

Greenhouse Gas Inventory Management Plan

United States Nuclear Regulatory Commission

Prepared by: Steven Griffin
January 31, 2011

Enclosure 2

TABLE OF CONTENTS

<u>1</u>	<u>GREENHOUSE GAS INVENTORY</u>	<u>1</u>
1.1	INTRODUCTION AND BACKGROUND	1
1.2	GOAL	1
<u>2</u>	<u>METHODOLOGY</u>	<u>1</u>
2.1	GUIDANCE	1
2.2	REPORTING PERIOD	2
2.3	ORGANIZATIONAL BOUNDARIES	2
2.4	GREENHOUSE GAS LIST	3
2.5	EMISSIONS QUANTIFICATION	3
2.6	FACILITIES SUMMARY	4
<u>3</u>	<u>ROLES & RESPONSIBILITIES</u>	<u>5</u>
<u>4</u>	<u>DATA MANAGEMENT</u>	<u>6</u>
4.1	DATA COLLECTION PROCESS	6
4.2	DATA COLLECTION PROCESS – QUALITY ASSURANCE	6
4.3	DATA COLLECTION SYSTEM SECURITY	6
4.4	SCHEDULE	6
<u>5</u>	<u>DATA ELEMENTS</u>	<u>7</u>
5.1	SCOPE 1	7
5.2	SCOPE 2	9
5.3	SCOPE 3	10
<u>6</u>	<u>INVENTORY MANAGEMENT</u>	<u>11</u>
6.1	TRAINING	11
6.2	CONTROL OF RECORDS	11
6.3	ADJUSTMENT – BASELINE	11
6.4	ADJUSTMENT – GUIDANCE CHANGES	12
6.5	RISKS	12
<u>7</u>	<u>QUALITY CONTROL</u>	<u>13</u>
7.1	INTERNAL QUALITY CONTROL	13
7.2	EXTERNAL QUALITY CONTROL	13
7.3	MANAGEMENT REVIEW	13
7.4	CORRECTIVE ACTION	13
7.5	IMP UPDATE PROCEDURE	13

1 Greenhouse Gas Inventory

1.1 Introduction and Background

This Inventory Management Plan (IMP) provides a framework for the management of greenhouse gas (GHG) accounting within the United States Nuclear Regulatory Commission (NRC).

The mission of the NRC is to license and regulate the nation's civilian use of byproduct, source, and special nuclear materials to ensure adequate protection of public health and safety, promote the common defense and security, and protect the environment.

1.2 Goal

NRC has developed a fiscal year (FY) 2008 GHG emissions baseline in accordance with Executive Order (EO) 13514, "Federal Leadership in Environmental, Energy, and Economic Performance," Section 2 "Goals for Agencies," Subsection (a), and submitted the baseline to the Council on Environmental Quality (CEQ) and the Office of Management and Budget (OMB). This baseline includes 13,800.4 metric tons CO₂-equivalent (MTCO₂e) of Scope 1 and Scope 2 emissions, and 21,522.3 MTCO₂e of Scope 3 emissions.

NRC has established a 4.4 percent reduction target for agency-wide Scopes 1 and 2 GHG emissions, and a 5 percent reduction target for agency-wide Scope 3 GHG emissions in absolute terms by FY 2020, relative to the FY 2008 baseline. NRC expects to achieve these reductions through the benefits of energy efficient construction of the new 3 White Flint North building and related re-consolidation of interim leased buildings. NRC has submitted and received approval for these targets by CEQ and OMB in accordance with EO 13514, Section 2 "Goals for Agencies," Subsections (a) and 2(b).

In accordance with EO 13514, Section 2 "Goals for Agencies," Subsection (c), NRC must establish and report to the CEQ Chair and OMB Director a comprehensive inventory of absolute GHG emissions, including Scope 1, Scope 2, and specified Scope 3 emissions. OMB and CEQ will use this inventory to track progress towards the GHG reduction targets. NRC will submit emissions data to the electronic GHG reporting portal developed by U.S. Department of Energy (DOE) Federal Energy Management Program (FEMP). The GHG reporting portal will then calculate NRC's emissions.

2 Methodology

2.1 Guidance

The Federal Greenhouse Gas Accounting and Reporting Guidance (the Guidance) details procedures for Federal agencies to comply with Subsection 2(c), EO 13514. The Guidance follows the basic guidelines found in the Public Sector GHG Accounting and Reporting Standard (Public Sector Protocol).

