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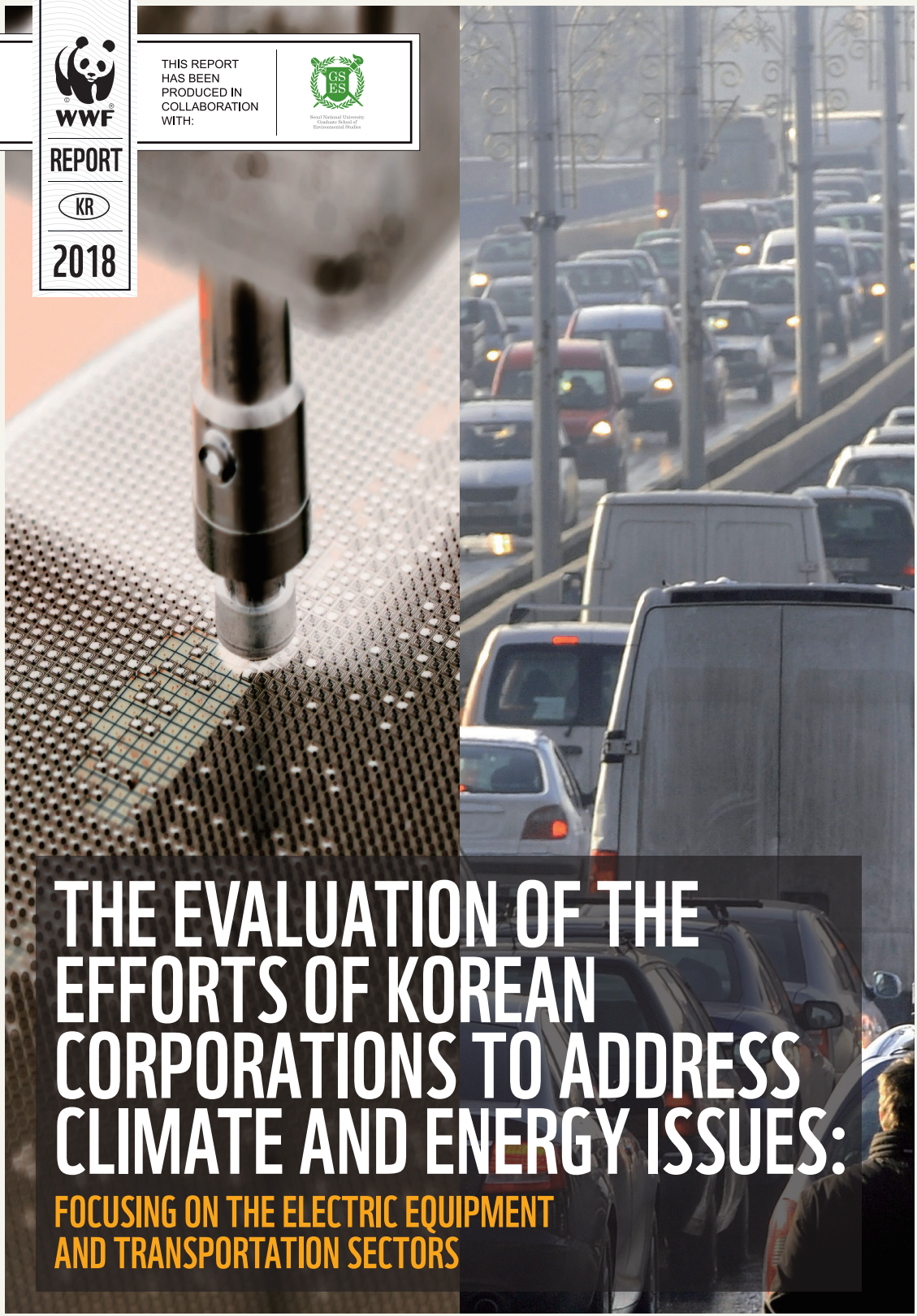

# THE EVALUATION OF THE EFFORTS OF KOREAN CORPORATIONS TO ADDRESS CLIMATE AND ENERGY ISSUES:

## FOCUSING ON THE ELECTRIC EQUIPMENT AND TRANSPORTATION SECTORS

**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

**Simon Yoon**
CEO, WWF-Korea

The year 2018 was exceptionally hot. Heatwaves caused an unprecedented damage of the crop which worth approximately KRW 11.4 billion in the Gyeongbuk region. In addition, natural disasters such as floods, typhoons, droughts, heavy snow and others are expected to be increased due to climate change.

This explains climate change is no longer considered as the problems only in highly vulnerable countries, but it has direct impacts on our daily life and activities. We are experiencing the speed of the climate change effects even with the 1 °C temperature rises. IPCC's special report “Global Warming of 1.5 °C”addresses that in order to keep global temperature rise below 1.5 °C, countries will have to cut global $CO_2$ emissions 45% below 2010 levels by 2030. 1.5 °C is a goal which must be achieved for the survival and prosperity of mankind.

In line with the 1.5°C goal, various economic entities including corporations, governments, and financial institutions are working together on climate action. Especially global leading companies approach climate change as a risk as well as opportunity and lead actions. Approximately 500 companies including 100 corporations from “fortune 500” joined the SBTi (Science-based Target Initiative) to meet the Paris Agreement goal and around 150 global companies declared their commitment to use 100% renewable energy.

In this paradigm shift to global climate regime, we hope to analyze and evaluate Korean electronics and transport companies’ climate actions. Furthermore, we hope to suggest directions and strategies for further climate actions. Tackling climate change must be viewed as a strategic issue, not only a regulatory problem. Starting with this report, we look forward to seeing Korea companies take opportunities.

Together Possible!



# ABSTRACT


### Chapter 1 and Chapter 2: Introduction; Research Subjects and Evaluation Methods

- To achieve Paris 1.5°C goal, all sectors of society to make unprecedented changes are required. Therefore, many major international corporations are taking aggressive climate action. To evaluate corporations’ climate actions, this report analyzes 16 high-impact corporations from the electrical sector (electricity, electronics and telecommunications industries) and 17 corporations from the transportation sector (transportations, logistics, automobile and shipbuilding industries) based on (1) targets & performance and (2) information disclosure

### Chapter 3: Consideration of Scoring Results for Each Major Scoring Criterion

- In the session of target & performance, this report evaluates corporations’ strategies of GHG reductions, energy efficiency, renewable energy expansions, etc., climate and renewable energy target, GHG reduction rate of Scope 1 & 2, comparison between performance and taken actions.
- In the session of information disclosure, this report analyzes the status of corporations' climate-related information disclosure based on the credibility of disclosed information and data, and credibility of target setting.

### Chapter 4: Scoring Results and Sector Comparison

- All the corporations in both of the electrical and transportation sectors disclose their information very well while corporations are required to make an effort on setting energy efficiency target,renewable energy target, setting long-term visions, and etc., The electrical sector scores higher than the transportation sector in the way in which the average score of the 16 corporations in the electrical sector is 58.2 out of 100, and the average score of the 17 corporations in the transportation sector is 39. Furthermore, foreign investor ratios and scores were positively correlated.

### Chapter 5: Comparison with Japanese Cases

- The scores of corporations in the electrical sector were higher than those in the transportation in Japan. The score result calculated by the 7 key indicators presents Japan, like Korea, is not active in setting energy efficiency and renewable energy targets. Furthermore, Korea is doing much better on third party evaluation than Japan.

### Chapter 6: Conclusion and Implications

- This report points out the importance of implementing a consistent government policy framework besides the global competitiveness in order to encourage corporates climate action. To encourage more aggressiveclimate action, ambitious long-term GHG reduction and renewable energy, detailed implementation plans, and clear information disclosure are necessary.

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# CHAPTER 1
# INTRODUCTION

According to the Special Report "Global Warming of 1.5ºC" of the IPCC, it requires all sectors of society to make unprecedented changes to achieve the target of the Paris Agreement.

In October 2018, the Intergovernmental Panel on Climate Change (IPCC) published a special report titled "Global Warming of 1.5°C." This special report was commissioned by the Conference of Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC) to help build a scientific foundation for achieving the top-line goal of the Paris Agreement, which was to limit temperature rise to 1.5°C (KMA press release, October 2018). The Paris Agreement was adopted at the United Nations Climate Change Conference in 2015 and became effective as international law in 195 countries in November 2016. According to the Special Report "Global Warming of 1.5ºC" of the IPCC, it requires all sectors of society to make unprecedented changes to achieve the target of the Paris Agreement. In particular, carbon dioxide emissions in 2030 need to be reduced by at least 45% compared to 2010 emissions, and net emissions must be close to zero by 2050.

Social acceptance is increasing on the fact that climate change is no longer a forecast for the distant future: It is a problem here and now. Many studies have shown that climate change causes disastrous extreme weather events such as typhoons, floods, and droughts (Mann et al., 2014; Stott, 2016). Companies therefore may endure significant cost increases. For example, climate change can endanger an enterprise's facilities and its chain of operations, supply, and distribution; it can also affect the supply of electricity and water. In addition, climate change can keep workers from commuting and adversely affect consumers' consumption (C2ES homepage). In other words, sudden environmental disasters and continuous temperature rise will undermine the resilience of companies, which can be defined as their elastic ability to return to a stable state after recovering from an impact.

Although these risks have important implications for companies, climate change may also present opportunities. Many major international corporations already take climate change as one of their top agenda.may also present opportunities. Many major international corporations already take climate change as one of their top agenda. More and more companies are taking aggressive actions to reduce carbon dioxide emissions, introduce innovative low-carbon technologies, and strengthen their resilience as they transition to a low-carbon economy. These corporate actions send positive signals to investors and consumers, and ultimately they strengthen the influence of each company in the era of climate change.

Companies that play leading roles in climate actions include those that have set goals of using 100% renewable energy. These companies include manufacturing-based or energy-consuming companies as well as

1. The Korean government has implemented the Korea Emission Trading Scheme (K-ETS) and the Target Management System. 591 Korean businesses which emits more than 125,000 tCO2-eq/year for a certain period or those with above 25,000 tCO2-eq/year of GHG emission, are automatically required to participate in the systems. According to the national GHG Target Management System, businesses with above 50,000 tCO2-eq/year or those with above 15,000 tCO2-eq/year of GHG emission are required to set targets for GHG emissions and energy usage, and currently a total of 393 corporates are participated in the system.



Although these risks have important implications for companies, climate change may also present opportunities. Many major international corporations already accept climate change as opportunities and work together for climate action.

companies with relatively low carbon emissions. For example, Google has been carbon neutral since 2007, and 100% of its eelectricity from renewable sources and has set a goal of using only renewable energy by 2030. Swiss Posts, one of largest communications, logistics, and transportation corporations,obtains all its electricity from certified renewable energy sources and has already introduced electric vehicles for logistics. Apple also has consumed all its power from renewable energy sources since 2018 and is investing in renewable energy projects. In these ways, major enterprises in various industrial sectors are actively working on climate actions.

This research was designed to evaluate the similar climate actions of Korean companies. Companies in Korea have already issued their own sustainability reports, and have disclosed their own carbon emission information to the Carbon Disclosure Project (CDP) (Figure 1). The Korean government has obliged companies to disclose carbon emissions above a certain level, introducing ways to engage in corporate carbon emissions reduction targets or to activate carbon trading[1]. But, few studies have evaluated corporate climate actions. Therefore, it is necessary to analyze the climate actions taken by these Korean companies. In this research, we evaluate companies according to their targets and performance and their information disclosure. We also discuss the results as they relate to carbon emission data and foreign investment ratio, and compare Korean companies with Japanese ones. Finally, we suggest important future climate action strategies for Korean companies. Contributing further to the CDP Korea report, this research distinctively investigated corporate goals and performance in detail, using criteria that were based on the indices used in the WWF Japan report (WWF, 2015).


