

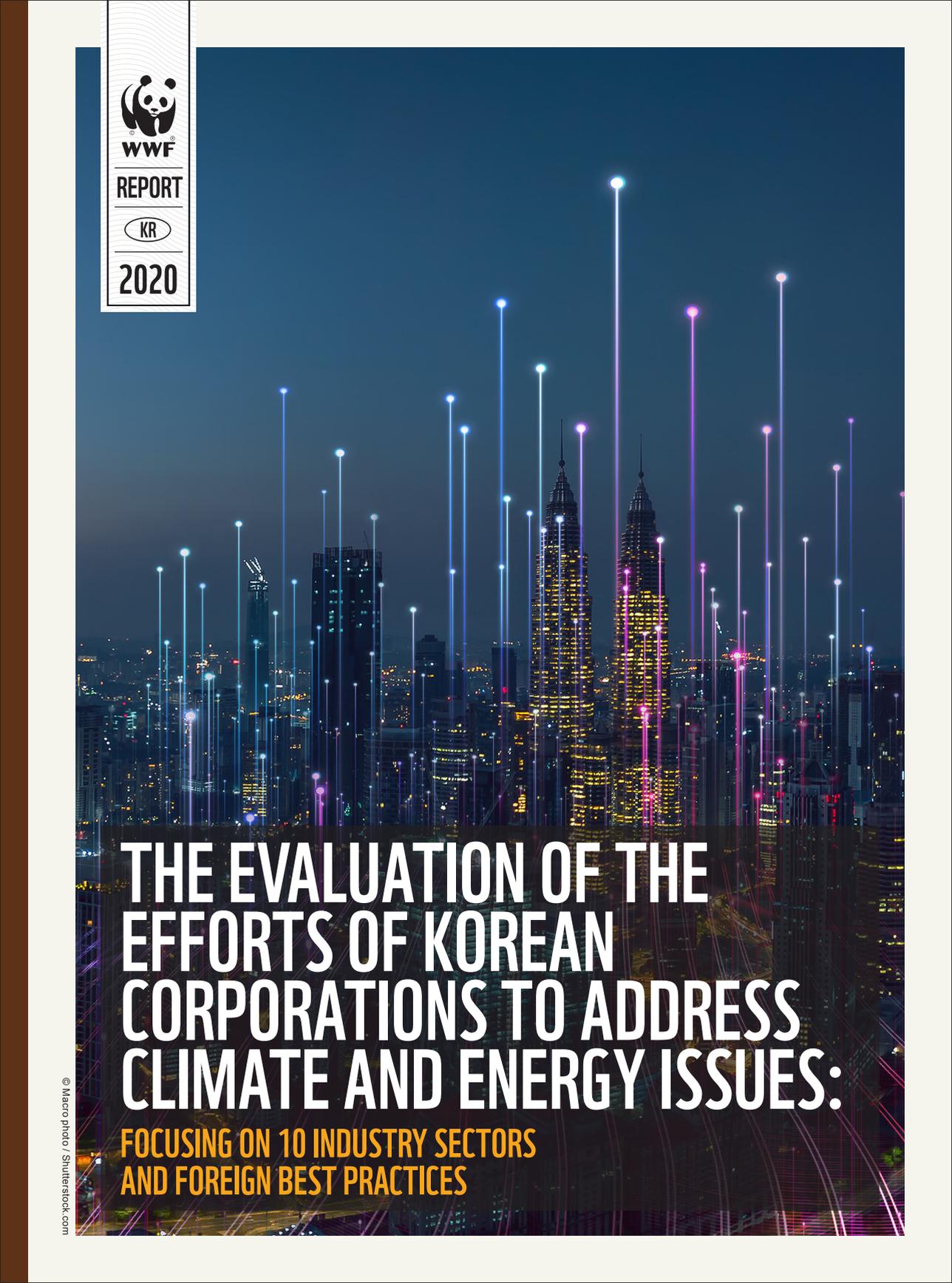


WWF

REPORT

KR

2020



THE EVALUATION OF THE EFFORTS OF KOREAN CORPORATIONS TO ADDRESS CLIMATE AND ENERGY ISSUES:

FOCUSING ON 10 INDUSTRY SECTORS
AND FOREIGN BEST PRACTICES

WWF (World Wide Fund for Nature)

WWF is one of the world's largest and most experienced independent conservation organizations, with over 5 million supporters and a global network active in more than 100 countries. WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature, by conserving the world's biological diversity, ensuring that the use of renewable natural resources is sustainable, and promoting the reduction of pollution and wasteful consumption. WWF-Korea was launched in 2014, after 10 years of conservation in Korea, based in Seoul.

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FOREWORD



YoonHee Hong
Executive Director,
WWF-Korea

This year is critical for tackling climate change. It marks the end of the Kyoto Protocol and is also a year before the official start of the post-2020 era of climate action under the Paris Agreement. At this juncture of transition, combating climate change is no longer the responsibility of some developed nations, instead becoming the shared responsibility of all countries of the world. According to the Special Report on Global Warming of 1.5°C approved by the Intergovernmental Panel on Climate Change (IPCC) in 2018, limiting global temperature rise to 1.5°C by 2100 would require reducing annual global greenhouse gas (GHG) emissions by around 50% by 2030 from 2010 levels. In line with this, each and every country is called upon to strengthen its national mitigation target for 2030 and establish a clear roadmap.

Global corporations, financial institutions, and other economic players are leading emissions-reduction efforts. Around 1,000 companies worldwide have joined the Science-Based Targets Initiative (SBTi) to set their mitigation targets in alignment with climate science. Over 200 companies have signed the RE100 commitment to go '100% renewable'. Just as addressing climate change is now the collective responsibility of all countries, not the developed world alone, efforts to reduce emissions from business activities should be undertaken by the business community as a whole, not only the top companies.

WWF-Korea released its Report on the Evaluation of the Efforts of Korean Corporations to Address Climate and Energy Issues in 2018, which highlights mitigation efforts in the electrical, electronics, telecommunications, transportation, logistics, automotive, and shipbuilding industries. This year's report assesses emissions-reduction efforts by Korean companies across 10 industries and compares them with their leading foreign counterparts, offering guidelines for improvement by industry. Climate change is not a problem that can be solved by merely complying with regulatory requirements. It is a complex problem with humanity at stake, and it revolves around the very issue of business strategy on which corporate survival and competitiveness in the global market hinge. I hope this report can inspire Korean companies to fulfill their responsibilities under the Paris Agreement, including crafting their long-term climate change vision and setting mitigation targets, and take the initiative in climate action.

Together Possible.

SUMMARY

Chapter 1: Introduction

- With an aim to help Korean companies better navigate the climate risk landscape, this report seeks to provide them with valuable insight on their response to climate change by examining domestic and foreign corporations across 10 industries, evaluating their current climate actions, and analyzing foreign best practices in relation to climate change.

Chapter 2: Research Subjects and Evaluation Methods

- For this report, 39 Korean corporations and 20 foreign corporations were selected from 10 industries. The former were chosen from among the Korean corporations that made their 2019 disclosure to CDP. The latter were from among high-performing foreign companies that received an A- or higher score in CDP's climate ranking for 2019 and that were also listed in the Brand Finance Global 500 ranking for 2019. As in the 2018 WWF report, these companies are evaluated in two categories (i) targets and performance and (ii) information disclosure.

Chapter 3: Summary of Evaluation Results

- On average, the Korean companies score 59 points on a 100-point scale, while their foreign counterparts average 80 points. This discrepancy between the two groups is attributable to their differences in subject selection criteria, emissions reduction units, renewable energy targets, and the level of reliability in setting targets. Notably, the top five performers in both the Korean and foreign groups are from the electrical, electronics, telecommunications, utilities, finance, and transportation industries, illustrating that the level of corporate commitment to climate change action varies depending on the characteristics of the industry.

Chapter 4: Establishing and implementing energy strategies – foreign companies' cases

- This chapter explores the leading global businesses with the best climate change practices. These exemplary cases are analyzed using seven key indicators. Among them, H&M's dedication to its long-term vision, Google's advocacy for climate change policies, and Apple's renewable energy projects provide Korean companies with meaningful guidance as to how to act on climate change and energy issues. BASF and Walmart also serve as good benchmarks in the areas of energy efficiency improvement and supplier engagement, respectively.

Chapter 5: Conclusion

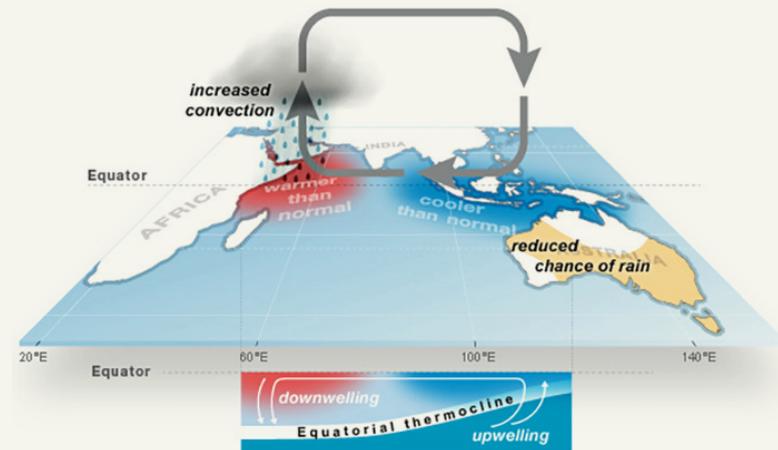
- This report finds that the Korean companies score lower than their international counterparts particularly in the areas of long-term vision, energy efficiency targets, and renewable energy targets. Climate change has now become a business risk that directly affects business operations and, therefore, requires a change in the way companies invest. In this context, it is imperative that Korean corporations take decisive action on climate change.



CHAPTER 1 INTRODUCTION

Australia experienced a catastrophe which caused 21% of the nation's forest to burn and the deaths of over a billion wild animals due to a massive spate of bushfires that broke out in Fall 2019 and spread out till early 2020. On the other hand, torrential rains and flooding that started in October 2019 and lasted more than 2 months in the East African region including Somalia and Sudan had a devastating effect on the lives of about 2 million people. These tragedies witnessed were caused by the Indian Ocean Dipole (IOD)¹, which refers to the difference in sea-surface temperature in opposite parts of the Indian Ocean. The impact of this extremely abnormal climate hasn't been limited to Australia and the African continent. It has been critically affecting Asia as well. In addition, these climate changes have been emerging as a key variable in the economic outlook. The MarketWatch forecasts that if the global average temperature rises by 4°C, the magnitude of economic losses over the next 80 years will reach 23 trillion. This would represent three to four times greater in economic losses than the impact of the 2008 global financial crisis. The MarketWatch also analyzes that stricter regulations on fossil fuel energy will inevitably have an adverse chain effect such as the reduction in corporate sales revenues and default in bank loans and lead to the subsequent economic crisis. As the climate crisis has been intensified, many countries, institutions, civil society and corporations around the world have addressed climate change as a major agenda.

Figure 1. Effects of the Indian Ocean Dipole on neighboring countries²



1. The Indian Ocean Dipole (IOD) refers to an irregular oscillation of sea surface temperatures in which the western Indian Ocean becomes alternately warmer (positive phase) and then colder (negative phase) than the eastern part of the Ocean.
 2. Abc.net.au "A positive Indian Ocean Dipole this winter is bad news for drought-hit parts of Australia"

In December 2015, the Paris Agreement was signed, and 196 countries around the world agreed on a target to limit global temperature rise to 2°C. Further, the 48th IPCC General Assembly in 2018 approved a special report aimed at limiting the increase of the global average temperature to the more ambitious target of 1.5°C (from the previous 2°C target as per the Paris Agreement) compared with that of the pre-Industrial Revolution. When the Paris Agreement takes effect from 2021, actions to deal with climate change will no longer be solely the responsibility of the few advanced countries, but all 196 countries around the world. In line with this trend, the European Commission of the European Union, announced the European Green Deal in December 2019, which aims to achieve carbon neutrality by 2050, citing "addressing climate change" as the most urgent task. Through this, the EU plans to reduce the level of carbon dioxide emissions by 50 to 55% by 2030 compared with that of 1990 and implement policies such as imposing Carbon Border Tax (CBT)³ on products imported from countries that emit a lot of greenhouse gases.

Since the mid-2000s, global corporations have no longer treated climate change as an agenda only for governments and international communities. Instead, they have recognized it as an important factor that adds to business risk because climate change can cause problems to their supply chain, lead to increased costs due to stricter regulations and increased pressure to reduce greenhouse gases from governments and international communities. Following the Paris Agreement, these movements have gained pace and become more obvious. A growing number of companies have been taking actions as to deal with climate risks. These actions include reducing carbon emissions by improving production efficiency, engaging in policy advocacy to the government for renewable energy-based power procurement, and developing innovative products that emit less carbon.

Korea's stranded asset loss will be the highest in the world if Korea maintains the current rate of coal-fired power generation. Korean companies, which have traditionally developed their international competitiveness in high greenhouse gas emission industries that use fossil fuels and nuclear energy, are now facing big changes for their future competitiveness.

3. Carbon Border Tax (CBT): A system that imposes tariffs on goods imported from countries with lax regulations on carbon dioxide emissions

Korea's growth has been based on manufacturing industries such as automobile, steel, and shipbuilding, which emit large amounts of greenhouse gases. This growth has been facilitated by inexpensive procurement of energy using fossil fuels. However, the climate crisis can completely change the landscape of the industries. A study by the UK's Carbon Tracker Initiative⁴ forecasts that Korea's stranded asset⁵ loss will be the highest in the world if Korea maintains the current rate of coal-fired power generation. This shows that Korean companies, which have traditionally developed their international competitiveness in high greenhouse gas emission industries that use fossil fuels and nuclear energy, are now facing big changes for their future competitiveness. Indeed, some of Korea's major trading partners are putting pressure on Korea to change its stance on the use of fossil fuel energy. One such notable example is the carbon border tax announced by the EU, which imposes carbon border tax on imported products from high greenhouse gas emission countries. The EU plans to implement the carbon border tax within the next year or two. If implemented, this may increase the cost of exports of Korean companies. In addition, there is also mounting pressure from investors to cut carbon emissions. Recently, 16 global investment institutions⁶ with total assets of 7178 trillion won issued a joint statement opposing the Korea Electric Power Corp.'s plan to invest in new coal-fired power plants overseas.

In an era where decarbonization of the economy and society as a whole is required around the world, this report is intended to identify the current status of climate action by domestic companies in comparison with the exemplary foreign companies across 10 industry sectors and thereby draw up areas that should be supplemented by domestic companies. Specifically, this report aims to examine the seven key indicators and their corresponding best practices and to convey the implications that domestic companies to take on board in their response to climate change.

There is a saying, "When the wind of change blows, some build walls while others build windmills." The way we respond to the current crisis may become an opportunity to open up a new future. Sharing the philosophy and practice of leading companies that have chosen to build windmills to use the wind, rather than merely blocking the wind, may inspire domestic companies to find the right direction to go in the face of the wind of climate change.

4. Carbon Tracker Initiative is a non-profit policy research institute based in London, UK, which studies the impact of climate change on the financial markets.

5. Stranded Assets: Assets that have already been invested, but are no longer yield economic returns before their end of life is reached.

6. This includes the global investment bank UBS, the Anglican Church of England, the Netherland's All Pensions Group (APG), and Japan's Mitsui Sumitomo Asset Management.



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CHAPTER 2 RESEARCH SUBJECTS AND EVALUATION METHODS

1. RESEARCH SUBJECTS

Further to the electronics and transportation industry, which was analyzed in our study published in 2018 “The Evaluations of the Efforts of Korean Corporations to Address Climate and Energy Issues” this study examines the current status of the way domestic and foreign companies address climate change and further analyzes cases of advanced foreign companies. Through this study, it aims to present the characteristics of addressing climate change per industry sector of domestic companies and guidelines of climate action.

The criteria for selecting domestic companies for our study are those companies that received the grade “D” or higher among those who submitted the 2019 Carbon Disclosure Project (CDP)^{7, 8}. As for foreign companies, we have chosen the companies that scored “A-” or higher in the 2019 CDP and who belonged to the Global 500 companies in Brand Finance⁹ 2019.

To fit the purpose of this study, the criteria for the classification of industries are drawn as shown in <Table 1> to identify the characteristics of dealing with climate change by the industry sector. As the main purpose is to identify the characteristics of the domestic industry sectors, the domestic companies with the 2019 CDP grade of “D” or higher are classified into industry sectors according to the CDP sectors and the GICS (Global Industry Classification Standard as of September 2018) classification.

Table 1. Industry Sector Classification

NO.	Industry Sector	Details
1	Construction and Engineering	Construction (including Infrastructure and Industrial Infrastructure), Electric Equipment and Machinery
2	Finance	Banking and Insurance
3	Transport	Transport, Automobile, Logistics and Shipbuilding
4	Energy	Energy Equipment and Services, Oil and Gas
5	Raw Material	Material: chemical, construction materials, containers, wrapping material, metal and mining, etc.
6	Utility	Electricity, Gas and Composite Utilities
7	Non-essential Consumer Goods	Household durable goods, consumer services, retail, etc.
8	Electric and Electronic	Hardware services: manufacturing of semiconductors and electronic equipment, software services: IT, etc.
9	Telecommunication	wired and wireless communication service, media, etc.
10	Essential consumer goods	Food, groceries, household goods, etc.

