

# **Federal Greenhouse Gas Accounting and Reporting Guidance**

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## **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 sections of this Guidance.

Section 9 of E.O. 13514 directed 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 served as the basis for the original Guidance document released in October 2010. This document presents the first Guidance update, based on recommendations developed by the Federal Working Group on GHG Accounting and Reporting, co-chaired by DOE-FEMP, the EPA, and the DoD, with input from working group members from various agencies in 2011.

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.

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

Under E.O. 13514, Federal agencies established and reported 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 an FY 2008 baseline.<sup>1</sup> In order to establish a formal baseline for determining progress towards the reduction targets, Federal agencies also reported FY 2008 baseline data on January 31, 2011.<sup>2</sup> 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.

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. While intended to be used at all levels, the data must be aggregated to the agency level for reporting.

### **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. To facilitate comparison among GHGs, a global warming potential (GWP) value is assigned to each GHG. The GWP represents the heat-trapping impact of a GHG relative to carbon dioxide (CO<sub>2</sub>), which has a GWP of 1.0, and functions as a warming "index." For instance, methane (CH<sub>4</sub>) has a GWP of 21, so each metric ton of CH<sub>4</sub> emissions has 21 times the impact on global warming (over a 100-year time horizon) as one metric ton of CO<sub>2</sub> emissions.

To provide a single metric that embodies all GHGs, emissions are reported in metric tons (tonnes) of carbon dioxide equivalent (MT CO<sub>2</sub>e). To calculate CO<sub>2</sub>e, the mass of emissions of each GHG is multiplied by the appropriate GWP for that greenhouse gas. Table 1 lists the GHGs covered under E.O. 13514, their common sources, and their associated GWPs (more detailed information is located in Appendix D of the TSD).<sup>3</sup>

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<sup>1</sup> In this document, baseline and base year inventory are used interchangeably. Per EO 13514, agencies set reduction goals relative to a fiscal year (FY) 2008 baseline. FY 2008's inventory, which may be adjusted per Section 5.3.1 of this Guidance, is an agency's base year inventory or baseline.

<sup>2</sup> Agencies are not required to submit an FY 2009 comprehensive inventory, but they may do so at their discretion.

<sup>3</sup> For additional information about GWP values and associated lifetimes, see the EPA's website at: [www.epa.gov/highgwp/scientific.html](http://www.epa.gov/highgwp/scientific.html)

**Table 1: GHGs, Common Sources, and GWPs**

Greenhouse Gas	Common Sources/Uses	GWP*
Carbon dioxide (CO <sub>2</sub> )	Mobile and stationary combustion	1
Methane (CH <sub>4</sub> )	Coal mining, fuel combustion, landfills, wastewater treatment	21
Nitrous oxide (N <sub>2</sub> O)	Fuel combustion, fertilizers	310
Hydrofluorocarbon gases (HFCs)	Refrigerants, fire suppressants, various manufacturing processes	12 – 11,700 <sup>†</sup>
Perfluorocarbon gases (PFCs)	Electrical equipment, various manufacturing processes, refrigerants, medicine	6,500 – 17,700 <sup>†</sup>
Sulfur hexafluoride (SF <sub>6</sub> )	Electrical equipment, various manufacturing processes, tracer in air modeling, medicine	23,900
<p>* 100-year Global Warming Potential. Source: Mandatory Reporting of Greenhouse Gases, Final Rule, 74 Fed Reg 56260-56519 (October 30, 2009).<sup>4</sup></p> <p><sup>†</sup> Many different individual gases constitute HFCs and PFCs, so there is a range of GWP values associated with each. When reporting on these gases, an agency should use the GWP value for the specific gas given in the Mandatory Reporting of Greenhouse Gases Final Rule or IPCC 1996.</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 (EPAct 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 GHG Reporting Program (GHGRP), formerly known as the GHG 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 practicable, this Guidance references calculation methodologies and emission factors in the EPA GHGRP. Although efforts have been made to streamline reporting requirements by adopting or referencing elements of the GHGRP, agencies should understand that the requirements of this Guidance are separate and distinct from those of the EPA GHGRP. For additional information on the GHGRP, see [www.epa.gov/climatechange/emissions/ghgrulemaking.html](http://www.epa.gov/climatechange/emissions/ghgrulemaking.html).

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<sup>4</sup> As part of its scientific assessments of climate change, the Intergovernmental Panel on Climate Change (IPCC) has published reference values for GWPs of several greenhouse gases. While the most current estimates for GWPs are listed in the IPCC's Fifth Assessment Report (AR5), this Guidance uses the 100-year GWPs listed in the IPCC's Second Assessment Report (SAR) to be consistent with the international standards under the United Nations Framework Convention on Climate Change (UNFCCC) (IPCC, 1996).

### 1.2.3. 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 emission reductions (“reduction”). These are two separate and discrete tasks. An inventory is an accounting of emissions and sinks that can improve over time as agencies gain more complete understanding of the methods, underlying processes, and activities. 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.

Under E.O. 13514, Federal agencies must report a comprehensive inventory of absolute<sup>5</sup> 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.

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.

### 1.2.4. Opportunities, Limitations, and Exemptions under E.O. 13514

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

Agencies may elect to inventory more GHGs than those required by E.O. 13514. For example, they could consider nitrogen trifluoride (NF<sub>3</sub>) or other fluorinated gases if they are prevalent due to manufacturing or other processes.

#### **Box 1**

From Section 17 (a) of E.O. 13514:

*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, if the head of the agency determines that such application is in the interest of the United States.*

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<sup>5</sup> The term ‘absolute GHG emissions’ is defined in EO 13514 as the total greenhouse gas emissions without normalization for activity levels and includes any allowable consideration of sequestration. For the purposes of this Guidance, considerations of sequestration are not currently included in Federal agency GHG accounting of progress towards achieving reduction targets.

## ***Reporting International Emissions***

Similarly, although international emissions are not required as part of an agency's GHG inventory or targets (see Box 1), agencies may elect to include international sources in their inventories and/or reduction targets. For certain agencies, many of their facilities and operations are overseas, often integrally related to the agency's mission and representing a significant portion of the agency's portfolio. As a result, these agencies may elect to voluntarily include these facilities and operations in their reporting as key to an overall emissions reduction strategy.

Agencies should consider the following when deciding whether or not to include international emission sources in their inventories:

- Are emissions large enough to warrant measurement and tracking?
- What is the feasibility and cost of collecting data?
- Are the emissions already tracked and reported by another agency? (Take care to avoid double counting.)

For voluntary reporting, agencies may find that the level of effort required to inventory minor emissions may exceed the benefits of quantifying and understanding their magnitude. Agencies are encouraged to pursue data collection for areas that represent a significant portion of their GHG footprint.

In addition, for some agencies, putting data collection systems in place and educating personnel may be a long-term process. Agencies may want to take a tiered approach where they focus initially on a few, key categories of emissions sources, then add more in future years.

After agencies decide what to include in their inventory, they need to evaluate whether or not to include these emissions in their reduction targets. Agencies should consider:

- What is the level of influence in reducing emissions?
- What is the cost of making reductions?
- How closely are emissions tied to mission operations that vary greatly from year to year?

These questions are intended to focus agencies on areas of their GHG inventory where they can have a positive influence on emission reductions without expending an inordinate amount of resources.

The same calculation methodologies used for required domestic emissions shall be used for voluntary reporting of international emissions, using country-specific emissions factors for electricity consumption in lieu of eGRID factors. Local emissions factors may not be used in mandatory, domestic, electricity reporting or voluntary reporting of international emissions that are included in reduction targets.<sup>6</sup> Instead, the factors available in the GHG Reporting Portal should be used in order to maintain consistency across agencies.

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<sup>6</sup> Local emission factors may be used in voluntary reporting of international emissions that are not included in reduction targets.



### **1.2.5. Federal GHG Accounting and Reporting Workgroup**

CEQ convened a Federal GHG Accounting Workgroup to address implementation issues and ongoing development of procedures and guidance.

The GHG Workgroup's mission is 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 convened in FY 2010 and FY 2011, provided recommendations incorporated in this Guidance, and will continue to coordinate with other E.O. 13514 working groups and relevant government programs to contribute to future revisions of this Guidance. It consists of participants from Federal agencies and meets and forms subcommittees, as necessary.<sup>7</sup>

### **1.2.6. Electronic GHG Accounting and Reporting Capability (GHG Reporting Portal)**

In accordance with Section 9(b) of E.O. 13514, DOE FEMP developed and updates, in coordination with other Federal agencies, an electronic GHG accounting and reporting capability (GHG Reporting Portal) for agencies to use in reporting required GHG baseline and inventory information. Where practicable, the GHG Reporting Portal automatically calculates emissions, using methodologies contained in the TSD, from aggregated agency-level activity data otherwise reported by the agency. This limits the burden on reporting agencies and facilitates comparable and consistent inventories. The existence of the GHG Reporting Portal does 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.

