Guidelines for Accounting and Reporting

Greenhouse Gas Emissions

China Electronic Equipment Manufacturing Enterprises

(Trial)

Instructions

I. Purposes and Significance of the Guidelines

The *Guidelines for Accounting and Reporting Greenhouse Gas Emissions from China Electronic Equipment Manufacturing Enterprises (Trial)* (the Guidelines), formulated by the National Development and Reform Commission (NDRC), seeks to achieve the aim of cutting carbon dioxide emissions per unit of GDP by 40% - 45% by 2020 from the 2005 level. The Guidelines were drafted according to demands of "establishing the statistical accounting system and building up carbon emission trading market" in the *12th Five-Year Plan Outline* and of "accelerating the establishment of 'national, local, enterprise' three-level accounting system of greenhouse gas emissions and system of requiring key enterprises to directly submit data of greenhouse gas emissions and energy consumption" in the *12th Five-Year Plan Work Program to Control Greenhouse Gas Emission* (No. 41 Document in 2011 of the State Council). The Guidelines endeavor to help enterprises (i) scientifically calculate and report their own greenhouse gas emissions, (ii) make control plans of greenhouse gas emissions, (iii) take active part in carbon emission trading, and (iv)strengthen enterprises' social responsibilities. Meanwhile, the Guidelines also pave the way for competent departments to establish and implement the system of key enterprises reporting greenhouse gas emissions, and make relevant policies accordingly.

II. Preparation Process

The Guidelines have been drafted by Sino Carbon Innovation & Investment CO., Ltd, entrusted by the National Development and Reform Commission. The drafting group used research achievements and practical experiences at home and abroad about accounting reports on greenhouse gas emissions, referred to the *Guidelines for Provincial Greenhouse Gas Inventories* issued by the General Office of the NDRC, conducted field researches, in-depth studies and pilot tests, and finally finished drafting the Guidelines for Accounting and Reporting Greenhouse Gas Emissions from China Electronic Equipment Manufacturing Enterprises (Trial). The

Guidelines strive to be science-based, comprehensive, standardized and practical. During the process of the Guideline development, strong support has been received from experts from China Electronics Standardization Institute, BOE Display Technology Co., Ltd (BOEDT), Foxconn Precision Components (Beijing) Co., Ltd and, Semiconductor Manufacturing International Corporation, among many others.

III. Main Contents

The *Guidelines for Accounting and Reporting Greenhouse Gas Emissions for China Electronic Equipment Manufacturing Enterprises* (Trial) include seven major sections and two appendices. The Guidelines provide the application scope, list of references, technical terminology, accounting boundary, accounting methodology, quality assurance, documentation and reporting content and forms. The greenhouse gases to be accounted include carbon dioxide, hydro-fluoro-carbons, perfluoro-carbon, sulfur hexafluoride and nitrogen trifluoride. The emission sources under consideration include fossil fuel burning, industrial production, net purchased electricity and heat. The Guidelines apply to electronic equipment manufacturing enterprises with legal person status and independent accounting units regarded as legal persons.

IV. Issues That Need Clarification

The Guidelines provide default parameter values associated with the industrial production for semiconductor manufacturing enterprises while referring to related data from the IPCC, WRI and Industrial Development Bureau, and the Ministry of Economic Affairs of Taiwan.

Considering the fact that enterprise-based GHG emissions accounting and reporting are a completely new endeavor, some inadequacies may be found in practical application of the Guidelines, and it is hoped that those application units may provide their individual feedback in a timely manner, all aimed at making further revision and improvement in the future.

The Guidelines are published by the National Development and Reform Commission, which is responsible for their interpretation and revision where

applicable.

Contents

1. Application Scope

The present Guidelines apply to accounting and reporting greenhouse gas emissions of electronic equipment manufacturing enterprises in China. Any enterprise engaged in electronic equipment manufacturing within the Chinese territory can make reference to the methods provided in the Guidelines to account the enterprise's greenhouse gas emissions and report its greenhouse gas emissions. In cases where enterprises produce other products apart from electronic equipment and also cause greenhouse gas emissions, they should calculate and report the emissions as requested in the GHG emission accounting and reporting guidelines for the enterprises in the relevant sectors.

2. References

The reference documents cited in the Guidelines mainly include:

Provincial Guidance on the Compilation of Greenhouse Gas Inventories (Trial);

The People's Republic of China National Greenhouse Gas Inventory; and

2006 IPCC Guidelines for National Greenhouse Gas Inventories.

The following documents are used as reference in the development of this Guideline:

Greenhouse Gas Accounting Tool (promulgated by Industrial Development Bureau (IDB), Ministry of Economic Affairs, Taiwan);

The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (2004 Revised Edition);

ISO 14064-1 Greenhouse gases Part 1: Specification with Guidance at the Organization Level for Quantification and Reporting of Greenhouse Gas Emissions and Removals; and

EU ETS Guideline- Methodology for GHG Monitoring and Reporting.

