

Greenhouse Gas (GHG) Emissions Measurement and Reporting Guidelines

PART I: INTRODUCTION TO THE GHG MEASUREMENT AND REPORTING REQUIREMENTS

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1. Introduction to the Guidelines

1.1 Purpose

This document is aligned with and supports the Greenhouse Gas Measurement and Reporting Regulations 2017 (i.e. GHG M&R Regulations gazetted on 22 Dec 2017) under the Energy Conservation Act (ECA).

This document is part of a series of Measurement and Reporting (M&R) Guidelines and templates provided by the National Environment Agency (NEA):

- i) **Part I: Introduction to the GHG Measurement and Reporting Requirements**
- ii) Part II: Monitoring Plan
- iii) Part III: Emissions Report

This series of Guidelines aim to provide guidance on:

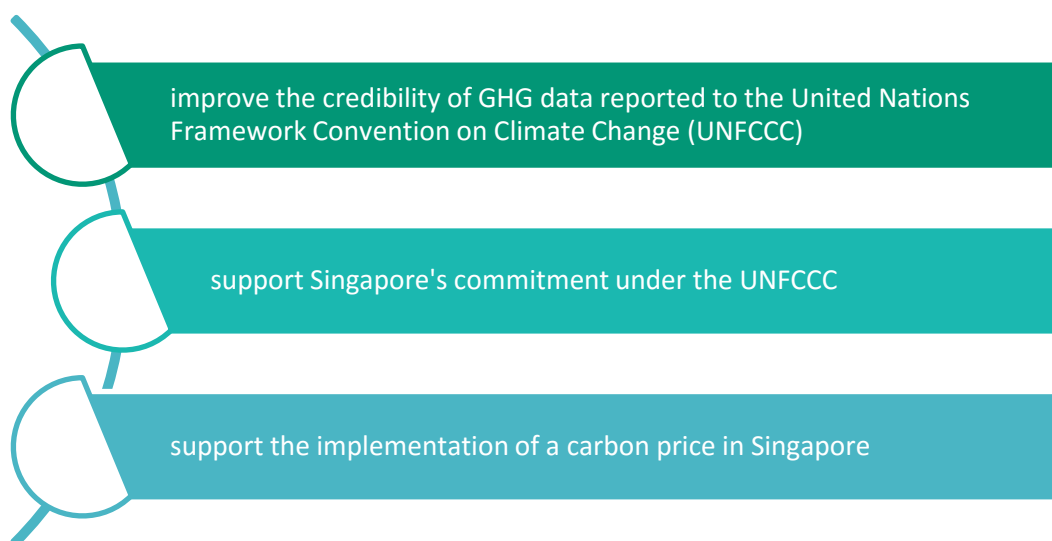
- i) the implementation of the Measurement and Reporting (M&R) requirements;
- ii) compliance requirements relating to the measurement and reporting of greenhouse gas (GHG) emissions; and
- iii) the preparation of the Monitoring Plan and the Emissions Report.

2. Introduction to the GHG Measurement and Reporting Requirements

2.1 Overview

Under the GHG M&R Regulations, a business activity of a registered corporation (herein referred to as ‘facility’¹) will be subject to the M&R requirements if it exceeds the prescribed greenhouse gas (GHG) emissions threshold (herein referred to as ‘threshold’). The registered corporation (herein referred to as ‘Corporation’) will be required to (i) compute facility-level GHG emissions, and (ii) implement quality management procedures, by submitting two main types of documentation for NEA’s approval, namely the Monitoring Plan and an annual Emissions Report².

The M&R requirements aim to improve the accuracy and rigour of GHG emissions data, in order to:



Prior to the implementation of the GHG M&R Regulations, registered corporations under the ECA have been reporting (i) energy, and (ii) non-energy data related to GHG emissions under the Energy Conservation (Energy Management Practices) Regulations (i.e. EMP Regulations).

The level of granularity of data to be measured and reported by each facility remains unchanged under the GHG M&R Regulations. Table 1 highlights the key changes in the measurement and reporting requirements under the GHG M&R Regulations, vis-à-vis the EMP Regulations.

¹ The term ‘facility’ is used in the Guidelines to refer to a business activity that is subject to the Measurement and Reporting requirements. This is defined as ‘reportable business’ in the GHG M&R Regulations.

