

CIRCULAR

METHODS FOR MEASUREMENT, REPORT AND VERIFICATION OF REDUCTION IN GREENHOUSE GAS (GHG) EMISSIONS AND GHG INVENTORY DEVELOPMENT IN INDUSTRY AND TRADE SECTOR

Pursuant to the Law on Environmental Protection dated November 17, 2020;

Pursuant to the Government's Decree No. 96/2022/ND-CP dated November 24, 2022 on functions, tasks, powers and organizational structure of the Ministry of Industry and Trade;

Pursuant to Government's Decree No. 06/2022/ND-CP dated January 07, 2022 on reduction in greenhouse gas (GHG) emissions and protection of ozone layer;

At the request of Director General of Energy Efficiency and Sustainable Development Department;

The Minister of Industry and Trade promulgates Circular on methods for measurement, report and verification of reduction in greenhouse gas (GHG) emissions and GHG inventory development in industry and trade sector.

Chapter I

GENERAL PROVISIONS

Article 1. Scope

This Circular provides for methods for measurement, report and verification of reduction in greenhouse gas (GHG) emissions and GHG inventory development in industry and trade sector.

Article 2. Regulated entities

1. This Circular applies to GHG-emitting facilities which are required to develop GHG inventory under the Prime Minister's Decision, and organizations and individuals involved in GHG inventory development, measurement, report, verification of reduction in GHG emissions in industry and trade sector according to regulations of law.
2. Facilities that are not included in the list of GHG-emitting facilities which are required to develop GHG inventory under the Prime Minister's Decision are encouraged to apply regulations herein.

Article 3. Definition of terms

1. "*GHG emission*" means an act of emitting GHG to the atmosphere.
2. "*GHG emission source*" means a place where there are physical and chemical processes that emit GHG or production activities using electricity or heat generated by fossil fuels.
3. "*Direct GHG emission*" means the emission of GHG generated by burning fossil fuels or extracting minerals from underground or open-pit mines or leaked from storage machinery and equipment.
4. "*Indirect GHG emission*" means the emission of GHG generated by using types of energy, including electricity, heat or steam, produced from the burning of fossil fuels and other relevant fuels.
5. "*Activity data*" means the quantitative data of fuels and materials used in a GHG emission source.
6. "*Emission factor*" of a type of GHG means the volume of GHG emitted or eliminated in each volume unit of the activity data.
7. "*Facility*" means a facility that is included in the list of GHG-emitting facilities which are required to develop GHG inventory under the industry and trade sector, issued by the Prime Minister.
8. "*Emission baseline*" means the assumption on the basis of science of total GHG emissions in every year of a sector or facility following a Business-As-Usual (BAU) scenario of that sector or facility when methods for reducing GHG emissions have not yet been adopted within a certain period of time.
9. "*Unit in charge of developing GHG inventory and formulating a report on reduction in GHG emissions at industry-level*" means an eligible unit assigned, commissioned or selected by the Ministry of Industry and Trade in accordance with regulations of law.

Article 4. Principles of measurement, report and verification of reduction in GHG emissions and GHG inventory development

1. The measurement of and report on reduction in GHG emissions and GHG inventory development

shall adhere to the following principles:

- a) Adequacy: the measurement of and report on reduction in GHG emissions and GHG inventory development shall be carried out at all GHG emission and absorption sources. The data shall be collected in a continuous and uninterrupted manner;
- b) Uniformity: the measurement of and report on reduction in GHG emissions and GHG inventory development shall achieve uniformity in terms of calculated data, and methods for supervision, development of GHG inventory and calculation of GHG emission reductions (ERs).
- c) Transparency: Documents, database, assumptions, activity data, applied factors and calculation methods shall be clearly specified, cited and stored, thereby ensuring high reliability and accuracy;
- d) Accuracy: the measurement of and report on reduction in GHG emissions and GHG inventory development shall ensure reliability according to the selected methodology and minimize deviations;
- dd) Comparability: results of the measurement of and report on reduction in GHG emissions and GHG inventory development shall satisfy requirements for data and similarity of methodologies to serve comparison.