3. Terminology and Definitions

For the purposes of the Guidelines, the following terminology and definitions apply.

3.1 Greenhouse gases (GHGs)

A greenhouse gas is a natural or man-made atmospheric component in a gaseous state that absorbs and emits radiation within the thermal infrared range. The greenhouse gases herein refer to the six kinds of greenhouse gases under the Kyoto Protocol Annex A, namely, carbon dioxide (CO_2), methane(CH_4), nitrous oxide(N_2O), hydrofluorocarbons(HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride(SF6), with the addition of nitrogen trifluoride(NF_3). The greenhouse gases accounted in the Guidelines include all of these gases except N_2O and CH_4.

3.2 Electronic equipment manufacturing enterprises

Electronic equipment manufacturing enterprises refer to those engaged in inter-computer communication manufacturing or other electronic equipment manufacturing activities.

3.3 Reporting entities

Reporting entities refer to corporate enterprises or independent accounting units regarded as legal persons, which involve greenhouse gas emissions in their activities.

3.4 Emissions from fossil fuel burning

Emissions from fossil fuel burning refer to greenhouse gas emissions generated in the combustion reaction between fossil fuels and oxygen.

3.5 Emissions from industrial production processes

Emissions from industrial production processes refer to greenhouse gas emissions resulting from physical or chemical changes, except for combustion of raw materials. Greenhouse gas emissions caused by physical or chemical reaction except for fuel combustion, greenhouse gas leakage, waste gas treatment etc. in industrial production.

3.6CO_2emissions from net purchased electricity and heat

CO_2 emissions from net purchased electricity and heat refer to CO_2emissions generated from enterprises' consumption of net purchased electricity and

heat(steam and hot water).

3.7 Activity level

Activity level refers to quantification of production or consumption activities causing greenhouse gas emissions, including consumption of various fossil fuels, use of raw materials, purchased electricity, purchased steam etc.

3.8 Emission factors

Emission factors refer to the quantified rate of greenhouse gas emissions per unit of activity. Emission factors are usually obtained through sampling measurement or statistical analysis, indicating the representative emission ratio of a particular activity under given operating conditions.

3.9 Carbon oxidation rate

Carbon oxidation rate is the percentage of total carbon in fuels containing carbon oxidized in the process of combustion.

3.10 Etching

Etching refers to the process of selectively eroding or removing the surface or the mulching film on the surface of the semiconductor substrate according to the etch-mask or design requirements.

3.11 Cleaning the Chemical Vapor Deposition (CVD) chamber

Chemical Vapor Deposition (CVD) is a chemical process used to produce thin films on the substrate surface by introducing the vapor of gaseous or liquid reactant that consists of film component and other gases required for the reaction into the reaction chamber. CVD chamber cleaning is a process of cleaning out the residuals in the chamber by chemical reaction.

4. Accounting Boundary

Enterprise boundary

The reporting entities should be limited to enterprise legal persons. They shall identify, account and report the greenhouse gas emissions from all the production facilities within enterprise boundary. Production facilities include main production system, ancillary production system and affiliated production system. Ancillary

production system includes power, electricity supply, water supply, tests, machine maintenance, storerooms, transportation etc. Affiliated production system includes production command system (factory headquarters) and departments and units that serve production (like staff canteen, workshop bathroom, health station etc.).

Greenhouse gas emissions from electronic equipment manufacturing enterprises include: emissions from fossil fuel combustion, industrial production and net purchased electricity and heat. The emissions generated in the industrial production of electronic equipment manufacturing enterprises mainly come from the etching operation and CVD chamber cleaning during the production of semiconductors.

For greenhouse gas emissions from electronic equipment manufacturing enterprises and accounting boundary, see Figure 1.