The most recent version of the GHG Reporting Portal is located on FedCenter at: <http://www.fedcenter.gov/programs/greenhouse/inventoryreporting/fempceqresources/portal/>

### **1.2.7. Relationship of the Guidance to Other GHG Reporting Requirements and Protocols**

#### ***State and Regional Programs***

In addition to the requirements established under E.O. 13514 and the EPA's GHGRP, some agency facilities may be subject to state-level GHG emissions reporting or reduction

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<sup>7</sup> Examples of topics addressed by subcommittees in the past included vendor and contractor emissions (E.O. 13514 Section 13 Workgroup); leased assets; and emissions and biological sequestration from land management techniques.

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 10 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 US Greenhouse Gas Emissions and Sinks.

#### **1.2.8. 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 US Public Sector* (US Public Sector Protocol, or PSP).<sup>8</sup> 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.

## **2.0 Setting Organizational and Operational Accounting Boundaries**

Setting organizational and operational accounting boundaries is necessary to develop a consistent agency-wide GHG inventory. Typically, organizational boundaries are defined by either the operational or financial control an entity has over its various activities. Operational control is generally defined as the authority to introduce and implement operating policies.<sup>9</sup> Financial control is the authority to direct the financial and operating policies of the operation with a view to gaining economic or other benefits from its activities.

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<sup>8</sup> The Public Sector Protocol 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 US Federal agencies. For more information, go to [www.ghgprotocol.org](http://www.ghgprotocol.org)

<sup>9</sup> See Chapter 3, Public Sector Protocol for more information on organizational boundaries and operational control.

This Guidance sets agency boundaries using an operational control approach to the extent practicable. Agencies are generally required to report emissions from operations over which they have operational control. Due to the complexity of the Federal Government and existing data collection systems, the Guidance may deviate slightly from a pure operational control approach. This chapter outlines how Federal agencies must set their organizational and operational boundaries to ensure compliance with E.O. 13514. The approach avoids double counting and gaps in GHG accounting.<sup>10</sup>

## 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 (such as international operations).

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. For example, although an agency may exclude law enforcement vehicles from its reduction target, emissions from these vehicles must be reported in the agency's comprehensive inventory as a target-excluded emission source, unless exempted with CEQ permission in accordance with Section 18 of E.O. 13514. 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 report emissions associated with the following:

- **Facility energy related to the operation or use of real property which the agency owns and operates or which the agency leases and operates and pays the energy bill(s) (see Section 2.1.1).**

Data needed to calculate these emissions are currently reported to FEMP for compilation in the Annual Report on Federal Government Energy Management (or FEMP Energy Report).<sup>11</sup> Energy bills include electricity, natural gas, fuel oil, hot/chilled water, and steam. Wastewater, potable water, and garbage services are not included in this definition.

- **Facility energy related to real property which the agency leases, but does not pay the utility bill - voluntary for FY 2012 and may be mandatory in FY 2013 for leases over 10,000 gross square feet (see Section 2.1.1).**<sup>12</sup>

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<sup>10</sup> Double counting occurs when two or more reporting organizations take ownership of the same emissions or reductions within the same scope.

<sup>11</sup> FEMP Energy Reporting must include government-owned/contractor-operated (GOCO) facilities.

<sup>12</sup> In instances where GSA is the leaseholder with a private landlord and assigns space to a Federal tenant, GSA would report scope 3 emissions. In instances where GSA has delegated its leasing authority to a Federal tenant and the Federal tenant leases directly with the private landlord, the Federal tenant would report scope 3 emissions. The party responsible for paying the utilities reports Scope 1 and 2 emissions.

Agencies report emissions associated with lighting, plug load, and centralized systems as Scope 3.<sup>13</sup>

- **Operation of mobile sources for which the agency purchases fuel (see Section 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.<sup>14, 15</sup>

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

These include fugitive and process emissions as defined in Section 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 Section 2.2.3.

### **2.1.1. Real Property**

Where an agency directly pays the energy bills for real property the agency owns and operates or leases (i.e., the agency leases from GSA or a private landlord), the agency reports the associated Scope 1 and 2 emissions.<sup>16</sup> Where GSA owns the facility and the agency does not directly pay energy bills, GSA is responsible for reporting the Scope 1 and 2 emissions associated with those energy bills. This is consistent with the 2008 baseline and 2010 inventories. In this case the occupant may voluntarily report all GHG emissions as Scope 3 in FY 2012.<sup>17</sup>

Where an agency leases and operates a facility, but does not directly pay the utility bill, the agency may voluntarily report associated emissions as Scope 3 in their inventory. This is voluntary for FY 2012, but may be considered in the future for mandatory reporting in FY 2013 and beyond for facilities of 10,000 gross square feet or greater. Agencies are not required to report these emissions for leases of fewer than 10,000 gross square feet, but are encouraged to do so voluntarily. If the landlord is a Federal entity (e.g., GSA), the Federal landlord should provide the tenant with the required data to calculate their emissions. For such leases with a private landlord, agencies will need to work with their private landlords to obtain the necessary energy information at no additional cost to the government.

Where an agency has a lease in a multi-tenant building, the agency (the government tenant occupying the space) will need to work with their landlord to determine their share of energy consumption for centralized building systems and common areas in order to voluntarily report

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<sup>13</sup> Mandatory inclusion of this emissions category for FY 2013 may be considered at a future date.

<sup>14</sup> For comprehensive inventories, some tactical fuel information may only be available in other databases that are outside of FAST and the FEMP Energy Report.

<sup>15</sup> Federal fleet vehicles and low speed electric vehicles (LSEVs) are considered to be mobile sources. Guidance for electricity used in these vehicles is included in Section 2.2.2.

<sup>16</sup> Agencies also report related Scope 3 emissions, such as contracted waste and wastewater disposal (see Section 2.2.3).

<sup>17</sup> Occupant reporting of these Scope 3 emissions may become mandatory for FY 2013 and beyond for leases of 10,000 gross square feet or greater.

Scope 3 emissions as they will need to pro-rate their share of the building’s total energy consumption in order to report Scope 3 emissions using modeling or other methodologies (in situations where the landlord is GSA, GSA will provide the pro-rated share to the tenant agency). Over time, agencies may wish to move to submetering systems to more accurately determine emissions.

Agencies should clearly define the approach used to compile, estimate, and report GHG emissions from leased assets in their inventory qualitative statements to ensure quality assurance.

Table 2 provides more information on accounting for emissions under different property arrangements that agencies may have.

**Table 2: Emissions from Agency Property Arrangements**

Type of Arrangement	Definition	Applicable Scopes
Single-net lease	Operating leases where the occupant pays a portion of the utility costs directly. Typically, the utilities netted from the lease do not include the building mechanical systems, but do include the electricity consumed by the occupant through lighting and plug load.	<p>Occupant reports Scope 2 for building electrical use (i.e., that portion of building electrical use for which the occupant is billed directly).</p> <p>Occupant reports Scope 3 for emissions from centralized systems (voluntary for FY 2012 and FY 2013, but may become mandatory for FY 2014 and beyond).</p> <p>Agencies that are Federal landlords report Scopes 1 and 2 (for all building-related GHG emissions except what is reported by the occupant).</p>
Triple-net lease	Operating leases for which the occupant has responsibility for operation and maintenance, including the payment of utilities, including those associated with the building mechanical systems.	Occupant reports Scopes 1 and 2.
Fully serviced lease	Fully serviced leases where the landlord has responsibility for operations and maintenance, including the payment of all utilities.	<p>Landlord reports emissions as Scope 1 or 2 (depending on the source).</p> <p>Occupant reports all GHG emissions as Scope 3 (voluntary for FY 2012, but may become mandatory for FY 2013 and</p>

		beyond for leases of 10,000 gross square feet or greater.)
Permit	The agency confers a permit to a private party for the use of government land.	Scope 3 (voluntary for FY 2012, but may become mandatory for FY 2013 and beyond for leases of 10,000 gross square feet or greater.)
Outgrant	A lease or license granted by the agency to a non-Federal entity for either temporary or permanent use.	Scope 3 (voluntary for FY 2012, but may become mandatory for FY 2013 and beyond for leases of 10,000 gross square feet or greater.)
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 (voluntary for FY 2012, but may become mandatory for FY 2013 and beyond for leases of 10,000 gross square feet or greater.)
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 <sup>†</sup>
Government remediation of private sites	The government may be responsible for the energy use associated with environmental remediation of private sites.	Scope 3 (voluntary for FY 2012, but may become mandatory for FY 2013 and beyond for leases of 10,000 gross square feet or greater.)
<sup>†</sup> 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. For instance, an agency may exclude emissions from certain cooperative research sites, such as a university, where the agency does not hold any control over operations or capital equipment, own the facility, or pay any utility bills.		