7. CDP (Carbon Disclosure Project): A carbon information disclosure program run by a non-profit organization led by financial institutions, which requests major listed companies in each country for management information related to responding to climate change issues
8. CDP evaluates each company's environmental responsibility in 4 grades such as A (Leadership, the best), B (Awareness), C (management), and D (Disclosure, the lowest). If a company scores 80% or higher in each stage, it can move to the next stage
9. Brand Finance is an independent British company established in 1996, specializing in the brand evaluation and business consulting.

Based on a total of 10 industries, three to four domestic companies and 2 foreign companies were selected for each industry. A total of 39 domestic companies and 20 foreign companies were finally selected and analyzed.

A total of 59 companies were evaluated with regards to setting, implementing and disclosing climate change targets based on each company's 2019 CDP and Sustainability Management Report in the reporting year 2018. If there was no report for the reporting year 2018, the previous year's report was used.



2. EVALUATION METHOD

For our evaluation, we adopt the same methods used in a report published by the WWF in 2018, titled “The Evaluations of the Efforts of Korean Corporations to Address Climate and Energy Issues.” The evaluation methods are composed of the following criteria.

The evaluation is largely divided into two categories. The first category is ‘Goals and Achievements’. Under this category, efforts to set and achieve targets are evaluated. The second category is ‘Disclosure of Information’, where evaluations are made as to whether information such as amounts of carbon emissions and renewable energy status are properly disclosed.

As shown in <Table 2>, the first category consists of 11 indicators and the second category consists of 10 indicators, and, thus, altogether 21 indicators. Since the score for each indicator ranges from 0 to 4, it is converted to 12 points, the least common multiple of perfect scores. Further, seven key indicators that are considered to be particularly important are given double the points. These seven key indicators are "long-term vision," "emission reduction target units," "energy efficiency targets," "renewable energy targets," "the ratio of annual GHG reduction of Scope 1 and 2 absolute reduction targets," "the disclosure of the full range of measurements and emissions," and "the third-party evaluation". The full score of 336 points is converted back to 50 points for each category, and finally adjusted to 100 points. These calculation methods follow the 2018 WWF report. The seven key indicators are evaluated based on the following criteria.



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- ① **Long-term vision:** If numerical targets are set and disclosed in the CDP and the Sustainability Management Report, points are given.
- ② **Emission reduction target units:** In addition to the absolute emissions and emissions intensity targets for reduction, the reduction target vis-a-vis BAU is considered as a company-specific INDEX and is given points accordingly.
- ③ **Energy efficiency targets:** If numerical targets are set and disclosed in the CDP and the Sustainability Management Report, points are given.
- ④ **Renewable energy targets:** Renewable energy is given full points only when accurate numerical targets (KW, etc.) are set.
- ⑤ **The ratio of annual GHG reduction of Scope 1 and 2 absolute reduction targets:** Based on CDP, Sustainability Management Report, the required annual reduction ratio is calculated and evaluated over the achievement period
- ⑥ **The disclosure of the full range of measurements and emissions:** Evaluations on the scope of the scope 3 disclosure are conducted.
- ⑦ **The third-party evaluation:** Points are given accordingly if there is a third-party evaluation on the amounts of greenhouse gas emissions.

However, as the employed evaluation methodology is centered around (1) goals and achievements and (2) the level of information disclosure of individual companies, there is a limitation that the status of greenhouse gas emissions and decarbonization itself in each industry sector cannot be sufficiently reflected. For example, comparing the overall scores of the energy industry, the telecommunications industry, and the finance industry does not help provide an overall picture of how each sector contributes and deals with climate change. Therefore, it may be necessary to utilize additional data when assessing the status of decarbonization by industry sector.

Table 2. Evaluation Indicators

Indicators		Achievements	Points	
1.	Goals and Timelines Scope	Long-term Vision	Setting up Long-term Goals (beyond year 2040)	2
			Setting up Medium-term Goals (year 2021 ~ year 2039)	1
			No mid- to long-term vision, only qualitative environmental policies	0
		Goals per timeline stage	Two or more goals per each timeline stage	2
			One goal per each timeline stage	1
			No goal	0
	Scope of Goals	Geographic scope	all major business areas, including overseas	3
			Partial business areas including overseas	2
			Domestic business areas only	1
			No clear boundaries or no goals	0
		Full range perspective	Targets for Avoided Emissions as well as Scopes 1, 2 and 3	4
			Targets for Scope 1 and 2, and Efforts for Scope 3 or Avoided Emissions	3
Targets for Scope 1 and/or Scope 2			2	
only one target across the entire scope (no target for each of Scope 1 and 2)			1	
No Target			0	
Climate Goals	Greenhouse Gases Targets(Scope 1 and 2)	Goals that include all GHGs	2	
		Emits other GHGs but targets are set for CO2 only	1	
		No target for reduction	0	
	Emission reduction target units (Scope 1 and 2)	Targets set for both absolute amount and intensity	4	
		Target for absolute amount only	3	
		Target for intensity only	2	
		Unique index only instead of targets for absolute amount or intensity	1	
		No climate-related explanation/no target	0	
	Energy Efficiency Targets(Scope 1 and 2)	Targets set for both absolute amount and intensity	3	
		Target for absolute amount only	2	
		Target for intensity only	1	
		No target	0	
	Renewable energy targets	Numerical targets (kW, etc.) of Scope 1 and 2 for the use of renewable energy (green power certificate, etc.)	2	
		Unique index: Emission reduction through the use of renewable energy to contribute to Scope 3	1	
		No target	0	
	Annual GHG reduction percentage of Scope 1 and 2 absolute reduction targets	Annual reduction percentage $\geq 1.5\%$	2	
		$1.5\% >$ Annual reduction $\geq 0.75\%$	1	
		0.75% Annual reduction percentage	0	
	Target achievement status	All targets are met.	2	
Not all targets are met.		1		
No met target/assessment not possible/no set target		0		
Comparison between result and actual performance	Review and explanation of climate-related actions implemented for each individual target	2		
	Mention of the implemented actions only without linking the actions to targets, or review of some selected actions only	1		
	No explanation of concrete actions/no targets	0		

2.	Composition of disclosure and reliability of data	Scope 1 and 2 GHG Emission Data	Absolute and Intensity	Disclosure of both absolute amount and intensity data	3	
				Disclosure of absolute amount data only	2	
				Disclosure of intensity data only	1	
				Disclosure of neither absolute nor intensity data	0	
		Time series data	Disclosure of data over the past 5 or more years in the form of charts or tables	3		
			Disclosure of data over the past 2 years or longer but less than 5 years in the form of charts or tables	2		
			Disclosure of data over the past 2 years only, can compare it with that of last year only	1		
			Disclosure of last year's data only, no previous years' data to compare with	0		
			Scope 1 and 2 Energy consumption data	Absolute and Intensity	Disclosure of both absolute amount and intensity data	3
					Disclosure of absolute amount data only	2
	Disclosure of intensity data only	1				
	Disclosure of neither absolute nor intensity data	0				
	Time series data	Disclosure of data over the past 5 or more years in the form of charts or tables		3		
		Disclosure of data over the past 2 years or longer but less than 5 years in the form of charts or tables		2		
	The renewable energy usage amount	Data scope (Scope 1-2)	Time series data	Disclosure of data over the past 2 years only, can compare it with that of last year only	1	
				Disclosure of last year's data only, no previous years' data to compare with	0	
				Disclosure of all quantitative data (kW, kWh, etc.) on the use of renewable energy	3	
				Disclosure of some data (kW, kWh, etc.) on the use of renewable energy	2	
				Disclosure of specific index data. Ex) Emission reduction through installation of renewable energy that contributes to Scope 3	1	
				No quantitative data disclosed	0	
the disclosure of the full range of measurements and emissions		The scope of the data is clearly stated	The scope of the data is clearly stated	1		
			The scope of the data is not clearly stated	0		
			Disclosure of emission data for all scopes 1, 2 and 3 with all 15 categories of scope 3 in mind	4		
			Disclosure of some emissions data of Scope 3 as well as Scope 1 and 2 data, and Avoided Emissions	3		
The third-party evaluation	The scope of the data is not clearly stated	Disclosure of some emissions data of Scope 1, 2 and 3	2			
		Disclosure of emissions data of Scope 1 and 2 only	1			
		No disclosure of emissions data at all	0			
		Evaluation by a reliable third-party	2			
		Expert's comments or opinions instead of third-party evaluation	1			
		No evaluation by a third-party	0			
Reliability of goal setting	Comparison of goals and results	Report of each fiscal year's results in chart form against the preset goals	1			
		Report of the results only, not possible to compare against the goals	0			
	The basis for setting goals	There is a clear basis for setting goals/short-term goals are linked to medium- or long-term goals	1			
		Arbitrarily set goals without a clear basis for setting goals	0			



**CHAPTER 3
SUMMARY
OF EVALUATION
RESULTS**

1. OVERALL EVALUATION RESULTS FOR DOMESTIC AND FOREIGN COMPANIES

In Section 1 of Chapter 3, evaluations are conducted by utilizing the comprehensively accumulated points from all 21 evaluation items. A more detailed analysis centered around the 7 key variables is provided in Section 2 of this chapter.

As shown in <Figure 2>, the results of evaluations of the domestic and foreign companies show 21 points difference between the domestic and foreign companies, with average scores of 59 points for the Korean companies and 80 points for foreign companies, respectively. The biggest source for this difference is the selection criteria for the companies. For the purpose of this study, which is firstly to identify the current status of domestic companies' response to climate change and secondly to derive the implying lessons from exemplary foreign companies, we have deliberately applied different criteria in selecting domestic and foreign companies. Domestic companies are selected evenly among the CDP-submitting companies (above-average, average, below-average) per industry sector whereas only the excellent CDP foreign companies are selected. Another reason for the difference in scores is "emission reduction target units," existence of "renewable energy targets" and "reliability of goal setting."

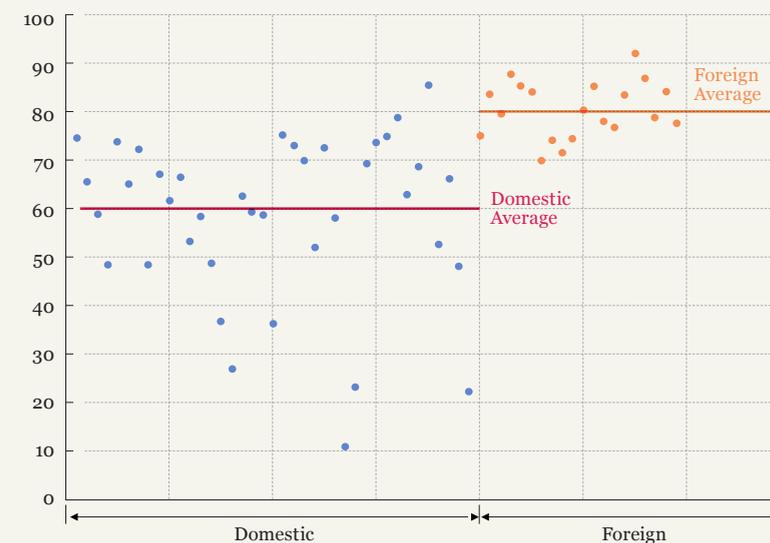
With regard to 'emission reduction target units', 23% of Korean companies and 60% of foreign companies set both absolute emissions and emissions intensity targets. This is similar to the long-term goals item which is set by 33% of domestic companies and 60% of foreign companies. Therefore, it can be seen that companies that accurately set goals for reducing greenhouse gas emissions in stages are more actively dealing with climate change by setting various reduction target units.

Domestic and foreign companies show 21 points difference with average scores of 59 points for the Korean companies and 80 points for foreign companies. The biggest source for this difference is the selection criteria for the companies. Another reason for the difference in scores is "emission reduction target units," existence of "renewable energy targets" and "reliability of goal setting."

As to "renewable energy targets", 15% of domestic companies and 35% of foreign companies set numerical targets. Other companies set somewhat abstract targets such as expansion of renewable energy. This relatively low percentage in domestic companies is attributed to the fact that domestic companies cannot utilize PPA (Power Purchase Agreement), REC (Renewable Energy Certificate) purchase, and green power use, etc., due to the domestic power structure. Currently, the methods that domestic companies can utilize are limited by direct installation or expansion of renewable energy usage in overseas branches. It is analyzed that the rate of setting targets for renewable energy by domestic companies is fairly low due to these factors.

Among the "reliability of goal setting" items, the "comparison of goals and results" item was specified by 31% of domestic companies and 85% of foreign companies. Further, the "basis for setting goals" item was found to be well-grounded among 44% of domestic companies and 100% of foreign companies. These indicators show the biggest difference in scored points between domestic and foreign companies. First of all, the 'comparison of goals and results' item is related to the setting of the goals, and, hence, if there was no goal, points were deducted. In addition, foreign companies disclose information on various environmental items, including greenhouse gases, through the Sustainability Management Report, along with directions and current status of their responses to climate change. Because the 'basis for setting goals' item is related to the possibility of utilizing renewable energy procurement methods, foreign companies that can easily secure renewable energy were able to score full points in the evaluation of the 'basis for setting goals' indicator since they could be verified through joining climate change initiatives such as SBTi and RE100.

Figure 2. Status of Scored Points of Domestic and foreign Companies



2. EVALUATION RESULTS OF DOMESTIC AND OVERSEAS COMPANIES PER INDUSTRY SECTOR

Evaluation results derived from this study are shown in <Table 3> and <Figure 3>. Because of the previously explained selection criteria, foreign companies have scored somewhat higher points than domestic companies. As shown in <Figure 3>, it can be seen that there exists the uniqueness in characteristics for each industry, which is confirmed by the similar average differences for each industry between domestic and foreign companies.

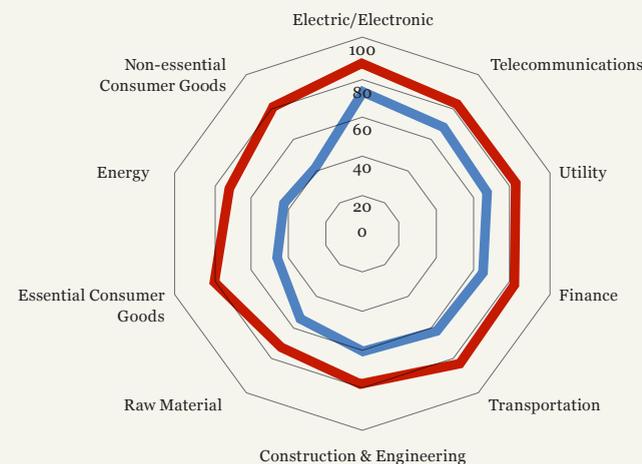
Table 3. Domestic and foreign industry rankings and average scores

NO.	Industry Sector	Domestic Ranking(Average Score)	Foreign Ranking(Average Score)
1	Electric and Electronic	1(74)	1(88)
2	Telecommunications	2(70)	5(83)
3	Utility	3(67)	4(83)
4	Finance	4(65)	3(83)
5	Transport	5(63)	2(85)
6	Construction and Engineering	6(62)	7(79)
7	Raw Material	7(55)	9(73)
8	Essential Consumer goods	8(47)	6(81)
9	Energy	9(43)	10(72)
10	Non-essential Consumer Goods	10(41)	8(77)

Figure 3. Schematic diagram of average scores by Domestic and Foreign industry

Key

- Domestic
- Foreign



<Table 3> shows that the top five industry sectors (electric and electronic, telecommunication, utility, finance, and transport) and the bottom five industry sectors (construction and engineering, raw material, essential consumer goods, energy, and non-essential consumer goods) are the same between domestic and foreign companies. Although there exist differences in evaluation scores based on the current state of domestic and foreign policies, national interest in climate change, and criteria for selecting domestic and foreign companies, it is analyzed that the efforts for dealing with climate change are similar depending on the industry.

1. Analysis of correlation between evaluation scores and sales revenue (corporate size)

In order to check the current status of climate change response according to the size of the company, we have examined the relationship between the company's sales revenue and evaluation scores from 2016 to 2018.

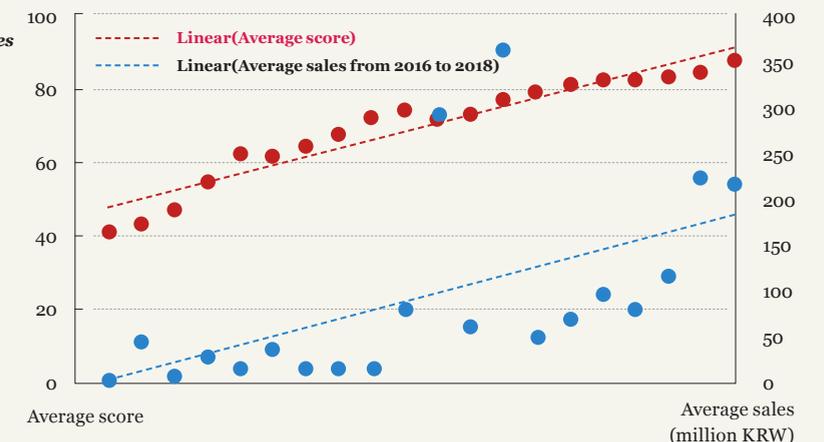
As shown in <Figure 4>, the evaluation scores and average sales revenue graphs show similar patterns. This indicates that world-class companies are aware of the need to deal with climate change and their roles and are taking preemptive actions.