***Figure 1. CSR reports of Korean companies & CDP report (example)***



# CHAPTER 2
# RESEARCH SUBJECTS AND EVALUATION METHODS

# 1. RESEARCH SUBJECTS

The target companies in this study include those that voluntarily publish corporate social responsibility (CSR) reports and belong to the “Korea 200”, to which the CDP sends its annual information request. From these, we selected companies in the electricity, electronics, and telecommunications industry (hereafter referred to as the electrical sector) and the transportation, logistics, automobile, and shipbuilding industries (hereafter referred to as the transportation sector). The sectors were chosen following consultation with the WWF. The electrical sector was selected because it is the most influential industry in Korea. Telecommunications corporations were grouped with the electricity and electronics industry because of ICT. The transportation sector was selected because the WWF has recently presented a methodology and tools for establishing carbon emission reduction targets that sector. Therefore, it is necessary to analyze the Korean transportation industry from that perspective.

***Table 1. Investigated companies (Electrical sector: 16, Transportation sector: 17)***

| Sector | Company Name | |
|---|---|---|
| Electrical | Samsung Electronics<br>Samsung Electro-Mechanics<br>Samsung SDI<br>ISU PETASYS<br>STEMCO<br>KT<br>LG Display<br>LG Innotek | LG Uplus<br>LG Electronics<br>LS Industrial Systems<br>LS Cable & System<br>SK Siltron<br>SK Innovation<br>SK Telecom<br>SK Hynix |
| Transportation | KUMHO TIRE<br>KIA Motors<br>DSME<br>Korean Air<br>Samsung Heavy Industries<br>Asiana Airlines<br>KORAIL<br>Hankook Tire<br>GM Korea | Hyundai Glovis<br>Hyundai Motors<br>Hyundai Mobis<br>Hyundai Mipo Dockyard<br>Hyundai Heavy Industries<br>CJ Logistics<br>LG International Corp.<br>STX Offshore & Shipbuliding |

This resulted in the inclusion of 16 companies from the electrical sector and 17 companies from the transportation sector (Table 1). This study assessed these 33 companies based on each company's 2017 sustainability report and the 2017 CDP report. Previous CSR reports from each company were also used.



# 2. EVALUATION METHOD

The evaluation included 21 indicators, divided into 2 major categories: 1) the target & performance and 2) information disclosure. The first category includes 11 indices and the second one has 10 indices (Table 2). The framework of evaluation followed a report of the WWF, “The Ranking of Japanese Corporations for Effective Efforts to Address Climate and Energy Issues.” However, we adjusted 2 indicators in the first category, the long-term vision (1-1-1) and the target year (1-1-2), to reflect the reality of Korea. In our evaluation, 2040 distinguishes long-term from medium-term because the Korean government established that year as the criterion for long-term in the national energy plan. This standard has been strengthened compared to criteria in the Japanese report, which is based on 2030. Also, the Japanese report included the phrase “with consideration of the earth’s capacity,” but this seemed ambiguous to us, so we omitted it. The target year indicator (1-1-2) was originally based on the division between long-term and short- or medium-term targets in the Japanese report. We found some vague points in this criterion, so we instead used the number of targets that included a time scope.

In order to prevent arbitrary weighting, all of the criterion scores were converted into a 12-point scale, as that was the least common multiple of the individual scores (2, 3, or 4). Then, we doubled the scores of companies that received the maximum points on 7 key indicators that we considered particularly important: the long-term vision (1-1-1), Unit of emissions reduction target (1-3-2), the renewable energy target (1-3-4), the annual GHG reduction rate of Scope 1&2 absolute target (1-4), the measurement & disclosure of life-cycle emissions (2-1-5), and third-party verification (2-1-6). The score in each category was converted to a 50-point scale, and these were summed to a total possible score of 100 points. This scoring followed the WWF Japan Report (WWF, 2015).

As noted before, this methodology is different from CDP scoring and has also been adjusted from the WWF Japan report.

***Table 2. Evaluation indicators***

| Evaluation indicators | | | Achievement levels | points |
|---|---|---|---|---|
| 1. Targets & Performance | 1-1. Time spans of targets | 1-1-1. Long-term vision | Setting a long-term target (2040~) | 2 |
| | | | Setting a medium-term target (2021~2039) | 1 |
| | | | No long- or medium-term target / Have only qualitative environmental policies | 0 |
| | | 1-1-2. Target years | Two or more targets by time scope | 2 |
| | | | One target by time scope | 1 |
| | | | No target | 0 |
| | 1-2. Range of targets | 1-2-1. Geographical boundary (Scope 1, 2) | Boundary includes all major business sites including overseas ones | 3 |
| | | | Boundary includes only subset of business sites including overseas ones | 2 |
| | | | Boundary includes only subset of domestic business sites | 1 |
| | | | Boundary not clear or no targets | 0 |
| | | 1-2-2. Perspective of life-cycle management | Have targets for all of Scope 1, 2, and 3 as well as for "avoided emissions" | 4 |
| | | | Have targets for both Scope 1 and 2. Also, make efforts in Scope 3 and/or "avoided emissions" | 3 |
| | | | Have targets for Scope 1 or 2 but not both | 2 |
| | | | Have only a single target throughout life-cycle stages (No individual targets for Scope 1 and 2) | 1 |
| | | | No targets | 0 |
| | 1-3. Climate targets | 1-3-1. Target GHGs (Scope 1 and 2) | Target covers all GHGs | 2 |
| | | | Target covers only CO2 in spite of other GHGs emitted | 1 |
| | | | No targets | 0 |
| | | 1-3-2. Unit of emissions reduction target (Scope 1 and 2) | Targets for both absolute and intensity,* Both for the same boundary | 4 |
| | | | Only absolute targets | 3 |
| | | | Only intensity targets | 2 |
| | | | Only peculiar indices other than absolute / intensity targets, despite climate-related description | 1 |
| | | | No climate-related description or no targets | 0 |
| | | 1-3-3. Energy efficiency target (Scope 1,2) | Targets for both absolute and intensity | 3 |
| | | | Only absolute targets | 2 |
| | | | Only intensity targets | 1 |
| | | | No targets | 0 |
| | | 1-3-4. Renewable energy target | Numerical targets (kW etc.) for Scope 1 and 2 renewable use including green power certificates, etc. | 2 |
| | | | Peculiar indices such as contribution to Scope 3 emission reduction via renewable deployment | 1 |
| | | | No targets | 0 |
| | 1-4. Annual GHG reduction rate of Scope 1&2 absolute target | | Annual reduction rate ≧ 1.5% | 2 |
| | | | 1.5% > Annual reduction rate ≧ 0.75% | 1 |
| | | | 0.75% > Annual reduction rate | 0 |
| | 1-5. Status of achievement | | All targets achieved | 2 |
| | | | Not all targets achieved | 1 |
| | | | No targets achieved / impossible to judge / No targets set | 0 |
| | 1-6. Comparison between performance and actions taken | | Review and explain the impacts of implemented climate actions for each of the company's targets | 2 |
| | | | Only refer to implemented actions without their linkage with targets / Only a part of actions reviewed | 1 |
| | | | Explain no concrete actions / No targets | 0 |
| 2. information disclosure | 2-1. Credibility of disclosed formation and data | 2-1-1. Scope 1 & 2 GHG ($CO_2$) emission data | 2-1-1-1. Absolute and intensity | Both absolute and intensity data disclosed | 3 |
| | | | | Only absolute data disclosed | 2 |
| | | | | Only intensity data disclosed | 1 |
| | | | | Neither absolute nor intensity data disclosed | 0 |
| | | | 2-1-1-2. Time-series data | Data disclosed for the past five years or more in the form of a chart, a table, etc. | 3 |
| | | | | Data disclosed for the past years (more than two and less than five) in the form of a chart, a table, etc. | 2 |
| | | | | Data disclosed for the past two years, enabling comparison only with last year | 1 |
| | | | | Only a single year of data disclosed, enabling no comparison with past data | 0 |
| | | 2-1-2. Scope 1& 2 energy consumption data | 2-1-2-1. Absolute and intensity | Both absolute and intensity data disclosed | 3 |
| | | | | Only absolute data disclosed | 2 |
| | | | | Only intensity data disclosed | 1 |
| | | | | Neither absolute nor intensity data disclosed | 0 |
| | | | 2-1-2-2. Time-series data | Data disclosed for the past five years or more in the form of a chart, a table, etc. | 3 |
| | | | | Data disclosed for more than two and less than five past years in the form of a chart, a table, etc. | 2 |
| | | | | Data disclosed for the past two years, enabling comparison only with last year | 1 |
| | | | | Only a single year data disclosed, enabling no comparison with past data | 0 |
| | | 2-1-3. Amount of renewable energy use | | All the quantitative data (kW, kWh, etc.) for renewable use disclosed | 3 |
| | | | | Some of the quantitative data (kW, kWh, etc.) for renewable use disclosed | 2 |
| | | | | Data for peculiar indices disclosed, such as contribution to Scope 3 emission reduction via renewables | 1 |
| | | | | No quantitative data disclosed | 0 |
| | | 2-1-4. Data boundary (Scope 1, 2) | | Data boundary clearly described | 1 |
| | | | | No clear description of data boundary | 0 |
| | | 2-1-5. Measurement & disclosure of life-cycle emissions | | Disclose emissions data for all of Scope 1, 2, and 3 with all 15 categories in mind for Scope 3 | 4 |
| | | | | Disclose emissions data for Scope 1, 2, and a part of Scope 3 as well as for "avoided emissions" | 3 |
| | | | | Disclose emissions data for Scope 1, 2, and a part of Scope 3 | 2 |
| | | | | Disclose emissions data for Scope 1 and 2 only | 1 |
| | | | | Disclose no emissions data at all | 0 |
| | | 2-1-6. Third-party evaluation | | Verified by reliable third party | 2 |
| | | | | Place comments from experts instead of third-party verification | 1 |
| | | | | No third-party evaluation | 0 |
| | 2-2. Credibility of target setting | | 2-2-1. Comparison of targets and results | Results for each fiscal year reported in comparison with targets in the form of a chart, etc. | 1 |
| | | | | Only results reported, enabling no comparison with targets | 0 |
| | | | 2-2-2. Grounds of target setting | Grounds clearly shown or short-term targets linked to medium- or long-term targets | 1 |
| | | | | Targets arbitrarily set with no clear grounds | 0 |

**To access Korean corporates' climate action and to suggest strategies, the evaluation included 2 major categories: 1) target & performance and 2) information disclosure.**

* avoided emission: emission reductions in companies' supply chains and operation facilities (ex. fuel efficient tire, teleconferences, etc.,).



# CHAPTER 3
# CONSIDERATION OF SCORING RESULTS FOR EACH MAJOR SCORING CRITERION

# 1. TARGETS & PERFORMANCE

## 1. Time spans of targets

In 2017, the Korean government laid out 3 plans for energy transition: the "Energy Transition Roadmap", "Renewable Energy 3020 Implementation Plan" and "8th Electricity Supply and Demand Basic Plan". In addition, the National Energy Basic Plan, which is the highest level administrative plan for the energy sector, is established every 5 years according to the Enforcement Decree of the Framework Act on Low Carbon, Green Growth. The government plans to establish a comprehensive vision of energy transition policies for 2040 in the Third National Energy Basic Plan, to be issued in 2019. Therefore, this report defined the short-term (through 2020), medium-term (2021-2039) and long-term (2040 and beyond) periods according to the time spans that will be used in the Third National Energy Basic Plan.

The national GHG & Energy Target Management System was introduced and implemented in April 2010, and the Emission Trading System was created in January 2015. Accordingly, companies are required to submit their GHG target plans to the government each year. If a company did not disclose its short-term goals in sustainability reports or to the CDP, it was given the lowest score, based on the assumption that this was not a voluntary goal of the company.

