



THINK THE GREEN

KC Green Holdings
2019 Sustainability Report

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About This Report

Report Overview KC Green Holdings and affiliates have been publishing the annual report on sustainability management, which will be the eighth report this year. Through the report, we would like to share our efforts to maintain the sustainability of global society and to have a positive impact on stakeholders, including the global environment and communities.

Format	GRI Standards
Target	KC Green Holdings and affiliates and workplace
Period	2018. 01 ~ 2018. 12 (including partial performance in 2019)
Criteria	Information for at least 3 years based on accounting year (currency unit: USD)
Verification	Korea Chamber of Commerce and Industry (KCCI), Business Institute for Sustainable Development (BISD)
Publication principle	KC Green Holdings website (www.kcgreenholdings.com) published at all times
Inquiries	KC Green Holdings Sustainable management team Tel +82-2-320-6351 E-mail Sustainability@green-kc.com

Think the Green []

*The blank can be filled with various terms such as Society, People, Company, and Business to complete the sentence with the keyword “Green,” which represents the global environment, to deliver a message about our connection with different stakeholders and about embracing their ideas.

2018 Sustainable Management at a glance



Business Performance

Sales
\$ 478 M
(\$ 163 M ↑)

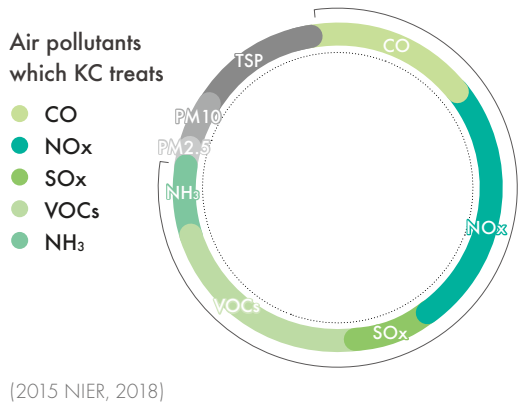
Net Profit
\$ 17 M
(\$ 9 M ↑)

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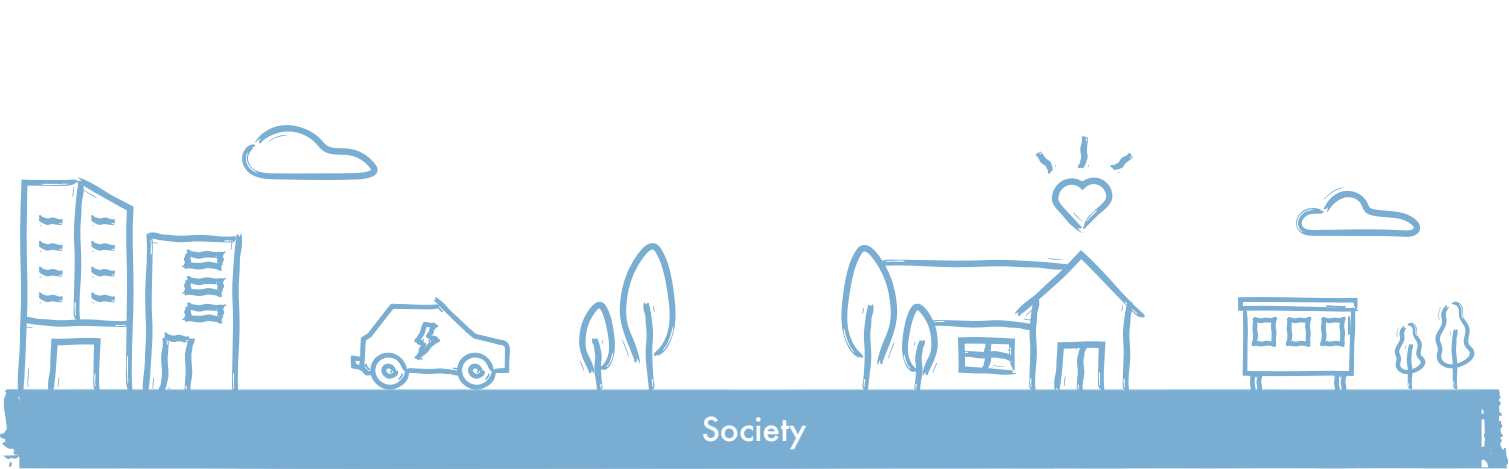


Pollution Control

KC Green Holdings and affiliates keep reviewing technologies and businesses to deal with various air pollutants as air pollution becomes more serious.



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Product Responsibility

ISO9001 Certification
13 network companies

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Working Conditions

Make KC a better workplace
KC Green Holdings is having a 'Great WorkPlace(GWP)' project to create a good corporate culture following a shift in generations in workplace.

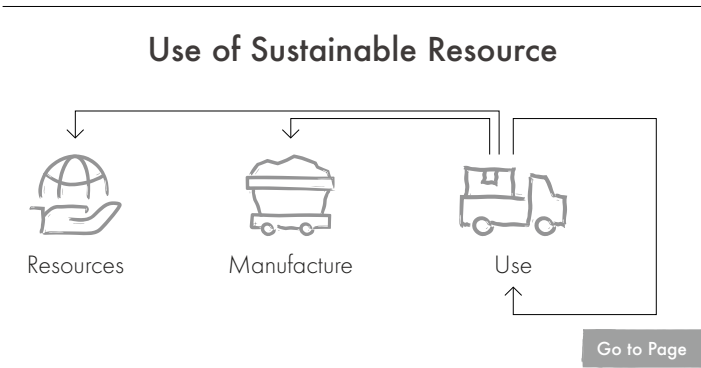
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Risk Management

KC Green Holdings endeavors to provide various environmental solutions to respond to the ever-changing business environment.

New business	New network companies
4	6

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Employee Health and Safety

Safety and Health Committee

To manage the health employees and prevent the safety accidents in advance, we have organized a Safety and Health Committee and operate it quarterly.

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Mutual Growth

Mutual growth conference

KC Glass & Materials has been hosting a mutual growth conference with major partners at least once a year and share market analysis and opinion for mutual development.

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Ethical Management

0

There have been no cases of corruption, child labor and forced labor in 2018

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Customer Health and Safety

8

Passed 8 safety and health tests.

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KC in the Era of Green Survival

KC has been initiating the following works to resolve major environmental issues in 2018 such as fine dust and waste.



Fine dust, KC's efforts to bring fresh air

Material Topic

Pollution Control

Links to SDGs



Why does this topic matter?

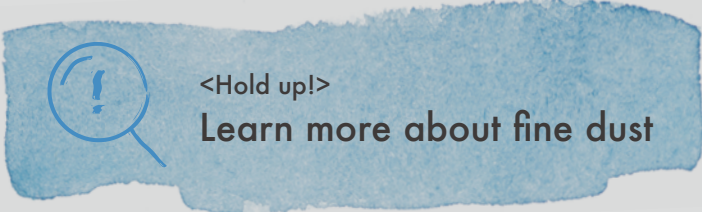
Fine dust refers to Particulate Matter 10 (PM10) with a diameter of 10 μ m (micrometer) or lower and Particulate Matter 2.5 (PM2.5) with a diameter of 2.5 μ m or lower. The size is so small that it is hardly visible to the naked eye, but constant exposure to fine dust can be fatal to one's health, weakening the pulmonary function and the cardiovascular system, which is why it should be considered as a green survival issue to be healthy and to maintain a pleasant life.

Fine dust has become an issue since March 2014 when China smog caused a high PM episode in Korea. According to a report by the Ministry of Environment, the number of PM advisory or warning alerts has increased every year in the winter season when the country is greatly affected by northwestern and when fossil fuel is most likely to be used. Unlike yellow dust (or Asian dust) that occurs naturally during spring, high PM episodes result from artificial causes such as the use of fossil fuel. Therefore everyone, including companies, government, and citizens, must work together to reduce the PM level.

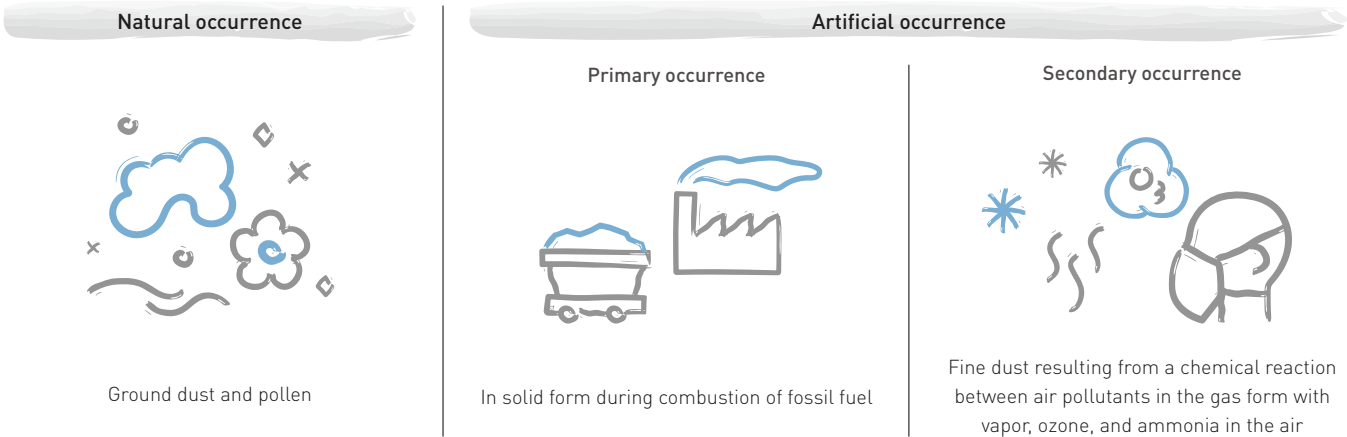
In September 2017, the government has announced comprehensive plans to reduce the PM level in various business fields such as power generation, industry as well as private enterprises. Last year, they have reinforced the environmental standards for fine dust to protect the old and the weak from high PM episodes as well. The government has taken the emergency action starting from February 2019 to control the occurrence of fine dust and to reduce the number of damages caused by it. The issue calls for various policies laid out by the government and the participation of people, but it is most important that companies that run industrial facilities, which can be the main cause of fine dust, show enthusiasm to reduce the level of PM.

Management Approach

KC Green Holdings is a company of green environmental business that reviews a technical agreement and ways to break into a new market to effectively take measures against global environmental issues. KC Green Holdings, formerly the KC Cottrell, has been founded in 1973 based on dust collecting technology, which had been prepared out of concerns for air pollution resulting from rapid industrialization. The company's main businesses include an electrostatic precipitator and denitrification and desulfurization facility that diminish the level of dust, sulfur oxides, and nitrogen oxides generated from industrial facilities such as coal-fired power plants and steelworks. It also engages in developing products that can be applied to various spaces other than industrial facilities such as ships and tunnels. It plans to grow into a company that can specialize in air pollution control through the development of VOCs reduction and carbon capture technology.

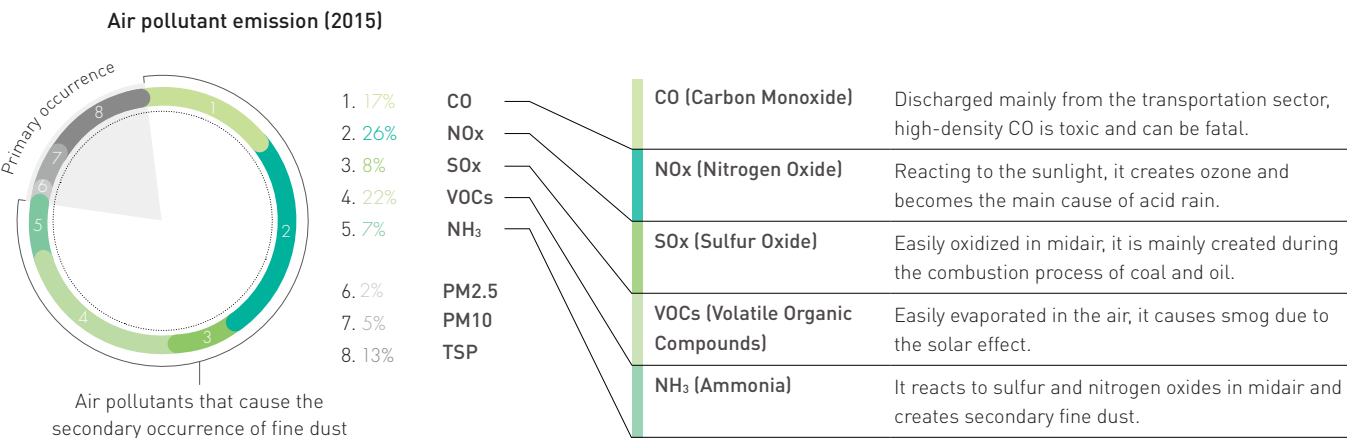


Source



Air pollutants that cause a secondary occurrence of fine dust

Since the percentage of air pollutants that cause the secondary occurrence of fine dust is much greater than that of air pollutants that cause primary occurrence, it is of most significance that the number of air pollutants that causes the secondary occurrence is reduced.



(Credit : National Institute of Environmental Research [NIER], 2018)

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Efforts made to reduce PM emission

Performance improvement project for the aged plants

Coal-fired power plants are known to be the main culprit of the PM crisis, but they are better than nuclear power plants in terms of safety, and they can provide a steady supply of electricity compared to other renewable energy plants. Indeed, they have been the primary power source in Korea with at least 60% of general output annually. For a steady supply of power without having to be concerned about the occurrence of PM, we need an electrostatic precipitator and denitrification and desulfurization facilities that remove dust, sulfur oxide, and nitrogen oxide, all of which can be found in the gas discharged after the combustion process of coal.

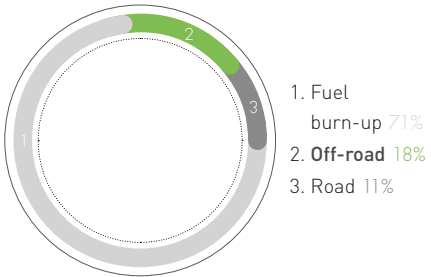
According to the comprehensive plans for the PM management that the government has announced in 2017, coal-fired power plants were ordered to be shut down in the spring season because there is relatively lower power demand for the concerns of increased discharge of air pollutants resulting from the degenerated performance of fine dust reduction equipment in aged plants. Recently, however, the number of days with high PM episodes detected has increased even in cold weather; therefore it would be necessary to review the performances of the environmental equipment in aged plants in order to ameliorate the concerns about the occurrence of fine dust and to provide steady supply of power in winter season when there is high power demand.

KC Cottrell has been conducting a project to improve the performances of the environmental equipment (electrostatic precipitator and denitrification and desulfurization facilities) in the sixth unit at Hadong Thermal Power Plant since February 2018. The performance improvement project has been applied with High Performance Perforated plate Package, HP III®, which has been organized for the first time in Korea to upgrade the effect of the desulfurization process. The performance test run in January 2019 showed that both the denitrification and desulfurization facilities have indeed made some improvement, exceeding the set goal, and we expect that this project will not only help provide a steady supply of power but also reduce the PM level.