Accounting for GHG emissions from leased assets in the methods described above creates a new Scope 3 category. For FY 2012 this reporting is voluntary and emissions will be reported in the agency's qualitative statement. Should this and other emissions categories become mandatory in

the future, an adjustment of the FY2008 baseline data may be required. At this time, the FY 2008 baselines do not require adjustment and GHG emission reduction targets established by agencies in response to the Executive Order will remain the same.

***GHG Reporting Relationship to Facility Energy Reporting***

To the extent practicable, 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 allowable exclusions for GHG reduction targets, such as those described earlier in Section 1.2, are not the same as the allowable exclusions 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).<sup>18</sup> The relationships between energy goal reporting exclusions and allowable GHG target exclusions are summarized in Table 3.<sup>19</sup>

**Table 3: Building Exclusion Comparison**

Type of building/structure as defined in FEMP’s “Guidelines Establishing Criteria for Excluding Buildings” for determining allowable EPA Act 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 – through at least FY 2012*
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. <sup>†</sup>	No <sup>†</sup>
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 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.	No

<sup>18</sup> This guidance can be found at [www.eere.energy.gov/femp/pdfs/exclusion\\_criteria.pdf](http://www.eere.energy.gov/femp/pdfs/exclusion_criteria.pdf).

<sup>19</sup> 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.

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 <sup>‡</sup>
<p>* Reporting guidance on fully serviced leases is explained in Section 2.1.1.</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

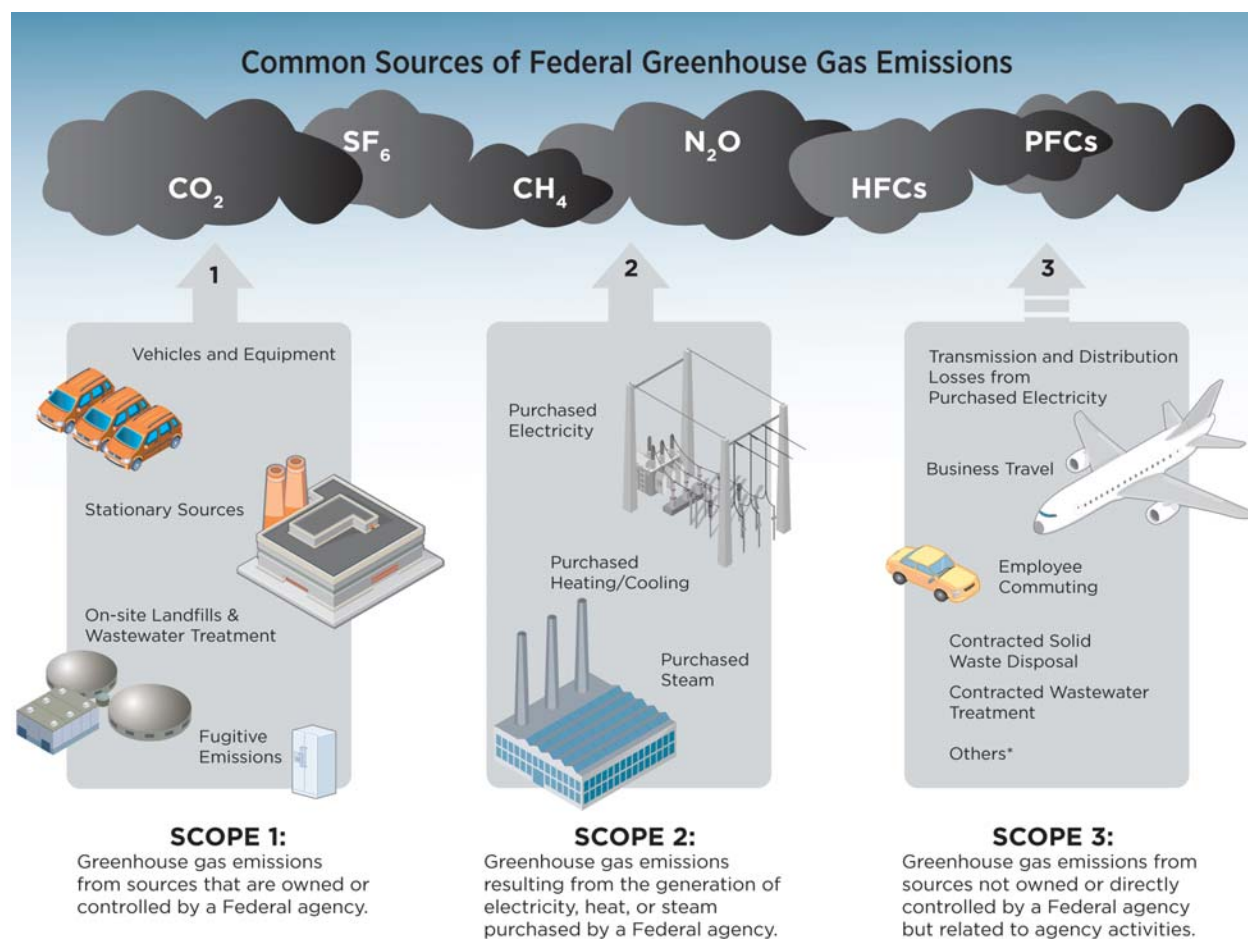


and process emission sources (as defined in Section 2.2.1). For fugitive and process emissions, the agency that pays for the purchase and maintenance of the emitting equipment must report the emissions. Agencies are encouraged to use existing data and document calculation methodologies and to improve, refine, and enhance data collection as appropriate to account for fugitive emissions within their inventory. Specified Scope 3 emissions in an agency's organizational boundary, where the agency does not have full operational control, are described in Section 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), as illustrated in Figure 1. The calculation methodologies for Scope 1, 2, and 3 emissions are detailed in the TSD. To avoid double counting, emissions from different agencies should never be combined. One agency's Scope 1 or 2 emissions may be another agency's Scope 3 emissions, so combining the emissions across all scopes for the two agencies may result in double counting within the total for the two agencies.

**Figure 1. Federal Greenhouse Gas Emissions Sources by Scope**



\*Additional, significant Scope 3 emission sources exist beyond the examples provided.

### 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 not include "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 included in the agency's inventory.

Scope 1 emissions result primarily from the following types of activities when they are owned or controlled by the reporting agency:

- **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 CH<sub>4</sub> and N<sub>2</sub>O emissions from biomass combusted for production of electricity, heat, cooling, or steam.<sup>20</sup>
- **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.<sup>21</sup> These include CH<sub>4</sub> and N<sub>2</sub>O emissions from biofuel combustion.<sup>22</sup>
- **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; SF<sub>6</sub> emissions from leaking electrical equipment; and CH<sub>4</sub> emissions from agency owned and operated coal mines, helium production, venting, etc.).<sup>23</sup>
- **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 subsequent 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 NF<sub>3</sub>.

Biomass and biofuel combustion result in GHG emissions of CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O. CH<sub>4</sub> and N<sub>2</sub>O 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 CH<sub>4</sub> and N<sub>2</sub>O 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

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<sup>20</sup> CO<sub>2</sub> emissions from stationary and mobile combustion of biomass (including biogas and biofuels) are not included in Scopes 1, 2, or 3, but are reported separately.

<sup>21</sup> Excluding rental vehicles.

<sup>22</sup> Id.

<sup>23</sup> Note that "fugitive emissions," as defined in this Guidance, are not intended to coincide with other statutory uses of the term.

the carbon cycle.<sup>24</sup> These CH<sub>4</sub> and N<sub>2</sub>O emissions are required under Scope 1 reporting, and are included in agency reduction targets.<sup>25</sup>

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 emission 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 and are assumed to be captured in agency facility electricity reporting. Agencies do not need to separately report electricity use in vehicles charging at the facility in the GHG Reporting Portal. Current policies stipulate that the electricity used in these vehicles should be reported as part of alternative fuel use through the FAST system,<sup>26</sup> which is a separate reporting system from the GHG Reporting Portal.

For the FY 2008 base year, FY 2010 inventory, and subsequent annual inventories, in addition to CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O from fossil fuels, agencies must also clearly identify and report Scope 2 CO<sub>2</sub> emissions associated with the portion of purchased electricity, steam, heating, or cooling generated from biomass or biofuels.<sup>27</sup> Related CH<sub>4</sub> and N<sub>2</sub>O must be reported along with emissions from fossil-based purchased electricity, steam, heating, or cooling.