***Table 3. Companies set GHG emission goals by period***

| | | Short-term | Medium-term | | Long-term | |
|---|---|---|---|---|---|---|
| Target year | Missing or unclear | ~ 2020 | 2021 ~ 2029 | 2030 ~ 2039 | 2040 ~ 2049 | 2050 ~ |
| Number of companies | 10 | 11 | 3 | 3 | 4 | 2 |
| Company Name | SK Innovation<br>ISU PETASYS<br>KUMHO TIRE<br>LG International –Corp<br>Asiana Airlines<br>Samsung SHI<br>STX O&S<br>Hyundai HHI<br>DSME<br>Hyundai HMD | Samsung Electronics<br>LG Electronics<br>LSIS<br>LG Innotek<br>STEMCO<br>LS C&S<br>SK Siltron<br>Hyundai Motors<br>Kia Motors<br>GM Korea | KORAIL<br>Hyundai Mobis<br>CJ Logistics | Samsung SDI<br>Hankook Tire<br>Hyundai Glovis | Samsung Electro-Mechanics<br>KT<br>LG Display<br>LG Uplus | SK Telecom<br>SK Hynix |

All the companies in Electrical equipment sector



Of the 33 companies surveyed, only 12 had established medium- and long-term plans for GHG reduction. All 6 companies had set targets for long-term periods after 2040 were in the electrical sector. Two companies set a plan for 2050: SK Hynix set a goal of reducing GHG emissions by 80% compared to 2014, and SK Telecom set a target of reducing them by 51.5% compared to 2016.

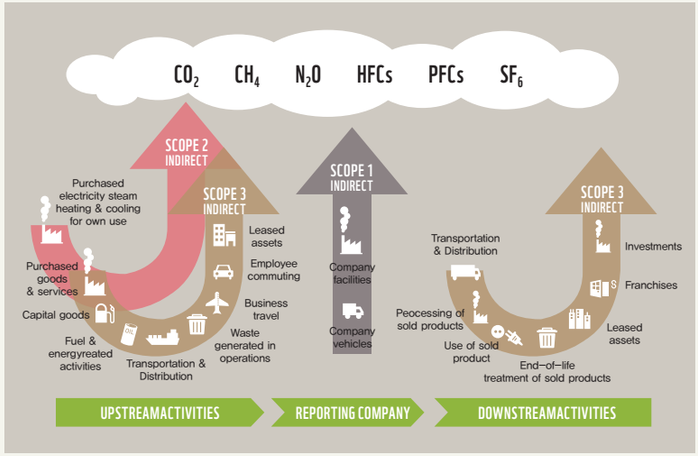
In addition to setting these reduction targets, companies have been developing comprehensive environmental strategies and directions, including climate change response, energy efficiency, resource efficiency, and environmental system planning. For example, "Carbon Impact 2020", the environmental management policy of KT, and the "Green 2020" campaign of LG Uplus include creating green workplaces, strengthening green business, and launching new green products. Samsung Electronics and LG Electronics set up medium- to long-term plans for 2020 in 2008, and both companies are preparing for a new long-term plan. Samsung Electronics was the only company to state in its CSR report that it had a plan to set a SBT (science-based target). KORAIL, in the transportation sector, earned a high score despite making a plan only until 2025, which is equivalent to the medium-term, because it set detailed goals and action plans that divided that period into its own short-, medium-, and long-term.

Regarding the target year indicator (1-1-2), the Japanese report gave 1 point if companies had only short- or medium-term (or long-term) targets, and 2 points for having both long-term and short- or medium-term targets. However, in this report it was given 1 point, if companies had one target based on time scope and 2 points for having two or more targets. The reason for this is that we had difficulty in unifying short-, medium-, and long-term segments due to each company's different basis for setting goals. Therefore, the evaluation was based on the number of targets by time scope set by the company.

**All six companies that had set targets for long-term periods after 2040 were found in the electrical sector. Samsung Electronics was the only company to state in its CSR report that it had a plan to set a SBT (science-based target).**

## 2. Range of targets

***Figure 2. The concept of scope (GHG Protocol)***




* To help delineate direct and indirect emission sources, improve transparency, and provide utility for different types of organizations, climate policies, and business goals.

| Scope 1 | Scope 2 | Scope 3 | Scope 4 |
|---|---|---|---|
| Direct GHG emissions<br>• From combustion in boilers, furnaces, vehicles, etc.<br>• From chemical production in process equipment | Electricity indirect GHG emissions<br>• From the generation of purchased electricity consumed by the company | Other indirect GHG emissions<br>• Consequence of the activities of the company<br>• Extraction and production of purchases materials, transportation of purchased fuels, use of sold products and services | Occurred outside of a product's life cycle or value chain, but as a result of the use of that product<br>• Low-temperature detergents, fuel-saving tires, energy-efficient ball-bearings, teleconferencing services |

This indicator measures the extent to which a company had set goals that took into account the full scope of emissions. Of the 23 companies that set targets, only 9 were trying to reduce Scope 3 emissions. Only 70 percent of the 31 companies set targets for emissions, even though they were taking part in the national GHG & Energy Target Management System or Emission Trading System (2 companies are not taking part of it). SK Telecom, KT, Samsung Electronics, and LG Electronics had the highest scores, based on having targets for Scope 1, 2, and 3, as well as for avoided emissions. KT calculated emissions by considering all 15 items in Scope 3, and it set a specific goal of increasing avoided emissions by three times compared to 2012 by 2030. However, most companies have focused more on quality efforts (e.g., establishing strategy, strengthening management plans, or process innovations) than on quantitative targets for Scope 3. Some companies manage their supply chain, resource use, water use, waste disposal, commuting, and business trips to reduce Scope 3 emissions. In the case of manufacturing companies that were operating factories, emission reductions from water and wastes were very good; telecom companies showed the greatest reductions in emissions from end-user product use.

Companies are also making efforts to reduce GHG emissions by operating solar power plants, improving the energy efficiency of equipment, and improving eco-friendly services using ICT (Information & Communication Technology). These efforts make very important contributions to climate change mitigation. However, it is important to set targets for Scope 1 and 2, because Scope 3 is self-assessed by the company and the method of estimating avoided emissions can be disputed. For example, reducing emissions through sales of energy-saving products could be regarded as a company's effort; on the other hand, it could instead be seen as a reduction of emissions based on consumers' choice. Therefore, in this section, companies could not get a good score on their efforts and targets for Scope 3 or for increasing avoided emissions without including goals for Scope 1 and 2.

**Even though the companies are covered by the K-ETS (Korea Emission Trading Scheme), only 70% of the companies set GHG reductions targets. It is clear that further efforts of the companies on reducing GHG is highly required.**

## 3. Climate targets

Regarding the greenhouse gas target (1-3-1), 15 of the 16 companies in the electrical sector set goals that included "all GHGs", while only 5 of the 17 companies in the transportation sector did so.

### Emission reduction, Energy efficiency and Renewable energy targets

Regarding the greenhouse gas target (1-3-1), 15 of the 16 companies in the electrical sector set goals that included "all GHGs", while only five of the 17 companies in the transportation sector did so. Korean companies set targets for GHG emissions (1-3-2) according to 3 criteria: absolute amount, intensity (emission per unit), and BAU (Business as usual). BAU targets were in line with the National GHG reduction target of 37% of conventional emissions by 2030. Because BAU targets predict future emissions based on current emissions rather than being based on past emissions, the absolute amount may increase.

Because the GHG emissions of a company are directly related to sales, it is important to set both absolute and intensity criteria when setting a target. 6 companies in the electrical sector with both absolute and intensity targets received the highest score of 4: SK Telecom, SK Hynix, Samsung Electro-Mechanics, Samsung SDI, LG Electronics, and SK Siltron. Most companies (18 companies, 54%) adopted only one of the 3 criteria, and 12 companies set greenhouse gas reduction targets based on the "base year." For example, LG Electronics set targets of reducing emissions by 150,000 tons (10.3%) and a 40% reduction per revenue in KRW by 2020 compared to 2008. Samsung Electro-Mechanics achieved a high score by setting a specific target of 57% reduction by 2040 and a 7% reduction per revenue in KRW by 2050 compared to 2014.

In addition to establishing GHG emissions targets, it is also important to reduce energy use through the efficiency of production facilities or set energy-use targets through renewable energy facilities. For example, converting fuel from petroleum or coal to natural gas can reduce carbon dioxide emissions, but it does not mean that it reduce the company's energy consumption. Only 5 companies (15%) set energy efficiency targets (1-3-3) that compared their energy consumption data and renewable energy use, as shown in Information Disclosure. In the transportation sector, only Korean Air had an intensity target for energy efficiency. In the electrical sector, SK Innovation set an intensity target for energy efficiency. SK Telecom, SK Hynix, and Samsung Electronics had both absolute and intensity targets for energy efficiency. Some companies in the electrical sector have already reached an advanced stage as a result of steadily improving the efficiency of production facilities, and it would be difficult to significantly improve energy efficiency further. For example, Samsung Electronics set an annual absolute target for energy use (2017 target: 23,603 GWh), and it had a plan to reduce GHG emissions by introducing energy-efficient facilities. Fewer companies have renewable energy targets. In the transportation sector, only KORAIL set its own goals; in the electrical sector, Samsung SDI set its own targets and SK Telecom and Samsung Electronics set more specific figures (i.e. kW). SK Telecom set its own goal for annual renewable energy generation, and Samsung Electronics set a more specific goal of using 100% renewable energy in Europe and China and 20% in Korea by 2030. Companies that produce electricity through renewable energy sources or those that mention renewable energy facilities are planning to expand photovoltaic or small wind power systems in their offices or factories. KORAIL plans to build a 3MW solar power plant, and LS Industrial Systems expects to produce about 1,149MWh of electricity each year at a 910kW solar power plant, reducing greenhouse gas emissions by about 900t $CO_2$eq.

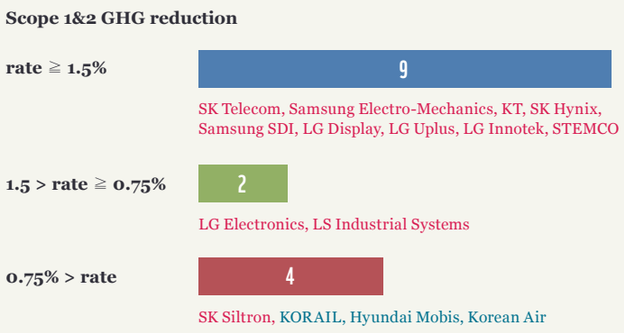
Conversion of existing fossil-fuel-based energy consumption to renewable energy is important for reducing GHG emissions to maintain temperature increases less than 1.5°C. In Japan, since the adaptation of a Feed-in-Tariff in 2012, corporate investment in renewable energy has steadily increased. Korean companies, in contrast, have not shown much interest in renewable energy investment due to the expansion of nuclear power plants and the cheap price of electricity for industry. However, since the Korean government announced the "Renewable Energy 3020 plan", which aims to increase the proportion of renewable energy generation to 20% by 2030, corporate interest has increased, and their investment is slowly expanding. Because companies are the most influential stakeholders for achieving this goal, it is very important that they set renewable energy targets.

Regarding the greenhouse gas target (1-3-1), 15 of the 16 companies in the electrical sector set goals that included "all GHGs", while only 5 of the 17 companies in the transportation sector did so. Only 5 companies (15%) set energy efficiency targets (1-3-3) that compared their energy consumption data and renewable energy use. Fewer companies have renewable energy targets.

## 4. Annual GHG reduction rate of Scope 1&2 absolute target

The IPCC's special "Global Warming of 1.5°C" called for carbon dioxide emissions to be reduced by at least 45% by 2030 compared to 2010 in order to achieve the 1.5°C temperature limit in the Paris Agreement. This can be converted to a CO2 reduction rate of 2.25% per year. In order to achieve a 37% reduction from the BAU by 2030, which is the GHG reduction target proposed by the Korean government, emissions should be reduced by 2.5% every year. Japan set a target of 80% reduction by 2050 as a long-term goal. To achieve this, companies set targets based on annual reductions of 1.5%. We gave maximum points on this indicator if a company reduced emissions by more than 1.5% per year in order to be consistent with the WWF survey in Japan, taking into account the timing of the reports and national policies.

*Figure 3. Annual GHG reduction rate of absolute target*




9 companies in the electrical sector set a reduction target of more than 1.5% per year, and 2 companies in that sector set a reduction target of 0.75% to 1.5% per year. Only 3 of the 15 companies that set reduction targets belong to the transportation sector, and they all set targets of 0.75% or less.