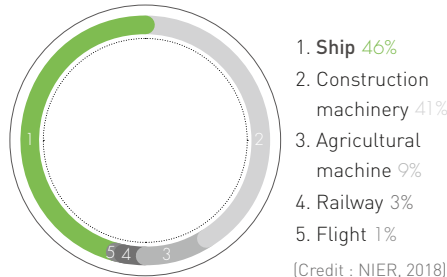
Technology development for the reduction of air pollutants discharged from ships

According to a report announced by the NIER last year, the occurrence of fine dust (PM10, PM2.5) in the off-road transportation sector was the second largest (18%) after the fuel burn-up sector. It was higher than the fine dust emission from the road (diesel) transportation sector (11%).

Secondary fine dust emission by sources (2015)



Fine dust emission by off-road transportation sources (2015)



In particular, the very source that accounted for the largest proportion of fine dust emission from the off-road transportation sector was the ship (46%). The International Maritime Organization (IMO) plans to initiate sulfur limit starting from 2020 to reinforce the standard for sulfur oxide in marine fuel from 3.5% to 0.5%. To take action against such

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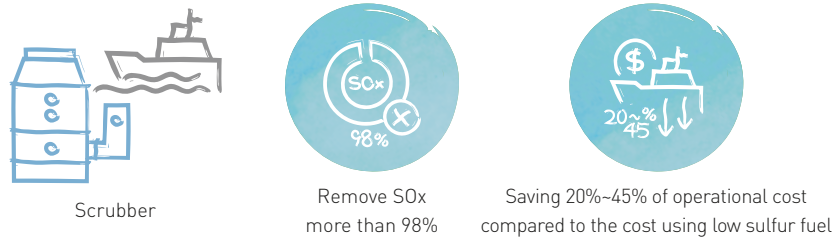
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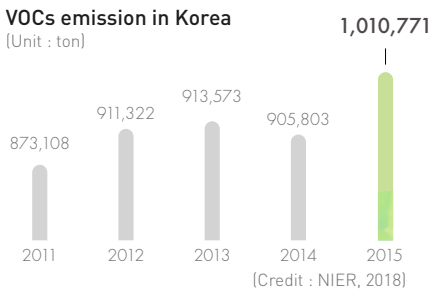
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international environmental regulations, KC Cottrell has been researching from 2012 to 2018 on developing technology that reduces the level of PM and BC (Black Carbon), which are air pollutants discharged from ships. Moreover, it has come up with Scrubber (sulfur oxide reduction system) for ships that can remove SOx more than 98% based on their 20 years of desulfurization technology know-how. The scrubber has been applied to various types of ships such as container ships, bulk carriers, and crude-oil carriers.

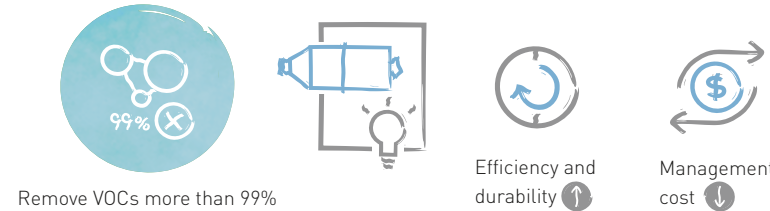


Launch of VOCs reduction business



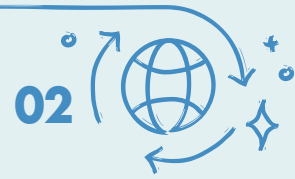
Volatile Organic Compounds (VOCs) are substances that trigger a chemical reaction in midair and change into an odor PM2.5, or ozone. They are managed by the government based on policies because they are hazardous substances that cause air pollution and smog. According to the NIER statistics, the VOCs emission in 2015 was the second highest (22%) next

to nitrogen oxide among the domestic air pollutants, and its annual emission has been on the rise. In August 2018, KC Cottrell has formed a business partnership with Environment and Energy that has a special technology called RTO system, which is a VOCs reduction system, and has established KCVCS in November to compete in the relevant market. The patent technology that KCVCS holds boasts of high efficiency, the durability of the performance, and affordable management cost compared to other companies. It is expected to play an important role in reducing the PM level.



International Cooperation

According to a decade-long study conducted by the Institutes of Environmental Research in Korea, China, and Japan from 2000, the annual average of 30~50% of air pollutants in Korea came from China. Since the issue of fine dust is becoming more serious, it is a matter that requires cross-border cooperation. KC Cottrell has been participating in the cooperative project of demonstrating environmental technology to reduce the PM level since 2016. Based on this project, air pollutant control technology of Korea has been applied to facilities that discharge a large number of air pollutants in China such as coal-fired power plants. Since November 2018, KC Cottrell and Changchun KC Envirotech have been remodeling desulfurization and denitrification facilities in local heating boilers and steelworks in China.



Circular economy, KC's efforts to protect a clean global environment with no waste

Material Topic

Use of sustainable resources

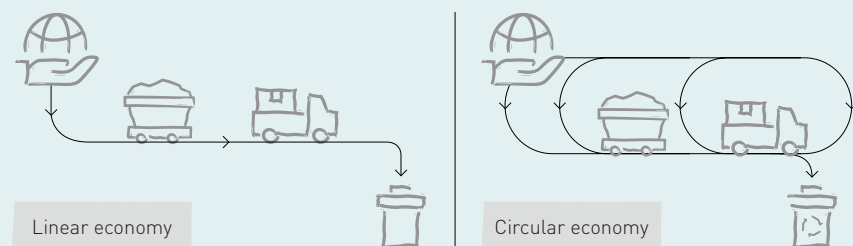
Links to SDGs



Why does this topic matter?

The earth has a limited amount of resources. This means a reckless collection of resources without considering its limitation will lead to the resource depletion. However, the fact that the economy has made rapid growth and has used an astronomical amount of resources along the way – more than the earth can regenerate by itself – thus leaving the increasing quantity of waste is a much bigger problem. News about having found a great deal of marine waste inside a sea turtle in Jeju Island last year is an example that shows the seriousness of the waste discharge. Last year in April, Korea went through a crisis regarding wastes when companies that used to collect recyclable waste to send to China stopped taking scrap vinyl and plastic waste away because China has restricted the import of recyclable waste for being concerned about the environmental pollution in their own country. In this regard, a concept called "A circular economy" rose to the surface as a solution to a problem of a linear economic model, which goes through a cycle of take-make-dispose.

The circular economy is a type of economic model that enables sustainable growth through saving, sharing, and recycling resources without having to rely on limited resources and fossil fuel. Not only the industry and the government but also the consumers have recognized the value of the circular economy and are pursuing the model. Starting from January 1, 2018, Korea has implemented the Framework Act on Resource Circulation, and the use of disposable cups has been restricted in coffee shops since August 1 based on the relevant act. The United Nations has also announced on January 16 to increase the plastic recycling rates and to regulate the use of microplastic, which hardly decomposes.



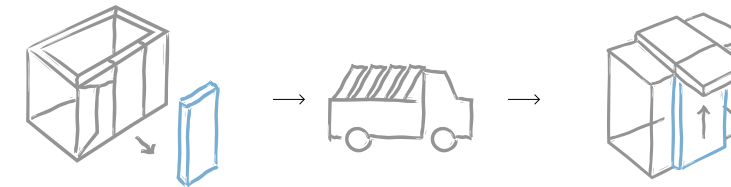
Management Approach

KC Green Holdings is organizing a portfolio based on environmental projects to grow into a company of green environmental business that protects the environment. Focusing on by-products created from the fast-growing economy and industry, we established KC EnviroServices in 2000 to initiate an environmental service business that treats waste. The business is about finding sustainable means to dispose of the waste based on their properties such as waste-to-energy (using the energy from incinerating the waste as fuel), waste-to-resource (selling the waste after manufacturing into a raw material form), waste collection and transportation, and waste incineration. The circular economy model is also applied to the existing manufacturing business sector.

2-1

Product life extension

In April 2018, KC Green Holdings has taken over Clestra Hauserman SA, a company that designs, manufactures, and installs monobloc and moveable office partitions. It was established in 1913 based on an idea that as the organizations change, and so do their space, a wall should not be fixed. Its items are finished products, designed to be immediately assembled in the construction site. It was touted to be an environment-friendly material for interior decoration because the occurrence of dust or odor was significantly low thanks to no additional processing. Previously in December, the company has announced to apply the circular economy model to its management strategy to enable research and development of longer-lasting products.



2-2

Recovery/recycling

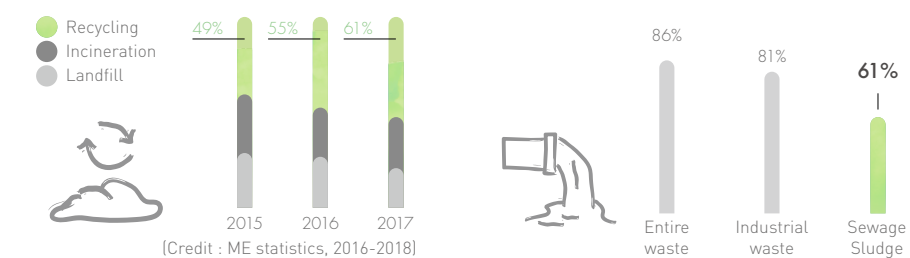
Recycling of coal ashes

Coal ashes are particle substances of minerals within coal that remained after incineration, most of which are discharged from coal-fired power plants where a large amount of coal is used. Coal-fired power plants in Korea generate about 8-9 million tons of coal ashes every year, and a majority of plants have been classifying them as industrial waste and treated them by landfill. Samcheok Eco Materials, an SPC Corporation of KC Green Materials, has recycled coal ashes discharged from the Samcheok Thermal Power Plants and has completed the establishment of a facility that can manufacture various products such as fine aggregate and concrete admixture with weight up to 400,000 ton a year in November last year. The recycling technology of coal ashes is expected to not only protect the environment near the plants but also to turn into an excellent environment technology to be used to recycle wastes into resources.

Recycling sewage sludge

Sewage sludge refers to precipitates in the sewage when solid bodies are separated from the water during the sewage treatment process. According to the London Convention, ocean disposal, including sewage sludge, has been prohibited from 2012, so sewage sludge must be treated through incineration, landfill, or recycling. The statistics from the ME showed that the daily recycling rate of sewage sludge in 2017 was 61% on average, which increased when compared to the average in 2015 and 2016, but the rate is still low considering the recycling rate of the entire waste is 86% or that of the industrial waste is 81%.

Daily average rate by sewage sludge treatment Daily recycling rate in 2017



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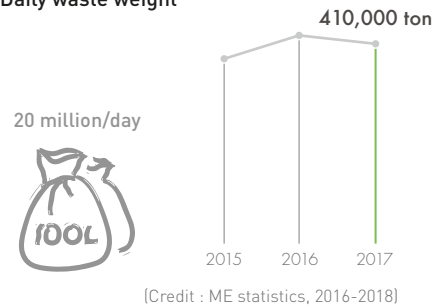
KC EnviroServices judged that recycling sewage sludge into fuel is a way better environmental technology to contribute to the resource circulation and to reduce the environmental impact than landfill or incineration, thus it has established KC Green Energy to produce sewage sludge fuels and has taken over Eumseong Biochips and Seongju Biochips that dispose of wood waste in order to provide efficient supply of wood flour required to produce sewage sludge fuels. Such fuels produced from KC Green Energy can be used for renewable energy at coal-fired power plants and it aims to become the largest sewage treatment plant in the country.

Investment in resource circulation facilities

While the quantity of waste created from the daily lives and industrial sites is increasing every year, the statistics from the ME showed that the daily waste weight has exceeded 400,000 ton in 2015 and has reached 410,000 ton in 2017. This indicates that if the weight of a full garbage bag of 100L is 20kg, then at least 20 million garbage bags are being thrown out every day.

KC Eco Logistics has established a resource circulation facility to conduct the selection and manufacturing processes to enable the recycling of wastes found from general

Daily waste weight



households and industrial sites into fuels. In particular, the company has implemented high-performance equipment that can grind the waste into 30mm size to produce fuel with combustibility that is higher than general waste synthetic resin. About 400 ton of daily waste can be recycled to be used as an auxiliary fuel for the cement kilns.

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Company overview (As of Dec. 31, 2018)

KC Green Holdings has separated the manufacturing business sector to improve management efficiency and ensure transparent corporate governance and has converted to a holding company in 2010.

Name	KC Green Holdings Co., Ltd.
Address	11 th Floor, 34, Sangamsan-ro, Mapo-gu, Seoul, South Korea
CEO	Taeyoung Lee
Est. Date	November 27, 1973
Shareholder	Taeyoung Lee 32.08% Sanyeon Co., Ltd. 8.14% Jaeyoung Lee 6.89%
No. of employees	30
Business details	Management consulting, investment and other holding business
Credit rating	A- (NICE D&B assessment) May 25, 2018
Website	www.kcgreenholdings.com

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CEO Message



Dear stakeholders,

The environmental issues have never attracted more public attention in 2018 than any other year in Korea. Having also acknowledged the gravity of the situation, KC Green Holdings and affiliates felt even more responsible as a company of green environmental business and thus made great efforts to resolve the environmental issues through various means such as making technological agreement with outside partners and developing new business projects while also ensuring internal stability at the same time in order to grow into a sustainable company in the ever-changing times.

In particular, we have continued to carry out the following assignments to meet the goal of “Improvement of awareness of affiliates on sustainable management.”
First of all, we incorporated sustainable management into actual business activities by adding sustainable management performance index such as “Environment and Safety,” “Balance between Work and Life,” and “Mutual Growth” to the Key Performance Indicator (KPI) for the KC network companies. The KPI for sustainable management is to be implemented starting from

this year, and we will use them to set goals and project plans based on the capabilities and conditions of each affiliate. Secondly, we established the KC Academy to provide KC executives and employees various training opportunities in accordance with our company management philosophy: “The company grows through the development and growth of employees.” We prepared a video based on the enterprise value of the KC and shared with our employees so that everyone not only from KC Green Holdings but also the affiliates can cultivate a team spirit to reach for the same goal.

This year marks the 10th anniversary of KC Green Holdings as a holding company. The primary assignment of KC Green Holdings and affiliates in 2019 would be to reorganize our business portfolio based on the current environmental issues and economic trends in order to prepare ourselves for the next 10 years. In this regard, we will be providing support to the affiliates to establish a management system for the KPI for sustainable management. In addition, KC Green Holdings will continue to keep our utmost priority of upgrading the training programs for employees and take aggressive actions to come up with ways to cooperate with local communities in order to not only create economic value but also make environmental contributions so that we can carry out our social responsibility as a member of society.

The 2019 sustainability report includes such details, focusing on the biggest environmental issues in 2018 such as fine dust and recycling of waste to show how KC Green Holdings and affiliates contribute to society with our businesses in the era of green survival when consideration of the environment is not an option but a requirement. Moreover, we have endeavored to make sure that the employees of the KC network, who can be said to be the most significant readers, can understand our work with ease.

