuels, the CH₄ and N₂O emissions from biomass combustion must be reported in the appropriate scope, and are included in agency reduction targets. Federal agencies are not required at this time to inventory and report GHG emissions resulting from wildland fires or prescribed burns.

3.3. Emissions and Biological Sequestration from Land Management Techniques

Sequestration refers to the storage of carbon to reduce atmospheric carbon and mitigate the effects of climate change. For the purposes of Federal land managers, biological sequestration occurs when atmospheric carbon is absorbed by plants or soils. Land management techniques, including changes in land use or land management strategies, can and do have a significant effect on atmospheric carbon release and biological sequestration. Within a parcel of land, carbon stocks may decrease (when carbon is released into the atmosphere through combustion and decay) or increase (when carbon is stored during tree growth or through soil absorption).

²¹ Revised 1996 IPCC Guidelines, Reference Manual, Section 1.1, Energy (<http://www.ipcc-nggip.iges.or.jp/public/gl/guidelin/ch1ref1.pdf>).

²² See Chapter 3 for details on GHG accounting for biomass and biofuel combustion.

²³ Due to ongoing analysis, efforts to collect and synthesize data, and the development of accounting approaches that will appropriately reflect the true atmospheric impact of biogenic emissions, agencies are not required to include these emissions in their reduction targets under E.O. 13514 at this time, but agencies are required to inventory their biogenic GHG emissions. Part or all of the carbon in these fuels is derived from material that was fixed by biological sources on a relatively short timescale. Depending on the full emissions impact of biomass production and use, these emissions may or may not represent a net change in atmospheric carbon dioxide. This contrasts with carbon from fossil fuels, which was removed from the atmosphere millions of years ago.

Biological sequestration is the net increase of carbon stored within a parcel of land over time, while the net decrease is considered an emission. In other words, a standing forest that exists today is not, in and of itself, considered sequestration, but any additional carbon that is stored within that forest as it grows over time would be considered sequestration.

Agency-level reporting of emissions and sequestration as a result of land management practices is not required at this time. In addition, reporting of emissions from wildfire management, prescribed burning, land-use, and land-use changes is not required. Agencies choosing to report activities undertaken to date in calculating such emissions should address them in the qualitative portion of their GHG inventory.

The calculations for sequestration are complex, especially when multiple ecosystem types and a variety of management practices are considered. Currently, EPA prepares an annual report on the National Inventory of Greenhouse Gas Emissions and Sinks at the national scale, which is appropriate for national and international discussions. The data in that report, however, are too coarse to address the effects of specific Federal land management practices on GHG emissions, sequestration, and fluxes. The U.S. Department of Agriculture's (USDA's) Forest Service Forest Inventory and Analysis Program collects data that could be used to quantify carbon stocks and fluxes on Federal lands, but additional data analysis would be required to present the data at a scale appropriate for small landholdings. In addition, the U.S. Geological Survey is acting to fulfill Congress' mandate to develop a methodology for a national assessment of current and potential GHG stores and fluxes in ecosystems.²⁴ This methodology, which is expected to provide data at a resolution more appropriate for small landholdings, will use as a starting point the existing GHG inventories and methodologies published by USDA and EPA, and is anticipated to be completed in 2010.

During FY 2011, a subcommittee of the GHG Workgroup described in Chapter 1, comprised of Federal land managers and scientists with expertise in GHG measurement and monitoring techniques, including remote sensing, will be tasked with developing guidance recommendations on measuring the impact of sequestration associated with land management. These recommendations will be implemented at a scale and level of accuracy appropriate to the objectives of E.O. 13514. This subcommittee will strive to accomplish the following:

- Evaluate existing models and data, as well as existing and future peer-reviewed methodologies, to assess current and potential GHG stores and fluxes in ecosystems.
- Recommend how these data, models, methodologies, and techniques should be utilized to account for (1) GHG sequestration and emissions from Federal land management practices, and (2) total GHG sequestration and emissions from Federal lands at appropriate spatial scales.
- Achieve significant cost efficiencies and uniformity of accepted practices to detect and measure GHG storage and fluxes on Federal lands.

²⁴ EISA 2007, Section 712-714.

3.4. Enteric Fermentation

Enteric fermentation refers to fermentation that occurs in the digestive systems of ruminant animals (such as cattle, sheep, and goats) that have a large “fore-stomach,” or rumen, within which microbial fermentation breaks down food into soluble products. The microbial fermentation that occurs in the rumen enables ruminant animals to digest coarse plant material for food, but also produces methane gas. Livestock management is considered to result in anthropogenic emissions of greenhouse gases. As such, in the case of livestock managed on Federal property, their emissions are typically reported as either scope 1 or 3.

Agencies are not required to report the emissions from enteric fermentation at this time, but they may be voluntarily reported. Additional requirements for reporting these emissions may be included in future versions of this Guidance. If the emissions are reported and the livestock in question are owned by the Federal agency, these emissions should be voluntarily reported as scope 1. If releases occur by livestock not owned by an agency, but occur on Federal land, these emissions are voluntarily reported as scope 3.²⁵ Agencies are not required to report releases that occur by undomesticated ruminants that are a part of a wildlife management program or by wild animals on Federal lands (e.g., a herd of elk in a National Park).

3.5. Composting

Composting may generate GHG emissions through the biodegradation of organic plant matter performed by bacteria, yeast, and fungi. Although composting of organic waste, such as food waste and grass clippings, is uncommon in many agencies, it remains an effective way to reduce landfill waste.

Reporting the emissions from composting is not required at this time. The calculation methodology for composting is still being developed and refined. As knowledge increases regarding the measurement of emissions from composting, this chapter may be updated.

3.6. Manure Management

Manure in large quantities can pose a risk of pollution to waterways and ecosystems. As a result, large-scale livestock operations often store or stabilize manure with a manure management system. These systems can include anaerobic lagoons, liquid slurry systems, storage pits, digesters, solid storage systems, dry lots, composting, incineration, and aerobic systems. They do not include natural pasturing, manure land application, daily spread systems, or off-site composting.

Reporting the emissions from manure management systems or other manure handling processes is not required at this time, but the emissions may be voluntarily reported. If these systems are owned or controlled by the agency, the emissions may be voluntarily reported as scope 1. If the

²⁵ Data sources and the calculation methodology regarding enteric fermentation can be found in *Emissions Factors & AP 42*, Fifth Ed., Volume I, Chapter 14, Supplement D.

activities take place on Federal land, but are operated by others, these emissions may be voluntarily reported as scope 3.²⁶

²⁶ Methodologies, data sources, emission factors, and further discussion of these issues can be found in the EPA's Mandatory Reporting of Greenhouse Gases Rule at www.epa.gov/climatechange/emissions/ghgrulemaking.html or in the Federal Register, Vol. 74, No. 209, in Subpart JJ.

4.0 Renewable Energy and Carbon Offsets

Renewable energy is defined as energy derived from resources that are renewed indefinitely. This includes solar, wind, biomass, landfill gas, ocean (including tidal, wave, current and thermal), geothermal, municipal solid waste, or new hydroelectric generation capacity achieved from increased efficiency or additions of new capacity at an existing hydroelectric project.^{27,28} Renewable energy can reduce GHG emissions by displacing conventional fossil fuel use. Agencies may not claim reductions greater than their gross GHG emissions (i.e., overall agency GHG emissions may not be reported as negative).