## 5. Status of achievement

Generally, companies that are making efforts to achieve their goals are continuously checking their achievement rate against key indicators such as annual sales targets. GHG reduction, energy efficiency, and renewable energy targets should also be transparently disclosed in the CSR report so they can review areas in which they are doing well or insufficiently, and reflect that in the next year's activities. This indicator earned 1 point when a company only mentioned some of its actions or parts of its performance that were not aligned with a goal, and a maximum score of 2 points when the company reviewed and explained the action for each goal.

Most of the companies described policies that could not be linked to their goals or only focused on their performance, such as presenting GHG reductions without specific explanations. In the electrical sector, 5 companies - SK Telecom, KT, SK Hynix, Samsung Electronics, LG Electronics - compared goals and achievements in the CSR report; only 1 company, Hyundai Mobis, did so in the transportation sector.

*Table 4. GHG Reduction Performance and Plan Comparison of Samsung Electronics*

| | Reduced gas used for manufacturing | Increase manufacturing process efficiency | Introduce high energy-efficent facillities | Switch to LED Lighting | Increase facillitiy efficiency | Others |
|---|---|---|---|---|---|---|
| GHG Emissions Reduced in 2017 | 52.1% | 32.8% | 8.8% | 2.0% | 1.9% | 2.0% |
| GHG Emissions Reduced Plan for 2018 | 80.7% | 0.1% | 1.1% | 0.2% | 14.2% | 3.7% |

**Fewer companies have renewable energy targets.**
**9 companies in the electrical sector set a reduction target of more than 1.5% per year, and 2 companies in that sector set a reduction target of 0.75% to 1.5% per year.**

# 2. INFORMATION DISCLOSURE

## 1. Credibility of disclosed formation and data

Information disclosure about the management of greenhouse gases is important. Information disclosure on greenhouse gas emissions was generally better than information disclosure on the use of renewable energy. In this category, there are 2 types of key indicators: “2-1-5, measurement & disclosure of full-scope emissions” and “2-1-6, third-party evaluation”. Even though they are making greenhouse gas emission data available to the public, it does not mean that most companies necessarily make substantial reductions in greenhouse gas emissions.

## 2. Scope 1 & 2 GHG emission data

Scope 1 & 2 GHG emission data is 2-1-1 indicator in our evaluation. This indicator evaluates the absolute and intensity data disclosure for Scope 1 and 2: 3 points for disclosing both absolute and intensity data, 2 points for disclosing only the absolute data, 1 point for disclosing only the intensity data, and 0 point when neither absolute nor intensity data was disclosed.
Both sectors received high scores for releasing greenhouse gas emissions data. In the electrical sector, 10 of the 16 companies disclosed both absolute and intensity data, and 5 companies disclosed only absolute data. The other one disclosed only intensity data. In the transportation sector, 3 of the 17 companies disclosed both absolute and intensity data, and the other 10 companies disclosed only absolute data.

***Table 5. Companies with full score in SCOPE 1, 2 GHG emission data disclosing***

| Electrical sector | | | Transportation sector | | |
|---|---|---|---|---|---|
| SK Telecom | Samsung Electro-Mechanics | SK Hynix | Hyundai Mobis | Hankook Tire | KUMHO TIRE |
| Samsung SDI | Samsung Electronics | LG Uplus | Korean Air | KIA Motors | |
| LSIS | LG Innotek | STEMCO | CJ Logistics | Hyundai Motors | |
| LS C&S | | | | | |

**Information disclosure about the management of greenhouse gases is important. Information disclosure on greenhouse gas emissions was generally better than information disclosure on the use of renewable energy.**



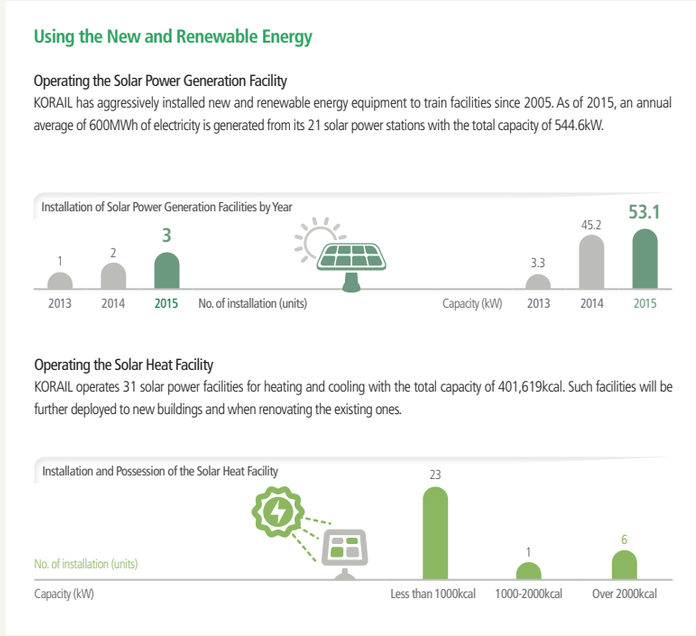
## 3. Amount of renewable energy use

Amount of renewable energy use is 2-1-3 indicator in our evaluation. Regarding renewable energy data disclosure, 3 points were received for disclosing both renewable energy generation capacity and generation and 2 points were received if only one of those was disclosed. 7 of the 33 companies disclosed the amount of renewable energy used and the amount of electricity generated, and 5 companies disclosed the amount of power generation or usage. To assess the amount of renewable energy used, we referred to the CDP Report of 2017 and the CSR of each company. Disclosure of renewable energy usage is clearly lower than greenhouse gas emissions data. Companies that did not disclose data either are not using renewable energy or have been validating the current renewable energy introduction.

***Table 6. Companies with full score in amount of renewable energy use disclosure***

| Electrical sector | | | Transportation sector |
|---|---|---|---|
| SK Telecom | KT | Samsung Electronics | KORAIL |
| LG Electronics | LS Industrial Systems | | GM Korea |

***Figure 4. KORAIL Renewable Energy Equipment Operation (ref. KORAIL CSR)***



## 4. Measurement & disclosure of full-scope emissions

We also evaluated the level of disclosure of greenhouse gas emissions information. This indicator is 2-1-5 in our evaluation. 4 points were given for disclosing Scope 1, 2, and 3, with all 15 categories of Scope 3 included; 3 points for disclosing Scope 1, 2, and 3 data and avoided emissions; 2 points for disclosing emission data for Scope 1 and 2 and part of Scope 3; 1 point for disclosing emission data for Scope 1 and 2 only; 0 points were given for not disclosing data at all.

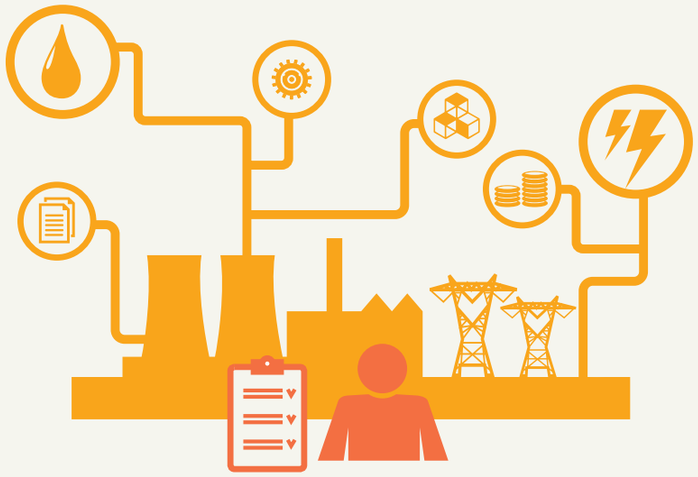
In the electrical sector, Samsung Electronics disclosed Scope 3 in 14 different categories. KT disclosed Scope 3 emissions, including Scope 1 and 2, to a large extent in the supply chain, use, and other (employee business trips, commuting, water, waste) stages, which are managed separately. In the transportation sector, 16 companies, all except KORAIL, disclosed only partial data for Scope 1, 2, and 3 and thus received 2 points.

Scope 3 also included data related to waste disposal. In Korea, Scope 1 and 2 emission sources must be included in the GHG inventory, but Scope 3 is voluntary. Therefore, companies that disclose data for Scope 3 or avoided emissions can actively disclose GHG information. Only 2 of 16 companies in the electrical sector and 1 of 17 in the transportation sector disclosed data, while in Japan 9 out of 47 companies in the electrical sector and 7 out of 25 companies in the transportation sector disclosed data. Japan had data from 22% of companies studied and Korea had data from 9%. Companies that got full scores in Korea were Samsung Electro-Mechanics and KT in the electrical sector and KORAIL in the transportation sector.



## 5. Third-party evaluation

Third-party evaluation is 2-1-6 indicator in our evaluation. With respect to receiving verification of greenhouse gas emissions data from a third-party, we gave 1 point if there was verification and 0 points if there was not. All 33 companies received a point. South Korea manages greenhouse gas emissions by designating corporate greenhouse gas emissions as management targets in the Framework Act on Low Carbon, Green Growth and guidelines on the management of greenhouse gas energy targets. Companies designated as management companies must undergo verification by a third party.[2] Third-party evaluation was an important indicator, but because all companies got a full score, one could not distinguish their efforts.



2. National Institute of Environmental Research, 2013, Fairness Management Manual for GHG·Energy Verification




# CHAPTER 4
# SCORING RESULTS AND SECTOR COMPARISON

# 1. PERFORMANCE LEVEL IN TERMS OF EVALUATION INDICATORS BY SECTOR

**56.3% of the companies in the electrical sector did not have a long-term vision for greenhouse gas reduction targets, 75% did not have energy efficiency targets, and 81.3% did not have renewable energy use targets.**

We compared the scores of the two sectors for each of the 21 indicators. If 50% of the companies received a full score on an indicator, that evaluation indicator was classified as “Excellent”. If 50% of the companies received “0”, that evaluation indicator was classified as “Poor”.

In the electrical sector, more than 50% of the assessed companies received perfect scores for 5 indicators: 87.5% of them included all types of greenhouse gases in the reduction targets, and 56.3% of them planned on more than 1.5% annual greenhouse gas reduction rates. More than 50% of these companies disclosed both emissions and energy usage in absolutes and intensities, and 93.8% of companies were accurately disclosing the range of data. All received third party assessments. On the other hand, 56.3% of the companies in the electrical sector did not have a long-term vision for greenhouse gas reduction targets, 75% did not have energy efficiency targets, and 81.3% did not have renewable energy use targets.

In the electrical sector, no indicator in the information disclosure category was rated “Poor”. None of the companies in electrical sector was evaluated as “Poor” in information disclosure indicator while none of the companies in transportation was evaluated as “Excellent” in target & performance indicator.

The transportation sector was evaluated as “Excellent” in terms of emissions and disclosure information on energy use, third party evaluation, and data range, just like the electrical sector. The transportation sector is classified as “Poor" in most of the indicators that evaluated targets & performance. The transportation sector has been ineffective in responding to climate change through setting greenhouse gas targets and performance.