Agencies that purchase electricity must report indirect emissions associated with transmission and distribution (T&D) losses in Scope 2 only for the electricity T&D operations they control. Emissions associated with T&D losses from purchased steam and chilled water are reported as Scope 2 emissions, and are not reported separately. 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 to be reported as Scope 3 emissions (see Section 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.

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<sup>24</sup> Revised 1996 IPCC Guidelines, Reference Manual, Section 1.1, Energy (<http://www.ipcc-nggip.iges.or.jp/public/gl/guidelin/ch1ref1.pdf>).

<sup>25</sup> See Chapter 3 for details on GHG accounting for biomass and biofuel combustion.

<sup>26</sup> <http://www.gsa.gov/portal/content/102677>

<sup>27</sup> Id.

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 baseline, 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:

- 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)<sup>28</sup>
- 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. 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. These emissions should be reported in the agency's qualitative statement. 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

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<sup>28</sup> Similar to the way other utilities are accounted for, contracted wastewater and solid waste should be reported by the party paying for the services (the Federal agency holding the lease will account for contracted waste and wastewater unless the agency pays for the service).

- 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 practicable, 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 if the emissions are included as part of their reduction targets. Baseline adjustment is not required for voluntary Scope 3 reporting that are not included as part of a reduction target and that are included in the agency's qualitative statement. 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
- 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 may be considered in Scope 3 at a future date.

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

- Operations associated with fully leased space<sup>29</sup> of 10,000 gross square feet or greater
- Vendors, contractors, tenants, concessionaires, and supply chain
- Production of fuels (biofuels, gasoline, hydrogen, etc.) used to operate internal combustion vehicles

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 Section 5.3.

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<sup>29</sup> Fully leased space refers to leasing arrangements where tenants are not directly responsible for utility bills. Currently, emissions from leased space are reported on a voluntary basis.

### ***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. While agencies are not required to report emissions related to their vendors and contractors at this time, agencies may voluntarily begin to identify their vendor and contractor (supply chain) emissions.

Preliminary efforts to inventory agency Scope 3 vendor and contractor emissions serves to signal to industry that the government finds supply chain sustainability important. For agencies to be able to identify and ultimately reduce Scope 3 vendor and contractor emissions, they need to access relevant data, both internally and from vendors. Voluntary reporting of vendor and contractor emissions encourages agencies to begin to identify their supply chain vendors, and related procured products/services, so that agencies have the time to identify system limitations and develop processes to overcome them. Agencies interested in voluntarily reporting supply chain emissions should scope their activities so that the focus is on mapping their supply chain, identifying what was procured from identified vendors and obtaining necessary vendor GHG emissions data, so that the internal data gathering system and process changes are identified and implemented.

The guidance related to vendor and contractor emissions may be updated as methodologies and policies related to quantification of Scope 3 emissions evolve.<sup>30</sup> Any vendor or contractor emissions reported must be reported separately from the agency's comprehensive GHG inventory in the agency's qualitative statement.

### **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. However, simplified estimation methodologies for particular categories are defined in the relevant sections of the TSD.

## **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 combustion 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

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<sup>30</sup> Agencies should note that outsourcing activities, such as IT services and data centers, may not be an effective GHG reduction strategy as outsourcing may result in greater Scope 3 emissions. See Chapter 5 for further details.

biodiesel and ethanol blended fuels.<sup>31</sup> 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. A Federal workgroup was 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 and Biomass Combustion**

Biomass and biofuel combustion result in GHG emissions of CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O. For the FY 2008 baseline, FY 2010, and subsequent annual inventories, in addition to reporting CO<sub>2</sub> from any fossil fuel portion of these fuels, agencies must clearly identify and report CO<sub>2</sub> emissions associated with combustion of the biogenic portion. These CO<sub>2</sub> emissions (CH<sub>4</sub> and N<sub>2</sub>O emissions are discussed separately below) are biogenic biomass / biofuel CO<sub>2</sub> combustion 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 CO<sub>2</sub> emissions in their reduction targets under E.O. 13514 at this time, but agencies are required to inventory their biogenic combustion 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 concentrations. This contrasts with carbon from fossil fuels, which was removed from the atmosphere millions of years ago.

CH<sub>4</sub> and N<sub>2</sub>O emissions resulting from combustion of biomass and biofuel are not considered biogenic combustion emissions, and are treated in the same manner as emissions of these gases from the combustion of fossil fuels. Combustion related CH<sub>4</sub> and N<sub>2</sub>O 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.<sup>32</sup> These CH<sub>4</sub> and N<sub>2</sub>O emissions may be included in agency reduction targets. All GHGs from the fossil fuel portion of biofuel blends, including CO<sub>2</sub>, must be reported within the appropriate scope.

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<sup>31</sup> Biogases yielded from landfills are not explicitly discussed in this section, although they may be considered a biofuel.

<sup>32</sup> Revised 1996 IPCC Guidelines, Reference Manual, Section 1.1, Energy (<http://www.ipcc-nggip.iges.or.jp/public/gl/guidelin/ch1ref1.pdf>).

### **3.2. 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 and stored 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 (such as when carbon is released into the atmosphere through combustion and decay) or increase (such as when carbon is stored during tree growth or through soil absorption). 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.

The calculations for sequestration are complex, especially when multiple ecosystem types and a variety of management practices are considered. Currently, EPA reports annually on national-level emissions and sequestration in the Inventory of U.S. Greenhouse Gas Emissions and Sinks, which is appropriate for national and international discussions.

Greenhouse gas inventories will include CO<sub>2</sub> emissions and changes in biological sequestration (additions or removals) from land management, but emissions reductions targets will not. Effects of biological sequestration will not affect progress towards meeting reduction goals.

#### ***Required Reporting: Net Carbon Stock Changes on forest land.***

Reporting of net carbon stock (C stock) changes on forest land, on a periodic basis, is required. These estimates will be derived by the US Forest Service and provided to agencies for inclusion in their reporting.<sup>33</sup> On behalf of Federal land management agencies, the Forest Service will periodically report C stock and net C stock change at 5 year intervals at an agency-level. Initial reporting will be completed for the FY 2013 report and be based upon the most current Forest Inventory and Analysis (FIA) data available at that time, and should reflect current carbon stocks as well as an estimate of the change in those stocks from a similar calculation based on data from 5 years earlier. Reporting will include the five main IPCC ecosystem pools reported in the US GHG Inventory: aboveground biomass, belowground biomass, dead wood, litter, and soil.<sup>34</sup> The net carbon stock changes on forest land may be positive (where carbon stock gains through sequestration exceed losses) or negative (where emissions exceed additional sequestration); in either of these cases, the estimates must be reported.<sup>35, 36</sup>

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<sup>33</sup> This requirement is limited to the data that is collected by Forest Service, which may not include certain regions of the country.

<sup>34</sup> Harvested wood products (HWPs) are an important component of forest C stock accounting, but due to the evolving nature of accounting for this category, reporting emissions from HWP is not currently required.

<sup>35</sup> In terms of scale of reporting, agencies are to report agency-level aggregate estimates for all required reporting categories, and it is recommended that voluntary reporting categories are reported at the agency level as well. If data are already available at a bureau/service level for certain reporting categories, however, disaggregating to that scale is preferred. Uncertainty decreases at this higher-scale and gathering field data/running models at a field/entity-scale would be overly burdensome for Federal agencies.



### ***Voluntary Reporting: N<sub>2</sub>O emissions associated with fertilizer use***

Nitrous oxide is produced in soils through the microbial processes of nitrification and denitrification both through anthropogenic and natural causes. Anthropogenic emissions of N<sub>2</sub>O from agricultural soils consist of both direct and indirect emissions that result from managed inputs of N fertilizer, and management practices that lead to a greater release of mineral nitrogen to the soil on managed lands.

Reporting of N<sub>2</sub>O emissions associated with fertilizer use on Federal lands is not required at this time but voluntary reporting is encouraged.<sup>37</sup>

### **3.3. 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 (CH<sub>4</sub>). Management of domesticated livestock is considered to result in anthropogenic emissions of GHGs. Conversely, emissions released by wild animals on Federal lands (e.g., a herd of elk in a National Park) are not considered anthropogenic.

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 may be voluntarily reported as Scope 3.<sup>38</sup> Agencies are not to report releases by wild animals on Federal lands.

### **3.4. 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

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<sup>36</sup> Emissions from wildfires and managed fires are not currently accounted for separately per this Guidance. However, fires will have an effect on net carbon stock and will impact the FIA data.

