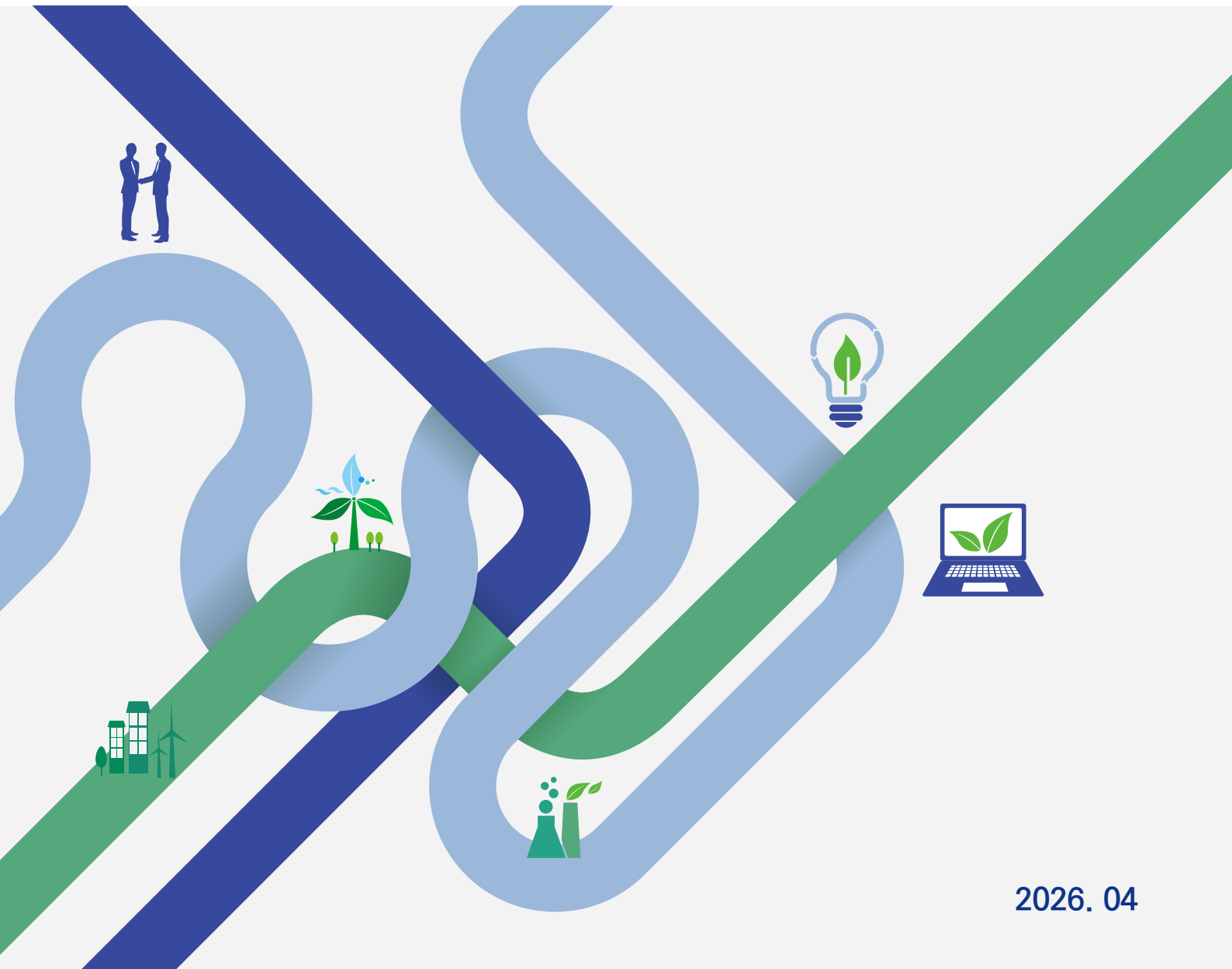


Calculation Guidance for Scope 3 Emissions in the Display Industry



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Ministry of Climate, Energy
and Environment



Korea Environmental
Industry & Technology Institute

Against the backdrop of prolonged low growth, major countries such as the United States (US) have implemented adjustments to ESG-related policies. Nevertheless, global corporations and investors continue to demand sustainability information, and many countries and regions, including the European Union (EU) and Japan, are steadily advancing the institutionalization of disclosure standards. As a result, the overall trajectory of sustainability, particularly in relation to environmental issues, is expected to remain valid in the long term.