This chapter provides agencies with guidance on measuring and accounting for emissions resulting from their purchase or use of renewable energy. This Guidance considers the current legislative and regulatory environment with regard to renewable energy and carbon offsets (carbon offsets are covered separately in Chapter 4.2). The enactment and promulgation of new laws and regulations related to climate change could affect the role of Renewable Energy Certificates (RECs) and carbon offsets in meeting agency GHG targets. This Guidance will be updated as necessary to reflect changes in policies or regulations.

4.1. Renewable Electricity

Federal agencies may reduce their GHG emissions by acquiring and claiming (or acquiring and retiring) RECs. RECs are essential to making claims about GHG reductions, and may be acquired by purchasing or producing electricity, heat, or steam generated from renewable energy sources, or by purchasing RECs separate from the purchase of electricity from the grid. For the purposes of this Guidance, the term “consumption” means the use of renewable energy acquired through methods that includes, but are not limited to, direct purchase, utility contract, a lease arrangement such as an enhanced use lease, and/or purchase of unbundled RECs, or other similar authorized contractual agreement. Whatever acquisition method is used, the REC must be owned by the agency to make the GHG reduction claim, and the RECs should include all their attributes, including GHG benefits, for the claim to be valid.

For electricity, a REC is a tradable certificate created when one MWh of electricity is generated from a renewable energy source. In many cases, RECs are formally issued to generators by state or regional electronic tracking systems that support verification of the generation and provide clear documentation of REC ownership, but even if they are not issued by a tracking system, RECs are nevertheless created by generation from a renewable energy source and may be tracked by contracts between parties. This is true for both electric and non-electric energy generated by renewable sources. RECs are generally defined by states and certification organizations to contain the “environmental attributes” of electricity generated from renewable energy sources. This allows REC owners to claim the attributes of renewable energy (e.g., GHG emissions benefits) when matched with conventional electricity or energy. By paying attention to the

²⁷ EPC Act 2005, Sec. 203.

²⁸ While not permitted under EPC Act 2005, Sec. 203, electricity generated from generating capacity added to a dam that did not previously have the capacity to generate electricity may be considered for the purpose of GHG reduction, subject to all applicable environmental laws and regulations.

specific attributes, buyers can purchase RECs based on the generation resource (e.g., wind, solar, geothermal), generator vintage, year of generation, and location of generation.

Power purchase agreements with renewable energy facilities do not automatically convey RECs to the purchaser of the power. Agencies purchasing electricity from renewable energy facilities should make clear in any contractual or lease arrangement which party, the buyer or the seller, will own the RECs and associated environmental attributes for the purpose of claiming emissions reductions under this Guidance. Likewise, agencies with on-site renewable generation, whether they own the facility or it is third-party owned, should be explicit in any agreement about which party owns the RECs.

Under this Guidance, the emission reductions associated with the use of renewable energy including the acquisition of electricity, heat, or steam generated from renewable energy sources, or RECs acquired separate from electricity, are considered *indirect* and may be used to reduce a purchaser's scope 2 emissions associated with conventional energy purchase and consumption.²⁹ There is an exception to this general rule, however, with respect to on-site renewable energy generation that displaces the direct use of fossil fuels on an agency facility; the associated emission reductions will occur in scope 1. This is discussed below in Chapter 4.1.1.

To account for RECs or renewable energy purchases, the scope 2 emissions from agencies' electricity purchases are adjusted to reflect the lower emissions from the purchase of renewable electricity, regardless of whether the agency purchases RECs bundled with energy or unbundled. Because the emission reduction benefit of renewable energy is derived from displacing other generation sources, agencies must pay particular attention to the location (region) of the generators that produced the electricity or RECs. When purchasing renewable electricity or RECs, the emission factor used to calculate reductions in the agency's scope 2 emissions must reflect the region in which the renewable generator is located. A different mix of generating resources will be displaced by renewable energy generation depending on the region in which the generation occurs. GHG emission impacts should always be based on the eGRID non-baseload output emission rates, which are appropriate for measures that reduce GHG emissions by reducing electricity use.³⁰ It is important that an agency's contract with a provider of renewable electricity bundled with RECs or of unbundled RECs specifies the resource type and region that the RECs are sourced from so that the appropriate eGRID non-baseload output emission rate can be used to quantify the scope 2 emission reductions.

Agency renewable energy use, including the source of the renewable energy, shall be reported separately from conventional energy and fuel use. To account for renewable energy purchases, emissions associated with agencies' use of electricity, heat, or steam purchases shall be adjusted accordingly to reflect reduced GHG emissions generated by the renewable source.

It is also important to report whether the generator is on the site where the renewable electricity is consumed or is being delivered through the electric grid because scope 3 transmission and distribution losses are eliminated from on-site projects. For off-site projects, transmission and

²⁹ Guidelines for eligible RECs are defined in FEMP's *Renewable Energy Requirement Guidance for EPA Act 2005* and E.O. 13423, see www.eere.energy.gov/femp/regulations/eo13423.html.

³⁰ See "The Value of eGRID and eGRIDweb to GHG Inventories," Rothschild, S, A. Diem, et. al., presented at EUEC 2010 Environmental Conference, Phoenix, AZ, February 2, 2010.

distribution losses are the same as electricity from a utility. Transmission and distribution GHG factors are included in the TSD.

Independent third-party services are available to track and verify the number, type, geographic origin, and other attributes of RECs that have been purchased. Federal agencies are required to include third-party verification of renewable energy and REC purchases under FEMP's *Renewable Energy Requirement Guidance for EPACT 2005 and E.O. 13423*.³¹

Facilities that have purchased renewable energy and RECs in the base year (FY 2008) should not have the credits included in their base year emissions inventory to ensure they are not unduly penalized for proactive investment.

4.1.1. Renewable Electricity Generated On-Site

If an agency owns an on-site renewable generating facility and consumes the energy that it produces, the agency may take credit for the renewable energy that it both produces and consumes, as long as it retains the RECs. Agencies are encouraged to register with state or regional tracking systems, when it is practical, for the purpose of being issued RECs for their on-site generation. If this renewable energy is replacing conventional energy that was generated from an on-site source, the agency must count the GHG emission reduction in scope 1. If on-site renewable energy is replacing purchased energy from off-site sources, the agency must count the GHG emission reductions in scope 2. Agencies must report renewable energy use separately from conventional energy and fuel use, and identify it as on-site generation whether it is owned by the agency or by a third party organization that is delivering the renewable energy and/or RECs from the system to the agency.

If the renewable energy is based on biomass or waste-to-energy (WTE), CH₄ and N₂O emissions, as well as emissions from the non-biomass content in WTE, must be accounted for in scope 1 if the facility is owned by the agency. If the facility is not owned by the agency, but the electricity is consumed on-site, associated emissions must be accounted for in scope 2.

All on-site renewable energy reduces GHG emissions from transmission and distribution losses, which may be accounted for in scope 3.

For agencies generating on-site renewable electricity that reduces on-site natural gas use or other fossil fuel combustion, the lower fossil fuel use resulting from the system should be automatically reflected in reduced scope 1 emissions when the agency reports less fossil fuel use. The agency does not need to calculate separate GHG emissions for the fossil fuel displaced by the renewable electricity.