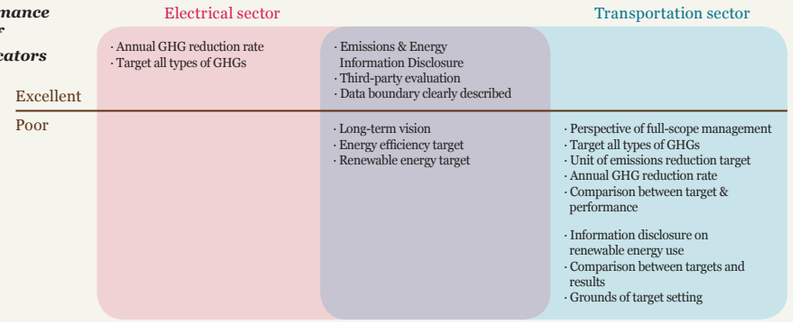



***Figure 5. Performance Level in terms of Evaluation Indicators by Sector***



# 2. SCORING RESULTS

| Electrical sector | Overall Score 100 | Targets & Performance 50 | Information Disclosure 50 | Rank | Transportation Sector | Overall Score 100 | Targets & Performance 50 | Information Disclosure 50 |
|---|---|---|---|---|---|---|---|---|
| SK Telecom | 84.4 | 43.8 | 40.6 | 1 | KORAIL | 61.8 | 19.8 | 42.0 |
| Samsung Electro-Mechanics | 78.4 | 32.6 | 45.8 | 2 | Hyundai Mobis | 53.0 | 16.1 | 36.8 |
| KT | 77.2 | 29.9 | 47.2 | 3 | Hankook Tire | 52.3 | 16.9 | 35.4 |
| SK Hynix | 75.8 | 36.2 | 39.6 | 4 | Hyundai Motors | 50.4 | 12.2 | 38.2 |
| Samsung SDI | 70.2 | 27.9 | 42.4 | 5 | Hyundai Glovis | 49.3 | 16.7 | 32.6 |
| Samsung Electronics | 68.2 | 24.5 | 43.8 | 6 | Korean Air | 47.4 | 12.0 | 35.4 |
| LG Display | 65.5 | 28.6 | 36.8 | 7 | GM Korea | 47.2 | 10.4 | 36.8 |
| LG Electronics | 63.4 | 22.4 | 41.0 | 8 | KIA Motors | 42.7 | 11.5 | 31.3 |
| LG Uplus | 59.5 | 24.5 | 35.1 | 9 | | | | |
| Average | 58.2 | 21.9 | 36.3 | | Average | 39.0 | 8.0 | 31.0 |

| | Average | | Standard Deviation | | t | p |
|---|---|---|---|---|---|---|
| | Electrical Sector (n=16) | Transportation Sector (n=17) | Electrical Sector | Transportation Sector | | |
| Overall Score | 58.2 | 39.0 | 17.7 | 12.5 | 3.6 | .001 |

***Table 7. Ranking of investigated companies***

The scores for targets and performance are significantly different, but there is not much difference in the information disclosure category. In the electrical sector, the average score in the targets and performance category is 21.9 of 50, while the transportation sector scored 8. In the electrical sector, the average score in the information disclosure category is 36.3 of 50, while the transportation sector scored 31. The average score (58.2 points) in the electrical sector is not much less than the score of KORAIL (61.8 points), which had the highest score in the transportation sector.

The average score of the 16 companies in the electrical sector is 58.2, and the average score of the 17 companies in the transportation sector is 39. The highest score in the electrical sector is 84.4, and the highest score in the transportation sector is 61.8. The lowest score in the electrical sector is 28.5, and the lowest score in the transportation sector is 20.3.

***Table 7-1. Ranking of investigated companies (Electrical sector)***


| Rank | Ranking of Electrical Sector Score | Name | Target & Performance (50) | Information Disclosure (50) |
|---|---|---|---|---|
| 1 | 84.4 | SK Telecom | 43.8 | 40.6 |
| 2 | 78.4 | Samsung Electro-Mechanics | 32.6 | 45.8 |
| 3 | 77.2 | KT | 29.9 | 47.2 |
| 4 | 75.8 | SK Hynix | 36.2 | 39.6 |
| 5 | 70.2 | Samsung SDI | 27.9 | 42.4 |

| | |
|---|---|
| 2nd group (59 ~ 70) | Samsung Electronics<br>LG Display<br>LG Electronics<br>LG Uplus |
| 3rd group (40 ~ 59) | LG Innotek<br>LSIS<br>STEMCO<br>LS Cable & System |
| 4th group (~40) | SK Siltron<br>SK Innovation<br>ISU PETASYS |

Above average within this industry

Below average within this industry

* Evaluated companies: 16 *Average score: 58.18 *Highest score: 84.4 *Lowest score: 28.5

***Table 7-2. Ranking of investigated companies (Transportation sector)***


| Rank | Ranking of Electrical Sector Score | Name | Target & Performance (50) | Information Disclosure (50) |
|---|---|---|---|---|
| 1 | 61.8 | KORAIL | 19.8 | 42.0 |
| 2 | 53.0 | Hyundai Mobis | 16.1 | 36.8 |
| 3 | 52.3 | Hankook Tire | 16.9 | 35.4 |
| 4 | 50.4 | Hyundai Motors | 12.2 | 38.2 |

| | |
|---|---|
| 2nd group (40 ~ 50) | Hyundai Glovis<br>Korean Air<br>GM Korea<br>KIA Motors |
| 3rd group (30~40) | KUMHO TIRE<br>CJ Logistics<br>LG International Corp.<br>Asiana Airlines |
| 4th group (~30) | Samsung SHI<br>STX O&S<br>Hyundai HHI<br>DSME<br>Hyundai HMD |

Above average within this industry

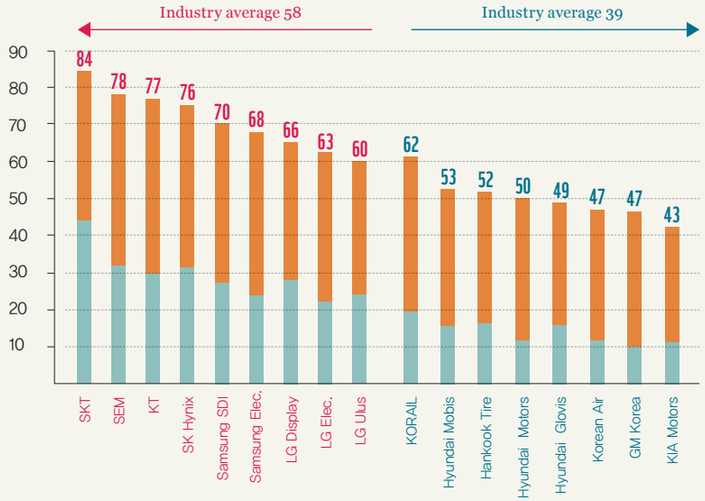
Below average within this industry

* Evaluated companies: 17 * Average score: 38.95 * Highest score: 61.8 * Lowest score: 20.3

***Figure 6. Ranking of investigated companies***

***Key***

- Information Disclosure
- Targets & Performance




* Only the companies above average

The 9 companies that received higher scores than average in the electrical sector are SK Telecom, KT, STEMCO, SK Hynix, Samsung SDI, Samsung Electronics, LG Display, LG Electronics, and LG Uplus.

The 8 companies that received higher scores than average in the transportation sector are KORAIL, Hyundai Mobis, Hankook Tire, Hyundai Motor, Hyundai Glovis, Korean Air, GM Korea, and Kia Motors.



# 3.7 KEY INDICATOR COMPARISON

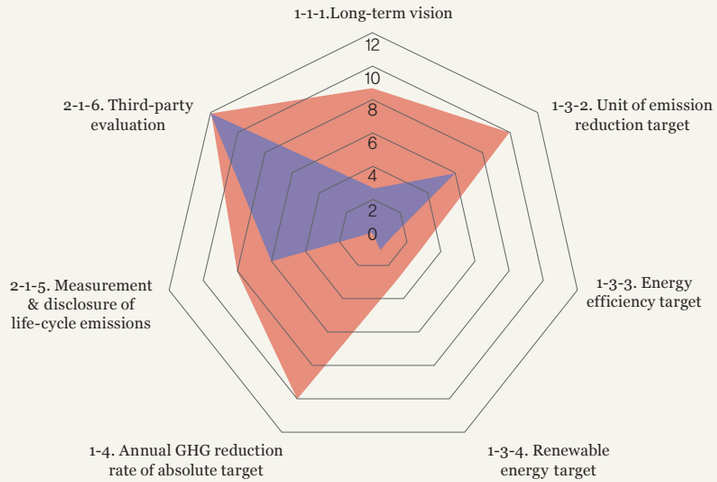
The average score of the 7 key indicators of the top groups shown in Figure 6 are compared in Figure 7. Companies in the electrical sector are superior in all areas to those in the transportation sector. Both sectors got the perfect scores in the third-party evaluation, and there were no significant differences in the measurement & disclosure of life-cycle emissions, both of which belong to the information disclosure category. As already mentioned in the scoring results, all companies disclose their information very well.

There are significant differences between the indicators “setting long-term vision” and “emissions reduction target by criteria”. No companies made an effort for “setting energy efficiency target” or “setting renewable energy target.

***[Figure 7. Comparison of average scores for 7 Key Indicators Between the electrical sector and the transportation sector***

***Key***

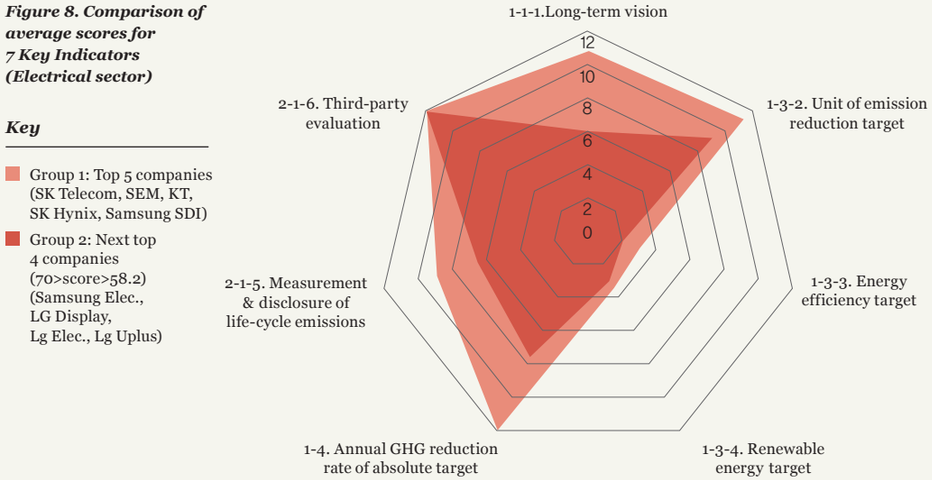
- Electrical companies(9)
- Transportation companies(8)



To compare the average scores for the 7 key indicators in the electrical sector, we first divided the top 9 companies in the electrical sector into two groups. Group 1 included companies that earned a total score of 70 or more: SK Telecom, KT, SEMCO, SK Hynix, and Samsung SDI. Group 2 included companies that earned a total score higher than average (58.2) and below 70: Samsung Electronics, LG Display, LG Electronics, and LG UPlus.

For the electrical sector, the scores of Group 1 and Group 2 are similar. However, there is a slight difference in “setting the long-term vision” and “the annual GHG reduction rate of absolute target”. All companies got full scores for “third-party evaluations”, and the groups showed no significant differences in “setting energy efficiency targets” and “setting renewable energy targets”. Therefore, setting “long-term vision” and “annual GHG reduction rate of absolute target” indicators created the differentiation. Companies such as Samsung Electronics and LG Electronics have been striving to reduce greenhouse gas emissions by announcing to set GHG reduction targets for 2020 by 2018.

***Figure 8. Comparison of average scores for 7 Key Indicators (Electrical sector)***

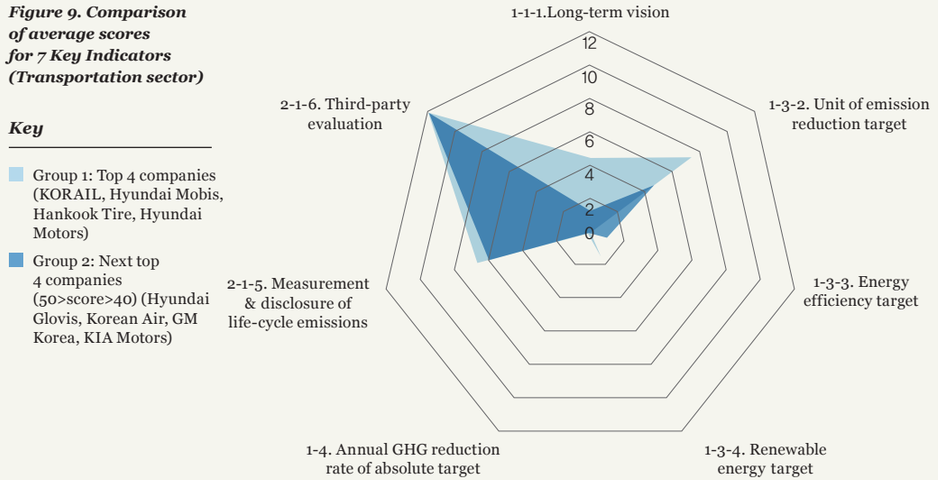





To compare the average scores for seven key indicators in the transportation sector, we divided the top 8 companies into two groups. Group 1 included companies that earned a total score of 50 of more: KORAIL, Hyundai Mobis, Hankook Tire, and Hyundai Motors. Group 2 included companies that earned total scores higher than 40 and below 50: Hyundai Glovis, Korean Air, GM Korea, and Kia Motors.