The top five industries with high evaluation scores include a number of companies belonging to the Global 500, 2019. This is because the higher the brand value, the greater the interest and pressure of the international community that the company receives. As a result, truly global companies appear to be more actively participating in dealing with climate change in their attempt to strengthen their position as eco-friendly brands and a proactively responding company to climate change.

Figure 4. Correlation between Evaluation Scores and Sales Revenue

Key

- Average score
- Average sales from 2016 to 2018



2. Analysis of the current status of each industry based on the seven key indicators

In our attempt to analyze the current status of the 10 industries in more detail, which are the subjects of our evaluation, the current status of each industry sector is examined, focusing on seven key indicators in the climate change evaluation methodology. Details of the seven key indicators are as follows:

- ① **Long-term vision:** To assess the company's long-term perspective and comprehensive strategic direction in dealing with the overall climate risk by looking at whether or not it has established its long-term goals
- ② **Emission reduction target units:** To assess the company's efforts to establish practical targets for the mitigation of climate change by examining whether the absolute amount criteria and intensity criteria have been used to set emission reduction targets
- ③ **Energy efficiency targets:** As one of the methods of reducing greenhouse gas emissions, the targets can be set based on absolute emissions and/or emissions intensity. It can be a starting point for performing research on the new innovative production processes as well as improving energy efficiency in existing production methods
- ④ **Renewable energy targets:** As one of the ways to reduce greenhouse gas emissions, not only the use of renewable energy in the production process but also the direct production of renewable energy can be set as targets.
- ⑤ **The ratio of annual GHG reduction of Scope 1 and 2 absolute reduction targets:** This indicator assesses the greenhouse gas reduction numeric targets set by the company, and checks whether the targets are set above the minimum ratio to cope with climate change.
- ⑥ **The disclosure of the full range of measurements and emissions:** While it is mandated in Korea that emission sources corresponding to Scope 1 and 2 must be included when building a greenhouse gas inventory, the Scope 3 calculation is left voluntary. This indicator assesses the comprehensiveness of the company's approach to the reduction of emissions by examining whether or not the company has a full range of emissions in mind including Scope 3 as well as Scope 1 and 2.
- ⑦ **The third-party evaluation:** Third-party verification of the information on climate change disclosed by the company can enhance the reliability of the information.

(1) Long-term vision

On the "Long-term vision", the domestic industry sectors that have received high scores are in the order of Telecommunications, Finance, Transport, Electric/Electronics, and Utility (see Figure 5). In our evaluation of climate change response, the "Long-term vision" is an important indicator that assesses whether or not the company's long-term perspective and comprehensive strategic direction have been established in dealing with the overall climate risk. It can also be said that setting goals is the beginning of the addressing climate change.

Among the companies within the telecommunications sector and finance sector that are subject to our evaluation, all companies except one have set the "Long-term vision".

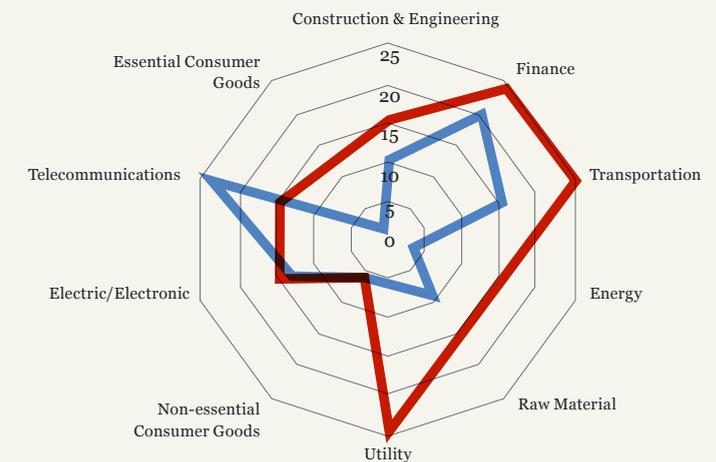
The electric and electronics industry has scored high in both domestic and foreign companies, and have been actively responding to climate change. However, on the 'Long-Term Vision', they have scored lower than other industries. After setting the "2020 Goals" in the late 2000s, the domestic companies recently announced that they were planning to establish a long-term plan. As such, it is deemed that there is no "Long-term vision" as per our evaluation methodology, and, hence, no points are given. Although foreign companies have already been active enough to complete the achievement of the long-term plan, some companies failed to score points as they replaced the long-term plan with mid-term plans (meaning higher target numbers than domestic ones).

In the case of foreign companies, the utility and energy industry sectors, which emit large amounts of greenhouse gases, have set the "Long-term vision". Setting up a "Long-term vision" is even more important in industries where the impact on overall corporate business strategies is relatively large.

Figure 5. Long-term vision average score by industry

Key

- Domestic
- Foreign



(2) Emission reduction target units (Scope 1-2)

On the “Emission reduction target units”, the domestic industry sectors that have received high scores are in the order of Construction and Engineering, Finance = Transport, Raw Material = Utility = Electric/Electronic. (see Figure 6). The indicator maintains about the same average score for all industries, with no particularly high or low industry. The “Emission reduction target units” indicator evaluates whether a company has set various targets that use “absolute emissions and emissions intensity” beyond merely setting greenhouse gas reduction targets.

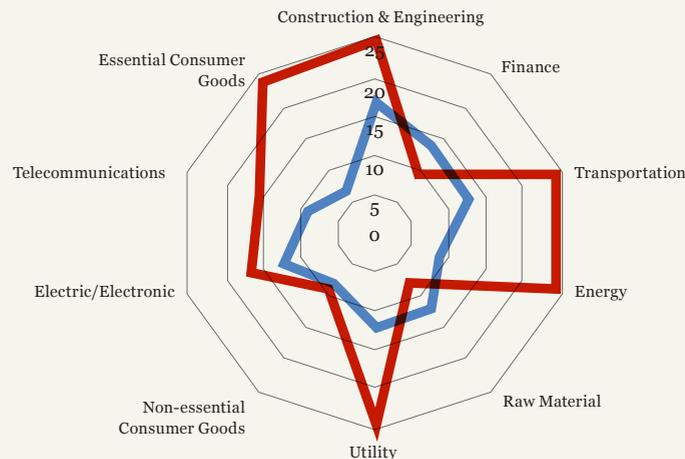
In general, the setting of the absolute emissions target is better evaluated than the setting of emissions intensity target. The setting of intensity target is useful in conducting a comparative analysis as its targets for emission reduction are determined afterward, instead of being preset, depending on other target criteria (such as sales revenue, products and the number of employees, etc.). However, it is difficult to confirm whether actual improvements are made due to its dependency on other economic variables. On the other hand, the absolute emissions target means determining an absolute reduction amount and setting it as a target. Therefore, whether or not the actual reduction is made is can be clearly determined. Full points are given if both the absolute target and the intensity target are set.

Most foreign companies within the construction and engineering, transportation, energy and utility industry sectors have set both the absolute emissions targets and the emissions intensity targets and disclosed them. It is interpreted that it is relatively easy for the companies in these two sectors to set the emissions intensity targets because of the products they make.

Figure 6. Emission Reduction Target Unit (Scope 1-2) Average score by industry

Key

- Domestic
- Foreign



10. The zero energy building is a building that maximizes energy efficiency and is equipped with facilities for renewable energy. It must satisfy the conditions of 1) high efficiency and low energy consumption, 2) its own renewable energy production facilities, and 3) connection with the power grid.

(3) Energy Efficiency Targets

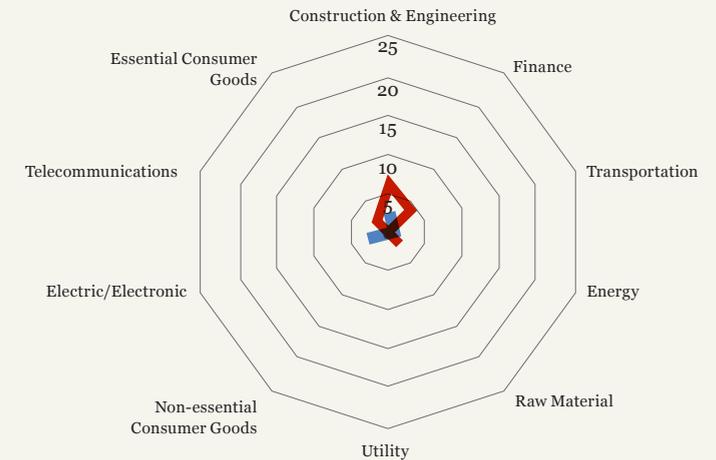
The “Energy efficiency targets” show the lowest scores among all indicators. This is because the employed evaluation methodology counts only numerical targets, not qualitative targets. Most companies have failed to score points by setting non-numerical targets (see Figure 7). Energy efficiency is an important part of the economic aspects of a company in any case even without consideration of dealing with climate change. Accordingly, many companies have made progress in their energy efficiency efforts, and most of them have been using advanced processes and facilities. Therefore, it is expected that they may have difficulties in setting additional energy efficiency targets.

Judging by the Sustainability Management reports and other verifiable material, the industry that shows the greatest efforts for energy efficiency is the electric/electronic industry. It is thought that it is because there are various factors that can be applied to energy efficiency improvements, such as data centers, manufacturing processes, and products, due to the nature of the electric/electronic industry. Foreign companies have set project-specific goals such as energy efficiency for their products, the achievement of zero energy building¹⁰, and energy efficiency improvements in factories. In particular, some companies support energy efficiency not only at their own company but also at their suppliers. Although many suppliers are interested in energy efficiency, they are unable to proceed with energy efficiency projects due to a lack of money, motivation, and expertise. In this regard, there is a case where a foreign company has launched an initiative, which aims at helping its suppliers, to promote energy efficiency. Through the initiative, the company has opened up its own energy-efficient methods to its suppliers, conducted joint projects with the suppliers, and built a data center infrastructure. It has generated more than 1 trillion KRW profits and created more than 11,000 jobs.

Figure 7. Energy Efficiency Target Average Score by Industry

Key

- Domestic
- Foreign



(4) Renewable Energy Targets

On the “Renewable energy targets”, the domestic industry sectors that have received high scores are in the order of Utility, Telecommunications, Electric/Electronics, Finance, and Non-Essential Consumer Goods (see Figure 8). The “Renewable energy targets” indicator has the lowest average score after the “Energy efficiency targets” among the seven key indicators. In particular, this indicator shows the largest gap between domestic and foreign companies. This is because there are not many ways to secure renewable energy for general companies other than power generation companies given the domestic power structure. The utility sector has received high marks both in domestic and foreign companies. It can be said that domestic utility companies have set their target for renewable energy as they focus on securing renewable energy to cope with the RPS¹¹ system. A foreign utility company has set goals by 2050 in line with the global trend of “Achieving Net-Zero¹² by 2050”, but some numeric targets for renewable energy were absent.

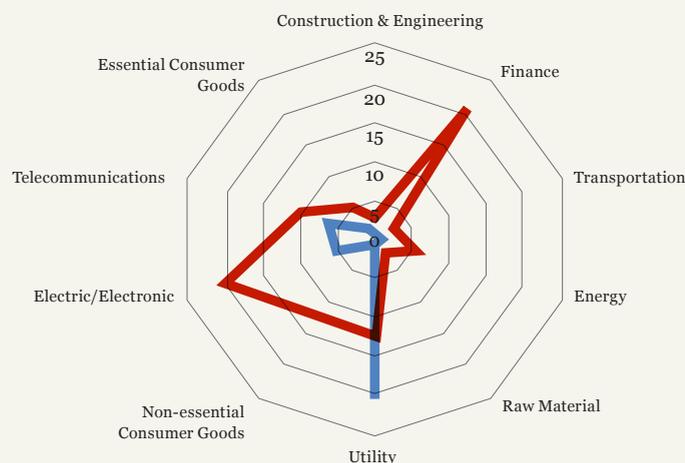
In the electric/electronic sector, Scope 2 emissions account for an average of more than 60% of the combined Scope 1 and 2 emissions, making it easier to reduce greenhouse gas emissions by securing renewable energy. In addition, there are a number of domestic and foreign global companies in the sector, so investors are also keenly interested in these global companies’ responses to climate change. Accordingly, electric/electronic companies are making more aggressive efforts to secure renewable energy. In particular, foreign companies are already procuring 100 percent of their electricity use from renewable energy sources. In addition to their own electricity consumption, they also demand their suppliers (Scope 3) to secure renewable energy.

In the finance sector, no domestic company has set targets for renewable energy, while all overseas companies have set targets. The reason for this absence of targets is thought to be because the domestic financial companies have their business sites in Korea, and, as such, have practical difficulties in securing renewable energy (such as highly costly direct installation) under the current Korean electricity power structure.

Figure 8. Renewable Energy Targets Average Score by Industry

Key

- Domestic
- Foreign



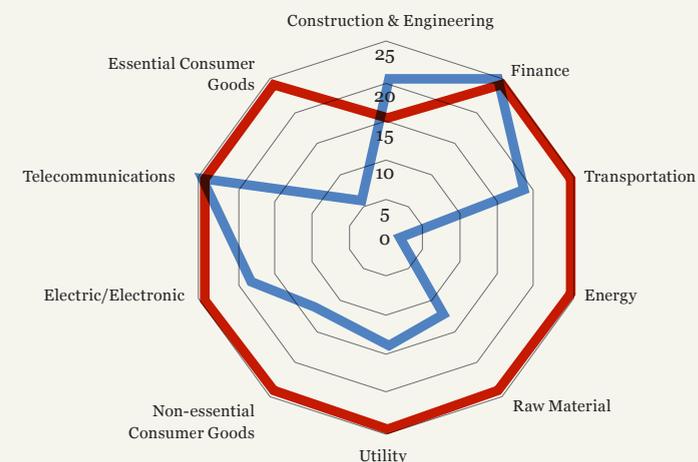
(5) The ratio of annual GHG reduction of Scope 1 and 2 absolute reduction targets

On the “ratio of annual GHG reduction of Scope 1 and 2 absolute reduction targets”, the domestic industry sectors that have received high scores are in the order of Finance=Telecommunications, Construction & Engineering, and Transportation=Electric/Electronics (see Figure 9). This indicator is related to the long-term vision and assesses the company’s mid- to long-term target levels, which means such targets that are set to achieve approximately 20C. Most companies have scored full points. All foreign companies except one in the construction and engineering industry have scored full points. As the climate sciences have been updated, the criteria for achieving “1.5°C and Well-below 2°C” required by SBTi¹³ have also been adjusted, and more and more companies have been gradually updating their targets.

Figure 9. The Ratio of Annual GHG Reduction of Scope 1 and 2 Absolute Reduction Targets Average Score by Industry

Key

- Domestic
- Foreign



11. Renewable Energy Portfolio Standard (RPS): A system that obliges large-scale power generation companies to generate electricity using renewable energy.
 12. Net-Zero: As much as carbon dioxide is emitted, measures are taken to absorb the carbon dioxide, which means zero in actual emissions
 13. SBTi (Science Based Target initiative) means initiatives for companies to set goals based on scientific evidence to gain an edge in the transition to a low-carbon economy.

(6) The disclosure of the full range of measurements and emissions

On the “disclosure of the full range of measurements and emissions”, the domestic industry sectors that have received high scores are in the order of Finance=Electric/Electronics, Construction & Engineering, Utility, and Raw material (see Figure 10). This indicator is related to the level of information disclosure. All companies have provided full and transparent disclosure of Scope 1 and 2 information. In Scope 3, similar categories should be reported by industry, however, but even if they are the same industry, comparisons by industry are not significantly meaningful due to differences based on the characteristics of the companies. Therefore, in the full range of measurement and emissions disclosure, mainly whether Avoided Emission¹⁴ data is disclosed or not has made a difference.

Consequently, the electric/electronics sector and telecommunications sector, where it is relatively easy to carry out avoided emission-related activities, have received high scores. The electric/electronics industry has developed shared drives and teleconferencing services, and the telecommunications sector has helped consumers reduce their avoided emissions by introducing eco-friendly services using ICT.

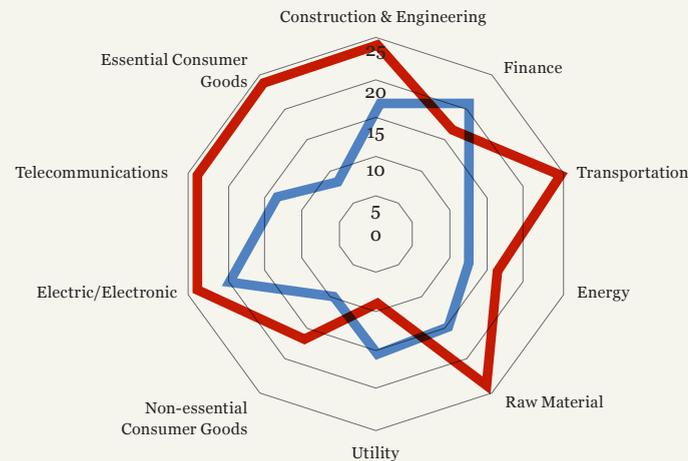
The construction & engineering industry has been supplying eco-friendly materials, constructing and consulting for zero-energy buildings. In addition, foreign raw material companies have been creating avoided emission effects by sharing new technology development and process models for raw material production processes for use by other companies as well.