4.1.2. On-Site Renewable Energy, Not Generating Electricity

On-site renewable energy systems that do not generate electricity but produce thermal energy, such as solar water heating, ground source heat pumps, and geothermal direct use, may be cost-effective ways to reduce thermal loads and, thus, GHG emissions. Whether the agency owns the

³¹ FEMP's *Renewable Energy Requirement Guidance for EPACT 2005 and E.O. 13423*, see www.eere.energy.gov/femp/regulations/eo13423.html.

on-site systems, or pays for them under an authorized contract agreement, there are no special steps required to report emissions. Such systems reduce the agency's generation and/or purchase of electricity, natural gas, or other conventional energy sources. The reductions of natural gas or other fossil fuel combusted on-site would be reflected in the agency's scope 1 emissions, while the reduced purchase of electricity or conventional non-electric energy would be reflected in the agency's scope 2 emissions. Agencies should input system characteristics in the GHG Reporting Portal to receive proper GHG emission credit, and for EPA Act 2005 and E.O. 13423 renewable energy goal reporting. These systems also reduce GHG emissions by avoiding scope 3 transmission and distribution losses.

Agencies that own on-site systems using biomass to produce non-electric energy (heat) must adjust their scope 1 emissions to reflect the emissions from the on-site biomass boiler. Agencies should remember, however, that biomass combustion involves fuels whose production and delivery (even from on-site wastes) can produce GHG emissions, especially CH₄ and N₂O. If the conversion equipment is owned by another entity that delivers steam, heated air, or hot water as the product, the emissions from the system should be reported as scope 2 emissions (see TSD for calculations).

4.1.3. Third-Party Ownership of On-Site Systems

Agencies may host an on-site renewable energy system on their facilities without owning the system. For example, a third-party entity may own the system and sell energy to the agency through a Power Purchase Agreement or other authorized contractual arrangement. Because the on-site system is not under the operational control of the agency, all associated emissions or avoided emissions from energy consumed by the agency from the system should be reported under scope 2. In this instance, an agency may only claim associated emissions reduction within scope 2 if it owns RECs for the energy produced by the system. If the agency does not own the RECs and environmental attributes for the renewable energy produced by the system, the electricity delivered and associated emissions are calculated as conventional grid-supplied electricity using the eGRID subregion factor. However, the avoided emissions from such third-party systems may contribute to reductions in the agency's scope 3 emissions when on Federal property. This same principle also applies to renewable systems that deliver non-electric or thermal energy.

In some cases, such as enhanced use leases, the third party may be contractually authorized to sell renewable electricity or energy to entities other than the agency. In this case, the emissions associated with on-site generation of energy, where the energy is not consumed by the host agency and the agency does not own the RECs, are considered scope 3. Future revision to this Guidance will include appropriate calculation methodologies and instructions for identification and reporting of these emissions.

4.1.4. Purchase of Electricity from Biomass Combustion

Emissions from biomass or biofuels combustion are covered in Chapter 3.³² For the FY 2008 base year, FY 2010 inventory, and subsequent annual inventories, agencies must clearly identify and report scope 2 CO₂ emissions associated with the biogenic portion of biofuel and biomass combustion. These are known as biogenic emissions.³³ The CH₄ and N₂O emissions from biomass combustion must be reported in scope 2, and are included in agency reduction targets. The default calculation methodology for addressing the CH₄ and N₂O emissions from biomass and WTE can be found in the TSD.

If the biomass-fueled electric generator is owned by the agency, see further guidance in Chapter 4.1.1 for On-site Generation.

4.1.5. Purchase of Electricity from Conversion of Landfill Gas

A common method for reducing emissions from landfills is the collection and combustion of landfill methane gas. At some landfills, gas is combusted by flaring, while at others gas is combusted to produce energy. Agencies that purchase renewable electricity from the conversion of landfill gas to energy should report only the scope 2 emission reductions from the displacement of generation on the electric grid. Direct emission reductions from capturing the landfill gas prior to energy generation are not part of the agency's emission reduction (unless the agency owns the landfill), and are not conveyed to the purchasers of electricity or the purchasers of RECs from landfill gas to energy projects.³⁴

4.1.6. Purchase of Electricity from Municipal Solid Waste Combustion

The combustion of municipal solid waste (MSW) at waste-to-energy (WTE) facilities is an eligible renewable resource. Although MSW consists largely of renewable biogenic resources, such as food, paper, and wood products, a significant portion is non-renewable materials derived from fossil fuels, such as plastics and tires. As a result, EPA's Mandatory Reporting of Greenhouse Gases Rule requires large WTE facilities that are subject to the rule to separately report their biogenic carbon dioxide emissions and non-biogenic, or fossil-derived, CO₂ emissions.³⁵ Assumptions regarding biomass content in waste incorporated into the default

³² Due to ongoing analysis, efforts to collect and synthesize data, and the development of accounting approaches that will appropriately reflect the true atmospheric impact of biogenic emissions, agencies are not required to include these emissions in their reduction targets under E.O. 13514 at this time, but agencies are required to inventory their biogenic GHG emissions. Part or all of the carbon in these fuels is derived from material that was fixed by biological sources on a relatively short timescale. Depending on the full emissions impact of biomass production and use, these emissions may or may not represent a net change in atmospheric carbon dioxide. This contrasts with carbon from fossil fuels, which was removed from the atmosphere millions of years ago.

³³ Id.

³⁴ This treatment is consistent with the EPA's Climate Leaders and Green Power Partnership; see *Climate Leaders Greenhouse Gas Inventory Protocol Offset Project Methodology for Project Type: Landfill Methane Collection and Combustion* (August 2008), p. 3, at www.epa.gov/climateleaders/documents/resources/draft_landfill_offset_protocol.pdf, and EPA Green Power Partnership, *Partnership Requirements* (April 2009), p. 10, at www.epa.gov/greenpower/documents/gpp_partnership_reqs.pdf.

³⁵ More information about EPA's Mandatory Reporting of Greenhouse Gases Rule can be found at www.epa.gov/climatechange/emissions/ghgrulemaking.html.

WTE emission approach are included in the TSD. For the FY 2008 base year, FY 2010 inventory, and subsequent annual inventories, agencies must clearly identify and report scope 2 CO₂ emissions associated with the biogenic portion of biofuel and biomass combustion. These are known as biogenic emissions.³⁶ CH₄ and N₂O emissions resulting from combustion are required in scope 2 reporting and are not considered biogenic, and are therefore included in agency reduction targets.

Agencies interested in reducing their scope 2 emissions by purchasing electricity sourced from WTE must ensure that the electricity is created from the renewable portion of the waste stream. WTE facilities reporting their biogenic CO₂ emissions and anthropogenic greenhouse gas emissions to EPA under the Mandatory Reporting rule should be able to provide this information to the electricity provider.

4.2. Carbon Offsets

Carbon offsets are not eligible at this time to reduce a Federal agency's emissions. The area of carbon offsets is broad, encompassing multiple organizations and validation/certification processes. More time and deliberate focus is necessary in understanding how the market for carbon offsets and use of those offsets could be applied consistently across the Federal community. It is likely that future versions of the Guidance will address the broader category of carbon offsets in greater detail.

