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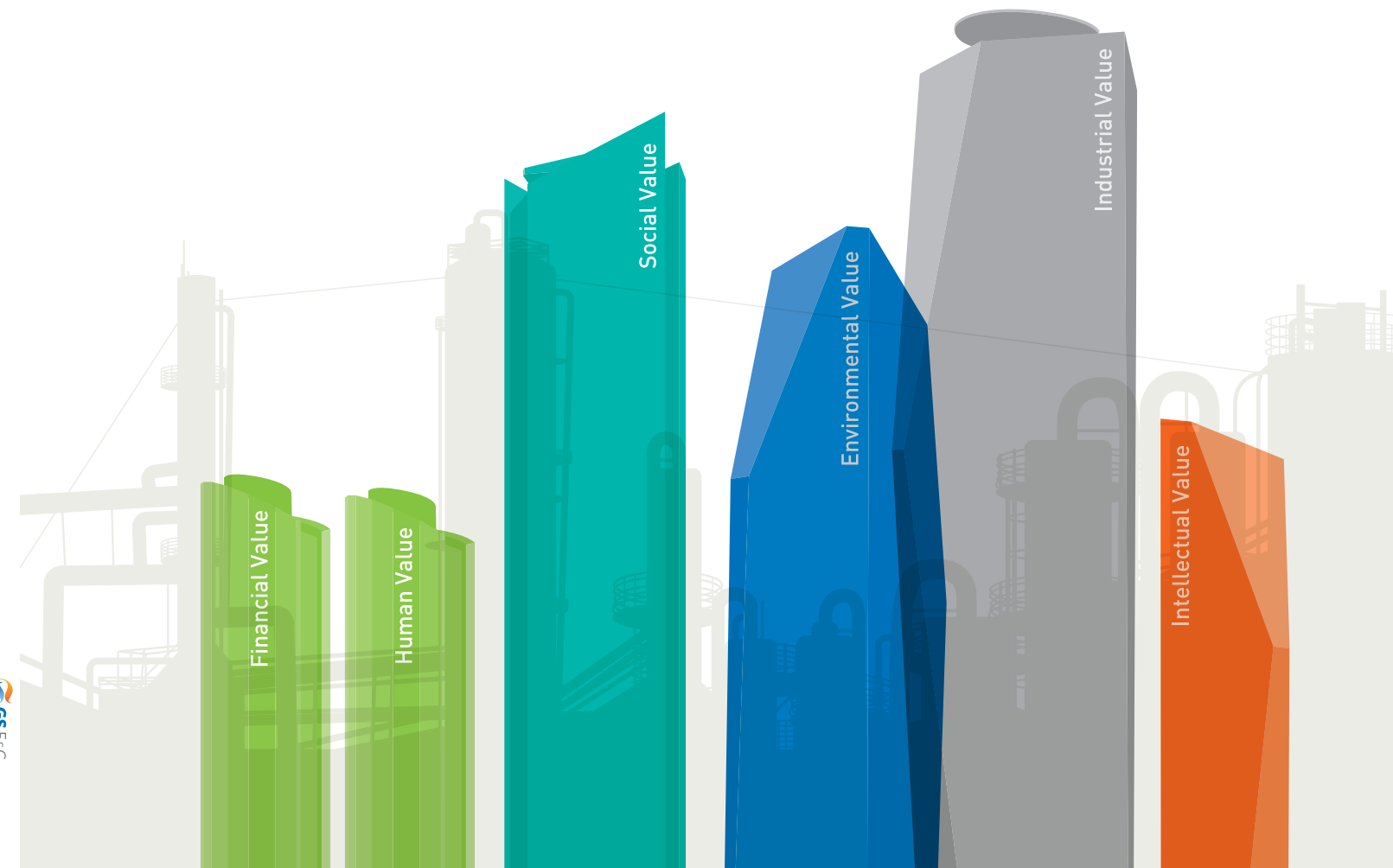


GS E&C Integrated Report 2018  
**HOW WE CREATE VALUE**



# HOW WE CREATE VALUE

GS E&C Integrated Report 2018



## GS E&C, Values Grounded on Sound Fundamentals

How we create value

With the business philosophy "Dreaming about Tomorrow with Clients, Creating New Values for Them," GS E&C is creating values that can be shared amongst our stakeholders and society.

### ABOUT THIS REPORT

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This is the eighth integrated report published by GS E&C.

GS E&C is rooted in the belief that values for our society and environment should be pursued in conjunction with business activities with stable and robust financial outcomes. Our responsibilities as an E&C (engineering and construction) company and commitment to sustainability management are carried out through our company-wide VISION 2020 GOAL, "Sustainable Global Company."

GS E&C publishes an integrated report every year to disclose financial and non-financial information to the stakeholders with transparency. This report covers the sustainability performance of all business sites, in Korea and abroad, as well as the major parts of the supply chain. The reporting period is from January 1st to December 31st, 2018; significant previous performance as well as action plans for 2019 have been included as needed.

We have based the financial performance information of this report on K-IFRS (Korean version of the International Financial Reporting Standards). In an effort to enhance the integrity of this report, non-financial information relevant to social responsibility has been jointly reported with our data and evaluation results for the Dow Jones Sustainability Index (DJSI). The reporting standards are based on the GRI (Global Reporting Initiative) Standards Guidelines Core Option, and no modifications have been made from the time of the previous report. The information in this document has been verified for reliability by THE CSR, a professional organization specialized in sustainability management.

For any questions about this report, please contact the Planning & Analysis Team.



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Dear Stakeholders,

I would like to extend my most sincere gratitude for your unwavering support and encouragement to GS E&C.

In spite of unfavorable business circumstances this past year, we at GS E&C remained grounded in the ethical management we are characterized by and remained grounded on our principles, resulting in the company reaching the highest ever financial performance since its founding. Abroad, we completed a majority of ongoing projects which contributed to achieving a successful turnaround, and domestically, we demonstrated remarkable results on the back of our brand power of "Xi."

At the moment, GS E&C is seeking strategic changes, such as the cultivation of mid- to long-term growth engines by identifying a variety of new businesses, while continuing to maintain a competitive edge by strengthening current businesses. Based on our accumulated experiences and lessons learned, we seek to enhance our competitiveness by enhancing our operational capabilities across to a global level.

In addition, we are making efforts to get a foothold in emerging markets by making bold investments and securing professional talents, while integrating smart technology in the products that we offer. In the mid- to long-term, we plan to explore new business opportunities and lay the foundation that will enable us to make another leap forward through efforts that fulfill the company's visions.

Beyond our financial business achievements, GS E&C pursues corporate sustainability through environmental and social performance. To achieve our goal to reduce greenhouse gas emission by 7.1% by 2020, GS E&C implements three strategic directions –the establishment of eco-friendly business sites, the enhancement of environmental management system and the reduction of greenhouse gas and energy consumption –in accordance with nine specific strategic tasks and develops eco-friendly technology that minimize environmental impacts generated on site, such as fine dust and waste.

Furthermore, GS E&C is committed to fulfilling our corporate social responsibilities and sharing sustainable values with our diverse stakeholders, including shareholders, customers, partners, and local communities. In particular, we highlighted safety as a core value, focusing on creating a safe work environment for our employees. GS E&C also ensured shared growth with our partners by providing various capacity building programs and financial support such as management grants.

Our goal is to contribute to the development of our society by creating shared value that benefits everyone from the perspective of sustainability management. As a global leader in sustainability management, GS E&C has been admitted in the Dow Jones Sustainability Asia Pacific Index for nine consecutive years. At GS E&C, we refuse to rest on our achievements and stay committed to each of our roles, with aims to create value that we can share with all members of society.

Thank you.

June 2019  
GS E&C  
President & CEO  
Byeong-yong Lim



# Sustainability Strategy

As a global company, the fundamentals of GS E&C's management philosophy and core value system are founded on the strong commitment to achieve sustainable development through social responsibility. GS E&C pursues a sustainability management strategy to become a company that provides the best value to not only our customers, but all of our stakeholders. As part of our efforts to become a "Sustainable Global Company," we have established a corporate vision and integrated management of the economic, environmental and social value categories created by our entire business process in accordance with our strategy system.

## Strategy



## Milestones

**01 Business Ethics**  
**DJSI Asia Pacific 9th Consecutive Admittance**



**02 Innovative Safety**



**03 Record-Breaking Financial Growth**  
**Operating Profits Surpass KRW 1 Trillion**



• Singapore project site where GS E&C ventured with partners



• Xi CEO Forum



**04 Shared Growth**

**05 Green Technology**  
**Joint Development of Sys Clean, Air Purification System**

• Sys Clean, air purification technology





# Sustainable Value Creation Process

## E&C Industry Value Creation Background

### E&C Industry Megatrends



### Value Creation in the E&C Industry

- **Financial value** Value generated from business performance
- **Industrial value** Value that enhances order-winning and business competitiveness
- **Intellectual value** Value derived from knowledge for responding to future trends with innovative technologies
- **Environmental value** Value gained from minimizing environmental impact at worksites
- **Human value** Value that enhances people's happiness, capacities and safety employees
- **Social value** Value contributed to societal development for customers, communities and partners

01  
UN SDG 8

### Infrastructure for Sustainable Business

Stage in which GS E&C explores new business areas and markets, while enhancing its capabilities by securing key talents and developing new technologies



#### Values created

#### Human

- Skills training completion by 34,237 employees (cumulative)
- Employee satisfaction score 58.9
- Family-friendly Company certified
- Return rate after childbirth leave 98%

#### Intellectual

- Development of 33 new technologies
- Construction of Smart Home Platform

02  
UN SDG 17

### Fair Evaluation & Biddings for Shared Growth

Stage in which GS E&C wins orders with partner support and enhanced quality competitiveness



#### Values created

#### Industrial

- New orders of KRW 10.9218 trillion

#### Social

- 20 partner mutual growth funds worth KRW 30 billion
- Partner-joint technology development investments worth KRW 510 million
- Partner CSR risk rate of 6.1% (economic, environmental and social risk)

03  
UN SDG 9, 13, 15

### Safe & Eco-friendly Construction

Stage in which GS E&C carries out construction on eco-friendly and safe worksites upon contracting



#### Values created

#### Environmental

- Reduction of GHG emissions 9,014 tCO<sub>2</sub>-e
- Waste recycling rate 97.8%
- Green purchases KRW 95.2 billion

#### Human

- Safety Innovation School completion by 5,263 persons (cumulative)
- Occupational safety accidents 2 cases; Construction/technological safety accidents: 1 case
- Expanded implementation of 52-hour workweek system in worksites abroad

#### Social

- Partner cash payment rate of 95% or more
- Purchase rate of 46.7% from local partners

04  
UN SDG 8

### Reliable Project Completion

Stage in which GS E&C enhances customer satisfaction with the completed project



#### Values created

#### Financial

- Sales of KRW 13.1394 trillion
- Operating income of KRW 1.0645 trillion

#### Social

- Corporate client satisfaction score 8.7 (out of 10)
- Customer satisfaction score 73.4 (out of 100)
- Home-preview app development for residents

05  
UN SDG 4 11

### Contribution to Development of Inclusive Communities

Stage in which GS E&C shares the fruits of its efforts and reinvests in societal development



#### Values created

#### Social

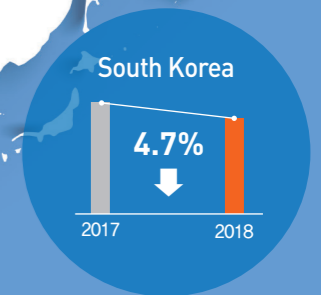
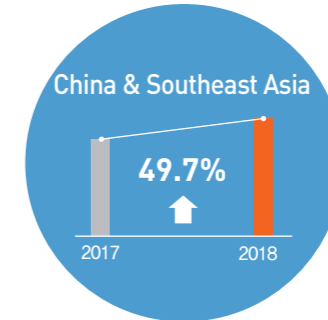
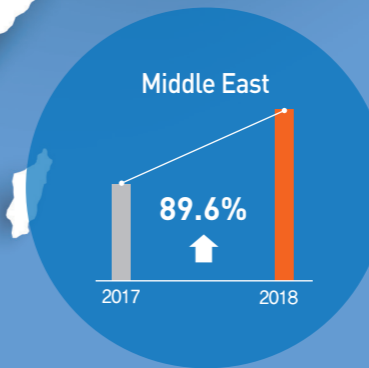
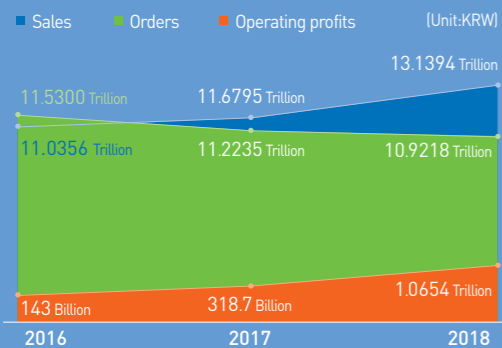
- Construction of 260 Dreams & Hopes Study Rooms
- Construction of 5th Busan Youth Share House
- Beneficiaries of 3,948 persons
- Partner CEO business management training completion 303 persons (cumulative)

# Business Overview 102-1, 102-2, 102-3, 102-4, 102-5, 102-6, 102-7, 102-10, 201-1

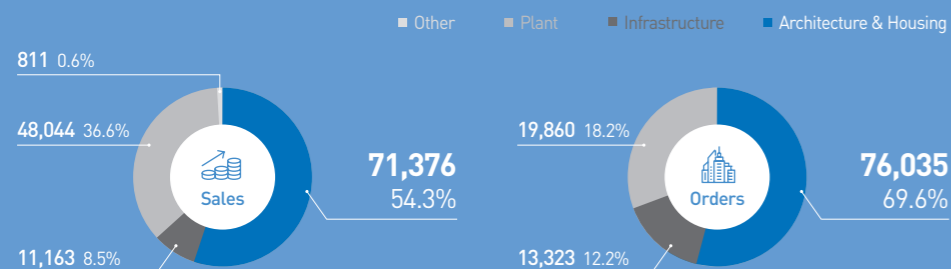
Established under the name "Lucky Development Co., Ltd" in December 19, 1969, GS E&C changed its title to its current name in March 2005 and has grown into an external auditing company and listed on the securities market. We have prioritized our customers' value for the last 50 years, striving to be the best partner and the best company in every business sector, including plants, power, environment, infrastructure, architecture, housing and more.

## General Status Consolidated basis as of December 2018

Company name	GS E&C
Establishment date	December 19, 1969
Total assets (KRW)	12.0333 Trillion
Number of employees	6,822 Persons
Credit rating	A-
Business sites	197



## Consolidated Sales & Orders by Business Sector [Unit: KRW 100 Million]



## Sales by Major Market [Unit: KRW]

	2017	2018
South Korea	8,0158 Trillion	7,0641 Trillion
Middle East	1,8461 Trillion	3,5009 Trillion
China & Southeast Asia	945.5 Billion	1,4154 Trillion
Other	872.1 Billion	581.8 Billion
<b>Total</b>	<b>11.6795 Trillion</b>	<b>13.1394 Trillion</b>

## 24 Overseas Subsidiaries & Branches

Overseas Branches	Overseas Subsidiaries
UAE (2), Saudi Arabia, Bahrain, Algeria, China, Singapore, Vietnam, Indonesia, Italy	India (2), Saudi Arabia, China, Vietnam (2), Canada, Spain (2), Indonesia, USA (2), Australia, UAE
<b>10 branches across 9 countries</b>	<b>14 subsidiaries across 10 countries</b>

[as of January 2019]



# Creating value-oriented high-quality spaces

## Areas of Business

Residential facilities, business facilities, education · research · hospital facilities, culture · leisure · sports · cleanroom · production facilities, logistics · remodeling, domestic and overseas development projects

## Overview

GS E&C generates exceptional sales and revenue in the housing sector with "Xi," the no. 1 ranking housing brand in Korea. According to 2018 performances of major construction companies, GS E&C has recorded the highest levels of sales and profits and continues to develop new products such as terraced and detached houses. In the architecture sector, GS E&C has secured specialized know-how based on exclusive technology for high-tech office buildings, advanced plant facilities, and online data centers, combined with vast experience in undertaking large-scale projects.

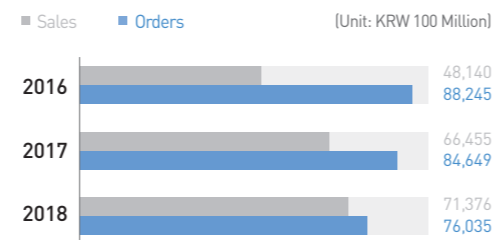
## Opportunity

GS E&C has the capability to perform both high-rise and complex projects both domestic and abroad with technical support from our engineering organization. Additionally, through the signing of MOUs with advanced companies overseas and outstanding local companies, we expand our overseas business foundations centered on strategic countries. Regarding housing, we recently reorganized our supply plan mainly through maintenance and public sector projects to secure the scale and stability of our business. In addition, we consistently explore highly profitable mid- to long-term business and plan to rejuvenate overseas businesses in markets such as Vietnam and Indonesia.