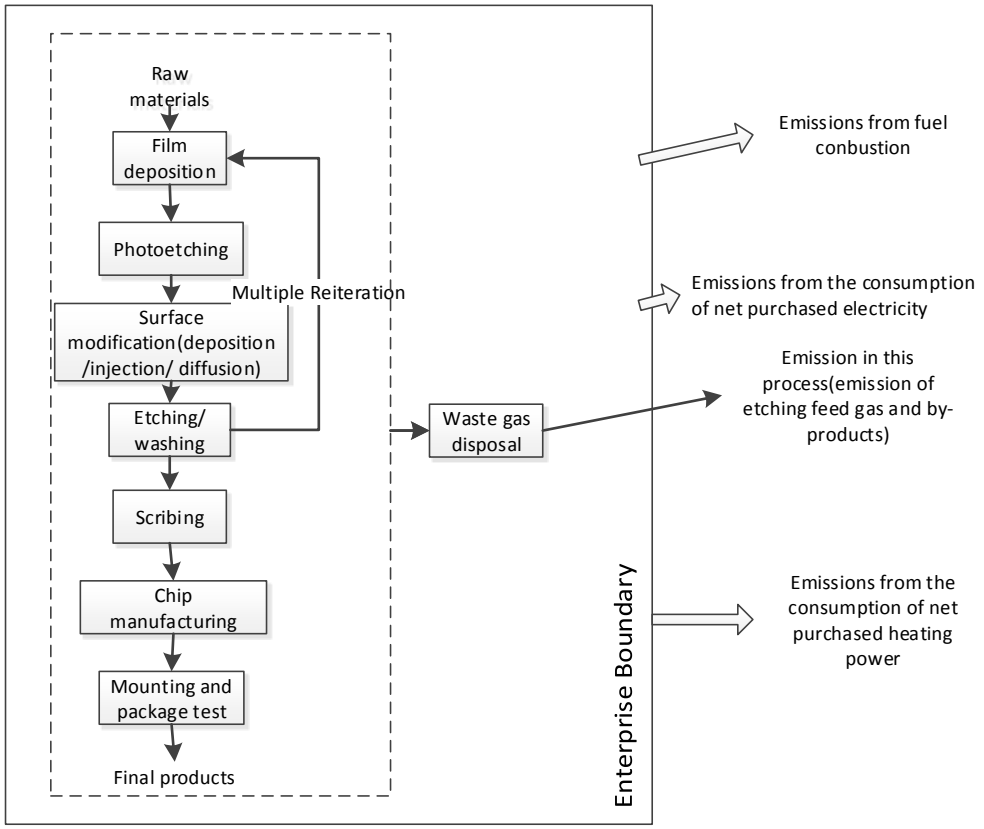

Figure 1 Typical greenhouse gas emissions from electronic equipment manufacturing enterprises and accounting boundary

Emission sources and types of gases that the reporting entities shall account include:

(1) Emissions from fossil fuel combustion. It refers toCO_2emissions generated by the combustion of fossil fuels with oxygen in all kinds of stationary or mobile combustion equipment (such as boiler, internal-combustion engine and waste gas treatment equipment etc.).

(2)Emissions from industrial production. It refers to the greenhouse gas emissions caused by chemical reaction or gas leakage in the process of etching and chamber cleaning though CVD of semiconductor production.

(3) CO_2emissions from net purchased electricity and heat. Although this part of emission actually takes place in enterprises producing electric power or heating power, it is triggered by consumption activities of the reporting entities. Thus this part of emissions shall be added to the total emissions of the reporting entities pursuant to relevant regulations.

(4) Other greenhouse gas emissions. In cases where reporting entities produce other products and cause extra greenhouse gas emissions, the enterprises shall account and report these emissions in accordance with the guidelines on accounting and reporting greenhouse gas emissions for the enterprises producing other products. Because related methods can be seen in the guidelines on accounting and reporting greenhouse gas emissions for the enterprises producing other products, no further explanation will be provided in the present Guidelines.

5. Accounting Methodology

The complete work flow for reporting enterprises to account greenhouse gas emissions includes:

(1) Setting the accounting boundary;

(2) Identifying the emission sources;

(3) Collecting activity level data;

(4) Selecting and obtaining data of emission factors;

(5) Calculating separately emissions from fossil fuel burning, industrial production and net purchased electricity and heat; and

(6) Adding up the total greenhouse gas emissions by companies.

The total greenhouse gas emissions by electronic equipment manufacturing enterprises equal the sum of all the greenhouse gas emissions from fossil fuels burning and in industrial production as well as that from net purchased electricity and heat. Calculate the emissions according to Equation (1):

$$\mathbf{E} = E_{burning} + E_{process} + E_{electricity} + E_{heat} \quad (1)$$

where,

E	total GHG (CO2) emissions (ton);
$E_{burning}$	CO2 emissions from fossil fuel burning within the boundary of companies (ton);
$E_{process}$	GHG (CO2) emissions in the process of industrial production within the boundary (ton);
$E_{electricity}$	CO2 emissions from net purchased electricity (ton); and
E_{heat}	CO2 emissions from net purchased heat (ton).