³⁶ Due to ongoing analysis, efforts to collect and synthesize data, and the development of accounting approaches that will appropriately reflect the true atmospheric impact of biogenic emissions, agencies are not required to include these emissions in their reduction targets under E.O. 13514 at this time, but agencies are required to inventory their biogenic GHG emissions. Part or all of the carbon in these fuels is derived from material that was fixed by biological sources on a relatively short timescale. Depending on the full emissions impact of biomass production and use, these emissions may or may not represent a net change in atmospheric carbon dioxide. This contrasts with carbon from fossil fuels, which was removed from the atmosphere millions of years ago.

5.0 Reporting GHG Emissions

This chapter describes the GHG reporting process, the use of emission factors in this Guidance, and the procedures for inventory recalculations. The TSD provides more details on the requirements for qualitative and quantitative data.

5.1. Reporting Process

5.1.1. Annual Date for Reporting

Reporting of FY 2010 GHG emissions to CEQ must occur by January 31, 2011, and by that date annually thereafter for the preceding fiscal year. Agencies must submit their FY 2008 base year inventory on the same date. Both the FY 2008 and FY 2010 inventories must be calculated following the provisions in this Guidance.

Agencies must include updates and corrections to their GHG emissions reports from previous years at the same time of their annual submissions. It is important to recognize that while E.O. 13514 excludes certain sources of Federal GHG emissions from agency GHG emissions reduction targets, these exclusions do not apply to agency comprehensive GHG inventories.

5.1.2. Electronic GHG Accounting and Reporting Capability (GHG Reporting Portal)

Section 9(b), E.O. 13514, requires DOE, in coordination with other agencies, to provide the necessary electronic reporting capability so that agencies can report their GHG inventories in a consistent and accurate manner. This capability will be operational by October 5, 2010, as required by E.O. 13514. The GHG Reporting Portal will be made freely available for agency use. Once established, agencies must use the GHG Reporting Portal to submit their annual GHG inventories.

The GHG Reporting Portal will accurately represent current GHG reporting requirements and provide GHG calculation functionality for the default calculation methodologies described in this chapter and the TSD. Current FEMP energy reporting will be integrated into this portal to reduce the reporting burden for agencies. Data residing in the FAST system will automatically be transferred to the GHG Reporting Portal, and FEMP will work to enable data sharing with other relevant Federal data systems. See Table 4 for a summary of GHG reporting requirements by scope and emission category. This table also summarizes those emission categories for which the GHG Reporting Portal will automatically calculate GHG emissions based on activity-level data entered by agencies.

Table 4: Summary of GHG Reporting Requirements

Scope	GHG Emission Category	Does the GHG Reporting Portal automatically calculate emissions based on activity-level data?
Scope 1 (Required FY	Stationary Combustion (Agency Owned and Controlled Electricity, Heat, and Steam)	Yes

Scope	GHG Emission Category	Does the GHG Reporting Portal automatically calculate emissions based on activity-level data?
2008, 2010)	Mobile Fossil Fuel (Agency Owned and Controlled Vehicles, Aircraft, Etc.)	Yes
	Fluorinated Gases (HFCs, PFCs, SF ₆)	Yes
	Wastewater Treatment (Agency Owned and Controlled)	Yes
	Solid Waste/Landfill (Agency Owned and Controlled)	Yes
	Others Fugitive and Process Emissions	No*
Scope 2 (Required FY 2008, 2010)	Purchased Electricity	Yes
	Purchased Steam, Hot Water, or Chilled Water	Yes
	Purchased Combined Heating and Power	Yes
	Purchased Steam from Waste-To-Energy	Yes
Scope 2 (Optional FY 2010)	Renewable Power Purchases and REC purchases	Yes
Scope 3 (Required FY 2008, 2010)	Business Air Travel	Yes
	T&D Losses	Yes
	Contracted Solid Waste Disposal	Yes
	Ground Business Travel	Yes
	Commuter Travel	Yes
	Contracted Wastewater Treatment	Yes
Scope 3 (Optional FY 2008, 2010)	Facilities Operated Under Private Sector and GSA Leases	No*
	Other Agency-specific Scope 3 Emissions	No*

*The TSD does not include a calculation methodology.

5.1.3. Reporting Approach

Emission categories are broken down into required reporting and voluntary reporting, as described in Chapter 2. Voluntary reporting refers to the reporting of emissions that do not currently have a specified calculation methodology in the TSD, or are not otherwise identified as required for reporting purposes in this Guidance. Agencies may report emissions for these items,

but must clearly identify them and provide documentation for calculation methods used in the submission of the agency’s inventory. Over time, new methodologies and procedures will be included in revisions to this document and supporting documents to improve the Federal government’s ability to account for and report GHG emissions.

The TSD provides existing default and advanced calculation methodologies for GHG emissions accounting and reporting. For each of the required categories, there exists a calculation methodology that will allow for the use of “**default**” methodologies where activity data can be directly entered into the GHG Reporting Portal. If using the default methodology, agencies will input activity level data, some of which can be drawn from existing programs and collection systems (e.g., FEMP Energy Report and FAST system). Calculation methodologies and emission factors will be built into the GHG Reporting Portal. To the greatest extent possible, the GHG Reporting Portal will provide calculation of GHG emissions associated with items that are already reported by Federal agencies, such as annual energy reporting and FAST data.

For many emission categories, “**advanced**” methodologies are also available, which can provide more accurate GHG accounting. Agencies may report using these advanced methodologies *instead* of the default methodologies, but their use is not required at this time. As agencies become more familiar with GHG reporting, they are encouraged to utilize the advanced methodologies to increase the accuracy of their inventories. If the GHG Reporting Portal does not provide an appropriate advanced methodology, agencies will need to calculate the emissions, and then manually enter the quantities of each GHG emitted in units of metric tons. For all required emission categories, agencies must report using either the default or advanced methodology. Refer to the TSD for detailed descriptions of default and advanced calculation methodologies. As noted in Chapter 2, voluntary reporting categories are also available. However, the GHG Reporting Portal will not calculate emissions for voluntary categories. Agencies electing to report emissions for these categories will need to calculate the emissions, and then manually enter the quantities of GHGs emitted into the GHG Reporting Portal.

5.1.4. Other GHG Calculation Tools

Although selected qualitative and quantitative GHG data must be submitted annually into the GHG Reporting Portal, this Guidance does not stipulate the use of any other particular GHG inventory calculation tool. Many agencies already have some experience developing GHG inventories, and, as a result, may have preferred tools to assist with performing calculations and

Advanced Calculation Example: On-site Landfill

To illustrate how an advanced methodology could be used, consider an agency that manages a total of five landfills at different facilities, all of which are maintained and reported as part of the facilities’ Clean Air Act (CAA) Title V permits. The agency’s GHG lead works with each facility’s air program manager to determine the site-specific variables for each landfill that are readily available. During this process, the agency determines that the landfills have been closed for several decades and emit lower amounts of CH₄ than reflected when using the scope 1 default methodology. Given that the data are available, the agency GHG lead decides to use the advanced GHG calculation methodology to calculate each of the five landfill’s emissions, and to report the total metric tons of CH₄ emissions under the Solid Waste/Landfill emission category in the GHG Reporting Portal.

managing GHG information. This Guidance is designed to integrate activity data for GHG accounting and reporting with other reporting requirements where possible, thereby allowing agencies to leverage existing tools and databases.

While all final agency reporting must be accomplished through the GHG Reporting Portal, agencies are not precluded from using other agency-specific tools to assist them in better managing and maintaining data necessary to develop and submit inventories. However, agencies must ensure that any agency-specific tools are appropriately aligned with this Guidance and the TSD.