Sustainability disclosures addressing environmental, social, and governance (ESG) factors increasingly emphasize climate-related information, particularly the calculation of greenhouse gas (GHG) emissions. These disclosure requirements often extend beyond the reporting entity's direct operations to include emissions across the entire value chain. While the US SEC recently excluded Scope 3 emissions from its initial climate disclosure proposal, both the European Sustainability Reporting Standard (ESRS) and the International Financial Reporting Standards (IFRS)'s Sustainability Disclosure Standard include Scope 3 emissions. This evolving landscape underscores the growing importance for Korean companies to be prepared for reporting Scope 3 emissions.

To support this effort, the Ministry of Environment launched a pilot series of documents entitled “*Calculation Guidance for Scope 3 Emissions*” in 2023. Among Korea's 15 major export industries, those facing the most urgent ESG and environmental regulatory challenges have been prioritized for guidance development. Following the publication of guidance for the rechargeable battery industry in 2023, the Ministry selected the semiconductor and display sectors as focus areas for 2024.

This current guidance for the display sector was developed by the Scope 3 Emissions Calculation Working Group for the Display Industry, a collaborative initiative involving the Ministry of Environment, the Korea Environmental Industry & Technology Institute (KEITI), leading display manufacturers, and the Korea Display Industry Association (KDIA). The working group reviewed domestic and international environmental-regulatory trends, analyzed current methodologies used by participating companies to calculate Scope 3 emissions, and incorporated expert feedback to enhance the completeness of this guidance.

The calculation methodology in the guidance is based on two key components of the internationally recognized GHG Protocol: the *Corporate Value Chain (Scope 3) Accounting and Reporting Standard* and the *Technical Guidance for Calculating Scope 3 Emissions*. To enhance its practical applicability, the guidance provides specific examples of calculations for each emissions category as defined by the GHG Protocol. While designed primarily for display companies, these examples are also applicable to other industries seeking to improve their emissions-reporting practices.

Calculating Scope 3 emissions enables companies to identify greenhouse gases generated throughout their supply chains, set credible reduction targets, and ultimately progress toward carbon neutrality. We anticipate that this guidance will serve as a valuable tool in supporting companies' ongoing efforts to achieve their net-zero goals.

* This guidance is current as of March 2025.





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I

Significance of Scope 3 Emissions in the Display Industry

01 Overview of the Display Industry

Korea's display sector—alongside semiconductors—has become one of the nation's flagship export industries, securing a pivotal position in the global market. Fueled by Fourth Industrial Revolution applications that extend beyond traditional TVs and computer monitors to include automotive and IT devices, the global display market is projected to reach USD 123.8 billion in 2024, representing year-on-year growth of 6.7 percent. Korea's display exports are expected to rise 6.5 percent to USD 19.8 billion, largely attributable to Korean firms' dominance in OLED panels.

Korea's display industry, once driven by LCDs, has gradually reduced its reliance on LCD production since 2019 in response to oversupply and large-scale investments from China, while actively promoting a strategic shift toward OLED technology as a new export growth engine. As a result, OLED accounted for 75.8 percent of Korea's display exports in 2023,¹⁾ and this upward trend is expected to strengthen in the years ahead.

The display value chain consists broadly of R&D, design, procurement, production, and end-use stages. Centered around panel makers, its value chain extends upstream to materials, parts, and equipment suppliers, and downstream to electronics manufacturers.

As a nation with a powerful end-to-end industrial base in displays, Korea has established a production and demand structure centered around large conglomerates and continues to exert significant influence in the global market by leading next-generation display technologies such as OLED, QLED, and Micro-LED. However, many upstream suppliers of materials, parts, and equipment are small or medium-sized enterprises (SMEs), highlighting the need to strengthen their competitiveness and foster a more balanced ecosystem.

Despite the sector's momentum, global climate change imperatives and GHG reduction commitments make it essential for display companies to manage and reduce their emissions. According to the 2020 National Greenhouse Gas

1) Press release by Korea Display Industry Association (KDIA): "OLED Leads Display Exports" (Feb 7, 2024)

Inventory Report by the Greenhouse Gas Inventory and Research Center (GIR), the display industry emitted 11.54 million tCO₂eq—approximately 0.3 percent of Korea's industrial emissions—ranking tenth among total industry sectors.²⁾ The primary sources are indirect emissions from electricity use and process emissions from high-Global Warming Potential (GWP) gases such as PFCs, SF₆, and NF₃, which are subject to increasingly stringent global regulations.