In particular, foreign financial companies have been working hardest to reduce Avoided Emissions through the issuance of green bonds. For example, one of the companies evaluated has been lending funds to projects such as PPA and self-installation of renewable energy through green bonds of USD 100 billion (KRW 100 trillion) for 10 years ('14~'23).

Figure 10. The Disclosure of the Full Range of Measurements and Emissions Average Score by Industry

Key

- Domestic
- Foreign



(7) The Third-party Evaluations

On the “Third-party evaluations”, all companies but two domestic ones have scored full points. As shown in Figure 11, GHG high emission companies are designated as management target under relevant legislation and guidelines (such as the Framework Act on Low Carbon and Green Growth, and GHG Energy Target Management Guidelines). Their GHG emission amounts are subject to special management and third-party verification. The two domestic companies that have received points deductions are non-allocated companies, where it is impossible to determine whether third-party evaluation has been conducted or not as per CDP and CSR.

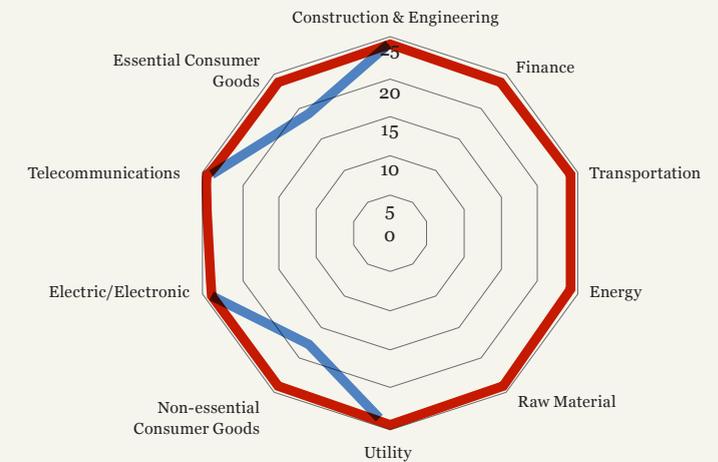
We have deliberately selected foreign companies with CDP grades A- or higher for our evaluation purposes. In order for them to receive such a high grade, they must submit proof of third-party verification. As such, all foreign companies evaluated have received a full mark in this third-party evaluation indicator.

Therefore, with regard to the 'third-party evaluation' indicator, domestic companies have scored high points due to the government policies in place and foreign companies have received full marks as they are already excellent CDP companies. Thus, evaluation by industry was not necessary.

Figure 11. The Third-party Evaluation Average Score by Industry

Key

- Domestic
- Foreign



14. Avoided Emissions (Avoidance of greenhouse gas emissions): Reductions that occur outside the life cycle and value chain of the product but result from the use of the product (e.g., fuel-strategic tires, teleconference services, etc.)

3. Overall summary of assessment results by sector

Among domestic companies, the industry sector with the highest level of climate change efforts is found to be the electric/electronic industry, followed by telecommunications, utilities, finance, and transportation. These are the same top five industries as those from foreign climate change evaluation. This can be interpreted to be due to the high pressure from the international community on climate change and the high level of interest in climate change among stakeholders in each industry.

The high scores for the **electric/electronic industry** sector may be explained by the globalization of the electric/electronic industry and the existence of high-profile global companies within the industry, which is naturally subject to high pressure and high scrutiny from the international community. The electric/electronic industry has scored above average on all seven key indicators. In particular, on the “disclosure of the full range of measurement and emission” indicator, it has scored the highest among all industries. Scope 3 emission information is difficult to collect because of the need for accurate definition and management of the value chain within the enterprise. Despite this difficulty, the electric/electronic companies for evaluation have disclosed all Scope 3 emissions that occur within a similar range according to the characteristics of the industry, which explains the highest scores they have received on the “disclosure of the full range of measurement and emission” indicator. However, the electric/electronic industry is found to be weak on the “long-term vision” indicator, compared with high scores on other indicators. Although the domestic electric/electronic industry, with a number of global domestic companies within it, has been under pressure from the international community on climate change, it is analyzed that they have been having difficulty in setting up a long-term vision due to domestic characteristics that make it very difficult to secure renewable energy.

Among domestic companies, the industry sector with the highest level of climate change efforts is found to be the electric/electronic industry, followed by telecommunications, utilities, finance, and transportation.



The **telecommunications industry** has shown the smallest difference in average scores between domestic and foreign companies, which indicates that the telecommunication industry has been actively dealing with climate change compared with other industries. All domestic companies in the telecommunications industry have set “long-term vision” and received full scores in the “ratio of annual GHG reduction of Scope 1 and 2 absolute reduction targets” as well. It is analyzed so because of pressure from global trends such as foreign investment when it is very important to gain a technological edge through 5G development. SK Telecom, in particular, is expected to strive to make more efforts to deal with climate change in the future since it has applied for SBTi membership. However, the domestic telecommunications industry has received lower scores compared to foreign telecommunications and other industries on the “Disclosure of Full Range of Measurement and Emission” indicator. The companies in the telecommunications industry were expected to have a similar scope of “measurement and emission range” disclosure, as the industry consists only of the same type of companies, not just similar types. However, the scope of the disclosure for each company has turned out to be different. This may lead to uncertainty in information disclosure. Therefore, it is necessary to ensure transparency of information through improved management of each company’s value chain.

The **utility industry**, a high-level GHG emission sector, is under pressure to reduce greenhouse gas emissions and switch to renewable energy. All domestic utility companies have set the mid-term targets only and, hence, received low scores on the “long-term vision” indicator. It is analyzed that these are the targets based on the achievement of the national 2030 greenhouse gas reduction roadmap. However, the rate of targeted reduction of GHG is lower than that of other industries. Therefore, actual climate change efforts are evaluated as low. On the other hand, with regard to the “renewable energy targets,” the utility industry has received the highest scores among all the domestic industries. It is analyzed so because the domestic utility industry has focused on securing renewable energy rather than reducing greenhouse gas emissions as an RPS target company. Foreign utility companies have set long-term targets in line with the global trend of “Achieving Net Zero in 2050”.

The **finance industry** as a whole has scored above average. In addition, it has received higher scores in the “2. Disclosure of Information” category than in the “1. Goals and Achievements” category. It is thought that this is because disclosure of information for investors is very important and that the finance industry is quite sensitive to pressure from the international community due to the unique characteristics of the industry. Therefore, both domestic and foreign companies have received high scores in the evaluation of indicators for "long-term vision," "the annual GHG reduction ratio of the target of absolute reduction of Scope 1 and 2," and "the disclosure of full range of measurement and emission." However, in the '1. Goals and Settings' category evaluation, the finance industry has received relatively low scores.

The **transportation industry** shows average scores. Neither domestic nor foreign companies have set "energy efficiency targets" nor "renewable energy targets." Companies within the transportation industry are also expected to have difficulty in setting targets as they have many factories and business sites located in various countries. However, factories and business sites being located in various countries can rather be a way to secure renewable energy for domestic transportation companies. It is advisable to first discuss the process of procuring renewable energy to factories and business sites located in countries where it is easy to secure renewable energy. Some domestic companies have already been increasing the amount of renewable energy secured through the method.

The **construction and engineering industry** has received high scores on the “emission reduction target units” indicator and on the “disclosure of the full range of measurements and emissions” indicator. The companies belonging to this industry have set the absolute emissions and the emissions intensity targets at the same time, and this is probably because they have clearly defined products given the characteristics of the industry. It is also because the definition of avoided emission along with scope 1, 2, and 3 is clear in the case of the “disclosure of the full range of measurements and emissions” indicator. The construction and engineering industry has secured many avoided emissions through the construction of buildings to which eco-friendly systems have applied. On the other hand, both domestic and foreign companies have scored low on the “long-term vision” indicator. The scores for the mid- to long-term vision of foreign companies are also found to be the lowest, even in the case of the best foreign companies.

The **raw material industry** has received an average score in the '2. Information Disclosure' category. However, it has received a low score in the '1. Goals and Achievements' category, which has pushed them down to the lower group. Accordingly, the raw material industry needs to prepare to advance to the goal setting stage beyond the information disclosure stage of climate change response information. A company in the domestic raw material industry has announced that it will consider RE100 membership in 2020 and plan to set mid- to long-term goals, so it is expected that they will take some positive actions to move to the current stage of setting goals for climate change.

The **energy industry** has received low scores on all indicators except the 'third-party evaluation' indicator. In particular, this industry has received very low scores in the category '1. Goals and Achievements'. It is analyzed that indicators such as 'long-term vision' within the category are closely linked with a company's long-term business plan and, therefore, cannot be set easily in a short period of time. In addition, it may be inevitable for the energy industry to be passive in setting reduction targets, as substantial reductions are very difficult for the energy industry to achieve.

The **essential and non-essential consumer goods industries** have received low scores on all evaluation indicators. These two industries have received deducted points even on the “third-party evaluation” indicator, on which all other industries have received full scores. The reason for the points deduction is because some companies haven't disclosed CDPs or published CSRs, which has made the verification of details difficult.

A large, complex offshore oil rig structure is shown against a blue sky with scattered white clouds. The rig is supported by a yellow steel frame and is situated over a deep blue ocean. The structure is multi-tiered, with numerous pipes, ladders, and cranes. The lighting suggests a bright, sunny day.

CHAPTER 4
ESTABLISHING AND
IMPLEMENTING ENERGY
STRATEGIES - FOREIGN
COMPANIES' CASES

This chapter analyzes the current status of best practices by foreign companies with a view to using it to help guide Korean companies in the right direction. The criteria for selecting best practices are based on the seven key indicators in our evaluation methodology.

- ① **Long-term vision:** Establishing ways to secure corporate renewable energy through Policy Advocacy related to the company's long-term vision and analyzing cases of urging the government to deal with climate change
- ② **Emission reduction target units (Scope 1 and 2):** Analyzing various goals of foreign companies through cases of foreign companies joining SBTi
- ③ **Energy efficiency targets:** Analysis of company's Scope 1 emission reduction through energy efficiency such as zero energy building, process efficiency, and low carbon technology development
- ④ **Renewable energy targets:** Analysis of the process of establishing a renewable energy strategy of leading companies based on the methods of securing renewable energy since the beginning of procurement of renewable energy by leading companies
- ⑤ **The ratio of annual GHG reduction of Scope 1 and 2 absolute reduction targets:** Analyzing various goals of foreign companies through cases of foreign companies joining SBTi
- ⑥ **The disclosure of the full range of measurements and emissions:** Given that Scope 3 consists of relatively various stakeholders, which causes difficulties in managing, best management practices are analyzed.
- ⑦ **The third-party evaluation:** Further case analysis is not carried out as most domestic and foreign companies have received perfect scores.

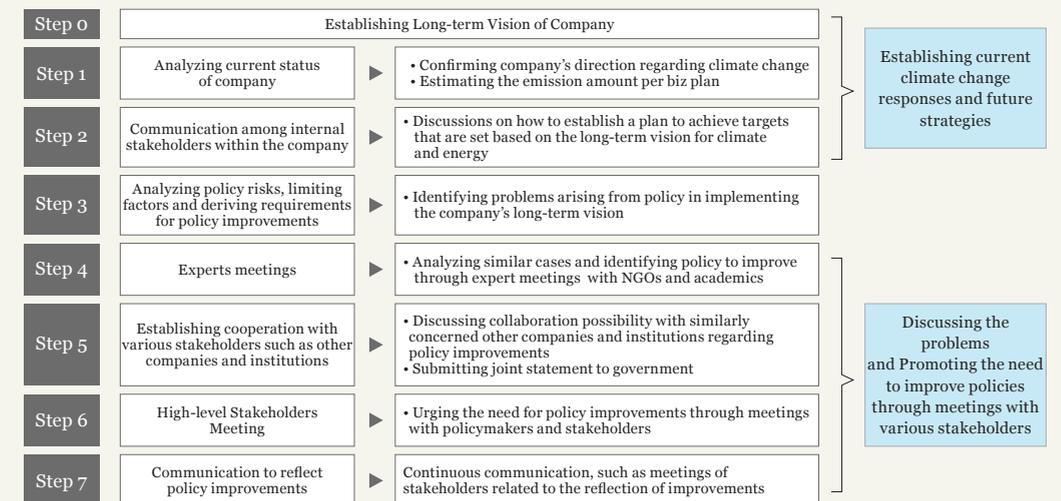
For “Long-term vision” it is necessary to set goals based on the latest climate science, to perform simulation of goals achievement, to conduct research on implementation methods, and to provide stakeholders with sufficient consultation and persuasion. When establishing a goal-achieving strategy, if the company's pursuit direction and market conditions do not match the policy of the regulatory authorities, the company can urge policy change through 'Policy Advocacy'.

1. LONG-TERM VISION: POLICY ADVOCACY

“Long-term vision” is an important decision that affects the business area of the company itself. As such, it is necessary to set goals based on the latest climate science, to perform simulation of goals achievement, to conduct research on implementation methods, and to provide stakeholders with sufficient consultation and persuasion. When establishing a goal-achieving strategy, if the company's pursuit direction and market conditions do not match the policy of the regulatory authorities, the company can urge policy change through 'Policy Advocacy'. In this section, we would like to introduce cases of 'Policy Advocacy' to find implementation measures past setting “long-terms vision”. Some of the most notable such cases include H&M's EU “Clean Energy for All Europeans” target change and Google's urge to revise Taiwan's Electric Power Act. In particular, it is worth noting that Google's call for a revision of the Taiwan Electric Power Act has made it possible to secure renewable energy in Taiwan, which used to have a similar electric power structure to Korea's.

Given these examples of corporate policy advocacy, the policy advocacy activities are conducted when it is deemed difficult to achieve long-term goals due to policy restrictions (such as the national power structure) during the stage of establishing a company's "long-term vision." In particular, foreign companies, when conducting policy advocacy activities, more strongly express their opinions through cooperation with other companies and institutions that are similarly concerned. Through the cases of foreign companies, we have drawn the process of policy advocacy as shown in <Figure 12>.

Figure 12. The Process of Policy Advocacy



1. H&M's Long-term Vision Policy Advocacy regarding EU 'Clean Energy For All Europeans'¹⁵

H&M is one of the leading companies in dealing with climate change, with getting more than 90% of their total energy consumption from renewable energy as of 2018 and setting a goal of achieving Net-Zero (Scope 1, 2 and 3) by 2040. In order to achieve the goal, they primarily try to reduce energy demand and expand renewable energy. While some carbon emissions by H&M may be inevitable, they try to offset the emitted amount by strengthening climate resilience behavior¹⁶.

After establishing the 2017 Climate Positive Value Chain goal, H&M registered with WWF's Climate Savers Programme¹⁷ to set specific methodologies, and has set the following targets for implementing the climate projects within H&M:

- To reduce Scope 1 and 2 emissions by 85% compared with that of 2014 by 2020 (Achieved 76% of the reduction target as of 2107)
- To actively promote and engage in climate policy activities
- To reduce energy consumption intensity by 25% compared with that of 2016 by 2030
- To achieve 100% of the electricity supply solely from renewable energy
- To achieve climate neutral supply chain by 2030
- To achieve climate positive value chain by 2040

With WWF's support, H&M jointly with IKEA and the Swedish headquarters of WWF as key players and 13 other Nordic companies have made policy advocacy to EU in their attempt to actively promote and engage in climate policy activities.

H&M's policy advocacy is worth noting in the sense that it didn't stop at setting their own "long-term vision." nor at urging the European Union to set a strong "long-term vision" It is important that H&M's policy advocacy contributed to the EU's resetting the final goal.

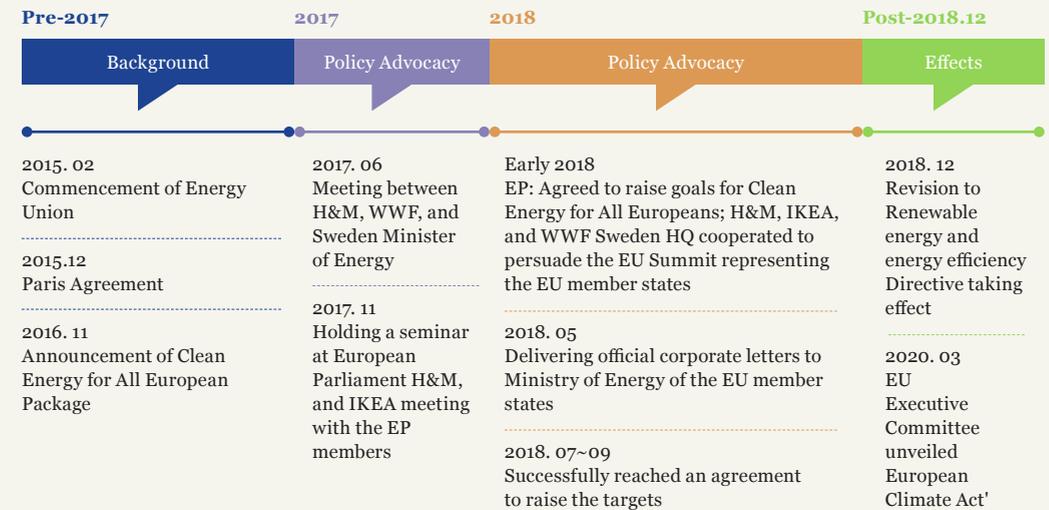
15. H&M WWF partnership "Making a Change Together" midterm result report (January 2016-July 2018)
 16. Strengthening Climate Resilience Behavior: Methods to achieve carbon neutrality through a methodology that absorbs emitted carbon by natural or artificial means, or by reducing carbon outside the H&M's value chain.
 17. Climate Savers Programme: A worldwide platform launched in 1999, which is designed to help companies achieve both climate solutions and economic growth. Working with experts, this programme sets carbon emission reduction targets, implements actions, and monitors progress.

