

PEOPLE.
TECHNOLOGY.



KT Environmental Management Guidelines

2018. 01 | KT Corp.

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I Site Environmental Guidelines

1. Site Environmental Guidelines

2. Site Environmental System

3. Environmental Leadership

4. Environmental Process

1. Site Environmental Guidelines

A site complies with environmental guidelines aligned with KT's enterprise environmental policy

A site contributes to environment protection and improvement through its business, and therefore we define environmental guidelines as follows by target, scope, characteristic, and impact on business

1.1 Energy Efficiency

1.1.1 Energy Efficiency

The Energy efficiency of facilities at data centers is measured regularly and a target energy efficiency is set

1.1.2 Energy-reducing Items

Energy-reducing items for the site and facilities are identified and applied accordingly

1.1.3 New Renewable Energy – Solar generation / geothermal energy

Generation and use of new renewable energy is encouraged, and facilities for solar generation and geothermal energy are established to reduce energy consumption

1.2 Resource Efficiency

1.2.1 Waste Management

Recycle and reuse of waste from the data center is encouraged and disposal in landfill/incineration of waste is minimized

1.2.2 Waste-reducing items

Waste-reducing items are identified and applied accordingly according to the nature of the sites

1. Site Environmental Guidelines

A site complies with environmental guidelines aligned with KT's enterprise environmental policy

A site contributes to environment protection and improvement through its business, and therefore we define environmental guidelines as follows by target, scope, characteristic, and impact on business

1.3 Eco-friendly SCM

1.3.1 Adoption of environmental system

Environmental system meeting global standards is adopted, and ISO 14001 certification and its retention are required

1.3.2 Environmental outcome management

Environmental outcomes from across all processes of activities and the value chain are analyzed regularly and measures for enhancement are devised

1.3.3 Environment training

Regular environment training for all employees at the center are conducted to minimize impacts on the environment

2. Site Environmental System

2.1 Organization

- 1) When mapping out a business plan regarding its operation, the site identifies and defines internal and external issues that are related to, and can impact its goals such as market conditions, government regulations/policy, and technological trends, etc.
- 2) Such issues contain environmental conditions that can be impacted by, or can impact the center.

2.1 <Output> derived from the organization becomes [a defined external/internal issue]

2.2 Demands & Expectations of stakeholders

- 1) The site defines the following:
 - a. Stakeholders related to environmental management systems
 - b. Demands and expectations of stakeholders (Ex. requirements)
 - c. Compliance requirements for the center arising from such demands and expectations (inc. statutory requirements)
- 2) The site reflects applies information in business planning and conducts annual monitoring and review.

2.2 <Output> derived from demands and expectations of stakeholders becomes [defined demands and expectations of stakeholders, compliance requirements]

2. Site Environmental System

2.3 Scope of application of environmental management systems

- 1) The center determines the range of environmental management system and their applicability to confirm the scope of the business
- 2) In determining the scope, the center takes into consideration the following:
 - a. External/internal issues as mentioned in 2.1
 - b. Compliance requirements as mentioned in 2.2
 - c. Department unit, function, and physical boundary of the center
 - d. Activity of the center, products, and services
 - e. Organization's authority and capacity to wield influence and management
- 3) Once the scope of application is determined, all activities, products, and services within this scope are incorporated into the environmental system
- 4) The scope of application should be described in "Ch.1 application scope" in this manual, and documented for use by stakeholders.

2.4 Environmental Management Systems

- 1) To reach performance goals (inc. environmental performance enhancement), the center should establish, execute, maintain, and continually improve environmental management systems including various processes required for ISO 14001 certification and mutual interactions between these processes.
- 2) In establishing and maintaining environmental management systems, knowledge acquired from 2.1 and 2.2 should be taken into consideration.

3. Environmental Leadership

3.1 Leadership and Commitment

- 1) A director of the center should demonstrate the leadership and commitment to the environmental management systems as follows:
 - a. Be responsible for the efficacy of the environmental management systems
 - b. Ensure **environmental guidelines and targets** are set and they are well-aligned with the organization's strategic direction and moves
 - c. Ensure requirements of the environmental management systems are integrated into the organization's business processes
 - d. Ensure resources required for use of the environmental management systems are available
 - e. Give salience to the importance of efficient environmental management systems and conformity with requirements thereof
 - f. Ensure that the environmental management systems help achieve the goals of the organization
 - g. Direct and support employees of affiliated organizations so as to contribute to the efficacy of the environmental management systems
 - h. Encourage constant improvement
 - i. When leadership is required in other related areas, support the responsible person in his/her conduct of leadership

3.2 Environmental Guidelines

- 1) A director of the center should **establish, execute, and maintain the environmental guidelines** as follows within the application of the environmental management systems
 - a. They should be **aligned with the goals and conditions of the organization**, including activities, products, nature of service and impacts on the environment
 - b. A framework for setting environmental targets should be provided
 - c. Prevention of contamination that might incur from activities of the organization and other specific **commitments to environmental protection should be incorporated**
 - d. Organization's commitment to compliance
 - e. **Commitment to constant enhancement** of environmental management systems for improved outcomesEnvironmental guidelines should be:
 - documented
 - communicated within the organization
 - made accessible for use by stakeholders

4. Environmental Processes

4.1.1 General description

The site should establish and run necessary processes to meet the requirements mentioned in **4.1.1** to **4.1.4**.

In designing the environmental management systems, the site should take the following into consideration:

- a. Issues related to 2.1
- b. Requirements related to 2.2
- c. Scope of application of the environmental management systems

It should also determine the environmental aspect (refer to **4.1.2**), obligations (refer to **4.1.3**), and risks and opportunities related to requirements and other issues stated in **2.1** and **2.2**. With these, the site can deliver values as follows:

- Assurance that the environmental system can generate the intended outcome
- Prevention or mitigation of harmful influences contingent on external factors that can impact the organization
- Constant improvement

The site should define within the scope of the application of the environmental management systems the potential emergencies that could have environmental impacts.

The site should document:

- risks and opportunities worth attention
- processes needed as mentioned in **4.1.1** to **4.1.4** (enough to assure execution as planned).

4.1.2 Environmental aspect

Considering the life cycle perspective within the defined scope of application of the environmental management systems, the site should determine the environmental aspects of the organization's activities, products, and services that it can manage and influence, and the environmental impacts thereof.

In determining the environment aspects, the site should take into consideration the following:

- a. Newly established, planned changes and new or modified activities, products, and services
- b. Abnormal conditions and reasonably predictable emergencies

4. Environmental Processes

The site should define environment aspects, aspects that inflict or can inflict material impacts on the environment, by leveraging established criteria.

The site should, at an appropriate level, communicate with a variety of departments regarding material environment aspects

The site should document:

- environmental aspects and impacts thereof
- criteria used to define the organization's significant environmental aspects
- significant environmental aspects

4.1.3 Compliance requirements

The site should conduct the following:

- a. Determine compliance requirements relevant to the environment aspects and makes them accessible
- b. Determine how such requirements apply to the organization
- c. Take such compliance requirements into account in establishing, executing, maintaining, and continually improving the organization's environmental management systems.