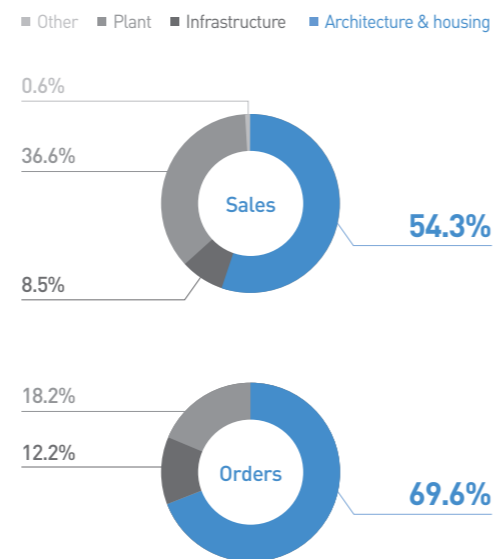
## Outlook

It is expected that the demand for high-tech office buildings equipped with the intelligent building systems and intelligent equipment production facilities for semiconductors and LCDs will constantly rise in the wake of the 4th Industrial Revolution. In addition, as the IT industry develops, orders for data centers and large medical facilities are expected to increase. Furthermore, we expect housing market conditions to improve as the Korean government expands its housing supply scheme, supplying more housing sites and building more new public housing, along with the acceleration of development through the improvement of regional transportation improvements such as the GTX (Great Train Express).

### Sales & Orders of Architecture & Housing



### Ratio of Architecture & Housing



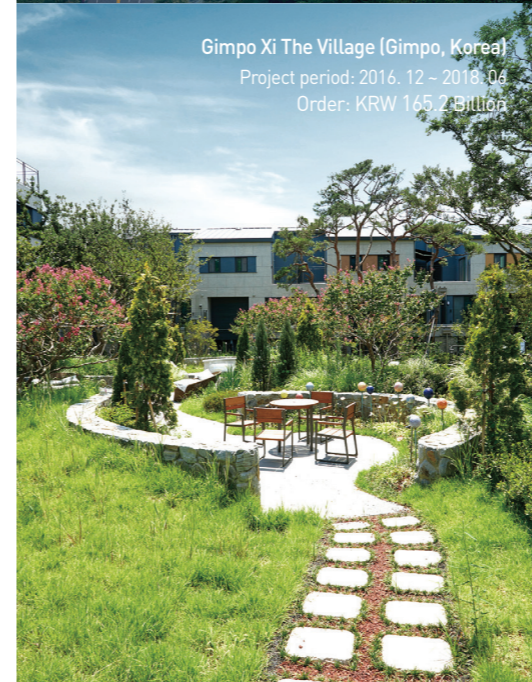
**Xi, the top premium apartment brand of Korea**

"Xi," which stands for eXtra Intelligent, implies extraordinary intellect and symbolizes the finest apartments as a choice for those who are always one step ahead.

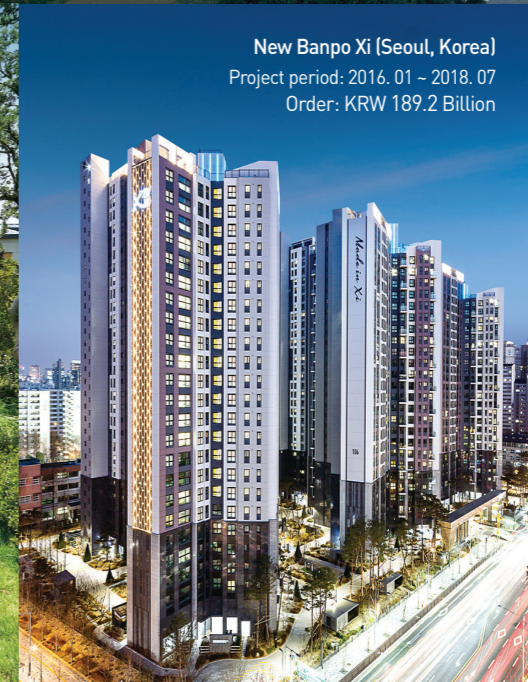
Going beyond the concept of mere housing, Xi is a value-oriented space of high elegance that integrates value and sensitivity. New spatial concepts are applied to the creation of a new set of values attained through the merging of aesthetics, culture, and high technology. GS E&C provides a luxurious lifestyle and a high-level cultural experience with attentive and courteous services that show residents the respect and high-quality residential culture they deserve.



Magok LG Science Park (Seoul, Korea)  
Project period: 2015. 05 ~ 2018. 06 | Order: KRW 342.7 Billion



Gimpo Xi The Village (Gimpo, Korea)  
Project period: 2016. 12 ~ 2018. 04  
Order: KRW 155.7 Billion



New Banpo Xi (Seoul, Korea)  
Project period: 2016. 01 ~ 2018. 07  
Order: KRW 189.2 Billion



Seoul Forest Riverview Xi (Seoul, Korea)  
Project period: 2015. 11 ~ 2018. 06  
Order: KRW 223.4 Billion



# Creating new spaces for society

## Areas of Business

Roads · bridges · railways, underground spaces, water resources · harbors

## Overview

Our infrastructure business aims to create new spaces in our natural environment for the public interest. GS E&C has a history of performing social infrastructure projects, including roads, bridges, railways, metro, airports, water resources, harbors, industrial complexes, underground storage facilities and more. As a result, we have successfully secured strong competitiveness in the construction and operation of large-scale infrastructure projects using private capital.

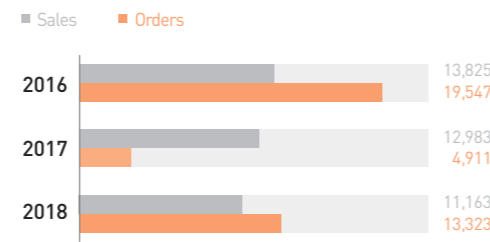
## Opportunity

GS E&C applies advancements in construction methods made possible by its Research Center to highly complex projects, such as underground tunnels with long span and great depths. In the Asian market, GS E&C undertakes transportation infrastructure projects to respond to urbanization. Through its high reputation, GS E&C has a competitive advantage upon entering the infrastructure sector of Kuwait, Saudi Arabia, Qatar and other Middle Eastern countries. GS E&C also ventures into new markets and diversifies business through overseas Public- Private partnership (PPP) infrastructure projects, so as to actively respond to changes in urbanization and the Economic Development Cooperation Fund (EDCF), among others. We refrain from engaging in bidding wars that are less profitable, and instead focus on investment- development projects.

## Outlook

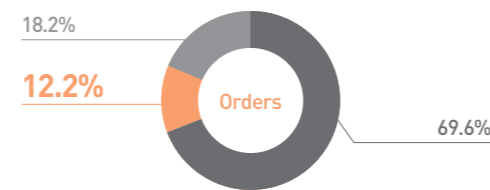
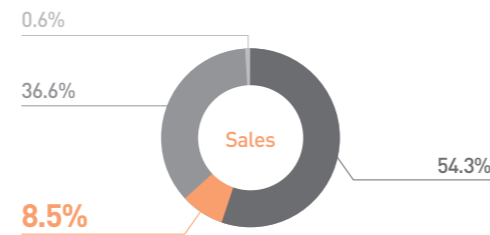
The Korean government consistently undertakes initiatives for securing social overhead capital (SOC) facilities, as well as job creation, green growth and acceleration of the construction industry through public infrastructure projects. The infrastructure industry is expected to shift from a form of construction-based simple service to a multi-industry structure interlinked with various industries. Modest expansions in the government's SOC budget and announcement of projects with preliminary assessment exemptions are expected to upstart the public construction market. As for the global infrastructure market, venture opportunities are expected to increase due to the expansion of infrastructure in emerging economies through the Overseas Economic Cooperation Fund, the Asian Infrastructure Investment Bank (AIIB) and the promotion of economic development policies in the Middle East and Africa.

Sales & Orders of Infrastructure (Unit: KRW 100 Million)



Ratio of Infrastructure

Other Plant Infrastructure Architecture & housing



- T301 (Singapore)**  
Project period: 2016.03 ~ 2024.02 | Order: KRW 1.6630 Trillion
- Korea-Myanmar Friendship Bridge (Myanmar)**  
Project period: 2019.05 ~ 2022.10 | Order: KRW 166.8 Billion
- HCMC MRT Line 1 CP2 (Vietnam)**  
Project period: 2012.07 ~ 2019.07 | Order: KRW 498.5 Billion





# Propelling industry with the power of technology

## Areas of Business

Oil, gas, petrochemical plants and environmental projects

## Overview

Plant construction is a complex business that combines the basic and detailed design of oil, gas, petrochemical and environmental (waste treatment and water treatment) facilities, with the procurement of materials and the final completion of construction, as well as all the services encompassing feasibility studies, maintenance and repairs. GS E&C secures competitiveness in the EPC<sup>1</sup> field based on various domestic and international construction experiences and accumulated technology.

## Opportunity

Despite decelerating global economic growth, investment plans for energy and industrial facilities across the globe, including the Middle East, are expected to remain stable. Investments in plant equipment are forecasted to maintain their momentum as demands for energy industry facilities are on the rise in emerging countries. It is within this context that GS E&C challenges leading companies in high-added value areas such as FEED<sup>2</sup> and O&M<sup>3</sup>. In the traditional EPC market, our leading position remains grounded in sensible proposals based on our technology and project track records, beating out the latecomers in the EPC market from China and India. On the other hand, demands for private investment projects expansions and environmental facility renovations are on the rise in the domestic environmental market.

## Outlook

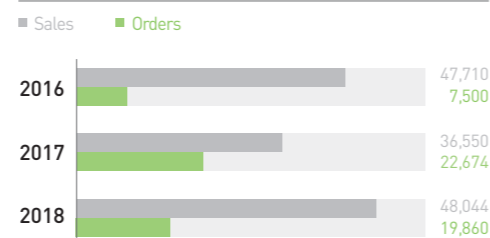
In the refinery sector of the plant construction industry, orders from the Middle East, Africa and Latin America are expected to continue. Particularly, environmental issues such as the toughening of carbon dioxide emission regulations are driving up demands for gas, which is relatively clean energy. In this regard, GS E&C is expanding its investments to secure original technologies, foster expertise and research and development activities that contribute to the continuous growth of the plant construction business. We continuously develop technologies in response to the concentration of environmental facilities demanded due to urban expansion, and to stay ahead of perpetual restrictions of emission regulations.

<sup>1</sup> EPC : Engineering, Procurement, Construction

<sup>2</sup> FEED : Front End Engineering & Design

<sup>3</sup> O&M : Operation & Maintenance

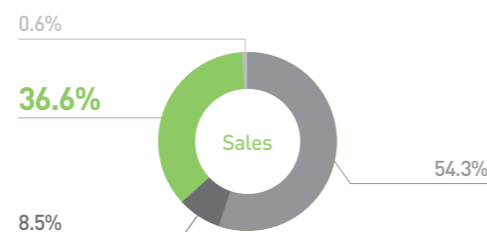
Sales & Orders of Plants (Unit: KRW 100 Million)



\*Plant sector includes power division

Ratio of Plants

Other Plant Infrastructure Architecture & housing



- 1. Rabigh II CP 3/4 (Saudi Arabia)**  
Project period: 2012.06 ~ 2017.07 | Order: USD 1.377 Billion
- 2. Guangzhou D-Project Industrial Wastewater GP3 (China)**  
Project period: 2017.07 ~ 2019. 12 | Order: KRW 305.0 Billion
- 3. UHV (Thailand)**  
Project period: 2012.10 ~ 2017.01 | Order: USD 640 Million





# Moving the world with energy

## Areas of Business

Thermal · nuclear · renewable energy, power control

## Overview

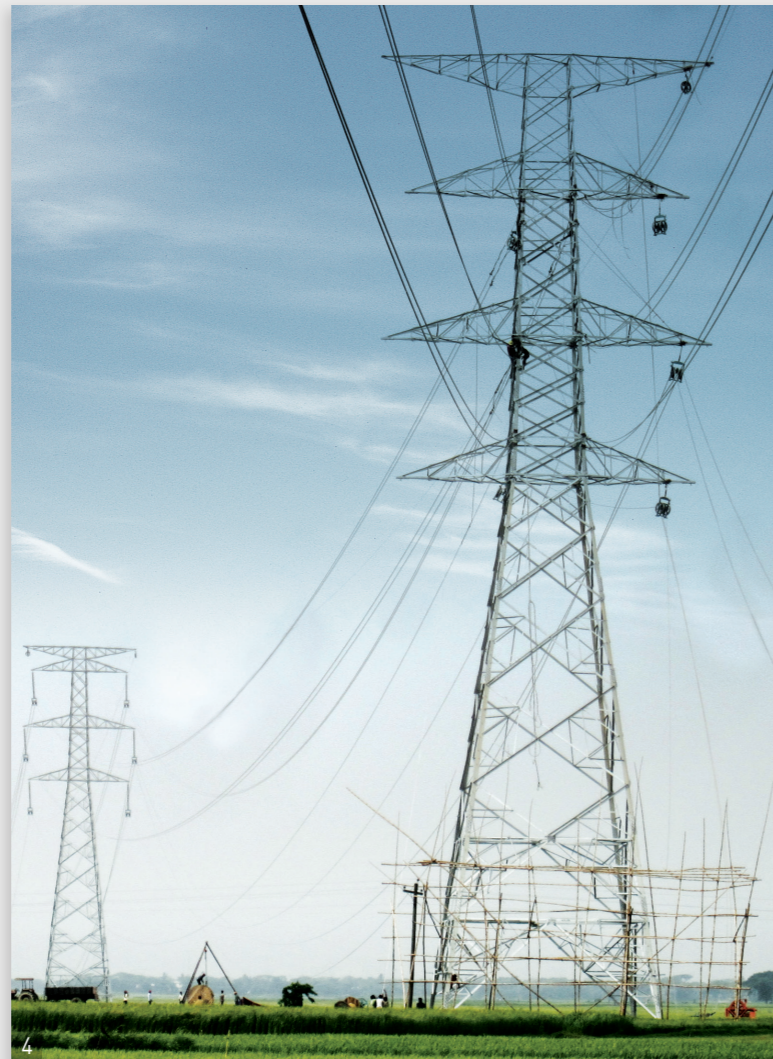
The power generation and power control business aim to build infrastructure for power and heat supply for the nation. GS E&C has secured its business competitiveness through the accumulation of varied construction know-how acquired by undertaking joint projects with power generation companies and construction projects related to coal thermal power, combined thermal power, biomass and wind power generation.

## Opportunity

In the global power generation market, orders are on the rise for renewable energy projects mainly centered around solar and wind power generation, as well as LNG and renewable energy projects in Korea as well. The power transmission/substation market is forecast to continue to grow mainly in emerging countries in the Middle East, Asia, and Africa due to rising demands for electric power. In the future, investments are expected in various new businesses linked to environmental issues. GS E&C plans to expand its business realm to emerging regions such as Asia and Latin America based on its project track record of numerous power transmission/substation projects completed at home and abroad.

## Outlook

Global energy demands and investments are constantly on the rise. In the domestic power generation market, the growth of renewable energy such as solar, wind, and low-carbon LNG power generation is expected to grow steadily due to constant drafting of coal capacity restriction policies and denuclearization policy. In addition, we plan to move toward the direction for smart power consumption, through distributed power utilization, micro grid technology with capacity for energy self-sufficiency, fuel cells, and Energy Storage System (ESS) utilization. In the power transmission/substation market, orders will continue to expand grounded on the rising demand for electricity in emerging economies, while investments are expected in various new business areas linked to environmental issues in the future.



1. Dangjin Biomass Power Plant (Dangjin, Korea)  
Project period: 2014.05 ~ 2017.07 | Order: KRW 594.2 Billion
2. Sinhanul Nuclear Power Plant Unit 1 & 2 (Uljin, Korea)  
Project period: 2010.04 ~ 2020.09 | Order: KRW 402.9 Billion
3. PP-12 Combined Cycle Power Plant (Saudi Arabia)  
Project period: 2012.05 ~ 2019.12 | Order: KRW 697.3 Billion
4. Bibiyana ~ Kaliakoir 400kV (Bangladesh)  
Transmission Line Project  
Project period: 2012.01 ~ 2015.07 | Order: KRW 71.0 Billion





## Sales

In 2018, GS E&C recorded KRW 13.1394 trillion in sales, a 12.5% increase from 2017. Domestic sales accounted for 58.2% of the total; specifically, those attributed to housing, which takes up the largest portion, stood at KRW 7.1376 trillion, roughly a 7% increase from 2017. Meanwhile, overseas sales amounted to KRW 5.4924 trillion, accounting for nearly 41.8% of total sales. In terms of the divisions of the company's construction business, the architecture & construction sector, the plant sector including the power division, the infrastructure sector, and others, accounted for 54%, 37%, 8%, and 1%, respectively.

Likewise, operating profits reached KRW 1.0645 trillion, skyrocketing 234% from 2017, based on the robust domestic results in the housing sector and the completion of pending projects overseas, including the obtaining of a change order<sup>1</sup> and improved cost ratio. As a result, earnings before tax turned positive.

Estimated sales for 2019 is KRW 11.300 trillion, a 14.0% decrease from 2018, which reflects the slowing of overseas orders following the closure of a large-scale EPC<sup>2</sup> project and the expected completion of the LG Display Project in China.