Agency-specific tools may include, but are not limited to:

- Headquarters-level, “top-down” data entry, calculation, aggregation, and analysis
- Facility-level, “bottom-up” data acquisition, entry, calculation and/or management
- Emission category / source data acquisition, calculation and/or analysis
- Project-level data capture, calculation, and analysis

If other GHG calculation tools are used, agencies must ensure that they conform to the methods and procedures described in this Guidance and in the TSD. Because different tools may produce different results depending on the calculation methodologies used, agencies must evaluate their calculation tools carefully prior to use and ensure that they are consistent with the methods used in the Guidance and, by extension, the GHG Reporting Portal. It is anticipated that such tools will increasingly be dynamically linked to the GHG Reporting Portal.

5.2. Emission and Conversion Factors

To ensure accurate GHG inventories, each agency must apply appropriate and consistent emission and conversion factors. This Guidance will be revised as needed to incorporate the current, accepted calculation methodologies and emission factors. The most currently available calculation methodologies should be used to prepare the GHG inventory for each reporting year.

For emission factors other than those for scope 2 purchased electricity, agencies may develop activity-specific or local emission factors. This is particularly applicable where on-site operators are familiar with the operating conditions and equipment characteristics. Examples include combined heat and power facilities that generate electricity, steam, and/or hot water; and waste-to-energy plants. Agencies must fully document the justification and methodology for developing emission factors not provided in the TSD.

Agencies may also substitute emission factors in the TSD with data from their operations utilizing continuous emissions monitoring (CEM) equipment.

Emission factors and methodologies referenced in this Guidance were selected because of their applicability to Federal operations, technical authority, and documented acceptance in other widely-recognized GHG reporting programs. The calculation methods and emission factors were leveraged from existing GHG regulatory and voluntary inventory protocols, with the EPA Mandatory Reporting Rule given priority wherever applicable, followed by other Federal sources. The TSD provides sources used for selected methodologies.

5.3. Base Year and Subsequent Year Inventories

E.O. 13514 established FY 2008 as the base year for Federal agency GHG emission reduction targets. Agencies must calculate base year inventories using the methodologies and the reporting format outlined in this Guidance.

In some cases, agencies may not have access to quality FY 2008 data, particularly for the scope 1 fugitive emissions and some scope 3 emission categories. When this occurs, agencies may use the earliest year for which data are available to include in the FY 2008 base year inventory. For example, if an agency's employee commuting data becomes available in 2011, those emissions could be used as a basis for into an adjusted FY 2008 baseline.

Renewable energy purchases and RECs purchased in FY 2008 should not be included in the FY 2008 base year scope 2 inventory.

Agencies with cyclical operations or events may find that FY 2008 is not representative of their scope 1 fluorinated gas fugitive emissions (i.e., HFCs, PFCs, and SF₆), particularly when limited to material procurement record data. In these situations, agencies may calculate a 3-year rolling average base year value for their specific scope 1 fluorinated fugitive emissions. This FY 2008 base year must consist of the average scope 1 fluorinated gas fugitive emissions for FY 2006, FY 2007, and FY 2008. If an agency uses a 3-year rolling average base year for fugitive emission, it must continue to use it for subsequent reporting years. For example, FY 2010 reporting in this category should report an average of FY 2008, FY 2009, and FY 2010. Use of this rolling average approach should be noted in the "Other Information" section of the agency's qualitative statement. Agencies may not use the rolling average approach for their entire comprehensive inventory, but only for the fluorinated gas fugitive emissions category.

5.3.1. Recalculations

To ensure a consistent comparison against a baseline that is representative of ongoing agency activities, it may be necessary to recalculate the base year and subsequent inventories. CEQ may direct an overall recalculation of baseline emissions due to significant improvements in emissions calculation methodologies, or the need to normalize data across the Federal sector. Otherwise, agencies must identify the need and provide reasoned support for agency-specific recalculation of its baseline emissions. Agencies that identify or anticipate the need to make significant changes to base year and subsequent inventories should provide CEQ and OMB with sufficient notice to allow for a timely determination as to why the change is necessary and what needs to be made. Agencies may also find it necessary to make smaller, routine changes to the base year and subsequent year inventories to reflect minor corrections or adjustments. Agencies do not need to notify CEQ and OMB regarding minor correction, but are still required to document all changes and provide necessary explanation in their inventory submission.

CEQ and OMB will provide additional information on the process for requesting approval to recalculate baseline and annual inventories prior to the FY11 reporting year.

Agencies should consider recalculating their base year and subsequent year emissions when one of the following occurs:

- Agency structural changes significantly increase or decrease emissions relative to the base year. A structural change involves the transfer of control of emissions-generating activities or operations from one agency to another. While a single structural change may not significantly impact base year emissions, the cumulative effects of a number of minor structural changes can. Examples of structural changes include the following:
 - Reorganization, division, consolidation, or significant change of organizational activities.
 - Significant outsourcing or insourcing of activities.
- Significant change in mission.
- Additional data and/or calculation methodologies for additional emission categories become available. For example, data may become available in FY 2011 for fugitive emissions that were not captured in FY 2010.
- Changes in calculation methodology, or improvements in the accuracy of emission factors or activity data, that significantly change calculated emissions relative to the base year.
- Errors, or a number of cumulative errors, are discovered that significantly increase or decrease emissions relative to the base year.
- A combination of the above result in a significant increase or decrease emissions relative to the base year.

Because determining the significance of such changes in emissions is difficult to stipulate for the full range of government operations, agencies must individually develop and monitor internal processes for comparing annual emissions in relation to the occurrence of the events listed above. Such a comparison should take into account the complexities of the agency's operations and serve to highlight the possible need to perform a recalculation of base year emissions and subsequent years' emissions.

6.0 Verification and Validation of GHG Emissions

The purpose of GHG accounting verification is to provide confidence that reports of GHG emissions are complete, accurate, consistent, transparent, and without significant errors.

6.1 Agency Responsibilities

At a minimum, agencies must verify that their inventories are reliable through a verification process that may be internal to the agency.³⁷ External (third-party) verification is not required at this time, but is an option agencies may consider. Agencies must use at least one of the three processes described below:

1. **Quality Assurance:** When an agency submits its GHG inventory, and therefore certifies that it is reliable, it can choose to include an Inventory Management Plan. This plan must

³⁷ For more information on validation and verification of GHG emissions, see Chapter 10, PSP.

describe the agency's process for verifying the reliability of the inventory, and its plan to improve data quality over time.³⁸

2. **Second-Party Verification:** Any verification that is performed by an entity within the agency is termed second-party verification. Entities performing a second-party verification must be independent of those responsible for reporting the GHG emissions inventory. If an agency uses second-party verifiers, it must identify the verifying entity in its annual reporting.
3. **Third-Party Verification:** If verification is performed by an entity external to the agency, it is termed third-party verification. Entities performing a third-party verification for the agency must be independent of those responsible for reporting the GHG emissions inventory. If an agency uses third-party verifiers, it must identify the verifying organization in its annual reporting.

Agencies are encouraged to use either second- or third-party verification for FY 2010. Entities performing the verification process for an agency may refer to the principles and requirements of ISO 14064-3:2006 for additional guidance on this process, as needed.³⁹

The agency Senior Sustainability Officer must certify the reported inventories via the certification provision in the GHG Reporting Portal.