The site should document the organization's compliance requirements

4.1.4 Action planning

The site should plan the following:

- a. Actions to take for the items below
 - 1) Material environmental aspects
 - 2) Compliance requirements
 - 3) Risks and opportunities identified in **4.1.1**
- b. Methods of execution for items below
 - 1) How to integrate aforementioned measures into the environment management system process (refer to **4.2**) or other business processes and execute them
 - 2) How to evaluate efficacy of the aforementioned measures

In planning such measures, the site should take into consideration the organization's technical features as well as financial, operational, and business requirements.

4. Environmental Processes

4.2.1 Environmental goal

Taking into account the organization's material environmental aspects, compliance requirements thereof, as well as the organization's risks and opportunities, the site should establish environmental goals for departments and levels

The environmental goals should be:

- a. consistent with the environmental guidelines
- b. measurable (if possible)
- c. monitored
- d. communicated
- e. kept up-to-date, if applicable

The site should document the environment goals.

4.2.2 Action planning for achieving the environmental goals

In planning how to achieve the organization's environmental goals, the site should determine the following:

- a. what needs to be done
- b. what resources are required
- c. who will be in charge
- d. by when it should be done
- e. how to evaluate the outcome including indicators used to monitor the progress for the organization's measurable goals

The site should take into account how to integrate activities required for achieving the environmental goals into the organization's business process

II Product & Service Environmental Guidelines

- 1. Product & Service Planning and Management**
- 2. Product & Service Environmental Outcome Evaluation**
- 3. Product & Service Environmental Improvements**

1. Product & Service Planning and Management

1.1 General description

Product & service organizations should establish, execute, manage, and maintain the processes required to meet the requirements of the environmental management systems, and to take measures described in 4.1 and 4.2 of the <Site Environmental Guidelines> with the use of the following:

- Environmental management manual
- Guidelines for internal evaluation
- Guidelines for identification of environmental aspects and evaluation
- Guidelines for management for each BM

Product & service organizations should conduct the following from a life cycle perspective:

- a. Establish controls as appropriate to ensure that the environmental requirements are incorporated across all steps of the design and development process of products and services
- b. Determine environmental requirements for the purchase of products and services as appropriate
- c. Distribute information regarding delivery or shipping of products and services, usage, disposal, and disuse that can have material impacts on the environmental aspects

Product & service organizations should document the information with which they can assure execution of the processes as planned

1.2 Preparation & Response to Emergencies

Product & service organizations should establish, execute, and maintain necessary processes to prepare for identified potential emergencies.

Product & service organizations should conduct the following:

- a) Plan actions for the prevention or mitigation of harmful impacts on the environment caused by emergencies
- b) Respond to actual emergencies
- c) Conduct appropriate measures in action against potential environmental impacts to prevent emergencies
- d) Conduct regular tests of planned measures in preparation for actual, possible outbreak of emergency
- e) Conduct regular review and revision of response processes after outbreak of emergency or tests
- f) Supply information and training regarding emergency response as appropriate to employees of product & service organizations as well as stakeholders.

Product & service organizations should maintain documented information with which they can assure execution of processes as planned

2. Product & Service Environmental Outcome Evaluation

2.1 Monitoring, measurement, analysis and evaluation

2.1.1 General description

Product & service organizations should monitor, measure, analyze, and evaluate the organization's environmental outcomes

Product & service organizations should determine the following:

- a) what to be monitored and measured
- b) applicable methods of monitoring, measurement, analysis, and evaluation to ensure valid results
- c) criteria and proper indicators to evaluate the outcome
- d) when to monitor and measure
- e) when results of monitoring and measurement will be analyzed and evaluated

Product & service organizations should ensure that they use and maintain qualified monitoring & measurement equipment as appropriate

Product & service organizations should evaluate environmental outcomes and the efficacy of the environment management systems

Product & service organizations should communicate the outcome information with internal and external parties according to the organization's communication processes and compliance requirements

Product & service organizations should document the results of monitoring, measurement, analysis, and evaluation.

2.1.2 Compliance evaluation

Product & service organizations should establish, execute, and maintain necessary processes required to evaluate the organization's compliance with requirements

Product & service organizations should conduct the following:

- a) determine the frequency of compliance evaluation
- b) conduct compliance evaluation and take necessary actions
- c) understand the compliance requirements

Product & service organizations should document the results of compliance evaluation

2. Product & Service Environmental Outcome Evaluation

2.2 Internal review

2.2.1 General description

Product & service organizations should conduct internal review according to the guidelines of internal review to provide information such as:

- a) whether the environmental management systems are suitable in regards to the items below:
 - 1) the organization's requirements for the environmental management systems
 - 2) the requirements of the environmental management manual
- b) whether the environmental management systems are efficiently run and maintained

2.2.2 Internal review program

Product & service organizations should establish and execute internal review guidelines including the frequency, methods, responsibility, and requirements of the internal review

In establishing the internal review guidelines, they should take into account environmental importance, changes, and results of previous review.

Product & service organizations should conduct the following:

- a) determine the criteria and scope for each review process
- b) select review panels to ensure objectivity and impartiality of the review process and conduct the review
- c) ensure that the results of the review are reported to managers in charge

Product & service organizations should document the execution of the internal review program and the results of the review for evidence

2. Product & Service Environmental Outcome Evaluation

2.2 Management review

Directors of product & service organizations should review environmental management systems regularly to ensure the organization's suitability, adequacy, and effectiveness.

In the management review, the following should be taken into account:

- a) Results of actions taken after the previous management review
- b) Changes as below
 - 1) Internal & external issues relevant to the environmental management systems
 - 2) Needs and expectations of stakeholders, including compliance requirements
 - 3) Material environmental aspects
 - 4) Risk and opportunities
- c) Level of achievement of the environmental goals
- d) Information about the organization's environmental outcomes including:
 - 1) Inappropriateness and remedies
 - 2) Results of monitoring and measurement
 - 3) Fulfilled compliance requirements
 - 4) Results of review
- e) Adequacy of resources
- f) Communications with stakeholders including complaints
- g) Opportunities for constant enhancement

The results of management review should include:

- Conclusion on the suitability, adequacy, and effectiveness of the environmental management systems
- Decision-making relevant to opportunities for constant enhancement
- Decision-making relevant to necessity of changes to the environmental management systems, including resources
- Necessary actions in case of the environment goals not being achieved
- Opportunities to improve integration of the environment management systems into other business processes
- Impacts on strategic moves of product & service organizations

Product & service organizations should document the results of management review for evidence

3. Product & Service Environmental Improvements

3.1 General description

Product & service organizations should define opportunities for possible improvement and take necessary actions to achieve the goals of the environmental management systems.