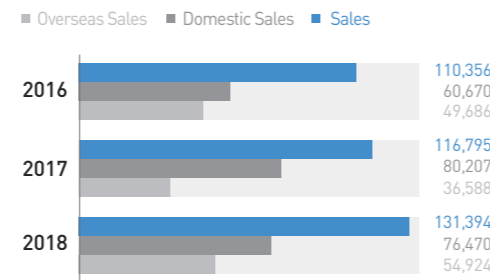
## Orders

The total value of contract orders in 2018 declined by 2.7% since 2017, recording KRW 10.9218 trillion. This record in orders was burdened by the weak performance in orders of overseas plants despite the growth of the Korean housing sector and overseas infrastructure. Specifically, overseas orders were sluggish due to delayed orders for large-scale plant projects overseas and intensified competition with global companies.

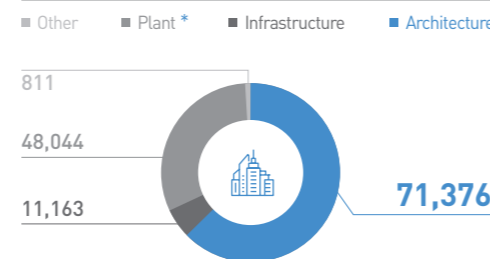
GS E&C's 2019 target for orders is KRW 13.4700 trillion, a 23.3% increase from this year's KRW 10.9218 trillion. As for overseas plants, investment plans centered on the Middle East region are likely to be resumed, while more orders for large-scale plant projects are expected in Korea. GS E&C's plans to focus on profitable projects and investments in Southeast Asia and Australia with relation to overseas infrastructure projects, as an effort to win more contracts. While a difficult year lays ahead for the domestic housing market due to toughening government regulations, the number of contracts is forecasted to remain robust due to new orders based on the company's strong brand power and product development.

<sup>1</sup> Change Order : Contract on addition and modifications to construction between the client and the contractor  
<sup>2</sup> EPC : Engineering, Procurement, Construction

Sales (Consolidated basis, unit: KRW 100 Million)

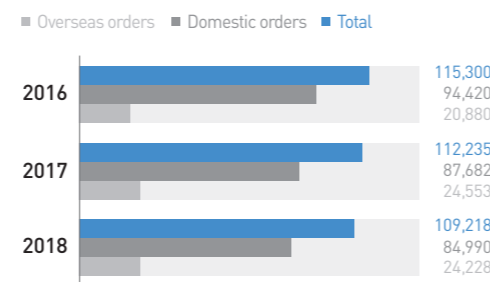


2018 Sales by Business Sector (Unit: KRW 100 Million)

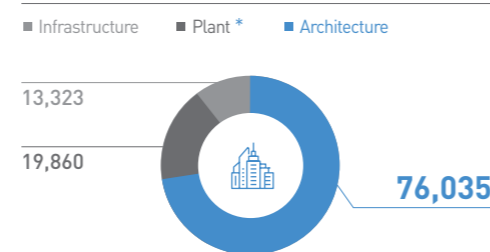


\* Plant sector results include the power division.

Orders (Consolidated basis, unit: KRW 100 Million)



2018 Orders by Business Sector (Unit: KRW 100 Million)



\* Plant sector results include the power division.

Credit Ratings

Organization	Corporate Credit Rating	Commercial Paper
Korea Ratings Korean Corporate Rating	A-(Positive)	A2-
NICE Investors Service	A-(Positive)	A2-
Korea Investors Service	A-(Positive)	A2-

Distribution of Stakeholder Economic Value (Unit: KRW 100 Million)

Employees	Labor costs and welfare benefits	12,827
Shareholder	Dividends and interest paid	1,561
Government affiliated institutions*	Corporate tax	4,252
Community	Contribution and social contribution operating expenses	99
Partner firm	Purchase and outsourcing costs	86,024

\* In 2018, the profit share of the relevant government institutions is the sum of corporate tax, tax and public imposts.

## Credit Rating

The corporate credit rating of GS E&C as evaluated by the major credit rating agencies is A-, and its credit rating projection has been upgraded from A- (stable) to A- (positive) due to improved operating profitability and financial stability. These agencies point out that, in light of various business and financial aspects, the housing sector demonstrates excellent sales performance, yet some overseas projects may burden the overall results, which explains the key evaluation factor. The elements that increase the credit ratings issued by the credit rating agencies include an EBIT<sup>3</sup>/sales over 3.0% and EBIT that are at least triple the amount of the financing costs, all of which were met by GS E&C in its 2018 results.

## Sharing Financial Value

### Protection of Stakeholder Financial Value

GS E&C makes various efforts to protect the interests of minority shareholders. Specifically, GS E&C works to provide unbiased information on the company's management through proactive voluntary disclosures, and investment-related information management information, IR activities, and IR data are posted on the GS E&C webpage<sup>4</sup> to ensure the same data is equally available to minority shareholders as well as institutional investors. Furthermore, GS E&C maintains various communication channels, such as its phone counseling service and inquiry webpage to enable smooth communication with minority shareholders.

<sup>3</sup> EBIT : Earnings before interest and taxes  
<sup>4</sup> Webpage : www.gsenc.com



# THE VALUE GS E&C CREATES

Aspiring a stronger nation, happier people, and a cleaner environment,  
GS E&C creates value through constant growth with its stakeholders.

- 22 GS E&C Industrial Value
- 26 GS E&C Intellectual Value
- 32 GS E&C Environmental Value
- 40 GS E&C Human Value
- 52 GS E&C Social Value

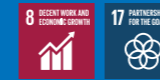
GyeongHui Palace Xi / Seoul (Korea)





# 01

## GS E&C INDUSTRIAL VALUE



# Bolstering project capability through persistent challenges

## Industrial Value, Why Is It Important?

While overseas construction orders contracted by the Korean construction industry in 2019 are estimated at about USD 30 billion, equivalent to the previous year, Korea's rankings in overseas sales continue to drop year after year. Notably, Chinese companies are rapidly increasing their market share based on price competitiveness. Within this context, GS E&C is expanding into a business field with high value-added and advanced technology, both of which are essential in securing competitiveness in the global construction market.

## Industrial Value, How Is It Created?

GS E&C is preparing for possible contractions in the domestic housing market by enhancing its global market competitiveness and discovering new growth engines while responding to the rising trends in overseas infrastructure and plant investments. Strengthening EPC<sup>1</sup> capacities through cost reduction and quality improvement is key to staying competitive in terms of pricing against latecomers from India, China and other regions. Moreover, GS E&C is diversifying its business portfolio and reinforcing its project execution capabilities for new growth engines. Through such means, GS E&C is securing its capacity to venture into new overseas markets.

<sup>1</sup> EPC: Engineering, Procurement and Construction

Securing Competitive Advantage	Identifying New Growth Engines
<ul style="list-style-type: none"> <li>Strengthening bidding competitiveness</li> <li>Strengthening project execution competitiveness</li> <li>Saving costs through preconstruction</li> </ul>	<ul style="list-style-type: none"> <li>New market venture across business divisions</li> <li>Identification of new business opportunities</li> </ul>
Relevance to Material Issues	
<ul style="list-style-type: none"> <li>① Creation of economic performance</li> </ul>	

## Industrial Value Created by GS E&C

**197 Sites**  
in 17 Countries  
Major Business Sites

**22.2%**  
Overseas Orders Ratio

**KRW 2.4228 Trillion**  
in New Overseas Orders

**41.8%** (▲10.4%)  
Expansion of Overseas Sales Ratio



**Joins 1 KRW Trillion Club**  
in Operating Profits



## Securing Competitive Advantage

### Strengthening Bidding Competitiveness

The top priority that GS E&C considers during the bidding process is the identification of projects with significant profit potential. This means that GS E&C plans to win high-quality projects where it can utilize its technological capabilities, rather than engaging in bidding wars for simple construction contracts. In 2019, plant investments are expected to expand in the Middle East and North Africa based on oil price increases, and in Asia, the business environment to win contracts should be favorable, centered around projects put forward by the Economic Development Cooperation Fund (EDCF). In this regard, GS E&C intends to further upgrade its ability to win contracts based on its strategies to reinforce the order-winning competitiveness of its business division in overseas markets.

#### Bidding Competitiveness Enhancement Strategy by Business Sector

Sector	Strategy
<b>Architecture</b>	Real estate development projects in Vietnam, Indonesia
<b>Infrastructure</b>	Focus on projects involving public-private partnership (PPP) and financial institutions in developing countries
<b>Plant</b>	Undertake projects to expand value chain including FEED <sup>1</sup> and O&M <sup>2</sup> . Identify new business models
<b>Electricity</b>	Undertake renewable energy development projects and overseas IPP development projects

#### Overseas Orders by Business Sector (Unit: KRW 100 Million)

	2016	2017	2018
<b>Architecture</b>	5,920	5,376	7,402
<b>Infrastructure</b>	13,390	72	8,351
<b>Plant*</b>	1,570	19,105	8,476
<b>Total</b>	20,880	24,553	24,228

\*Overseas orders for plants include the energy sector.

### Strengthening Project Execution Competitiveness

Grounded on its accumulated experience and lessons learned while performing its business operations overseas, GS E&C is concentrating on improving its execution capabilities across the fields of design, construction and operation. GS E&C has established a global design system by strengthening networks with Indian design corporations and hiring skilled design experts to secure design competencies needed for overseas projects. Moreover, GS E&C continues to enhance its capabilities by reinforcing on-site execution capabilities and establishing a direct construction system through its architecture execution center and the infrastructure execution center, while upgrading the capabilities of its overseas construction corporations. In addition, GS E&C strives to efficiently operate and manage its workforce by allocating excellent workforce on site and upgrading the proficiency of personnel assigned to overseas projects.

### Advancing Project Management with Pre-construction

GS E&C provides pre-construction service (PCS), an advanced project management method. With the implementation of the PCS, the client, designers and contractors are organized into a team in the beginning planning and designing stages. By reducing construction period, costs and quality risks through project management methods including Process Mapping<sup>3</sup>, Cost Trending<sup>4</sup> and BIM<sup>5</sup>, the project is executed to benefit all stakeholders.

Ever since the first-ever application of PCS in Korea to the construction of the Integrated Data Center of Hana Financial Group in 2014, GS E&C has been a leading company in adopting the PCS system, which was instrumental to its winning of the contract for the Siheung-Eungye S4 Block Apartment project and the Daegu DGB Data Center. Most notably, the DGB project saw a budget reduction of KRW 14.9 billion, which corresponds to a 15% of the initially planned construction cost of KRW 99.8 billion. As such, GS E&C is securing robust order-winning competitiveness in and business results on the back of its outstanding achievements in PCS.

## Identifying New Growth Engines

### Venturing New Markets Across Business Divisions

The architecture & housing sector is an integral part of GS E&C, one that has led to overall sales and profit growth in terms of profitability and stability. Identification of profitable markets and businesses suitable for long-term profits is on the top of GS E&C's agenda, rather than focusing on overseas outsourcing projects. This will be the start to securing additional development business opportunities in markets such as the US, Vietnam and Indonesia, where market presence of GS E&C has already been established, as well as in new markets including Saudi Arabia and Thailand.

The plant sector is GS E&C's major area of business, comprising 37% of the entire sales. GS E&C intends to continuously identify new opportunities in the form of limited competition and investment development, such as L(Licensor)+EPC and FEED+EPC, beyond the mere EPC business format of high risk and low profits. Meanwhile, GS E&C plans to venture into new markets through plant turnaround<sup>6</sup> projects, environmental waste treatment and identification of public-private partnerships.

The overseas infrastructure business is a key business sector for GS E&C to maintain its industrial value. With investments in infrastructure expected to continue based on economic development policies of emerging countries and the Middle East, GS E&C intends to further identify public-private partnership projects (PPP) and financing arrangements (EPC + F) for the Myanmar and Tanzania markets, where it has ventured into from 2018. Besides the transportation infrastructure business, GS E&C plans to expand its business into the hydro Independent Power Producer (IPP) and the harbor sector.

### Discovering Various New Business Opportunities

GS E&C is seeking new business opportunities to effectively respond to changes in the construction industry environment. GS E&C's new business strategy regards business incubation as instrumental in leading the future of the company in the mid-to long-term. GS E&C is currently seeking various business opportunities by making incursions into the ACS (Air Cleaning System) business in cooperation with its subsidiary, Xi S&D. In particular, GS E&C intends to build a future-oriented business portfolio by creating new businesses through technology convergence, such as the establishment of a smart home and city projects, to be able to respond to the ICT-based 4th Industrial Revolution. For projects that have been confirmed, GS E&C plans to secure the advantage in new markets by securing professional manpower equipped with planning and operational competencies backed up with bold investments.



### Joins KRW 1 Trillion Club in Operating Profits

In 2018, GS E&C recorded its highest operating profits since its founding at KRW 1.0645 trillion. Such growth in operating profits can be attributed to the significant profit improvements in the plant sector, confirmation of the change order<sup>7</sup> that had been under discussion with the client and relentless dedication to cost reduction. In 2019, GS E&C will continue to pursue proactive investments in new businesses and secure a stable profit structure in markets in and outside of Korea. More importantly GS E&C will continue its efforts to identify investment development and operation projects for FEED and O&M, which are high value-added fields, including overseas developer projects<sup>8</sup>, further solidifying GS E&C's status as a global construction company.

<sup>7</sup> Change Order: Contract dealing with additions and modifications to a construction between the client and the contractor

<sup>8</sup> Developer project: Entire process of real estate development, including land purchase, planning, design, construction, marketing, follow-up management, etc.

<sup>6</sup> Turnaround: Plant facility maintenance work

<sup>1</sup> FEED: Front End Engineering Design

<sup>2</sup> O&M: Operation and Maintenance

<sup>3</sup> Process Mapping: a management tool that visually describes the flow of work

<sup>4</sup> Cost Trending: a process that analyzes the change in construction cost

<sup>5</sup> BIM (Building Information Modeling): a process of virtual modeling



02

GS E&C  
INTELLECTUAL  
VALUE

SC SysClein



# Designing a new future with innovative technology

## Intellectual Value, Why Is It Important?

With the advent of the 4th Industrial Revolution, rooted in the Internet of things, artificial intelligence, and big data, the boundaries between industries have become blurred, and changing technology and the way companies do business. Accordingly, the construction market is looking for new growth engines by combining existing technologies with IT. Technology innovation and convergence based on IT are key elements for strengthening future business competitiveness and securing future growth engines. Technology innovation also has the potential to further solve environmental problems and contribute to sustainable development.

## Intellectual Value, How Is It Created?

Until now, the focal point of the construction industry has been placed on maximizing profits by improving productivity, rather than creating new businesses based on technology. However, creating value with exclusive technology in the midst of a changing market environment and social expectations is increasingly becoming an important factor for sustainable growth. In this spirit, GSE&C is committed to fulfilling its vision of "developing technology for a global company grounded in exceptional values and excellence" by cultivating technology-led business and world-class project execution.

Cultivating IT-based Technology	Focusing on Eco-Friendly Technology Development
<ul style="list-style-type: none"> <li>Innovative technology development centered on key technology</li> <li>Smart energy city platform</li> <li>Energy storage simulator Relevance to Material Issues</li> </ul>	<ul style="list-style-type: none"> <li>Eco-friendly wastewater treatment facility</li> <li>Integrated management solution for smart waterworks system</li> <li>Desalination technology through salinity difference</li> </ul>
Relevance to Material Issues	
<ul style="list-style-type: none"> <li>⑦ Development and dissemination of eco-friendly technology</li> </ul>	

## Intellectual Value Created by GS E&C

**KRW 52.7 Billion** (▼2.6%)  
R&D Investment

**33 Cases** (▲9 cases)  
Technology Development

**Salinity Differential Energy Recovery System**  
GS Inima Joint Development

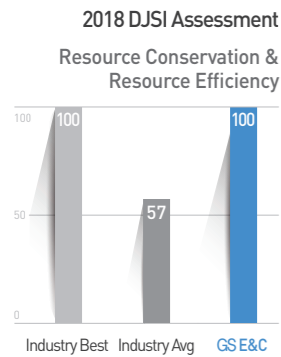
**87 Sites** (▲42.6%)  
Application of Technology

**KRW 19.04 Billion** (▼15.6%)  
Technology Commercialization

**Smart Home**  
Xi SmartHome App



## Cultivating IT-based Technology



### Technological Innovation Centered on Core Technology Sectors

GS E&C is establishing technology development strategies in preparation for the future environment and construction market trends, both domestic and abroad. To develop eco-friendly technologies and bolster core competencies, GS E&C cultivates specialists in new and renewable energy, low carbon materials and energy saving technologies. In addition, GS E&C is building an innovative project execution system based on BIM<sup>1</sup> across the entire business process, utilizing ICT and automation technology.

#### Key Innovative Technology Tasks

Technology development task	Description
<b>Smart Construction</b>	BIM is a futuristic construction execution system that integrates digital measuring instrument and telecommunication equipment into the established drawings to conduct and manage construction projects accordingly, while improving productivity and securing safety with automated equipment.
<b>Core technologies of new eco-friendly businesses</b>	Development and adoption of technology to enhance competitiveness in new business areas such as new and renewable energy and green smart housing/building/urban projects.