<sup>37</sup> If this source is elected, the recommended methodology is a Tier 1 approach as described in the IPCC 2006 Greenhouse Gas Guidelines. Data sources and the calculation methodology regarding fertilizer use can be found in IPCC (2006) *2006 IPCC Guidelines for National Greenhouse Gas Inventories*. Volume 4, Chapter 11: “N<sub>2</sub>O Emissions from Managed Soils and CO<sub>2</sub> Emissions from Lime and Urea Application.” The National Greenhouse Gas Inventories Programme, The Intergovernmental Panel on Climate Change, H.S. Eggleston, L. Buendia, K. Miwa, T. Ngara, and K. Tanabe (eds.). Hayama, Kanagawa, Japan.

<sup>38</sup> If this source is elected, the recommended methodology is a Tier 1 approach as described in the IPCC 2006 Greenhouse Gas Guidelines. Data sources and the calculation methodology regarding enteric fermentation can be found in IPCC (2006) *2006 IPCC Guidelines for National Greenhouse Gas Inventories*. Chapter 10: “Emissions from Livestock and Manure Management.” The National Greenhouse Gas Inventories Programme, The Intergovernmental Panel on Climate Change, H.S. Eggleston, L. Buendia, K. Miwa, T. Ngara, and K. Tanabe (eds.). Hayama, Kanagawa, Japan.

waste and grass clippings, is uncommon in many agencies, it remains an effective way to reduce landfill waste.

Reporting the emissions from composting is voluntary at this time.<sup>39</sup>

### **3.5. 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 and aerobic lagoons, liquid slurry systems, storage pits, digesters, solid storage systems, dry lots, composting, incineration, and aerobic systems. Natural pasturing, manure land application, daily spread systems, or off-site composting are not considered manure management systems.

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 operated or controlled by the agency, the emissions may be voluntarily reported as Scope 1. If the activities take place on Federal land, but are operated by others, these emissions may be voluntarily reported as Scope 3.<sup>40</sup>

## **4.0 Renewable Energy and Carbon Offsets**

Renewable energy is defined as energy derived from resources that are renewed indefinitely. This includes solar, wind, sustainable 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.<sup>41, 42</sup> Renewable energy can reduce GHG emissions by displacing conventional fossil fuel use.

Agency renewable energy use, including the source of the renewable energy, shall be reported separately from conventional energy and fuel use. This chapter provides agencies with guidance on accounting for emissions from on-site agency owned renewable energy consumption (Section

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<sup>39</sup> If this source is elected, the recommended methodology is a Tier 1 approach as described in the IPCC 2006 Greenhouse Gas Guidelines. Data sources and the calculation methodology regarding composting can be found in IPCC (2006) *2006 IPCC Guidelines for National Greenhouse Gas Inventories*. Volume 5, Chapter 4: “Biological Treatment of Solid Waste.” The National Greenhouse Gas Inventories Programme, The Intergovernmental Panel on Climate Change, H.S. Eggleston, L. Buendia, K. Miwa, T. Ngara, and K. Tanabe (eds.). Hayama, Kanagawa, Japan

<sup>40</sup> If this source is elected, the recommended methodology is a Tier 1 approach as described in the IPCC 2006 Greenhouse Gas Guidelines. Methodologies, data sources, emission factors, and further discussion of these issues can be found in IPCC (2006) *2006 IPCC Guidelines for National Greenhouse Gas Inventories*. Chapter 10: “Emissions from Livestock and Manure Management.” The National Greenhouse Gas Inventories Programme, The Intergovernmental Panel on Climate Change, H.S. Eggleston, L. Buendia, K. Miwa, T. Ngara, and K. Tanabe (eds.). Hayama, Kanagawa, Japan.

<sup>41</sup> EPAAct 2005, Sec. 203.

<sup>42</sup> While not permitted under EPAAct 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.

4.1) and on adjustments to be applied against their inventory resulting from the purchase or use of off-site renewable energy and/or purchase of Renewable Energy Certificates (RECs) (Section 4.2).

Agencies are encouraged to allow third-party owned and/or operated renewable energy systems on Federal land to facilitate renewable energy generation with low greenhouse gas emissions. Section 4.3 of this chapter provides agencies with guidance related to reporting of renewable energy generated on Federal land.

This chapter also describes the rationale for excluding the use of carbon offsets, which are covered in Section 4.4.

This Guidance considers the current legislative and regulatory environment with regard to renewable energy and carbon offsets. The enactment and promulgation of new laws and regulations related to climate change could affect the role of RECs and carbon offsets in meeting agency GHG targets. This Guidance will be updated as necessary to reflect changes in policies or regulations.

#### **4.0.1 Reporting On-Site versus Off-Site Renewable Energy Use**

It is important to report whether electricity consumed from a renewable energy generator is from a generator located on the site where it is consumed or whether the electricity is being delivered through the electric grid from off site. There are no Scope 3 transmission and distribution losses associated with on-site projects.<sup>43</sup> For off-site projects (projects where power is transmitted through the electric grid), transmission and distribution losses are the same as electricity from a utility. Transmission and distribution GHG factors are included in the TSD.

#### **4.0.2 Retention of Renewable Energy Certificates (RECs)**

In all cases of agency consumption of electricity generated by eligible renewable energy generation sources, if an agency does not own the RECs and environmental attributes for the renewable electricity that it consumes, the consumed electricity and associated emissions are considered and calculated the same as conventional grid-supplied electricity and are reflected as such in Scope 2 emissions. Once a REC has been used to make a claim of renewable energy use or reduced scope 2 emissions from purchased electricity, the REC cannot be sold or transferred. Making a claim constitutes retirement of the REC and avoids the possibility of a claim by another party or double counting of the renewable energy. For further guidance on RECs, see Section 4.2.<sup>44</sup>

#### **4.0.3 Purchase of Energy from Biomass Combustion**

Emissions from biomass or biofuels combustion are covered in Section 3.1. For the FY 2008 baseline, FY 2010 inventory, and subsequent annual inventories, agencies must clearly identify

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<sup>43</sup> This is the same for generation units that are in close proximity to the site of consumption and fed directly to the agency without passing through the grid.

<sup>44</sup> RECs are generated when electricity is generated from a renewable electricity system on-site even if they are not formally issued by an issuing body or tracking system. In such cases, agencies must retain these RECs to make claims concerning renewable energy and adjustments to GHG emissions.

and report biogenic combustion emissions associated with the biogenic portion of biofuel and biomass combustion.<sup>45</sup> If the facility is not owned by the agency, but the renewable electricity is consumed on-site, associated emissions, including CH<sub>4</sub> and N<sub>2</sub>O and biogenic CO<sub>2</sub>, must be accounted for in Scope 2. Biogenic CO<sub>2</sub> and CH<sub>4</sub> and N<sub>2</sub>O emissions from biomass combustion must be accounted for in Scope 1 if the facility is owned by the agency. If the biomass-fueled electric generator is owned by the agency, see further guidance in Section 4.1.1.

The default calculation methodology for addressing the CH<sub>4</sub> and N<sub>2</sub>O emissions from biomass can be found in the TSD.

#### **4.0.4 Purchase of Energy 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. Direct emission reductions from capturing and destroying the landfill gas prior to energy generation are not part of the agency's emission reporting (unless the agency owns the landfill). Direct emission reductions are not conveyed to the purchasers of electricity, energy, or RECs from landfill gas to energy projects.

#### **4.0.5 Purchase of Energy 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 partly 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. As a result, EPA's GHG Reporting Program (GHGRP) requires large WTE facilities that are subject to the rule to separately report their biogenic CO<sub>2</sub> emissions and non-biogenic, or fossil-derived, CO<sub>2</sub> emissions.<sup>46</sup> Assumptions regarding biomass content in waste incorporated into the default WTE emission approach are included in the TSD.

If renewable energy is based on waste-to-energy (WTE), CH<sub>4</sub> and N<sub>2</sub>O 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 renewable electricity is consumed on-site, associated emissions must be accounted for in Scope 2.

For the FY 2008 baseline, FY 2010 inventory, and subsequent annual inventories, agencies must clearly identify and report Scope 2 CO<sub>2</sub> emissions associated with the biogenic portion of waste to energy projects. Fossil CO<sub>2</sub> and CH<sub>4</sub> and N<sub>2</sub>O emissions resulting from combustion during

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<sup>45</sup> 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 biomass / biofuel combustion CO<sub>2</sub> 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.

<sup>46</sup> More information about EPA's Greenhouse Gases Reporting Program can be found at [www.epa.gov/climatechange/emissions/ghgrulemaking.html](http://www.epa.gov/climatechange/emissions/ghgrulemaking.html)

generation of electricity 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 renewable electricity sourced from WTE must ensure that the electricity is created from the renewable portion of the waste stream. WTE facilities reporting their biogenic CO<sub>2</sub> emissions and anthropogenic greenhouse gas emissions to EPA under the GHGRP should be able to provide this information to the electricity provider.