As shown in Figure 9, Group 1 and Group 2 scored similar except in “long-term vision” indicator. In other word, “long-term vision” indicator made the differences in scores. The only indicator that received full scores among the 7 key indicators is “third-party evaluation”.

***Figure 9. Comparison of average scores for 7 Key Indicators (Transportation sector)***




**There is a wide gap between the electronic and transportation sectors in terms of "long-term vision" and "Unit of Emission Reduction Target". Both sector did not put much effort on setting energy efficacy target and renewable energy target.**

# 4. INTERPRETATION OF RESULTS

We examined corporates' GHG intensity and emission amount to see how the scores correlated with actual reductions . Most of the companies have been increasing their GHG intensity, even though they are relatively well-informed (Figures 10 and 11). Evaluated companies are comparably well at information disclosure and climate action, the absolute amount of the companies' GHG increased, and only 50% of the corporations decreased GHG intensity.

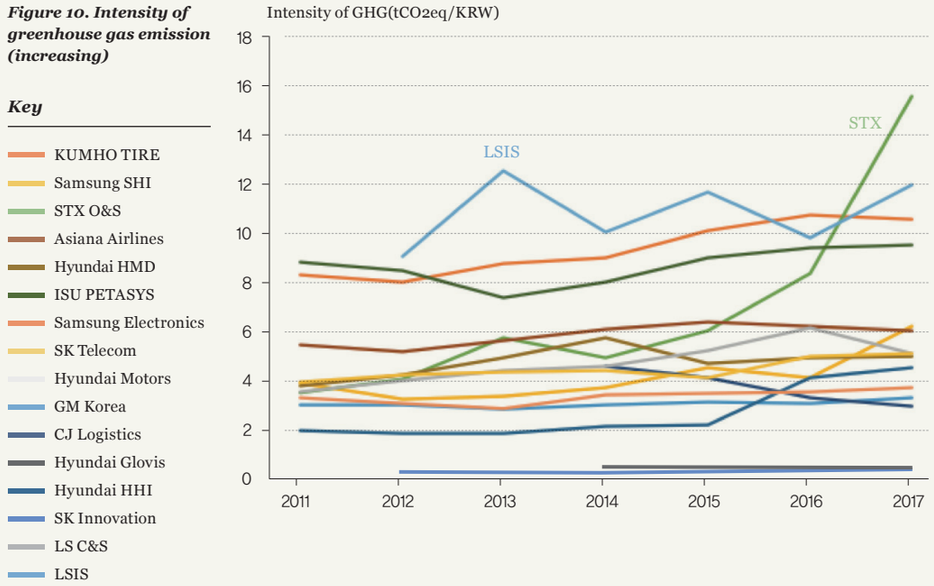
The companies with the largest increases in unit emissions were shipbuilding companies. This is because the Korean shipbuilding industry has suffered a major crisis and sales volume has decreased sharply. SEMCO, KT, SK Hynix, and Samsung SDI were included among the companies whose GHG intensity decreased, which means that 4 of the top 5 electrical companies reduced their GHG intensity. However, SK Telecom, which received the highest score, increased its GHG intensity. In the transportation sector, top-tier companies (KORAIL, Hankook Tire, and Hyundai Motors), except Hyundai Mobis, decreased their GHG intensity. There is some correlation between emission targets, information disclosure and the GHG intensity.

**Evaluated companies are comparably well at information disclosure and climate action, the absolute amount of the companies' GHG increased, and only 50% of the corporations decreased GHG intensity.**

3. The timeframe of the GHG emission data is based on disclosed emission statistics(2011~2017) of Green house Gas Inventory and Research Center(GIR, http://www.gir.go.kr). The companies' sales revenues, which is used to calculate GHG intensity are based on NAVER Finance.



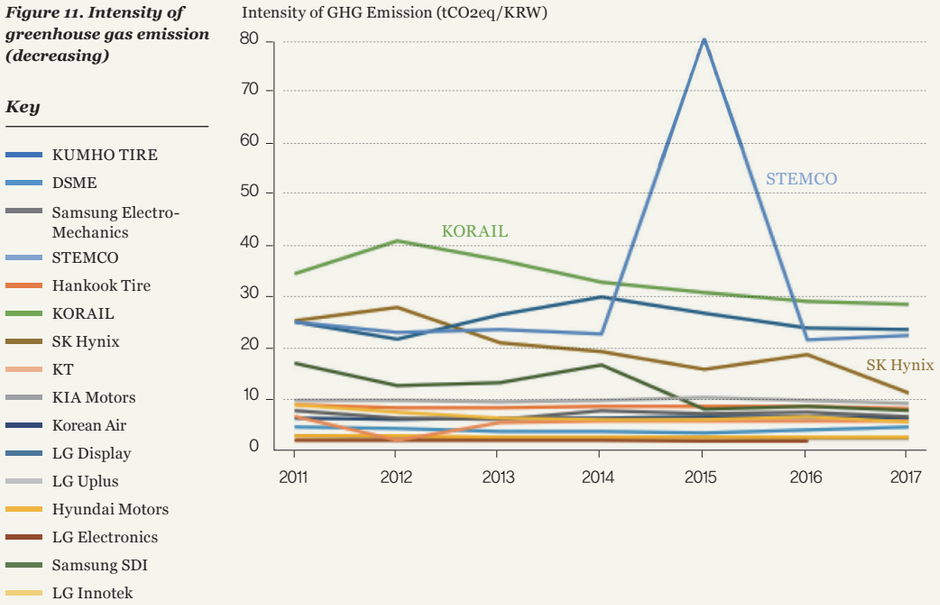
***Figure 10. Intensity of greenhouse gas emission (increasing)***





**Most of the companies that saw the increase in GHG intensity were shipbuilding businesses. This is because the sales volume of Korean shipbuilding industry has decreased sharply.**

***Figure 11. Intensity of greenhouse gas emission (decreasing)***

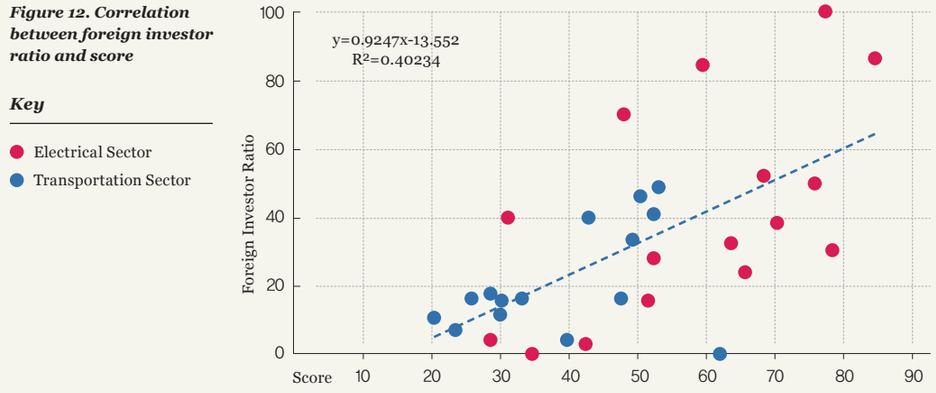



SEMCO, KT, SK Hynix, and Samsung SDI were included among the companies whose GHG intensity decreased, which means that 4 of the top 5 electrical companies reduced their GHG intensity. However, SK Telecom, which received the highest score, increased its GHG intensity. In the transportation sector, top-tier companies (KORAIL, Hankook Tire, and Hyundai Motors), except Hyundai Mobis, decreased their GHG intensity. There is some correlation between emission targets, information disclosure and the GHG intensity.



Foreign investor ratios and scores were positively correlated. The more foreign stake there is, the more active the response to climate change. This reflects the international community's demand for climate action. As shown in Figure 12, the foreign investor ratio is higher in the electrical sector than in the transportation sector. Almost all companies with a foreign investor ratio of more than 60% are in the electrical sector.

***Figure 12. Correlation between foreign investor ratio and score***




The more foreign stake there is, the more active the response to climate change. This reflects the fact that the international community's demand for climate action. The foreign investor ratio is higher in the electrical sector than in the transportation sector.


CHAPTER 5
COMPARISON WITH JAPANESE CASES

# 1. COMPARISON TARGETS AND METHODS

We have used Japanese company evaluation scores from the WWF Japan report[4] for comparison. Although there are many companies in the electrical and transportation sectors in Korea, we evaluated only those for which we had information. Therefore, it is meaningful to compare the number of evaluated companies.

Since we have selected companies which officially discloses their data related to indices, Korea evaluated 16 companies in the electrical sector and 17 companies in the transportation sector, while Japan evaluated 47 companies in the electrical sector and 25 companies in the transportation sector.

The evaluation indicators are the same as that of Japan for all but two indicators. The two items that differed are as follows.

### Setting long-term vision

Japan evaluated companies based on setting a long-term vision considering the capacity of the planet. But Korean companies did not have a long-term vision based on the Science Based Targets initiative so we have altered some of the scoring indicators. Thus this analysis gave 2 points to companies that set up long-term (2040 or beyond) goals, 1 point to companies that established medium-term goals (2021-2039), and 0 points to companies that did not have medium- or long-term goals.

### Target year

The Japanese report gave 2 points for companies with both longand mid-to-short-term targets, and 1 point with either a longterm or mid-to-short-term goal. This analysis did not consider long-term nor mid-to-short-term, but gave 2 points if there were two or more time-scale goals, and 1 point if there were one time-scale goal.

SCIENCE BASED TARGETS
DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

**While Japan is based on the long-term goal setting that considers the capabilities of the Earth, no Korean company has yet established a long-term goal based on the Science-Based Targets Initiative (SBTi).**

4. WWF (JULY 2015) "Ranking of Japanese Corporations for Effective Efforts to Address Climate and Energy Issues - Vol. 1 Electrical Equipment Industry –", WWF (JUNE 2016) "Ranking of Japanese Corporations for Effective Efforts to Address Climate and Energy Issues - Vol. 2 Transportation Equipment Industry –" Reference.



# 2. SCORE COMPARISON

In the electrical sector, the scores of the top 9 companies in Korea are not much different than in Japan.

Omitting two indicators above, Korean electric companies outscored Japanese ones in average score, Target & Performance and Information Disclosure. It is possible to say that Korean companies are more devoted to climate change response, but since Japan have 47 companies, the top 9 companies for both countries are quite similar.

Rather, it is possible to say that Japanese companies' data is well-disclosed than Koreans', since there were 47 companies with assessable data in Japan.