#### Innovative Technology Development

(Unit : KRW 100 Million, cases)

	2016	2017	2018
R&D investment	463.1	540.9	526.6
Financial benefits of technology application	173.5	225.7	190.4
Sites applied	86	61	87
Technology development	34	24	33

### IT-based Technology Development

#### Research on IT-Based Infrastructure to Secure Safety

GS E&C conducts research on Smart Safety Structure to achieve a safe construction environment by combining IoT, telecommunication technology and advanced materials with structures. Such an approach minimizes casualties from natural disasters, fires, explosions, and other incidents in addition to industrial and financial loss as it facilitates the restoration of building structure functions in early stages. GS E&C intends to secure the safety of the construction environment by applying IT-based infrastructure to more construction sites.

#### Research on Energy Management Schemes for Smart Energy City

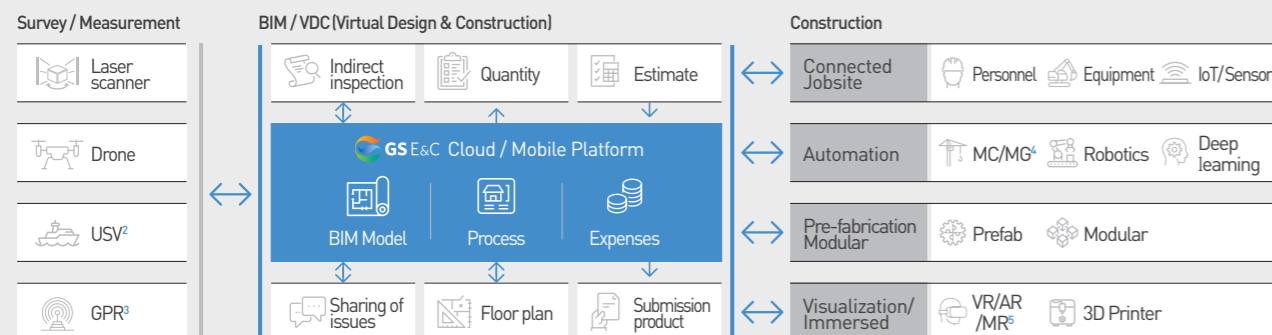
GS E&C developed an urban energy management program to build a sustainable city and reduce carbon. It was developed by monitoring and analyzing energy consumption on existing business facilities, commercial facilities and public housing in cities with the aim to effectively contribute to cutting down on carbon emission in cities.

#### Development of Optimized Energy Storage Simulator

GS E&C conducts research and development activities for efficient energy use. Most distinctively, the company successfully developed a simulator that provides a variety of functions for the benefit analysis of installing and operating an energy storage system (ESS), which is based on the charging system classified by season and time, and optimized prediction-based operation functions. This simulator is expected to save energy effectively and reduce greenhouse gas emissions.

<sup>1</sup> BIM : Building Information Modeling  
<sup>2</sup> USV : Unmanned Surface Vehicle  
<sup>3</sup> GPR : Ground Penetrating Radar  
<sup>4</sup> MC/MG : Machine Control, Machine Guidance  
<sup>5</sup> VR/AR/MR : Virtual Reality, Augmented Reality, Mixed Reality

### IT-based Technology Conceptual Diagram



## Focusing on Eco-friendly Technology Development

### Eco-Friendly Alkaline Wastewater Treatment System

GS E&C developed an alkaline wastewater treatment facility which uses carbon dioxide in replace of strong acid chemicals that are harmful to construction workers and the surrounding environment. This is an eco-friendly and economical system that is easy to handle for operators, corrosion-free for safety, relatively affordable cost of chemicals and quick reaction speed with wastewater.

### Construction Pollution Ventilation System

In long tunnels that extend 1 kilometer or longer, dusts generated from construction remain stagnant inside, which may cause on-site safety hazards and even health issues of local residents if leaked. In response, GS E&C developed rapid ventilation and portable dust collection technology for the health and safety of construction workers and residents in the area. This technology determines the operation frequency of the fans and dust collectors that collect dust inside the tunnel based on real-time dust meters installed inside the tunnel. GS E&C meets the legal ventilation standards (e.g., carbon monoxide, NOx, dust) by applying rapid ventilation and mobile dust collectors to the construction site of the long tunnels. The actual pollutant amounts vary depending on the construction site conditions.

### Underwater Barrier Technology

Water intake and offshore construction of power plants along the coast affect aquatic organisms. In order to prevent the inflow of aquatic organisms and reduce the underwater noise generated during construction, GS E&C developed a barrier technology, the first construction company in Korea to do so. This eco-friendly technology, which prevents the diffusion of underwater noise by generating bubbles underwater, enabled us to preserve the aquatic ecosystem and operate eco-friendly construction projects and plants.

### Algae-targeted Membrane Filter Water Purification System

Climate change has caused large quantities of algae, such as algal blooms, aggravating the quality of the source water. To solve this problem, GS E&C internally developed a membrane filtration system that automatically determines the time and amount of injection of activated carbon based on tidal concentration data measured from the water source in real time, as well as titration and salt concentration during backwashing. This system helps save up to 56% of chemical costs by reducing the chemical cleaning cycle for membrane contamination; the actual reduction amounts may vary depending on the water quality conditions where the system is applied.

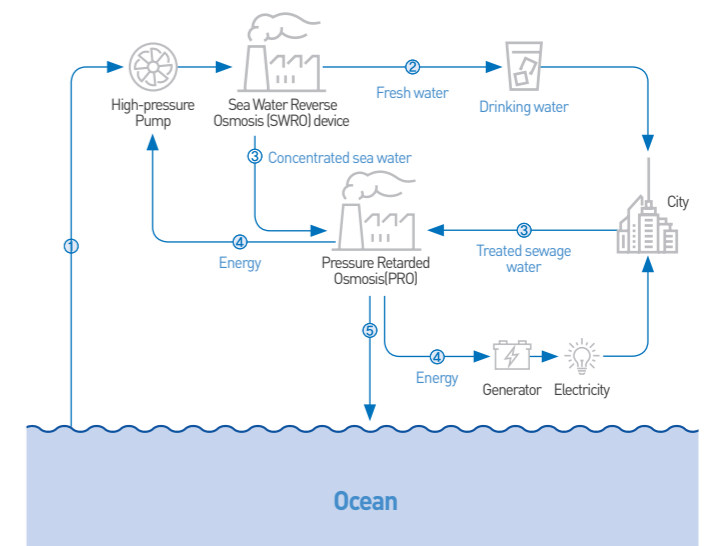
### Smart Water Supply System Design and Integrated Management Solution (GSWaterS)

Water shortage is worsening due to rapid population growth in recent years, and it is becoming increasingly difficult to supply water due to the deterioration of water supply facilities. In response, GS E&C developed smart water solutions (with optimal design and operation management) based on ICT, IOT(internet of things), and big data for real-time measurement and simulation as well as efficient integrated management of the water supply design and operation factors (e.g., quantity, water pressure, water quality and energy). This has brought about an improved rate of water supply, reduced leakage, minimized impact of water cutoffs, improved asset management efficiency and stabilized water supply. In particular, it leads to financial benefits by reducing operating costs by 10% on average.

### Salinity Differential Energy Recovery System

The seawater desalination process, which converts seawater to fresh water in order to secure a supply of fresh water, generates highly enriched saltwater and adversely affects the marine ecosystem at sea. GS E&C takes pride in the new and advanced technology that produces electric energy by tapping into the high salinity difference between the enriched water and the sewage treated effluent. GS E&C is the first ever to develop such salinity differential energy recovery technology in the world. This technology is applied to the seawater desalination business in cooperation with GS Inima, our subsidiary and the world's 10th largest company for seawater desalination, to process enriched water and produce water in an eco-friendly manner.

### Next-generation Desalination Plant Process



# Focus on Intellectual Values



## Smart House Construction with Advanced Technology



▲ Demonstration booth of the smart home linked to Amazon Alexa

### First Smart Home in Korean E&C Industry, linked to Xi App



#### A Comfortable, Convenient and Safe Home

Recently, the dissemination of IoT-based sensors and home appliances, and the convergence of advanced information and communication technologies prompted the E&C industry to develop smart home technology that can be applied to housing construction. GS E&C's Smart Home aims to make customer's home comfortable, convenient and secure with a smart home environment that consists of video entertainment devices, AI speakers, home monitoring security equipment, connected lighting, smart thermostats, furniture and other technologies. Xi Smart Home App is all the customers need to remotely control key functions inside their house, such as lighting, gas, etc. anytime and anywhere.

### Smart Home in Cooperation with Amazon and Kakao



#### Artificial Intelligence (AI) Smart Home

GS E&C's smart home is the first of its kind in the industry. Additionally, GS E&C's proprietary Smart Care app and the data platform collect the users' consumption patterns to learn and act on its own to provide an automated, customized service depending on various situations, be it sleeping, waking up, going out and so forth. An interactive algorithm is embedded into the AI speakers of Amazon and Kakao to take advantage of the Home Secretary function for a variety of lifestyle information notifications and internet searching. Using voice recognition speaker such as Amazon Echo and Kakao mini, Smart Home customers can easily use various functions such as adjusting the stand lighting and automatically opening and closing the window.

### Korea's First Ventilation-type Air Purification System

#### AI-based Fine Dust Sensor Embedded

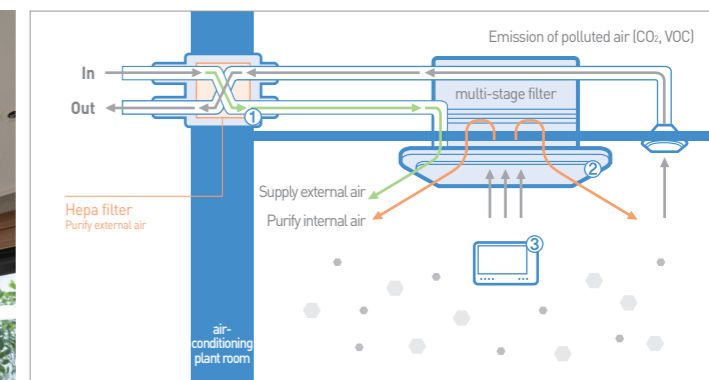


#### AI Air Cleaning System with No Need for Ventilation

The inherent limitation that conventional air purifiers have is that the carbon monoxide concentration can be heightened due to its operation in a closed space. However, this innovative air purification system with an AI-based fine dust sensor provides a pleasant indoor environment for the dwellers. Sys Clein, an air purification system developed jointly by GS E&C and Xi S&D, uses an air-conditioning heat exchanger with enhanced air purification functionality to let in the fresh air from outside while purifying any harmful substances in the air, including fine dust. Sys Clein added a HEPA-quality filter to the existing total heat exchanger to purify even fine particulate matter. Leading the domestic construction culture, GS E&C will continue to create new standards for an advanced residential culture with accumulated know-how and technology.



▲ Sys Clein, ceiling air purifier



▲ Diagram of Sys Clein



# 03

## GS E&C ENVIRONMENTAL VALUE



# Minimizing environmental impact

### Environmental Value, Why Is It Important?

Currently, global CO<sub>2</sub> emissions amount to nearly 150% of the level posted in 1990, and the global average temperature and sea levels are steadily rising. Moreover, large amounts of CO<sub>2</sub> are being emitted in the process of producing building materials and performing facility maintenance even more than from the actual installation process. As a result, various efforts are made in the domestic and overseas construction markets to minimize environmental impacts by, for example, using eco-friendly materials, recycling wastes, and setting up high-efficiency energy buildings. In recent years, awareness spiked on particulate matters, turning the reduction of fine particulate matter generated at construction sites into an important task.

### Environmental Value, How Is It Created?

Waste and wastewater comprises the largest portion of environmental impact that arises during GS E&C's business operations is waste and wastewater. In this regard, GS E&C links an internal Green-Information System to the ALLBARO system, operated by the Korea Environment Corporation, to better manage the amount of waste generated and increase recycling rates. The company also established an environmental management system in accordance to business management to control environmental impacts. Furthermore, GS E&C took an active and proactive action to respond to the problem of particulate matter on construction sites in 2018.

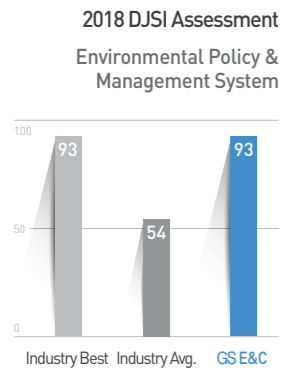
Implementing Environmental Management	Responding to Climate Change	Reducing Environmental Impact
<ul style="list-style-type: none"> <li>Set 2020 GHG reduction target</li> <li>Present key performance indicators</li> <li>Provide big data-based environmental solutions across construction methods</li> </ul>	<ul style="list-style-type: none"> <li>Utilize green concrete</li> <li>Construct buildings with high energy efficiency</li> <li>Induce partners to respond to climate change</li> </ul>	<ul style="list-style-type: none"> <li>Operate EP Green Information System</li> <li>Conserve water resources through heavy water recycling</li> <li>Protect endangered wildlife</li> </ul>
<b>Relevance to Material Issues</b>		
<ul style="list-style-type: none"> <li>⑩ Compliance with environmental laws</li> </ul>		<ul style="list-style-type: none"> <li>③ Management of wastewater and waste</li> <li>⑦ Development and dissemination of eco-friendly technology</li> </ul>

### Environmental Value Created by GS E&C

<p><b>9,014 tCO<sub>2</sub>-e</b> GHG Emission Reduction</p>	<p><b>KRW 95.3 Billion</b> (▲28.8%) Green Purchase Increase</p>	<p><b>97.8%</b> (▲4.6%) Waste Recycling Rate</p>
<p><b>KRW 2.4 Billion</b> GHG Emission Reduction Saved Cost Estimates</p>	<p><b>164,362 Ton</b> (▼25.8%) Wastewater Treatment Decrease</p>	<p><b>Star Grade</b> Eco-friendly E&amp;C Company Certification Building &amp; Construction Authority of Singapore</p>



## Implementing Environmental Management



### Enforcement of Environmental Management

With the Green Environment Team in charge, GS E&C implements environmental management by promoting environmental management strategies and managing performance. With the purpose of reducing greenhouse gas (GHG) emissions by 7.1% by 2020, three major strategic directions and nine strategic tasks were established to create eco-friendly business sites, strengthen the environmental management system and reduce GHG and energy consumption.

### Environmental Management Strategy System



### Compliance with Environmental Regulations Across Business Processes

GS E&C carries out the environmental conservation activities when planning and undertaking any business. Recently, GS E&C made efforts to minimize chemical emissions and fine dust on construction sites to adhere to the government's environmental laws and regulations, such as the Special Act on Fine Dust and Enforcement Decree of the Toxic Chemicals Control Act. Especially, in case of emergency reduction measures, GS E&C records management cards at all sites and also the GS E&C technology research center has also developed a wastewater treatment technology that uses carbon dioxide to reduce sulfuric acids utilized in wastewater discharge facilities.

### Environmental Accident Prevention via Self-Inspection of Mandatory Environmental Rules

GS E&C has established and enforced its "Mandatory Environmental Rules," consisting of environmental violations that are likely to occur on site. At the end of 2018, the "Mobile app for self-inspection of mandatory environmental rules" was developed to facilitate the monitoring of environmental issues on site. In accordance with the 4th Industrial Revolution, GS E&C has also begun using big data to compile and manage self-inspection data by site. Big data enables the analysis of violation occurrences by construction site, type and environment so as to suggest environmental solutions suitable for the given site.

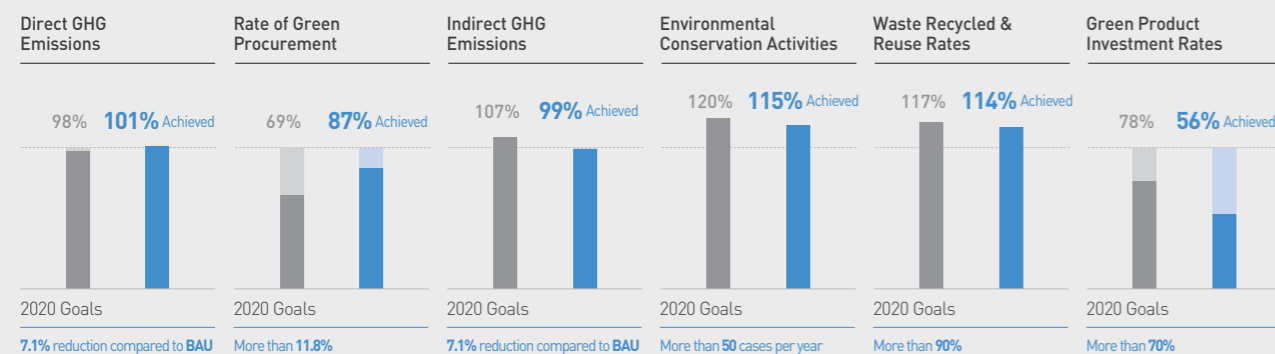
### Environmental Regulations Violations <sup>307-1</sup>

(Unit: Case, KRW 1 Thousand)

	2016	2017	2018
Violations	8	8	10
Fines	4,400	7,700	9,480

### Environmental Management Performances

■ 2017 ■ 2018



## Responding to Climate Change

### Eco-Friendly Activities for GHG Reduction

GS E&C is committed to reducing GHG emissions through continuous eco-friendly activities. In 2018, we successfully reduced GHG emissions by a total of 9,014 tCO<sub>2</sub>-e including the usage of green concrete, video conferencing, LED lighting, and other eco-friendly activities.