KC Green Holdings and affiliates promise to provide a transparent report of our sustainable management activities and performances and to become a sustainable company through constant communication. We look forward to your encouragement and support on the development that KC Green Holdings and affiliates will make for the next 10 years.

June 2019
CEO of KC Green Holdings
Taeyoung Lee

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Holding company
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 - KC Air Filtertech
 - NoI-Tec Korea
 - Yuyang Technologies
 - KCVCS
02. Changchun KC Envirotech
03. Lodge Cottrell
04. KC Cottrell Vietnam
05. KC Cottrell India
06. NoI-Tec Systems

 - NoI-Tec Systems Shanghai
07. NWL Pacific
08. KC Thermal
09. KC Envirotech E&C (Fushun)
10. KC Glass & Materials
11. Clestra Hauserman SA

 - Clestra Hauserman
 - Clestra Hauserman HongKong
 - Clestra K.K
 - Clestra Hauserman (Taicang) Architecture Product
 - Clestra International
 - Mecanalu
 - Clestra USA
 - Clestra Hauserman Overseas Contracting
12. KC EnviroServices

 - KC Landfill Service
 - KC Eco Cycle
 - Eumseong Biochips
 - Seongju Biochips
 - KC Green Energy
13. KC Enviro Construction
14. KC Eco Logistics
15. KC Green Materials
16. KC Solar Energy

*The list of KC network only includes domestic and international affiliates of KC Green Holdings and workplace.

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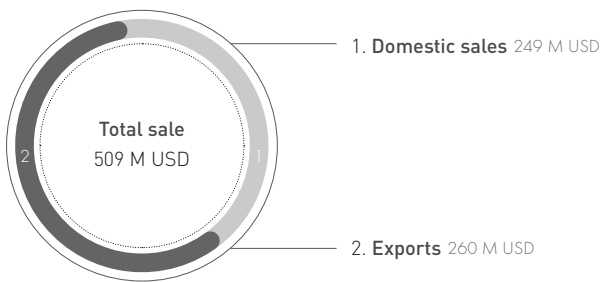
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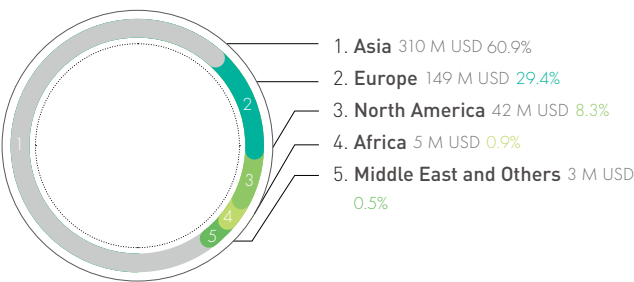
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Domestic sales/exports



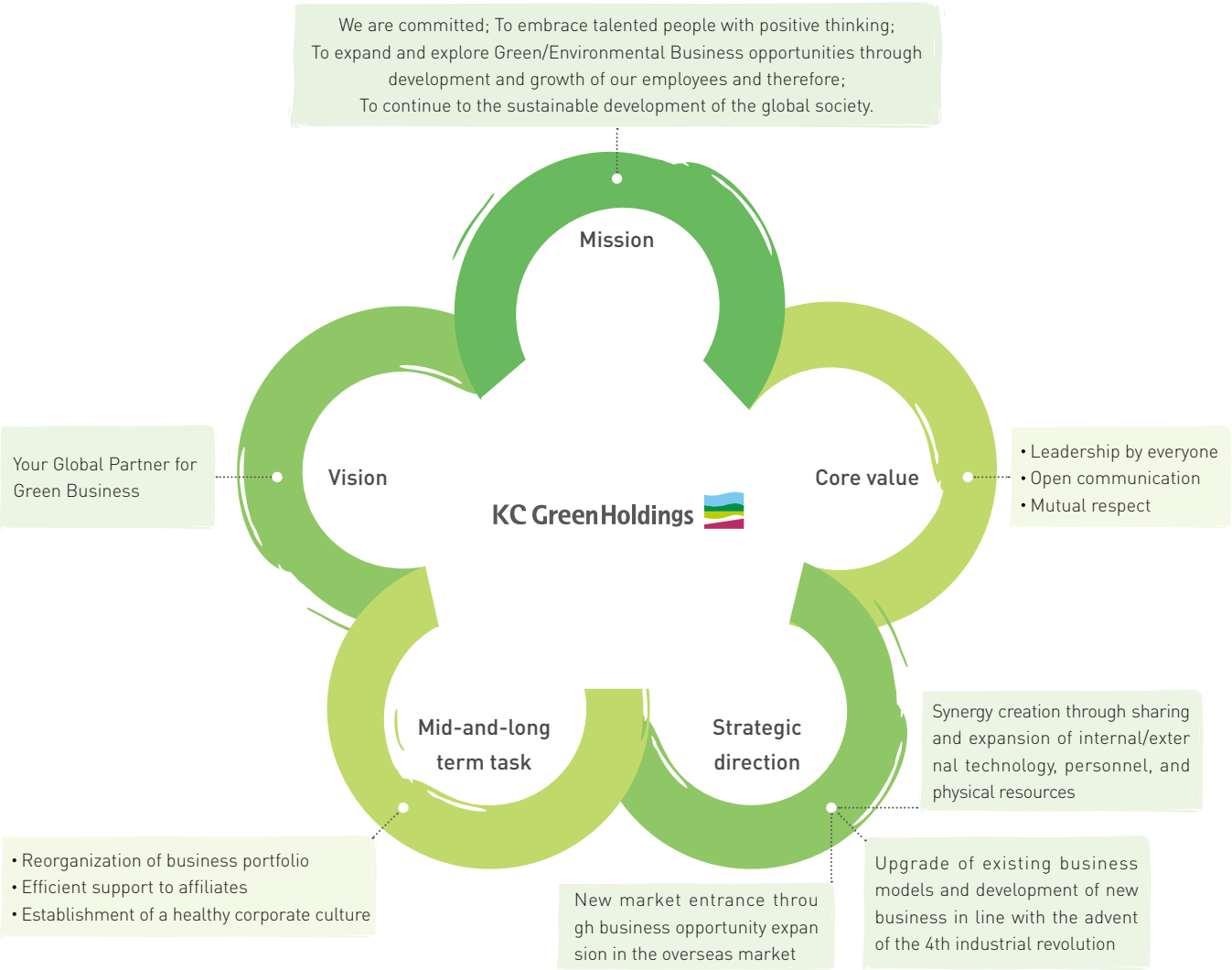
Sales by continents



*As of December 31, 2018, domestic sales/exports and sales by continents include internal transactions between KC network, respectively.

Mission, Vision, and Core Value

KC Green Holdings has a vision “Your Global Partner for Green Business” that reflected our future business direction of specializing in environment businesses and our long-term goal of becoming a global company beyond the domestic market. This new vision uses the word “Partner” to imply the message of open communication and mutual respect, core values of KC Green Holdings.



KC's Core Value Story

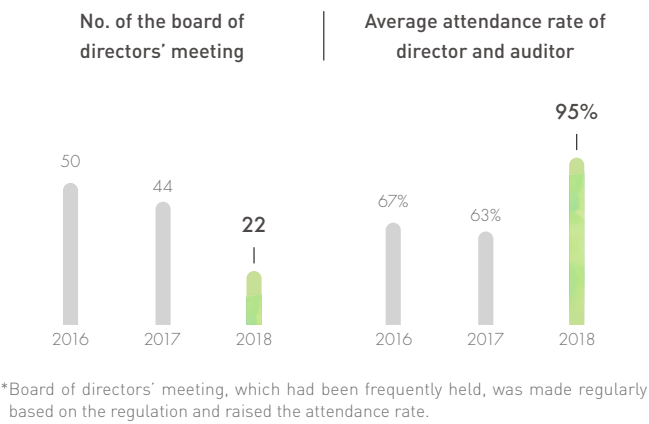
KC Green Holdings has been compiling data since 2018 to make a video titled “KC’s Core Value Story” to help employees better understand the mission, vision, and core value of KC as the number of affiliates and newcomers increased. We plan to initiate the internalization of corporate value to the training course so that every member can engage in their work based on it. This is expected to give employees the idea of team spirit and to create a special bond of membership in the company by becoming goal-oriented.

Governance

Board of directors

In October 2018, board regulations have been made to increase the efficiency of business management and the specialty of directorate management. Board of Directors is an organization that makes decisions that lead to important factors in engaging in work, conforming to the company’s fundamental principles, items commissioned by the share holder’s meeting, and items defined by the articles of association or by law. Information such as the agenda and attendance of outside directors is announced through electronic disclosure. The board consists of 7 people, including 4 internal directors, 2 outside directors, and an auditor. There has been a total of 22 meetings in 2018, and the attendance rate of outside directors and auditor is 95% on average.

The board of directors’ meeting in 2018



Directors and auditors (As of April 2019)

Category	Name	Major careers	Inauguration	Sex
Internal director	Taeyoung Lee	KC Green Holdings CEO, KCCI and BISD auditor, Ecomom Korea director, Simon Fraser University MBA, Seoul Nat'l Univ. BA	MAR 2018	M
	Jongkyoo Kim	KC Green Holdings COO, KC Solar Energy CEO, Seoul Nat'l Univ. BA	MAR 2018	M
	Jeongwan Kim	KC Green Holdings CFO, KC Glass & Materials CEO, Seoul Nat'l Univ. BA, MA, CPA	MAR 2019	M
	Kisuh Park	KC Green Holdings CTO, KC Thermal President, KC Green Materials CEO, Seoul Nat'l Univ. B.Eng	MAR 2019	M
Outside director	Kyeonghoon Lee	Former, POSCO ENERGY CFO, Sunchon Nat'l Univ. M. Eng. Ph.D, Chung-Ang Univ B.Eng	MAR 2017	M
	Jaekyung Lee	Prof. Dept. of Management, Kookmin Univ., The University of Texas, Austin Ph.D. in Accounting, University of California, Berkeley MBA, Seoul Nat'l Univ. BA	MAR 2019	M
Auditor	Jongryeol Kim	Former, Adjunct Prof. Hanyang Univ., Graduate School of Engineering, Hoseo Univ. Graduate School of Venture Ph.D, Inha Univ. MBA, Chung-Ang Univ. BA	MAR 2017	M

Evaluation and remuneration

The remuneration of directors and auditors is paid by considering basic salary and incentive based on the financial and non-financial management performance within the annual remuneration limit approved in the shareholders’ meeting in March 2018. The total remuneration limit of directors and auditor approved by the board of directors’ meeting in 2018 was 3,131 thousand dollars, and the actual payment was about 775 thousand dollars.

Category	No. of person	Limit of remuneration	Actual payment
Director	Internal director 4	2,684 thousand dollars	620 thousand dollars
	Outside director 2		70 thousand dollars
Auditor	1	447 thousand dollars	85 thousand dollars

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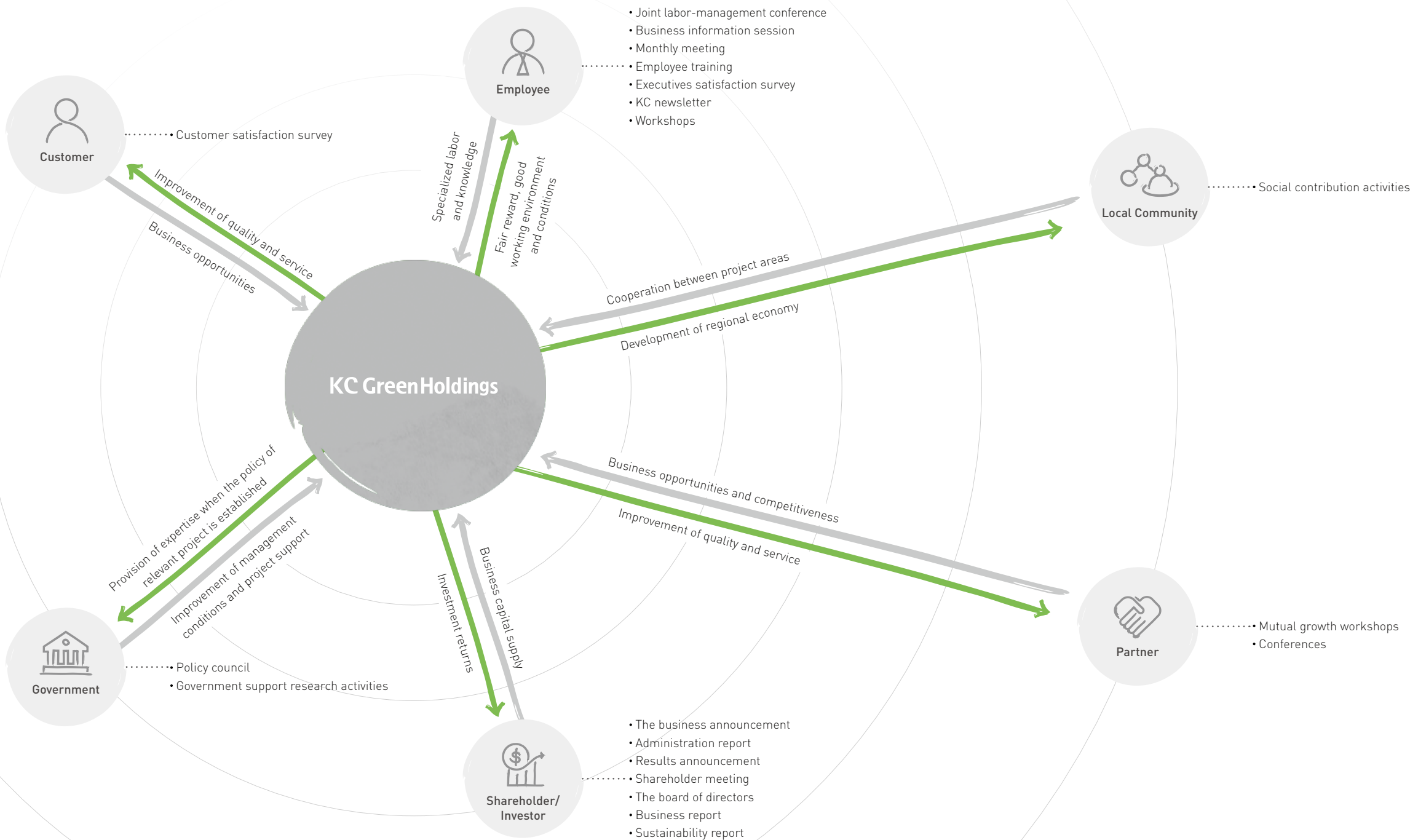
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Stakeholders Communication

KC's stakeholders are defined as groups that either influence or are influenced by the management activities of KC Green Holdings and our affiliates. We have selected interviewers from each group of employee, local community, partner, and shareholder to collect various feedbacks about the sustainability report, communication activities with stakeholders and more. We will prepare a two-way communication channel to listen to the stakeholders' opinions.



Feedbacks

Employee

“Please share major agendas of the year and future goals in terms of sustainable management.”

