



Measuring your Footprint:
Greenhouse Gas Accounting for Military Organizations

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Should military organizations worry about climate change?

- ❖ Climate change will create a host of new military and security challenges

“We will pay for this one way or another. We will pay to reduce greenhouse gas emissions today, and we’ll have to take an economic hit of some kind. Or, we will pay the price later in military terms. ..**And that price will involve human lives. There will be a human toll.**”

General Anthony C. Zinni
U.S. Marine Corps

Why measure your footprint?

“The first step in addressing climate change is to measure and manage the emissions that cause this phenomenon.”

Eileen Claussen,
Former US Assistant Secretary of State
President, Pew Center



Key Steps in GHG Accounting

- ❖ Choose a system boundary for your inventory
- ❖ Identify all activities that contributed to baseline or base-year emissions and that will contribute to future emissions
- ❖ Establish the baseline of historical activity levels
- ❖ Calculate direct emissions from these activities
- ❖ Estimate indirect emissions associated with these activities
- ❖ Develop a plan for monitoring and verification of future emissions



Quantities measured for the inventory

- ❖ Total emissions of all six 'Kyoto' gases (CO_2 , CH_4 , N_2O , SF_6 , HFCs, PFCs)
- ❖ Non- CO_2 emissions converted to CO_{2e} , using Global Warming Potential (GWPs)
- ❖ Includes direct emissions from fuel consumption, industrial processes, and fugitive emissions as well as indirect emissions from purchased electricity
- ❖ Does not include embodied emissions



Approaches to GHG Accounting

- ❖ Entity-level:
 - Accounts for absolute emissions of an entire organization;
 - Usually referenced to a historical base-year
- ❖ Project-level:
 - Accounts for emissions reduced or avoided by a specific project, activity, or operation;
 - Usually referenced to a historical baseline



Standards and Protocols for GHG Accounting

- ❖ ISO 14064 Standard for Quantification, Measurement, and Verification of Greenhouse Gas Emissions
- ❖ WRI/WBCSD Greenhouse Gas Protocol
- ❖ UNFCCC Approved Methodologies for the Clean Development Mechanism
- ❖ Global Reporting Initiative



ISO 14064 Standard

- ❖ Developed by national member organizations of 80 countries
- ❖ Separate modules for entity and project inventories, guidance for verifiers
- ❖ Broadly applicable: regime neutral, technology neutral, fuel neutral
- ❖ Ensures technical rigor



WRI/WBCSD GHG Protocol

- ❖ Developed by a coalition of 350 stakeholders including OECD companies and NGOs
- ❖ Incorporates one module for entity inventories and one for project-based activities
- ❖ Allows first-party verification



Key Principles of GHG Accounting

- ❖ Transparency
- ❖ Accuracy
- ❖ Completeness
- ❖ Materiality
- ❖ Relevance
- ❖ Consistency



Why prepare and publish an inventory?

- ❖ Comprehensive GHG accounting reveals exposures to future risks
- ❖ Having a credible inventory allows you to get credit for future reductions
- ❖ Inventory often reveals key opportunities to increase efficiency and productivity of your units
- ❖ Publishing an inventory can improve public perceptions of your organization



Key Issues

- ❖ Where to place the system boundary?
- ❖ Which gases to include?
- ❖ What's the right baseline?
- ❖ Which activities to include?
- ❖ Where to get emissions factors for key activities?



Set the System Boundary

- ❖ A process of determining what must be included in the inventory
- ❖ Boundary may be defined by:
 - Scope of control (e.g., operational, financial)
 - Geographic location
 - Contribution to a collective effort



Identify Relevant Activities

- ❖ Identify all activities that contributed directly to the baseline or base-year activities by burning fuel, releasing non-CO₂ gases, or reducing natural sinks
- ❖ Can include industrial gas releases, fugitive emissions, or flaring
- ❖ Includes purchases of power, heat, and steam used in normal operations



Establish historical activity levels

- ❖ Identify the activity level associated with all relevant sources and sinks in the historical base-year or in the baseline scenario
- ❖ Activity level should be quantified in measurable physical units
- ❖ Direct emissions include fuel consumed in operations and transport of materials, physical or chemical processing, fugitive emissions
- ❖ Indirect emissions include emissions associated with electricity, heat, or steam purchased from an outside vendor or supplier
- ❖ Typically, does not include employee travel or emissions from waste disposal



Calculate direct emissions for historical base-year or baseline scenario

- ❖ Emissions(t) = Activity level * emissions factor
- ❖ Emissions factor should be based on measured characteristics of fuel used or gases released
- ❖ Absent information about actual characteristics, standardized (i.e., average) emissions factors can be used



Calculate indirect emissions for historical base-year or baseline scenario

- ❖ Indirect emissions are most often emissions from electricity generated elsewhere, but used in onsite or in activities under your control
- ❖ Indirect emissions(t) = Activity Level * Fuel Mix * Composite Emissions Factor



Develop a plan for monitoring, reporting, and verification

- ❖ Inventory is only a snapshot
- ❖ To be useful as a tool for planning and management, must monitor, report, and verify future activities
- ❖ Plan should be developed with extensive stakeholder involvement
- ❖ Monitoring must be regular, follow best-practices
- ❖ Independent verification is critical to credibility



For additional information

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