### GHG Reductions

(Unit: tCO<sub>2</sub>-e, KRW Million)

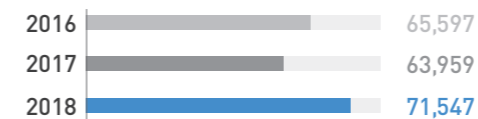
	2016	2017	2018
Total emissions	286,412	285,234	291,233
Reductions	50,517	37,586	9,014
Saved cost estimates	9,685	8,487	2,392

\*Reduction records and estimates include installed LED, green concrete, video conferencing, and KVER records.

### GHG Emissions

(Unit: tCO<sub>2</sub>-e)

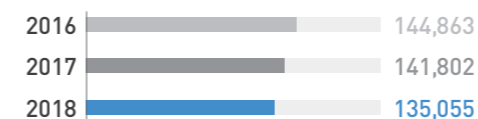
#### Scope 1(Direct)



#### Scope 2(Indirect)



#### Scope 3(Other indirect)



### Development & On-Site Use of Green Concrete

About 7% of global greenhouse gases are emitted in the production course of cement, the main material of concrete. In this regard, GS E&C developed green concrete, which reduces the amount of cement usage through the use of byproducts, and built a Pre-Mix facility to ensure high strength and excellence in quality. In 2018, green concrete was utilized in five sites, including Heungdeok Park Xi, resulting in cost savings of 1.25 billion won.

### GHG Reductions & Saved Costs from Green Concrete Use

(Unit: tCO<sub>2</sub>-e, KRW 100 Million)

	2016	2017	2018
GHG emission reductions	48,405	34,088	7,466
Cost reductions	85.4	64.5	12.5

### Construction of High Energy-efficient Building

With the enforcement of the "Green Building Development Support Act" in 2013, the range of energy management targets for buildings was expanded and management standards strengthened. GS E&C thus pursued energy conservation policies for buildings by establishing efficient energy saving design schemes to disseminate green buildings and green homes, and developed the optimal energy building design technology by evaluating a building's energy consumption in the initial designing stage. These eco-friendly building technologies were applied to the Yongsan Relocation Plan (YRP) by the US Forces for the Communication Center and Jincheon National Training Center. We plan to actively utilize this technology to win future public projects and technical proposals. In 2018, DGB Innovation Center was completed and certified as second-tier energy- efficiency building; the overall high-efficiency buildings ratio was 47%.

### Encouragement of Climate Change Action for Partners

GS E&C established the green procurement system to manage information of enterprises certified with the eco-friendly materials and monitor green purchasing records. Newly registered enterprises are organized according to their eco-friendly materials and certification information, and additional points are rewarded for such materials as a way to incentivize suppliers to obtain green certifications. Moreover, we regularly update the major policy details on the GS-Constmat, our internal communication webpage, to encourage green purchasing.

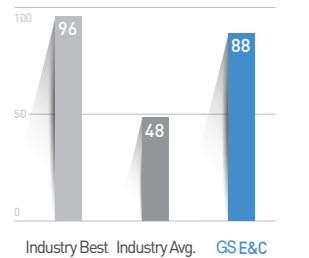
### Green Purchases

(Unit: KRW 100 Million)

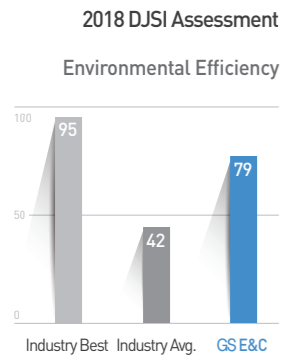
	2016	2017	2018
Green purchases	585.65	740.03	952.92

### 2018 DJSI Assessment

#### Climate Change Strategy



## Reducing Environmental Impact



### Waste Management

#### Real-time Waste Management

GS E&C strengthens its waste management through thorough waste separation, treatment, storage and recycling of rapidly growing waste alongside an increase in the project volume. GS E&C connected the legal waste disposal system and in-house construction waste management system in real-time for efficient management so as to achieve the target of 90% waste recycling rate by 2020. The waste generated is divided into six major construction wastes, and the amounts of waste recycled is managed in real-time.

Generated Waste (Unit: Ton)

	2016	2017	2018
Generated wastes	293,037	259,329	664,663

\*High increases in waste is attributed to demolition works at redevelopment and reconstruction sites.

#### Recycle of Construction Waste on Site

GS E&C is committed to preventing waste of resources by minimizing landfill or incineration rates of construction wastes while increasing recycling rates. To achieve this, GS E&C established its internal recycling procedures for construction waste and set up precautionary measures. In 2018, GS E&C recycled 107.2 ton of sewage sludge generated on the sites of Expressway Gwangju Beltway Package 2 and Saemangeum East-West Road Line 2 (#1). The recycled sludge was used as filling material and refilling soil.



\*Transporting the construction sludge for recycling

### Waste Treatment for Resource Circulation

With rapid increases in resource and energy consumption, waste generation, waste incineration and landfill disposal are also on the rise. In this regard, the "Framework Act on Resource Circulation" was promulgated in January 2018 to promote waste recycling, and the "waste disposal allowance" was introduced to incentive reductions in waste incineration and landfill, which cause pollution in air and soil. GS E&C pays this allowances for wastes being incinerated or buried in accordance with national efforts to transform into a resource recycling society. In 2018, the GS E&C's recycled wastes increased by 168% from 2017, and continues efforts are made to reduce incineration and landfill treated wastes.

Waste Treatment (Unit: Ton)

	2016	2017	2018
Recycling	281,458	241,777	649,890
Landfill & incineration	11,579	17,553	14,773

### Construction & Operation of Waste-to-Energy Plant

Waste-to-energy technology is a resource recovery technology that produces electricity and energy from waste incineration. It is essential to address rapidly rising waste issues and to produce electricity and steam necessary for our lives. GS E&C has a record of 21 construction projects of waste-to-energy plants in Korea, including Mapo Resource Recovery Plant which guarantees world-class performance, as well as 20 facility operation projects, using its competitive waste-to-energy technologies such as the automatic waste collection system, Mechanical Biological Treatment (MBT) for wastes, stoker incineration technology and more.

### Water Consumption Management

#### Operation of Smart Water Supply System

The Smart Water Solutions (Optimal Design and Optimal Operation Management) developed by GS E&C based on ICT, Internet of things, and big data is used for real-time measurement as well as efficient management of the water supply design and operation. It is currently used for building the water supply in Brazil and its operation to reduce water consumption and to prepare for the possible water shortage crisis through stable water supply.

#### Water Circulation System through Sewage Treatment Water Reuse

To prepare for the water shortages, a sound and sustainable water circulation system is necessary, and thus, sewage treatment water should be recognized as a resource to be recycled, not merely wasted. GS E&C utilized state-of-the-art sewage water reclamation technology via reverse osmosis membranes to transform sewage water into valuable resources, such as supplying 90,000m<sup>3</sup> (ton) of reclaimed wastewater, in addition to reducing river pollution.

Amount of Water Used (Unit: m<sup>3</sup>)

	2016	2017	2018
Total	2,762,239	2,698,668	2,687,953
Service water	1,840,577	2,013,403	1,935,270
Ground water	517,883	307,813	426,384
River Water	403,780	377,453	326,299

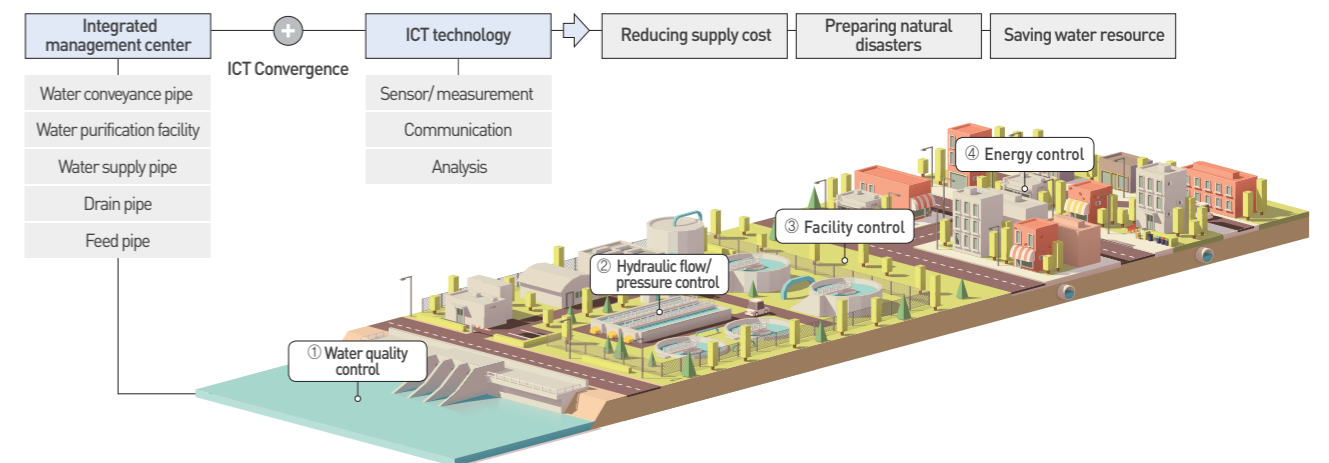
### Protection of Endangered Wildlife

GS E&C minimizes the impact on endangered wildlife that may occur during the construction process through the Bukpyeong 2nd General Industrial Complex Project and Singapore C937 construction sites. Specifically, GS E&C successfully created alternative habitats for endangered wildlife, such as Korean Golden Frog and a narrow-mouthed toad in the course of the railway test track completed in March 2019. The inhabitation of the Korean Golden Frogs was identified during the construction process in 2015. GS E&C thus launched a conservation council consisting of diverse stakeholders including construction companies, clients, experts, local governments and environmental organizations and established plans for alternative habitat selections and monitoring. After coordinating the opinions between the members, alternative habitats were built in neighboring locations with similar environments, and the periodic monitoring was performed on the alternative habitat by the end of 2018 to confirm stable settlement of the endangered species.

### Protection of Water Resources through Rainwater Recycling

GS E&C uses manufacture water used for a hydrostatic test on oil and LNG storage tanks as heavy water. At the Anyang Combined Heat Power Plant in 2018, the reuse water used for the hydrostatic tests performed on one 11,000m<sup>3</sup>-capacity filtrate tank and two clean 2,000 m<sup>3</sup> - capacity tanks recycled as heavy water. GS E&C's company-wide dedication brought about a 73% cost reductions of manufacture water, Korea population basis 27-days' worth of energy savings and ultimately saved KRW 310 million.

### Advanced Integrated Water Management System



# Focus on Environmental Values



## Environmental Impact Minimization through Proactive Worksite Management



### Highest Level Singapore GGBS Certification



### Managing & Recycling Waste on the Singapore Worksite

As much as GS E&C operates a total of 197 worksites in 17 countries, the company makes every effort to comply with the environmental regulations in accordance with local regulations and guidelines and minimize adverse impacts that construction sites may impose on local communities. GS E&C's commitment to thorough waste management and reduction at its construction sites in Singapore, including the T301, has been recognized through the certification of the Star rating of the Green & Gracious Builder Scheme (GGBS), overseen by the Building & Construction Authority (BCA) of Singapore. Striving to "Build the Green Construction Sites," GS E&C has established eight key performance indicators for concrete waste, rebar waste, and electricity consumption by site. Various practices have been implemented at the construction sites, and policy efforts have been made for over 11 factors such as noise, vibration and water quality to reduce their environmental impact. Notably, generated wastes are classified according to their type to facilitate systematic management, and discarded building materials such as concrete and bricks are recycled on construction sites in 20 different methods, including water tanks, stairs and lamps.

<sup>1</sup> Steel formwork used instead of wooden formwork for wood waste reduction  
<sup>2</sup> Process wastes and debris recycled as lightweight aggregates on road  
<sup>3</sup> On-site garden using surplus concrete

## "Voluntary Agreement to Counter Highly-concentrated Fine Dust"



### Making Efforts to Reduce Fine Dust on Construction Sites

Fugitive dust is often generated near residential areas, causing harm to neighboring residents; however, it is difficult to control due to the inherent characteristics of how it is discharged. Moreover, relevant regulations and their effectiveness are often undermined by the limitations of administrative law. Recognizing that public health and safety is threatened, construction companies and the Ministry of Environment of Korea have collaborated to reduce fugitive dust. In order to decrease fine dust generated on construction sites, GS E&C has been participating in the "Voluntary Agreement to Counter Highly-concentrated Fine Dust" organized by the Ministry of Environment of Korea since 2016. GS E&C signed this voluntary agreement along with other major construction companies to protect public health and improve air quality by reducing fine dust emissions around residential areas. Furthermore, before the full implementation of the Korea Digital Optical Method, GS E&C is taking the initiative for environment conservation through on-site management, such as fugitive dust monitoring based on the government's fine dust emergency measures as well as adjusting and reducing the construction period of sites with large volumes of fugitive dust.

◀ Voluntary Agreement to Counter Highly-concentrated Fine Dust

## Maximum 50% Reduction of Construction Site Noise Using the Noise Barrier



### Bolstering Construction Noise Management

Civilian complaints are rising due to noise and vibration from construction sites. To minimize any adverse effects, GS E&C is making various efforts to cut down on the on-site noise and vibration by periodically conducting measurements of noise and vibration; disclosing external noise data in real time; installing aerial sound barriers, portable soundproof walls and removable soundproof panels as well as implementing a drop-down system for dismantling the aluminum formwork. In addition, GS E&C developed a noise management application capable of measuring on-site noise and establishing a noise-arresting plan from the convenience of your smartphone. This aims to improve the company's capabilities to manage noise-related complaints by preempting on-site noises and automatically analyzing the effectiveness of implemented actions. Through such methods, GS E&C is stepping up its research and development activities with the help of the latest technologies, such as noise sensors that attach to construction equipment, silent drones, 3D noise maps, etc. A prime example is the "Noise Barrier" developed at the Yongin Technology Research Center. GS E&C has been effectively utilizing the Noise Barrier, a lightweight and eco-friendly sound insulator of excellent quality, to reduce the noise generated on site by up to 50%. Thanks to its convenient installation, it is currently in use at many construction sites.

◀ On-site noise management application





# Boosting employee well-being

## Human Value, Why Is It Important?

As demands for technology and management of securing talented professionals and developing expertise levels are key to the company's technological growth in terms of capacity and quality. Furthermore, there is an innate difficulty in the safety management at construction sites due to the structure of large projects involving main contractors and subcontractors. As such, it is the nature of the construction industry what causes a huge impact on the employees and those of the partner companies throughout the entire business process.

## Human Value, How Is It Created?

GS E&C continues to cultivate global talents and deepen its organizational capacity to secure competitive advantage in domestic and overseas construction markets. Furthermore, GS E&C strives to cultivate a human-centered work environment so that its employees can demonstrate their full competencies and achieve a work-life balance. On domestic and overseas worksites, safety trainings are thoroughly implemented to prevent accidents of our people as well.

Developing Employee Expertise	Prioritizing Our People	Ensuring a Safe Workplace
<ul style="list-style-type: none"> <li>Systematic talent development strategy</li> <li>Strengthening employee competence</li> <li>Global-standard training programs</li> </ul>	<ul style="list-style-type: none"> <li>Fair performance review and compensation</li> <li>Family-friendly benefits</li> <li>Diversity through inclusive institutions</li> <li>Transparent labor-management relations</li> <li>Human rights protection</li> </ul>	<ul style="list-style-type: none"> <li>Establishing and implementing a safety management system</li> <li>Activating safety and accident prevention programs</li> </ul>
<b>Relevance to Material Issues</b>		
<ul style="list-style-type: none"> <li>③ Labor and management relationship</li> <li>① Diversity and equal opportunity</li> <li>② Human rights assessment</li> </ul>		<ul style="list-style-type: none"> <li>④ Occupational health and safety</li> </ul>

## Human Value Created by GS E&C



**54.4 Hours** (▲43.2%)  
Training per Employee



**Implementation of 52-hour Workweek**  
Scope Expansion to Overseas Sites



**5,263 Persons**  
Safety Innovation School Graduates (cumulative)



**ISO 29990 Certified**  
Global Talent Training Course



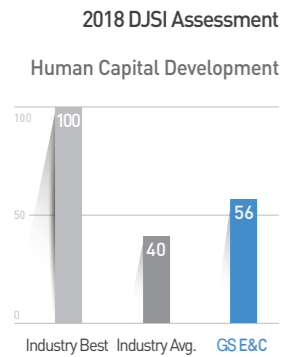
**2018 Family-friendly Company Certification**  
Ministry of Gender Equality & Family



**Establishment of Safety Innovation School in Singapore**  
Expansion of Overseas On-site Safety Support



## Developing Employee Expertise



### Employee Competency Enhancement Systematic Talent Development Strategy

GS E&C aims to cultivate global talents with the skills and leadership necessary to contribute to achieving performance goals. GS E&C's Human Resources Development System consists of a "Leadership Course," "Job Specialization Course," and "Global Course." These training programs utilize various platforms such as group training, online training, video training, smartphone applications, etc. to help employees upgrade their business performance capacities.