2. The verification of reduction in GHG emissions shall adhere to the following principles:

- a) Independence: Maintaining independence from relevant items during the performance of tasks and objectivity during assessment;
- b) Equality: Ensuring truthfulness, accuracy, objectivity and balance

Chapter II

TECHNICAL PROCEDURES FOR GHG INVENTORY DEVELOPMENT

Section 1. INDUSTRY-LEVEL GHG INVENTORY DEVELOPMENT IN INDUSTRY AND TRADE SECTOR

Article 5. Technical procedures for industry-level GHG inventory development

1. Identification of scope of industry-level GHG inventory development.
2. Collection of activity data for industry-level GHG inventory development.
3. Selection of industry-level GHG emission factors.
4. Identification of method for industry-level GHG inventory development.
5. Management and assurance about the quality of industry-level GHG inventory development.
6. Assessment of uncertainties of industry-level GHG inventory development.
7. Recalculation of industry-level GHG inventories.
8. Preparation of reports on industry-level GHG inventory development.

Article 6. Scope of industry-level GHG inventory development.

GHG inventories intended for industries, including energy, industrial processes and product use in the industry and trade sector encompass:

1. GHG inventories intended for energy industry:
 - a) Emission of GHGs produced by burning fuels during electricity generation and energy consumption in industrial industries under management of the Ministry of Industry and Trade;
 - b) Emission of GHGs from mineral extraction.
2. GHG inventories intended for industrial processes and product use:
 - a) Emission of GHGs produced by physical and chemical processes without energy consumption in chemical industries and metallurgy;
 - b) Emission of GHGs that are refrigerants in devices and the process production and trade in refrigerants.

Article 7. Collection of activity data for industry-level GHG inventory development.

1. The activity data for industry-level GHG inventory development is specified in Appendix I issued together with this Circular.
2. The activity data is collected from central and local statistics offices, relevant agencies and organizations and investigations of specialized units.

Article 8. Selection of industry-level GHG emission factors.

1. The unit in charge of industry-level GHG inventory development shall calculate, determine and use

GHG emission factors in conformity with the reality of industry after the competent authority grants consent.

2. In case where GHG emission factors are not calculated, determined and used according to regulations in Clause 1 of this Article, the unit in charge of industry-level GHG inventory development shall apply emission factors according to the list of emission factors serving GHG inventory development announced by the Ministry of Natural Resources and Environment.

3. In case where GHG emission factors are not specified in Clause 2 of this Article, GHG emission factors shall be applied under the latest guidelines of Intergovernmental Panel on Climate Change – IPCC.

Article 9. Method for industry-level GHG inventory development.

1. The method for GHG inventory development applied to industries of energy and industrial processes shall comply with the 2006 IPCC Guidelines for National GHG Inventories (hereinafter referred to as "IPCC 2006") and the 2019 Refinement for the 2006 IPCC Guidelines for National GHG Inventories (hereinafter referred to as "IPCC 2019").

2. Formula for calculation of industry-level GHG inventories.

a) Formula for calculating emission of each type of GHG for a sub-industry

$$KNK_{i,t} = \sum_t AD_{i,t} * EF_{i,t}$$

Where:

- i : type of GHG;
- t : sub-industry;
- $KNK_{i,t}$: total GHG emissions of sub-industry t and GHG i (tonne);
- $AD_{i,t}$: activity data of sub-industry t and GHG i ;
- $EF_{i,t}$: Emission factor of GHG i with regard to the activity data of sub-industry t (tonne/unit of AD).

b) Formula for calculating CO₂ emission equivalent of GHG i in sub-industry t

$$TPT_{i,t} = KNK_{i,t} * GWP_i$$

Where:

- $TPT_{i,t}$: CO₂ emission equivalent of GHG i in sub-industry t (tonne of CO_{2td});
- GWP_i : global warming potential of GHG i applicable according to the latest IPCC guidelines.

c) Formula for calculating total GHG emissions of sub-industry t

Total GHG emissions (TPT_t (tonne of CO_{2td})) of the sub-industry t in a certain period shall be equal to total emissions from all GHG i emission sources in the reporting period, calculated by the following formula:

$$TPT_t = \sum_i TPT_{i,t} = \sum_i KNK_{i,t} * GWP_i$$

d) Calculation of industry-level GHG inventories.