Calculate the aforementioned greenhouse gas emissions in the following ways:

5.1 Emissions from fossil fuel burning

5.1.1 Equation

CO2 emissions from fossil fuel burning is the sum of CO2 emissions from all types of fossil fuel consumed in the enterprise's accounting and reporting year. Calculate the amount according to Equation(2).

$$E_{burning} = \sum_{i=1}^{n} (AD_i \times EF_i) \quad (2)$$

where,

$E_{burning}$	CO2 emissions from fossil fuel burning within the boundary of companies (ton);
AD_i	Activity level of No.*i* fossil fuel during the reporting year(GJ);
EF_i	Emission factor of No.*i* fossil fuel (tCO2/GJ); and
I	Type of fossil fuel.

5.1.2 Obtaining activity level data

Activity level of fossil fuel burning by electronic equipment manufacturing enterprise are the result of all types of fuels consumption multiplied by the average low calorific value in the enterprise's accounting and reporting year. Calculate the value according to Equation(3):

$$AD_i = NCV_i \times \quad (3)$$

where,

AD_i	Activity level of No.*i* fossil fuel during the reporting year(GJ);
NCV_i	The average low calorific value of No.*i* fossil fuel during the reporting period; for solid or liquid fuel, the unit is GJ/t; for gas fuel, the unit is GJ/10,000Nm3;
FC_i	Net consumption of No.*i* fuel during the reporting period; for solid or liquid fuel, the unit is ton; for gas fuel, the unit is 10,000Nm3; and
I	Type of fossil fuel.

Net consumption of fuels is obtained through enterprise's measuring data, and the measuring device used should meet the requirements of*GB17168 General Principle for Equipping and Managing of the Measuring Instrument of Energy in Organization of Energy Using*. The reporting enterprise can use the recommended value in Appendix II of the Guidelines for average low calorific value of fossil fuel. Qualified enterprises can carry out actual measurement on their own, entrust specialized agencies to do the test, or use test results provided in the voucher of clearing by relevant parties. If the enterprise were to carry out actual measurements, the low calorific value test of fossil fuel should follow the standards in *GB/T 231 Determination of Calorific Value Coal, GB/T 384 Determination of Calorific Value of Petroleum Products* and *GB/T 22723 Energy Determination for Natural Gas*.

5.1.3 Obtaining emission factors data

Data of emission factors of fossil fuel burning from machinery manufacturing enterprises can be calculated through unit carbon content in NCV and carbon oxidation rate. Calculate the value according to Equation(4):

$$EF_i = CC_i \times OF_i \quad (4)$$

where,

EF_i	CO2 emission factor of No.*i* fuel (tCO_2 / GJ);
CC_i	Carbon per calorific value of No.*i* fuel (tC/GJ), use recommended value in Appendix II of the Guidelines;
OF_i	Carbon oxidation rate of No.i fossil fuel burning(%), use recommended value in Appendix II of the Guidelines; and
I	Type of fossil fuel

5.2 Emissions from industrial production

The emissions generated in the industrial production of electronic equipment manufacturing enterprises mainly come from the etching operation and CVD chamber cleaning. The greenhouse gas emissions in this process comprise the fluorated gas leakage and by-products (greenhouse gas) generated from the production. Fluorated gases include but are not limited to: NF_3, SF_6, CF_4, C_2F_6, C_3F_8, C_4F_6, c-C_4F_8, c-C_4F_8O, C_5F_8, CHF_3, CH_2F_2, and CH_3F. By-products include but are not limited to: CF_4, C_2F_6, C_3F_8.

Calculate the greenhouse gas emissions from etching and CVD chamber cleaning according to Equation(5):

$$E_{FC} = \sum_i E_{EFC,i} + \sum_{i,j} E \quad (5)$$

where,

E_{FC}	Greenhouse gas emissions from etching and CVD chamber cleaning, tCO_2e;
$E_{EFC,i}$	Emissions from of No.*i*fluorated gas leakage, tCO_2e;
$E_{BP,i,j}$	Emissions of No.*j* by-product generated by No.*i*fluorated gas, tCO2e;
I	Type of fluorated gas; and
J	Type of by-product.

Calculate the emission of each kind of fluorated gas according to Equation(6):

$$E_{EFC,i} = (1-h) \cdot FC_i \cdot (1-U_i) \cdot (1-a_i \cdot d_i) \cdot G \quad (6)$$

where,

$E_{EFC,i}$	Emissions from No.*i*fluorated gas leakage, tCO2e;
h	The proportion of residual gas in fluorated gas container, %;
FC_i	Usage of fluorated gas No.*i* during the reporting period, t;
U_i	Utilization rate of fluorated gas No.*i*, %;
a_i	Efficiency of fluorated gas No.*i* collection for exhaust treatment device, %;
d_i	Efficiency of fluorated gas No.*i* removal for exhaust treatment device, %;
GWP_i	Global warming potential(GWP） of fluorated gas No.*i;* and
I	Type of fluorated gas.