² The term ‘Emissions Report’ in the Guidelines refers to the ‘enhanced emissions report’ in the GHG M&R Regulations.

Table 1: Key changes in Measurement and Reporting requirements under the Greenhouse Gas Measurement and Reporting Regulations VS. Energy Management Practices Regulations

Requirements	Energy Management Practices Regulations	Greenhouse Gas Measurement and Reporting Regulations
Report data at system / process level for fuel combustion activities	Yes (requirements unchanged)	
Report data at system / process level for non-fuel combustion activities (i.e. industrial processes and product use (IPPU))	Yes (requirements unchanged)	
Compute GHG emissions for both fuel combustion and IPPU activities	Partial (for IPPU)	Yes (for both fuel combustion and IPPU)
Implement quality management procedures, i.e. Quality Control / Quality Assurance (QC/QA) procedures	No	Yes
Submit documentation / justification on quantification of GHG emissions and QC/QA procedures	No	Yes

2.2 Threshold and Scope

A facility will be subject to the M&R requirements when its total direct GHG emissions (Scope 1³) exceeds the threshold of **25,000 tonnes of carbon dioxide equivalent (CO₂e) in any calendar year⁴**.

The types of processes or activities resulting in GHG emissions are broadly categorised into (i) fuel combustion (i.e. energy use) and (ii) industrial processes and product use (IPPU)⁵ (i.e. non-energy use). GHG emissions directly released into the atmosphere from both fuel combustion and IPPU activities within the facility boundary and under operational control of the Corporation, are to be measured and reported in accordance with the M&R requirements.

The GHGs covered by the M&R requirements are:

- i) Carbon dioxide (CO₂)
- ii) Methane (CH₄)
- iii) Nitrous oxide (N₂O)

³ Three scopes of reporting are defined by the GHG Protocol (<http://www.ghgprotocol.org/corporate-standard>), direct emissions as Scope 1, indirect emissions related to production of energy commodities used (e.g. electricity) as Scope 2 and other indirect emissions as Scope 3.

⁴ The calendar year during which the direct GHG emissions first exceed the threshold is defined as the 'base calendar year' in the GHG M&R Regulations.

⁵ 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 3 Industrial Processes and Product Use: <http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol3.html>

- iv) Sulphur hexafluoride (SF₆)
- v) Nitrogen trifluoride (NF₃)
- vi) Hydrofluorocarbons (HFCs)
- vii) Perfluorocarbons (PFCs)

However, in ascertaining whether a facility exceeds the threshold, the Corporation shall exclude (i) NF₃ emissions, and (ii) CO₂ emissions from biomass and fuel derived from biomass.

The emissions covered under the M&R requirements are summarised in Table 2.

Table 2: Emissions covered under the M&R requirements

Emissions <u>covered</u> under M&R requirements and count towards meeting the threshold	Emissions <u>covered</u> under M&R requirements but <u>do not</u> count towards meeting the threshold	Emissions <u>excluded</u> from M&R requirements
- Direct emissions of CO₂, CH₄, N₂O, SF₆, HFCs and PFCs from fuel combustion and IPPU activities - Direct CH₄ and N₂O emissions from biomass and fuel derived from biomass	- Direct NF₃ emissions - Direct CO₂ emissions from biomass and fuel derived from biomass	- Indirect emissions (Scope 2 and Scope 3) - Emissions from land-based activities (as defined by the UNFCCC) - Transport emissions (on-site and off-site)

A facility subject to the M&R Regulations will cease to be one if:

- i) The Corporation ceases to have operational control over the facility; or
- ii) The direct GHG emissions from the facility did not exceed the threshold for 3 consecutive years; or
- iii) Subject to NEA's approval, the facility has carried out emissions reduction projects such that the facility did not exceed the threshold for 1 year, and has demonstrated that it would not exceed the threshold for the subsequent 2 consecutive years.