The report certainly shows the KC value and performance in terms of sustainable management, but it would be better if we could see what the company is focusing on each year and its long-term goal. We believe that frequent communication between affiliates will facilitate cooperation.

Local Community

“We are looking forward to participating in various social activities so that the company can contribute to creating a sustainable society besides business.”

Thank you for your efforts to create a sustainable environment through projects and continuous research and development. However, we would like to see some joint activities with local communities such as investment in environmental education and raising awareness of both employees and citizens so that sustainable development is made to create a sustainable society.

Partner

“We need more windows for communication.”

The sustainability report indeed showed how the company was willing to make efforts to create a sustainable global society through environmental projects, and this has helped us grow and establish a confidential relationship. However, there seemed to be not enough variety of communication activities. It also would be better if you shared the market analysis data of environmental projects as well.

Shareholder/Investor

“Detailed project introduction and aggressive market entrance.”

It was impressive to see how financial information and economic performances were interpreted in different ways. Because KC's business is not familiar to the public, it would be more interesting if detailed explanation on your business were included in the report. Environmental issues are not limited to Korea, so we hope to see you initiate your projects in countries in need of the KC technology and make achievements in both areas of environment protection and development.

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Materiality Assessment

KC Green Holdings has been reporting sustainable management topics that are considered significant to the stakeholders, and we have been conducting a materiality assessment to systematically manage the material topics.

→ STEP 1. Lay out issues

GRI Standards and ISO26000 Global Standard Index have been reviewed to lay out 101 issues that considered KC Green Holdings and affiliates.

→ STEP 2. Conduct materiality surveys

A total of 101 issues has been categorized and narrowed down to 28 topics, based on which a survey was conducted on stakeholders from both inside and outside. The survey was distributed via e-mail, website, and groupware announcements, and 91 stakeholders from outside and 59 stakeholders from inside the company have participated.

→ STEP 3. Select material topics

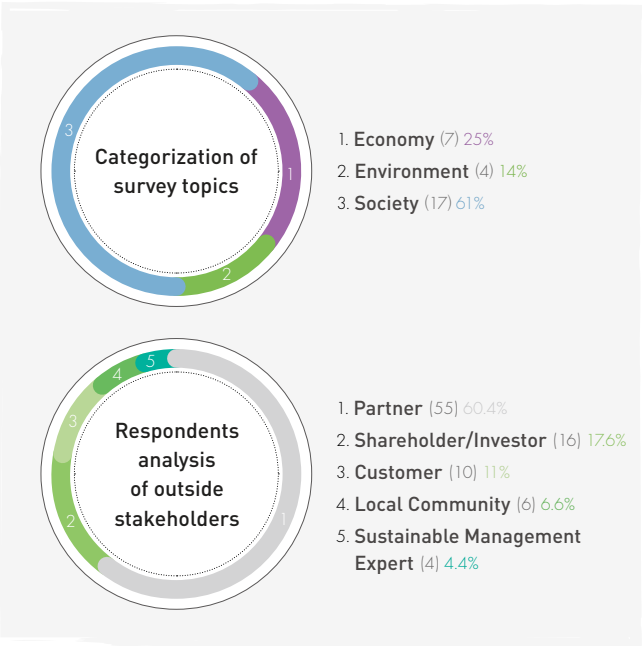
Material topics were selected and prioritized based on the analysis of surveys on outside stakeholders and the analysis of the global standard index to understand the interests of stakeholders as well as the analysis of surveys on the employees to learn its impact on business. We draw the top 10 topics.

TOP 5 topics to attract stakeholders interests

- 1 Use of sustainable resources (Environment)
- 2 Business performance (Economy)
- 3 Mutual growth (Society)
- 4 Pollution control (Environment)
- 5 Customer health and safety (Society)

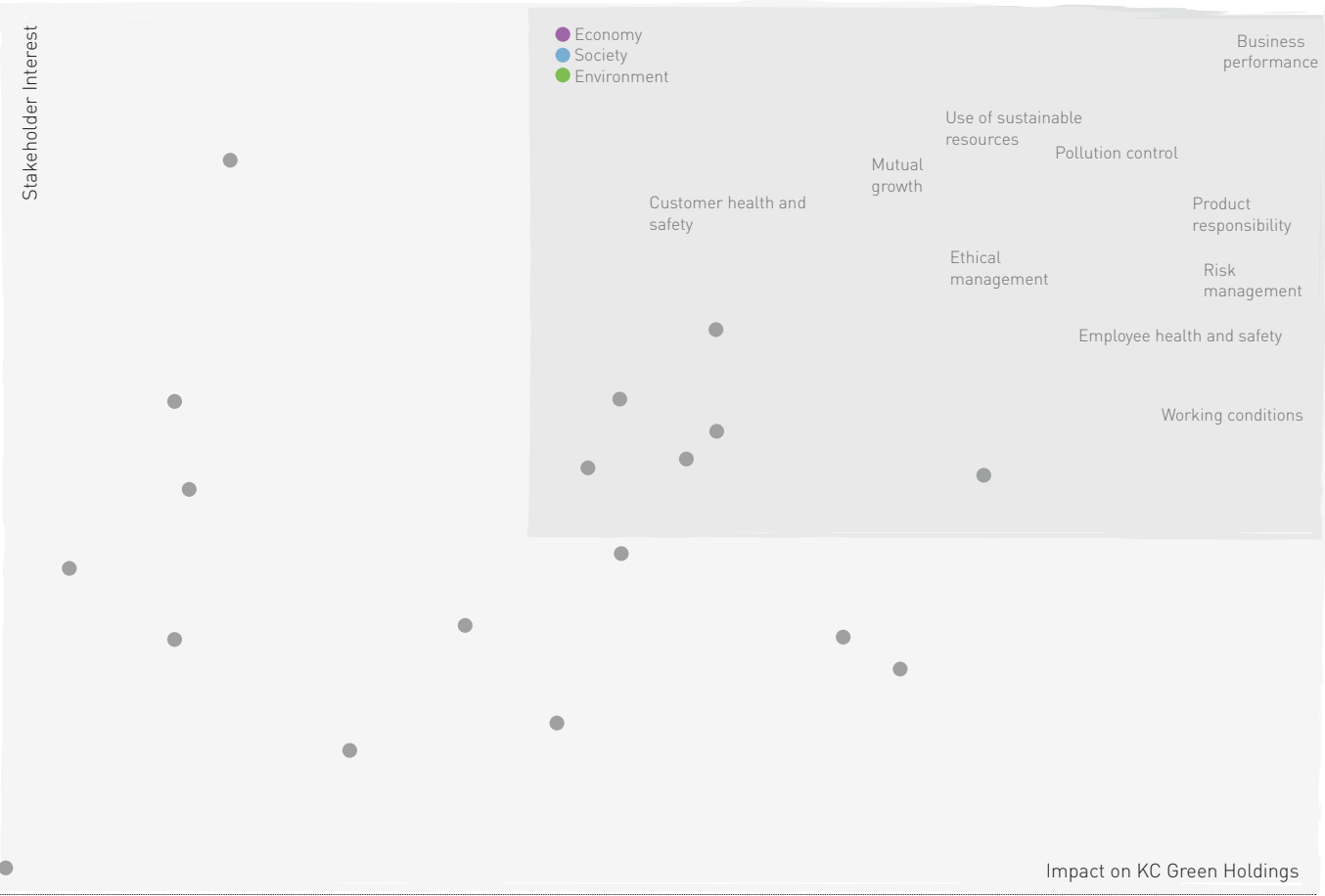
TOP 5 topics that affect business

- 1 Business performance (Economy)
- 2 Working conditions (Society)
- 3 Risk management (Economy)
- 4 Product responsibility (Society)
- 5 Employee health and safety (Society)



Analysis of material topics

The 2019 materiality assessment showed that the levels of interest and significance of business performance were highest after the results in 2017 and 2018. The remaining topics included product responsibility, risk management, employee health and safety ethical management, mutual growth, and customer health and safety just as in the previous year. Compared to 2018, noticeable topics were related to the environment because the interests in fine dust and marine pollution resulting from microplastic have grown. Accordingly, a topic about pollution control has been placed third on the list, rising seven steps year-on-year, and a topic about the use of sustainable resources has newly appeared on the list. Furthermore, it is interpreted that people’s growing interests in the government policy on jobs and social issues such as the 52-hour workweek policy, increased minimum wage, and ideal workplace may have led to the selection of working conditions as one of the new material topics.



Overall TOP 10 material topics

No	Material topics	Yr-on-yr	Page	Relevant stakeholder	GRI Aspect
1	Business performance	-	24, 25	Shareholder/investor	Economic achievements
2	Product responsibility	2▲	32	Customer	Marketing and labeling
3	Pollution control	7▲	4-7, 27, 28	Local community	Discharge water and waste
4	Risk management	1▼	4-10	Local community, shareholder/investor, employee	Strategy
5	Use of sustainable resources	NEW	8-10	Local community	Raw materials, energy, water resources
6	Employee health and safety	1▼	31, 32	Employee	Employee health and safety
7	Ethical management	2▲	30	Employee, partner	Ethics and integrity
8	Working conditions	NEW	30	Employee	Employment
9	Mutual growth	1▼	32	Partner	-
10	Customer health and safety	3▼	32	Customer	Customer health and safety

→ STEP 4. Report and verify material issues

The materiality assessment results were reviewed by the executives of KC Green Holdings, and the review process and its data were verified by the KCCI and BISD.

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We share the performance in 2018 of KC Green Holdings and affiliates, which seek to enhance the sustainability of the earth and improve the well-being and development of employees.

Economic Reliability	24
Environmental Soundness	27
Social Responsibility	29
Holding Business	33
Environmental Engineering Business	34
Environmental Service Business	36
Environmental Manufacturing Business	38
Renewable Energy Business	39

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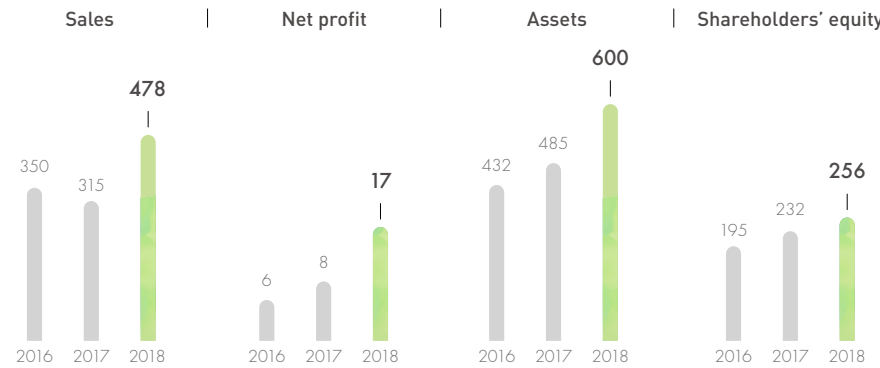
01 Economic Reliability

MANAGEMENT APPROACH

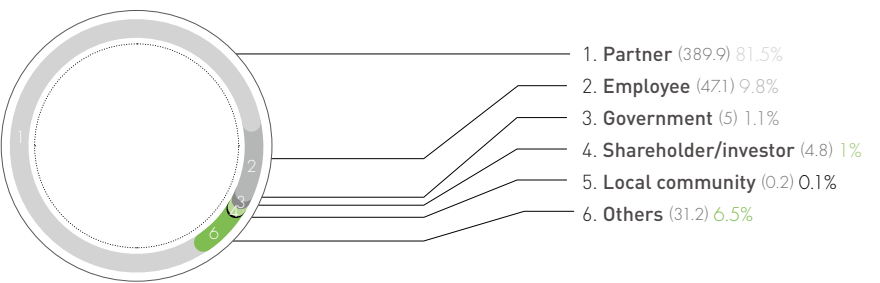
As interest in the environment began to rise, people started expecting responsibility for environmental issues from corporations and government tightened related regulations. KC Green Holdings has moved forward from our existing businesses and has diversified our portfolios with projects that can respond to such expectation and regulations.

KEY FIGURES

Value creation in 2018 (Unit : M USD)



Value distribution in 2018 (Unit : M USD)



Government grant

2M USD



Proportion of senior management employed in local community
(Average of total affiliates)

66.8%



Proportion of spending on local suppliers
(Average of total affiliates)

44.4%



Advancement to new market and business

KC Green Holdings and affiliates have established or acquired six new companies that can provide new environmental solutions and invested in new facilities to take actions against various environmental issues.

Environmental engineering

Establishment of KCVCS Since the VOCs discharge regulations in both Korea and abroad have been reinforced, KC Cottrell has acquired the technology of removing the odor (VOCs). To preoccupy the RTO system market, KC Cottrell has taken advantage of its global network together with its unique technology to establish the KCVCS by investing in 70% of its shares in 2018.

Environmental services

Acquisition of KC Eco Cycle KC EnviroServices has acquired Korea 3R E&I to expand its project portfolio using domestic waste instead of industrial waste and changed the name of the company into KC Eco Cycle. It selects, and separates the domestic waste that can be recycled and then produces them into more than 20 types of recycling materials such as paper, can, and compressed PET.

Establishment of KC Green Energy, Acquisition of Eumseong Biochips and Seongju Biochips Large scale power plants in Korea have been in search of ways to reach the GHG reduction goals. KC EnviroServices has established KC Green Energy to make sewage sludge fuels which is a biofuel. Sewage sludge fules can be made by combining with wood flour. Then it has acquired Eumseong Biochips and Seongju Biochips to facilitate the steady supply of wood flour to KC Green Energy.

KC Cottrell's R&D projects in 2018

Project Name	Project Period						
	'14	'15	'16	'17	'18	'19	'20
Refinement of coal ash and stabilization of heavy metals of inorganic wastes for CO ₂ solidification technology commercialization							
Development of innovative technology for value-added chemical product using the captured CO ₂							
Development of PM, BC reduction technology for MW class marine engine							
Ultra fine particle control and FGD system stable operation by Wet ESP application at downstream of FGD absorber.							
Improvement of 10 MW-scale Dry-Sorbent CO ₂ Capture Technology and Development of 50 ton/day-scale CO ₂ Liquefaction Technology							

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R&D projects

KC Cottrell
Ultra fine particle control and FGD system stable operation by Wet ESP application at downstream of FGD absorber

KC Cottrell has participated in the project of researching the water film nozzle electrostatic precipitator that can not only remove PM2.5 but also prevent the sulfur mist discharged from the desulfurization facility from causing secondary pollution such as corrosion of facilities and ground pollution. This technology can increase the energy efficiency of the equipment and can be applied to various processes besides the desulfurization facility.