Total GHG emissions (TPT (tonne of CO_{2td})) of the industry in a certain period shall be equal to total GHG emissions from all sub-industries t in the reporting period, calculated by the following formula:

$$TPT = \sum_t TPT_t$$

Article 10. Management and assurance about the quality of industry-level GHG inventory development.

1. The unit in charge of industry-level GHG inventory development shall manage the quality of GHG inventory development for the following contents:

- a) Assumptions and methods for selection of activity data, emission factors and conversion factors;
- b) Accuracy of the inputted data;
- c) Results of GHG emissions;
- d) Transparency and uniformity of the data;
- dd) Data continuity;

e) Review and assessment of the adequacy of internal documents.

2. The agency or unit that does not participate in GHG inventory development shall ensure the quality of industry-level GHG inventory development for the following contents:

a) Calculation assumptions and standards for selection of activity data, emission factors and conversion factors;

b) Applied methods and procedures for GHG inventory development, and quality of the inputted data during calculation and inventory processes;

c) Results of GHG emissions;

d) Suitability of conversion factors selected in formulas;

dd) Transparency of the data;

e) Uniformity of the data;

f) Data continuity;

g) Errors of data input;

h) Uncertainties of inventory reports;

i) Review of the system for storing internal documents.

Article 11. Assessment of uncertainties of industry-level GHG inventory development.

1. Uncertainties of the industry-level GHG inventory development shall be assessed for the following contents:

a) Completeness of the report;

b) Suitability of the inventory model and method for the actual situation;

c) Adequacy of data used for calculation;

d) Representativeness of data;

dd) Abnormality of data;

e) Lack of transparency and violations of inventory development.

2. The quantification of uncertainties of industry-level GHG inventory development shall comply with guidelines in Chapter 3, Book 1 of IPCC 2006 and IPCC 2019.

Article 12. Recalculation of industry-level GHG inventories.

1. Recalculation of industry-level GHG inventories of the previous periods shall be carried in the following cases:

a) There are changes to methods for GHG inventory development, thereby causing considerable changes to results of the latest inventory;

b) There are changes to GHG emission sources and factors.

2. The unit in charge of industry-level GHG inventory development shall add recalculation results to reports on industry-level GHG inventory development of the reporting period.

Article 13. Preparation of reports on industry-level GHG inventory development.

The unit in charge of industry-level GHG inventory development shall prepare reports on industry-level GHG inventory development under management of the Ministry of Industry and Trade according to Form No. 01 Appendix II of the Government's Decree No. 06/2022/ND-CP dated January 07, 2022.

Article 14. Verification and report on industry-level GHG inventory development

1. The Energy Efficiency and Sustainable Development Department shall take charge of organizing verification of reports on industry-level GHG inventory development in industry and trade sector according to procedures in Article 10 of Circular No. 01/2022/TT-BTNMT dated January 07, 2022 of the Ministry of Natural Resources and Environment.

2. The unit in charge of industry-level GHG inventory development shall complete reports on industry-level GHG inventory development according to conclusions of the verification council and send them to the Ministry of Industry and Trade via the Energy Efficiency and Sustainable Development Department for consolidation.

3. The Energy Efficiency and Sustainable Development Department shall take charge of preparing reports to serve national GHG inventory development of the Ministry of Industry and Trade according to regulations in Point a, Clause 3 Article 11 of Decree No. 06/2022/ND-CP.