#### Strategy for Organizational Performance

Cultivation system	Curriculum	Trainees
<b>Leadership</b> Cultivating excellent leaders	<ul style="list-style-type: none"> <li>Targeted to executives and team leaders</li> <li>Provide leadership diagnosis and education</li> <li>Encourage change in leadership behavior</li> <li>Expanded to lower-level employees (expected)</li> </ul>	1,123 persons
<b>Job Expertise</b> Cultivating competent talents	<ul style="list-style-type: none"> <li>Targeted to employees</li> <li>Provide on-site employee performance competencies</li> <li>Provide training according to job level</li> <li>Provide training to newly transferred employees</li> </ul>	29,908 persons
<b>Global</b> Cultivating global talents	<ul style="list-style-type: none"> <li>Targeted to executives and employees</li> <li>Promote performance competencies for overseas projects</li> <li>Provide foreign language training</li> <li>Cooperation training for Korean employees posted overseas</li> </ul>	3,206 persons

#### Talent Development Performance

(Unit: persons, KRW 100Million, hours)

	2016	2017	2018
Trainees (Cumulative)	31,385	34,802	34,237
Total training costs	32.8	17.4	13.4
Training hours per trainee	55.0	38.0	54.4



\*ISO 29990 Certification Ceremony

### Global Level Trainings

GS E&C needs global talent that can perform global-scale projects. Accordingly, global training courses and the GS E&C Speaking Test (GST) are provided to our employees. The GST is GS E&C's internal English speaking test developed to strengthen global competencies that will generate tangible results in overseas businesses as well as assess employees' proficiency levels when registering for the company global language course. The test is also used to evaluate whether an employee is eligible for overseas business and as English proficiency accreditation for promotion opportunities. The GST is required for all employees working at GS E&C, and while this speaking test is taken in person, those working on sites may take it via video call. In 2018, GS E&C's testing program obtained the ISO 29990 international certification<sup>1</sup>, showing that global training programs and GST provided by GS E&C meet international standards. Such programs will be instrumental in securing the success and reliability of the company's human resources development strategies.

### Organizational Competency Management

GS E&C conducts an annual organizational competency survey, in which all employees are required to participate, to accurately identify the organization's competencies, diagnose organizational culture and upgrade business performance capacity. This survey diagnoses nine elements that are essential to management activities: strategy, value and culture, business processes, individual and team competencies, human resources management, organizational structure, compensation and recognition, leadership, and performance. The strengths and weaknesses of the organization are analyzed accordingly to undertake improvement programs. In the 2018 company-wide organizational competency survey, the percentage of those who responded positively to the organizational capability assessment was 58.9%, up by 0.5%p from 2017. This slight increase can be attributed to the results of GS E&C's constant work efficiency improvement activities.

#### Employee Satisfaction Survey

(Unit: %)

	2016	2017	2018
Employee satisfaction level	57.1	58.4	58.9

## Prioritizing Our People

### Fair Evaluation & Compensation

#### Performance Cultivating Management System

GS E&C operates a performance management system that cultivates and promotes individual performance while improving employee expertise. Beyond the existing performance management paradigm, GS E&C's internal evaluation is divided into two criteria: achievement and competency. Challenge-inducing, yet achievable business goals and self-development plans are established according to individual job positions, and feedback is regularly provided. To ensure a fair evaluation, various methods such as MBO assessment<sup>2</sup>, multi-faceted evaluation and relative performance evaluation are conducted. The evaluation grade is determined through the evaluation coordination meeting attended by all executives within each business division and headquarters, and the results are verified by HR monitoring results to enhance the objectivity of the evaluation.

#### Employee Performance Evaluation

(Unit: %)

	2016	2017	2018
Performance evaluation rate	95.0	95.3	94.6

### Performance-based Personnel Management System & Compensation

GS E&C operates a system to provide reasonable compensations for employee performance. Fair compensation and rewards are given based on proven results without any discrimination based on gender or race. Individual performance is reflected in employee salaries and possible promotions to keep employees motivated, while continuous feedback is utilized as an opportunity to complement any skills in need of improvement. As for top management, performance across all areas, from finance to level of recognition, environment and social achievements, are all reflected.



### Diversity with Inclusive Systems

#### Provisions of Equal Opportunity

GS E&C implements an anti-discrimination policy to prevent any type of discrimination based on gender, age, nationality, marital status, health status or political orientation. Opportunities for compensation and promotions are granted solely based on the needs of the business. GS E&C also continues to take into account the proportion of women, handicapped persons, veterans in the recruitment process to provide equal opportunities for women and minorities.

While it is true that female employee and manager ratios are not as high due to the nature of the construction industry, GS E&C is providing continuous support to cultivate female leadership and aims to secure more women in senior management positions in the long term by selecting talented women with excellent managerial skills. In addition, handicapped persons, veterans are given preference in recruitment, and GS E&C adopts a mandatory recruitment system to hire more than one employee with disabilities at each construction site, mainly for positions in which safety is ensured. In 2018, GS E&C hired a monthly average of 110 handicapped persons. GS E&C is doing its very best to keep up with the government regulations to hire employees with disabilities.

#### 2018 Equal Opportunities

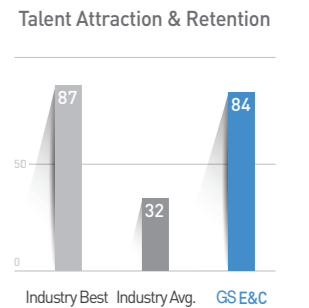
(Unit: persons)

Female employees	Handicapped persons	Veterans
635	110	97

### Support for Foreign Workers

All foreign workers at GS E&C are given the same rights and responsibilities as their Korean full-time counterparts except regarding wages. Foreign part-time workers qualify for a full-time position if their individual performance is deemed eligible. In 2018, one foreign worker qualified to become a full-time employee, and likewise, six foreign employees are expected to follow in 2019. GS E&C implements an integrated HR policy established in 2015 for full-time GPs (Global Permanent) to comply with regulations such as prohibition of sexual harassment and grievance processes, which are directly related to human rights and employment. Some of the regulations were revised in 2018 to strengthen compensation during foreign employees' required stay in their country of origin or during their visa issuance period. In addition, GS E&C provides orientation and consultation services in regard to life in Korea. In 2018, GS E&C began publishing its e-newsletter in English to share its corporate activities across the board, building a sense of belonging to GS E&C.

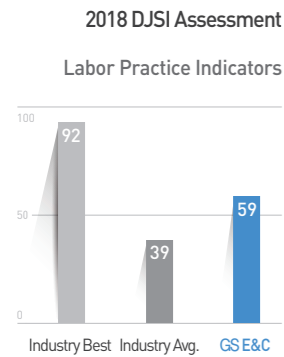
### 2018 DJSI Assessment



<sup>1</sup> ISO 29990 : International standards on quality assurance for learning services

<sup>2</sup> MBO (Management by Objectives) assessment: A performance assessment system that reviews objective-centered performance by an employee, based achievement levels





### Family-friendly Benefits

#### Family-friendly Company

GS E&C was accredited as Family-friendly Company in 2018 for its exemplary operation of family-friendly programs, including childbirth and childcare support, leave-on-time system, flexible working hours system and establishment of a family-friendly workplace culture. GS E&C was also selected as one of the Top 20 Major Corporations among the newly certified Family-friendly Companies.

#### Childbirth Support

In response to an emerging social problem of declining fertility rates, GS E&C has created a family-friendly environment that enables employees to focus on their work even after pregnancy. Specifically, GS E&C offers childbirth and childcare support to all employees by providing financial support to cover childbirth expenses, operating in-house day care facilities, an infertility/subfertility leave system, as well as expanding childbirth and parental protection support, which in turn improves work efficiency. The employee rate using parental leave is on the steady rise, and more than 90% of GS E&C employees who return to work after their parental leave stay with the company for longer than 12 months after returning.

#### In-House Daycare Facilities

GS E&C was the first company in the domestic E&C industry to open an in-house daycare center in 2010 to achieve balance between work and family. At the center, "GS E&C Nursery of Hopes & Dreams," toddlers from the age of 8 months to preschoolers are accepted into six different classes operated from 7:30 AM to 7:30 PM and provided with education customized to each age group.

#### Childbirth & Childcare Support (Unit: persons, %)

	2016	2017	2018
Parental leave users	31	32	27
Parental leave users	33	50	51
Female parental leave users	24	31	30
Return rate after parental leave	97	97	98

### Transparent Labor-management Relations

#### Open Management Program

GS E&C implements a CA (Change Agent) system to facilitate communication between the CEO and the employees. The CA Department is responsible for the planning and execution of organizational competency improvement programs by division, headquarter and individual office; the department also communicates with employees to provide support in the leadership improvement programs and engage in company-wide social contribution activities. GS E&C organizes CA workshops and external trainings to revitalize the CA system and encourages employee engagement by providing financial support for engagement activities and end-of-year volunteer activities.

#### Labor-management Cooperation (Unit: 102-41 402-1)

GS E&C operates a labor union which consists of 910 full-time employees (43.7%), excluding positions subordinate to management divisions (i.e., financial administration, planning, human resources and administrative affairs). GS E&C respects and ensures the three basic labor rights by, for example, signing a wage agreement (every year) and a collective agreement (every other year) through labor-management negotiations. GS E&C notifies the labor union about matters deemed important by management without delay, for consultation, and the labor-management conference is held once every quarter. In 2018, the conference agenda consisted of issues related to the common interests of labor and management, including the improvement of working conditions such as safety and health, promotion of employee well-being and employee performance evaluation.

#### Labor Union Membership (Unit: persons, %)

	2016	2017	2018
Union members	1,107	970	910
Union membership rate	41.8	41.4	43.7

#### Current Management Agenda Conferences

GS E&C discusses its business status and management performance through its Management Committee and Current Management Agenda Conferences, and relevant meetings. During the conferences, information regarding the current business environment and annual business strategy is shared, along with strategies to enhance organizational capabilities and so forth. The Management Committee deliberates the business management issues, such as company-wide mid- to long-term business strategies, major implementation tasks and major risk factors in management.

### Preemptive Human Rights Protection

#### Human Rights Training

GS E&C prevents human rights violations by internalizing a culture of respect and regularly conducts education to instill a proper awareness of human rights. In 2018, 6,764 employees completed the annual 2-hour sexual harassment prevention training, and 6,609 employees completed a 1-hour awareness building session on rights of handicapped persons, which was newly introduced in 2018.

#### GS E&C Human Rights Assessment Survey (Unit: 412-2)

##### Category of human rights violation/grievance

Prohibition of discrimination in employment	2.16
Guarantee of the right to organize and collective bargaining	2.02
Prohibition of unjust labor	1.82
Guarantee of industrial safety	1.92
Responsible supply chain management	1.87
Protection of rights of local community	1.75
Guarantee of environmental rights	1.88
Protection of consumer rights	1.88
Violation of employee human rights	1.81

\* Scale : 1 - Never occurs  
5 - Often occurs

#### Employee Grievance Process (Unit: cases)

	2016	2017	2018
Korea (domestic)	8	8	7
Overseas	2	5	3
Total	10	13	10

### Prevention of Human Rights Risks

GS E&C continues to expand the scope of its human rights assessment to accurately understand the human rights status within its supply chain, beyond simply amongst its employees. GS E&C's human rights survey conducted in 2017 was only targeted to employees; however, in 2018, the scope was expanded to include partners, joint ventures and subsidiaries to identify the current status of human rights within the supply chain. Survey respondents totaled to 251 stakeholders and provided answers regarding experience or witness across nine categories, including the prohibition of employment discrimination and freedom of association and collective bargaining. The average score of human rights violation and grievances was 1.9 points (out of 5), indicating that the status of human rights protection in the supply chain of GS E&C is favorable; yet detailed responses revealed that the treatment of part-time workers, unfair labor activities and the safety environment at workplace need improvement. GS E&C will strive to develop appropriate improvement measures and responsibly manage its supply chain.

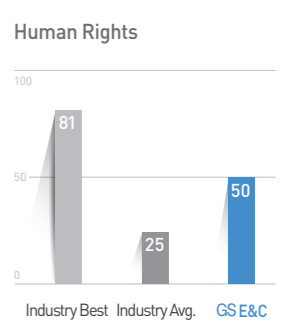
#### Employee Grievance Resolution

GS E&C makes regular visits to the worksites, both domestic and abroad, to directly listen to and handle grievances, thereby alleviating the employees' difficulties at work and improving their well-being. In 2018, GS E&C collected feedback from its employees overseas and improved its regular holiday system overseas in July. Specifically, GS E&C became the first major construction company in Korea to expand the regular vacation from three times a year to four, boosting employee spirits abroad by providing more opportunities to meet with family members. Furthermore, regulations on domestic and international business travel expenses were ameliorated by eliminating differences across all positions as well as upgrading accommodation and daily expenses to senior managerial standards.

#### Online Grievance Processing Bulletin

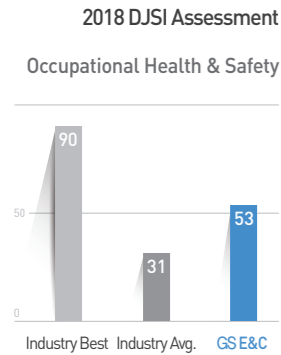
GS E&C operates the VOE (Voice of Employee), an online grievance processing bulletin that serves as a channel to listen to any complaints that the employees might have and address them promptly. In case an employee posts an inquiry on the board, the corresponding administrator leaves a reply no later than two weeks, and the response is rated by the inquiry submitter. In 2018, a total of 43 complaints were submitted, including requests for improvement of the conference room booking system, and all submissions were processed accordingly.

### 2018 DJSI Assessment





## Ensuring a Safe Workplace



### Safety & Health Management System

GS E&C put "safety" at the forefront as its core organizational value for 2018. In alignment, while the Management Committee and Q-HSE Operations Committee reported safety issues to chief directors of each business division, the CEO also emphasized his commitment to safety management. The focal point is placed on bolstering the management of quintessential safety rules and the safety management of equipment in accordance with the company's safety and health policy – "Plan, Inform and Act." Every single GS E&C worksite committed to achieving zero critical accidents.

### ISO 29990:2010 Certification (Education and Training Management System)

On August 29th, 2018, GS E&C's Safety Innovation School became the first in the Korean construction industry to be certified the ISO 29990:2010, an education and training management system issued by the International Standard Organization (ISO). With this certification, GS E&C successfully secured international trust in its safety and health trainings. To provide practical safety training applicable to the rapidly changing business environments, GS E&C operates a Curriculum Development Deliberation Committee, composed of on-site employees and experts, and develops an optimized curriculum centered on the trainees.



\*International standard certification of education and training management system

### Casualty Prevention

#### Safety Traffic Signal System

GS E&C has been operating the Safety Traffic Signal System for the fourth year now, aiming to examine the level of safety management on the worksite and actively preparing for any possible accidents. In 2018, GS E&C bolstered the support for inspection on acceleration works<sup>1</sup>, high-risk operations and worksites with poor evaluation results to ensure practical support specified to each construction site. In case the Safety Traffic Signal assessment reveals a worksite to have a mediocre safety level, GS E&C has the worksite carry out a workshop to improve the safety and health of workers and provides support for improvement areas through collaboration with relevant departments. For projects involving equipment that could cause a crash accident, the safety status is checked by intensive inspection to prevent critical disasters. On the other hand, exemplary worksites that received a "Green" for three consecutive Safety Traffic Signal evaluations are granted autonomous safety activities for one year and are encouraged to do more by awarding them with a certificate plaque and prize money. In the first half of 2018, seven worksites were titled Best Practice Sites.

#### 2018 Safety Traffic Signal System

	Safety Signals Warning System	Early Interim Inspection	Inspection Support	Total
Inspection & evaluation	152 cases	250 cases	33 cases	435 cases
Best practice sites	7 sites			



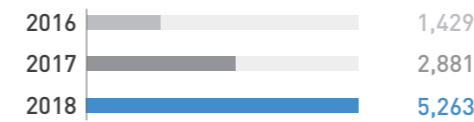
\*"Best Practice Site" certification

### Expanded Operations of Safety Innovation School

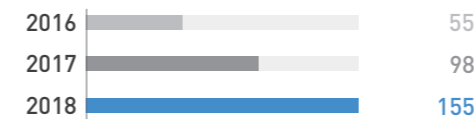
GS E&C has been operating the Safety Innovation School since 2015, providing worksite-visit training services. Safety awareness-raising trainings to cultivate an appropriate safety culture are provided to on-site workers, as well as customized training courses centered around firsthand experiences and functional practice trainings, such as periodical special safety training. Furthermore, safety and health manager trainings, required by law, are incorporated into the curriculum but adjusted to meet specific company needs. In 2018, GS E&C developed eight health and safety training programs based on VR (Virtual Reality) and secured eight more education/trainings through business agreements, totaling 16 types of "VR- experience health and safety training services." These endeavors brought about a 96% increase in on-site training support in 2018 from the prior year. GS E&C will continue to improve the effects of safety education by adding more educational contents in the future.