2.3 Submission of Monitoring Plan and Emissions Report

Under the GHG M&R Regulations, the Corporation will be required to submit the following for NEA's approval:

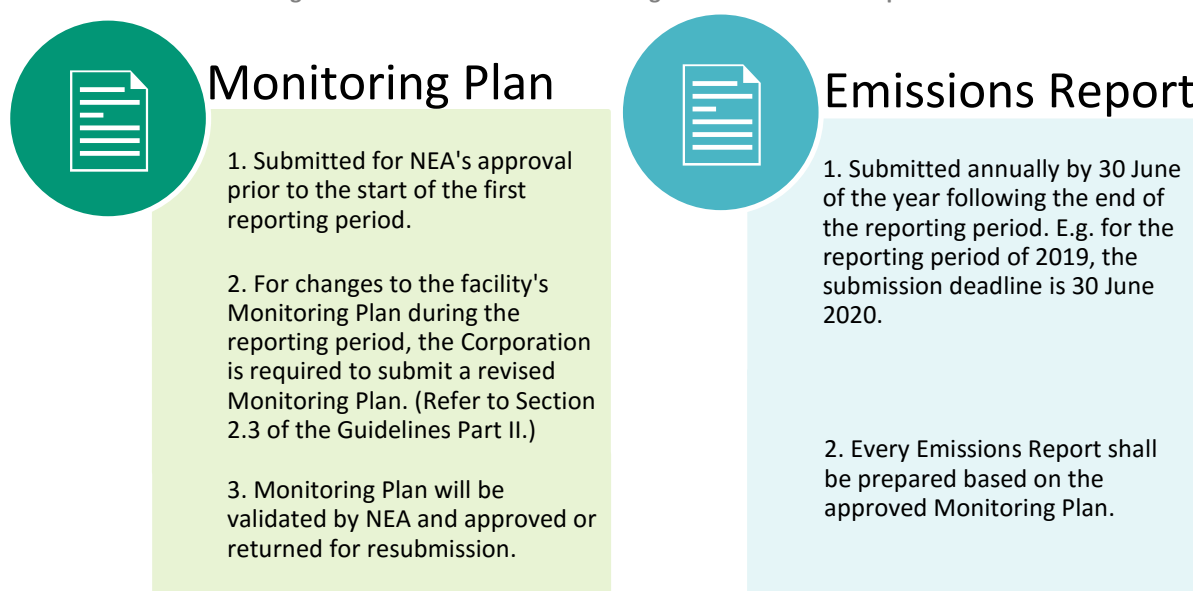
- i) Monitoring Plan: The Corporation is required to prepare, submit and maintain a Monitoring Plan for each facility that exceeds the threshold. The Monitoring Plan identifies and describes the facility's GHG emission sources and streams, emissions quantification methods, alternative methods, quality management procedures and uncertainty. The Monitoring Plan

submission includes the Monitoring Plan Template ('MP Template') and the necessary supporting documents. The facility is required to use the MP Template provided by NEA which can be downloaded online from the Emissions Data Monitoring and Analysis (EDMA) system. The Monitoring Plan submission will need to be uploaded via the EDMA system and approved by NEA before the start of the first reporting period. The reporting period⁶ is the calendar year during which the direct GHG emissions are measured and reported. The approved Monitoring Plan will apply for all future reporting periods unless there is change to the Monitoring Plan. The Corporation shall ensure that the Monitoring Plan remains current and up-to-date.

- ii) Emissions Report: The Corporation is required to compile and submit an Emissions Report annually for each facility that exceeds the threshold. The Emissions Report for each reporting period shall contain information on the facility's activity data, computation for each direct GHG emissions, and the total direct GHG emissions. The Emissions Report shall be submitted by 30 June of the year following the end of each reporting period. The Emissions Report shall be prepared based on the approved Monitoring Plan. The facility is required to use the Emissions Report User-Interface (UI) provided online by NEA in the (EDMA) system. This Emissions Report UI builds on the forms and templates used for energy use reporting and IPPU emissions reporting under the ECA prior to the implementation of the GHG M&R Regulations. The Emissions Report shall be substantiated with supporting documents.