3.2 Unconformity and remedies

In case of unconformity, product & service organizations should conduct the following:

a) They should respond to unconformity and conduct the following, if applicable:

- 1) take actions to manage unconformity and remedy it
- 2) handle consequences (inc. mitigation of harmful impacts on environment)

b) measures to eliminate the cause of unconformity to prevent recurrence or occurrence in other areas

- 1) review unconformity
- 2) determine the cause of unconformity
- 3) determine any similar unconformity or its possible occurrence

c) conduct all necessary actions

d) review the efficacy of all actions taken

e) make changes to the environmental management systems if necessary

Remedies should conform to the importance of the impact of the unconformity which occurred including environmental impact

Product & service organizations should document the following for evidence

- nature of unconformity and all follow-up actions taken
- results of all remedies

3.3 Constant improvement

Product & service organizations should constantly improve the suitability, adequacy and effectiveness of the environmental management systems to enhance the environmental outcomes

III GHG Emission Monitoring Guidelines

- 1. Rules on Organizational Boundaries**
- 2. Determination of Organizational Boundaries**
- 3. Process chart**
- 4. Management of Measuring Devices by Facility**
- 5. Methods of Monitoring**
- 6. Calculation of GHG Emissions**

1. Rules on Organizational Boundaries

1.1 Rules on determination of organizational boundaries

Management service providers should define the scope of management controls taking into account geographic, physical, and activity boundaries to determine organization boundaries that wield influence.

To determine the organizational boundaries for the scope of management controls, management service providers should confirm the geographical boundaries of the site, GHG emission facilities and energy consuming facilities within the boundaries, GHG reduction facilities, changes in the organization, other corporations residing within the boundaries, and the presence of monitoring related facilities, and identify the agents of such facilities and their management and the agents of the economic benefits arising from relevant activities.

1.2 Determination of organizational boundaries

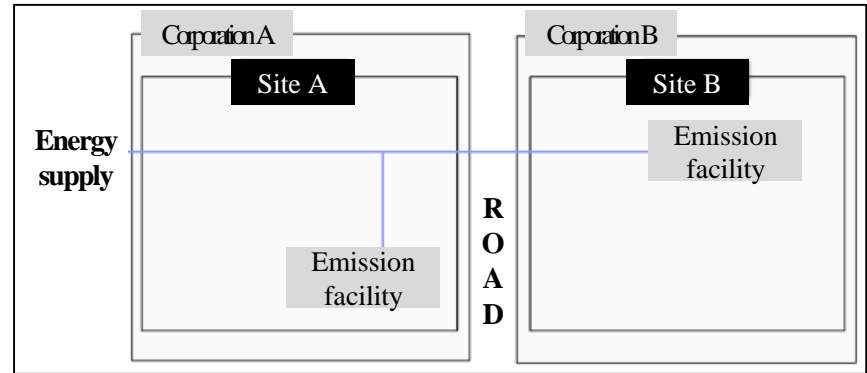
Organizational boundaries are determined as follows. The organizational boundaries are determined by the nature of the site, and descriptions of such determination should be added to the monitoring plan in detail.

- 1) Determination method for cases where there are multiple service providers linked to each other in terms of energy consumption
- 2) Determination method for cases where there are other corporations residing within the organizational boundaries
- 3) Determination method for organizational boundaries of buildings

2. Determination of Organizational Boundaries

2.1 Determination of organizational boundaries

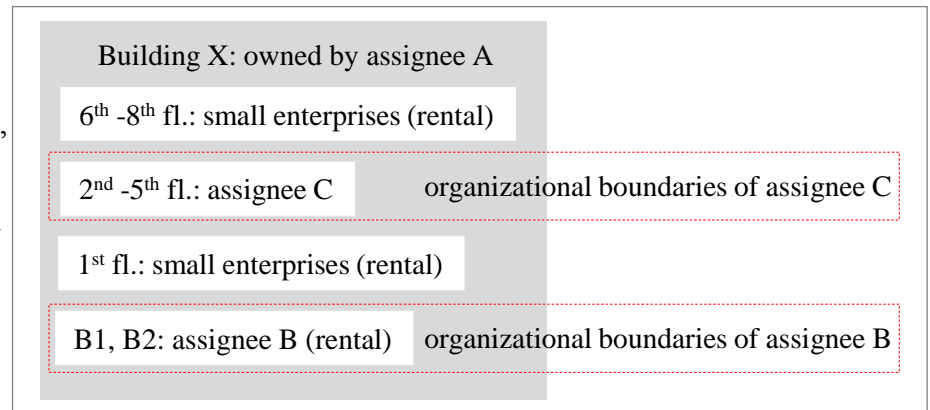
Even though multiple management service providers share energy, they are separate corporations, therefore each service provider needs to set the boundaries for its monitoring of each energy consumption



2.2 Organizational boundaries of buildings

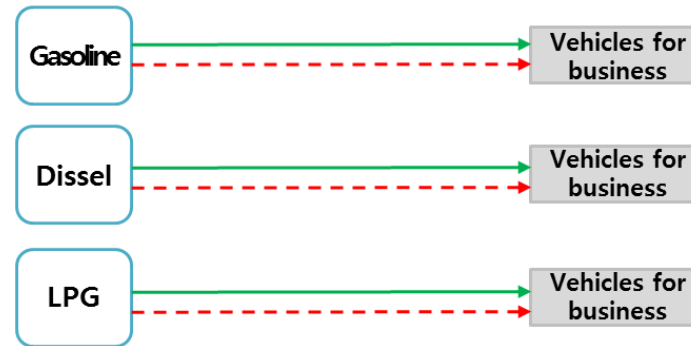
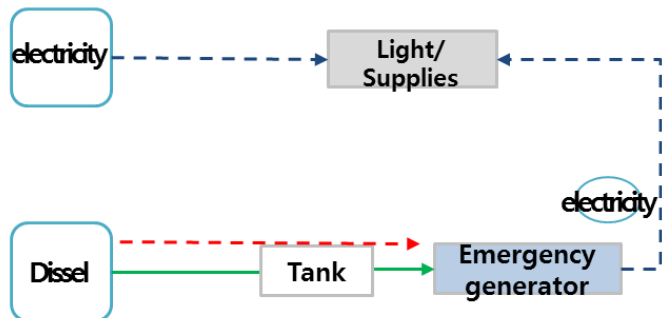
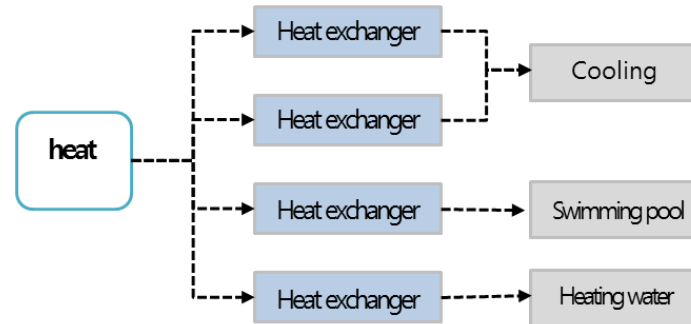
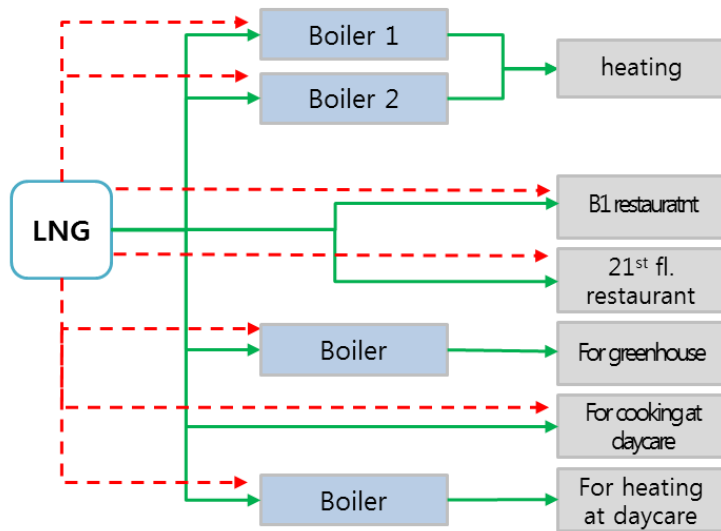
Ownership of buildings can be verified through the building ledger according to the 'Rule of statement and management of building registrations' and the terrier according to 'The Real Estate Registration Act.'