## **4.1. Agency Owned On-site Renewable Energy**

### **4.1.1. Consumption of Renewable Electricity Generated On-Site**

If an on-site renewable energy system is used to generate electricity, the agency's Scope 1 GHG emissions will be lower than they would have been if the electricity had been produced by combustion of fossil fuel on-site. If an on-site renewable electricity system is replacing electricity purchased from the grid, the agency's Scope 2 GHG emissions will be lower than they would have been if the energy had been purchased from the grid.

As stated in Section 4.0.2, if the agency does not own the RECs and environmental attributes for consumed energy generated on site, the electricity delivered to the agency and associated emissions are considered the same as conventional grid-supplied electricity and should be reflected as such in Scope 2 emissions.

If agencies use on-site renewable energy systems, they 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 on-site renewable electricity system is based on biomass or waste-to-energy (WTE), CH<sub>4</sub> and N<sub>2</sub>O 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. See Sections 4.0.3 and 4.0.5 for more detail on biomass and WTE reporting.

All on-site renewable energy lowers GHG emissions from transmission and distribution losses, which should be reflected in Scope 3.<sup>47</sup>

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.

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<sup>47</sup> This is the same for generation units that are in close proximity to the site of consumption and fed directly to the agency without passing through the grid.

#### **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 fossil fuel use for thermal loads and, thus, GHG emissions. Whether the agency owns the 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 lower emissions associated with the reduced combustion of natural gas or other fossil fuel 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 as part of the GHG emissions reporting for EPA Act 2005 and E.O. 13423 renewable energy goal reporting. These systems also lower GHG emissions by avoiding Scope 3 transmission and distribution losses if they reduce the purchase of electricity.

Scope 1 emissions of agencies that own on-site systems using biomass to produce non-electric energy (heat) must account for the emissions from the on-site biomass boiler. Emissions from biomass or biofuels combustion are covered in Section 3.1. Agencies should remember, however, that biomass combustion involves fuels whose production and delivery (even from on-site wastes) can produce GHG emissions, especially CH<sub>4</sub> and N<sub>2</sub>O. 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).

#### **4.2. Renewable Energy Purchases and Use of Renewable Energy Certificates to Meet GHG Reduction Targets**

Federal agencies may calculate adjustments to their GHG emissions inventories to help meet their GHG emission reduction targets by purchasing renewable energy and/or acquiring and retaining (or requiring retirement of) renewable energy certificates (RECs). RECs are essential to claims concerning renewable energy and adjustments to GHG emissions. RECs may be acquired with purchased or produced electricity generated from renewable energy sources, or by purchasing RECs separate from the delivery of energy (unbundled RECs). For the purposes of this Guidance, the term "consumption" means the use of renewable energy acquired through methods that include, 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 in order to qualify for adjustment to their Scope 2 emissions to meet GHG reduction targets, and the RECs must include all their attributes, including GHG benefits, for the claim to be valid. Therefore, if the agency does not own the RECs and environmental attributes for the renewable energy produced by the generation system, the electricity delivered to the agency and associated emissions are the same as conventional grid-supplied electricity and are reflected as such in Scope 2 emissions.

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 to be using renewable energy as well as the attributes of renewable energy (e.g., GHG emissions benefits) when compared with conventional electricity or energy. By paying attention to the 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 adjusting emissions under this Guidance, as the REC must be owned by the agency in order to qualify for adjustment to their Scope 2 emissions to meet GHG reduction targets. Likewise, agencies with on-site renewable energy systems, whether they own the facility or it is third-party owned, should be explicit in any agreement about which party owns the RECs.<sup>48</sup>

RECs can be used to help meet GHG reduction targets regardless of whether the agency purchases RECs bundled with energy or unbundled. Because the benefits of renewable energy are 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 for Scope 2 emissions adjustments 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. Adjustments should be based on emission rates specified in the TSD. It is important that an agency’s contract with a provider of renewable electricity bundled with RECs or of unbundled RECs specifies the location of the project and the renewable resource so that the appropriate emission rate can be used to quantify the Scope 2 emission adjustment for purposes of meeting the agency’s GHG reduction target. In some cases, renewable energy tracking systems assign unique serial identification numbers to each qualified REC generated by facilities in the region, state, or province covered by the system, and enable secure transfer and retirement of RECs amongst account holders within the system. When available, agencies should request serial numbers of purchased RECs for tracking purposes.

As noted in Section 4.0.1, it is important to report whether a renewable energy generator is on the site where the renewable electricity is consumed or is being delivered through the electric grid because there are no Scope 3 transmission and distribution losses associated with on-site projects.<sup>49</sup> For off-site projects (projects where power is transmitted through the electric grid)

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<sup>48</sup> Guidelines for eligible RECs are defined in FEMP's *Renewable Energy Requirement Guidance for EPC Act 2005* and E.O. 13423, see [www.eere.energy.gov/femp/regulations/eo13423.html](http://www.eere.energy.gov/femp/regulations/eo13423.html).

<sup>49</sup> This is the same for generation units that are in close proximity to the site of consumption and fed directly to the agency without passing through the grid.

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

Agency adjustments associated with renewable energy and REC purchases cannot exceed their reported Scope 2 GHG emissions (i.e., overall agency GHG emissions minus adjustments may not be reported as less than zero). RECs may be used to adjust Scope 2 emissions associated with purchased electricity and Scope 3 emissions associated with transmission and distribution losses. All adjustments associated with renewable energy projects (such as purchase of RECs) must also be reported separately from initial inventory emissions.

### **4.3. Third-Party Operated Renewable Energy Generation on Agency Land**

An on-site renewable energy system may be built on Federal land without an agency owning or operating the system. In this case, the agency is facilitating renewable energy production, but the agency may or may not be purchasing the energy or the associated RECs.<sup>50</sup> For the purpose of this Guidance, this arrangement is referred to as “third-party operated” renewable energy generation.

#### **4.3.1. Third-Party Operated Renewable Energy Generation Where the Agency Purchases Energy and/or RECs**

If the agency purchases renewable energy or RECs from a third-party renewable electricity generator at a Federal site (e.g., through a Power Purchase Agreement or other authorized contractual arrangement), the power is treated the same as any renewable electricity purchase (see Section 4.2) and should be reported as generated on-site. Because the on-site system is not owned or operated by the agency, all associated emissions from electricity consumed by the agency should be reported under Scope 2. As with any renewable electricity purchase, if the agency does not own the RECs for the renewable electricity produced by the system, the electricity delivered to the agency and associated emissions are the same as conventional grid-supplied electricity and are reflected as such in Scope 2 emissions.

In some cases, such as enhanced use leases, the third party may be contractually authorized to sell electricity or energy to entities other than the agency, but the agency may own the RECs from the project. Because the agency owns the RECs for the energy produced by the system, the agency is allowed to claim adjustments to be applied against its Scope 2 emissions to reflect the use of renewable energy.

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<sup>50</sup> Accounting for emissions associated with third-party generation of electricity on Federal land from conventional generation (e.g., through combustion of fossil fuel) and for emissions reductions associated with third-party generation from renewable energy sources is not currently addressed in this Guidance. While accounting for emissions reductions associated with third-party operated renewable energy generation is not addressed in the Guidance, Section 4.3.1 provides guidance on calculating adjustments to be applied against Scope 2 emissions for purchase of renewable energy generated by a third-party operator. Additional guidance for emissions reporting for energy generated by third-party systems operated by a third-party systems may be included in future versions of this Guidance.



#### **4.3.2. Third-Party Operated Renewable Energy Generation Where the Agency Does not Purchase Energy and/or RECs**

Renewable energy systems on Federal land facilitate energy generation with low greenhouse gas emissions even if the agency does not own the system, use the energy, or own the renewable energy attributes. Agencies are encouraged to support such development as they can contribute to lowering the emission intensity of the country's power supply as a whole. However, if an agency does not purchase or own RECs from renewable energy generation owned and operated by third parties on its land, the agency does not own the environmental attributes of the energy. Instead the purchasers of RECs (and the associated environmental attributes) generated by third-party operated renewable energy systems have the exclusive rights to claim the environmental attributes of the renewable energy, including any associated GHG reductions. In some cases, the purchaser of the REC may use the REC to calculate adjustments to their Scope 2 GHG emissions inventories to help meet their sustainability goals.

While agencies that do not purchase or own RECs from renewable energy systems owned and operated by third parties on their land do not own the environmental attributes of the energy, the agency's action of supporting the renewable energy enables other parties to reduce their Scope 2 emissions. In order to increase the opportunity for these reductions, agencies and/or third-party generators may need to sell the REC in order to fund renewable energy projects. These projects ultimately increase the national supply of renewable energy regardless of the REC ownership.