The Public Sector Protocol divides GHG emissions into three types:

- **Scope 1:** Direct GHG emissions from sources that are owned or controlled by the Federal agency
- **Scope 2:** Indirect emissions associated with consumption of purchased or acquired electricity, steam, heating, or cooling
- **Scope 3:** 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

CEQ selected the emission factors and methodologies referenced in the Guidance because of their applicability to Federal operations, technical authority, and acceptance in other GHG reporting programs. Emission factors and methodologies come from the following sources, in order of authority:

1. Environmental Protection Agency (EPA), Mandatory Greenhouse Gas Reporting Rule (MRR), Federal Register, October 30, 2009
2. EPA, Climate Leaders Program, Technical Guidance
3. EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks
4. EPA, eGRID Technical Support Document, Chapter 3
5. DOE, 1605(b) Voluntary Reporting of Greenhouse Gases Program, Technical Guidelines
6. Energy Information Agency, Emissions of Greenhouse Gases in the United States, Documentation and Emission Factors
7. International Panel on Climate Change, 2006 Guidelines for National Greenhouse Gas Inventories

2.2 Reporting Period

EO 13514 requires Federal agencies to establish and report a comprehensive inventory of FY 2010 absolute GHG emissions by January 2011 to the CEQ Chair and OMB Director. Annually thereafter, NRC will report the inventory of the preceding FY by January.

2.3 Organizational Boundaries

The organizational boundaries for this GHG inventory align with the requirements of the Public Sector Protocol and the Guidance. The inventory includes emissions from:

- Facility energy related to the operation of facilities for which NRC directly pays energy bills
- The operation of mobile sources for which NRC purchases fuel
- All other emissions from activities over which NRC has operational control¹
- Domestic sources only (U.S. states and territories)

¹ The Guidance defines operational control as “operational responsibility for an activity or process and the authority to implement operating policies associated with the activity or process.” Examples include fugitive emissions from research or industrial processes, and onsite wastewater and solid waste disposal.

2.4 Greenhouse Gas List

This inventory includes the six GHGs covered under EO 13514. The table below lists all six gases, as well as their common sources and uses:

Greenhouse Gas	Common Sources/Uses
Carbon dioxide (CO ₂)	Mobile and stationary combustion
Methane (CH ₄)	Coal mining, fuel combustion
Nitrous oxide (N ₂ O)	Fuel combustion, fertilizers
Hydrofluorocarbon gases (HFCs)	Refrigerants, fire suppressants, various manufacturing processes
Perfluorocarbon gases (PFCs)	Electrical equipment, various manufacturing processes, refrigerants, medicine
Sulfur hexafluoride (SF ₆)	Electrical equipment, various manufacturing processes, tracer in air modeling, medicine

2.5 Emissions Quantification

2.5.1 Emission Sources

This inventory includes all emission sources required by the Guidance (see table below). The Guidance states that CEQ may require future inventories to include additional Scope 3 sources.

Emission Category
Scope 1
Stationary combustion
Mobile combustion
Fugitive emissions <ul style="list-style-type: none"> - Fluorinated gases - On-site wastewater treatment - On-site landfills and municipal solid waste facilities
Process emissions
Scope 2
Purchased electricity
Purchased steam, hot water, and chilled water
Combined heating and power
Renewable energy purchases and Renewable Energy Credit (REC) purchases
Scope 3
Federal employee business air travel
Transmission and Distribution (T&D) losses
Contracted municipal solid waste disposal
Federal employee business ground travel
Federal employee commuting
Contracted wastewater treatment

2.5.2 Methodologies & Emission Factors

The Federal Greenhouse Gas Accounting and Reporting Guidance – Technical Support Document lists required GHG data, calculation methodologies, and emission factors. The Senior Sustainability Officer (SSO) or designate will gather all required data and input it into the FEMP GHG reporting portal. The GHG reporting portal will then calculate emissions.

2.6 Facilities Summary

NRC owns zero facilities and leases one facility from the General Services Administration (GSA) and one facility from the private sector through GSA.