In cases where other assignees (B, C) rent the space in assignee A's building, management for the space rented by B, C is under each assignee (B, C) while the management for the rest of the building is under assignee A.






3. Process Chart

The process chart is made based on the flow of fuel and GHG



4. Management of Measuring Devices by Facility

4.1 Symbol and type of measuring devices

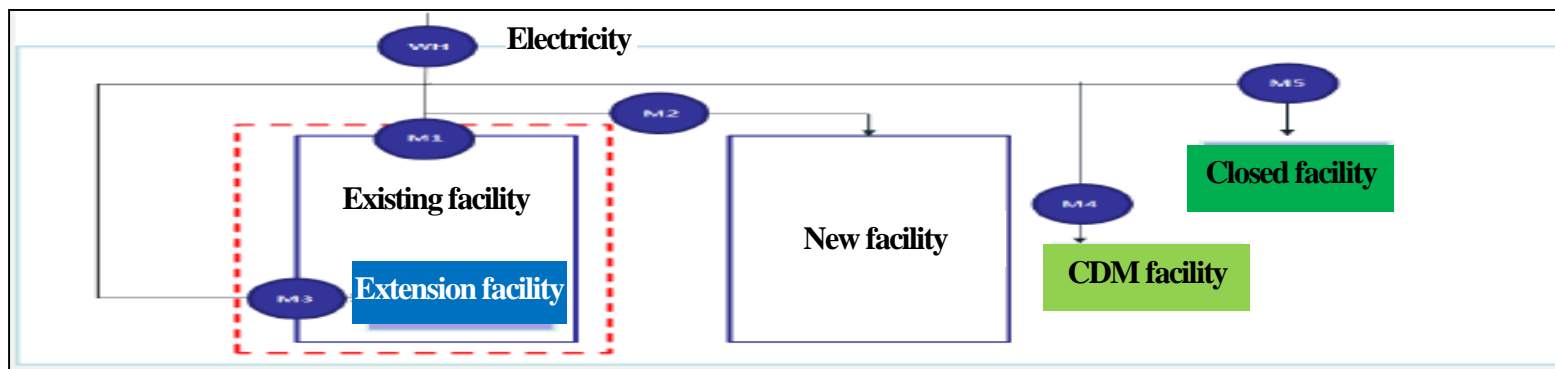
Symbol	Description
	A legal measuring device used for legal measurement for commerce or verification and subject to Article 2 of the Measures Act
	A device installed by a management service provider, subject to regular inspection for accuracy by testing, correctional, and inspection institutions under Article 14 of the Framework Act on National Standards
	A device installed by a management service provider, not subject to regular inspections for accuracy

4.2 Identification of measuring devices

Measuring devices not inspected for accuracy regularly are marked as FL in parentheses.

In cases where there are more than 2 symbols for the same device in an emissions facility, numbering after the symbol is required for identification

In cases where a symbol in the monitoring diagram is different from that used in measurement, the symbol used at measurement is followed by the symbol in the diagram in parentheses



5. Methods of Monitoring

5.1 Names and types of measuring devices

For names and types of measuring devices, refer to the types and specifications of measuring devices in the Enforcement Decree of the Measures Act

Type of device for accreditation	Subject to regular inspection	Type of device for accreditation	Subject to regular inspection
Non-automatic weighing instruments	O	Calibration tank	O
Weight	-	Calibration tank lorry	O
Portable rail weight	O	Heat meter	-
Gas meter	-	Electricity meter	-
Water meter	-	Grain moisture meter	-
Oil meter	-	Speed gun	-
Lubricator	-	Thermometer	-
LPG meter	-	Sphygmomanometer	-

5.2 Management of measuring devices

Name, serial number, scope of measurement, inspection period, accreditation, etc

속검유체	clean gases
표시	3 1/2 digit LCD
측정범위	0 ~ 50 l/min
고정범위	0 ~ 10 mL/min
	0 ~ 20 mL/min
	0 ~ 50 mL/min
	0 ~ 100 mL/min
	0 ~ 200 mL/min
	0 ~ 500 mL/min
	0 ~ 1 L/min
	0 ~ 2 L/min
	0 ~ 5 L/min
	0 ~ 10 L/min(기준사항)
정밀도	전체 범위에서 ± 1.5% (15~20°C 용 0.4~4.1bar) 전체 범위에서 ± 1%(고정범위)
재현성	전체 범위에서 ± 0.5%
온도계수	전체 범위에서 0.15%/°C
압력계수	전체 범위에서 0.01%/psi
응답속도	민속측정의 경우: 800 ms time
상대습도	70%
최대내압	1,000 psig (70 bars)
최대사용온도	5 ~ 50°C
Leak Integrity	1 x 10 ⁻⁷ sm ³ /sec He max to the outside environment
출력	linear DC 0 ~ 5 V

6. Calculation of GHG Emissions

6.1 Criteria for calculation of grade

Calculation of GHG emissions is based solely on direct emissions, excluding indirect emissions

In cases of different types of fuel being in use at emissions facilities, application of Tier is eased for supplementary fuel, whose emissions are less than 5% of the total emissions at the facilities, to be granted with the second lowest grade

Total amount of emissions for the second lowest grade should be less than 25,000 tons

6.2 Identical level of emissions activity applied to multiple emissions facilities

For multiple emission facilities with different grades, yet consuming identical fuel and resources and demonstrating identical emissions flow, identical parameters, measurements, and analysis results should be applied. In such cases, the highest grade among the facilities is applied

In cases of identical fuel and resources, yet demonstrating different emissions flow and emissions source, a grade is applied to each facility (ex.: for by-product gas, separate parameters, measurements, and analysis by grade is required)