***Table 8. Scoring results comparison with Japan (electrical sector)***

| Korea | Overall Score 100 | Targets & Performance 100 | Information Disclosure 50 | Rank | Japan | Overall Score 100 | Targets & Performance 100 | Information Disclosure 50 |
|---|---|---|---|---|---|---|---|---|
| SK Telecom | 84.4 | 43.8 | 40.6 | 1 | Sony | 82.2 | 33.6 | 48.6 |
| Samsung Electro-Mechanics | 78.4 | 32.6 | 45.8 | 2 | Toshiba | 81.4 | 32.8 | 48.6 |
| KT | 77.2 | 29.9 | 47.2 | 3 | Ricoh | 80.6 | 32.0 | 48.6 |
| SK Hynix | 75.8 | 36.2 | 39.6 | 4 | Konica Minolta | 75.7 | 31.3 | 44.4 |
| Samsung SDI | 70.2 | 27.9 | 42.4 | 5 | Fujitsu | 74.3 | 29.9 | 44.4 |
| Samsung Electronics | 68.2 | 24.5 | 43.8 | 6 | Casio Computer | 67.1 | 33.1 | 34.0 |
| LG Display | 65.5 | 28.6 | 36.8 | 7 | Seiko Epson | 65.1 | 32.8 | 32.3 |
| LG Electronics | 63.4 | 22.4 | 41.0 | 8 | Hitachi | 61.0 | 22.1 | 38.9 |
| LG Uplus | 59.5 | 24.5 | 35.1 | 9 | Sharp | 55.4 | 21.4 | 34.0 |
| Top 9 Average | 71.4 | 30.0 | 41.4 | | Top 9 Average | 71.4 | 29.9 | 41.5 |
| Overall Average | 58.2 | 21.9 | 36.3 | | Overall Average | 48.7 | 19.4 | 29.3 |

| Electrical Sector | Average | | Standard Deviation | | t | p |
|---|---|---|---|---|---|---|
| | Korea (n=16) | Japan (n=47) | Korea | Japan | | |
| Overall Score | 58.2 | 48.7 | 17.7 | 14.1 | 1.9 | .065 |

In the transportation sector, the scores of the top 8 companies in Korea were much different than those of the top 9 companies in Japan, especially in the targets and performance category. In the information disclosure category, the average score of Korean companies was higher than that in Japan.In Japan, there were 5 automobile companies among the top 8 companies Automakers are paying attention to climate change response and information disclosure. Nissan Motors received a full score in the information disclosure category. The scores in the target and performance category for Hyundai and KIA Motors were significantly lower than those of Japanese automobile companies.

***Table 9. Scoring results comparison with Japan (transportation sector)***

| Transportation Sector Korea | Overall Score 100 | Targets & Performance 50 | Information Disclosure 50 | Rank | Transportation Sector Japan | Overall Score 100 | Targets & Performance 50 | Information Disclosure 50 |
|---|---|---|---|---|---|---|---|---|
| KORAIL | 61.8 | 100 | 42.0 | 1 | Nissan Motors | 87.5 | 37.5 | 50.0 |
| Hyundai Mobis | 53.0 | 16.1 | 36.8 | 2 | Honda Motors | 70.4 | 27.3 | 43.1 |
| Hankook Tire | 52.3 | 16.9 | 35.4 | 3 | Toyoda Gosei | 65.0 | 28.9 | 36.1 |
| Hyundai Motors | 50.4 | 12.2 | 38.2 | 4 | Toyota Motors | 63.8 | 26.0 | 37.8 |
| Hyundai Glovis | 49.3 | 16.7 | 32.6 | 5 | Mazda Motors | 59.1 | 23.7 | 35.4 |
| Korean Air | 47.4 | 12.0 | 35.4 | 6 | Suzuki Motors | 55.6 | 23.7 | 31.9 |
| GM Korea | 47.2 | 10.4 | 36.8 | 7 | Tokai Rika | 52.5 | 14.3 | 38.2 |
| KIA Motors | 42.7 | 11.5 | 31.3 | 8 | Denso | 50.6 | 18.0 | 32.6 |
| Top 8 Average | 50.5 | 14.5 | 36.1 | | Top 8 Average | 63.1 | 24.9 | 38.1 |
| Average | 39.0 | 8.0 | 31.0 | | Average | 46.7 | 18.8 | 28.0 |

| Transportation Sector | Average | | Standard Deviation | | t | p |
|---|---|---|---|---|---|---|
| | Korea (n=17) | Japan (n=25) | Korea | Japan | | |
| Overall Score | 39.0 | 46.8 | 12.5 | 16.1 | -1.8 | .084 |

In the electric sector, Korean companies outscored Japanese ones in average score, Target & Performance and Information Disclosure. The score was similar when comparing the top 9 group. The Japanese top 9 was the foremost leading group which was top 20% of 47 companies while Korean top 9 was an above-average group which was top 56%. Japanese companies in the electrical sector were better in target setting and information disclosure than those in the transportation sector as in Korea. Nevertheless, it can be inferred that Japanese transportation companies are more concerned with responding to climate change than Korean ones.

Figure 13 compares the scores of electrical companies in Korea and Japan on the 7 key indicators. Korea is doing much better on third party evaluation than Japan. The long-term vision and annual GHG reduction rate are more active in Korea than in Japan. In terms of emission reduction targets, greenhouse gas emissions measurement, and all process disclosure items, the scores in Korea and Japan are almost the same. Japan, like Korea, is not active in setting energy efficiency targets and renewable energy targets.



***Figure 13. Comparison of average scores for 7 Key Indicators between Korea and Japan (Electrical sector)***

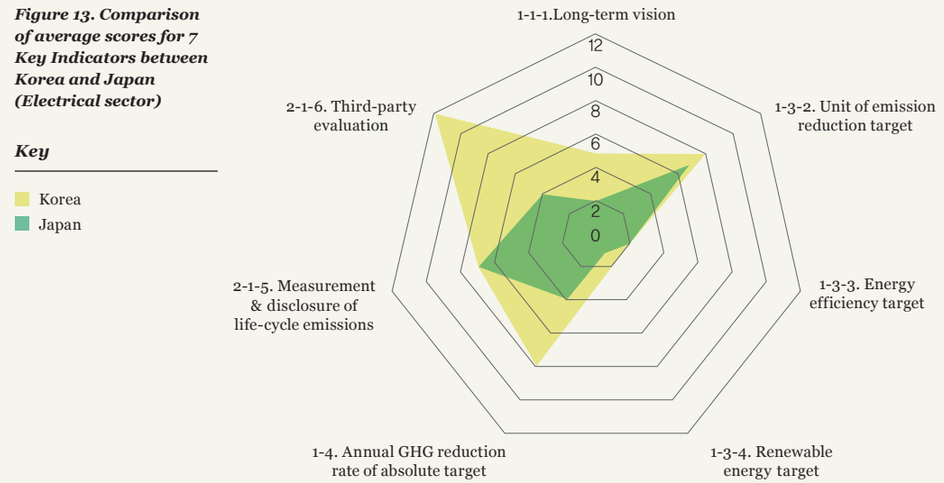
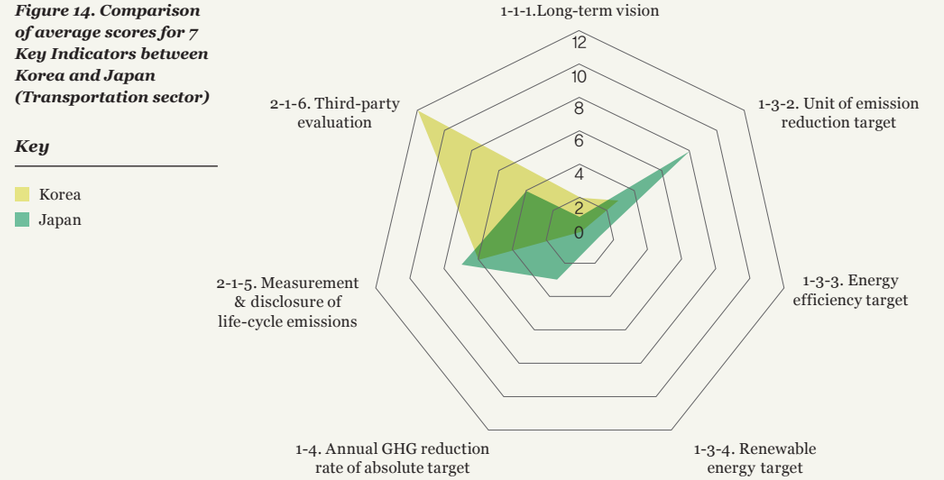



***Figure 14. Comparison of average scores for 7 Key Indicators between Korea and Japan (Transportation sector)***




**Japan, like Korea, is not active in setting energy efficiency targets and renewable energy targets.**

Figure 14 represents the comparison of 7 key indicators between Korean and Japanese transportation companies. Results of third-party evaluation is prominent just as in electrical sector. Korea is significantly better in Third-party evaluation than Japan. Japanese companie s are significantly better in Emissions reduction target criteria than Korean ones. Japan barely outscored Annual GHG reduction rate of absolute target, while similarly scored in Measurement & disclosure of full-scope emissions. Just as in the electrical sector, both Japan and Korea are very undevoted to Energy efficiency target and Renewable energy target.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# CHAPTER 6
# CONCLUSION AND IMPLICATIONS

Only 12 of the 33 companies that were the subject of this analysis set medium- and long-term targets for greenhouse gas emissions. None of them set goals for greenhouse gas reduction that considered science-based targets (SBT). However, Samsung Electronics said it is preparing to set a goal for SBT. A company's strategy to cope with climate change is hard to achieve in a short period of time without established goals. Thus, the absence of long-term goals serves as the first obstacle to a firm's aggressive climate action.

The IPCC issued its "Global Warming 1.5°C" special report, according to which companies should strive to establish and implement medium- and long-term climate action goals in a more aggressive way. Since the companies generally lacked quantitative targets for energy efficiency and the use of renewable energy, companies should pay attention to this and look for ways to achieve energy efficiency and energy transitions.

In contrast to target & performance, the Korean companies that were the subject of this analysis received fairly good evaluations in terms of information disclosure. This indicates that the government policy has high impacts on corporates to take climate actions. All of the companies were subject to the greenhouse gas emission management system, so the disclosure of information was mandatory. Therefore, they disclosed emissions data that had been verified by a third party. This suggests that government policy has a great influence on the climate action taken by companies. The implementation of a consistent government policy framework will drive future corporate climate action. In this way, the government can send a policy signal to companies that they can become active agents of climate action.

Overall, companies in the electrical sector scored better than those in the transportation sector. This is partly due to the fact that the electrical sector is more affected by pressures from the international market to cope with climate change. The relatively high proportion of electrical companies' exports accounts for the fact that these companies are leading the way in climate action. The transportation industry is also expanding through global mergers and acquisitions and group synergies. The Korean domestic transportation industry needs to actively engage in climate action in order to secure its global competitiveness.

**This suggests that government policy has a great influence on the climate action taken by companies. The implementation of a consistent government policy framework will drive future corporate climate action.**



**In light of the fact that climate risks are being amplified, this approach is not just a matter of corporate social responsibility or ethics, but a matter of life and death in terms of corporate survival.**

In addition to disclose reliable and transparent financial information, global investors are demanding that corporations to disclose information about the effects of climate change that is based on various international standards. The corporations have been putting efforts on includin g Paris and UN sustain ability goals in their CSR reports. An increased level of foreign investment corresponded to more active countermeasures being taken against climate change. This implies that pressure from international society and international markets can encourage corporate climate action.

Even though Korean companies have established short- or medium- and long-term goals, they are still not able to attain their active goals in climate action. In particular, although this study was conducted on representative companies in Korea's electrical and transportation sectors, most of the companies' GHG emissions were on the rise, and only 50% of the companies had a decrease in GHG emissions compared with their revenue. Korean companies should recognize their status and role in the international community and be more active in climate action. In light of the fact that climate risks are being amplified, this approach is not just a matter of corporate social responsibility or ethics, but a matter of life and death in terms of corporate survival. We believe that companies that prepare for and respond to climate change using the criteria described in this analysis report will be able to strengthen their global competitiveness.