(1) Main Contents

In 2017, H&M and WWF began urging the European Parliament to set higher levels of renewable energy and energy efficiency targets, and the company also announced that it would set their own targets at higher levels. Centered around H&M, IKEA and the Swedish headquarters of WWF, 13 other Nordic companies (Vestas, Danfors etc.) joined the group. They continued to deliver messages from 2017 to 2018, contributing to positive changes that started to emerge in December 2018.

In particular, H&M's policy advocacy is worth noting in the sense that it didn't stop at setting their own "long-term vision" nor at urging the European Union to set a strong "long-term vision" It is important that H&M's policy advocacy contributed to the EU's resetting the final goal. This means that H&M's policy advocacy activities were far beyond just a company's response to climate change and greatly influenced a nation as well as other companies. This is a good example of H&M's activeness in dealing with climate change. It is likely to have had positive influences on other companies. <Figure 13> shows how the H&M's policy advocacy activities have progressed.

Figure 13. Policy Advocacy Process



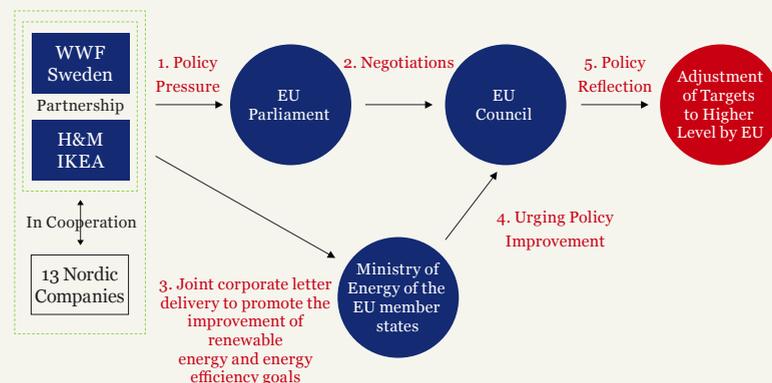
1) Background

In February 2015, the European Union (EU) announced the expansion of renewable energy through the introduction of the Energy Union Strategy¹⁸ (EU's energy policy). Subsequently, through the Paris Agreement in December, the EU set a goal of reducing greenhouse gas emissions by 40% compared to that of 1990 by 2020. Accordingly, the European Parliament announced the "Clean Energy for All Europeans" package to establish a policy framework for concrete implementation of the Energy Union Strategy and the transition to clean energy.

2) Process and Promotion Activities

- In June 2017, as shown in <Figure 14>, H&M and the Swedish Headquarters of WWF held a discussion with the Swedish Energy Ministry and the EU on renewable energy and energy efficiency target changes. Since then, IKEA has joined the WWF and H&M partnerships, making it possible to voice their opinions even more strongly.
- With help from two Swedish members of the European Parliament, Jytte Guteland and Fredrick Federley, H&M, IKEA and the Swedish Headquarters of WWF held a seminar at the European Parliament through which they delivered messages for renewable energy and the improvement of energy efficiency targets to the Parliament. In addition, Vanessa Rothschild, Head of Global Sustainability Business at H&M, and Karol Gobzycynski, IKEA's Climate and Energy Manager, explained what the EU's enhancement of goals means to their businesses along with each company's climate and energy strategies.
- After the seminar, H&M and IKEA held one-on-one talks with the European Parliament's pivotal members and expressed their view that higher levels of goals must be set first within the EU in order for the companies to achieve their own climate goals.
- In early 2018, the European Parliament decided to reflect the positions of H&M and IKEA. In addition, through the partnership¹⁹(see Figure 14), H&M delivered a statement of support for enhanced targets for renewable energy and energy efficiency to each EU member country.
- In May 2018, the H&M Partnership delivered an official letter signed by 13 Nordic companies, including IKEA, Vestas and Danfors, to all energy departments of EU member states, urging them to agree on setting higher levels of goals at the European Summit.
- After the final agreement in the third quarter of 2018, as shown in Figure 15, it contributed to raising the target to 32% of renewable energy and 32.5% of energy efficiency, which are higher than the existing targets (27% each).

Figure 14. H&M's Policy Advocacy Promotion Activities Diagram

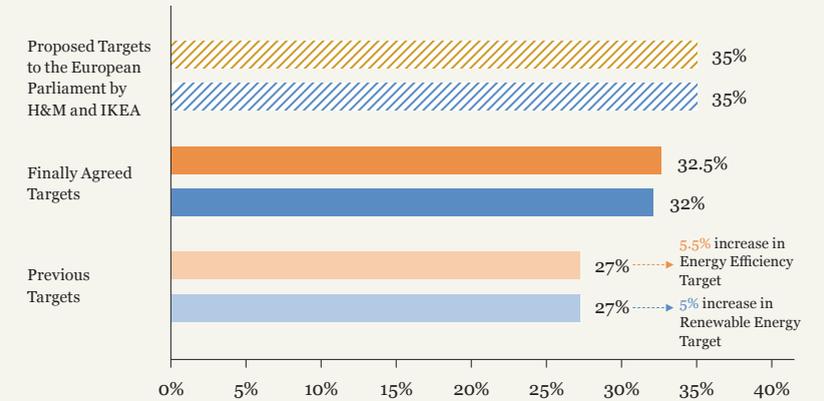


(2) Results of Promotion Activities

Figure 15. Results of H&M's Policy Advocacy Promotion Activities Diagram

Key

- Energy Efficiency
- Renewable Energy



The EU completed the upward revision of its renewable energy target through the legislation of “Renewable energy directive 2018/2001/EU”, which took effect in December 2018. The EU member states have drafted and submitted a 10-year National Energy and Climate Plans (NECPs) from 2021 to 2030 with a view to achieving the elevated targets. Furthermore, the EU member states should change their respective national laws by June 2021 to reflect the new guidelines.

With regard to energy efficiency, the EU issued a revision to the “Directive on Energy Efficiency (2018/2002)” in December 2018. In addition to the existing target of 20% energy efficiency improvement in the EU by 2020, it was upwardly revised to 32.5% energy efficiency by 2030.

18. Energy Union Strategy: Policies for the stable, sustainable and affordable supply of energy to consumers in the EU

19. H&M Partnership: Partnership with H&M, WWF, and IKEA being the key members and with 13 other Nordic companies also as members

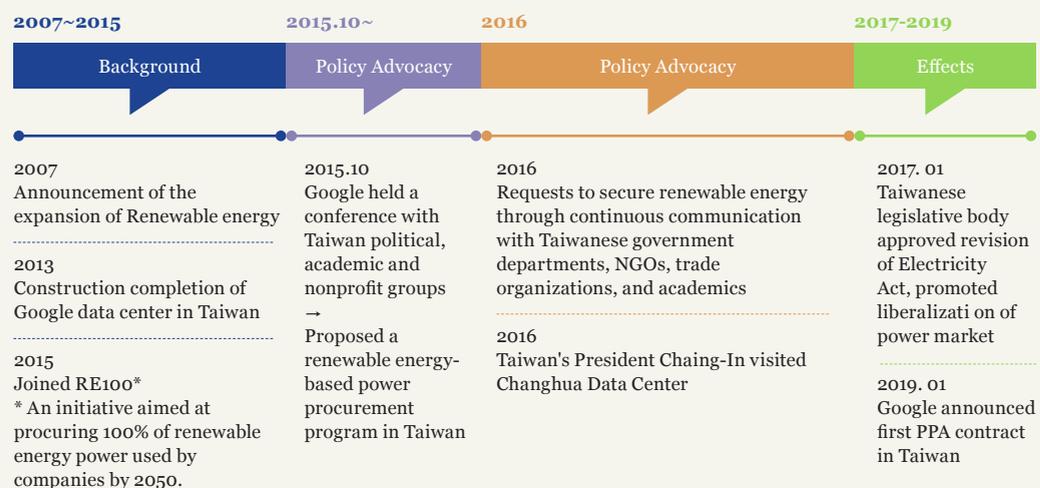
2. Google in Taiwan: Long-term Vision Policy Advocacy²⁰

(1) Main Contents

1) Background

Google has been procuring 100% of the electricity power consumed in data centers and offices as renewable energy since 2017. Google currently has data centers in “USA (13), South America (1), Europe (5), Asia (2 - Taiwan, Singapore)”. Google promotes the use of renewable energy in all of its facilities. However, if it is difficult to do so in some cases due to a certain electricity power structure in a region, they purchase a bigger amount of renewable energy from a specific grid, which has sufficient supply of renewable energy, than that region requires so that the overall usage of renewable energy can become nominally 100%. Google's ultimate goal is to supply electricity power utilizing renewable energy to all grids operated by Google and to create new power supply and demand models in regions where renewable energy is not available. Under this Google stance, Policy Advocacy in Taiwan has proceeded as shown in <Figure 16>.

Figure 16. Google's Policy Advocacy Process



20. Google website: <https://sustainability.google/projects/taiwan-renewable-energy/>

2) Process and Promotion Activities

Google completed its data center in Taiwan in 2013 and began calling on the Taiwanese government to make changes which are required to accommodate Google's transition to renewable energy-based electricity from 2015. Renewable energy procurement means a lot more than just reducing the carbon footprint for Google. This is because renewable energy-based power can be procured at fixed prices to ensure price certainty, which helps establish long-term business plans. Moreover, as the price competitiveness of renewable energy-based power has improved, Google has made efforts more actively to procure renewable energy-based power.

Google's internal public policy team creates and reviews policies related to energy, sustainability, and climate change strategies. The team members actively conduct research related to policy advocacy in the United States, Europe, and other countries. Notable examples of such policy advocacy include a request for a revision of the EU's renewable energy policy and electricity market structure in 2017, and the instrumental role they played in the approval of the electric power IRP²¹ in the State of Georgia in the USA in 2016. It is thought that the Public Policy Team played a significant role in the revision of the Taiwanese Electricity Act. The Public Policy Team's reports will ultimately reach the Chief Legal Officer (CLO), who has the authority to oversee Google's policies and communications organization. Google's Sustainability Team also utilizes the Public Policy Team during the review phase to check for consistency with its climate change strategy.

In October 2015, Google held a meeting with Taiwan's political and academic circles and non-profit organizations and proposed a program to help companies in Taiwan obtain renewable energy-based electricity. Google met with various stakeholders, including meetings with the Taiwan Energy Bureau, the Taiwan Renewable Energy Alliance and the Business Council for Sustainable Development Taiwan, and the Chung-hua Institution for Economic Research and began to demand for institutional measures by which they can procure renewable energy-based power.

Throughout 2016, Google had continued its discussions with the high-level Taiwanese stakeholders and requested them to secure access to renewable energy. Most notably, Google invited Taiwanese President Tsai Ing-Wen to its Changhua County Data Center to discuss Google's sustainability goals and opportunities to procure renewable energy in Taiwan. In addition, through continuous discussions with relevant government departments, NGOs, trade organizations, and academics, Google kept making efforts for renewable energy purchase system and renewable energy certification system to be established in Taiwan.

Google's ultimate goal is to supply electricity power utilizing renewable energy to all grids operated by Google and to create new power supply and demand models in regions where renewable energy is not available.



21. Integrated Resource Plan (IRP): A long-term power generation plan, tailored to the forecasted electricity demand by the electricity supplier, is mandated to submit in 33 states in the USA.

(2) Result

In January 2017, Taiwan's legislature revised the Electricity Act to allow all consumers to purchase renewable energy directly, pushing for the liberalization of the electricity market. Through the revision of the Electricity Act, the Taiwanese government made it possible for consumers to secure renewable energy through PPA, allowing power generation companies to sell renewable energy produced power directly to private companies. In response, Google announced its first PPA contract in Taiwan in January 2019. This is the first case of such electricity purchase following the Taiwan Electricity Act revision. Google signed a contract with a 10MW solar power plant located in Daenam City. The generated power will be connected to Google's data center located in Changhwa County for its use.

Google actively persuaded the government to revise related laws under the situation where the existing laws and regulations made it impossible to secure renewable energy. This is the result of Google's commitment and efforts against climate change, an example of the importance of policy advocacy activities by companies.

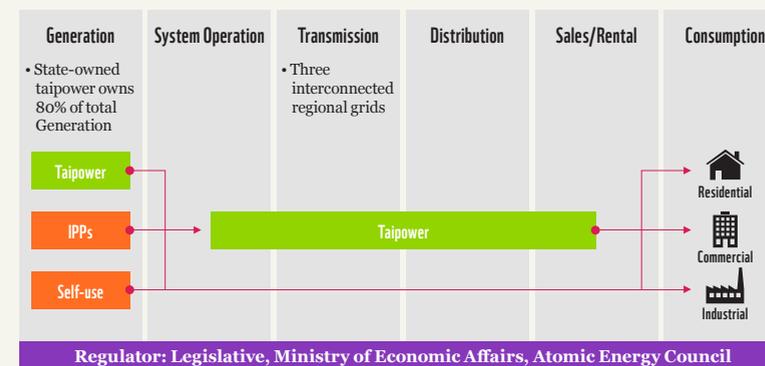
This revision of the Electricity Act allows Google to be able to procure renewable energy-based electricity at a stable price for a long period of time, which means it can minimize the uncertainty caused by rising power prices in the future. It appears that Google has taken policy advocacy as an opportunity to develop its long-term business plans, rather than just as a means to reduce carbon emissions.

* Main points of the revision of the Electricity Act of Taiwan

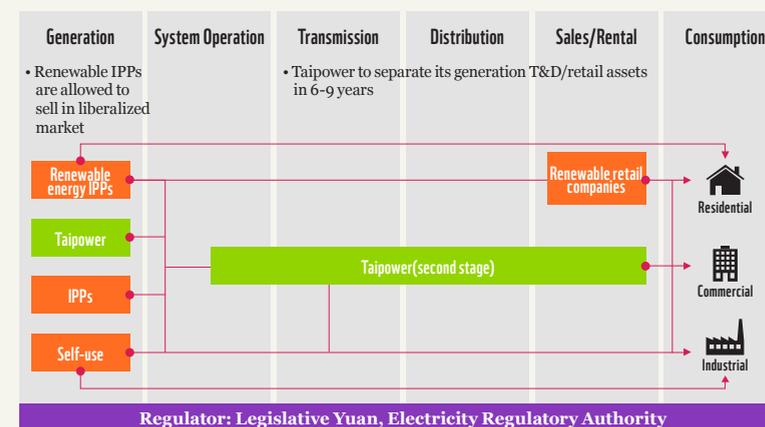
Prior to the revision of the Electricity Act, the Taiwanese power market had been dominated by Taipower (Taiwan Power Company), the state-run electric power company, which had provided 80% of electricity (as of 2016) and had the exclusive right for power transmission and distribution functions until 2016. The remaining twenty percent were provided by independent power producers (IPP) and self-generating companies in the industrial sector. Most of the produced electricity was directly consumed or sold to Taipower. Before and after the revision of the Taiwan Electricity Act is as shown in <Table 4>.

Table 4. Comparison before and after the revision of the Taiwan Electricity Act²²

BEFORE: Electricity market structure before the revision of the Taiwan Electricity Act



AFTER: Electricity market structure after the revision of the Taiwan Electricity Act



The revised Electricity Act of Taiwan, heavily influenced by Google's Policy Advocacy, shows a clear difference before and after the revision regarding electricity production, transmission and supply, monitoring and management of electricity producers and the electricity market, and system transition. Details of the revision are shown in <Table 5>.

Table 5. Details of the Revision of the Electricity Act - Main points²³

Class	Details
Diversification of electricity production and suppliers	Electricity can be purchased without going through Taipower. Renewable energy generating companies are allowed to sell produced electricity directly.
Liberalization of electricity sales and purchases	The liberalization of the electricity market allows consumers to purchase electricity with a choice between public electricity providers, renewable energy producers, and renewable energy sellers.
Differentiation of Monitoring and Management of Electricity Producers and the Electricity Market	By exercising its appropriate authority, the central government established a regulatory body to monitor the electricity market. The electricity cost charged by the public power seller is under the control of the regulatory body. Has launched energy price stabilization fund to minimize price volatility.

22. Korea Energy Economics Institute, World Energy Market Insight No. 18-19, 2018

23. The Executive Yuan of Republic of China official website

2. EMISSION REDUCTION TARGET UNITS (SCOPE 1 & 2) AND THE RATIO OF ANNUAL GHG REDUCTION OF SCOPE 1 AND 2 ABSOLUTE REDUCTION TARGETS: PARTICIPATION IN SBTi²⁴

1. Main Contents of SBTi

The “Emission Reduction Target Units” (Scope 1-2) is to evaluate whether a company’s reduction targets are set at the level which can contribute to climate change mitigation. The 'annual GHG reduction ratio of Scope 1 and 2 absolute reduction targets' evaluates whether a company meets the minimum criteria for achieving the Paris Agreement goal (The goal of the Paris Agreement is to limit the rise in global temperature to much lower than 2°C, and try to curb it to 1.5°C than before industrialization.). In this section, examples of meeting these indicators through participation in the Science Based Target Initiative (SBTi) are reviewed.