To encourage generation of renewable energy projects on Federal lands and its indirect effect on the emissions profile of the country's energy supply, agencies may earn credit towards achievement of Scope 3 targets through allowing third-party operated renewable energy projects on its land. These "Scope 3 percentage points" do not represent emission reduction claims, but are rather a policy tool designed to help agencies meet the intended goals of Executive Order 13514 and to assist agencies in meeting Scope 3 targets established in response to the Executive Order. As the rights to emission reduction claims associated with third-party energy generation belong exclusively to the owner of the RECs, agencies without REC ownership shall make no claim of emission reductions and shall not apply Scope 3 percentage points towards claims of GHG emission reductions or progress towards carbon neutrality.

For transparency, Scope 3 percentage points associated with third-party renewable energy generation on Federal land must be reported separately from emissions in the GHG Reporting Portal. The points will not be used to adjust reported Scope 3 emissions; the points are to be used instead to show progress towards achieving Scope 3 goals. The points shall be calculated by using the methodology specified in the TSD and are reported in units of percent progress towards target achievement as they have no emission reduction value. The amount of points that an agency can earn for allowing third-party renewable energy generation on its land is limited to the amount of their Scope 3 emissions target.<sup>51</sup>

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<sup>51</sup> If an agency's Scope 3 reduction goal is 10%, for example, an agency cannot earn more than 10 percentage points towards their goal through allowing third-party renewable energy generation on its land.

## **4.4. Carbon Offsets**

At this time carbon offsets are not allowed to be applied as an adjustment against a Federal agency's emissions for purposes of meeting their targets. However, agencies may voluntarily report production, purchase, or sale of offsets in their qualitative statement. The area of carbon offsets is broad, encompassing multiple organizations and validation/certification processes. More time and deliberate focus is necessary to understand how the market for carbon offsets and use of those offsets could be applied consistently across the Federal community. Future versions of the Guidance may address the broader category of carbon offsets in greater detail.

## **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 annual comprehensive GHG emissions to CEQ must occur by January 31 of every year for the preceding fiscal year. Agencies must submit revisions to their FY2008 baseline inventory on the same date, where necessary. Comprehensive and baseline 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 as their annual submissions.

#### **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. 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 section and the TSD. Current FEMP energy reporting is integrated into this portal to reduce the reporting burden for agencies. FEMP will work to enable data sharing with other relevant Federal data systems. See Table 5 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 5: Summary of GHG Reporting Requirements**

Scope	GHG Emission Category	Does the GHG Reporting Portal auto-calculate emissions based on activity-level data?
<b>Scope 1</b> (Required)	Stationary Combustion (Agency Owned and Controlled Electricity, Heat, and Steam)	Yes
	Mobile Fossil Fuel (Agency Owned and Controlled Vehicles, Aircraft, Etc.)	Yes
	Fluorinated Gases (HFCs, PFCs, SF <sub>6</sub> )	Yes
	Wastewater Treatment (Agency Owned and Controlled)	Yes
	Solid Waste/Landfill (Agency Owned and Controlled)	Yes
	Other Fugitive and Process Emissions	No*
<b>Scope 2</b> (Required)	Purchased Electricity	Yes
	Purchased Steam, Hot Water, or Chilled Water	Yes
	Purchased Combined Heating and Power	Yes
	Purchased Steam from Waste	Yes
<b>Adjustments to Scope 2</b> (Voluntary)	Renewable Power Purchases and REC purchases	Yes
<b>Scope 3</b> (Required)	Business Air Travel	Yes
	T&D Losses	Yes
	Contracted Solid Waste Disposal	Yes
	Ground Business Travel	Yes
	Commuter Travel	Yes
	Contracted Wastewater Treatment	Yes
<b>Scope 3</b> (Voluntary)	Facilities Operated Under Private Sector and GSA Leases (Voluntary FY 2012)	No**
	Other Agency-specific Scope 3 Emissions	No*
<b>Adjustments to Scope 3</b> (Voluntary)	REC Purchases to adjust Scope 3 T&D losses	Yes
<b>Third Party Renewable Generation on Federal Land</b> (Scope 3 % points)	Scope 3 percentage points to be applied towards meeting agency Scope 3 goals relative to base year FY 2008	No***

\* The TSD does not include a calculation methodology.

\*\* A separate portal will be used to calculate these emissions for FY 2012.

\*\*\* The portal does not track annual progress towards agency goals relative to their FY 2008 baseline.

### 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 alternative 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 practicable, 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.

#### **Alternative Calculation Example: On-site Landfill**

To illustrate how an alternative 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 CH<sub>4</sub> than reflected when using the Scope 1 default methodology. Given that the data are available, the agency GHG lead decides to use the alternative GHG calculation methodology to calculate each of the five landfill's emissions, and to report the total metric tons of CH<sub>4</sub> emissions under the Solid Waste/Landfill emission category in the GHG Reporting Portal.

For many emission categories, “**alternative**” methodologies are also available, which can provide more accurate GHG accounting. Agencies may report using these alternative 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 alternative methodologies to increase the accuracy of their inventories. Agencies using alternative methodologies must include a detailed description of the methodologies in their qualitative statement for review by FEMP. If the GHG Reporting Portal does not provide an appropriate alternative 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 alternative methodology.

Refer to the TSD for detailed descriptions of default and alternative 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. A breakdown of voluntarily reported emissions by emission source and a description of calculation methodologies for all voluntary emissions should be included in the reporting agency's qualitative statement.

#### **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 managing GHG information. This Guidance is designed to integrate activity data for GHG accounting and reporting with other reporting requirements where practicable, 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. The most current calculation methodologies and emission factors available at the time should be used to prepare the GHG inventory for each reporting year. This Guidance and the TSD will be revised as needed to incorporate the current, accepted calculation methodologies and emission factors.

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 GHGRP 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 calculated and submitted base year (baseline) inventories using the methodologies and the reporting format outlined in this Guidance.

In some cases, agencies did not have access to quality FY 2008 data, particularly for the Scope 1 fugitive emissions and some Scope 3 emission categories. As such, agencies are authorized to use the earliest year for which data are available to include in the FY 2008 baseline inventory. For example, if an agency's employee commuting data becomes available in 2012, those emissions could be used as a basis for an adjusted FY 2008 baseline.

Renewable energy purchases and RECs purchased in FY 2008 should not be included in the FY 2008 baseline 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 SF<sub>6</sub>), particularly when limited to material procurement record data. In these situations, agencies may calculate a 3-year average baseline value for their specific Scope 1 fluorinated fugitive emissions. This FY 2008 baseline 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 average baseline for fugitive emissions, it must continue to use the rolling average for subsequent reporting years. Using this approach, agencies will use a rolling average to determine their inventories for a given year. For example, FY 2010 reporting would use an average of FY 2008, FY 2009, and FY 2010. Future targets will be evaluated relative to the average value calculated for FY 2008. Use of this rolling average approach should be noted in the "Other Information" section of the agency's qualitative statement. Agencies may only use the rolling average approach for the fluorinated gas fugitive emissions category, not for their entire comprehensive inventory.

#### **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. In the future, 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. Similarly, agencies may identify the need for an agency-specific recalculation of its baseline emissions. 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, or to private industry. While a single structural change may not significantly impact base year emissions, the cumulative effects of a number of minor structural changes can create an impact.<sup>52</sup> 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.
- New emission categories are added to the inventory.
- Additional data and/or calculation methodologies become available. For example, data may become available in FY 2013 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.<sup>53</sup>
- 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, as appropriate. The breadth of agency sizes and diversity of missions makes establishing a threshold for baseline recalculation challenging; but the situations described above, where an agency's emissions for a given scope change by 5 percent or greater, can trigger a discussion with CEQ to determine the need to recalculate the FY 2008 baseline. However, this threshold should not preclude instances of baseline recalculation, where emissions changes are less than 5 percent. Agencies should consult CEQ and OMB if they are uncertain if a baseline recalculation is warranted. If it is determined that a baseline adjustment is necessary, the agency should work in collaboration with FEMP to update the data as appropriate.

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<sup>52</sup> Generally, routine changes in workforce size and addition or closing of new facilities without a significant change in mission or structural change does not warrant a baseline recalculation.

<sup>53</sup> Agencies should not recalculate base years or previous annual inventories when updates to eGrid subregion factors released, or when other similar updates are made to account for changes in technologies, fuels, etc. over the years.

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 whether the change is necessary and what change 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 corrections, but are still required to document all changes and provide necessary explanation in subsequent inventory submissions.