Calculate the consumption of fluorated gas according to Equation(7)：

$$FC_i = IB_i + P_i - IE_i \quad (7)$$

where,

FC_i	Usage of fluorated gas No.*i* during the reporting period, t;
IB_i	Initial stock of fluorated gas No.*i*, t;
IE_i	Closing stock of fluorated gas No.*i*, t;
P_i	Amount of fluorated gas No.*i* purchased during the reporting period, t; and
S_i	Outward sales/export amount of fluorated gas No.*i* during the reporting period, t.

Calculate the greenhouse gas emissions as by-products from etching and CVD chamber cleaning according to Equation(8):

$$E_{BP,i,j} = (1-h) \cdot B_{i,j} \cdot FC_i \cdot (1 - a_j \cdot d_j) \cdot (\quad (8)$$

where,

$E_{BP,i,j}$	Emissions of No.*j* by-product generated by No.*i*fluorated gas, tCO_2e;
H	The proportion of residual gas in fluorated gas container, %;
$B_{i,j}$	Transformation factors of by-product No.*j* generated from fluorated gas No.*i*, t by-product/t;
FC_i	Usage of fluorated gas No.*i* during the reporting period, t;
a_j	Efficiency of by-product No.*j* collection for exhaust treatment device, %;

d_j Efficiency of by-product No.*j* removal for exhaust treatment device, %;

GWP_j Global warming potential (GWP) of by-product No.*j;*

I Type of fluorated gas; and

J Type of by-product.

Enterprises shall confirm the usage of fluorated gas based on current account, statistical statement, purchase record, picking list etc. Refer to Table 2.2 for information about utilization rate of fluorated gas and transformation factors of by-product generated from fluorated gas. The collection and removal efficiency of fluorated gas and by-product for exhaust treatment device is provided by device provider. If not available, adopt the relevant recommended values in Table 2.2. Adopt the default 10% as the proportion of residual gas in fluorated gas container. The recommended values in the second assessment report of IPCC are adopted in global warming potential (GWP) of greenhouse gas.

5.3 Emissions generated from net purchased electricity and heat

5.3.1 Equation

CO_2emissions generated by net purchased electricity and heat are calculated according to Equations (9) and (错误!未找到引用源。).

$$E_{electricity} = AD_{electricity} \times EF_{elect} \quad (9)$$

$$E_{heat} = AD_{heat} \times E. \quad (10)$$

where,

$E_{electricity}$ CO_2emissions from net purchased electricity(ton);

E_{heat} CO_2emissions from net purchased heat(ton);

$AD_{electricity}$ Net purchased electricity used by the enterprise, MWh;

AD_{heat} Net purchased heat used by the enterprise, MWh;

$EF_{electricity}$ Emission factor of annual average electricity supply in the regional grid, tCO_2/MWh; and

EF_{heat} Emission factor of heat supply, tCO_2/GJ.

5.3.2 Acquisition of activity level data

Volume of net purchased electricity is based on electricity meter records. If no records are available, data in the electricity bill or settlement vouchers provided by suppliers can be adopted. The enterprise should calculate net purchased electricity data from different grids separately.

Volume of net purchased heat is based on thermal meter records. If no records are available, data in the thermal invoice or settlement vouchers provided by suppliers can be adopted.

5.3.3 Acquisition of emission factor data

Average emission factors of regional power grid should be divided based on the current production address of the enterprise in relation to the grid in the Northeast, North China, East China, Central China, Northwest, and Southern China. Regional emission factors in corresponding areas released by national authorities should be used for calculation. The CO2 emission factor for purchased heat is assumed to be 0.11 tCO2/GJ for the time being until official data is released by the government authority and should remain updated.

6. Quality Assurance and Documentation

Reporting entities should set up a quality guarantee and filing system for reporting greenhouse gas emissions, which shall includes:

6.1 Setting up rules and regulations for accounting and reporting of greenhouse gas emissions, including institutions and persons in charge, work procedure and content, work cycle and timelines; appointing professionals to take charge of the accounting and reporting of the company's greenhouse gas emissions;

6.2 Establishing and improving the record system of greenhouse gas emissions and energy consumption;

6.3 Making and improving greenhouse gas emissions monitoring plans. Companies, if permitted, can monitor parameters on a regular basis including net calorific value and carbon content of main fuels, carbon oxygenation rate of key combustion equipment, collection and removal efficiency of exhaust treatment device;

6.4 Setting up an internal auditing system for greenhouse gas emission reports; and

6.5 Setting up a management system of documents to save documents and related data of greenhouse gas emission accounting and reporting.