KC Glass & Materials

KC Glass & Materials' R&D Projects in 2018

Project Name	Project Period			
	'15	'16	'17	'18
Development of the oxide materials and components and application systems				
Metallic magnetic alloy materials with complex properties of high EMI shielding and high heat radiation				

R&D status in 2018



New patents			
Patent name	Right holder	Reg. date	Reg. no.
Sintered exhaust gas discharged nitrogen oxide remover and removal method	KC Cottrell	FEB-12-18	10-1830477-0000
Simultaneous exhaust gas discharged nitrogen oxide and sulfur oxide remover		JUL-30-18	10-1876413-0000
Container type coal ash carrier		SEP-06-18	10-1898224-0000
Exhaust gas treatment system for ships	KC Air Filtertech	SEP-18-18	10-1901572-0000
Cartridge filter media and its manufacturing method		APR-27-18	10-2017-0162827
Bag filter assembly for dust collector		NOV-23-18	10-2018-0146070
Method of improving desulfurization rate for dry-type desulfurization process	Nol-Tec Systems	NOV-23-18	10-2018-0146112
Conveying system for injecting material at a convey line pressure		OCT-02-18	US 10,086,993 B2
Dispensing assembly with continuous loss of weight feed control		DEC-11-18	US 10,151,621 B2
Medium wave infrared transmission BaO-GeO ₂ -Fe ₂ O ₃ -ZnO type glass and its manufacturing method	KC Glass & Materials	APR-19-18	10-2018-0045391
Molten metal treatment of ferrous copper		JUL-11-18	10-2018-0065338
Transmission controlled lithium alumino-silicate glass ceramics and its manufacturing method and hot plate manufactured using this method		OCT-15-18	10-1910242
EMI shielding ferrous copper rolled sheet and its manufacturing method	KC Solar Energy	OCT-16-18	10100382
Integral type of solar electric power plant that can maintain balance on the water		MAR-22-18	1543727

Improvement of 10 MW-scale Dry-Sorbent CO₂ Capture Technology and Development of 50 ton/day-scale CO₂ Liquefaction Technology

It has also joined the project of demonstrating the energy technology development business conducted by Korea Southern Power. The project, which began in October 2018 and is planned to be finished in December 2020, is about learning the technology of safely capturing and storing CO₂ created from coal-fired power plants and relevant industries. It is expected to be used as a low carbon technology to deal with climate change in the future.



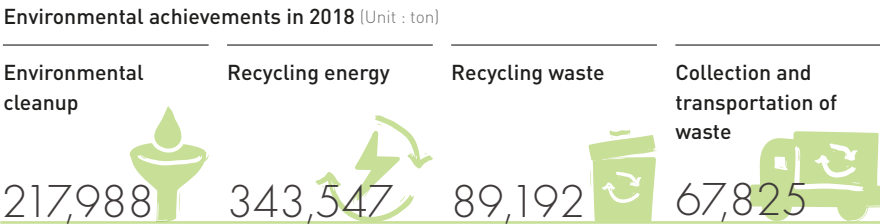
02 Environmental Soundness

MANAGEMENT APPROACH

KC Green Holdings and affiliates have a portfolio mostly based on the environmental business, but we also aim to manage and possibly reduce the environmental impacts resulting from operating business.

KEY FIGURES

Environmental impacts in 2018					
2018			Unit	2018	
Total weight of materials	Non-renewable raw material	8,213	ton	Renewable raw material rate	95.7%
	Renewable raw material	184,078	ton		
Total energy consumption	Fuel energy	305	TJ	Renewable energy use rate	0.5%
	Renewable energy	4	TJ		
	Electric energy	518	TJ		
Total weight of water withdrawn	Surface water	13,205	ton	Recycled water rate	21% (36,431 ton)
	Ground water	76,972	ton		
	Rainwater	25,463	ton		
	Water supply	58,244	ton		
GHG emissions	Direct GHG emissions	281,344	tCO ₂ eq	GHG emissions intensity ratio	2.63 tCO ₂ eq/M KRW
	Indirect GHG emissions	26,994	tCO ₂ eq		
Air pollutant discharge	NOx	183	ton	Water discharge	28,105 ton
	SOx	53	ton		
	VOCs	1	ton		
	PM	7	ton		
Water discharge		28,105	ton		
Water pollutant discharge	COD	81	mg/l	Collection and transportation of waste	67,825
	BOD	33	mg/l		
	T-N	50	mg/l		
	T-P	1	mg/l		
Waste discharge		60,214	ton		



*Environmental cleanup: Total amount of waste, waste oil, and wastewater treatment
*Recycling energy: Total amount of reused steam generated during incineration of waste
*Recycling waste: Total amount of recycled waste such as construction wastes, waste glass, and waste articles

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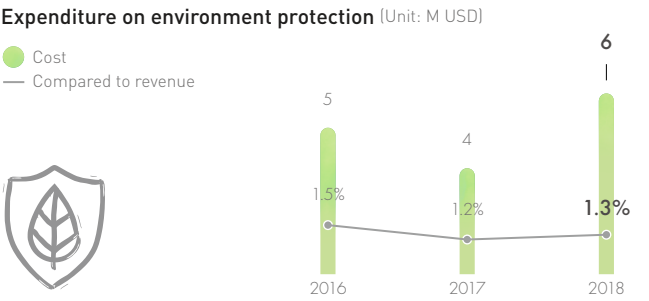
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Environmental management

KC Cottrell, Lodge Cottrell, KC EnviroServices, KC Eco Cycle, KC Enviro Construction, KC Glass & Materials, and Clestra Hauserman, have acquired ISO 14001 certification for the environmental business management and have been applying it to their projects. The expenditure on environment protection last year was about 6 M USD, which is 1.3% of the 2018 revenue.



Waste management

The amount of waste occurred from KC Green Holdings and affiliates in 2018 totaled 60,214 ton. 56,072 ton of total was cinder from the incineragion of waste conducted by KC EnviroServices and was buried since they can not be reused or recycled. But the remaining 2,353 ton was recycled. 1,727 ton incinerated, and 62 ton treated using other methods.

Compliance with environmental regulation

In 2018, KC EnviroServices paid about 360 dollars worth of penalty for the violation of the detailed standard of transporting hazardous waste. The company plans to conduct training programs on the regulations to prevent a recurrence. There were no other affiliates that paid a penalty for the violation of any environmental law and regulations or that received non-monetary punishment.

Minimization of environmental impact

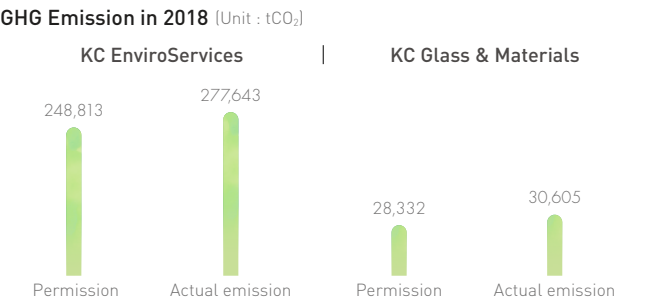
Category	Company	Activity details	Results
Recycling	KC Glass & Materials	Wood pellets for wrapping that are carried when stocking raw materials are recycled.	The purchasing cost of wood pellets saved by around 1,300 dollars
		The weight of the cullet which is used to make glass, is increased from 85.9% to 87%.	About 43,655 ton of waste glass recycled
Energy use reduction	KC Cottrell	KC Cottrell Anseong Plant uses the energy storage system (ESS) to reduce the use of electricity.	Use of electricity reduced by 15% year-on-year
	KC EnviroServices	Energy inefficient and aged equipment are replaced to reduce the use of energy.	Use of electricity reduced by 4% year-on-year
		High energy wastes are used as fuel to increase fuel efficiency.	Use of fuel reduced by 22% year-on-year
	KC Glass & Materials	Equipment operation during electric power peak hours is adjusted to reduce the use of energy.	792kw reduced year-on-year
		Waste heat from the melting furnace is reused to prevent the container from freezing.	Use of kerosene for heating saved by around 1 thousand dollars

An environmental assessment for suppliers

When Lodge Cottrell selects the new suppliers, suppliers have to go through tests to see if they satisfied the environmental standards. Five out of five new suppliers had been evaluated for environmental impact, and not one was considered to have an actual or potential negative impact on the environment.

Climate change response

KC EnviroServices and KC Glass & Materials have been managing the GHG emission according to the Framework Act on Low Carbon Green Growth. KC EnviroServices manages GHG not only caused by incineration but also occured from waste trucks and electric facilities in the work place. Meanwhile, KC Glass & Materials copes with GHG created from raw material solutions for making glasses as well as from electric facilities in the workplace. The GHG permission for KC EnviroServices and KC Glass & Materials based on the secondary planning of the GHG allocation in 2018 was 248,813tCO₂ and 28,332tCO₂ respectively, and the actual GHG emission was 277,643tCO₂ and 30,605tCO₂ each. For excess emission, the companies plan to use the emission trading system and to steadily reduce the amount of GHG to take measures against climate change.

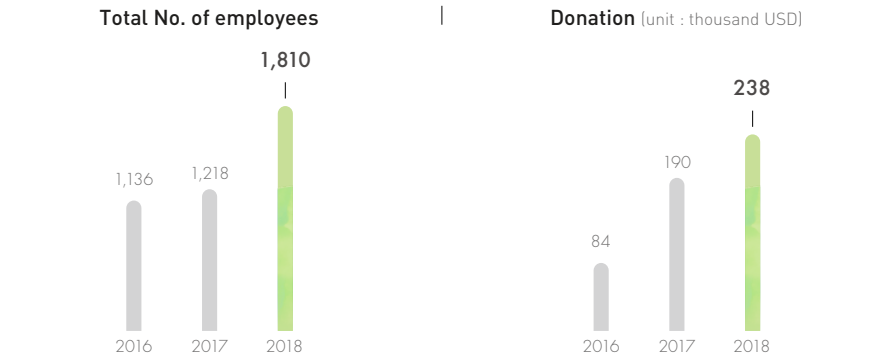


03 Social Responsibility

MANAGEMENT APPROACH

KC Green Holdings endeavors to create a working condition that satisfies the employees, who are the main agents of sustainable growth. We also plan to prepare various communication channels for feedback to have positive influences on our customers, partners, and local community.

KEY FIGURES



Employment in 2018

No. of employees	Female	293	
	Male	1,517	
New hiring	Female	40	
	Male	157	
Turnover/ retirement	Female	45	
	Male	211	
Parental leave	No. of workers approved of parental leave	Female	12
		Male	0
	No. of workers returned to work after parental leave	Female	7
		Male	0
No. of labor union members		216	

Average hours of training per employee in 2018

	Female	22 hours
	Male	29 hours

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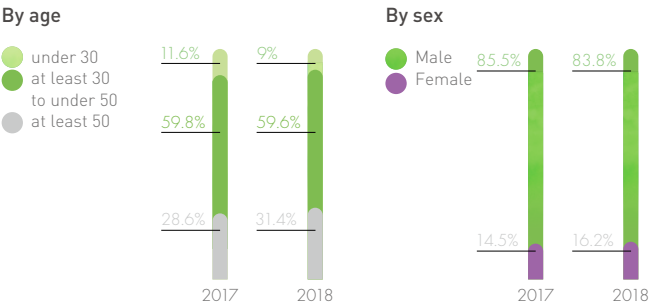
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Employment

KC Green Holdings and affiliates provide every applicant equal opportunity for employment regardless of their sex, age, and religion. As of the end of 2018, the manpower status showed that the number of employees in KC Green Holdings and affiliates totaled 1,810. The number was increased by 592 from 1,218 in 2017, which was due to new hiring as a result of the expansion of business and the addition of manpower after the acquisition of Clestra Hauserman SA last year. By sex, male employees account for 83.8% while female employees are 16.2%. By age, employees under 30 years account for 9%, employees in at least 30 years and under 50 years with 59.6%, and employees at least 50 years with 31.4%.

Manpower status in 2018 year-on-year



Parental leave

In 2018, the number of female employees who received approval of parental leave from KC Green Holdings and affiliates amounted to 12, and 7 employees returned from the leave, showing 100% return-to-work rate. However, there were no male employees who requested for parental leave last year.

Human rights and non-discrimination

KC Green Holdings prohibits any kind of unreasonable discrimination to employee, customer, and stakeholder and states that the human rights of all employees are respected by the code of ethics. Accordingly, there have been no cases of sexual harassment or discrimination from KC Green Holdings and the affiliates during the reporting period.

Ethical business management

KC Green Holdings has opened a training course for legal duty at KC Academy to have all employees complete the course. We also plan to include the code of ethics to the orientation program designed for new employees starting from 2019 so that they can be honest and genuine based on ethical responsibility as a member of the KC. There have been no cases of corruption, child labor and forced labor in KC Green Holdings and affiliates in 2018.

Working conditions

Make KC a better workplace KC Green Holdings and affiliates strive to improve the working conditions for our employees so that they can use the working hours more efficiently. Since January 2018, KC Green Holdings has been posting posters both online and offline every month to promote and improve the awareness of employees regarding the corporate culture.

Minimum wage KC Green Holdings and affiliates conform to the minimum wage system. We have adjusted the wage according to the minimum wage that has been raised in 2018, leaving no employees behind their salary.

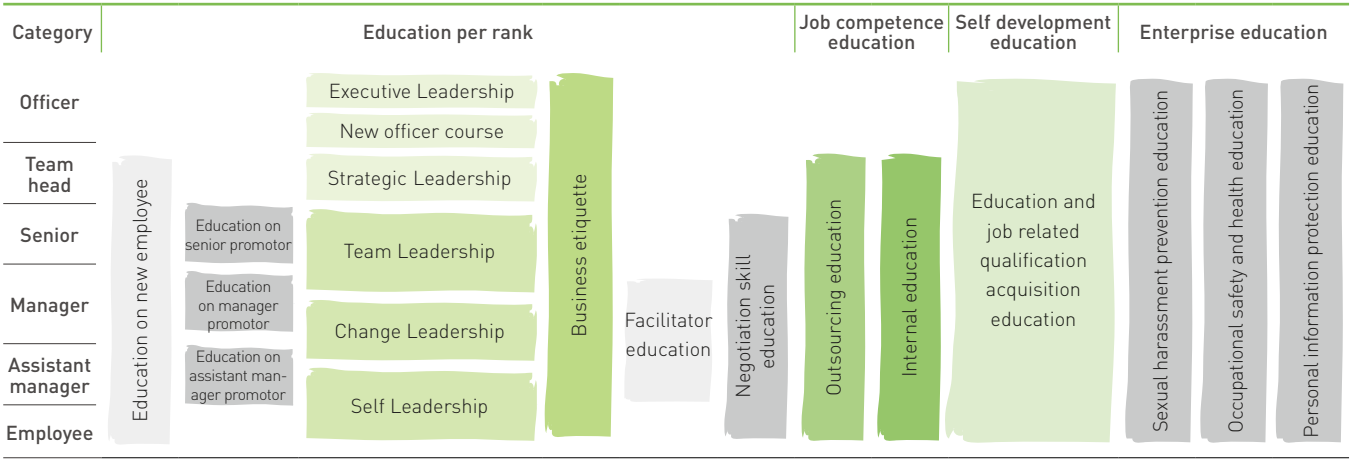
52-hour workweek policy The 52-hour workweek policy, of which bill passed in February 2018, has taken effect on industrial sites and public institutions with at least 300 employees since the first day of July. Neither KC Green Holdings nor any of affiliates in the report applied to this policy, but industrial sites with 50~299 employees that will be under the influence of the policy from January 2020 would include KC Cottrell, KC EnviroServices, KC Glass & Materials, and Clestra Hauserman. In particular, KC EnviroServices, where people work in three shifts, will primarily take measures to minimize the overtime by each division and then inquire plans to apply the four-team-three-shift system. KC Glass & Materials will also reach an agreement with the union in steps as a way of coping with the 52-hour workweek policy.