#### Safety Innovation School (Unit: persons, visits)

##### Safety Innovation School graduates (cumulative)



##### Safety Innovation School visits



### Reinforcement of Equipment Safety Management

In 2018, GS E&C designated professionals for equipment examination and strengthened overall management based on the number of tower cranes (T/C) to prevent possible safety accidents that may take place during the installation, dismantling and ascending operation of T/Cs. More specifically, the equipment inspectors will stand by at a worksite where there are more than 5 T/Cs, while the job will be outsourced if the number of T/Cs is smaller. Moreover, GS E&C will train three more equipment experts to add to the current four experts, and provide customized on-site trainings for management personnel to ensure independent equipment inspection and management through systematic support.

#### 2018 Equipment Expert Inspections

Inspection activity	Details	Times
Intensive management of tower crane	Supervision of installation and dismantling work	299
	Supervision of ascending and descending works	143
Preliminary inspection of construction machinery	Tower crane, construction lift	127
	Pile driving machine, mobile crane, etc.	95

#### On-site Customized Support Training Programs

Safety-conscious mindset	Safety management of installed wire
Intensive T/C Signal-person training	First aid (CPR)
Understanding basic GS E&C safety rules	Safety training for virtual reality (VR) experience
Safety management of confined spaces	Keeping a worksite clean and tidy (5 S/3 C) <sup>2</sup>
Practical risk assessment	Construction safety: Scaffold building
Fire prevention: Safety management	Emergency simulations

<sup>1</sup> Acceleration works: Construction projects in which entire personnel and equipment are concentrated in order to meet the construction period.  
<sup>2</sup> 5 S: Sort, Set in order, Shine, Standardize, Sustain  
3 C: Consistency, Capability, Cultivation



### Safety Management for Foreign Workers

GS E&C makes a concerted effort to protect foreign workers from occupational hazards at worksites, in Korea and abroad. In Korea, the Safety Health Team first hired employees responsible for the development of training materials in Chinese and translation in 2016 with aims to provide safety and health trainings mainly to Chinese workers accounting for the majority of the foreign workers on site. In 2018, 21 chapters of safety and health training content was developed and distributed to Chinese workers on each site. Furthermore, the direct support of Chinese interpreters on 26 worksites contributed greatly to the prevention of safety accidents among foreign workers. In addition, safety and health training materials were distributed in 12 different languages, including Chinese, to ensure that foreign workers complete the safety and health trainings.

As for overseas worksites, high-risk sites are selected through environmental analysis by country and quarterly on-site audits are conducted. For the selection of overseas partners, GS E&C encourages the voluntary safety activities by reflecting it in the safety assessments. In addition, themed safety activities are carried out monthly at overseas sites and video trainings are conducted on a regular basis. The results of a 5-year accident tendency analysis on overseas sites are shared with relevant sites, and the major risk factors and measures are distributed to encourage participation of field employees and workers in safety activities.

### Executive Member Safety & Health Management

GS E&C ensures that the CEO and executives make regular visits to the worksites to raise safety awareness among employees and encourage further efforts. In 2018, the CEO and CSO (Chief Safety Officer) visited a total of 10 sites and 262 sites, respectively. These site-visits actively deliver legal and company-enforced safety and health policies to the worksite and employees, in addition to emphasizing accident prevention for the improvement of on-site safety. Beginning in 2019, GS E&C will expand the scope of worksite visits from the executives of relevant departments to all executives to ensure responsible safety management.

### 3 Major Health Control Tasks

In 2018, GS E&C redefined the previous three major health control tasks from "Enclosed spaces, Work environments, Controls for hazardous substances" to "Enclosed space operations management, Controls for hazardous substances, Heat-related illness management." Along with the adjusted priorities for health-related tasks, a coaching guidebook for health works was published accordingly, and training programs were further subdivided for health managers, bolstering internal safety and health personnel. GS E&C also held regional council meetings to enable health managers to improve their task efficiency through communication.

#### Redefined 3 Major Health Management Tasks



#### Executives Worksite Visits (Unit: visits)

Year	CEO	CSO
2016	10	100
2017	10	118
2018	10	262

### Current Status of Safety

#### Status of Workplace Fatalities

Experiencing three to four fatalities consistently in the recent five years, GS E&C carefully analyzed the patterns of accidents and made an effort to prevent disasters with high mortality rates. As a result, GS E&C witnessed two critical industrial disasters and one fatality case in the category of technical safety in 2018. GS E&C will continue to engage in enforcement of preventive actions against unsafe behavior by workers and strengthen the management of the techniques prone to accidents and construction safety activities, seeking to achieve the goal of "Zero Critical Accidents."

#### Critical Injuries of Partners (Unit: persons)

	2016	2017	2018
Industrial safety	4	4	2
Construction/technical safety	0	0	1
<b>Total fatalities</b>	<b>4</b>	<b>4</b>	<b>3</b>



\*On-site Visit CSO Inspection



\*On-site Visit CEO Inspection

### Occupational Injury Loss Management of Employees & Contractors

GS E&C actively manages the injuries of employees and the subcontract workers based on its management philosophy that puts the employee safety first. As for the employees of GS E&C, their sick leaves are managed based on the type of injury and the number of sick days. The number of injured subcontract workers in Korea and that of the subcontract workers overseas are managed by branch offices to better identify the status of work injuries and manage losses.

#### Employee & Partners Occupational Illness/Injury (Unit: persons)

	2016	2017	2018
Employee occupational injury	0	0	1
Employee LTIFR <sup>1</sup>	0	0	0.06
Contractor occupational injury	262	265	379
Contractors LTIFR <sup>1</sup>	0.94	1.15	1.31
Employee occupational illness	47	52	47
Employee OIFR <sup>2</sup>	3.13	3.63	2.87

<sup>1</sup> Lost-Time Injury Frequency Rate: (Number of lost-time injuries in the accounting period) / (Total hours worked in accounting period) x 1,000,000

<sup>2</sup> Occupational Illness Frequency Rate: (Number of occupational illnesses in the accounting period) / (Total hours worked in accounting period) x 1,000,000



# Focus on Human Values

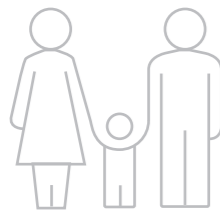


## Shorter Hours, Greater Efficiency



▲ GS E&C employees

### Family-friendly Company Certification (Ministry of Gender Equality & Family)



#### Change in Work Culture

Work-life balance is increasingly gaining social buzz in recent years. The Korean government and corporations alike continue making various efforts to raise work efficiency, ensure higher-quality life after work and create a culture that balances family and work. Acknowledging the extended work periods as factor in burdening both gross national happiness and productivity, the government initiated the revision of the Labor Standards Act in February 2018, resulting in the enforcement of the 52-hour workweek system. The maximum working time in Korea used to be 7 days (56 hours) per week, including holidays, plus 12 hours of overtime work, totaling a maximum of 68 hours per week; now, it is limited to 52 hours per week with working holiday hours included in the 12-hour overwork time.

### 52-hour Workweek Enforcement

#### PC On/Off System Implementation



#### Introduction of the 52-hour Workweek System

GS E&C was quick to introduce the 52-hour workweek system beginning June 2018 and expanded it to overseas sites in July 2018. GS E&C also adopted a flexible working hour system. The flexible working hour system makes up for any extensions in the statutory working hours of any given week for the needs of a particular project, by shortening the working hours during other periods to ultimately achieve an average of 40 working-hours per week. GS E&C also introduced the PC On/Off system to ensure enhanced compliance with the 52-hour workweek system. The PC On/Off system reduces unnecessary overtime work and increases concentration and efficiency. GS E&C intends to establish an advanced organizational culture through initiatives such as leaving work on time, actively using vacation days, having a sound culture of staff events and more.

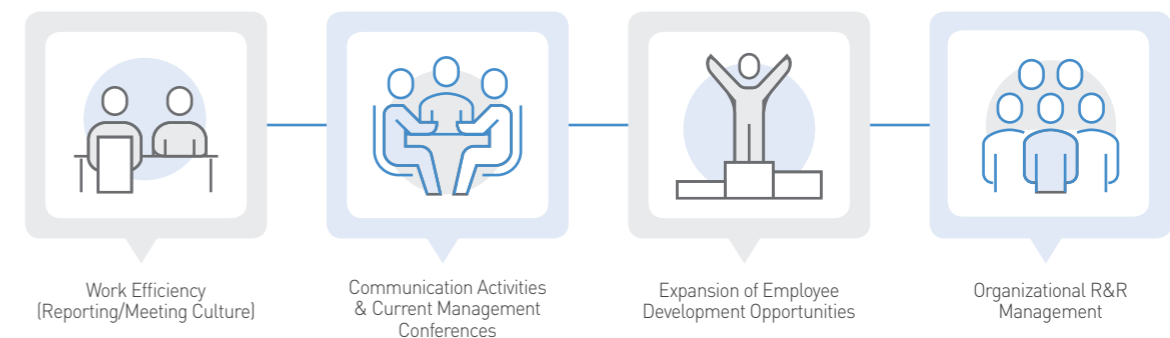
### Average Improvement Action Plan Execution Rate 96.3%



#### Improvement Activities for Organizational Capacity

Within GS E&C, 17 teams carried out improvement programs across four areas of work efficiency, competency development, communication activities, and R&R (responsibilities and roles). As part of improving work efficiency, 10 teams established and monitored the "Ground Rules" to improve reporting and meeting culture. Specifically, each team decided on meeting rules, such as preliminary sharing of meeting agenda, strict punctuality, ending meetings on-time, while improving the reporting culture by minimizing unnecessary paperwork to facilitate free and efficient communication. In addition, individual work efficiency has been improved through clear work allotment. Each team identified and improved uncertainties in R&R between on-site departments and examined the implementation of improvement activities amongst participants of the previous workshop.

### 2018 Key Tasks for Improved Organizational Capacity Development





# 05

## GS E&C SOCIAL VALUE



Family supported by the Study Room of Dreams & Hopes



# Boosting value together

## Social Value, Why Is It Important?

Responsible supply chain management is increasingly moving into the global spotlight especially due to the nature of the construction industry, where business operates with numerous stakeholders, from the pre-construction stages to completion. Supply chain management, particularly in the construction industry, goes beyond simply risk management to support for partners to secure their competitiveness; it involves joint technology development and overseas ventures. In addition, quality control is integral to deliver the utmost satisfaction to customers who are direct consumers of buildings, residential areas, infrastructure, and plants as well as corporate clients. Finally, as projects are based in communities, efforts to rejuvenate the community is also necessary.

## Social Value, How Is It Created?

GS E&C offers a wide range of support to grow with its partners and maintain the highest level of satisfaction among both customers and corporate clients through quality assurance activities. At the same time, GS E&C strives to be a responsible global corporate citizen through social contribution activities that tackle social problems.

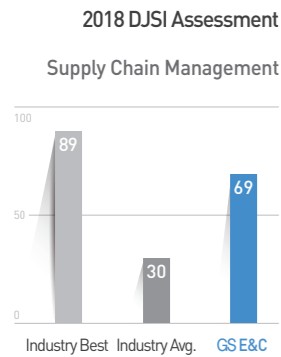
Growing with Partners	Ensuring Quality for Customers	Brightening the Community
<ul style="list-style-type: none"> <li>Encouraging partners' social responsibility</li> <li>Providing an array of support for shared growth</li> </ul>	<ul style="list-style-type: none"> <li>Reinforcing systematic quality inspections</li> <li>Customer satisfaction surveys</li> </ul>	<ul style="list-style-type: none"> <li>Managing social contribution activities comprehensively</li> <li>Undertaking social contribution activities to alleviate social issues</li> </ul>
Relevance to Material Issues		
⑥ Indirect contributions to society through infrastructure		

## Social Value Created by GS E&C

<p><b>KRW 30 Billion</b> Shared Growth Funds Deposit</p>	<p><b>Partner Ratio with CSR Risk 6.1%</b> (Economic, environmental, social)</p>	<p><b>KRW 5.31 Billion (▲46.7%)</b> Social Contributions Increase</p>
<p><b>KRW 510 Million</b> Partner Joint Technology Development</p>	<p><b>8.7 (out of 10)</b> Corporate Client Satisfaction</p>	<p><b>260 Families (cumulative)</b> Dreams &amp; Hopes Study Room</p>



## Growing with Partners 102-9



### Encouraging Partner Social Responsibility

#### Selection of Partners

GS E&C selects partners using an automatic selection system based on "fairness," "objectivity" and "transparency." Then, partners are registered in the partner registration system and scored through a grading system divided into the categories of main focus, candidate status, and verification, to grant the higher scoring ones' consent to participate in the bidding process. GS E&C advocates for the enhancement of competitiveness among its partner companies in a fair competitive environment; as a result 33 companies were registered as partners in 2018.

Partner Selection Score Index	(Unit: point)
Frequency of selection	20
Profitability (Total)	35
Quarterly evaluation(Safety score: 14 points)	40
Same area	5
Other Bonus/deduction points	+3p to -3p
Partner Selection Score	100

#### Leading CSR among Partners

With aims to build a basis for the growth of the company and its partners, GS E&C encourages partners to fulfill social responsibilities in accordance with the triple bottom line of sustainability management –economy, the environment and society.

#### CSR Strategy Encouraged for Partners

Category	Main Issues	Major Indicators
Economy	<ul style="list-style-type: none"> <li>Corporate governance</li> <li>Risk management</li> <li>Ethical management</li> <li>CRM</li> </ul>	<ul style="list-style-type: none"> <li>CEO forums</li> <li>Partner financial support</li> </ul>
Environment	<ul style="list-style-type: none"> <li>Environmental policy</li> <li>Eco-friendly activities</li> <li>Climate response strategy</li> </ul>	<ul style="list-style-type: none"> <li>Environmental accidents</li> </ul>
Society	<ul style="list-style-type: none"> <li>Compliance to labor code</li> <li>Human rights management</li> <li>Employee training</li> <li>Social contribution activities</li> <li>Safety and health</li> </ul>	<ul style="list-style-type: none"> <li>Safety training personnel</li> <li>Occupational injuries</li> </ul>
Infrastructure	<ul style="list-style-type: none"> <li>External authentication and disclosure</li> <li>Sustainability management system</li> </ul>	

#### 2018 Partner Ratio with Risks

Economic 6.0% (60 partners)	Environmental 0%	Social 0.1% (1 partner)
-----------------------------	------------------	-------------------------

### Management of Critical Partners

GS E&C minimizes negative impacts on mid- to long-term value creation by identifying the critical partners with relatively significant influence to effectively their manage their economic, environmental and social risks. The focal point is placed on partners that maintain a long-term business relationship with GS E&C or handle large transaction volumes. In 2018, 327 companies, accounting for 33.0% of all partners, were classified as critical partners of GS E&C and managed accordingly.

#### Identification of Critical Partners (Unit: companies, %)

	2016	2017	2018
Partners	1,106	1,063	991
Critical partners	345	320	327
Sales ratio of critical partners	74.5	72.7	66.8

### Partner Risk Management

The financial and non-financial risks of partners have the potential to influence GS E&C's mid- to long-term value creation. As preemptive measures, critical partner risks are classified into economic, environmental, and social categories, and subsequently evaluated and monitored according to strict criteria. Failure to meet the requirements results in the termination of the partnership. GS E&C's regular management of the potential partner risks has minimized the ratio of high-risk partners. GS E&C aims to reach a 0% ratio of high-risk partnerships.

### Restrictions on Partners

GS E&C conducts regular evaluations on partners, not only to ensure successful joint business operations, but also to restrict them as needed, based on evaluation results. This is done with the purpose of increasing their long-term competitiveness. When irresponsible business practices are identified, a warning is issued, while those scoring low points in the comprehensive evaluations including credit ratings, safety and customer satisfaction will be warned at first and then exempt in the worst-case scenario. In 2018, specifically, 22 partners with poor ratings were issued written warning statements.

## Strengthening Multifaceted Support for Shared Growth

### Financial Support

GS E&C offers financial support to its partners through management funds, shared growth funds, and the improvement in payment terms, among other programs. The cumulative amount of support funds provided in the form of pre-payments through the management fund system implemented since 2010 stands at a total of KRW 93 billion. GS E&C signed an agreement with banks to provide direct loans to recommended partners at low interest rates, and currently provides financial support to companies with a joint overseas venture partnership.

<b>2018 Performance</b>	· Management Fund of <b>KRW 31.3 Billion</b> (avg.annual balance)
	· <b>20 Shared Growth Funds of KRW 30.0 Billion</b> (in management)
	· Contract Guarantee Exemption for Small-scale Constructions under KRW 100 Million

### Active Communication

GS E&C operates on- and off-line programs to enhance communication with partners. GS E&C executives and partner CEOs attend the annual Xi CEO Forum to share key policies, and "Excellent Partners" awardees are given preferential opportunities in biddings. GS E&C also strives to fully reflect the issues raised by partners in meetings, such as the Internal Review Committee for Subcontracting and the Subcon Board for Partners. GS Partner, a convenient online communication tool, is another channel used to share information, including partners' difficulties and opinions for shared growth as well as changes in major orders and designs.

<b>2018 Performance</b>	· <b>100 Partner CEOs Xi CEO Forum Participants</b>
	· <b>8 Outsourcing Policy Briefings/meetings</b>
	· <b>26 Internal Review Committee Hearings</b>



\*2018 Xi CEO Forum

### Education & Training System

GS E&C provides education and trainings to promote shared growth. Most notably, the Xi CEO Forum for partner CEOs has improved bidding competitiveness and business operations of critical partners, by not only providing trainings on construction market trends, finance and leadership, but also sharing other valuable information amongst partners. Trainings on safety, quality, environment and labor are also available for site directors and field staff of partners. GS E&C continues to expand programs offered as the number of trainees increases every year.