7. Content and Format of Report

The Report should include contents according to the format specified in Appendix I:

7.1 Basic information of the reporting entity

Basic information of the reporting entity should include the name of the entity, its nature of business, reporting year, industry involved, organization code, legal representative, person in charge and contact information.

7.2 Greenhouse gas emissions

Reporting entities should report the annual total amount of greenhouse gas emissions, as well as the amount of fossil fuel burning and discharge, emissions during industrial production, and emissions from net purchase of electricity and heating power.

7.3Activity level and its sources

Reporting entities should report the consumption of fuels for production and their corresponding net calorific value during the reporting year, the consumption of fluorated gas in industrial production and the net amount of purchased electricity and heat. Sources of these data should be noted (using the recommended value or measured value in this Guideline).

If reporting entities are also engaged in production other than electronic equipment manufacturing, they should report their activity level data and sources by referring to greenhouse gas emission accounting and reporting guidelines for relevant industrial sectors.

7.4Emission factors and their sources

Reporting entities should report data in the reporting year such as the amount of unit carbon content in NCV and carbon oxidation rate of fuels for production, the proportion of residual gas in fluorated gas container, the utilization rate of fluorated gas, transformation factors of by-products generated by fluorated gas, collection and removal efficiency of exhaust treatment device, annual average emission factors of power supply in regional power grids, and emission factors of heat power supply.

Entities should also note the sources of data (using recommended value or measured value in this Guideline).

If reporting entities are engaged in productions other than electronic equipment manufacturing, they should report their data of emission factors and sources of emission by referring to greenhouse gas emission accounting and reporting guidelines for the relevant industries.

Appendix I: Report Format Template

Greenhouse Gas Emissions Report for China's Electronic for China Electronic Equipment Manufacturing Enterprises

Reporting Entity (Seal):

Reporting Year:

Date: Day/ Month/ Year

Based on the *Guidelines for Accounting and Reporting Greenhouse Gas Emissions from China Electronic Equipment Manufacturing Enterprises* (Trial) issued by the National Development and Reform Commission, the entity has checked the amount of greenhouse gas emissions in the year of ____ and completed related tables. Relevant facts are listed as follows:

I. Basic Information of the Company

II. Greenhouse Gas Emissions

III. Activity Level lData and Source

IV. Data of Emission Factors and Sources

This report is true and reliable. If the information provided in this report fails to reflect the reality, this enterprise will bear the corresponding legal responsibility.

Legal Representative (Signature):

Day/ Month/ Year

Attachments:

Table 1-1: Summary Sheet of Greenhouse Gas Emissions of Reporting Entity

Table 1-2: Activity Level Data of Reporting Entity

Table 1-3: Emission Factors of Reporting Entity

Table 1-1: Summary Sheet of Greenhouse Gas Emissions of Reporting Entity

Types of Sources	**Types of Sources Mass of Greenhouse Gas**	**CO_2 Equivalent （Unit：tCO_2e）**
CO_2 emissions from fossil fuel burning		
CO_2emissions from industrial production		
HFCs* emissions from industrial production		
PFCs* emissions from industrial production		
NF_3 emissions from industrial production		
SF_6 emissions from industrial production		
CO_2 emissions from net purchased electricity and heat		
Total greenhouse gas emissions of enterprises(tCO_2e)		

*: Report the actual emissions of HFCs and PFCs and voluntarily report other emissions.

Table 1-2: Emission Data of Reporting Entity Types of Fuels

	Types of fuel	Consumption (t, 10,000Nm3)	Net Calorific Value （NCV） （GJ/t，GJ/10,000Nm^3）
Fossil Fuel Burning*	Blind coal		
	Soft coal		
	Brown coal		
	Cleaned coal		
	Other washed coal		
	Briquette coal		
	Petroleum coke		
	Other coal products		
	Coke		
	Crude oil		
	Fuel oil		
	Gasoline		
	Diesel		
	Common kerosene		
	Refinery dry gas		
	Liquefied natural gas		
	Liquefied petroleum gas		
	Naphtha		
	Aviation gasoline		
	Aviation kerosene		
	Other petroleum products		
	Natural gas		
	Coke oven gas		
	Blast furnace gas		
	Converter gas		
	Other coal gas		
Industrial Process**	**Name of Parameter**	**Value**	**Unit**
	Consumption of NF_3		t
	Consumption of SF_6		t
	Consumption of CF_4		t
	Consumption of C_2F_6		t
	Consumption of C_3F_8		t
	Consumption of C_4F_6		t
	Consumption of c-C_4F_8		t
	Consumption ofc-C_4F_8O		t
	Consumption of C_5F_8		t

	Consumption of CHF_3		t
	Consumption of CH_2F_2		t
	Consumption of CH_3F		t
Net Purchase of Electricity and Heat	Net purchase of electricity		MWh
	Net purchase of heat		GJ

* The company should add other types of energy actually consumed but not listed in the table.