Training

KC Green Holdings and affiliates believe that the growth of employees is the foundation for becoming a sustainable company, thus we provide full support for our workers regarding self-development. In 2018, the average training hours per employee for both male and female employees in KC Green Holdings and affiliates were 29 hours and 22 hours, respectively.

KC Academy KC Green Holdings has established the “KC Academy,” a virtual in-house training institute, to provide an opportunity to take various and useful courses. The academy is available to every KC employee, and there are online training services as well to allow the workers to take the courses regardless of location. Online training programs will not only facilitate managers to keep track of individual training status and manage the training course for legal duty but is also expected to help employees access various content such as legal duty, liberal arts, and language wherever

KC training system



they are. Based on the KC training system, we keep sharing information, including promotion courses and job competency improvement courses through KC Academy.

KC executives workshop KC Green Holdings has been hosting workshops every April for the executives in domestic affiliates with positions of director and higher. Emerging companies or new executive members are introduced in the workshop to create a network and lectures based on the current state of affairs are provided to build leadership. In the 2018 workshop, which was held under the theme of “Sustainable Management of KC, ” there were lectures on how to be a long-living company, CSR that stressed the importance of risk management, and studying how people should work in the era of 4th industrial revolution were provided to help the company become sustainable, and 2017 performances and 2018 business plans were shared.

Support for a stable life after retirement KCSLS is a corporation established by retirees of KC Green Holdings and affiliates. Employees of KCSLS provide competitive management and engineering advisory services. The retirees-to-be in KC Green Holdings and affiliates are surveyed six months before their retirement on whether they would want to work at KCSLS. For those who do not want to work at the company, they are supported to practice self-development for lives after retirement. KC Green Holdings and 10 affiliates have adopted Defined Benefit Retirement Pension to guarantee the workers’ severance pay.

Employee health and safety

KC Green Holdings’ affiliates are exposed to many risks due

to the business characteristics of manufacturing and waste processing. In this regard, KC Green Holdings recognizes the safety and health of employees as the main risk and manages it at the enterprise.

Safety of workplace The safety of workplaces has been one of the major issues in Korea last year due to a fire breaking out and explosions in plants. KC Green Holdings and affiliates endeavor to share and improve the safety issues every quarter through the Safety and Health Committee to create a safer working environment.

Activities by Safety and Health Committee in 2018

Date	Main agenda
First-quarter (March 16, 18)	1. Expand the scope of Safety and Health Committee 2. Share accident cases in KC Cottrell 3. Review advance legislation of 2018 4. Support KC Cottrell run safety inspection
Second-quarter (July 11, 18)	1. Share performances in the second quarter 2. Provide major safety and health-related issues 3. Conduct training of industry safety and health rules
Fourth-quarter (November 30~ December 01, 18)	1. Announce safety and health plan results of each company and 2019 plans 2. Comment on health policy 3. Discuss means to revitalize the committee 4. Establish measures to inspect affiliates

Safety education 12 domestic affiliates of KC Green Holdings should be obliged to carry out occupational safety and health education. And employees have been taking education regularly, which includes supervisor and manager course, new employee course, and special safety and health course.

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Health improvement of employees KC Glass & Materials has installed soundproof booths in large worksites with big noises last year to protect the hearing of employees. The company has closed the smoking areas on the first day of February 2018 and transformed them into rest areas for workers. The entire industrial sites have become nonsmoking areas since March 1, 2018. The prohibition of smoking from the industrial sites was to create a clean working environment and to promote the health of our employees, and it is also expected to reduce the fire risk caused by smoking.



Safety and health evaluation Pungrim Jeon, an auditor of KC Cottrell in charge of safety and health audit in KC Green Holdings and affiliates, has been visiting every year to evaluate the safety and health activities of the previous year and to award the affiliates that received an excellent assessment. In 2018, Mr. Jeon evaluated the safety and health activities of 16 industrial sites of domestic and international affiliate from January 22 to April 4. KC Cottrell Anseong Plant and KC EnviroServices Yeosu Division and Jeonju Division won the grand prize for their excellent work, and KC Enviro Construction acquired an assessment of gradual improvement and received a special award.

Safety and health certification status

ISO 45001	1 company (Lodge Cottrell)
OHSAS 18001	3 companies (KC Cottrell, Changchun KC Envirotech, KC EnviroServices)
KOSHA 18001	5 companies (KC Cottrell, Yuyang Technologies, KC EnviroServices, KC Glass & Materials, Clestra Hauserman)
Risk certification	3 companies (KC Cottrell, KC Air Filtertech, KC EnviroServices)

Donation in 2018

 238 thousand dollars	Local community	Sponsoring local community events and donation events
	Social welfare	Sponsoring a charity event
	Education	Sponsoring children environmental organization and schools for the disabled
	Culture and sports	Sponsoring international sports festival and orchestra
	Environment preservation	Collecting cullet, sponsoring environmental organizations, and conducting nature conservation campaign

Job creation

With an awareness of youth unemployment as a social problem, KC Green Holdings has been hosting an annual internship program in the first half of year to provide young job seekers opportunities to have real experience at the workplace and to better understand the environmental business through assignments. In 2018, a total of five people took part in the program for seven weeks from January 8 to February 23.

Product responsibility

KC Green Holdings endeavors to carry out its responsibility to the fullest in every production process of products and services to meet the ISO9001 certification. In 2018, there has been no violation of any legal regulations and self-regulations with regard to product and service information.

13 companies that received ISO9001 certification

KC Cottrell, KC Air Filtertech, Yuyang Technologies, Changchun KC Envirotech, KC Cottrell India, Lodge Cottrell, NWL Pacific, KC Thermal, KC EnviroServices, KC Enviro Construction, KC Glass & Materials, Clestra Hauserman, KC Solar Energy

Mutual growth

KC Green Holdings and affiliates have been observing the Fair Trade Act and endeavoring to maintain a transparent and healthy relationship with partners. KC Glass & Materials believes that the very growth engine that propelled them to become a sustainable company was the cooperation with partners based on trust in each other, and thus has been hosting a mutual growth conference together with major partners at least once a year. In 2018, KC Glass & Materials and seven of its major partners held a conference in November to exchange domestic and international market analysis data and discuss means for mutual development. The company plans to establish various support programs for partners.

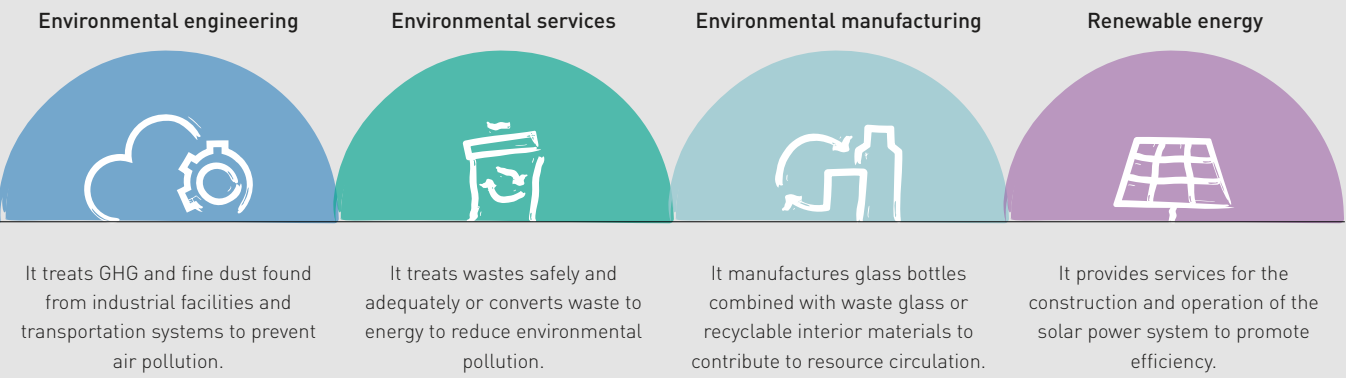
Consumer safety and health

KC EnviroServices has conducted TMS measurement, dioxin measurement, air pollutant self-measurement, water quality test, VOCs/odor check, ground pollution test, and surrounding environmental impact assessment, all of which were confirmed to meet the standard. KC Glass & Materials has been asked by the Korea Conformity Laboratories to evaluate of toxic substances such as lead and cadmium in glass bottles, and the results showed that no toxic substances were detected. Besides, there has been no violation of any legal regulations and self-regulation concerning the impact of products or services on the safety and health of consumers in 2018.

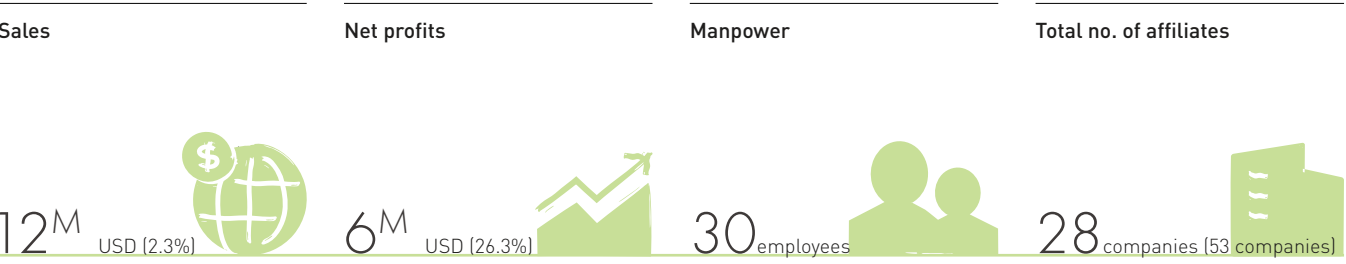
What we do

Holding Company

WHAT WE SOLVE
KC Green Holdings has converted to a holding company in 2010. We have prepared our business portfolio based on green environmental businesses, and we provide advisory services to our affiliates for efficient and professional business management of KC network.



KEY FIGURES



*The above sales includes the value of transactions between each affiliate
*The above affiliates only include domestic and international affiliates of KC Green Holdings and workplace specified in the 2018 sustainability report. The numbers inside the parenthesis include affiliates considered based on the equity method.

KC Green Holdings

KC Green Holdings consists of three teams: Finance Management team, Strategy & Management team, and Sustainable Management team. Each team exchanges information about the current state of affairs with the affiliates to promote the steady business management of the overall KC network.



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Environmental Engineering

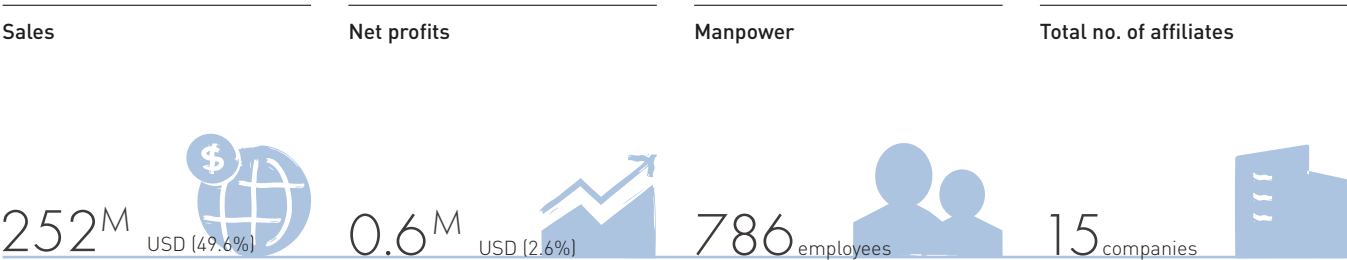
WHAT WE SOLVE

With KC Cottrell as a start since 1973, we have been expanding the environmental engineering market by establishing overseas corporations in China, U.K., U.S., Vietnam, and India.

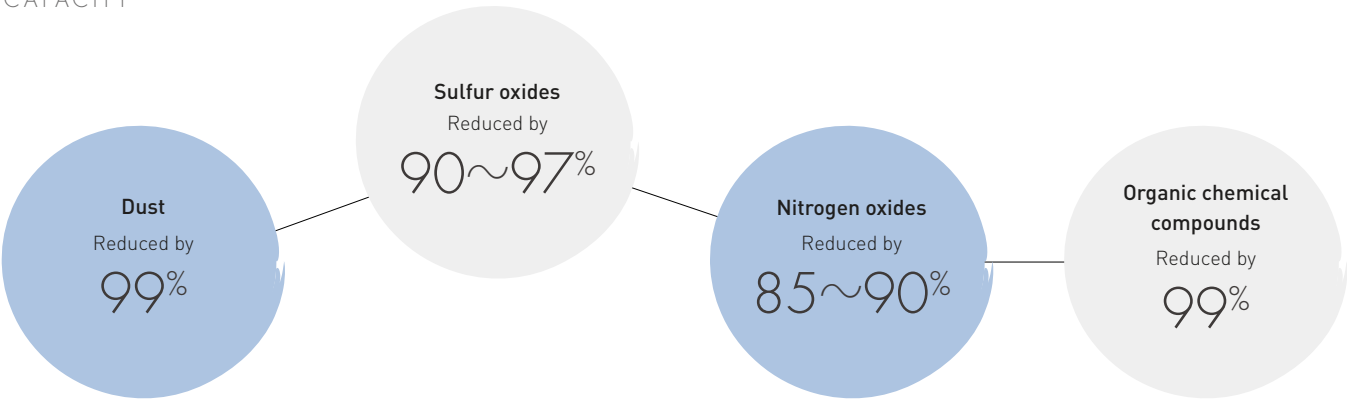
NWL Pacific, KC Thermal, and KC Envirotech E&C had been classified as companies engaging in the environmental manufacturing business due to the manufacturing of environmental industrial facilities, but they were judged to be more relevant to the environmental engineering business. They have been considered to be specializing in the environmental engineering business since 2018. In November 2018, KC Cottrell has established KCVCS, a company that produces the RTO system that reduces VOCs, and is growing to specialize in preventing air pollution.