In response, major display companies are adopting carbon-neutral strategies, including expanding renewable-energy procurement and installing additional abatement facilities at the process stage. As full value-chain (Scope 3) accounting gains importance, emission management is now critical not only for large panel makers, but also for suppliers of materials, parts, and equipment. Therefore, this guidance aims to support all actors across the display value chain in calculating their emissions accurately, paving the way for sustained reductions and more sustainable production practices.

02 Supply Chain-Related Regulations

In the face of urgent climate challenges and the transition toward sustainability, the global economy is undergoing profound transformation. Achieving sustainable management requires companies to assume responsibility across their entire supply chains, rather than limiting efforts to their own operations. Additionally, supply chain disruptions triggered by US-China trade tensions and pandemic-related border closures have prompted major economies to adopt regulations designed to bolster economic security.

Prominent supply-chain measures include the EU's Corporate Sustainability Due Diligence Directive (CSDDD) and the Critical Raw Materials Act (CRMA). These frameworks require companies to uphold environmental responsibilities not only in their own production processes but also across their supply chains by adopting transparent and sustainable practices. As a result, robust supply chain management has become integral to credible corporate carbon neutrality strategies ([Reference 1]).

Within Korea's display sector, government and industry initiatives have reduced import dependence for most OLED-related materials, parts, and equipment. However, reliance on certain critical inputs—such as fine metal masks (FMMs) and polyimide—remains nearly complete. This dependence leaves the sector particularly vulnerable to supply-chain regulations, making comprehensive oversight more critical than in many other industries. Consequently, display manufacturers must work closely with suppliers to enhance environmental responsibility across the supply chain and systematically measure and manage Scope 3 GHG emissions. Both efforts are indispensable for improving global competitiveness.

2) Industrial Sector Greenhouse Gas Statistics under the Carbon Neutrality section in the Energy GHG Total Information Platform Service (EG-TIPS) (https://tips.energy.or.kr/carbon/Ggas_industry.do)

Scope 3 emissions capture all carbon emissions generated across a company’s value chain, with a significant portion originating in the supply chain. Accordingly, supply-chain regulations affect not only reporting companies but also their upstream and downstream partners. To address these challenges, many companies are actively engaging stakeholders to identify and mitigate climate-related risks throughout the value chain, including emissions accounting. In addition, they are providing training and support to suppliers to encourage green procurement practices.

[Reference 1]

Examples of supply chain regulations in the EU

Regulation	Scope	Key Obligations	Major Impacts
CSDDD	• (July 2028 ~) Companies with €900 million in net turnover and over 3,000 employees ¹⁾	• Report on due diligence measures for direct supply chains—including risk assessment, prevention, and mitigation measures—based on monitoring conducted every five years.	• Companies with a high proportion of exports to the EU need to proactively prevent supply chain risks
	• (July 2029 ~) Companies with €450 million in net turnover and over 1,000 employees	• Adopt and implement a climate transition plan, updating it annually	
CRMA	• Companies involved in mining, processing, or recycling of 34 designated critical raw materials	• Conduct a supply chain risk assessment every two years and indicate the origin of raw materials used	• Reviewing climate transition plans including supply chain emissions is necessary
		• Meet requirements for sourcing and recycling a certain proportion of raw materials within the EU	• Changes in raw material sourcing and recycling systems are needed

(Source: Compiled and edited based on information from corporate-sustainability-due-diligence-directive.com and the Critical Raw Materials Act section of the European Commission website.)

1) Although the laws for this group of companies were initially scheduled to take effect in July 2027, the EU adopted the “Stop-the-Clock” Directive on April 14, 2025, which postponed the obligations for this group from July 2027 to July 2028. The deadline for EU member states to transpose CSDDD into national law has also been delayed by one year to July 26, 2027.