SBTi is a voluntary initiative to strengthen corporate climate action by providing guidelines and methodologies for setting science-based greenhouse gas emission reduction targets that meet the Paris Agreement goals. The SBTi-approved targets submitted by companies and their motivation for joining SBTi are investigated. The SBTi setup process for a company is shown in <Figure 17>.

24. SBTi website: <https://sciencebasedtargets.org/>

Figure 17. SBTi Set-up Process



As of August 2020, 961 companies have joined the Initiative, 445 of which set SBT (Science Based Target) targets that were approved. A total of three Korean companies, SK Telecom, SK Securities, DGB Financial Group have joined the Initiative, but they have yet to set targets.

In order for their submitted targets to be approved, companies can utilize various methodologies such as SBA (Sector-based approach), ABA (Absolute-based approach), and EBA (Economic-based approach) provided by SBTi. If the target set by the company to reduce greenhouse gas emissions meets the level necessary to achieve the Paris Agreement goals, it is approved as a SBT (Science Based Target). In addition to the benefit of having its targets certified, a company pursues the establishment of SBT targets to satisfy the demands of various interested parties and to ensure reliability.

2. Best Practice Companies

Although the scope of the target setting varies slightly from company to company, it is recommended that all of Scope 1, 2, and 3 be included and that both the absolute emissions targets and the emissions intensity targets be set at the same time. Among the 445 companies that have already set goals, some of the major best-practice companies²⁵ are as follows. These best-practice companies consist of the exemplary companies selected by SBTi and the companies subject to this study evaluation.

25. SBTi website: <https://sciencebasedtargets.org/case-studies-2/>

(1) DELL: Electric/Electronic Industry

- After confirming the value of sustainable management in 2011, DELL had invested a lot of time to set targets over the next two years from 2012 to 2013. In order to reduce GHG emissions, they focused on reducing the energy consumption of their products, the biggest source of emissions. Then, in October 2013, the target levels were finally agreed by all parties, including the top management and the product production group. As part of the 2015 climate change strategy review, the targets were reported to the CDP and WWF and approved by the SBTi.
- Target 1: Absolute Emissions) 40% reduction in absolute amounts of emissions of Scope 1 and 2 by 2020 compared to those of 2010
- Target 2: Emissions Intensity) 80% reduction in intensity based on products by 2020 compared to 2011

(2) Kellogg's: Essential Consumer Goods Industry

- Kellogg's consulted with NGOs such as WWF and CDP to set targets. SBT target setting is a way to gain the trust of internal and external stakeholders. In order to distinguish it from the existing greenhouse gas reduction targets, the target set by utilizing the SBTi method is described as the 'SBT target'. Despite the costs that obviously incur for setting and achieving targets, considering the trust of customers and stakeholders gained from achieving the targets and the savings from energy use costs in the long term, the SBT target setting can be viewed as a Win-Win strategy.
- Target 1: Emissions Intensity) 15% reduction in emissions per ton of food by 2020 compared to 2015
- Target 2: Absolute Emissions) 20% reduction in Scope 3 emissions by 2030 compared to 2015
- Target 3: Absolute Emissions) 65% reduction in absolute amounts of Scope 1 & 2 emissions by 2050 compared to 2015
- Target 4: Absolute Emissions) 50% reduction in absolute amount of Scope 3 emissions by 2050 compared to 2015

(3) Daiwa House Industry: Construction and Engineering Industry

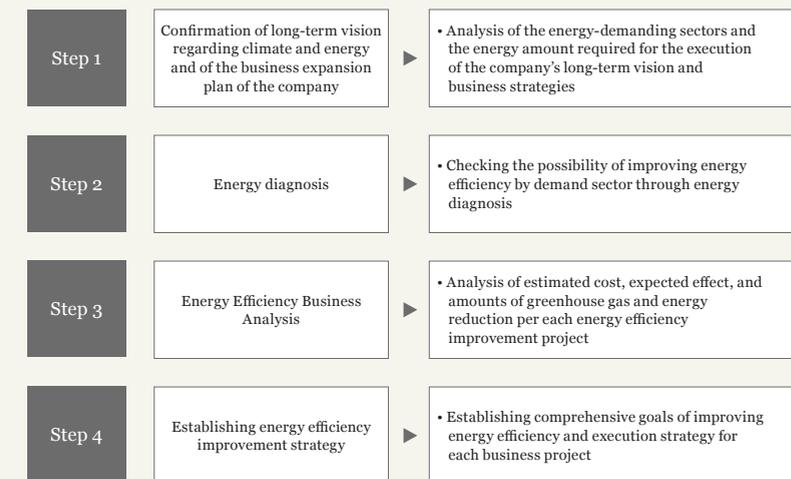
- Since the official announcement of the long-term environmental vision "Challenge ZERO 2055" in 2016, they had utilized SBTi to set specific targets and to gain trust of stakeholders. Their SBTi membership was finally approved in 2018. They plan to announce EGP (Endless Green Program) in every three years and report the status of target achievements and future plans.
- Target 1: Emissions Intensity) 45% reduction in Scope 1-& 2 emissions per sales by 2030 compared to 2015
- Target 2: Absolute Emissions) 22% reduction in absolute amounts of Scope 1 & 2 emissions by 2030 compared to 2015
- Target 3: Emissions Intensity) 30% reduction in Scope 3 emissions per sold area by 2030 compared to 2015

3. ENERGY EFFICIENCY TARGETS

Most companies have set strategic goals rather than energy efficiency numerical targets. This seems to be due to difficulties in setting specific targets as companies have already introduced advanced processes and facilities. Therefore, this study would like to introduce two examples that have shown various perspectives beyond the general concept of energy efficiency. They are Google's energy efficiency initiative operation and BASF's energy efficiency strategy establishment. In particular, BASF's energy efficiency strategy is significant in that it continues to strive for innovative development rather than settle for existing technologies. They also try to contribute to the response to climate change by sharing their new technologies with other companies.

In general, in order to establish energy efficiency targets, companies should first identify the greenhouse gas and energy reduction targets in response to climate change and conduct energy diagnosis as shown in <Figure 18.> Subsequently, reduction items are derived based on energy diagnosis results and strategies are established.

Figure 18. Process of Energy Efficiency Target Establishment



100% of the electricity that Google used in 2017 was supplied from renewable energy. Google has been expanding its policy regarding renewable energy use and energy efficiency improvement to its suppliers.

1. Google's Technical Pilot Program for China Energy Management and Performance Evaluation²⁶

(1) Main Contents

Google declared carbon neutrality in 2006, and has since pushed for energy efficiency initiatives and renewable energy expansion. 100% of the electricity that Google used in 2017 was supplied from renewable energy. Google has been expanding its policy regarding renewable energy use and energy efficiency improvement to its partner companies (suppliers). Google ultimately aims to ensure that its suppliers can also use 100% renewable energy-based electricity. As such, the "Technical Pilot Program for China Energy Management and Performance Evaluation", a pilot program for supporting energy efficiency, had been carried out for 18 months since 2017.

This pilot program had been carried out for Flex and Gold Circuit Electronics (GCE) among Google's partners in China, in collaboration with CNIS²⁷, a non-profit research institute in China.

This pilot program aimed at "(1) improving the energy management system (2) tracking the performance of energy consumed in the production of Google products (3) reducing energy consumption, and (4) improving operational performance". In addition, Google wanted to develop the self-reliance of its suppliers to continue to manage energy efficiency even after the program ended.

Google also shared its knowledge, cases, and resources (such as tools for calculating the effects of energy efficiency) with its suppliers to improve their energy efficiency. The program was conducted based on four methods as shown in Table 6.

Order	Classification	Contents
1	Training and Coaching	<ul style="list-style-type: none"> • Application of energy management system and identification of energy cost reduction factors • Providing training and company-tailored coaching
2	Energy savings, cost savings, and productivity improvements	<ul style="list-style-type: none"> • Improving understanding of energy use within the facility • Reducing energy costs and increasing productivity
3	Continuous improvements in energy performance	<ul style="list-style-type: none"> • Analyzing local laws and regulations and complying with them • Bringing out energy performance through locally applicable methods
4	Internal recognition	<ul style="list-style-type: none"> • Education for understanding the results of energy efficiency performance • Enabling suppliers to educate customers, regulators and shareholders about the results

26. Google website: <https://sustainability.google/projects/supply-chain-energy-emissions/>

27. CNIS (China National Institute of Standardization): Development and Reform Commission of China, provides technical guidelines and national guidelines related to energy efficiency.

28. Reconstruction from Google's official website and the CSR content

(2) Results of the Pilot Program

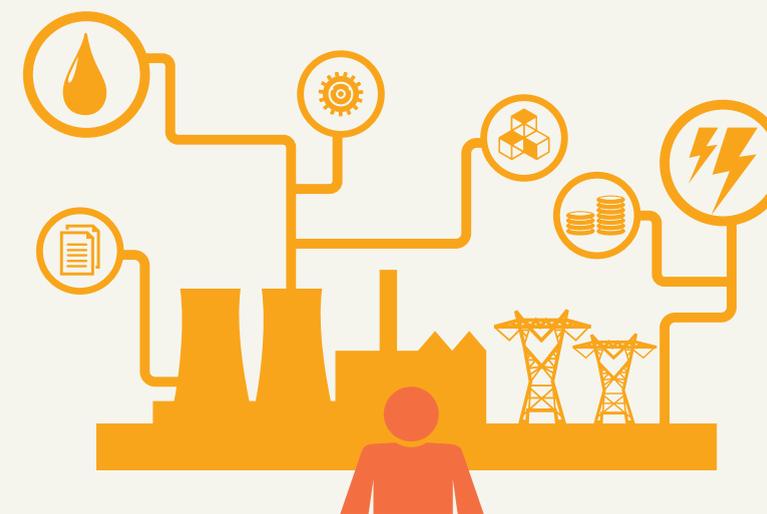
1) Flex (Multinational electronics manufacturer)

Flex participated in the program from July 2017 for its production plants located in China. A total of three workshops were conducted, and an internal energy management system that applied ISO 50001 standards was introduced.

At the second workshop, Flex and the CNIS team selected five major energy-saving projects to be carried out within Flex factories located in Zhuhai and Shenzhen, China. Successful completion of the projects may result in an energy savings of about 6 GkWh per year, which is equivalent to the energy consumption of more than 3,500 Chinese households per year. Details of the project include lighting improvement, water heater improvement, and high-efficiency compressor installation, and it is expected that the investment will be recouped within one to three years. In addition, the application of ISO 50001 has enabled Flex to show itself as a climate change response company to its employees, customers and various stakeholders.

2) Gold Circuit Electronics (GCE) (Print Circuit Board Manufacturer)

GCE has participated in the program since the second half of 2017 for its production plants located in China. GCE set up an action plan to apply ISO 50001 and completed certification in March 2019. It also selected three energy-saving projects, including lighting efficiency improvement and compressor replacement, with its partners. This may result in a savings of 227,000 kWh per year, if successfully completed. In addition, GCE identified energy saving factors by utilizing energy diagnosis provided by Google and established energy efficiency measurement and saving methods through energy management training.



2. Carbon Management Program at BASF^{29, 30, 31}

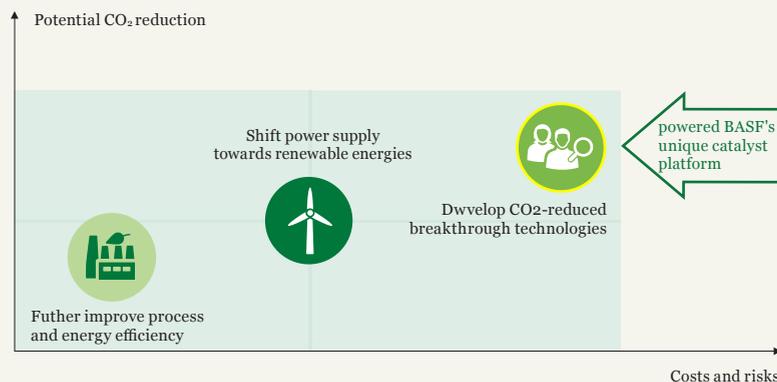
BASF, a German chemical company, is well-known for its improved process efficiency with its proprietary Verbund system. The Verbund system is a BASF-specific production network that allows products produced in one process and leftover raw material to be used as raw material in the next process. For example, waste heat generated during one production process is converted into energy in another process. BASF saved 19,200,000 MWh of electricity in 2019 through the Verbund system, which means a carbon reduction of 3,900,000 tons CO₂e.

BASF began to take an interest in Carbon Management in earnest in 2018 and aims to achieve carbon neutrality by 2030. To achieve carbon neutrality within the next 10 years, BASF began to implement actions in its business areas in response to climate change in January 2019 and included "climate protection" in its business strategy. To reduce greenhouse gas emissions, BASF adopted three approaches as follows:

- ① To achieve advanced production and process efficiency
- ② To secure renewable energy
- ③ To develop new technologies for low greenhouse gas emission (R&D Program)

BASF classified the above three approaches based on cost and risk factors and the potential for carbon emissions reduction. As shown in <Figure 19>, BASF decided that advancement in production and process efficiency could minimize cost and risk, but the potential carbon reduction would not be significant. On the other hand, in the case of R&D, the cost and risk are high, but it is expected that the potential carbon emission reduction effect will be substantial if successful.

Figure 19. Potential carbon reduction, cost, and risk estimates based on the different carbon management approaches³²



29. 'Innovations for a climate-friendly chemical production' Press release
 30. 'Carbon Management at BASF-R&D strategies to reduce CO₂' Presentation material
 31. 'Carbon Management' fact sheet
 32. BASF Carbon Management at BASF - Presentation material

BASF began to take an interest in Carbon Management in earnest in 2018 and aims to achieve carbon neutrality by 2030.



BASF's Carbon Management R&D program aims to reduce Scope 1 emissions by introducing high-efficiency processes (new technologies) in the production of energy-intensive basic chemicals. Given the fact that 70% of the CO₂ emitted by the European chemical industry originates from the production of basic chemicals, it can be seen as a program created by taking into account the characteristics of the chemical industry and the carbon-reducible factors.

According to the 2019 CDP report, BASF spends nearly half of its R&D investment on programs to increase energy and raw material efficiency and to protect the climate. Given that their R&D investment cost was 2.028 billion euros (KRW 2.75 trillion) in 2018, it means that more than 1 trillion won is invested annually on programs for energy efficiency and climate protection. Considering that BASF conducts over 3000 projects per year and employs more than 11,000 R&D personnel around the world, a significant proportion of this R&D workforce and projects also appear to work on programs for energy efficiency and climate protection.

The results of this Carbon Management program began to appear in 2019, one year after the program was launched. Most notably, there has been a successful development of a climate-friendly methanol production process, about which BASF has submitted applications for PCT³³ international patent. The new process developed by BASF incinerates waste gas steam generated from the synthesis of methanol and isolates CO₂ produced during this process and uses it again as a feedstock in the process. Currently, BASF has been working with the German Ministry of Education and Research for the "climate-friendly production process for hydrogen (methane pyrolysis)" research project.

Finally, BASF hopes not only to reduce its own emissions through the development of new technologies, but also to contribute to the reduction of avoided emissions through the dissemination of new technologies they develop. In particular, this case is significant in that it has attempted a new approach called the development of new technologies for low-emission greenhouse gas (R&D Program). The BASF's goal is to develop a new process system through the development of innovative new technologies, beyond the usual energy efficiency improvement (advancements of production and process efficiency) which typically utilize commonly commercialized technologies. As BASF, like many leading companies, had already been using highly advanced processes and facilities, it was expected to be very difficult to improve energy efficiency further. In the face of the expected difficulties, BASF has made great efforts to find new innovative ways rather than being complacent. As such, this case has many positive implications for companies in a similar position.

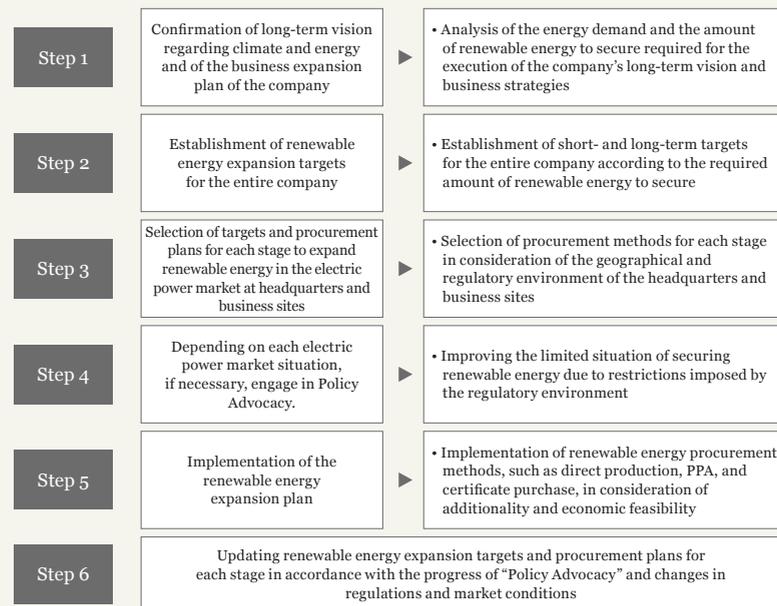
33. Patent Cooperation Treaty (PCT): The international patent application system under the Patent Cooperation Treaty has the effect of filing a domestic application to all or part of PCT member countries designated by the applicant in a single application.