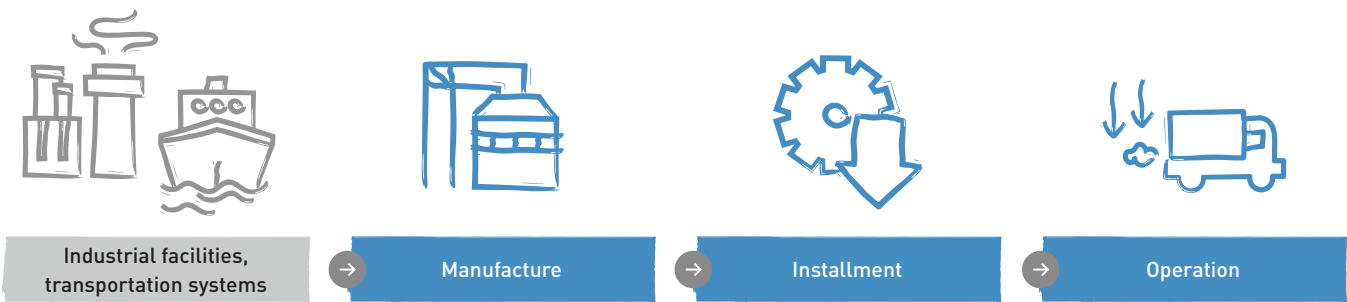
KEY FIGURES



CAPACITY



VALUE CHAIN



KC Green Holdings' Affiliates



KC Cottrell
CEO : Dongyoung Seo
Est. date : November 1973 (spin-off when holding company was founded on January 1, 2010)
Since founded as an air pollution control plant company in 1973, it provides optimal air pollution control facilities such as electrostatic precipitator, gas treatment facility that removes sulfur and nitrogen oxides, industrial heat exchanger, and pneumatic conveying system to different sites such as power plants, steelworks, tunnels, and ships.

Major subsidiaries : KC Cottrell Taiwan, KC Air Filter tech, Nol-Tec Korea, Yuyang Technologies, KCVCS



Changchun KC Envirotech
CEO : Hui Wang
Est. date : June 2002
Changchun KC Envirotech has delivered various products to China throughout the country such as electrostatic precipitator, bag filter, desulfurization facility, wastewater treatment equipment, and waste incinerator and has consolidated a position in China's air environmental market.



Lodge Cottrell
CEO : Kevin Bridgewater
Est. date : 1913 (equity acquisition in March 2005)
Lodge Cottrell has succeeded in commercializing the world's first electrostatic precipitator in 1913 and has maintained the reputation in the European air environmental market for more than 100 years. It has expanded its business areas to renewable energy system business such as biomass in line with the changing markets.



KC Cottrell Vietnam
CEO : Dongho Baek
Est. date : November 2008
It is the first environmental facility specialized company in Vietnam. It provides optimum air pollution control equipment for environmental protection of Vietnam, which has the potential for economic growth, and it provides installation and management services of waste treatment equipment.



KC Cottrell India
CEO : Deokyoung Han
Est. date: November 2008
It provides installation and management services of optimum air pollution control equipment, and It has opened an engineering center in April 2019 to upgrade our competitiveness by developing and training skilled manpower based on reasonable labor cost in the Indian market.



Nol-Tec Systems
CEO : Todd Larson
Est. date : 1983 (equity acquisition in August 2010)
It manufactures integral type equipment that transports, loads, and combines bulk materials using air.

Major subsidiaries : Nol-Tec Systems Shanghai



NWL Pacific
CEO : Hyeonsu Kim
Est. date : May 1998
It specializes in producing commutation type transformers, automatic control panels, and plasma power supply equipment, all of which are essential parts of the electrostatic precipitator.



KC Thermal
CEO : Seil Jang
Est. date: December 2003
KC Thermal supplies air-cooled type heat exchanger and various kinds of industrial equipment to be used to improve the efficiency of oil refining/petrochemical plants and energy-based devices such as the generating units.



KC Envirotech E&C (Fushun)
CEO : Yun Lun Jie
Est. date : June 2005
Established to secure a hub to advance into Chinese and global environmental market, KC Envirotech E&C (Fushun) produces and supplies the optimal air pollution prevention facilities and various kinds of the industrial structure at a reasonable price.

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Environmental Service

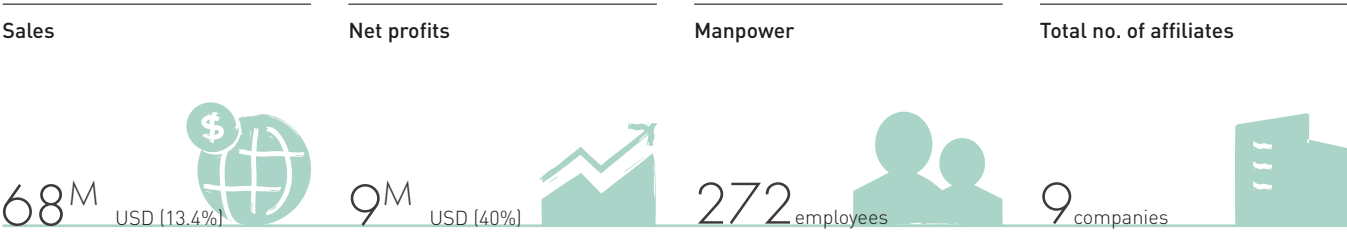
WHAT WE SOLVE

In 2000, KC EnviroServices was established to collect general waste and specified waste found from industrial facilities and to treat them by properties, launching environmental service business. Afterward, the company has taken over waste incineration companies in Changwon and Jeonju and has grown to consolidate its position in the domestic waste treatment market. Other than the intermediate treatment business, the range of business has been expanded as well to include landfill of waste and recycling waste into fuel energy.

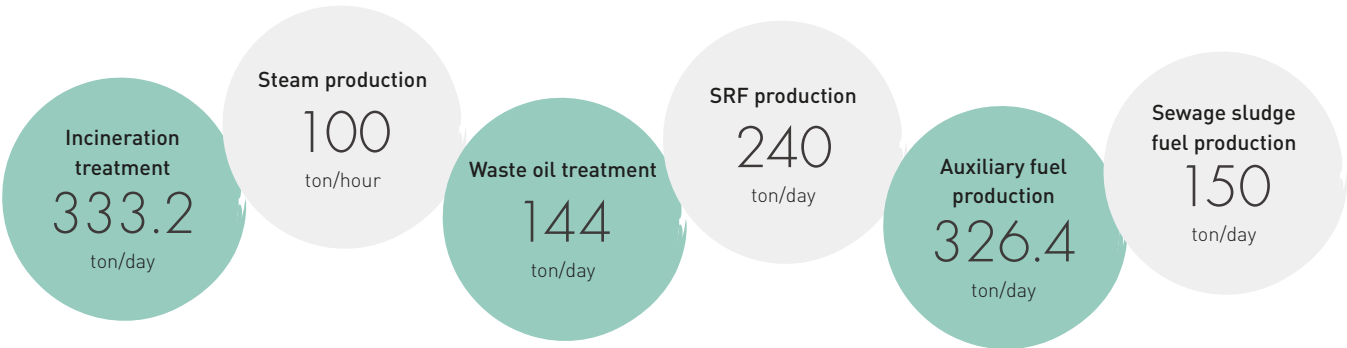
The new environmental service business consists of three categories: Waste to Energy where wastes are used as energy, Waste to Resource where wastes are manufactured and sold as raw materials, and Waste Management where the remaining wastes are buried, collected, and transported to be treated. In 2018, we have started on business that recycles coal ashes discharged from coal-fired power plants, that converts sewage sludge into fuel, and that reuses waste synthetic resin as higher value-added fuel and has become a company specializing in different waste treatment business.



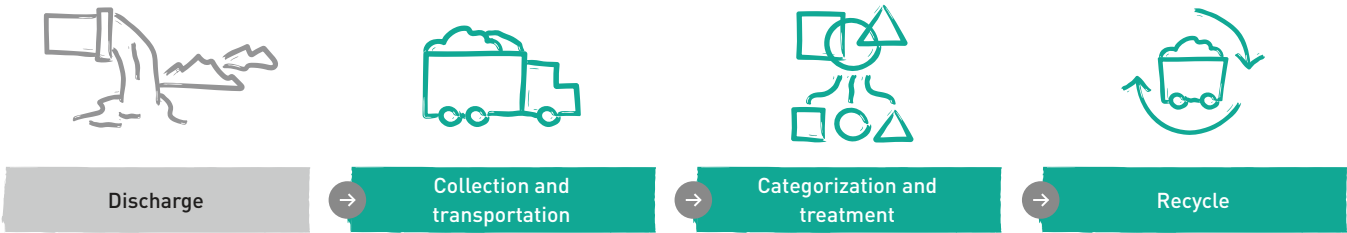
KEY FIGURES



CAPACITY



SUPPLY CHAIN



KC EnviroServices
CEO : Gangwook Lee
Est. date : June 2000
KC EnviroServices, having divisions in Yeosu, Changwon, and Jeonju, produces steam energy through the intermediate treatment of various general or specified waste found from industrial sites and recycles waste into fuel.

Major subsidiaries : KC Landfill Service, KC Eco Cycle, Eumseong Biochips, Seongju Biochips, KC Green Energy



KC Enviro Construction
CEO : Subaek Chae
Est. date : November 1996 (equity acquisition in October 2007)
It recycles construction waste through waste treatment facilities applied to new technology.



KC Eco Logistics
CEO : Junki Kang
Est. date : October 2015
It has started the waste recycling business to manufacture auxiliary fuel for the cement kilns by collecting waste and delivering them to treatment companies by properties.



KC Green Materials
CEO : Kisuh Park
Est. date : April 2009
It recycles the coal ashes generated from power plants into concrete admixture and cement admixture through hydration and refining processes.

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Environmental Manufacturing

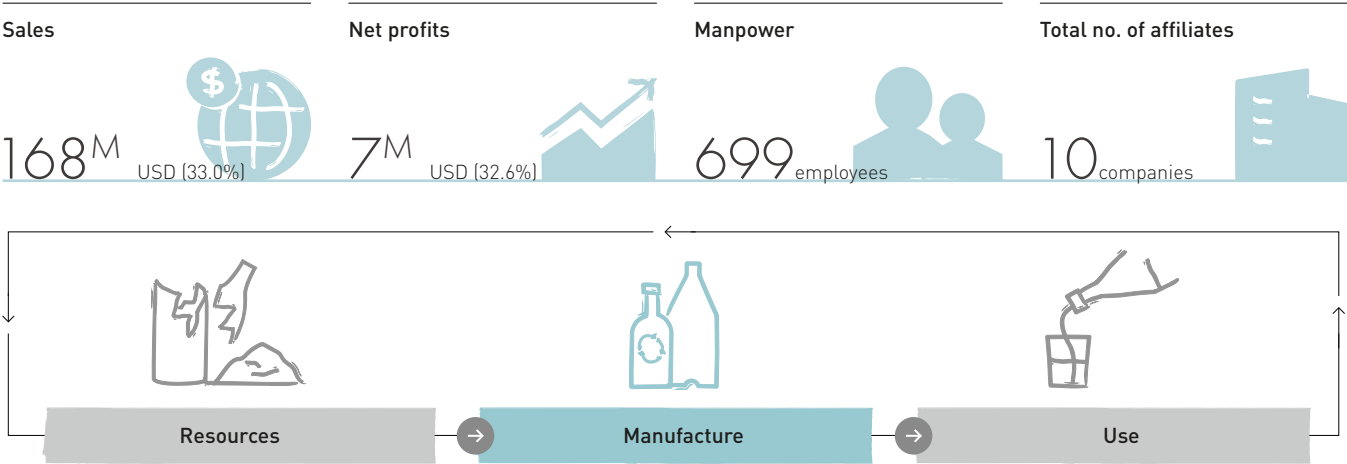
WHAT WE SOLVE

In 1997, KC Green Holdings has challenged to environmental manufacturing business by taking over Clestra Hauserman, a company that designs and manufactures monobloc office partitions and ceiling materials. Then we have taken over KC Glass & Materials, a company that produces glass bottles by combining with waste glasses, to contribute to the circular economy.

In 2018, we have acquired Clestra Hauserman SA (head office of Clestra Hauserman in France), a company that specializes in comprehensive office interior design and clean room, to expand our market position in Europe.



KEY FIGURES



KC Glass & Materials
CEO : Jeongwan Kim
Est. date : June 1971 [equity acquisition in September 2007]
KC Glass & Materials produces glass vessels mixed with waste glass by 80~90% and Glass Frits that offers light weight, high solidity, and excellent heat and chemical resistance. Recently, it has developed ferrous copper that includes 5% of iron and are searching for ways to use it as EMI shielding and thermal interface material.



Clestra Hauserman SA
CEO : Vincent Paul Petit
Est. date : 1913 [equity acquisition in January 2018]
Clestra Hauserman SA creates space according to the demand and situation of customers and produces and provides interior design assembly products with environment-friendly materials for the health of customers and the global environment.

Plants: Illkirch in France, Gumi in Korea, and Taicang in China
Major subsidiaries : Clestra Hauserman, Clestra Hauserman HongKong, Clestra K.K, Clestra Hauserman (Taicang) Architecture Product, Clestra International, Mecanalu, Clestra USA, Clestra Hauserman Overseas Contracting

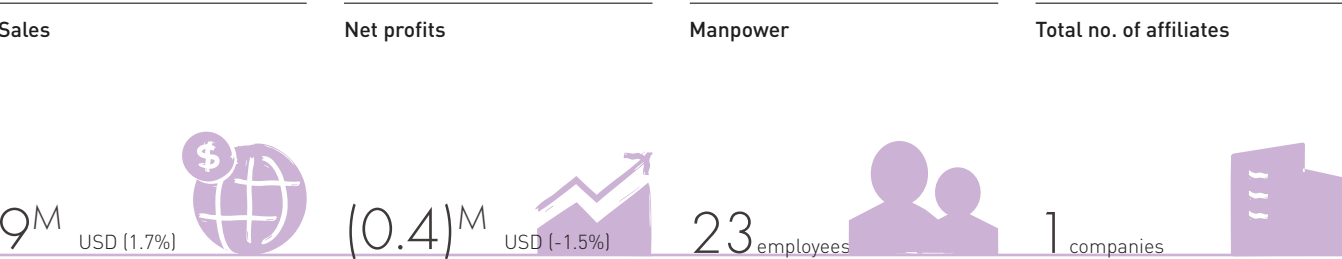
Renewable Energy

WHAT WE SOLVE

KC Solar Energy constructs ESS and a solar power system that fits into various spaces besides rooftops of buildings such as ruined salt fields, parking lots, and on the water. It also provides operation and maintenance services to preserve the system's function and to improve its efficiency.



KEY FIGURES



SUPPLY CHAIN



KC Solar Energy
CEO : Jongkyoo Kim
Est. date: November 2005
It constructs power generation systems from a small generation system for housing to MW (megawatt) level commercial generation system and carries out consignment operation and management of the complete solar power plants.

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Financial Information

Independent Auditors’ Report

English Translation of a Report Originally Issued in Korean

To the Shareholders and the Board of Directors of
KC Green Holdings Co., Ltd:

We have audited the accompanying consolidated financial statements of KC Green Holdings Co., Ltd. and subsidiaries (the “Group”). The financial statements consist of the consolidated statements of financial position as of December 31, 2018 and 2017, and the related consolidated statements of comprehensive income, consolidated statements of changes in shareholders’ equity and consolidated statements of cash flows, all expressed in Korean won, for the years ended December 31, 2018 and 2017. And it consists of the summary description and other information about the significant accounting policies.