03 Global Sustainability Disclosure Standards

1. Overview of Global Disclosure Standards

As the need for mandatory ESG disclosure and standardization becomes increasingly prominent, corporate sustainability reporting standards are converging on the ESRS³⁾ of the European Financial Reporting Advisory Group (EFRAG), the US SEC’s climate disclosure requirements,⁴⁾ and the IFRS’s ISSB disclosure standards⁵⁾ ([Reference 1]). Although requirements differ across these frameworks, they commonly mandate calculation and disclosure of a reporting entity’s Scope

3) European Sustainability Reporting Standards (ESRS)
4) U.S. Securities and Exchange Commission (SEC), The Enhancement and Standardization of Climate-Related Disclosures for Investors
5) International Sustainability Standards Board (ISSB), Sustainability Disclosure Standards.

3 emissions based on materiality assessments. Notably, the US SEC’s final rules exclude Scope 3 emissions from mandatory disclosures.

[Reference 1]

Overview of key global sustainability disclosure standards

Disclosure standards	EU ESRS ¹⁾	US SEC Regulation ²⁾	IFRS ISSB
Overview	• Sustainability reporting standards detailing the requirements for entities, including EU Taxonomy disclosures • Consists of two general standards (ESRS 1, ESRS 2) and 10 topical standards (ESRS E1–E5, ESRS S1–S4, ESRS G1)	• Climate information disclosure is required for SEC-listed companies • Consists of general climate disclosures (Items 1500–1504 [metrics and targets] under Regulations S–K), GHG emissions disclosures (Items 1505–1506 under Regulations S–K), and disclosures on the impact on financial statements (Articles 14–01 and 14–02 under Regulations S–X)	• Global disclosure standards for information about sustainability • Consists of general principles for sustainability topics (S1) and climate-related disclosures (S2), with S2 further divided into cross-industry and industry-based disclosure requirements
Scope and Timeline	• (FY24, Wave 1) Listed enterprises with more than 1000 employees and either a net turnover above EUR 50 million or a balance sheet above EUR 25 million³⁾ • (FY27, Wave 2) Unlisted enterprises with more than 1000 employees and either a net turnover above EUR 50 million or a balance sheet above EUR 25 million • (FY28, Wave 4) Large* EU subsidiaries or branches (net turnover above EUR 50 million) and non-EU parent companies with net turnover in the EU exceeding EUR 450 million.⁴⁾ * A large company defined as meeting at least two of the criteria (assets above EUR 25 million, net turnover above EUR 50 million, or more than 250 employees) per Commission Delegated Directive (EU) 2023/2775 Article 1(4)).	• (FY25) Large Accelerated Filers (LAF)* • (FY26) Accelerated Filers (AF)** • (FY27) Non-Accelerated Filers (NAF) (including SRC, EGC)*** * Market capitalization of USD 700 million or more ** Market capitalization between USD 75 million and USD 700 million and annual revenue of USD 100 million or more *** The abbreviations for Small Reporting Company, and Emerging Growth Company	• Companies reporting general-purpose financial statements in participating countries • Adoption of the disclosure standards determined by each jurisdiction
Organizational Boundaries	• Follows the financial reporting boundaries, with additional consideration of operational control* * Includes both consolidated entities and non-consolidated entities under operational control for		

2. GHG Emissions Reporting Requirements According to Global Disclosure Standards

1) ESRS

(Reporting entities and scope) Under the ESRS framework, the disclosure timelines for entities subject to sustainability reporting are aligned. According to the ESRS guidelines, reporting entities must report Scope 1 and Scope 2 emissions separately for all entities over which they exercise operational control. They must also disclose total Scope 3 emissions, along with emissions from key categories identified through value chain analysis. Any exclusions of Scope 3 categories must be explicitly justified. The calculation of Scope 3 emissions follows the *GHG Protocol Accounting and Reporting Standard*.

According to the detailed guidelines, entities must report emissions on both financial and operational control bases. Specifically, companies are required to include 100% of Scope 1, Scope 2, and Scope 3 emissions from subsidiaries over which they have financial (accounting) control in the reporting entity's inventory. For other types of companies—such as joint ventures, associates, and non-consolidated subsidiaries—emissions should be calculated and reported based on whether operational control is exercised, clearly distinguishing these entities from wholly owned subsidiaries.

(Reporting boundary) Reporting entities are required to disclose, for the reporting period, the total GHG emissions for Scope 1, Scope 2, and Scope 3, the aggregated total GHG emissions across all Scopes; the proportion of emissions calculated using primary data; the calculation methodologies applied; and any calculation tools used, if applicable.