4. RENEWABLE ENERGY TARGETS

Foreign companies with more diverse means of procuring renewable energy than domestic companies have been actively procuring renewable energy. Indeed, some companies (Apple, Google, etc.) have already procured 100% of their electricity from renewable energy. Apple, in particular, has been selected as one of the best-practice companies with a steady increase in renewable energy use, as a result of their efforts to seek new procurement methods from the beginning of the response to climate change.

Apple's case shows that the first thing to do for setting renewable energy targets is to estimate the required amount of greenhouse gas to reduce and the required amount of renewable energy to secure by thoroughly analyzing the company's current status as shown in <Figure 20>. When setting the initial renewable energy targets, there may exist too many barriers if it is attempted to supply renewable energy to the entire group of companies. Therefore, it is advisable to identify the applicable business sites for renewable energy supply as a priority, such as a business site that can easily secure renewable energy or a business site that needs priority supply, and then secure methods for procuring renewable energy for each business site. Apple also carried out Policy Advocacy, depending on the location of the business site (e.g., the 2013 Nevada Green Rider Program).

Figure 20. Renewable Energy Target Setting Process



1. Apple's Renewable Energy Expansion Project³⁴

(1) Background

Apple has long been dedicated to addressing its environmental footprint. Over a decade ago, Apple began a full-fledged renewable energy procurement program to power its data centers, offices and retail stores with 100% renewable energy. As of Fiscal Year 2019, Apple achieved this goal, with all of its operations using 100% renewable energy, with 83% of the contributing renewable energy projects directly created by Apple. In Fiscal Year 2015, Apple expanded its renewable energy efforts to its supply chain with the Supplier Clean Energy Program, with the goals of helping suppliers transition to 100% renewable energy for Apple production, and bringing online 4 GW of clean energy by 2020.

In July 2020, Apple announced its most ambitious environmental goal yet: By 2030, all operations, manufacturing and product use will be carbon-neutral, and 100% of the electricity used to make Apple products will be sourced from clean energy.

(2) Project Contents: Apple's Facilities Renewable Energy Procurement Evolved Via Consistent Innovation

1) Introduction

For more than a decade, Apple has steadily increased its use of renewable energy for corporate facilities and its supply chain. They have opened up new markets every year by employing various new procurement and investment methods. When it was difficult to access renewable energy, they developed a new program in cooperation with a local power generator. When it was difficult to secure renewable energy due to existing electric power structures, they sought other ways, such as equity investment (China) and strategic solutions pertinent to particular markets (Japan and Singapore), to procure renewable energy.

All electricity used at Apple's data centers has been 100% renewable energy-based since 2014. In April 2018, the company announced that it was using 100 percent renewable energy-based power for all of its facilities in 43 countries around the world. Apple recorded an average annual growth rate of 33% in renewable energy between 2013 and 2018³⁵.

2) Project Examples

Innovation played a key role in how Apple contracted and built projects to help it reach 100 percent renewable energy by January 2018. These examples illustrate the evolution of Apple's strategy, optimized for geographic considerations, over the years:

34. Apple_Environmental_Responsibility_Report_2014-2019

35. https://www.apple.com/environment/pdf/Apple_Environmental_Responsibility_Report_2018.pdf

- PURPA³⁶ in 2012: In North Carolina, Apple developed a 20MW solar facility, followed by a second 20MW solar facility and 10MW fuel cell facility in 2013, and a third 17.5MW solar facility in 2015. In 2015, two Oregon hydropower projects were also developed under PURPA. Apple used the U.S. Public Utility Regulatory Policies Act (PURPA) to minimize the company's risk. The utilization of PURPA was a groundbreaking method for renewable energy development at the time, which has since increased.
- Direct Access in 2012: Apple's data centers in California began purchasing renewable energy directly from independent power plants, opting out of energy from the local utility's existing resources. An Apple data center in Oregon began using direct access in 2013.
- Green Rider in 2013: Apple opened a new data center in Nevada in 2013. For the data center's use of renewable energy, Apple worked with the local utility to develop the NV GreenEnergy Rider (Nevada Renewable Energy Use Policy)³⁷, a regulatory structure that allows Apple to enter into long-term contracts with new renewable energy projects. Through this program, four solar energy projects, with a total capacity of 320MW, were implemented.
- Equity investment in 2014: Apple established a first-of-its-kind joint venture company to expand its renewable energy options. For the renewable energy-based electricity consumption at the headquarters and retail stores in China, Apple carried out equity investments in a total of two 20MW solar projects.
- Portfolio solutions in 2015 and 2016: Rooftop photovoltaic installations in Singapore and Japan were carried out in line with the local electric power structure. In Singapore, the Singapore version of PPA, which is similar in structure, was used. In the case of Japan, despite the existing electric power structure that makes it difficult and complex to utilize renewable energy, Apple was able to identify economical ways to produce renewable energy by utilizing low voltage tariffs.
- Renewable microgrid in 2017: The new Apple Park (headquarters) is configured as a microgrid and has a total of 16MW of rooftop solar power, 4MW of biogas fuel cells and 4MWh of battery storage installed.
- Reaching 100% in 2018: Apple contracted for renewable energy generation in new markets like India, Turkey, Israel, Brazil, and Mexico to cover our remaining loads in those and neighboring countries.

36. PURPA (Public Utility Regulatory Policies): It regulates the use of energy-saving and renewable energy resources as a starting point for power market restructuring.
 37. Nevada Green Rider: Policy to enable long-term contracts for renewable energy projects

Figure 21. Energy Consumption Status of Apple by Year

Key

- Non-renewable energy consumption
- PPA
- renewable energy certificate
- self-generation for own consumption
- contract
- other

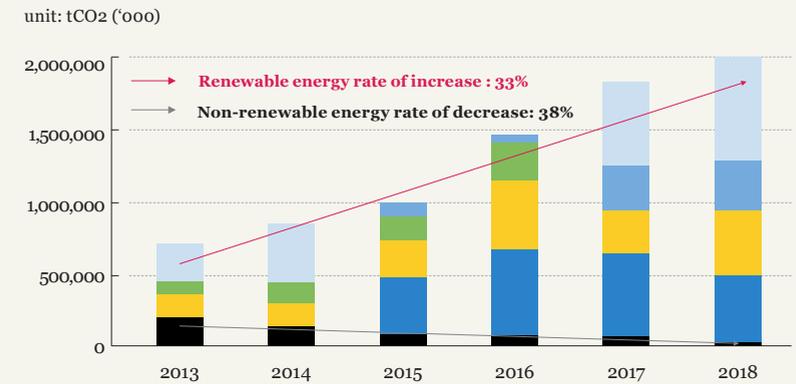


Table 7. Apple's Energy Consumption Proportion Year-by-Year³⁸

Category	2013	2014	2015	2016	2017	2018	2019
Non-renewable Energy Consumption	27%	13%	7%	4%	3%	1%	0%
Renewable Energy Consumption	73%	87%	93%	96%	97%	99%	100%

(3) Greening the Supply Chain

Apple's Supplier Clean Energy Program is recognized as a leader the field and is a critical part of reducing the company's overall emissions. Emissions from manufacturing make up about three quarters of Apple's overall carbon footprint. Of Apple's Top 200 suppliers, Korean companies make up 12%³⁹. Most of the emissions in Apple's manufacturing supply chain are from the electricity used to manufacture its products. So Apple focuses on increasing energy efficiency at supplier facilities, and then on transitioning suppliers to clean, renewable electricity. These efforts are helping to reduce product-related carbon emissions, create a more resilient supply chain, and contribute to healthier communities—while also paving the way for others to follow. To date, 72 manufacturing partners in 17 countries (including SK hynix and Daesang in Korea) have committed to 100 percent renewable energy for Apple production. Apple itself has invested directly in renewable energy projects to cover a portion of upstream emissions. The Supplier Clean Energy Program now has 7.8 gigawatts of clean energy commitments. Once completed, these commitments will avoid over 14.3 million metric tons of CO₂e annually—the equivalent of taking over 3 million cars off the road each year. As part of meeting Apple's 2030 commitment, all Apple suppliers will soon use renewable energy to support Apple production.

38. https://www.apple.com/environment/pdf/Apple_Environmental_Progress_Report_2020.pdf
https://www.apple.com/environment/pdf/Apple_Environmental_Responsibility_Report_2018.pdf
 39. Top 200 Apple suppliers by spend: <https://www.apple.com/supplier-responsibility/pdf/Apple-Supplier-List.pdf>

(4) Project: Green Bond

1) Main Contents and Results

Apple first issued a US\$1.5 billion green bond in February 2016 (“2016 Green Bond”) to secure investments in renewable energy, and issued the second green bonds worth US\$1 billion in 2017 (“2017 Green Bond”). When they issued the second green bond, they expanded project eligibility criteria so that bond proceeds could not only be applied to Apple's own projects but also be invested directly in supply chains and suppliers’ facilities and products. Although direct investment in suppliers' facilities is very rare, Apple uses green bonds across supply chains, operations and products to reduce carbon footprints. Both the 2016 and 2017 Green Bonds were fully allocated as of the close of Apple’s 2018 fiscal year.

In November 2019, Apple issued a third green bond, a 2 billion Euro offering, this time devoted to global initiatives to lower carbon emissions. This latest issuance brought the total green bonds Apple has used to US\$4.7billion. Apple remains the largest corporate issuer of green bonds, underscoring its strong commitment to the environment.

<Table 8> shows how Apple allocated the funds from its first two green bonds.

Table 8. Apple’s Final Allocation of its 2016 and 2017 Green Bonds⁴⁰

Classification	2016 Green Bond (million \$)	2017 Green Bond (million \$)
Renewable energy	194.2	75.47
Green buildings	495.9	608.03
Energy efficiency	665.9	165.56
Water efficiency	98.5	85.82
Material conservation	36.3	21.06
Greener materials	3.6	2.76
Environmental design	0	36.5
Total	1,494.4	995.2

Apple has allocated green bond funds to over 30 projects. Among them, there was a rooftop solar power installation project in Japan in the field of renewable energy. Despite the difficulties due to spatial constraints, Apple made investments by using green bonds so that they could achieve the target of 100% renewable energy-based power at all of Apple's business sites around the world. More than 600 solar rooftop systems with a total capacity of 24.4 MW have been installed, which has resulted in about 42,000 MWh of renewable energy-based power generation and emission reduction of 24,800 tons of CO₂e every year.

40. Apple Green Bond Report 2018

2016 Green Bond

3,379,600 sq.ft.

Greenbuildings

304

Installed renewable energy capacity

399,900 MWh

Energy produced from renewable sour

**43,200 MWh +
222,300 therms**

Energy savings

89,000,000 gal.

Water savings

43,400 metric tons

Waste diverted from landfills

439,000 metric tons

Avoided greenhouse gas emissions³

Figure 22. Estimates of Expected Effects of Green Bonds

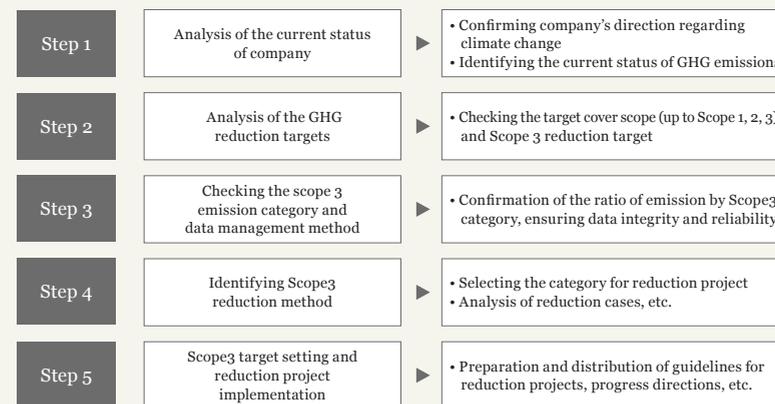


5. DISCLOSURE OF THE FULL RANGE OF MEASUREMENTS AND EMISSIONS: SUPPLIER MANAGEMENT PROGRAM

The 'Disclosure of the Full range of Measurements and Emissions' indicator evaluates the disclosure of Scope 1-2-3 data and Avoided Emission. Among the scope of greenhouse gas disclosure (Scope 1, 2, 3) Scope 3 is a difficult part to manage due to various categories and complexity of stakeholders. Walmart has a very large proportion of Scope 3 emissions (more than 91% of total emissions) and has more than 100,000 suppliers. Accordingly, Walmart's supplier management program has been selected and analyzed as a representative example.

As we can see in Walmart's case, establishing a supplier management program requires a detailed understanding of Scope 3 through analysis of the company's current status and analysis of the company's greenhouse gas reduction targets, as shown in <Figure 23>. In particular, it should focus on the accuracy of data collection in all categories where Scope 3 is emitted. After analyzing the current status of Scope 3, the final targets should be set in consideration of whether the reduction project is applicable and whether stakeholders can cooperate.

Figure 23. Process of Establishing a Supplier Management Program



1. Walmart's Project Gigaton⁴¹

(1) Background

Walmart has been working on Green Initiative⁴² with its suppliers since 2005. However, there was a limitation that Walmart's strategy could not be directly reflected in the business activities of its suppliers. In response, Walmart introduced a new strategy for supplier management in 2016. The targets were set as "18% reduction of Scope 1-2 emissions by 2025 compared to 2015 and 1 Gigaton reduction of Scope 3 by 2030" and were approved by SBTi in November 2016.

Walmart's Scope 3 emissions account for about 91% of total emissions (as of 2018). In its attempt to reduce emission amount efficiently, Walmart officially announced Project Gigaton⁴³ in November 2016 and officially launched it in April 2017. Project Gigaton consists of "6 topics: Energy, Agriculture, Waste, Product Use and Design, Packaging, and Deforestation" and suppliers can participate by voluntary choice. If a partner has a target for SBTi approval, it is possible to participate in "other" outside the six topics mentioned above.

Walmart, in cooperation with NGOs, such as WWF, EDF (Environmental Defense Fund), CI (Conservation International, an American environmental non-profit organization), TNC (The Nature Conservancy, a charitable environmental organization), SPC (the Sustainable Packaging Coalition), and CDP, developed the "Projects Gigaton Calculator". The role of each organization is as shown in <Table 9>. Through the "Project Gigaton Calculator", Walmart allows many suppliers to join without being limited by company size, assets, and industries. Walmart provides participating suppliers with case sharing and support for sustainable management through community operation and ultimately aims to help participating suppliers be able to stand on their own feet.

Walmart introduced a new strategy for supplier management in 2016. The targets were set as "18% reduction of Scope 1-2 emissions by 2025 compared to 2015 and 1 Gigaton reduction of Scope 3 by 2030" and were approved by SBTi in November 2016. Project Gigaton consists of 6 topics and suppliers can participate by voluntary choice.

41. walmart-2019-esg-report 2018~2019

42. Green Initiative: Walmart's Sustainability Agenda started in 2005, creating a 20 million tCO₂e reduction effect from Scope 3 by 2015

43. Walmart website: <https://www.walmartsustainabilityhub.com/project-gigaton>

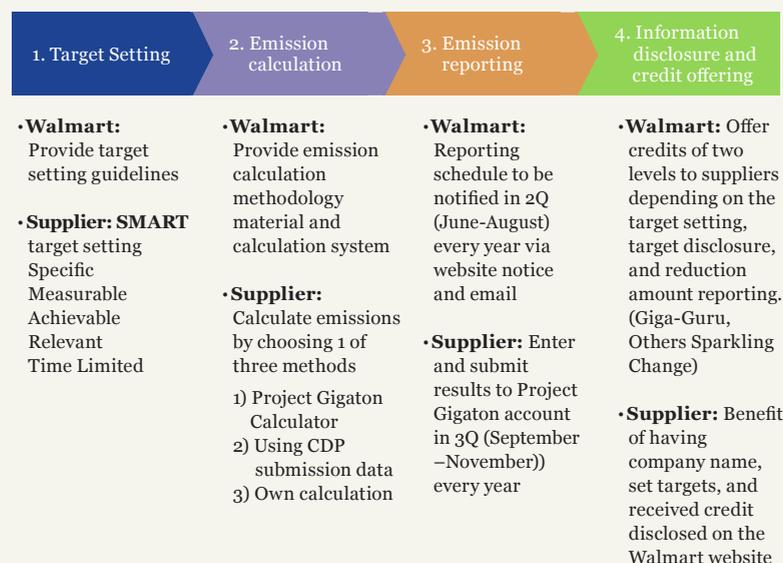
Table 9. Role of each organization in development for Project Gigaton Calculator⁴⁴

Organization Name	Roles
WWF	• Project Gigaton Tool Design
EDF	• Support for SBTi Target setting and achievement • In partnership with Walmart since 2005 and has provided Project Gigaton guidelines
CI	• Mainly focusing on analyzing the supply chain of palm oil, beef, and soybeans and changing to the sustainable supply chain policy. • Providing deforestation solutions
TNC	• Institutions related to climate change control, sustainable supply of water and food, etc. • Providing supply chain solutions
SPC	• Supporting companies to use sustainable packaging materials • Providing solutions for using sustainable packaging materials
CDP	• Carbon Disclosure Project (CDP) CO2 Reduction Response Evaluation Organization • Utilizing carbon emission data provided to the CDP

(2) Operation Phases

Project Gigaton covers the total emissions of suppliers that account for the upstream and downstream of Scope 3, and is carried out by voluntary participation by suppliers. Suppliers can participate at any time, regardless of the period, and there are four ways to participate as shown in <Figure 24>.