Section 2. FACILITY-LEVEL GHG INVENTORY DEVELOPMENT IN INDUSTRY AND TRADE

SECTOR

Article 15. Technical procedures for facility-level GHG inventory development

1. Identification of scope of facility-level GHG inventory development.
2. Collection of activity data for facility-level GHG inventory development.
3. Selection of facility-level GHG emission factors.
4. Identification of method for facility-level GHG inventory development.
5. Management of the quality of facility-level GHG inventory development.
6. Assessment of uncertainties of facility-level GHG inventory development.
7. Recalculation of facility-level GHG inventories.
8. Preparation of reports on facility-level GHG inventory development.

Article 16. Scope of facility-level GHG inventory development.

Facility-level GHG inventories shall be developed at emission sources under management of a Facility. To be specific:

1. Direct emission sources:

- a) Emission from fixed sources: Burning fuels in fixed equipment, including boilers, furnaces, burners, turbines, fireplaces, incinerator, etc.
- b) Emission from mobile sources: Burning fuels in transportation equipment;
- c) Emission from industrial processes, including physical and chemical processes that produce GHG in the production line of the facility;
- d) Emission from diffusion through machinery and equipment or mineral extraction and processing, etc.;
- dd) Emission of GHGs that are refrigerants, produced by the process and equipment for production and trade in refrigerants;
- e) Emission from collection, management and treatment of waste.

2. Indirect emission sources:

- a) Emission from electric energy consumption;
- b) Emission from use of stream power;

Article 17. Collection of activity data for facility-level GHG inventory development.

1. The facility shall collect, manage and store the activity data related to emission sources under its management.
2. The activity data to be collected for facility-level GHG inventory development is specified in Section 1 Appendix II issued together with this Circular.

Article 18. Selection of facility-level GHG emission factors.

1. Facilities shall calculate and determine GHG emission factors in conformity with technology status and production procedures according to the 2006 IPCC Guidelines and obtain the consent from the competent authority.
2. In case Clause 1 of this Article is not applicable, emission factors according to the list of emission factors serving GHG inventory development announced by the Ministry of Natural Resources and Environment shall be applied.
3. In case where GHG emission factors are not specified in Clause 2 of this Article, GHG emission factors shall be applied under the latest guidelines of Intergovernmental Panel on Climate Change – IPCC.

Article 19. Method for facility-level GHG inventory development.

1. Calculation methods applied to GHG emission activities are provided in Section 2 Appendix II issued together with this Circular.
2. Formula for calculating GHG emissions:

$$KNK_i = AD_i * EF_i$$

Where:

- i : type of GHG;
- KNK_i : emission of GHG i (tonne);

- AD_i : activity data of GHG i ;
- EF_i : emission factor of GHG i .

3. Formula for calculating total GHG emissions of a facility:

$$TPT = \sum_i K_i K_i * GWP_i$$

Where:

- TPT : Total GHG emissions of the facility (tonne of CO₂td);
- GWP_i : global warming potential of GHG i applicable according to the latest IPCC guidelines.

Article 20. Management of the quality of facility-level GHG inventory development.

Procedures for management of the quality of facility-level GHG inventory development shall be carried out upon Section 6.1.2 of TCVN ISO 14064-1:2011, Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals

Article 21. Assessment of uncertainties of facility-level GHG inventory development.

The assessment of uncertainties of facility-level GHG inventory development shall follow guidelines specified in Article 11 of this Circular.

Article 22. Recalculation of facility-level GHG inventories.

1. A facility shall give explanation and recalculate GHG inventories of the previous periods in the following cases:

- a) There are changes to scope of GHG inventory development;
- b) There are changes to methods for GHG inventory development, thereby causing changes to results of the latest inventory;
- c) There are changes to GHG emission sources and factors.

2. The facility shall add recalculation results to the Report on facility-level GHG inventory development of the reporting period.