6.3 Other information

Due to revision, the coefficient of emission for Tier2 is applied to Tier1

- Transport combustion(aviation), combustion of waste fuel in cement production, petrochemical products, ferroalloy production, lead production, semiconductor/LCD/PV in electronic industry

IV Waste Management Guidelines

- 1. General Information**
- 2. Unused Goods Determination Criteria and their Management**
- 3. Classification of Unused Goods**
- 4. Disposal of Valuable Unused Goods**
- 5. Methods of Disposal**
- 6. Guidelines for the Calculation of Waste GHG Emissions**

Waste Management Guidelines

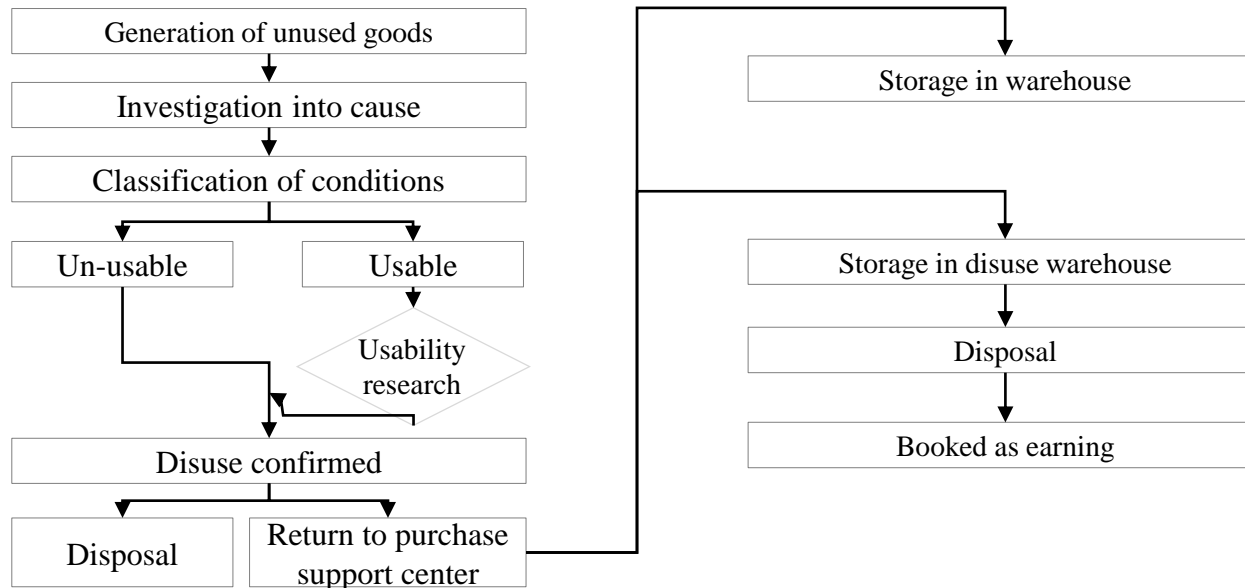
1. General information

For guidelines for the disposal and management of unused goods, the distribution manual is first applied and, for other matters, guidelines on the determination of unused goods and their management are applied

2. Unused goods determination criteria and their management

Type	Managed by	Decision of disuse made by	Guideline
Fixed assets	Asset mgmt. inst.	Asset mgmt. inst.	Finance manual OA/OE asset management manual, etc
Evacuation of fixed assets	Construction inst. Asset mgmt. inst.	Construction inst. Asset mgmt. inst.	standard of unused goods management by asset mgmt. institution or relevant documents, etc
Articles remaining from construction	Construction inst.	Construction inst.	
Products, stock	Asset mgmt. inst.	Asset mgmt. inst.	
Off-the-book assets	Asset mgmt. inst.	Asset mgmt. inst.	

2.1 Procedure for the determination of unused goods



Waste Management Guidelines

3. Classification of unused goods

Based on their value at disposal, unused goods can be classified into valuable unused goods and non-valuable ones.

3.1 Storage

Type	Definition	Key items	Stored by
Valuable unused goods	Unused goods not re-usable, yet with resources/components (recycle) with a value at disposal greater than disposal costs, hence returned to local distribution	Copper cable, terminals, etc.	Storage institution
Non-valuable unused goods	Any unused goods other than valuable ones	Optical cable, electronics/furniture, etc	Storage institution

3.2 Types of valuable unused goods

Only valuable unused goods, not re-usable for their intended purpose in and outside of KT and disposable only for resource recycling or component recycling purposes, can be returned to purchase support centers, and asset management institutions shall try to increase asset value through discretionary recycling and disposal as second-hand before they return the unused goods.

4. Disposal of valuable unused goods

Items confirmed as unused goods are disposed of through sell-out, donation, gratuitous grant, scrap, and disassembling. Items for sell-off (for resource/component recycling purposes), disposal, disassembling, designated wastes (jelly CA, battery), and items near designated wastes (oil-filled devices, etc) are subject to the Wastes Control Act regarding their shipping, storage, and discharge.

Waste Management Guidelines

5. Methods of disposal

5.1 Sell-off

HQ/local departments in charge of sell-off select companies for partnership and execute according to organizational strategy, regulation, and the relevant law.

A. Departments in charge of sell-off

HQ/local departments in charge of sell-off conduct sell-off in terms of unit contract, total contract, etc

B. Companies in partnership

- It is possible to assign a partner company for disposal of unused goods with repeated occurrence.
- A partner company should be selected based on organizational strategy, regulation, and the relevant law

5.2 Donation

A. Items for donation: items deemed necessary for donation based on the company's strategic necessity

B. Method

- ① Negotiation for donation
- ② Request for donation (purpose of donation, quantity, etc)
- ③ Shipping to donee
- ④ Donation management (date, department, quantity, etc)

5.3 Gratuitous grant

A. Items for gratuitous grant

- items that have not been sold, or without prospect of being sold
- items, sell-off of which would harm the company or is inappropriate
- items whose disposal costs exceed disposal income
- items banned from usage or ownership according to the law
- other items as deemed necessary for business

Waste Management Guidelines

B. Methods

- ① Negotiation for donation
- ② Request for donation (purpose of donation, quantity, etc)
- ③ Shipping to donee
- ④ Donation management (date, department, quantity, etc)

5.4 Scrapping

A. Items for scrapping

- Items deemed not sellable due to deterioration, decomposition, or other matters
- Items, whose sell-off or donation is deemed harmful to the company

B. Methods

Items not sellable due to deterioration, decomposition, and other matter should be scrapped

5.5 Disassembling

A. Items for disassembling

Items, whose components have better chances of being sold separately rather than in the whole set

B. Methods

Selection of items and disposal

Waste Management Guidelines

6. Guidelines for the calculation of waste GHG emissions

6.1 Data collection

Enterprise wastes are collected and classified into construction waste, daily waste, and recyclable waste

6.2 Determination of emission coefficient

- description by waste
- decision on emission coefficient made based on national LCI database networks

6.3 Calculation of emissions

- With waste emissions and a coefficient applied, GHG emissions are calculated

6.4 Verification

- The employee in charge assigns a company to conduct verification on emissions and deliver a final report

V Supplier Environmental Guidelines

- 1. Principles for Suppliers' Environmental Management**
- 2. Environmental Management Systems**
- 3. Evaluation of Environmental Outcomes**
- 4. Climate Change**
- 5. Water**
- 6. Recycling of Waste**

1. Principles for Suppliers' Environmental Management

Climate change, and water shortage arising therefrom, pose a great threat to humankind. A corporation, a member of the society, holds a responsibility to protect the environment that serves as the very base for every business activity. In this respect, KT fully commits itself to the fulfillment of such responsibilities through its activities and policies, and we equally expect our suppliers also to strive to protect the environment.