NRC leases facilities at One and Two White Flint North in Rockville, Maryland. NRC also leases five fully-serviced facilities in or around the Rockville, Maryland area, in addition to leased facilities in King of Prussia, Pennsylvania; Atlanta, Georgia; Lisle, Illinois; Arlington, Texas; Las Vegas, Nevada; and, Chattanooga, Tennessee.

NRC does not pay utilities at fully-serviced lease facilities, and is not responsible for inventorying GHGs at these facilities.

NRC purchases fuel for approximately 27 vehicles, all leased from GSA.

3 Roles & Responsibilities

POC	Responsibility
Kathryn O. Greene, NRC Director, Office of Administration Senior Sustainability Officer	Review and approve NRC GHG inventory
Steven Griffin, NRC Senior Building Management Specialist (SBMS) Steven.Griffin@nrc.gov 301-415-6686	Energy, waste and water data Scope 1, 2, and 3 categories
Reginald Stansbury, NRC Administrative Services Specialist Reginald.Stansbury@nrc.gov 301-415-2095	Provision of Fuel Accounting System Tool (FAST) data
John Walker, NRC Senior Staff Accountant John.Walker@nrc.gov 301-415-7575	Business Air and Ground Travel Scope 3 emissions
John White, WW Contractors Facilities Manager Johnw@wwcontractors.com 301-415-0545	Fugitive emissions data
Contractor Team: Nicole White, PRIZIM Inc. Senior Associate nwhite@prizim-inc.com 301-840-2222 x177 Daniel Waller, Project Performance Corporation Technical Lead Daniel.waller@ppc.com 703-748-7298 Kristen Yezzi, Project Performance Corporation Associate Kristen.Yezzi@ppc.com 703-748-7282	Second party verification of GHG inventory Compiles data sets and quality assurance (QA)/quality control(QC) Data compiler

4 Data Management

4.1 Data Collection Process

Section 5 lists how NRC will collect each data element.

4.2 Data Collection Process – Quality Assurance

For more information on inventory QA (refer to Section 7).

4.3 Data collection System Security

NRC uses highly protected servers to store all of their data. Some data files are also password protected to avoid any possible data corruption. Any other networks (contractor team) the data is transferred to, the servers are also protected.

4.4 Schedule

Task	Annual Completion Date
Update IMP	August 1
Provide training to all relevant personnel	September 15
Release all data calls and data collection tools	October 1
Submit all data (HARD DEADLINE: later submissions will not be accepted)	December 1
Complete inventory <ul style="list-style-type: none">- Compile all data- Analyze data with appropriate tools	December 20
Pre-submission inventory QA review (Section 7)	January 1
Management review and approval of inventory	January 15
Upload inventory to FEMP	January 31
Post-submission inventory QA review (Section 7)	April 1

5 Data Elements

5.1 Scope 1

The contractor team will work with appropriate NRC contacts to collect all data necessary for completing the GHG inventory in compliance with EO 13514. The Contractor team will keep records of all original data used in the GHG inventory calculations and this data will remain available to NRC for review.

5.1.2 Stationary Combustion

Required Data	Fuel consumption by fuel (target subject and excluded)
Data Source	Energy bills
Existing Reporting	FEMP Energy Report
Collection Tool	NRC FY 2008 energy data report; FY 2010 utility bills
POC - Data Collection	Contractor Team
POC - Data Review	Senior Building Management Specialist

5.1.3 Mobile Combustion: Fleet Vehicles

Required Data	Fuel consumption by fuel
Data Source	FAST
Existing Reporting	FEMP Energy Report
Collection Tool	FAST 2008-2010
POC - Data Collection	Contractor Team
POC - Data Review	Administrative Services Specialist

5.1.4 Mobile combustion: Non-Fleet Vehicles and Equipment

Required Data	Fuel consumption by fuel Fuel cost by fuel
Data Source	N/A
Existing Reporting	FEMP Energy Report
Collection Tool	N/A
POC - Data Collection	N/A
POC - Data Review	N/A

5.1.5 Fugitive emissions: Refrigerants and Fluorinated Gases (Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), SF₆)

Required Data	Quantity purchased / issued by gas Quantity returned to supply by gas
Data Source	WW Contractors
Existing Reporting	Facility Clean Air Act Title VI reporting materials Procurement Records Facility hazardous material management
Collection Tool	Refrigerant Gas Usage 2008-2010
POC - Data Collection	Contractor Team
POC - Data Review	WW Contractors – Facility Manager