- **Scope 1** Total GHG emissions
- **Scope 2** Total location-based and market-based GHG emissions
- **Scope 3** Total GHG emissions by categories and justification for any exclusions

2) ISSB

(Reporting boundary) Entities reporting under ISSB are required to disclose GHG emissions, including Scope 3, unless otherwise determined by jurisdictional authorities. The adoption timeline and requirements are subject to each country's regulatory decisions. Entities must follow the GHG Protocol methodology (e.g., equity method and control approach) for both consolidated and non-consolidated entities.

(Reporting entities and scope) Reporting entities must disclose total GHG emissions for Scope 1, Scope 2, and Scope 3. For each Scope, they are required to provide detailed descriptions of calculation methodologies used and justification for any methodological changes during the reporting period. Detailed guidelines further require that Scope 3 disclosures be based on a Measurement Framework for Reliable Emission Calculation. This framework

emphasizes the use of dependable measurement methods, input factors, and assumptions. Companies are advised to prioritize data sources according to defined criteria to ensure accuracy and reliability.

- **Scope 1** Total GHG emissions
- **Scope 2** Total location-based GHG emissions (market-based disclosures are required if contractual instruments exist)
- **Scope 3** Total GHG emissions by categories and justification for any exclusions

3) KSSB⁶⁾

(Reporting entities and scope) Entities reporting under KSSB must follow the GHG Protocol methodology (equity method and control approach) for both consolidated and non-consolidated entities. The obligations and timeline for mandatory disclosure are currently being finalized after stakeholder feedback was collected until August 31, 2024.

(Reporting boundary) Entities must disclose total GHG emissions for Scope 1, Scope 2, and Scope 3. Reports must specify measurement approaches used, input variables (such as emission factors), assumptions applied, and justifications for any changes in methodologies during the reporting period. According to the KSSB exposure draft, disclosure of Scope 3 emissions is expected in order to enhance information utility and ensure alignment with international standards. However, the mandatory timeline for Scope 3 disclosure will be finalized after incorporating stakeholder feedback.

- **Scope 1** Total GHG emissions
- **Scope 2** Total location-based GHG emissions
- **Scope 3** Total GHG emissions by categories (including the input variables and assumptions used in the calculation)



6) Exposure Draft of the Korean Sustainability Disclosure Standards (KSDS), developed by the Korea Sustainability Standards Board (KSSB) on April 30, 2024

Building a Scope 3 Greenhouse Gas Inventory

01 Significance of Scope 3

1. Defining Scope 3 Emissions

GHG emissions are broadly categorized into direct and indirect emissions, as well as Scope 1, Scope 2, and Scope 3, determined by the organizational and operational boundaries of the reporting entity. Direct GHG emissions come from sources owned or controlled by the reporting entity, while indirect GHG emissions result from the entity’s activities but occur at sources not owned or controlled by the reporting entity. To ensure that GHG emissions are calculated and reported without double counting or omission, they are categorized into three Scopes: Scope 1 encompasses all direct emissions, while Scope 2 and Scope 3 include indirect emissions ([\[Reference 1\]](#)).

[Reference 1]

Definitions of Scope 1, Scope 2, and Scope 3

- **Scope 1 (direct emissions)**
Direct GHG emissions originating from sources owned or controlled by the entity
Examples: Emissions from combustion in entity-owned or controlled boilers, furnaces, or motor vehicles
- **Scope 2 (indirect emissions)**
Indirect GHG emissions resulting from the generation of purchased electricity, steam, heating, or cooling consumed by the entity
Examples: Emissions from the production of electricity, steam, or heat consumed by the entity in its operations
- **Scope 3 (indirect emissions)**
All other indirect GHG emissions arising from the reporting entity’s value chain that are not included in Scope 1 and 2, including both upstream and downstream emissions
Examples: Emissions from the production of purchased goods and services; emissions associated with employee business travel and commuting; emissions from the transportation and distribution of purchased products

Scope 3 refers to all indirect GHG emissions from activities in the value chain that are outside the entity’s ownership or direct control. In other words, Scope 3 encompasses indirect emissions that are not within Scope 1 and 2. These emissions may include those associated with the extraction and production of purchased goods, transportation-related activities (such as the transport of purchased materials, goods, and fuels, employee business travel and

commuting, the transport of sold products, and waste transport), electricity-related activities not included in Scope 1 or Scope 2, and emissions from leased assets and franchised operations.