Apart from the responsibilities of environment protection, environmental factors themselves impact the company in terms of costs. Environmental issues have long been deemed extra financial factors. With the limited reserves of natural resources and the rapid growth of the global market recently, however, it can be predicted that purchasing costs of natural resource and raw materials will increase significantly. Even though we cannot predict how significantly costs will increase and what factors will play a role in such increases, we can easily forecast that the purchasing costs of raw materials, energy, and water will rise to a great extent. In this regard, KT encourages suppliers to set up management and monitoring systems to enhance resource efficiency in line with efforts to reduce costs.

2. Environmental Management Systems

Assessment of environmental impacts should be preceded with to establish guidelines for environmental management. KT encourages suppliers, through the assessment of environmental impacts, to minimize their impacts on the environment and reduce natural resource expenses incurred over the life cycle of products and services.

Model cases of good practices that KT promotes:

- ✓ Accountability: The enterprise (HQ, plants) is held accountable for environmental management
- ✓ Assessment of environmental impacts: Environmental impacts from the suppliers' business activities are assessed
- ✓ Environmental management systems: Standards and external certification (ISO 14001) for environmental management is kept up-to-date.
- ✓ Environmental training: Environmental training is offered to personnel in charge

(Minimum) requirements for suppliers:

Suppliers should comply with the environmental regulations imposed to all business sites, and, if there are any critical violations of such regulations, they are subject to termination of their partnership with KT.

3. Evaluation of Environmental Outcomes

As in the saying “Only the measurable can be managed,” measurements of resource utilization and contamination can provide opportunities for efficiency improvements. KT encourages suppliers to measure their environmental impacts and resource utilization to improve efficacy against costs.

Model cases of good practices that KT promotes:

- ✓ Measurement of outcomes: The amount of resources used, energy, water, raw materials, emissions of GHG, and waste are measured.
- ✓ By measuring waste water, exhaust gas and other discharge air, the environment around the sites is managed.
- ✓ Frequency of measurement: Environmental outcome and contamination are regularly measured.
- ✓ Data management systems: With a central database, data on environmental outcomes is collected, measured, and forecasted.

(Minimum) requirements for suppliers:

Suppliers should collect data on environmental outcomes.

As of 2014, it became obligatory to collect data on energy usage, emissions of GHG, and water usage of suppliers.

4. Climate Change

KT runs thorough measurement systems in an effort to restrain GHG emissions and minimize impacts on climate change, and we equally encourage our partners to put in as much efforts as we do.

Model cases of good practices that KT promotes:

- ✓ We strive to reduce GHG emissions generated from business activities and the use of products/services
- ✓ Measurement of GHG emissions: We set up and manage GHG inventory according to accredited domestic/international standards (GHG protocol).
- ✓ Roadmap for GHG reduction and goals: We establish quantified annual and long-term goals to reduce GHG.

(Minimum) requirements for suppliers:

Suppliers should comply with existing and upcoming regulations regarding climate change and GHG emissions.

As of 2014, suppliers are obligated to report to KT their GHG emissions.

5. Water

Water is the origin of every living creature. It is our responsibility to understand the importance of water resources and participate in water saving activities. KT encourages suppliers to understand this responsibility and take part in such activity.

Model cases of good practices that KT promotes:

- ✓ We strive to reduce water usage.
- ✓ We measure the amount of water used for business activities.
- ✓ We measure the contamination of waste water generated from business sites.

(Minimum) requirements for suppliers:

Suppliers should comply with the laws and regulations regarding the protection and use of water resources.

6. Recycling of Waste

KT encourages suppliers to proactively reduce the amount of raw materials in use, separate, and recycle waste in an effort to reduce raw material usage and impact on the environment.

Model cases of good practices that KT promotes:

- ✓ We run facilities to separate waste.
- ✓ We increase the rate of recycling against the total amount of waste.

(Minimum) requirements for suppliers:

Suppliers should comply with the law and regulations regarding waste disposal (recycling/landfill).

VI Value Chain GHG Emissions Calculation Guidelines

1. General Provisions

2. Scope 3 GHG Emissions Calculation Guidelines

1. General Provisions

1.1. Background

The global surface temperature has risen by 0.7°C (1.7°C in Korea) over the past 100 years, and climate change entailing extreme weather phenomena, a rise in sea level, and the extinction of wild creatures has become a global issue, with international communities calling for international cooperation in preparation for climate change. Sustainability, in this regards, has been strengthened within the global market, by beefing up international standards and agreements thereof, and regulations on domestic energy and climate change have also been expanded. With the growth of the green finance market and rising demand for information on carbon by stakeholders, the systematic response of the enterprise management system is urgently called for.

GHG emissions in Korea have rapidly increased, the country ranking 7th over the globe as of 2010 due to the rapid growth of energy-intensive industry, with consequent pressure from the international community for reduction in GHG emissions. In addition, a domestic policy for climate change was set for 30% reduction BAU (Business As Usual) by 2020, signaling that it is a critical point for businesses to manage carbon emissions. Therefore, proactive management systems and outcomes are called for that include not only just internal reduction but also involve suppliers, logistics, employees, and product use to control and reduce carbon emissions. Following this trend, we also need to establish measures in preparation for such a business climate.

For voluntary introduction of carbon management systems, not just compulsory response to regulations, KT established the calculation of Scope 3 carbon emissions, representing suppliers, use of products and services, daily commutes and business trips by employees, methods of reduction, and calculates the metrics to lead the upcoming climate-energy market.

To that end, KT developed a manual for the calculation of Scope 3 carbon emissions and reduction to set up an internal carbon management system.

These guidelines are for KT's calculation of Scope 3 carbon emissions.

1. General Provisions

1.2. Purpose

KT aims to enhance employees' understanding and capacities in carbon management by controlling Scope 3 emissions and strengthening the carbon management system, step up responses to climate change and identify new business opportunities by taking on leadership in sustainable management with enhanced brand value as an eco-friendly business.

These guidelines are created to instruct working groups (executive lead, segment lead) about Scope 3 GHG emissions calculation.

1.3. Scope of application

Scope 3 emissions refers to indirect emissions of energy consumed and GHG outside the business activity territory, not subject to the control of the business, hence falling into the scope of the business' voluntary management not related to regulations

KT set the scope of Scope 3 emissions management including emissions from supply chains by suppliers (supply chains), emissions from the use of products/services by consumers (use), emissions from employees' business trips • daily commutes • internal water use and waste disposal (other Scope 3), and aims to calculate and manage these emissions according to these guidelines.