6.1. FEMP Responsibilities

FEMP will also review the data submitted by the agency and follow up with agency representatives, as appropriate, to clarify questions on data quality. This data review is not the same as verification and does not substitute for or duplicate the verification that the agency performs. Some of the data review conducted by FEMP will be incorporated within the GHG Reporting Portal as automated checks.

³⁸ For more information on managing inventory quality, see Chapter 7, PSP.

³⁹ Greenhouse gases—Part 3: Specification, provides guidance for the validation and verification of greenhouse gas assertions.

Appendix A: Summary of E.O. 13514 Sections Addressed in the Guidance

Key E.O. 13514 Provisions Relevant to GHG Reporting	Role of this Guidance
<p>Section 1. Policy</p> <ul style="list-style-type: none"> • Federal agencies shall...measure, report, and reduce their GHG emissions from direct and indirect activities • Agencies' efforts and outcomes in implementing this order shall be transparent and agencies shall publicly disclose results 	<ul style="list-style-type: none"> • Establishes how to measure and report agency GHG emissions from direct and indirect activities • Supports consistency of data • Incorporates GHG results into FEMP annual report
<p>Section 2a. Goals for Agencies (scope 1 and 2 emissions)</p> <ul style="list-style-type: none"> • Establish and report...a percentage reduction target for reducing agency-wide scope 1 and 2 GHG emissions in absolute terms by FY 2020, relative to a FY 2008 baseline of agency's scope 1 and 2 GHG emissions • Where appropriate, the target shall exclude direct emissions from excluded vehicles and equipment and from electric power produced and sold commercially to other parties in the course of regular business 	<ul style="list-style-type: none"> • Progress in meeting scope 1 and 2 targets will be determined by completing an FY 2008 base year inventory and subsequent annual inventories using this Guidance • Clarifies how allowable target exclusions relate to GHG reporting
<p>Section 2b. Goals for Agencies (scope 3 emissions)</p> <ul style="list-style-type: none"> • Establish and report... a percentage reduction target for reducing agency-wide scope 3 GHG emissions in absolute terms by FY 2020, relative to a FY 2008 baseline of agency scope 3 emissions • Agency head shall consider reductions associated with (i) pursuing opportunities with vendors and contractors to address and incorporate incentives to reduce GHG emissions; (ii) implementing strategies and accommodations for transit, travel, training, and conferencing that actively support lower carbon commuting and travel by agency staff; (iii) GHG emission reductions associated with pursuing other relevant goals in this section; and (iv) developing and implementing innovative policies and practices to address scope 3 GHG emissions unique to agency operations 	<ul style="list-style-type: none"> • Progress in meeting scope 3 targets will be determined by completing an FY 2008 base year inventory and subsequent annual inventories using this Guidance • Provides calculation methodologies for scope 3 emission sources
<p>Section 2c. Goals for Agencies (comprehensive inventory)</p> <ul style="list-style-type: none"> • Establish and report...a comprehensive inventory of absolute greenhouse gas emissions, including scope 1, scope 2, and specified scope 3 emissions (i) within 15 months of the date of this order for FY 2010 and (ii) thereafter, annually at the end of January, for the preceding FY 	<ul style="list-style-type: none"> • Provides methodologies for calculating and reporting comprehensive GHG inventory of scope 1, scope 2, and specified scope 3 emissions
<p>Section 8. Agency Strategic Sustainability Plan</p> <ul style="list-style-type: none"> • Each agency shall develop, implement, and annually update an integrated Strategic Sustainability Performance Plan that will prioritize agency actions based on life-cycle return on investment 	<ul style="list-style-type: none"> • Identifies procedures that may be incorporated into Strategic Sustainability Performance Plans as a means to monitor performance in meeting GHG reduction targets
<p>Section 9a. Recommendations for GHG Accounting and Reporting</p> <ul style="list-style-type: none"> • The DOE, through its Federal Energy Management Program, and in coordination with EPA, DoD, GSA, DOI, DOC, and other agencies as appropriate, shall: (a) within 180 days develop and provide recommended Federal GHG reporting and accounting procedures for agencies to use in carrying out their obligations under subsections 2(a), (b), and (c) of this order, including procedures that will ensure that agencies: <ul style="list-style-type: none"> ○ (i) accurately and consistently quantify and account for GHG emissions from all scope 1, 2, and 3 sources, using accepted GHG accounting and reporting principles, and identify appropriate opportunities to revise the FY 2008 baseline to address significant changes in factors affecting agency emissions such as reorganization and improvements in accuracy of data collection and estimation procedures or other major changes that would otherwise render the initial 	<ul style="list-style-type: none"> • Includes GHG reporting and accounting procedures for scope 1, 2, and 3 sources, where accurate methodologies exist • Addresses inventory recalculations based on changes in factors affecting agency emissions (see Chapter 5) • Addresses sequestration (see Chapter 3)

<p>baseline information unsuitable;</p> <ul style="list-style-type: none"> o (ii) consider past Federal agency efforts to reduce GHG emissions; and o (iii) consider and account for sequestration and emissions of GHGs resulting from Federal land management practices 	
<p>Section 9b. Recommendations for GHG Accounting and Reporting</p> <ul style="list-style-type: none"> • The DOE, through FEMP, and in coordination with EPA, DoD, GSA, DOI, DOC, and other agencies as appropriate, shall: (b) within 1 year, to ensure consistent and accurate reporting, provide electronic accounting and reporting capability for the Federal GHG reporting procedures developed under subsection (a) of this section, and to ensure compatibility between this capability and existing Federal agency reporting systems 	<ul style="list-style-type: none"> • Requires DOE to provide electronic accounting and reporting capability (GHG Reporting Portal) by October 5, 2010 • Addresses the GHG Reporting Portal and how it relates to this Guidance (see Chapter 5)
<p>Section 9c. Recommendations for GHG Accounting and Reporting</p> <ul style="list-style-type: none"> • The DOE, through its Federal Energy Management Program, and in coordination with EPA, DoD, GSA, DOI, DOC, and other agencies as appropriate, shall: (c) every 3 years from the date of issuance of the initial version of the reporting guidance, and as otherwise necessary, develop and provide recommendations for revised Federal GHG reporting procedures use in implementing subsections 2(a), (b), and (c) of this order. 	<ul style="list-style-type: none"> • Revised Guidance will likely be issued in FY 2011, and as otherwise necessary
<p>Section 13. Recommendations for Vendor and Contractor Emissions</p> <ul style="list-style-type: none"> • Within 180 days, GSA in coordination with DoD, EPA, and other agencies as appropriate, shall review and provide recommendations... regarding the feasibility of working with the Federal vendor and contractor community to provide information that will assist Federal agencies in tracking and reducing scope 3 GHG emissions related to the supply of products and services to the Government 	<ul style="list-style-type: none"> • Provides calculation methodologies for selected scope 3 emissions, but not all vendor and contractor emissions (Section 13 recommendations do not include calculation methodologies)
<p>Section 17. Limitations</p> <ul style="list-style-type: none"> • This order shall apply to an agency with respect to the activities, personnel, resources, and facilities of the agency that are located within the United States. The head of an agency may provide that this order shall apply in whole or in part with respect to the activities, personnel, resources, and facilities of the agency that are not located within the United States... 	<ul style="list-style-type: none"> • Clarifies how “limitations” relate to GHG reporting
<p>Section 18. Exemption Authority</p> <ul style="list-style-type: none"> • The Director of National Intelligence may exempt an intelligence activity of the United States, and related personnel, resources, and facilities • Authorizes heads of agencies to exempt certain activities, facilities, equipment, and vehicles (e.g., intelligence, law enforcement, protective emergency response, military tactical fleets, and national security interests) from the provision of the order (other than Sections 18 and 20). • The head of an agency may exempt law enforcement activities of that agency, and related personnel, resources, and facilities... 	<ul style="list-style-type: none"> • Provides “exemption authority”
<p>Section 19. Definitions</p> <ul style="list-style-type: none"> • E.O. 13514 includes definitions 	<ul style="list-style-type: none"> • Includes relevant definitions from E.O. 13514 and other sources