5.1.6 Fugitive Emissions: On-site Wastewater Treatment

Required Data	- On-site treatment process at each facility [see below] - Population served at each facility [no. of people]
Data Source	N/A
Existing Reporting	N/A
Collection Tool	N/A
POC - Data Collection	N/A
POC - Data Review	N/A

5.1.7 Fugitive emissions: On-site Landfills and Municipal Solid Waste Facilities

Required Data	Mass of solid waste disposed on-site Landfill open and close date
Data Source	N/A
Existing Reporting	Clean Air Act Title V permit reporting
Collection Tool	N/A
POC - Data Collection	N/A
POC - Data Review	N/A

5.1.8 Industrial Process Emissions

Required Data	Emission quantity
Data Source	N/A
Existing Reporting	N/A
Collection Tool	N/A
POC - Data Collection	N/A
POC - Data Review	N/A

5.2 Scope 2

5.2.1 Purchased Electricity

Required Data	Purchased electricity by the Emissions & Generation Resource Integrated Database (e-GRID) Sub-region (goal subject and goal excluded)
Data Source	Energy bills
Existing Reporting	FEMP Energy Report
Collection Tool	NRC FY 2008 and FY2010 utility bills
POC - Data Collection	Contractor Team
POC - Data Review	Senior Building Management Specialist

5.2.2 Purchased Steam, Hot Water, or Chilled Water

Required Data	Purchased steam, hot water, or chilled water
Data Source	N/A
Existing Reporting	FEMP Energy Report
Collection Tool	N/A
POC – Data Collection	N/A
POC – Data Review	N/A

5.2.3 Combined Heating and Power

Required Data	Purchased heating and electricity
Data Source	N/A
Existing Reporting	FEMP Energy Report
Collection Tool	N/A
POC – Data Collection	N/A
POC – Data Review	N/A

5.2.4 Renewable Energy Purchases and Renewable Energy Certificates Purchases

Required Data	Renewable energy and renewable energy certificates purchases
Data Source	N/A
Existing Reporting	FEMP Energy Report
Collection Tool	N/A
POC – Data Collection	N/A
POC – Data Review	N/A

5.3 Scope 3

5.3.1 Federal Employee Business Air Travel

Required Data	CO2 emissions
Data Source	Bookings
Existing Reporting	Passenger Name Records to GSA
Collection Tool	NRC08-GHG Air, NRC10-GHG Air
POC - Data Collection	Contractor Team
POC - Data Review	Senior Staff Accountant

5.3.2 Transmission and Distribution Losses

The FEMP reporting tool automatically calculates T&D losses, using purchased electricity data (5.2.1).

5.3.4 Contracted Municipal Solid Waste Disposal

Required Data	Mass of solid waste disposed off-site
Data Source	Bills/Statements
Existing Reporting	EO 13423 & EO 13514 Solid Waste and Diversion Reporting
Collection Tool	NRC waste numbers
POC - Data Collection	Contractor Team
POC - Data Review	Senior Building Management Specialist

5.3.5 Federal Employee Business Ground Travel

Required Data	Number of trips by vehicle type
Data Source	GSA tool
Existing Reporting	Passenger Name Records currently submitted to GSA Agency Travel Reporting
Collection Tool	NRC08-GHG Car, NRC10-GHG Car
POC - Data Collection	Contractor Team
POC - Data Review	Senior Staff Accountant

5.3.6 Federal Employee Commuting

Required Data	Distance traveled by vehicle type
Data Source	On-site survey
Existing Reporting	N/A
Collection Tool	Commuter data survey
POC - Data Collection	Contractor Team
POC - Data Review	Senior Building Management Specialist

5.3.7 Contracted Wastewater Treatment

Required Data	Population served at each facility
Data Source	Administration
Existing Reporting	N/A
Collection Tool	www.fedscope.opm.gov
POC - Data Collection	Contractor Team
POC - Data Review	Senior Building Management Specialist

6 Inventory Management

6.1 Training

During 2010, NRC used long-standing data collection procedures; hence training will be limited to the identification of changes from previous year data requirements. NRC also participates in the monthly Industry Webinar series offered by DOE.

6.2 Control of Records

Management of GHG related records will be in accordance with the NRC's procedures for document retention and recordkeeping. Raw data will be retained in the respective sources and will be backed up per the policies governing the administrators.