** The company should add greenhouse gas emission links actually covered but not listed in the table. If the company engages in production other than electronic equipment, greenhouse gas emission links not covered in the Guidelines should be reported. Please mark the amount of consumption of other fluorine-containing gas.

Table 1-3: Emission Factors and Calculation Coefficients of Reporting Entity

	Types of fuel	unit carbon content in NCV (tC/GJ)	Carbon oxidation rate （%）
Fossil Fuel Burning*	Blind coal		
	Soft coal		
	Brown coal		
	Cleaned coal		
	Other washed coal		
	Briquette coal		
	Petroleum coke		
	Other coal products		
	Coke		
	Crude oil		
	Fuel oil		
	Gasoline		
	Diesel		
	Common kerosene		
	Refinery dry gas		
	Liquefied natural gas		
	Liquefied petroleum gas		
	Naphtha		
	Aviation gasoline		
	Aviation kerosene		
	Other petroleum products		
	Natural gas		
	Coke oven gas		
	Blast furnace gas		
	Converter gas		
	Other coal gas		
Emissions from industrial production**	**Name of Parameter**	**Value**	**Unit**
	Utilization rate of NF_3		%
	Utilization rate of SF_6		%
	Utilization rate of CF_4		%
	Utilization rate of C_2F_6		%
	Utilization rate of C_3F_8		%
	Utilization rate of C_4F_6		%
	Utilization rate of c-C_4F_8		%
	Utilization rate of c-C_4F_8O		%
	Utilization rate of C_5F_8		%
	Utilization rate of CHF_3		%
	Utilization rate of CH_2F_2		%
	Utilization rate of CH_3F		%

Transformation factor of CF_4 generated from NF_3		%
Transformation factor of CF_4 generated from C_2F_6		%
Transformation factor of CF_4 generated from C_3F_8		%
Transformation factor of CF_4 generated from c-C_4F_8		%
Transformation factor of CF_4 generated from CHF_3		%
Transformation factor of CF_4 generated from CH_2F_2		%
Transformation factor of C_2F_6 generated from C_4F_6		%
Transformation factor of C_2F_6 generated from c-C_4F_8		%
Transformation factor of C_2F_6 generated from C_5F_8		%
Transformation factor of C_3F_8 generated from c-C_4F_8O		%
Efficiency of NF_3 collection for exhaust treatment device		%
Efficiency of SF_6 collection for exhaust treatment device		%
Efficiency of CF_4 collection for exhaust treatment device		%
Efficiency of C_2F_6 collection for exhaust treatment device		%
Efficiency of C_3F_8 collection for exhaust treatment device		%
Efficiency of C_4F_6 collection for exhaust treatment device		%
Efficiency of c-C_4F_8 collection for exhaust treatment device		%
Efficiency of c-C_4F_8O collection for exhaust treatment device		%
Efficiency of C_5F_8 collection for exhaust treatment device		%
Efficiency of CHF_3 collection for exhaust treatment device		%
Efficiency of CH_2F collection for exhaust treatment device		%
Efficiency of CH_3F collection for exhaust treatment device		%
Efficiency of NF_3 removal for exhaust treatment device		%

	Efficiency of SF_6 removal for exhaust treatment device		%
	Efficiency of CF_4 removal for exhaust treatment device		%
	Efficiency of C_2F_6 removal for exhaust treatment device		%
	Efficiency of C_3F_8 removal for exhaust treatment device		%
	Efficiency of C_4F_6 removal for exhaust treatment device		%
	Efficiency of c-C_4F_8 removal for exhaust treatment device		%
	Efficiency of c-C_4F_8O removal for exhaust treatment device		%
	Efficiency of C_5F_8 removal for exhaust treatment device		%
	Efficiency of CHF_3 removal for exhaust treatment device		%
	Efficiency of CH_2F removal for exhaust treatment device		%
	Efficiency of CH_3F removal for exhaust treatment device		%
Net Purchase of Electricity and Heat	Electricity		tCO_2/MWh
	Heat		tCO_2/ GJ

* The company should add other types of energy actually consumed but not listed in the table.