Appendix B: Definitions

This appendix defines the key terms included in this Guidance. The definitions derived from Section 19, E.O. 13514 are displayed in italics. Every effort has been made to maintain consistency in use of definitions across various statutes, regulations, and Executive Orders. However, should any inconsistencies arise, the definitions in this document will be used for the purposes established within this Guidance.

Absolute greenhouse gas emissions: *Total greenhouse gas emissions without normalization for activity levels and includes any allowable consideration of sequestration.*

Agency: *An executive agency as defined in Section 105 of title 5, United States Code, excluding the Government Accountability Office.*

Anthropogenic emissions: Emissions produced as a result of human activity that releases GHG emissions into the atmosphere. One of the largest sources of anthropogenic GHG emissions is the combustion of fossil fuels or fossil fuel-based products to produce electricity.

Base year: A specific fiscal year against which an organization's emissions are tracked over time.

Base year emissions recalculation: A recalculation of emissions in the base year that reflects a change in the structure of the organization or reflects a change in the accounting methodology used. It ensures data consistency over time, i.e., comparisons of like with like over time.

Biofuels: Liquid fuel made from plant material, e.g., wood, straw, and ethanol from plant matter.

Biogenic emissions: CO₂ emissions as a result of natural biological processes, such as the decomposition or combustion of vegetative matter. Due to ongoing analysis, efforts to collect and synthesize data, and the development of accounting approaches that will appropriately reflect the true atmospheric impact of biogenic emissions, agencies are not required to include these emissions in their reduction targets under E.O. 13514 at this time, but agencies are required to inventory their biogenic GHG emissions. Part or all of the carbon in these fuels is derived from material that was fixed by biological sources on a relatively short timescale. Depending on the full emissions impact of biomass production and use, these emissions may or may not represent a net change in atmospheric carbon dioxide. This contrasts with carbon from fossil fuels, which was removed from the atmosphere millions of years ago. Examples of emission sources include burning vegetation (biomass) to produce electricity or using plant-based biofuels for transport.

Biological sequestration: The capture and storage of the atmospheric greenhouse gas carbon dioxide by biological processes, such as photosynthesis (through practices such as reforestation or preventing deforestation) or by enhanced soil carbon trapping in agriculture.

British Thermal Unit: The quantity of heat required to raise the temperature of one pound of water by one degree Fahrenheit at 39.2 degrees Fahrenheit.

Carbon dioxide (CO₂): One of the six primary GHGs, consisting of a single carbon atom and two oxygen atoms. It is the principal anthropogenic greenhouse gas and is the reference gas against which other greenhouse gases are measured, and therefore has a GWP of 1. While it is a naturally occurring gas, it is also a by-product of burning fossil fuels and biomass, as well as land-use changes and other industrial processes.

Carbon offset: A tradable financial instrument that represents the sequestration, destruction, or reduction of one metric ton of carbon dioxide or its equivalent in other greenhouse gases outside an organization's boundary to compensate for emissions produced inside an organization's boundary. Carbon offsets are created by projects outside an agency's organizational boundary, such as methane capture or reforestation projects, that reduce the amount of carbon dioxide or greenhouse gases emitted into the atmosphere and are used to offset or compensate for emissions inside an agency's organizational boundary.

Carbon sequestration: The removal and storage of carbon from the atmosphere in carbon sinks (such as oceans, forests, or soils) through physical, man-made, or biological processes. It consists of both biological and geological sequestration.

Certification: The method used to ensure that an agency's GHG emissions inventory (either the baseline or subsequent years) has met a minimum quality standard and complied with an appropriate set of procedures and protocols for submitting emissions inventory information.

CO₂ equivalent (CO₂e): The universal unit of measurement to indicate the GWP of each of the six GHGs, expressed in terms of the GWP of one unit of CO₂. It is used to evaluate releasing (or avoiding releasing) different GHG emissions against a common basis, and is commonly expressed as (metric tons carbon dioxide equivalent) MT CO₂e, which is calculated by multiplying the metric tons of a gas by the appropriate GWP.

Cogeneration/combined heat and power: A facility producing both electricity and steam heat using the same fuel supply.

Control approach: An emission accounting approach for defining organizational boundaries in which an organization reports 100 percent of the GHG emissions from operations under its financial or operational control.

Control: The ability of an organization to direct the policies of another operation. It is defined as either operational control (the organization or one of its subsidiaries has the full authority to introduce and implement operating policies at the operation) or financial control (the organization has the ability to direct the financial and operating policies of the operation with a view to gaining economic benefits from its activities).

de minimis: A minimum emissions accounting threshold below which reporting is not required. Federal agency GHG inventories have no *de minimis* reporting threshold for required emission categories.

Direct GHG emissions: Emissions from sources that are owned or controlled by the reporting organization.

Double counting: Two or more reporting organizations take ownership of the same emissions or reductions within the same scope. Indirect emissions (scope 2 and 3) are inherently another entity's direct, scope 1 emissions.

eGRID non-baseload output emission rate: The Emissions & Generation Resource Integrated Database (eGRID) is a comprehensive inventory of environmental attributes of electric power systems. The preeminent source of air emissions data for the electric power sector, eGRID is based on available plant-specific data for all U.S. electricity generating plants that provide power to the electric grid and report data to the U.S. Government. eGRID integrates many different Federal data sources on power plants and power companies, from three different Federal agencies: the Environmental Protection Agency (EPA), the Energy Information Administration (EIA), and the Federal Energy Regulatory Commission (FERC). eGRID provides the output emission rate for power plants in a certain aggregation (e.g., eGRID subregion) that combust fuel and have capacity factors less than 0.8, weighted by generation and a percentage of generation determined by capacity factor.

Emission factor: A representative value that attempts to relate the quantity of a pollutant released into the atmosphere with an activity associated with the release of that pollutant.

Emissions: Gases and particles that are put into the air or emitted by various sources.

Enteric Fermentation: The breaking down of food in the gut of ruminant animals, especially cattle, producing methane which is eliminated from the animal's body.

Fugitive emissions: For the purpose of this Guidance, emissions that are not physically controlled, but result from the intentional or unintentional releases of GHGs. They commonly arise from the production, processing, transmission, storage, and use of fuels and other chemicals, often through joints, seals, packing, and gaskets.

GHG sink: Any physical unit or process that stores GHGs, usually in reference to forests and underground or deep sea reservoirs of CO₂.

GHG source: Any physical unit or process that releases GHGs into the atmosphere.