As established in section 5(c) of EO 13514, the CEQ Chair, in consultation with the OMB Director, must review and approve agency reduction targets. As outlined in this section, an agency's Scope 3 baseline emissions may change significantly, and thus alter considerations that went into the formulation of the agency's initial Scope 3 reduction target. To the extent that the agency believes the initial Scope 3 target should be amended as a result of baseline changes, the agency must request approval of any proposed changes to the target from CEQ, who, in coordination with OMB, will respond to the agency. The Scope 1 and 2 reduction target may not be changed due to baseline recalculations.

## 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

As part of their qualitative report, agencies should accurately describe the steps taken to develop the inventory, document the processes used to collect the inventory data, and include points of contact. The qualitative report should: provide a description of the verification process, which may be internal to the agency; provide a process for identifying and correcting errors; and may discuss areas of improvement for future inventories.<sup>54</sup> In addition to a qualitative report, agencies may use one of the verification processes described below:<sup>55</sup>

1. **Second-Party Verification:** Any verification that is performed by an entity within the agency is termed second-party verification. Entities performing 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.
2. **Third-Party Verification:** If verification is performed by an entity external to the agency, it is termed third-party verification. Entities performing 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 and future annual inventories. Entities performing the verification process for an agency may refer to the

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<sup>54</sup> For more information on managing inventory quality, see Chapter 7, PSP.

<sup>55</sup> For more information on validation and verification of GHG emissions, see Chapter 10, PSP.



principles and requirements of ISO 14064-3:2006 for additional guidance on this process, as needed.<sup>56</sup>

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.

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<sup>56</sup> ISO 146064-3:2006: 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><b>Section 1. Policy</b></p> <ul style="list-style-type: none"> <li>• Federal agencies shall...measure, report, and reduce their GHG emissions from direct and indirect activities</li> <li>• Agencies' efforts and outcomes in implementing this order shall be transparent and agencies shall publicly disclose results</li> </ul>	<ul style="list-style-type: none"> <li>• Establishes how to measure and report agency GHG emissions from direct and indirect activities.</li> <li>• Supports consistency of data.</li> <li>• Incorporates GHG results into FEMP annual report.</li> </ul>
<p><b>Section 2a. Goals for Agencies (Scope 1 and 2 emissions)</b></p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• 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.</li> </ul>	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Clarifies how allowable target exclusions relate to GHG reporting.</li> </ul>
<p><b>Section 2b. Goals for Agencies (Scope 3 emissions)</b></p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• 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.</li> </ul>	<ul style="list-style-type: none"> <li>• Progress in meeting Scope 3 targets will be determined by completing an FY 2008 base year inventory and subsequent annual inventories using this Guidance.</li> <li>• Provides calculation methodologies for Scope 3 emission sources.</li> </ul>
<p><b>Section 2c. Goals for Agencies (comprehensive inventory)</b></p> <ul style="list-style-type: none"> <li>• 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.</li> </ul>	<ul style="list-style-type: none"> <li>• Provides methodologies for calculating and reporting comprehensive GHG inventory of Scope 1, Scope 2, and specified Scope 3 emissions.</li> </ul>
<p><b>Section 8. Agency Strategic Sustainability Plan</b></p> <ul style="list-style-type: none"> <li>• 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.</li> </ul>	<ul style="list-style-type: none"> <li>• Identifies procedures that may be incorporated into Strategic Sustainability Performance Plans as a means to monitor performance in meeting GHG reduction targets.</li> </ul>
<p><b>Section 9a. Recommendations for GHG Accounting and Reporting</b></p> <ul style="list-style-type: none"> <li>• 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"> <li>○ (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</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Includes GHG reporting and accounting procedures for Scope 1, 2, and 3 sources, where accurate methodologies exist.</li> <li>• Addresses inventory recalculations based on changes in factors affecting agency emissions (see Chapter 5).</li> <li>• Addresses sequestration (see Chapter 3).</li> </ul>

<p>procedures or other major changes that would otherwise render the initial baseline information unsuitable;</p> <ul style="list-style-type: none"> <li>o (ii) consider past Federal agency efforts to reduce GHG emissions; and</li> <li>o (iii) consider and account for sequestration and emissions of GHGs resulting from Federal land management practices.</li> </ul>	
<p><b>Section 9b. Recommendations for GHG Accounting and Reporting</b></p> <ul style="list-style-type: none"> <li>• 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.</li> </ul>	<ul style="list-style-type: none"> <li>• Requires DOE to provide electronic accounting and reporting capability (GHG Reporting Portal) by October 5, 2010.</li> <li>• Addresses the GHG Reporting Portal and how it relates to this Guidance (see Chapter 5).</li> </ul>
<p><b>Section 9c. Recommendations for GHG Accounting and Reporting</b></p> <ul style="list-style-type: none"> <li>• 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.</li> </ul>	<ul style="list-style-type: none"> <li>• Revised Guidance will be issued as necessary.</li> </ul>
<p><b>Section 13. Recommendations for Vendor and Contractor Emissions</b></p> <ul style="list-style-type: none"> <li>• 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.</li> </ul>	<ul style="list-style-type: none"> <li>• Provides calculation methodologies for selected Scope 3 emissions, but not all vendor and contractor emissions (Section 13 recommendations do not include calculation methodologies).</li> </ul>
<p><b>Section 17. Limitations</b></p> <ul style="list-style-type: none"> <li>• 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.</li> </ul>	<ul style="list-style-type: none"> <li>• Clarifies how “limitations” relate to GHG reporting.</li> </ul>
<p><b>Section 18. Exemption Authority</b></p> <ul style="list-style-type: none"> <li>• The Director of National Intelligence may exempt an intelligence activity of the United States, and related personnel, resources, and facilities.</li> <li>• 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).</li> <li>• The head of an agency may exempt law enforcement activities of that agency, and related personnel, resources, and facilities.</li> </ul>	<ul style="list-style-type: none"> <li>• Provides “exemption authority.”</li> </ul>
<p><b>Section 19. Definitions</b></p> <ul style="list-style-type: none"> <li>• E.O. 13514 includes definitions.</li> </ul>	<ul style="list-style-type: none"> <li>• Includes relevant definitions from E.O. 13514 and other sources.</li> </ul>

## 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 biomass/biofuel combustion emissions:** Emissions resulting from the combustion of materials that naturally sequester CO<sub>2</sub>, such as biomass, or biofuels derived from vegetable oils or animal fats.

**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 (CO<sub>2</sub>):** 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:** An instrument that represents the sequestration, destruction, or reduction of one metric ton of carbon dioxide equivalent outside an organization's boundary, used to compensate for emissions produced inside the organization's 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.

**Carbon stock:** The quantity of carbon contained in a “pool,” meaning a reservoir or system which has the capacity to accumulate or release carbon.

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

**CO<sub>2</sub> equivalent (CO<sub>2</sub>e):** Aggregated unit used in combining multiple greenhouse gases, based on the GWP of each greenhouse gas. The reference gas for the GWP used is CO<sub>2</sub>, and therefore GWP-weighted emissions are measured in mass units of CO<sub>2</sub> equivalent.

**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 US electricity generating plants that provide power to the electric grid and report data to the US 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 for the rate of emissions released that relates 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.

**Energy bill:** A bill or invoice that shows for each energy or utility commodity, the amount consumed/consumption, with units of measure, rates, and costs, for a specific time period.

**Enteric fermentation:** The breaking down of food in the gut of ruminant animals, including 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, soils, and underground or deep sea reservoirs of CO<sub>2</sub>.

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

**Global warming potential (GWP):** A factor describing the radiative forcing impact of one unit of a given GHG relative to one unit of CO<sub>2</sub>.

**Greenhouse gases:** Gases that trap heat in the atmosphere. Some greenhouse gases occur naturally and are emitted to the atmosphere through natural processes and human activities, while other greenhouse gases are created and emitted solely through human activities. The principal greenhouse gases that enter the atmosphere because of human activities are Carbon Dioxide (CO<sub>2</sub>), Nitrous Oxide (N<sub>2</sub>O), Methane (CH<sub>4</sub>), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), and Sulfur Hexafluoride (SF<sub>6</sub>).

**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 (IPCC):** 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 (CH<sub>4</sub>):** 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 (N<sub>2</sub>O):** 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 consequences 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 CO<sub>2</sub> that arises from the breakdown of CaCO<sub>3</sub> 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 (SF<sub>6</sub>):** 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):** A treaty 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 <sub>4</sub>	Methane
CO <sub>2</sub>	Carbon Dioxide
CO <sub>2</sub> 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
GHGRP	EPA's GHG Reporting Program (formerly the Mandatory Reporting Rule)
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

MSW	Municipal Solid Waste
MT	Metric Tons (Tonnes)
NECPA	National Energy Conservation Policy Act
NERC	North American Electric Reliability Council
NF <sub>3</sub>	Nitrogen Trifluoride
N <sub>2</sub> 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 <sub>6</sub>	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