***[Appendix 1] Climate Action Assessment (Electronic Sector)***

| Evaluation indicators | | | SK Telecom | Samsung Electro-Mechanics | KT | SK Hynix | Samsung SDI | Samsung Electronics |
|---|---|---|---|---|---|---|---|---|
| 1. Target & Performance | 1-1. Time spans of target | 1-1-1. Long-term vision | 24 | 24 | 24 | 24 | 6 | 0 |
| | | 1-1-2. Target years | 12 | 12 | 12 | 12 | 12 | 6 |
| | 1-2. Range of target | 1-2-1. Geographical boundary (scope 1,2) | 4 | 8 | 4 | 8 | 8 | 8 |
| | | 1-2-2. Perspective of life-cycle management | 12 | 9 | 12 | 9 | 3 | 12 |
| | 1-3. Climate targets | 1-3-1. Target GHGs (Scope 1, 2) | 12 | 12 | 12 | 12 | 12 | 12 |
| | | 1-3-2. Unit of emission reduction target (Scope 1, 2) | 24 | 24 | 9 | 24 | 24 | 6 |
| | | 1-3-3. Energy efficiency target (scope 1,2) | 8 | 0 | 0 | 8 | 0 | 8 |
| | | 1-3-4. Renewable energy target | 24 | 0 | 0 | 0 | 06 | 24 |
| | 1-4. Annual GHG reduction rate of Scope 1&2 absolute target | | 24 | 24 | 24 | 24 | 24 | 0 |
| | 1-5. Status of achievement | | 12 | 6 | 6 | 6 | 6 | 6 |
| | 1-6. Comparison between performance and actions taken | | 12 | 6 | 12 | 12 | 6 | 12 |
| 2-1. Information disclosure | 2-1-1. Scope 1&2 GHG ($CO_2$) emission data | 2-1-1-1. Absolute and intensity | 12 | 12 | 8 | 12 | 12 | 12 |
| | | 2-1-1-2. Time-series data | 12 | 12 | 12 | 12 | 12 | 12 |
| | 2-1-2. Scope 1&2 energy consumption data | 2-1-2-1. Absolute and intensity | 12 | 12 | 8 | 12 | 12 | 12 |
| | | 2-1-2-2. Time-series data | 12 | 12 | 12 | 12 | 12 | 12 |
| | 2-1-3. Amount of renewable energy use | | 12 | 0 | 12 | 0 | 8 | 12 |
| | 2-1-4. Data boundary (scope 1,2) | | 12 | 12 | 12 | 12 | 12 | 12 |
| | 2-1-5. Measurement & disclosure of life-cycle emissions | | 9 | 24 | 24 | 6 | 6 | 6 |
| | 2-1-6. Third-party evaluation | | 24 | 24 | 24 | 24 | 24 | 24 |
| 2-2. Credibility of target setting | 2-2-1. Comparison of targets and results | | 12 | 12 | 12 | 12 | 12 | 12 |
| | 2-2-2. Grounds of target setting (Scope 1,2) | | 0 | 12 | 12 | 12 | 12 | 12 |
| 1. Subtotal | | | 43.8 | 32.6 | 29.9 | 36.2 | 27.9 | 24.5 |
| 2. Subtotal | | | 40.6 | 45.8 | 47.2 | 39.6 | 42.4 | 43.8 |
| Total | | | 84.4 | 78.4 | 77.2 | 75.8 | 70.2 | 68.5 |

| LG Display | LG Electronics | LG Uplus | LG Innotek | LSIS | STEMCO | LS C&S | SK Siltron | SK Innovation | ISU PETASYS |
|---|---|---|---|---|---|---|---|---|---|
| 24 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 0 |
| 8 | 8 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 0 |
| 9 | 12 | 9 | 12 | 12 | 12 | 12 | 12 | 12 | 0 |
| 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 0 | 0 |
| 9 | 24 | 9 | 9 | 9 | 9 | 0 | 24 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 24 | 6 | 24 | 24 | 6 | 24 | 0 | 0 | 0 | 0 |
| 6 | 6 | 6 | 0 | 6 | 0 | 6 | 0 | 0 | 0 |
| 8 | 8 | 12 | 12 | 12 | 12 | 12 | 4 | 8 | 8 |
| 8 | 8 | 12 | 12 | 12 | 12 | 12 | 4 | 8 | 8 |
| 12 | 12 | 12 | 12 | 12 | 12 | 12 | 8 | 12 | 12 |
| 8 | 8 | 12 | 12 | 12 | 12 | 12 | 4 | 8 | 8 |
| 12 | 12 | 12 | 12 | 12 | 12 | 12 | 8 | 12 | 12 |
| 0 | 12 | 8 | 8 | 12 | 0 | 0 | 0 | 0 | 0 |
| 12 | 12 | 12 | 12 | 12 | 12 | 12 | 0 | 12 | 12 |
| 6 | 6 | 9 | 6 | 9 | 6 | 6 | 6 | 6 | 6 |
| 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 |
| 12 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 28.6 | 22.4 | 24.5 | 18.2 | 15.1 | 16.7 | 11.2 | 15.9 | 2.6 | 0 |
| 36.8 | 41 | 35.1 | 34 | 36.5 | 31.3 | 31.3 | 18.8 | 28.5 | 28.5 |
| 65.5 | 63.4 | 59.5 | 52.3 | 51.6 | 47.9 | 42.4 | 34.6 | 31.1 | 28.5 |

*[Appendix 2] Climate Action Assessment (Transportation Sector)*

| Evaluation indicators | | | | KORAIL | Hyundai Mobis | Hankook Tire | Hyundai Motor | Hyundai Glovis | Korean Air |
|---|---|---|---|---|---|---|---|---|---|
| 1. Target & Performance | 1-1. Time spans of target | 1-1-1. Long-term vision | | 6 | 6 | 6 | 0 | 6 | 0 |
| | | 1-1-2. Target years | | 12 | 6 | 12 | 6 | 12 | 6 |
| | 1-2. Range of target | 1-2-1. Geographical boundary (scope 1,2) | | 4 | 8 | 8 | 8 | 4 | 0 |
| | | 1-2-2. Perspective of life-cycle management | | 9 | 3 | 9 | 9 | 9 | 3 |
| | 1-3. Climate targets | 1-3-1. Target GHGs (Scope 1, 2) | | 12 | 6 | 12 | 12 | 12 | 6 |
| | | 1-3-2. Unit of emission reduction target (Scope 1, 2) | | 9 | 9 | 6 | 6 | 3 | 9 |
| | | 1-3-3. Energy efficiency target (scope 1,2) | | 0 | 0 | 0 | 0 | 0 | 4 |
| | | 1-3-4. Renewable energy target | | 6 | 0 | 0 | 0 | 0 | 0 |
| | 1-4. Annual GHG reduction rate of Scope 1&2 absolute target | | | 0 | 0 | 0 | 0 | 0 | 0 |
| | 1-5. Status of achievement | | | 12 | 12 | 6 | 0 | 12 | 12 |
| | 1-6. Comparison between | | | 6 | 12 | 6 | 6 | 6 | 6 |
| 2. Information disclosure | 2-1. Credibility of disclosed formation and data | 2-1-1. Scope 1&2 GHG ($CO_2$) emission data | 2-1-1-1. Absolute and intensity | 8 | 12 | 12 | 12 | 8 | 12 |
| | | | 2-1-1-2. Time-series data | 12 | 8 | 12 | 12 | 12 | 12 |
| | | 2-1-2. Scope 1&2 energy consumption data | 2-1-2-1. Absolute and intensity | 8 | 12 | 12 | 12 | 8 | 12 |
| | | | 2-1-2-2. Time-series data | 12 | 8 | 12 | 12 | 12 | 12 |
| | | 2-1-3. Amount of renewable energy use | | 12 | 0 | 0 | 8 | 0 | 0 |
| | | 2-1-4. Data boundary (scope 1,2) | | 12 | 12 | 12 | 12 | 12 | 12 |
| | | 2-1-5. Measurement & disclosure life-cycle emissions | | 9 | 6 | 6 | 6 | 6 | 6 |
| | | 2-1-6. Third-party evaluation | | 24 | 24 | 24 | 24 | 24 | 24 |
| | 2.2 Credibility of target setting | 2-2-1. Comparison of targets and results | | 12 | 12 | 0 | 0 | 0 | 12 |
| | | 2-2-2. Grounds of target setting (Scope 1,2) | | 12 | 12 | 12 | 12 | 12 | 0 |
| 1. Subtotal | | | | 19.8 | 16.1 | 16.9 | 12.2 | 16.7 | 12 |
| 2. Subtotal | | | | 42 | 36.8 | 35.4 | 38.2 | 32.6 | 35.4 |
| Total | | | | 61.8 | 53 | 52.3 | 50.4 | 49.3 | 47.4 |

| GM Korea | KIA Motors | KUMHO TIRE | CJ Logistics | LG International -Corp | Asiana Airlines | Samsung SHI | STX O&S | Hyundai HHI | DSME | Hyundai HMD |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 6 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 6 | 0 |
| 4 | 8 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 |
| 3 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| 8 | 12 | 12 | 12 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| 12 | 8 | 12 | 8 | 12 | 12 | 8 | 8 | 12 | 0 | 4 |
| 8 | 8 | 12 | 12 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| 12 | 8 | 12 | 8 | 12 | 12 | 8 | 8 | 12 | 0 | 4 |
| 12 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 0 | 12 | 0 |
| 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12 | 12 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 10.4 | 11.5 | 1.6 | 4.7 | 1.6 | 1.6 | 2.6 | 1.6 | 1.6 | 3.1 | 1.6 |
| 36.8 | 31.3 | 38.2 | 28.5 | 28.5 | 28.5 | 25.7 | 25.7 | 24.3 | 20.1 | 18.8 |
| 47.2 | 42.7 | 39.8 | 33.2 | 30 | 30 | 28.3 | 27.3 | 25.9 | 23.3 | 20.3 |

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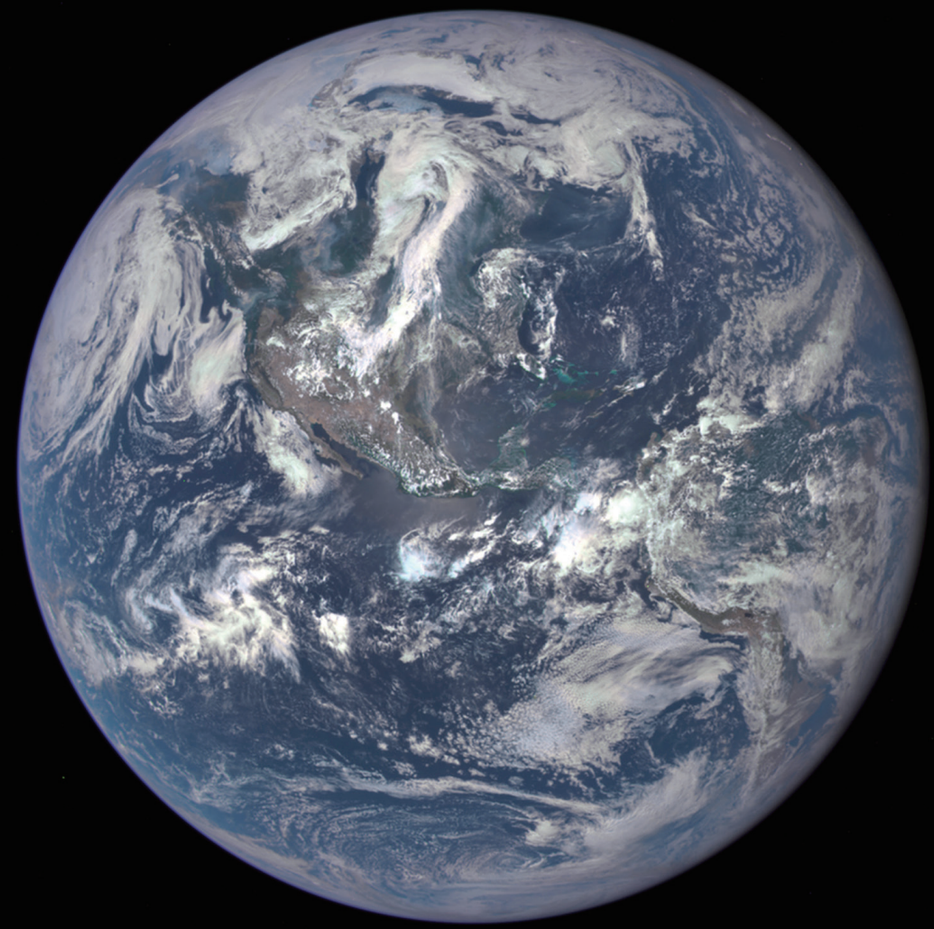



# Together Possible

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

**58.2**

Average climate action score of companies in the electrical sector

**39**

Average climate action score of companies in the transportation sector

**71.4**

Average climate action score of 9 leading companies in the electrical sector

**50.5**

Average climate action score of 9 leading companies in the transportation sector

*The climate action score is measured based on the level of their climate-related efforts and information disclosure, and every corporation was graded on a 100-pooint scale.

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