Article 23. Preparation of reports on facility-level GHG inventory development.

Facilities shall prepare reports on facility-level GHG inventory development, using Form No. 06 Appendix II of Decree No. 06/2022/ND-CP.

Article 24. Verification and report on facility-level GHG inventory development

1. Procedures for verification of facility-level GHG inventory development shall comply with regulations in Clause 4 and Clause 6 Article 11 of Decree No. 06/2022/ND-CP and Article 12 of Circular No. 01/2022/TT-BTNMT.

2. Facilities shall complete reports on GHG inventory development according to notification of verification results and report results of GHG inventories in accordance with regulations in Point c Clause 4 Article 11 of Decree No. 06/2022/ND-CP and Clause 4 Article 12 of Circular No. 01/2022/TT-BTNMT.

3. The Energy Efficiency and Sustainable Development Department shall take charge of receiving and consolidating reports on facility-level GHG inventory development in order to update them to the online database on GHG inventory development under management of the Ministry of Industry and Trade.

Chapter III

MEASUREMENT, REPORT, VERIFICATION OF REDUCTION IN GHG EMISSIONS

Section 1. GUIDANCE ON MEASUREMENT, REPORT, VERIFICATION OF REDUCTION IN INDUSTRY-LEVEL GHG EMISSIONS IN INDUSTRY AND TRADE SECTOR

Article 25. Bases for measurement, report, verification of reduction in industry-level GHG emissions

Measurement, report and verification of reduction in GHG emissions shall be carried out according to the industry-level GHG emission reduction plan and the Project for supervision of implementation of this plan. To be specific:

1. The industry-level GHG emission reduction plan under management of the Ministry of Industry and Trade, using Form No. 01 Appendix IV of Decree No. 06/2022/ND-CP includes the following contents:
 - a) Results of the industry-level GHG inventory development in the latest inventory period;
 - b) Emission baselines according to Business-As-Usual (BAU) scenarios for industries and

sub-industries according to guidance in Section 1 Appendix III issued together with this Circular;

c) Potential and objectives of reduction in GHG emissions;

d) Methods for and acts of reducing GHG emissions;

dd) Implementation organization;

2. The Project for supervision of implementation of the Plan for industry-level GHG emission reduction includes the following contents:

a) Information about the supervision system;

b) Methods for calculating GHG emissions for solutions to reduction in GHG emissions;

c) Measures for supervising and assessing objectives of industry-level GHG emission reduction.

Article 26. Measurement and calculation of industry-level GHG emission reductions in industry and trade sector

1. The measurement of industry-level GHG emission reduction shall be consistent with the Project for supervision of implementation of the plan for GHG emission reduction of this industry.

2. Industry-level GHG emission reductions in industry and trade sector shall be annually determined by the following formula:

$$GPT_{CT} = \sum GPT_t$$

Where:

- GPT_{CT} : Total GHG emission reductions of industries in the industry and trade sector in a year (tonne of CO_{2td});

- t : sub-industry t ;

- GPT_t : emission reduction of sub-industry t in a year (tonne of CO_{2td}). GPT_t is calculated as follows:

$$GPT_t = \sum_i (PTCS_{it} - KNK_{it})$$

Where:

- $PTCS_{it}$: GHG emissions in a year according to a Business-As-Usual (BAU) scenario with regard to sub-industry t and emission source i (tonne of CO_{2td});

- KNK_{it} : GHG emissions of sub-industry t and emission source i in a year (tonne of CO_{2td}).

Article 27. Industry-level GHG emission reduction report

Units shall take charge of preparing industry-level GHG emission reduction reports under management of the Ministry of Industry and Trade, using Form No. 01 Appendix III of Decree No. 06/2022/ND-CP.

Article 28. Verification and report on reduction in industry-level GHG emissions

1. The Energy Efficiency and Sustainable Development Department shall take charge of organizing verification of industry-level GHG emission reduction in the industry and trade sector according to procedures specified in Article 11 of Circular No. 01/2022/TT-BTNMT.