Figure 1 summarises the submission requirements for the Monitoring Plan and Emissions Report:

Figure 1: Submission of the Monitoring Plan and Emissions Report



The timelines for submission of Monitoring Plan and Emissions Report are illustrated in Figure 2 for a facility that has exceeded the threshold in 2016 based on the Jun 2017 ECA submission; and in Figure 3 for all other cases, including for a Corporation/facility that is not currently registered under the ECA. It is an offence under the GHG M&R Regulations if the Corporation (i) fails to submit the Monitoring Plan or Emissions Report, (ii) fails to resubmit the Monitoring Plan or Emissions Report when directed, or (iii) submits false or misleading information in the Monitoring Plan or Emissions Report.

⁶ The term 'reporting period' in the Guidelines refers to the 'prescribed period' in the GHG M&R Regulations.

Figure 2: Submission timeline for a registered corporation/facility that has exceeded the threshold in 2016 based on Jun 2017 ECA submission

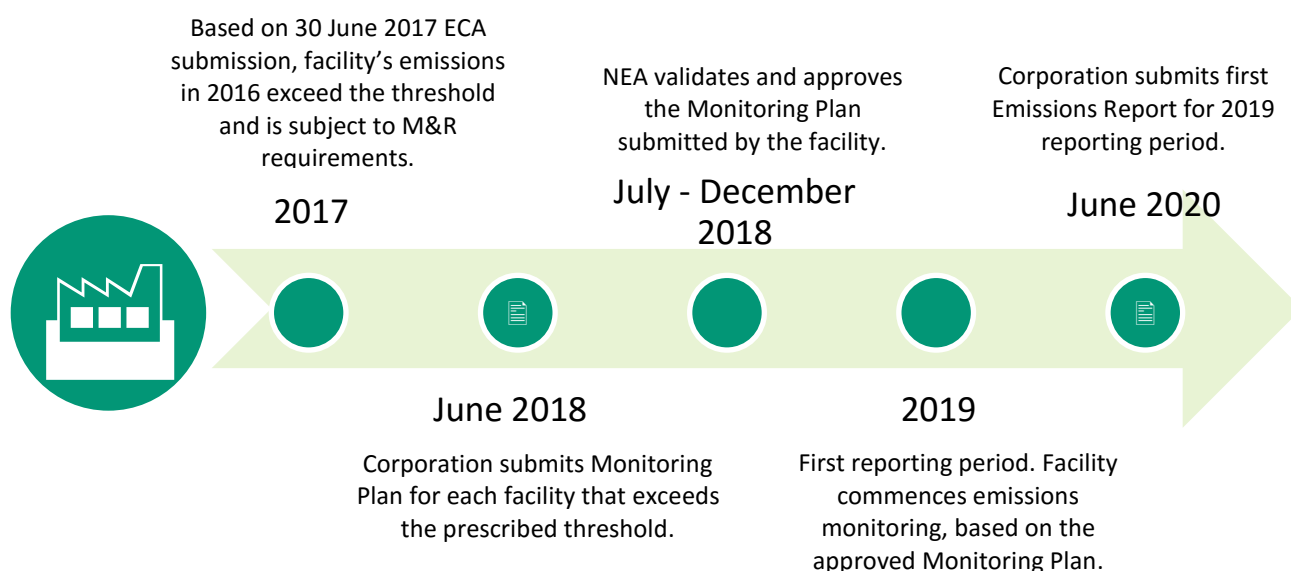
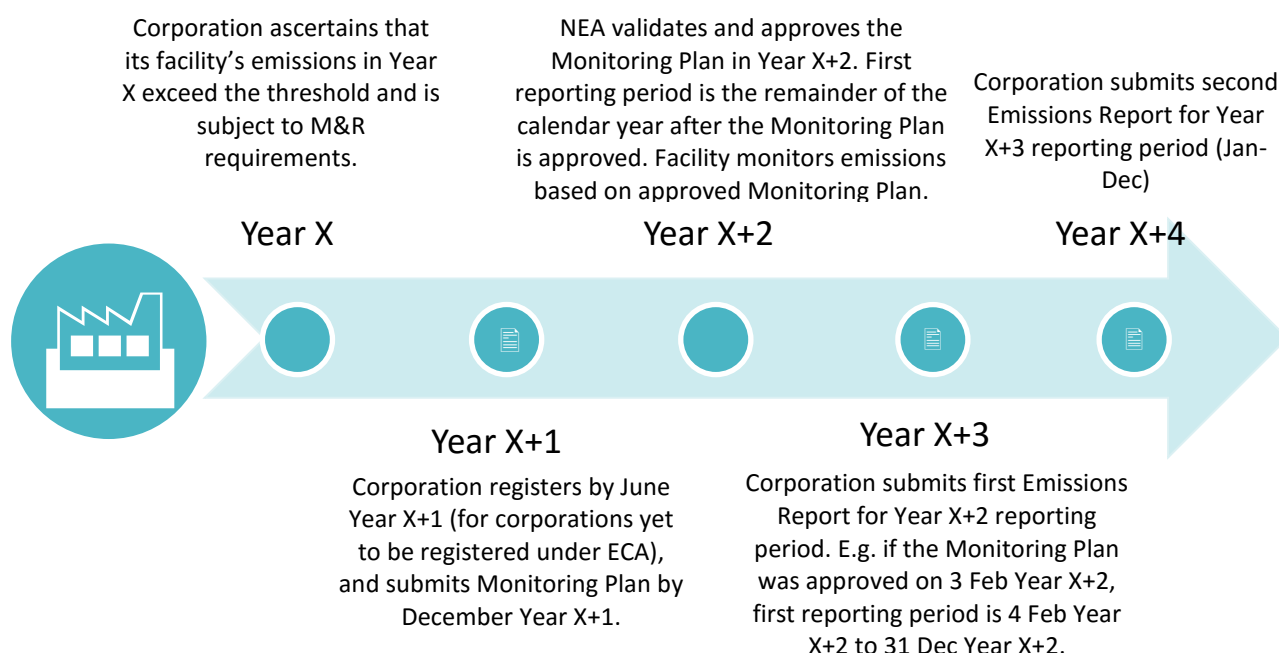