Scope 3 emissions are further classified into 15 detailed categories as defined by the GHG Protocol, which are broadly divided into upstream and downstream emissions (refer to “01. Significance of Scope 3” under “II. Building a Scope 3 Greenhouse Gas Inventory”). Upstream emissions refer to indirect GHG emissions resulting from the goods and services purchased or acquired by the reporting entity, covering emissions that occur until the point where the purchased goods are received. Downstream emissions, on the other hand, refer to indirect GHG emissions that occur during the distribution, storage, use, and disposal of sold products and services. This category encompasses emissions that arise after control of the goods has been transferred from the reporting entity to other companies or consumers.

2. Classifying Scope 3 Categories

Scope 3 emissions encompass all indirect emissions, excluding Scope 1 and Scope 2 emissions, that occur within the value chain of the reporting entity. The reporting entity shall calculate Scope 3 emissions according to its established organizational and operational boundaries, including the following items:

- Report the aggregated GHG emissions (CO₂, CH₄, N₂O, HFCs, PFCs, SF₆, NF₃) from all Scope 3 activities within the organizational and operational boundaries.
- Exclude from Scope 3 any biological CO₂ emissions from the value chain (e.g., CO₂ emissions from biomass combustion) and GHG removals (e.g., biological carbon sequestration), which can be reported separately (e.g., in a corporate disclosure report).

The reporting entity should attempt to achieve completeness in GHG accounting. However, it may not be feasible to account for all Scope 3 emissions, and some categories may not be applicable in certain situations (e.g., when no leased assets or franchises are present). In such cases, the reporting entity should report “zero” emissions or “not applicable” for the relevant categories. Additionally, if certain data constraints or other limitations make it impossible to estimate emissions (e.g., difficulties in data collection), the corresponding Scope 3 activities can be excluded from reporting. However, any exclusions should be disclosed and justified, along with a plan to improve data collection and estimation in the future.

As a general principle, activities that are likely to contribute significantly to Scope 3 emissions shall not be excluded. The reporting entity’s Scope 3 inventory shall accurately reflect its GHG emissions to meet the needs of both

internal and external

Industries required to use the financial control approach according to IFRS S2 industry-based guidance

The IFRS S1 (General Requirements for Disclosure of Sustainability-related Financial Information) and S2 (Climate-related Disclosures) standards do not prescribe a specific approach for setting organizational boundaries. However, the industry-based guidance (IBG) for IFRS S2 requires using the financial control approach for reporting consolidated GHG emission data in certain industries when disclosing GHG emissions.

The industries for which the IBG requires the financial control approach are as follows:

No.	IFRS S2 annex	Sustainable Industry Classification System (SICS) industry
1	7 (EM-CO)	Coal operations
2	8 (EM-CM)	Construction materials
3	9 (EM-IS)	Iron & steel producers
4	10 (EM-MM)	Metals & mining
5	11 (EM-EP)	Oil & gas—exploration and production
6	12 (EM-MD)	Oil & gas—midstream
7	13 (EM-RM)	Oil & gas—refining and marketing
8	20 (FB-AG)	Agricultural products
9	22 (FB-FR)	Food retailers & distributors
10	23 (FB-MP)	Meat, poultry, & dairy
11	32 (IF-EU)	Electric utilities & power generators
12	38 (IF-WM)	Waste management
13	43 (RR-PP)	Pulp & paper products
14	47 (RT-CH)	Chemicals
15	48 (RT-CP)	Containers & packaging
16	57 (TC-SC)	Semiconductors
17	60 (TR-AF)	Air freight & logistics
18	61 (TR-AL)	Airlines
19	65 (TR-CL)	Cruise lines
20	66 (TR-MT)	Marine transportation
21	67 (TR-RA)	Rail transportation
22	68 (TR-RO)	Road transportation

(Source: Compiled and edited based on information from the Industry-based Guidance on Implementing IFRS S2 Volume 1–68.)

* For industries where GHG emissions are not a disclosure requirement, the IBG, like IFRS S2, does not mandate the use of any specific approach.