Figure 24. Project Gigaton Operation Phases



44. Reconstruction from Walmart-2019-esg-report 2018~2019 official website

1) Target setting

Suppliers who want to participate should sign up for Project Gigaton through the website. Then, the targets are set by using the target setting guidelines provided by Walmart. If there are existing targets, they can be used.

2) Estimation of emissions

Each supplier must calculate the emissions annually using a suitable method for the company.

- Project Gigaton Calculator: Calculation systems developed in collaboration with NGOs, industry, and government agencies can be used to estimate the supplier's emissions.
- Utilization of CDP submission data
- Company self-calculation: In addition to the above two methods, this is the company's own emission reduction data based on the company's self-calculation, but Walmart does not recommend this method since it is considered that the data has not been evaluated by a third party.

3) Emissions reporting

Suppliers must enter their emissions into the Project Gigaton account at the third quarter of each year. The results of the selection of excellent companies will be announced in the second quarter of the following year.

4) Disclosure of excellent partner (supplier) information and provision of credit

Walmart recognizes credit by dividing it into Giga-Gurus and Others Sparkling Change according to ① SMART target setting ② disclosure of set targets ③ compliance with recent reduction report. Suppliers selected as excellent partners are officially announced on the Walmart website. If selected, it will have an impact on supplier contracts and management in the future. As of 2019, 428 Giga-Gurus and 424 Others Sparkling Change companies have been selected.

- Hansae Fashion Worldwide: This Korean company joined in December 2017, and aims to reduce emissions by 25% per million garments by 2025.
- Samsung Electronics: This Korean company joined in May 2017 and aims to reduce 250 million tCO₂e during the product use phase between 2009 and 2020.
- HP Inc.: HP joined in May 2017 and aims to reduce greenhouse gas emissions by 25 percent per product by 2020 compared to 2010. It also strives to reduce deforestation for paper and packaging of HP Inc.

(3) Current Status

Since the launch of the project in 2017, more than 1000 suppliers have joined during the next two years and the number is increasing fast. The total cumulative reduction amount is 93,656,639 tCO_{2e}, accounting for about 9% of the overall target.

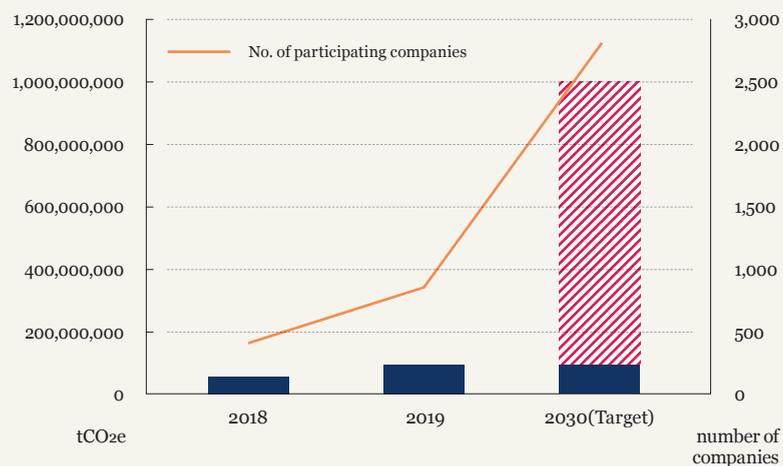
In particular, for their suppliers' energy efficiency projects, Walmart has provided McKinsey & Company's RedE (Resource Efficiency Deployment Engine) program tool and encouraged suppliers to use the tool. As a result, as of 2019, 940 factories introduced the RedE system to their processes, saving up to US\$29 million (KRW 35.6 billion) and reducing emissions of 199,854 tCO_{2e}.

Walmart's Project Gigaton is significant in the sense that it has gone through the process of identifying limitations and things to improve by learning from past experiences. Efforts have been made to compensate for difficulties involved in direct management of suppliers' emissions and to remove entry barriers for participating suppliers. To encourage the active participation of suppliers, entry barriers have been lowered or removed. For example, anyone wishing to participate can easily join in. No penalty is imposed even if targets are not met. Further, It can be learned that Walmart provides goal-setting guidelines, emission estimation methodology tools, Walmart success stories, and reduction efficiency program for companies that have difficulty in dealing with climate change due to their capital and business perspective. Walmart has more than 100,000 suppliers. As shown in <Figure 25>, in order to achieve the goal of 2030, Walmart needs to expand its suppliers' participation by more than 100 times in the future and reduce 83 million tCO_{2e} annually by 2030. Therefore, it is expected to encourage the active participation of suppliers in the future.

Figure 25. Current Status of Project Gigaton⁴⁵

Key

- Cumulative reduction
- Additional reduction target



45. Reconstruction from Walmart-2019-esg-report 2018~2019

6. SUMMARY OF IMPLICATIONS FOR ANALYSIS OF FOREIGN COMPANIES BEST PRACTICES

For the common goal of reducing carbon emissions, each company endeavors to find effective ways to reduce their emissions and strives to set and implement scientific and systematic targets.



In 2017, Google procured 100 percent of its electricity use on a renewable energy basis. Google has been making efforts to use renewable energy not only at its headquarters but also where its branch offices are located. As part of the move, Google called on the Taiwanese government to revise its policy to procure renewable energy-based power. Through their diligent two-year effort, Google had contributed to bringing about a revision of Taiwan's Electricity Act and building a business environment where renewable energy-based power can be purchased at a stable price for a long period of time. This could have many implications for domestic companies in that Google's call for a revision of Taiwan's Electricity Act made it possible to secure renewable energy in Taiwan, which had a similar electric power structure to Korea, and that foreign companies actively demanded the government to do so.

Apple also procures 100% of its electricity as renewable energy. In particular, Apple can be seen as a good example of securing renewable energy in that it sought ways to secure renewable energy step by step and tried new procurement methods from a time when other companies' interest in renewable energy was low. It is also notable that Apple carried out policy advocacy in regions where it was difficult to secure renewable energy.

BASF, a German chemical manufacturing company, incorporated climate change response into its main strategy of business, and began operating the Carbon Management program in 2018. In addition, BASF is preparing for climate risks by launching an R&D team to develop innovative technologies that enhance energy efficiency and dramatically reduce carbon emissions.

Walmart in the US has set a goal to reduce Scope 3 emissions by 1 gigaton by 2030. In particular, after identifying that 90% of its carbon emissions come from Scope 3, Walmart has been actively conducting a campaign, Project Gigaton, so that it can reduce carbon emissions with its suppliers. This is significant in that it has come up with an accurate analysis of the company's emissions status and corresponding measures accordingly.

Many foreign companies, including Google, Apple, BASF, and Walmart, have taken various measures depending on the type of industry they belong to and the cause of carbon emissions. For the common goal of reducing carbon emissions, each company endeavors to find effective ways to reduce their emissions and strives to set and implement scientific and systematic targets.



CHAPTER 5
CONCLUSION

The world is experiencing a paradigm shift away from the existing fossil fuel-based economy. Amid rising calls for economic and social decarbonization on an international scale, corporate strategies for managing climate risks have extended beyond the sole domain of corporate social responsibility. In major industries, such strategies have become a business imperative that directly affects an entity's ability to continue as a going concern, management strategies, and competitiveness. In this context, this report analyzes 10 key economic sectors and sheds light on foreign best practices in addressing climate change, thus providing practical guidance to help businesses enhance their climate action.

It is found from the analysis that the Korean and overseas companies show consistent differences in their level of commitment on climate change depending on which industry they belong to, not on their geographical location, except for the fact that the foreign companies showed somewhat stronger overall performances than their Korean counterparts due to the difference in subject selection criteria between the two groups. This demonstrates that corporate climate action varies in its characteristics among different industries. In both groups, the five highest-scoring industries are electrical, electronics, telecommunications, utilities, finance, and transportation, while the five lowest-scoring industries are construction and engineering, raw materials, consumer staples, energy, and consumer discretionary. From this, it can be seen that, despite a score discrepancy between the two groups due to differences in climate policy landscape, national climate awareness and engagement, and subject selection criteria, they share similar patterns of climate change response by industry.

One such pattern is that the Korean company subjects received fairly good scores in the second category of information disclosure because they are mostly on the Korea Emissions Trading Scheme, under which information disclosure and third-party verification are mandatory. However, they have deficiencies in the first category of targets and performance because of their shared lack of a long-term vision, energy efficiency targets, and renewable energy targets.

Across the 10 industries, the Korean and overseas companies scored low in the 'energy efficiency target' and 'renewable energy target' indicators. Both subject groups mostly received lower scores in the former indicator. Since energy efficiency has long been taken as an integral component of corporate cost reduction efforts, companies already have advanced processes and equipment in place, with little room for any additional 'energy efficiency target'. However, this limit can be overcome if they resist complacency with the current state of energy efficiency and actively seek to develop innovative low-carbon technologies and mitigation measures.

In the 'renewable energy target' indicator, the Korean subject group scored low. This is mainly because it is virtually impossible to secure renewable energy without disruptions due to the nation's electricity industry structure. However, the world's leading corporations are not only stepping up their efforts to secure renewable energy, but also increasingly demanding their suppliers to do so as well, though they have not yet made it mandatory. If they require their Korean suppliers to source their electricity from renewables, this will pose a significant risk to the national economy. For this reason, Korean companies strongly urged the government to formulate measures to secure renewable energy from 2018 to 2019. Thanks to this, the nation launched a pilot project on renewable energy usage verification at the end of 2019. As such, in today's world, active engagement in policy-making on renewables and climate risk mitigation via policy suggestions are closely linked to corporate competitiveness.

When building strategies to achieve the targets set under a long-term vision, companies can resolve any divergence between corporate goals, market conditions, and regulatory policies by urging the regulatory authority to change the policies via policy advocacy. A long-term vision is an important strategic decision that affects the overall directions of business operations. In this regard, it requires the most recent climate science-based target-setting, subsequent simulation for target achievement and research on implementation measures, and sufficient stakeholder consultation and persuasion. In addition to a long-term vision, companies should set science-based targets and other detailed climate and energy targets in compliance with the Paris Agreement and put climate mitigation measures into practice.

The following is a summary of complementary measures that all Korean corporations need to take:

- Establish a comprehensive, long-term vision to address physical and transition climate risks across their business operations;
- Set science-based targets, renewable energy targets, and other detailed climate and energy targets according to the long-term vision and develop and carry out implementation measures; and
- Create a climate-friendly landscape using existing climate mitigation policies and systems and policy advocacy activities.

A new era is quickly approaching. Climate change no longer remains a consideration for only a few departments or a CSR issue. It puts business survival at stake. As evident from its implications, including changing patterns of investment and consumer behavior and global corporations' demands for switching to renewables, climate change has become a market risk and is increasingly emerging as an operational risk. We hope this report can provide corporations with directions and recommendations for further climate action, thereby helping them reinforce their global competitiveness and capacity to cope with climate change.

**Appendix 1. Evaluation Results
by Domestic Industry (1/2)**

Evaluation Indicators			Domestic	Overseas	Domestic	Overseas	Domestic	Overseas	Domestic	Overseas	Domestic	Overseas	
			Construction & Engineering		Finance		Transportation		Energy		Raw Material		
1. Goals & Achievements	1-1. Goals, Timeline Scope	1-1-1. Long-term Vision	11	15	20	24	15	24	3	15	9	15	
		1-1-2. Goals per timeline stage	11	12	9	12	9	12	6	9	5	12	
	1-2. Scope of Goals	1-2-1. Geographic Scope (scope 1,2)	9	12	4	10	10	12	3	12	5	12	
		1-2-2. Full range Perspective	10	9	9	12	8	9	6	9	5	9	
	1-3. Climate goals	1-3-1. Greenhouse Gas Target (scope 1,2)	11	6	12	12	9	12	6	12	12	12	
		1-3-2. Emission reduction target units (scope 1,2)	17	24	13	9	13	24	9	24	12	8	
		1-3-3. Energy Efficiency Target (scope 1,2)	2	6	-	4	-	-	-	-	-	2	
		1-3-4. Renewable Energy Target	-	3	-	24	2	3	-	6	-	3	
	1-4. scope 1,2 Annual GHG reduction rate absolute reduction targets		20	15	24	24	18	24	2	24	12	24	
	1-5. Target achievement status		6	6	8	6	5	6	3	6	5	6	
1-6. Comparison between achievement and actual implementation		8	12	9	12	8	12	6	12	6	12		
2. Information Disclosure	2-1. Composition of disclosure and reliability of data	2-1-1. scope 1,2 GHG emission data	2-1-1-1. Absolute and Intensity	12	12	11	12	11	12	9	12	11	10
			2-1-1-2. Time series data	11	12	12	12	12	12	12	12	12	12
		2-1-2. Scope 1,2 energy consumption data	2-1-2-1. Absolute and Intensity	11	8	9	8	9	10	8	2	11	8
			2-1-2-2. Time series data	12	12	12	12	12	12	11	12	12	12
		2-1-3. Renewable energy usage amount		-	10	6	8	5	10	2	2	4	10
		2-1-4. Data scope (scope 1,2)		6	12	9	12	12	12	6	12	6	12
		2-1-5. disclosure of full range of measurement and emissions		17	24	20	17	13	24	12	17	15	24
		2-1-6. Third-party evaluation		24	24	24	24	24	24	24	24	24	24
	2-2. Reliability of goal setting	2-2-1. Comparison of goals & results	-	12	-	12	3	12	-	6	3	-	
		2-2-2. Basis of setting goals	9	12	3	12	6	12	6	12	6	12	
Sum of 1		26	31	28	39	25	36	11	34	18	30		
Sum of 2		35	48	37	45	37	49	31	38	36	43		
Total		62	79	65	83	62	85	43	72	54	73		

**Evaluation Results by
Domestic Industry (2/2)**

Evaluation Indicators			Domestic	Overseas	Domestic	Overseas	Domestic	Overseas	Domestic	Overseas	Domestic	Overseas	
			Utility		Non-essential Consumer Goods		Electric/Electronic		Telecommunications		Essential Consumer Goods		
1. Goals & Achievements	1-1. Goals, Timeline Scope	1-1-1. Long-term Vision	6	24	6	6	14	15	24	15	2	12	
		1-1-2. Goals per timeline stage	9	12	3	12	8	12	10	9	8	9	
	1-2. Scope of Goals	1-2-1. Geographic Scope (scope 1,2)	6	10	4	12	10	8	4	12	9	10	
		1-2-2. Full range Perspective	9	9	5	9	9	9	9	9	5	9	
	1-3. Climate goals	1-3-1. Greenhouse Gas Target (scope 1,2)	12	12	6	12	12	12	12	6	9	12	
		1-3-2. Emission reduction target units (scope 1,2)	12	24	8	9	12	17	9	15	7	24	
		1-3-3. Energy Efficiency Target (scope 1,2)	-	-	-	-	2	-	-	-	-	2	
		1-3-4. Renewable Energy Target	24	15	-	15	6	24	8	12	2	6	
	1-4. scope 1,2 Annual GHG reduction rate absolute reduction targets		14	24	12	24	18	24	24	24	6	24	
	1-5. Target achievement status		6	9	3	9	6	12	6	9	5	6	
1-6. Comparison between achievement and actual implementation		12	12	5	12	11	12	12	12	5	12		
2. Information Disclosure	2-1. Composition of disclosure and reliability of data	2-1-1. scope 1,2 GHG emission data	2-1-1-1. Absolute and Intensity	11	12	11	12	12	12	12	12	10	12
			2-1-1-2. Time series data	10	12	6	12	12	12	12	12	11	12
		2-1-2. Scope 1,2 energy consumption data	2-1-2-1. Absolute and Intensity	10	10	9	10	11	12	12	16	11	10
			2-1-2-2. Time series data	12	12	6	12	12	12	12	12	9	12
		2-1-3. Renewable energy usage amount		11	10	2	10	6	12	9	10	8	8
		2-1-4. Data scope (scope 1,2)		12	12	12	12	12	12	12	12	12	12
		2-1-5. disclosure of full range of measurement and emissions		16	9	10	17	20	24	14	24	9	24
		2-1-6. Third-party evaluation		24	24	18	24	24	24	24	24	18	24
	2-2. Reliability of goal setting	2-2-1. Comparison of goals & results	6	12	3	12	12	12	8	12	3	12	
		2-2-2. Basis of setting goals	-	12	3	12	12	12	4	12	3	12	
Sum of 1		29	39	13	31	28	38	31	32	14	33		
Sum of 2		39	43	28	46	46	50	41	51	33	48		
Total		67	83	41	77	74	88	72	83	47	81		

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Together Possible



THE EVALUATION OF THE EFFORTS OF KOREAN CORPORATIONS TO ADDRESS CLIMATE AND ENERGY ISSUES

Long-Term Vision

By setting a long-term vision, companies can assess the company's long-term perspective and comprehensive strategic direction in dealing with the overall climate risk.

SBTi

Companies can use the SBTi to strengthen corporate climate action by providing guidelines and methodologies for setting science-based greenhouse gas emission reduction targets that meet the Paris Agreement goals.



Renewable Energy Targets

As one of the ways to reduce greenhouse gas emissions, companies can not only expand use of renewable energy in the production process but also set renewable energy targets through direct production.

Citi Foundation



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To stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature.

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