2. Scope 3 GHG Emissions Calculation Guidelines

2.1. Accountability and authority

We define roles and responsibilities by task and organization to build up a Scope 3 GHG emissions calculation system and consistent management

2.1.1. Chief Env. Officer

Highest ranking person responsible for enterprise environmental management, with accountability and authority on support and approval required for conducting Scope 3 emissions calculations.

- Heads up organization of task force for Scope 3 calculation and management
- Sources human resources for task force
- Provides necessary technical and financial support to task force
- Final confirmation on internal/external reports and results of review

The Chief Env. Officer can delegate to a person in charge the accountability and authority required for conducting Scope 3 emissions calculations and their management.

2.1.2. Person in charge

Person in charge of Scope 3 emissions calculation, with accountability and authority on the operation of the task force for Scope 3 calculations

- Operation of task force
- Allocates and manages human resources
- Reviews role and responsibility of each employee in charge
- Any other duties imposed by the director of a climate change committee

2. Scope 3 GHG Emissions Calculation Guidelines

2.1.3. General Manager

The general manager is responsible for the execution of Scope 3 emissions calculation, with accountability and authority on the management of actual emissions calculation, responses to verification, and reporting.

- Calculation planning
- Requests for data collection to segment managers
- Compiles estimation and supporting documents and reviews estimation
- Selects outsourcing verification agencies and responds to verification
- Confirms results of verification
- Revision of management manual contingent upon internal/external changes
- Reports the calculation

2.1.4. Segment Manager

More than 1 person can assume the role of segment manager, with accountability and authority on data collection for their respective segment

- Supply chain • Use segment
- other Scope 3 segments

2. Scope 3 GHG Emissions Calculation Guidelines

2.2. Scope 3 GHG emissions calculation and reporting process

Scope 3 GHG emissions calculation is conducted from January to April for the given year, with classification of supply chain, use, and other Scope 3.

2.2.1. Emissions calculation planning (1st-2nd week of Jan., General Manager)

After being informed by the Chief Env. Officer (or segment lead) of the annual environmental management plan and organizational structure, the general manager sets out calculations planning regarding the company's Scope 3 GHG emissions for the given year.

It is conducted for all modules, and calculation plans with those of prior years taken into account will be forwarded to people in charge

2.2.2. Selection of verification agency (3th-4th week of Jan., General Manager)

The general manager selects an agency for verification of Scope 3 GHG emissions, enters into a contract, and arranges the timeline for verification. Applied to all modules.

2.2.3. Selection of calculation subject (1st-2nd week of Feb., Segment Manager)

Segment managers for supply chains and use segments confirm the process of 'subject selection' and pre-select suppliers, products, and services subject to calculation for the given year.

2.2.4. Set-up of scenario, logic, and emissions coefficient (3rd-4th week of Feb., Segment Manager)

Segment leads for supply chains and use segments confirm 'calculation scenario, logic, coefficient' from the manual, establish calculation logic and the scenario for the given year, and pre-set up the emission coefficient.

2. Scope 3 GHG Emissions Calculation Guidelines

2.2.5. Data collection and completion of calculation (1st-4th week of March, Segment Manager)

Managers of each segment collect activity data required for emissions calculations, calculate emissions, and once calculations are completed, forward them to the general manager. Applied to all modules

2.2.6. Review of calculation and response to verification (1st-2nd week of April, General Manager)

The general manager confirms the consolidated calculations based on inputs made by each segment manager and compiles supporting documents to prepare for verification. Applied to all modules.

2.2.7. Completion of verification and reporting (3rd-4th week of April, General Manager)

The general manager completes the response to verification and reports verified emissions to the Chief Env. Officer (or person in charge). Once applied to all modules, Scope 3 emissions calculations for the given year are completed.

VII Logistic Environmental Guidelines

- 1. Purpose**
- 2. Scope of Application**
- 3. Definition of Terms**
- 4. Management**
- 5. Requests for Vehicle Use and Records**
- 6. Emissions Management**

Logistic Environmental Guidelines

1. Purpose

These guidelines' purpose is to define supply criteria of vehicles (hereinafter “mobile equipment”) under the management of KT (hereinafter “Company”) and management rules, promoting rationalization of mobile equipment management.

2. Scope of application

These guidelines are applied to acquisitions, management, and disposal of all mobile equipment under the Company's management, except for cases with separate rules subject to relevant law or company policy.

3. Definition of terms

① “Vehicle“ as defined in the Motor Vehicle Management Act refers to automobiles and (motorized) two-wheeled vehicle, and can be categorized by function and use as below:

1. Car
2. Van
3. Truck
4. Special car
5. Two-wheeled car

② “Acquisition“ refers to, through a new purchase or onerous or gratuitous transfer, increases in assets of the company.

③ “Maintenance“ refers to all maintenance conduct including preventive ones to prevent malfunction, increase life-cycle, and promote safe driving.

Logistic Environmental Guidelines

4. Management

- ① The director of a department defines such matters as requirements, acquisitions, extension, replacement, transfer, and scrapping of mobile equipment.
- ② Mobile equipment is registered under the name of the company's corporate registration and business license, and the use base field on the car registration should be filled out with the management institution name, address, and contact number and utility bill payment and other tasks must be carried out in due course.

5. Requests for vehicle use and records

- ① When personnel designated as drivers of mobile equipment (incl. main, asst.) drive a vehicle during the course of their regular routine, they may omit requests for vehicle use but must input driving results (driving records and safety maintenance) into the system.

For non-designated drivers (incl. main, asst.), prior approval from the director is required and safe driving and driving records should be guaranteed.

- ② After vehicle use, a driver should record the driving route, travel distance, and gas consumption as demonstrated by the mileage integrating meter.

6. Emissions management

Emissions should not exceed the amount prescribed by law.

(Article 36 or 38, Article 57, Article 59 of the Clean Air Conservation Act, and Article 29 of the Enforcement Decree of the Clean Air Conservation Act)

VIII Social Impacts of Carbon Emissions Guidelines

- 1. Calculation of Reduction Planning**
- 2. Designation of Verification Agency**
- 3. Review of Calculation Results and Response to Verification**
- 4. Completion of Verification and Reporting**

Social Impacts of Carbon Emissions Guidelines

1. Calculation of reduction planning

- The general manager is informed by the Chief Env. Officer (or segment lead) of the annual environmental management plan and organizational structure.
- The general manager revises the dept. in charge and the person in charge’s name and personal information on the ‘R&R’ sheet according to the information on organizational structure.
- The general manager establishes reduction plans for social impacts for the given year according to the environmental management plan.

2. Designation of verification agency

- The general manager selects an agency to verify the social impacts of reduction, enters into a contract, and coordinates the timeline for verification.