Figure 3: Submission timeline for all cases other than in Figure 2, including for a Corporation/facility yet to be registered under the Energy Conservation Act



2.4 Responsibilities and Required Qualifications/Experience of GHG Manager

The Corporation shall appoint at least one GHG Manager to be responsible for preparing and submitting the Monitoring Plan and Emissions Report for each facility. More than one GHG Manager may be appointed to form a GHG Management Team.

The appointment of external service providers to assist the GHG Manager(s) in the preparation of the Monitoring Plan and Emissions Report is allowed, but service providers shall not be appointed as the GHG Manager. The job titles and roles of other personnel involved in the M&R process will need to be detailed in the Monitoring Plan (refer section 5.8.2 of Part II of the Guidelines).

The duties and responsibilities of a GHG Manager include, but are not limited to, the list below:

- i) Be responsible for data collation, preparation and analysis of the Monitoring Plan and Emissions Report;
- ii) Assess applicability of the Monitoring Plan and data collection for the requisite parameters that contribute to GHG emissions;
- iii) Document measurement approaches;
- iv) Monitor GHG emission sources and their operating parameters on a regular basis;
- v) Measure and report GHG emissions;
- vi) Submit the Monitoring Plan and Emissions Report in accordance with the GHG M&R Regulations; and
- vii) Ensure the Monitoring Plan and Emissions Report are, to the best of the knowledge of the GHG manager, complete and accurate.

Each GHG Manager must have at least one of the following qualifications or experience:

- i) Singapore Certified Energy Manager (certified by the Institution of Engineers, Singapore)
- ii) Qualifications or at least three years' experience in any of the following fields:
 - a. Energy management;
 - b. Energy auditing;
 - c. GHG emissions computation;
 - d. GHG accounting;
 - e. Any standard of ISO 14064;
 - f. Any standard of ISO 50001.
- iii) At least three years' experience in the operational processes and activities of the facility.

The Corporation is to justify and provide evidence to NEA, within 30 days after appointing the GHG Manager, that the GHG Manager has the required qualifications or experience to properly carry out the duties of a GHG Manager.

In the event where the only GHG Manager is no longer appointed as a GHG Manager, the Corporation is required to appoint a replacement GHG manager within 3 months.

Some recommended training are available from the GHG Management Institute⁷, including:

- i) 201 Basics of Organisational GHG Accounting; and
- ii) Document measurement approaches.

⁷ Please refer to the GHG Management Institute's website <http://ghginstitute.org/courses/> for more information on training courses.