2. The unit in charge of preparing reports on reduction in industry-level GHG emissions shall complete such reports according to conclusions of the verification council and send them to the Ministry of Industry and Trade via the Energy Efficiency and Sustainable Development Department for consolidation.

3. The Energy Efficiency and Sustainable Development Department shall take charge of consolidating annual reports on reduction in industry-level GHG emissions of the Ministry of Industry and Trade in accordance with regulations in Point b Clause 3 Article 10 of Decree No. 06/2022/ND-CP.

Section 2. GUIDANCE ON MEASUREMENT, REPORT, VERIFICATION OF REDUCTION IN FACILITY-LEVEL GHG EMISSIONS IN INDUSTRY AND TRADE SECTOR

Article 29. Bases for measurement, report and verification of reduction in facility-level GHG emissions

Measurement, report and verification of reduction in GHG emissions shall be carried out according to the facility-level GHG emission reduction plan and the Project for supervision of implementation of this plan. To be specific:

1. Facility-level GHG emission reduction plan, using Form No. 02 Appendix IV of Decree No. 06/2022/ND-CP.

2. Project for supervision of implementation of the Plan for facility-level GHG emission reduction in accordance with regulations in Section 2 Appendix III issued together with this Circular.

Article 30. Measurement and calculation of facility-level GHG emission reductions

1. The measurement of facility-level GHG emission reduction shall be consistent with the Project for supervision of implementation of the plan for GHG emission reduction of this facility.
2. GHG emission reductions of the facility in a year shall be determined by the following formula:

$$GPT = \sum_d GPT_d$$

Where:

- GPT : GHG emission reductions of the facility in a year (tonne of CO_{2td});
- d : Method for reducing GHG emissions of the facility;
- GPT_d : GHG emission reductions of the facility in a year when the reduction method d is adopted (tonne of CO_{2td}); GPT_d is calculated as follows:

$$GPT_d = PTCS_d - PT_d$$

Where:

- PT_d : GHG emissions of the facility in a year in case when the reduction method d is adopted (tonne of CO_{2td});
- $PTCS_d$: Estimated GHG emissions of the facility in a year in case when the reduction method d is not adopted according to the Business-As-Usual (BAU) scenario (tonne of CO_{2td});

3. Methods for determining estimated GHG emissions and calculating GHG emission reductions of the facility shall be consistent with the GHG emission reduction plan and the Project for supervision of implementation of this plan of the facility.

Article 31. Facility-level GHG emission reduction report

The facility shall prepare a facility-level GHG emission reduction report, using Form No. 02 Appendix III of Decree No. 06/2022/ND-CP.

Article 32. Verification and report on reduction in facility-level GHG emissions

1. The verification of facility-level GHG emission reduction shall follow technical procedures specified in Section 3 Appendix III issued together with this Circular.
2. The facility-level GHG emission reduction verification report shall be prepared according to Form Appendix II.2 of Decree No. 01/2022/TT-BTNMT.
3. Facilities shall send reports on reduction in GHG emissions according to Point a, Clause 3 Article 10 of Decree No. 06/2022/ND-CP and Clause 4 Article 13 of Circular No. 01/2022/TT-BTNMT.

Chapter IV

IMPLEMENTATION PROVISIONS

Article 33. Entry into force

This Circular comes into force from February 11, 2024.

Article 34. Implementation

1. The Energy Efficiency and Sustainable Development Department shall provide guidance and conduct inspection and supervision of implementation of this Circular.
2. In case any legislative documents referred to in this Circular are amended, supplemented, or replaced, the new documents shall prevail.
3. Any difficulties that arise during the implementation should be reported to the Ministry of Industry and Trade (via Energy Efficiency and Sustainable Development Department) for consideration and settlement./.

**PP. MINISTER
DEPUTY MINISTER**