Global warming potential: A factor describing the radiative forcing impact of one unit of a given GHG relative to one unit of CO₂.

Greenhouse gases: *Carbon Dioxide (CO₂), Nitrous Oxide (N₂O), Methane (CH₄), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), and Sulfur Hexafluoride (SF₆).*

Hydrofluorocarbons (HFCs): One of the six primary GHGs primarily used as refrigerants; a class of gases containing hydrogen, fluorine, and carbon, and possessing a range of GWP values from 12 to 11,700.

Indirect emissions: Emissions that are a consequence of the actions of a reporting entity, but are produced by sources owned or controlled by another entity. For example, emissions that occur at a utility's power plant as a result of electricity purchased by a Federal agency represent the agency's indirect emissions.

Intergovernmental Panel on Climate Change: An international body of climate change scientists established by the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO). The role of the IPCC is to assess the scientific, technical, and socio-economic information relevant to the understanding of the risk of human-induced climate change.

Inventory: A comprehensive and quantified accounting of an agency's GHG emissions and sources.

Livestock: One or more domesticated animals raised in an agricultural setting to produce commodities (e.g., food, fiber, or labor). Livestock generally are raised for profit or for subsistence. The term "livestock" in this document includes poultry or farmed fish. The definition of livestock excludes animals in a wildlife management program (e.g., a herd of elk in a National Park).

Methane (CH₄): One of the six primary GHGs, consisting of a single carbon atom and four hydrogen atoms; a GWP of 21; and produced through the anaerobic decomposition of waste in landfills, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion.

Municipal solid waste: A mixed material waste stream consisting of residential solid waste and some non-hazardous commercial, institutional, and industrial wastes. It does not include construction and demolition waste materials.

Nitrous oxide (N₂O): One of the six primary GHGs, consisting of a two nitrogen atoms and a single oxygen atom; a GWP of 310; and typically generated as a result of soil cultivation practices (particularly the use of commercial and organic fertilizers), fossil fuel combustion, nitric acid production, and biomass burning.

Operation: A generic term used to denote any kind of business, irrespective of its organizational, governance, or legal structures. An operation can be a facility, subsidiary, affiliated company, or other form of joint venture.

Operational boundary: The boundaries that determine the direct and indirect emissions associated with operations owned or controlled by the reporting organization. This assessment allows an organization to establish which operations and sources cause direct and indirect emissions, and to decide which indirect emissions to include that are a consequence of its operations.

Operational control: Full authority to introduce and implement operating policies at an operation. Operational control is one of two ways to define the control approach.

Organizational boundary: The boundaries that determine the operations owned or controlled by the reporting organization, depending on the consolidation approach taken (equity or control approach).

Perfluorocarbons (PFCs): One of the six primary GHGs consisting of a class of gases containing carbon and fluorine typically emitted as by-product of industrial and manufacturing processes, and possessing GWPs ranging from 5,700 to 11,900.

Process emissions: Emissions generated from manufacturing processes, such as the CO₂ that arises from the breakdown of CaCO₃ during cement manufacture.

Renewable energy: *Energy produced by solar, wind, biomass, landfill gas, ocean (including tidal, wave, current, and thermal), geothermal, municipal solid waste, or new hydroelectric generation capacity achieved from increased efficiency or additions of new capacity at an existing hydroelectric project.*

Reporting year: The fiscal year in which the reported emissions occurred. For example, if emissions that occurred in FY 2010 are being reported in 2011, the reporting year is FY 2010.

Scope 1 emissions: *Direct greenhouse gas emissions from sources that are owned or controlled by the Federal agency.*

Scope 2 emissions: *Indirect greenhouse gas emissions resulting from the generation of electricity, heat, or steam purchased by a Federal agency.*

Scope 3 emissions: *Greenhouse gas emissions from sources not owned or directly controlled by a Federal agency, but related to agency activities, such as vendor supply chains, delivery services, and employee travel and commuting.*

Sequestered atmospheric carbon: Carbon removed from the atmosphere by biological or geological sinks and stored in plant tissue or below ground. For the purposes of this document, sequestered atmospheric carbon does not include GHGs captured through carbon capture and storage.

Stationary combustion: Burning of fuels to generate electricity, steam, heat, or power in stationary equipment, such as boilers and furnaces.

Sulfur hexafluoride (SF₆): One of the six primary GHGs, consisting of a single sulfur atom and six fluoride atoms, a GWP of 23,900, and primarily used in electrical transmission and distribution systems.

Target: A reduction goal in absolute GHG emissions over time. E.O. 13514 requires that agencies have targets for scope 1 and 2 GHG reductions and for scope 3 GHG reductions.

United Nations Framework Convention on Climate Change: UNFCCC, signed in 1992 at the Rio Earth Summit, is a milestone climate change treaty that provides an overall framework for international efforts to mitigate climate change. The Kyoto Protocol is a protocol to the UNFCCC.

United States: *The fifty States, the District of Columbia, the Commonwealth of Puerto Rico, Guam, American Samoa, the United States Virgin Islands, and the Northern Mariana Islands, and associated territorial waters and airspace.*

Verification: An assessment of the reliability of a GHG inventory, considering completeness and accuracy. Independent verification can be either second-party or third-party verification.

Appendix C: Abbreviations

CEQ	Council on Environmental Quality
CH ₄	Methane
CO ₂	Carbon Dioxide
CO ₂ e	Carbon Dioxide Equivalent
DLA	Defense Logistics Agency
DOC	Department of Commerce
DoD	Department of Defense
DOE	Department of Energy
DOI	Department of Interior
eGRID	Emissions and Generation Resource Integrated Database
EIA	Energy Information Administration
EISA	Energy Independence and Security Act
E.O.	Executive Order
EPA	Environmental Protection Agency
EPAct	Energy Policy Act
FAQ	Frequently Asked Questions
FAST	Federal Automotive Statistical Tool
FEMP	Federal Energy Management Program
FR	Federal Registry
FY	Fiscal Year
GHG	Greenhouse Gas
GOCO	Government-Owned/Contractor-Operated
GSA	General Services Administration
GWP	Global Warming Potential
HFC	Hydrofluorocarbon Group of Gases
IPCC	Intergovernmental Panel on Climate Change
LSEV	Low-Speed Electric Vehicle
LMI	Logistics Management Institute
MRR	Mandatory Reporting Rule
MSW	Municipal Solid Waste
MT	Metric Tons

NECPA	National Energy Conservation Policy Act
NERC	North American Electric Reliability Council
NF ₃	Nitrogen Trifluoride
N ₂ O	Nitrous Oxide
ODS	Ozone Depleting Substance
OFEE	Office of the Federal Environmental Executive
OMB	Office of Management and Budget
PFC	Perfluorocarbon Group of Gases
POC	Point-Of-Contact
PSP	Public Sector Protocol
REC	Renewable Energy Certificate
RGGI	Regional Greenhouse Gas Initiative
SF ₆	Sulfur Hexafluoride
T&D	Transmission and Distribution
TSD	Technical Support Document for Federal GHG Accounting and Reporting Guidance
UNFCCC	United Nations Framework Convention on Climate Change
USDA	U.S. Department of Agriculture
WBCSD	World Business Council for Sustainable Development
WTE	Waste-to-Energy
WRI	World Resources Institute
WWTP	Wastewater Treatment Plant