2) Operational control approach

A reporting entity is considered to have operational control over an activity if it has full authority to introduce and implement policies, either directly or through one of its subsidiaries. Specifically, if the reporting entity or any of its subsidiaries acts as the operator of a facility, it holds the authority to establish and enforce operational policies and, therefore, may adopt the operational control approach for GHG emissions reporting. Under this approach, the reporting entity accounts for and reports 100% of the GHG emissions from operations it controls. However, operational control does not necessarily imply full authority over all decisions. For example, major capital investments may require approval from all partners with joint financial control. That said, exceptions such as emission facilities located within entities included in the organizational boundary but not under operational control should be assessed based on the reporting entity’s own judgment and internal criteria.

3. Consolidation at Multiple Levels

All levels of an organization shall follow the same consolidation policy to ensure consistent data when consolidating GHG emissions across the organization. The parent entity’s management shall first decide on an approach for setting organizational boundaries (i.e., equity share, financial control, or operational control) and then develop a consolidation policy. The policy must be applied consistently across all sub-levels of the organization.

Total estimated category 1 emissions amounted to 153,600 tCO₂eq. For excluded items, emissions were estimated as follows:

Item	Estimated emissions (tCO ₂ eq)	Share of category 1 emissions (%)	Share of total Scope 3 emission (%)
Component m	89,000	57.9%	1.2%
Component n	6,800	4.4%	0.09%

In line with criterion 2, Company A included emissions from Component m in its category 1 calculation, since it exceeded 1% of total Scope 3 emissions. Component n, however, was excluded due to its negligible impact on both category 1 and total Scope 3 emissions.

2. Quantification Methods and Data Types

Two main methods exist for quantifying GHG emissions. First, direct measurement involves monitoring or stoichiometric calculations, applying the formula ((emission data) × (GWP¹²⁾). Second, calculation involves multiplying an activity data value by an emission factor and a GWP value ([Reference 3]), using the formula ((activity data) × (emission factor) × (GWP)). These two methods require different types of data. In practice, calculation is most commonly used method for quantifying Scope 3 emissions. For the calculation method, two types of data are required: activity data and emission factors.

[Reference 3]

Considerations when setting values for GWP

The reporting entity should convert GHG emissions data into the standardized metric of carbon dioxide equivalent (CO₂eq) based on the GWP for each GHG. The reporting entity should use the most recent GWP values published by the Intergovernmental Panel on Climate Change (IPCC). Although the reporting entity may choose GWP values appropriate for its specific circumstances, it is important to use such values consistently across inventories. Additionally, the reporting entity is required to disclose the source of the GWP values used to calculate the inventory. [Reference 3-1] lists the GWP values for the seven GHGs¹³ as provided in the IPCC’s second, fourth, fifth, and sixth assessment reports and approved for use under the GHG Protocol.

– The GHG Protocol requires using consistent 100-year GWP values from the IPCC across Scope 1, 2, and 3 inventories. Reports should use the most recent GWP values. To maintain consistency, a reporting entity that has already developed Scope 1 and Scope 2 GHG inventories¹⁴ should use the same GWP values for Scope 3. However, entities that have not yet developed a corporate GHG inventory should use the most recent GWP values available.

12) Global warming potential (GWP) indicates the extent to which one unit of a specific GHG contributes to global warming while it remains in the atmosphere. It is used to compare and assess the relative warming effects of different GHGs.

13) Carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF₆), and nitrogen trifluoride (NF₃).

14) The Korean Act on the Allocation and Trading of Greenhouse-Gas Emission Permits adopted its GWP values from the IPCC’s SAR.

[Reference 3-1]

GWP values for GHGs (partial list)

GHG		GWP			
		IPCC Second Assessment Report (SAR)	IPCC Fourth Assessment Report (AR4)	IPCC Fifth Assessment Report (AR5)	IPCC Sixth Assessment Report (AR6)
Carbon dioxide (CO ₂)		1	1	1	1
Methane (CH ₄)		21	25	28	27.9
Nitrous oxide (N ₂ O)		310	298	265	273
Hydrofluorocarbons (HFCs)	HFC-23	11,700	14,800	12,400	14,600
	HFC-32	650	675	677	771
	HFC-41	150	–	116	135
	HFC-43-10mee	1,300	1,640	1,650	1,600
	HFC-125	2,800	3,500	3,170	3,740
	HFC-134	1,000	–	1,120	1,260
	HFC-134a	1,300	1,430	1,300	1,530
	HFC-143	300	–	328	364
	HFC-143a	3,800	4,470	4,800	5,810
	HFC-152a	140	124	138	164
	HFC-227ea	2,900	3,220	3,350	3,60