[KT Scope 3 emissions/reduction calculation manual] verification agency
 Records of agency to verify emissions/reduction calculation

#	계약일	검증 기간	검증 기관 명	담당자	연락처	e-mail	비고
1	YYYYMMDD	MMDD-MMDD	00000	000	000-0000-0000	0000@00000	-
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

Social Impacts of Carbon Emissions Guidelines

3. Review of calculation results and response to verification (executed only after calculation by module -3.2~3.5- is completed)

- The general manager collects and compiles each segment manager's calculations and their evidentiary documents.

[KT Scope 3 emissions/reduction calculation manual] summary of emissions and reduction

Checklist for internal review

2

구분	점검 항목	확인	
수집 현황	1. 산정 대상에 해당하는 모든 데이터가 취합되었는지 확인한다	<input type="checkbox"/> 예	<input type="checkbox"/> 아니오
데이터	2. 입력된 데이터가 산정 해당 연도의 데이터가 맞는가?	<input type="checkbox"/> 예	<input type="checkbox"/> 아니오
	3. 입력된 데이터가 1년 단위로 취합될 값이 맞는가?	<input type="checkbox"/> 예	<input type="checkbox"/> 아니오
	4. '재공유형', '협력업체명', '순위', '서비스 명' 등이 올바르게 입력되었는가?	<input type="checkbox"/> 예	<input type="checkbox"/> 아니오
	5. 데이터 순위(1,2,3)의 분류가 제대로 되었는가?	<input type="checkbox"/> 예	<input type="checkbox"/> 아니오
	산정량	6. 산정된 결과가 과소/과대하지는 않는가? *참고 -국가 감축목표량: '20년 배출전망치(BAU) 대비 30%인 약 244백만 tCO2 -KT 사업장 전체의 연간 온실가스 배출량: '11년도 KT Scope 1&2 배출량 1,173천 tCO2	<input type="checkbox"/> 예
	7. 배출량/감축량 개별값과 총계가 일치하는가?	<input type="checkbox"/> 예	<input type="checkbox"/> 아니오
	8. 산정 결과의 단위를 확인하였는가?	<input type="checkbox"/> 예	<input type="checkbox"/> 아니오

Summary of emissions from supply chains

1

	총계	1순위		2순위		3순위		계	
		-	tCO2e/년	-	tCO2e/년	-	tCO2e/년	-	tCO2e/년
구매전락실	총계	-	tCO2e/년	24	tCO2e/년	-	tCO2e/년	24	tCO2e/년
	교환/BCN	-	tCO2e/년	-	tCO2e/년	-	tCO2e/년	-	tCO2e/년
	선기자재	-	tCO2e/년	24	tCO2e/년	-	tCO2e/년	24	tCO2e/년
	전송/전동	-	tCO2e/년	-	tCO2e/년	-	tCO2e/년	-	tCO2e/년
	전원	-	tCO2e/년	-	tCO2e/년	-	tCO2e/년	-	tCO2e/년
	이동통신(A)	-	tCO2e/년	-	tCO2e/년	-	tCO2e/년	-	tCO2e/년
	미디어	-	tCO2e/년	-	tCO2e/년	-	tCO2e/년	-	tCO2e/년
	단말	-	tCO2e/년	-	tCO2e/년	-	tCO2e/년	-	tCO2e/년
	초고속	-	tCO2e/년	-	tCO2e/년	-	tCO2e/년	-	tCO2e/년
		-	tCO2e/년	-	tCO2e/년	-	tCO2e/년	-	tCO2e/년

Social Impacts of Carbon Emissions Guidelines

- ① The general manager confirms the summary of calculations for each module in the 'Summary of emissions and reduction' sheet.
- ② The general manager confirms the calculations by using the checklist in the 'Summary of emissions and reduction' sheet.
- If the general manager finds that reduction is miscalculated or evidentiary documents are insufficient, he/she submits requests for re-calculation and re-reporting to each segment manager
- The general manager compiles the calculations and evidentiary documents to prepare for verification.

4. Completion of verification and reporting

- The general manager prepares for verification
 - He/she sends documents required by the verification agency for verification.
 - He/she revises the information, if necessary, in an effort to respond to corrective measures.
- Once verification is completed by the agency, the general manager receives a verification report.
- The general manager reports to the Chief Env. Officer (or person in charge) a verification report and relevant information.

IX M&A Emission Management Guidelines

- 1. M&A**
- 2. Sell-off & Division**
- 3. Closure**
- 4. Suspension**

M&A Emission Management Guidelines

1. M&A (Mergers and Acquisitions)

1.1 Definition:

Changes in organizational boundaries due to ownership transfer of sites or emissions facilities of other management service providers or non-management service providers to a management service provider for the executing year, or such ownership transfer to non-management service providers

1.2 (Adjustment Plan 1) KT acquires the site, emissions facilities of an outside management service provider or company with emissions credit

- Emissions cap of KT added to that of the acquired site, emissions facilities to evaluate performance

1.3 (Adjustment Plan 2) KT acquires the site, emissions facilities of a non-management service providers or company without emissions credit

- No adjustment in emissions credit is made, and the site and emissions facilities of the non-management service provider are subject to evaluation during the following planning period.

1.4 (Adjustment Plan 3) A subsidiary of KT (non-management service provider) acquires the site, emissions facilities of a management service provider or company with emissions credit

- Acquired company alone subject to evaluation, and emissions of KT's subsidiary are evaluated for the following planning period.

M&A Emission Management Guidelines

2. Sell-off & Division

2.1 Definition:

Changes in organizational boundaries due to transfer or statutory division of ownership of sites, emissions facilities of management service providers or companies with emissions credit for the executing year

2.2 (Adjustment Plan 1) KT sells off the site, emissions facilities to an outside management service provider or non-management service provider

-KT is subject to evaluation with the total emissions credit less emissions credit of the site, facilities to be sold or divided for the executing year

2.3 (Adjustment Plan 2) KT divides the corporation and establishes a new one

- KT's emissions credit is allocated to each enterprise, subject to separate evaluation

3. Closure

3.1 Definition:

Parts of emissions facilities or equipment groups* of management service providers being physically excluded or registered for closure within the executing year

3.1 (Adjustment Plan 1) For closure of emissions facilities, KT's emissions credit for the executing year less emissions credit of facilities to be closed

- Unit bundling together equipment with similar functions and roles, using the same fuel, and with the same purpose (Article 2 of the Guidelines)

3.2 (Adjustment Plan 2) For partial closure of equipment, emissions cap is calculated based on equipment group emissions table* for the base year with the rate of the executing year taken into account

M&A Emission Management Guidelines

4. Suspension

4.1 Definition:

Facilities with emissions of 15,000 tons* or more for the base year at the time of planning suspending operations of the facilities or of a portion of the equipment groups for a fixed period of time (over 30 days in a row) for the executing year

* A regulatory institution can downgrade the criteria based on the nature of the industry

4.2 (Adjustment Plan 1) Emissions cap is calculated based on the operation period for the base year with the rate* of the suspension period taken into account

* For equipment, adjustment as in 'closure' (mediation 2) is applied

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