Management’s Responsibility for the Financial Statements

The Group’s management is responsible for the preparation and fair presentation of the consolidated financial statements and responsible for internal control relevant to the preparation of the consolidated financial statements that are free from material misstatement, whether due to fraud or error

Auditor’s Responsibility

Our responsibility is to express an opinion on these consolidated financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the Republic of Korea. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the consolidated financial statements. The procedures selected depend on the auditor’s judgement, including the assessment of the risks of material misstatement of the consolidated financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control

relevant to the entity’s preparation and fair presentation of the consolidated financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity’s internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Audit Opinion

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the consolidated financial position of KC Green Holdings Co., Ltd. and subsidiaries, as of December 31, 2018 and 2017, and the results of its operations and its cash flows for the year ended in accordance with Korean International Financial Reporting Standards (“K-IFRS”).

Charm Academy Capital

March 20, 2019

Notice to Readers

This report is effective as of the auditors’ report date. Certain subsequent events or circumstances may have occurred between the auditors’ report date and the time the auditors’ report is read. Such events or circumstances could significantly affect the accompanying consolidated financial statements and may result in modifications to the auditors’ report.

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Consolidated Statement of Financial Position

FY 2018 12/31/2018 Current
FY 2017 12/31/2017 Current
FY 2016 12/31/2016 Current
(Unit : KRW)

	FY 2018	FY 2017	FY 2016
Assets			
Non-current assets	329,007,341,004	293,034,850,291	294,504,217,721
Property, plant and equipment	192,693,859,489	168,409,800,800	179,466,552,879
Investment property	11,988,801,780	12,082,777,308	12,176,752,837
Long-term trade receivables, gross	20,464,257,878	16,487,803,901	13,168,656,965
Investments for related company	16,798,582,682	27,399,977,709	26,304,573,215
Goodwill, gross	42,809,776,726	34,458,998,598	34,182,948,415
Intangible assets other than goodwill	11,842,357,793	4,668,065,763	4,219,968,373
Deferred tax assets	1,917,112,331	1,386,004,210	5,217,684,745
Other non-current financial assets	26,851,391,105	24,143,079,442	16,819,578,114
Other non-current non-financial assets	3,641,201,220	3,998,342,560	2,947,502,178
Current assets	341,833,125,895	226,898,804,433	168,246,790,048
Inventories	30,367,550,428	14,365,734,784	6,410,010,406
Short-term trade Receivable	124,527,299,538	75,479,385,391	61,639,350,456
Due from customers for contract work	46,605,161,149	45,768,606,726	42,393,074,781
Other current receivables	58,455,921,844	22,711,089,848	16,937,699,307
Current derivative asset	0	855,779,168	0
Current tax assets	3,996,665,788	722,941,032	597,559,943
Other current financial assets	6,769,844,616	6,584,059,268	4,158,437,988
Cash and cash equivalents	71,110,682,532	60,411,208,216	36,110,657,167
Total assets	670,840,466,899	519,933,654,724	462,751,007,769
Equity			
Equity attributable to owners of parent	174,837,713,218	162,117,297,819	158,042,571,097
Issued capital	11,217,490,000	11,217,490,000	11,217,490,000
Elements of other stockholder's equity	48,567,164,006	46,116,079,313	44,981,617,421
Other Reserves	8,367,867,482	7,076,627,535	7,560,539,925
Retained earnings	106,685,191,730	97,707,100,971	94,282,923,751
Non-controlling interests	111,889,873,534	86,047,324,124	50,276,820,454
Total equity	286,727,586,752	248,164,621,943	208,319,391,551

	FY 2018	FY 2017	FY 2016
Liabilities			
Non-current liabilities	108,444,733,881	92,498,073,477	102,322,711,952
Other non-current provisions	20,241,631,411	21,404,836,121	23,962,948,835
Long-Term trade Payables, gross	10,089,664,819	6,807,006,494	6,459,039,574
Long-term borrowings, gross	49,378,326,556	41,444,984,776	51,669,548,059
Convertible bonds	0	0	2,143,381,730
Post-employment benefit obligations	13,067,830,288	6,455,635,163	9,792,302,290
Non-current derivative liabilities	6,805,707,022	6,805,707,022	96,728,877
Deferred tax liabilities	0	0	0
Other non-current financial liabilities	8,861,573,785	9,579,903,901	8,198,762,587
Current liabilities	275,668,146,266	179,270,959,304	152,108,904,266
Other current provisions	0	119,103,923	133,229,754
Short-term borrowings	44,962,050,847	25,196,545,858	28,885,246,113
Trade payables	78,820,017,428	61,688,198,806	59,487,844,214
Current portion of convertible bonds	0	2,216,462,309	0
Other current liabilities	66,563,334,284	29,209,516,947	20,053,079,260
Advance from customers	66,749,613,029	46,805,787,244	28,318,075,504
Current tax liabilities	4,678,098,032	3,859,016,422	2,894,751,252
Current derivative liabilities	55,882,802	0	3,862,888,189
Current portion of long-term borrowings	13,149,334,684	9,991,504,972	8,466,789,980
Other current financial liabilities	688,281,459	0	0
Other current non-financial liabilities	1,533,701	184,822,823	7,000,000
Total liabilities	384,112,880,147	271,769,032,781	254,431,616,218
Total equity and liabilities	670,840,466,899	519,933,654,724	462,751,007,769

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Consolidated Statement of Comprehensive Income

FY 2018 From 01/01/2018 To 12/31/2018
FY 2017 From 01/01/2017 To 12/31/2017
FY 2016 From 01/01/2016 To 12/31/2016
(Unit : KRW)

	FY 2018	FY 2017	FY 2016
Revenue	534,720,764,469	352,407,286,959	391,371,451,730
Sales	527,973,685,623	343,692,574,895	384,458,617,331
Revenue from valuation of associates	1,144,092,416	3,976,323,435	1,503,874,015
Revenue from rendering of services rental	5,602,986,430	4,738,388,629	5,408,960,384
Operating expense	521,444,779,348	332,657,781,714	365,499,473,346
Cost of sales	422,286,848,182	282,960,936,629	318,312,477,460
Loss from valuation of associates	7,178,249,307	2,067,246,101	1,688,001,050
Selling general administrative expenses	91,979,681,859	47,629,598,984	45,498,994,836
Operating income (loss)	13,275,985,121	19,749,505,245	25,871,978,384
Other gains	23,859,703,655	14,168,981,472	7,417,301,749
Other losses	12,852,725,196	14,073,663,057	13,228,319,206
Finance income	1,760,276,380	1,189,023,796	864,808,564
Finance costs	3,615,604,567	3,419,974,145	3,734,529,518
Profit (loss) before tax	22,427,635,393	17,613,873,311	17,191,239,973
Income tax expense	3,657,873,832	8,252,090,554	10,453,493,413
Profit (loss)	18,769,761,561	9,361,782,757	6,737,746,560
Other comprehensive income	758,046,360	803,293,189	2,228,675,147
Other comprehensive income that will not be reclassified to profit or loss, net of tax	(1,073,969,670)	1,585,427,129	862,370,062
Other comprehensive income, net of tax, gains (losses) on remeasurements of defined benefit plans	(1,070,725,446)	1,570,511,568	887,581,035
Profit and loss on valuation of available-for-sale financial assets	(3,244,224)	14,915,561	(25,210,973)
Other comprehensive income that will be reclassified to profit or loss, net of tax	1,832,016,030	(782,133,940)	1,366,305,085
Gains (losses) on exchange differences on translation, net of tax	825,995,016	(374,070,460)	1,402,206,851
Share of other comprehensive income of associates and joint ventures accounted for using equity method that will be reclassified to profit or loss, net of tax	1,006,021,014	(408,063,480)	(41,304,665)
Profit and loss on the interest rate swap	0	0	5,402,899
Total comprehensive income	19,527,807,921	10,165,075,946	8,966,421,707
Profit (loss), attributable to			
Profit (loss), attributable to owners of parent	12,810,724,235	5,132,259,374	4,669,664,309

	FY 2018	FY 2017	FY 2016
Profit (loss), attributable to non-controlling interests	5,959,037,326	4,229,523,383	2,068,082,251
Comprehensive income attributable to			
Comprehensive income, attributable to owners of parent	11,617,535,736	6,484,137,690	6,165,183,563
Comprehensive income, attributable to non-controlling interests	7,910,272,185	3,680,938,256	2,801,238,144
Earnings per share			
Basic earnings (loss) per share	579	232	211
Diluted earnings (loss) per share	579	232	211

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External Assurance Statement

The Business Institute for Sustainable Development (“BISD”), led by the Korea Chamber of Commerce and Industry, was requested by KC Green Holdings to serve as an independent “Third party assurance institute” for the KC Green Holdings 2019 Sustainability Report (“Report”) and submits the assurance statement as follows:

Responsibilities and Independence

The Report contains matters on KC Green Holdings’ sustainable management efforts, achievements and future plans in 2018. All responsibility regarding the preparation of the Report lies with KC Green Holdings.

In conducting assurance procedures on the Report and providing assurance opinions to the board of directors, BISD has no management-related interests in profits with KC Green Holdings, aside from carrying out third-party assurance, in order to maintain independence and autonomy.

Assurance Standards and Limitations

BISD performed a Type 1, Moderate Level assurance in accordance with the AA1000AS (2008) and verified if three accountability principles (inclusivity, materiality, and responsiveness) of the AA1000APS were applied. In addition, BISD verified if the Report complied with the Global Reporting Initiative (GRI) Standards.

The scope of the assurance engagement was limited to only those performances stated in the Report and excludes data from previous years and data reported online. Physical inspection was conducted at KC Green Holdings located in Seoul, Korea.

Major Assurance Procedures

Major assurance procedures undertaken are as follows:

- Review of compliance with the GRI Standards Core option
- Review of rationality of the materiality assessment process and core issues
- Review of data management and reporting process through interviews
- Review of basis of core data through field inspection

Assurance Opinions

BISD performed the assurance engagement in accordance with Major Assurance Procedures and confirmed that the Report was written in accordance with the GRI Standards Core option.

The opinions of the Report on the application of the AA1000APS principles are as follows:

Inclusivity: Does KC Green Holdings adhere to the principle of stakeholder engagement in order to ensure a responsible and strategic response in promoting sustainability management?

- KC Green Holdings gathered major concerns and opinions from core stakeholders, including its customers, employees, local communities, partners, shareholders and investors, and government.
- BISD is not aware of any significant stakeholder groups that were omitted from the KC Green Holdings’ stakeholder communication channels.

Materiality: Does KC Green Holdings include material issues that affect stakeholders in the entire spectrum of sustainability management?

- KC Green Holdings identified core issues through the materiality assessment.
- BISD is not aware of any significant issues that were omitted from the process of materiality assessment by KC Green Holdings.

Responsiveness: Does KC Green Holdings respond appropriately to stakeholder issues?

- KC Green Holdings has acknowledged the impact of its business activities on stakeholders, responded properly with coherent actions, and presented relevant performances in the Report.
- BISD confirmed that KC Green Holdings responded properly to stakeholders’ needs and interests on core issues.

Recommendations

BISD makes the following recommendations for future Reports and improvement of sustainability level:

- KC Green Holdings succeeded in business expansion by discovering new projects and diversifying business areas. Accordingly, the domestic and international stakeholders of KC Green Holdings were also increased. BISD hopes that KC Green Holdings understands the group of stakeholders by affiliates and actively engage in communication with them regarding material issues.
- KC Green Holdings is a company specializing in environmental businesses that is contributing to improve the global sustainability by coping with various environmental issues such as fine dust and circular economy. BISD hopes that KC Green Holdings conducts quantitative analysis on social and environmental values created through business in order to evaluate their performance and to establish long-term sustainable goals.
- Pre-emptive risk management has grown to prominence due to rapid change in business environment worldwide with regard to economy, society, and environment. BISD recommends KC Green Holdings to be aware of financial and non-financial risk factors through systematic risk management and to construct plans to respond to them throughout the enterprise.

June 2019



President **Kyungsang Lee**



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Membership of Associations

KC Green Holdings	Korea Listed Companies Association, Korea International Trade Association, Korea Association for Chief Financial Officers, Korea Chamber of Commerce and Industry
KC Cottrell	Korea Chamber of Commerce and Industry, Korea Environmental Preservation Association, Korea Electric Power Corporation, Korea Environmental Industry Association, Doosan Heavy Industry Cooperative Association, Korea Association of Machinery Industry, Korea Construction Engineers Association, Korea Chamber of Commerce and Industry The Business Institute for Sustainable Development, Korea Association for Chief Financial Officers, Construction Association of Korea, Korea Electrical Contractors Association, Korea Electric Association, Federation of Middle Market Enterprise of Korea, Korea Council on Latin America & the Caribbean, Korea International Trade Association, Korea Engineers Alliance, Machinery Financial Cooperative, Korea Fire Facility Association, Korean Federation of Science and Technology Societies
KC Air Filtertech	Korea Industrial Technology Association
Yuyang Technologies	Korea Construction Equipment Association, Korea Gas Inspection Association, Korea Mech. Const. Contractors Association, Korea Engineering and Consulting Association, Shingyeum Industrial Complex Association, POSCO Outsourcing Partner Association
Lodge Cottrell	Sustainability West Midlands
Nol-Tec Systems	Worldwide Pollution Control Association
NWL Pacific	Korea International Trade Association, Electricity Construction Association, Korea Fire Safety Institute
KC Thermal	Machinery Financial Cooperative
KC EnviroServices	Yeosu Industrial Complex Environmental Association, Korea Resource Recycling Energy Mutual Aid, Korea Council of Medium Industry, Korea Specialty Contractor Financial Cooperative, Korea Construction Association, Jeonbuk Environmental Conservation Association, Jeonbuk Environmental Technology Association, Jeonju Corporate Environment Association, Korea Resource Recycling Energy Mutual Aid, Korea Electric Engineers Association, Korea Energy Technology Association, Jeonju Chamber of Commerce and Industry, Jeonju Wanju Fire Safety Association, Jeonju Industrial Complex Health and Safety Administrator, Korea Industrial Water Treatment Association, Masan Free Trade Association, Changwon Chamber of Commerce and Industry, Gyeongnam Environmental Technology Association, Korea Fire Safety Institute, Gyeongnam Opera Association, Gyeongnam Community Chest of Contributions, Social Welfare Collective Campaign
KC Enviro Construction	Korea Construction Resource Association, Korea Mutual Aid Association for Construction Waste Treatment
KC Eco Logistics	Gyeonggi Province Freight Transport Association
KC Glass & Materials	Chungnam Bukbu Chamber of Commerce and Industry, Korean Red Cross, Korea International Trade Association, Korea Industrial Safety Association, Korea Environmental Preservation Association, Korea Fire Safety Institute, Korea Electric Engineers Association, Korea Auto Bottle Making Association, Korea Industrial Technology Association, Korea Institute of Ceramic Engineering and Technology, Korea Core Industrial Technology Investment Association
Clestra Hauserman	Korea Chamber of Commerce and Industry, Korea International Trade Association, Korea Specialty Contractors Association, Korea Specialty Contractor Financial Cooperative
KC Solar Energy	Korea Photovoltaic Industry Association, Renewable Energy Association, Electricity Construction Association, Overseas Construction Association

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