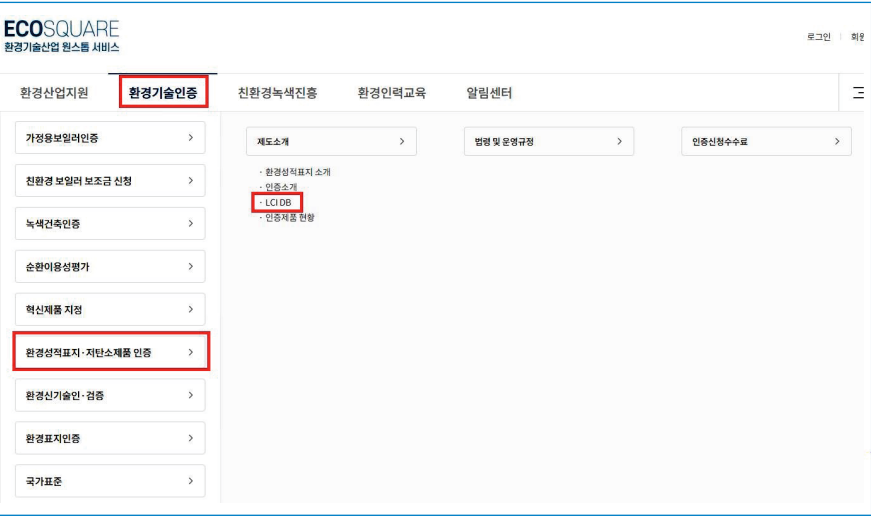
If the reporting entity can obtain activity data on general waste incineration, it can calculate the relevant emissions under category 5 using the methodology for disposal method-based calculation specified in the GHG Protocol. The necessary emission factors, categorized by waste type and disposal method, can be derived from the LCI DB for general waste incineration.

Additional explanation: Method for deriving emission factors

When calculating Scope 3 emissions using the LCI DB, the first step is to convert its inputs and outputs data into emission factors for the specific GHGs being measured. The following steps (Step 1 through Step 5) may be used in this process:

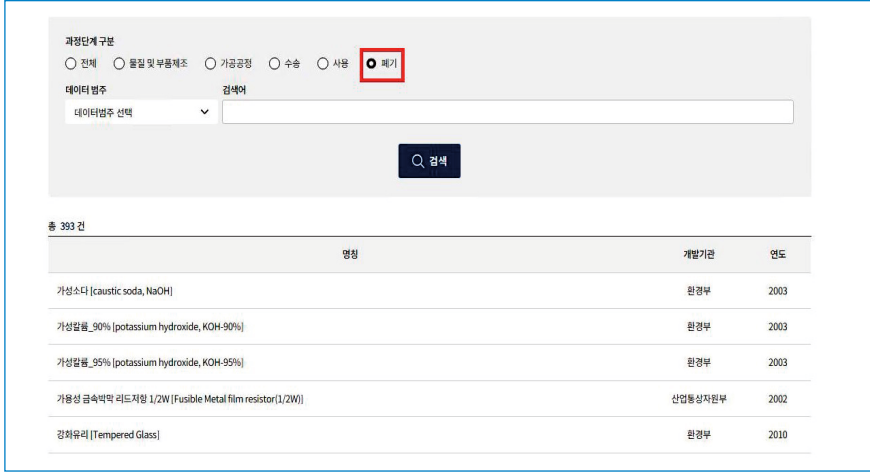
Step 1

Access KEITI's Environmental Technology Industry One-Stop Service, EcoSquare (www.ecosq.or.kr) and select "환경기술인증" (Environmental Technology Certification) from the main menu options ➡ From the dropdown menu, select "환경성적표지·저탄소제품 인증" (Environmental Product Declaration · Low Carbon Product Certification) ➡ Navigate to the "제도소개" (System Introduction) section ➡ From the dropdown menu, select "LCI DB," and then choose "National LCI DB."



Step 2

From the National LCI DB, locate the relevant life cycle stage and data category for the item subject to emission calculation. Then access the corresponding entry in the LCI DB (example in the image below: 폐기 (Disposal) ➡ 폐플라스틱 소각 [Waste plastic incineration]).



Step 3

On the detailed page for the selected item, select the Excel file option in the "LCI DB 보기" (LCI DB view) section to download the file.



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