The SBMS, following certification and approval by the SSO, shall authorize upload of data to the FEMP GHG reporting portal.

6.3 Adjustment – Baseline

To ensure a consistent comparison against a baseline that is representative of ongoing agency activities, it may be necessary to recalculate the FY 2008 base year or subsequent inventories. If a baseline adjustment is required, formal written justification shall be submitted to the SBMS explaining the reasons and quantitative methods proposed for the baseline adjustments. The SBMS will formally review the request, and if approved submit the request to the SSO for approval. Once approved by the SSO, the SBMS shall notify CEQ and OMB of the proposed changes and the reasons these changes were necessary. After addressing any CEQ/OMB comments/recommendations, the SBMS shall direct the Inventory Database administrator to coordinate the required changes with FEMP and to change NRC data sources and reports.

The SBMS must provide a narrative description in the GHG reporting portal that explains the reasons for a recalculation, and provide a quantitative description of the impact of those changes on the agency's inventory. The SBMS will notify CEQ and OMB in advance of changes made to base year emissions calculations.

The Guidance and Public Sector Standard outline potential reasons for baseline recalculations. These reasons may include:

- Agency and Organizational Unit structural changes
- Significant change in mission
- Improvements in emissions calculation methodologies
- Availability of additional data
- Calculation errors

6.4 Adjustment – Guidance Changes

CEQ may direct agencies to alter their inventory processes. CEQ will communicate any new requirements by updating the Guidance. Changes may include:

- Requiring additional Scope 3 categories
- Modifying calculation methodologies for existing categories
- Modifying emission factors

The SBMS shall notify the SSO of any CEQ directed changes. The SBMS shall be responsible for directing changes to future data call guidance, adjusting the database to accommodate the new data fields and developing a new data analysis plan. If modifications are required to data from previous years, the SBMS shall notify the respective personnel and direct the database administrator to make the required changes. If the changes affect previous year reporting, the SBMS shall order the development of replacement reports.

6.5 Risks

Although some of the requested data is new, the data collection and review process are similar to the processes previously established for EO 13423 purposes. However to succeed, NRC must guard against a number of potential risks that may lead to material discrepancies in the GHG inventory:

- Misidentification or double counting of energy;
- Early identification of data reporting questions;
- Inability to collect data in support of Scope 3 inventory calculations (air, ground and commuter travel);
- Potential for errors in original documentation/vouchers (e.g., energy invoices, travel reports);
- Potential for errors in transcribing data from metering/billing and other reports into the respective databases;
- Inaccuracies due to slow or lack of response to corrective action requests for error resolution;
- The event of personnel changes.

NRC has elected to conduct second-party data verification. A verification team consisting of contractors from PRIZIM Consulting reviewed NRC practices and reviewed data as necessary

to verify the accuracy of data submittal by the NRC. Such a process mitigates the risks discussed above, except errors in original documentation. This risk can only be mitigated by alertness on the part of NRC staff.

7 Quality Control

7.1 Internal Quality Control

Raw data shall be submitted by NRC offices to the contractor team for compilation. Each office shall have in place a QC process to ensure that source data and its entry into reporting mechanisms are routinely reviewed and that errors in the data are corrected.

The SBMS shall review office procedures to ensure data quality and shall verify data to establish the reliability of the submitted data. This review constitutes a second party verification per Section 6.1.2 of the Federal Greenhouse Gas Accounting and Reporting Guidance.

7.2 External Quality Control

External, optional third- party data review will not be conducted for the FY 2008 and FY 2010 GHG emissions inventories.

7.3 Management Review

The Director, Office of Administration is responsible for the final review and approval of the GHG inventory, as outlined in Section 3. This review is required by January 15 of each year, in advance of the January FEMP submission deadline.

7.4 Corrective Action

Errors of format may be corrected by the SBMS. Errors of substance shall be addressed to the appropriate points of contact within NRC. Corrections should be made with the concurrence of the SBMS and the designated personnel in the appropriate office within NRC.

7.5 IMP Update Procedure

The IMP is a living document that will drive continuous improvement in the accuracy and efficiency of the NRC GHG emissions inventory. SBMS is responsible for working with relevant staff to annually update the IMP by August 1st of each year. Potential updates to the IMP include:

- Data management procedures
- Data requirements and collection tools
- Auditing and verification procedures