** The company should add greenhouse gas emission links actually covered but not listed in the table. Other parameters of the same category should also be listed. If the company engages in production other than electronic equipment, greenhouse gas emission links not covered in the Guidelines should be reported.

Appendix II: Recommended Value of Relevant Parameters

Table2-1: Recommended Value of Relevant Parameters of Common Fossil Fuels

Types of fuel		Unit of measurement	Net Calorific Value (NCV) (GJ/t, GJ/10^4Nm^3)	unit carbon content in NCV (tC/GJ)	Carbon oxidation rate of fuels
Solid Fuels	Blind coal	t	26.7[c]	27.4[b]×10^{-3}	94%
	Soft coal	t	19.570[d]	26.1[b]×10^{-3}	93%
	Brown coal	t	11.9[c]	28[b]×10^{-3}	96%
	Cleaned coal	t	26.334[a]	25.41[b] ×10^{-3}	90%
	Other	t	12.545[a]	25.41[b] ×10^{-3}	90%
	Briquette	t	17.460[d]	33.6[b]×10^{-3}	90%
	Petroleum	t	32.5[c]	27.5[b]×10^{-3}	98%
	Other coal	t	17.460[d]	33.60[d]×10^{-3}	90%
	Coke	t	28.435[a]	29.5[b]×10^{-3}	93%
Liquid Fuel	Crude oil	t	41.816[a]	20.1[b]×10^{-3}	98%
	Fuel oil	t	41.816[a]	21.1[b]×10^{-3}	98%
	Gasoline	t	43.070[a]	18.9[b]×10^{-3}	98%
	Diesel	t	42.652[a]	20.2[b]×10^{-3}	98%
	Common	t	43.070[a]	19.6[b]×10^{-3}	98%
	Refinery dry	t	45.998[a]	18.2[b]×10^{-3}	99%
	Liquefied	t	44.2[c]	17.2[b]×10^{-3}	98%
	Liquefied	t	50.179[a]	17.2[b]×10^{-3}	98%
	Naphtha	t	44.5[c]	20.0[b]×10^{-3}	98%
	Others	t	40.2[c]	20.0[b]×10^{-3}	98%
Gas Fuel	Natural gas	10^4Nm^3	389.31[a]	15.3[b]×10^{-3}	99%
	Coke oven	10^4Nm^3	179.81[a]	13.58[b]×10^{-3}	99%
	Blast furnace	10^4Nm^3	33.000[d]	70.8[c]×10^{-3}	99%
	Converter	10^4Nm^3	84.000[d]	49.60[d]×10^{-3}	99%
	Other coal	10^4Nm^3	52.270[a]	12.2[b]×10^{-3}	99%

Note: a: *Annals of China Energy Statistics in 2013*; b: *Provincial Guidance on the Compilation of Greenhouse Gas Inventories (Trial)*; c: *2006 IPCC Guidelines for National Greenhouse Gas Inventories;* d: *The People's Republic of China National Greenhouse Gas Inventory (2007).*

Table2-2: Emission Factors and Recommended Value In Industrial Production

	Utilization rate of fluorated gas	Efficiency of fluorated gas/by-product collection for exhaust treatment device	Efficiency of fluorated gas/by-product removal for exhaust treatment device	Transformation factor of CF_4 generated from fluorated gas	Transformation factor of C_2F_6 generated from fluorated gas	Transformation factor of C_3F_8generated from fluorated gas
NF_3	0.8①	0.9①	0.95①	0.09①		
SF_6	0.8①	0.9①	0.9①			
CF_4	0.1①	0.9①	0.9①			
C_2F_6	0.4①	0.9①	0.9①	0.2①		
C_3F_8	0.6①	0.9①	0.9①	0.1①		
C_4F_6					0.2②	
c-C_4F_8	0.9①	0.9①	0.9①	0.1①	0.1①	
c-C_4F_8O						0.04②
C_5F_8					0.04②	
CHF_3	0.6①	0.9①	0.9①	0.07①		
CH_2F_2				0.08②		
CH_3F						

Note: Sources of aforementioned data: ①*Greenhouse Gas Accounting Tool (promulgated by Industrial Development Bureau* (IDB), Ministry of Economic Affairs, Taiwan); ②IPCC2006

Table2-3: Recommended Value of Other Emission Factors

Name of Parameter	Unit	Emission Factor of CO_2
Electricity	tCO_2/MWh	the latest national value adopted
Heat	tCO_2/ GJ	0.11