<b>2018 Performance</b>	· <b>30 Xi CEO Forum Participants</b> (303 cumulative)
	· <b>37 Site Director Training Participants</b>
	· <b>205 Safety Innovation School Partner Graduates</b> (5,263 cumulative)
	· <b>242 On-site Training Participants</b> (1,540 cumulative)

### Technical Support & Protection

GS E&C develops its competitiveness together with partners through technology development support. GS E&C conducts joint research activities on new and advanced technologies, providing assistance for development expenses and commercialization, while utilizing the jointly developed technologies throughout the project execution, even beginning in the bidding stages. To protect SME-developed technology, which tend to be more vulnerable to intellectual property leakage, GS E&C carries out joint patent applications and design registration for joint technologies, and cover application costs.

<b>2018 Performance</b>	· <b>Joint Technology Development KRW 510 Million</b>
	· <b>6 Technology Patents &amp; Registrations</b>
	· <b>20 PRECON Activities for Cost Reduction</b>

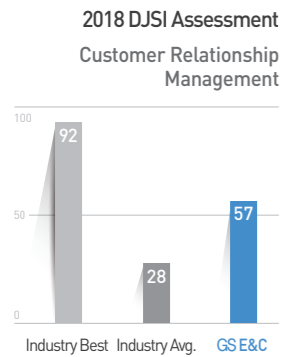
### Improvement of Payment Terms

GS E&C has improved the payment-in-cash ratio among subcontractor payment methods and operates a win-win payment system that promotes partners' interests. As a result, payment-in-cash ratio was raised from approximately 50% in 2010 to nearly 90% in 2018. Furthermore, the company designates payment due dates for subcontractors no later than 10 days to support the liquidity of partner, and is the first major Korean construction company to complete payments within the shortest possible period at the end of a project.

<b>2018 Performance</b>	· <b>Payment-in-cash Ratio Over 95%</b>
	· <b>100% Retention Rate of Case Payment</b>
	· <b>Payment Due Date Within 10 days</b>



## Ensuring Quality for Customers



### Reinforcing Systematic Quality Inspections

#### Quality Control Efforts for Materials

The starting point of quality control is ensuring reliability of material quality. To achieve this, GS E&C provides a guidebook on material quality standards of KS Certification and individual client organizations on 234 types of materials; the compliance to company-wide quality control standards of equipment and materials for civil engineering and construction is also monitored. Furthermore, GS E&C inspects the production process of raw materials by tracking the production at facilities like remicon (ready mix concrete) plants.

#### Quality Awareness & Specialized Training

GS E&C provides trainings for not only employees but also on-site worker from our partners so that all participants in the construction project can raise their awareness of quality and capability. Employees are obliged to complete the basic-duty trainings according to their skill capabilities, as well as practical and specialized courses, while partners attend GS E&C's quality education at the Safety Innovation School in addition to other programs. At construction sites, training courses are provided to workers before construction in order to ensure the construction quality.

#### Preliminary Quality Control Process

	Commencement	D-75	D-35	Completion	D+60
Quality Control (QC)		Quality check by construction stage			
Before Service (BS)		On-site training focused on failure cases & inspection			
Functionality Test		Inspection of less visible defects			
Pre Quality Controls (PQC)		Customer-oriented quality control			

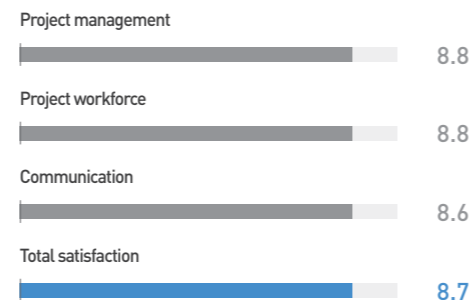
### Preliminary Quality Control

From construction to completion, GS E&C conducts preliminary quality inspection to examine the technical status of work processes step-by-step and proceed to the total inspection accordingly. GS E&C checks quality through a process involving quality control (QC) and before service (BS), and performs pre quality controls (PQC) 75 days before completion. In addition to a total visual inspection, there is a total functionality inspection to check for less visible residual defects, such as the performance of machinery and fixtures. Afterwards, a group consisting of a variety of stakeholders, including partners, Xi S&D engineers, and individual customers, examines a criterion of 30 elements, such as architecture, facilities, and electricity to preempt any presumably inconvenient issues residents might experience.

### Monitoring Client Satisfaction

GS E&C strives to provide high quality services not only to our customers, but also our corporate clients. In a client satisfaction survey that targeted all divisions of architecture, housing, infrastructure, and plant construction, in Korea and abroad, GS E&C recorded a total satisfaction score of 8.7 points out of 10 as well as high scores in other categories, including project management, workforce, communication, and others. GS E&C will continue to conduct customer satisfaction surveys on a regular basis and implement survey results upon project operations.

#### Corporate Client Satisfaction Survey (Unit: points, out of 10)



\* Survey was target towards all 42 clients from the domestic/overseas projects in progress in 2018 (response rate: 29.0%)

### Expansion of Customer-First Support

#### Protection of Customer Privacy

In order to prevent social value losses, GS E&C adopts a thorough information security policy, based on the Personal Data Protection Committee, established in 2012, consisting of relevant executives. The committee convenes three to four times a year, but can also hold temporary meetings or, if necessary, be substituted with written correspondences. GS E&C encrypts customer, recruitment and personal employee/partner information, and manages access rights to the personal data processing system for high-level security. As a result, zero abnormalities have been reported in the personal data management status examination conducted by the Ministry of the Interior and Safety, and zero cases of personal data loss has been reported.

#### Extension of Customer Communications

GS E&C provides a convenient experience to its customers and promptly handles complaints. The submission of complaints is streamlined to improve efficiency through the company-wide VOC (Voice of Customer) system and the Housing Customer Relationship Management (CRM), and the principle of instant handling is put into practice when responding to them. In 2018, GS E&C developed "Xi My House Visit App" for house previews, requests for after-sales services and monitor request statuses in real time. Ever since its launch in the second half of 2018, customer satisfaction has increased due to its positive influence on customer trust, also increasing work efficiency based on reduction of workforce. Happy Call, a system to check the customer satisfaction level after the warranty service is done, is also monitored daily, rather than weekly, to further understand the customer responses in detail. As the volume of tenants skyrocketed in 2017, there was also an increase in customer complaints and VOC submissions. In this regard, GS E&C is expanding its operations with teams of multi-functional after-sales engineers at Xi S&D to address defects more promptly by dispatching new engineer teams two additional times during the specified timeframe for moving in.

#### Customer Complaints (Unit: case)

	2016	2017	2018
Housing complaints	610	896	4,304
VOC complaints	498	436	1,103

\*The increase of complaints in 2018 is attributed to a surge in the number of tenants and duplicate cases from collective complaint submissions.

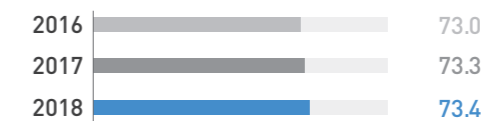
### Upgraded Customer Service

GS E&C is focusing on providing resident customer satisfaction through high-quality customer service. Through expanded periods and frequency of initial customer services such as the "Xi+1 service," the early operation of the Xi'an center, landscaping maintenance, move-in cleaning, GS E&C is making efforts to further push customer satisfaction levels.

### Maintenance of High Customer Satisfaction

GS E&C's outstanding achievement of customer satisfaction has been acknowledged by various external agencies. The company's customer satisfaction level in 2018 increased to 73.4 and was ranked 1st in the Global Customer Satisfaction Competency Index (GCSI) for the 14th consecutive year. GS E&C's iconic apartment brand "Xi" also won the grand prize for the 10th consecutive year in "Korea First Brand: Apartment Category" and the Korea Luxury Brand Grand Prize for nine consecutive years. In 2019, GS E&C plans to utilize more diverse channels, such as resident phone surveys at the six-month mark upon moving in to actively manage customer satisfaction.

#### Customer Satisfaction Survey (Unit: point)



\*Source: Global Customer Satisfaction Competency Index (GCSI) Results







# Focus on Social Values



## Overseas Market Ventures & Shared Growth with Partners



▲ T301 worksite in Singapore where GS E&C has been working with partners

### Leading Company in Win-win Partnerships

GS E&C takes the initiative in seeking and implementing directions for shared growth with partners. Equal opportunities in addition to quality and safety trainings for partners are ensured to improve competitiveness. Grounded on project execution capabilities and the expertise of GS E&C and its partners, the company has ventured into major projects at home and abroad. The T301 project in Singapore, a project order won in March 2016, is a prime example.

### Four Key Practices for Win-win Partnerships



▲ President Moon Jae-in and his delegations visited T301 site

**T301 Worksite**  
**15 Million Hours Zero Accidents**  
 (2 years and 8 months as of 2018.11)

**Local Safety Innovation School**  
**Accident Prevention Training**  
**10,000+ Local Client-related Persons**  
 (cumulative)

### Mutual growth through overseas expansion

The T301 project, amounting to KRW 1,700 trillion, is often considered to be an exemplary case of a successful joint overseas ventures through win-win partnerships between GS E&C and its partners, including Sambo E&C, DONG-Ah Geological Engineering Company, etc. Overseas clients accredited the team of a major E&C company and SMEs with robust technological capacities, even winning the support of local governments for the project. GS E&C has been successfully expanding overseas with long-time partners and will continue to carry out projects to meet the trust demonstrated by the Singaporean government, further elevating the global status of the Korean construction industry.

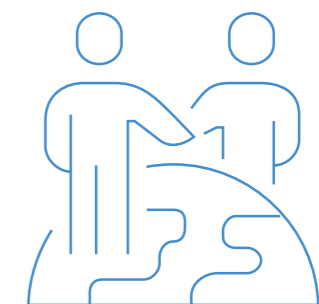
### Safety Innovation School in Singapore

With the Safety Innovation School, GS E&C became the first local construction company to operate an institution with comprehensive on-site and on-the-job training programs with partners. The Safety Innovation School for the T301 Project in Singapore demonstrated GS E&C's strong commitment to safety to local clients and media.

Workers at the T301 worksite are required to complete the same program offered by the Safety Innovation School, while new entrants must participate in the four-hour program three times a week. Full commitment to safety training has contributed to GS E&C having zero accident for two years and eight months as of November 2018. The Safety Innovation School in Singapore is a prime example of GS E&C's commitment to not only solidify its credibility in terms of safety and on-duty health education, but also shared growth with partners.



▲ Safety Innovation School in Singapore





# THE FUNDAMENTALS GS E&C SUPPORTS

Based on its robust governance and ethical management, GS E&C leads its partners and society towards sustainability management to lead the next few decades rather than days.

- 64 Stakeholder Engagement & Materiality Test
- 66 Governance
- 68 Ethics Management
- 70 Risk Management

E-LAB / Alexandria (Egypt)





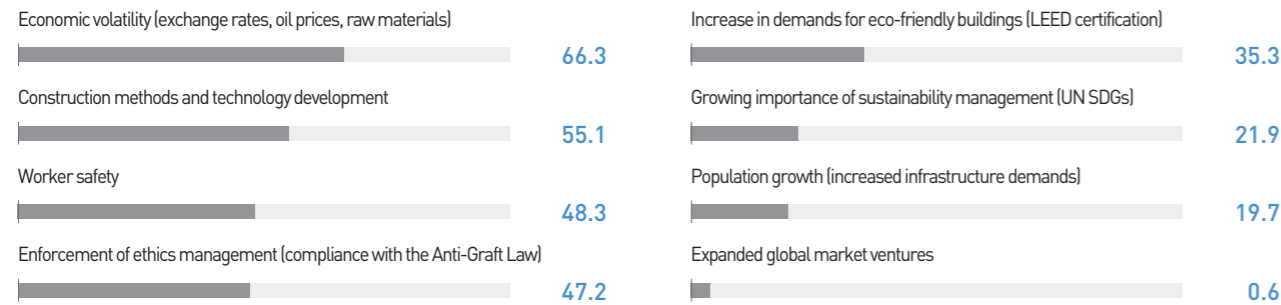
# Stakeholder Engagement & Materiality Test

To continuously create value, it is important for all stakeholders to build a CSR mindset by analyzing the key factors and issues that contribute to value creation within the company in a comprehensive manner. GS E&C asked for the stakeholders' opinions to identify their level of awareness of sustainable management and to evaluate the factors that create value for the company.

## GS E&C stakeholders' recognition of sustainable management



## Sustainability Issues the E&C Industry Should Focus On



## Stakeholders' expectations

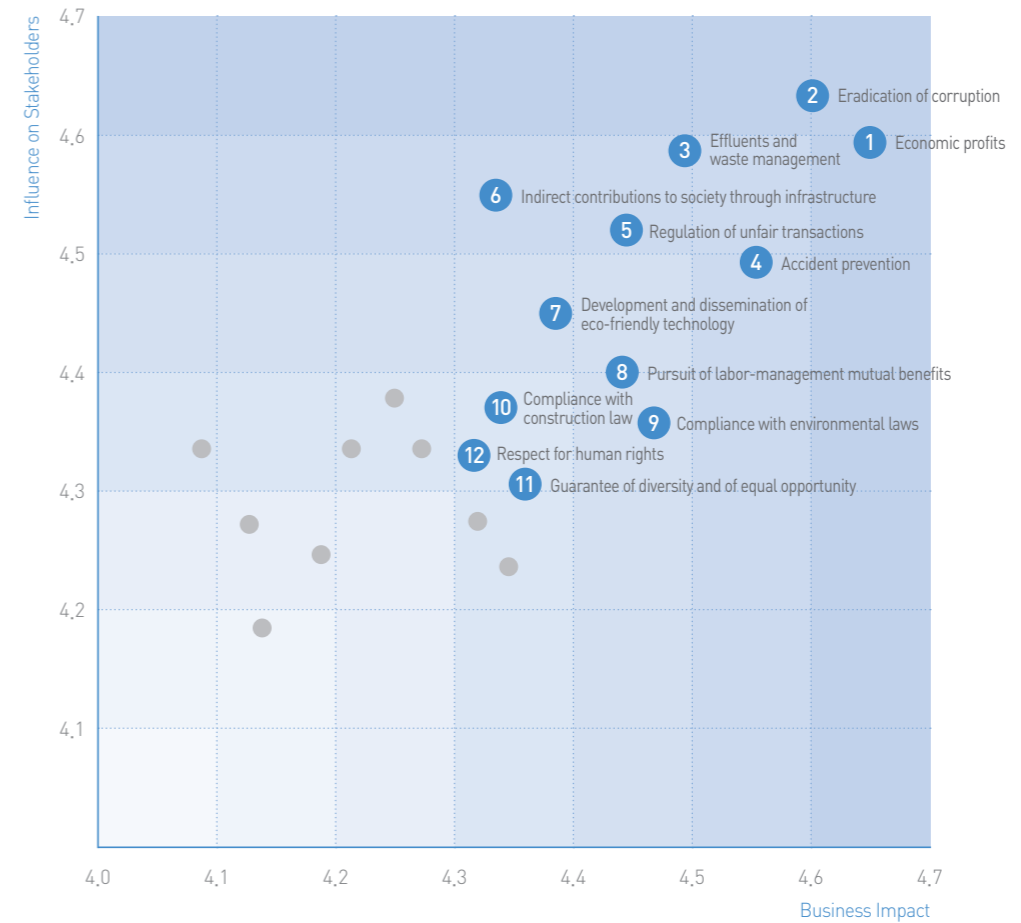
GS E&C identifies the expectations of seven major stakeholder groups every year. Their expectations were identified based on the verified responses received from 208 respondents for the 2018 materiality test and are reflected in GS E&C's management activities and included in GS E&C's Integrated Report 2018.

Stakeholders group	Expectations
Employees	Employment stabilization and creation, development of differentiated technology and cultivation of experts, transparent ethical management, respect for human rights, legal compliance
Press · Media	Fair and transparent bidding environment, eradication of illegal funding, domestic and overseas social contributions
Government · Related organizations	Regulatory compliance
Shareholders · Investors	Creation of fair profits
Partners	Shared growth with partners, promotion of on-the-job skills training for partners, employment and diversity, eradication of unfair trade practices, prevention of subcontractor deficits
Corporate · General customers	Regulatory compliance
Community	Consistent social contribution, job creation, environmental preservation

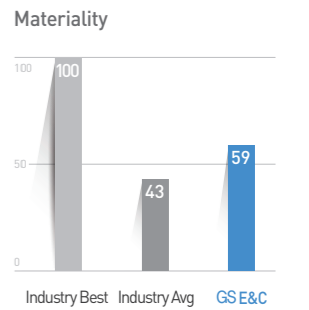
## Materiality Test

GS E&C identified 24 issues through relevance testing such as media analysis and benchmarking, and of these identified issues, 12 were selected as material issues. In the process of material issue identification, the opinions of 208 stakeholders regarding economic, environmental and social issues were collected, and the stakeholders' credibility toward and responsiveness of the reported information was strengthened through consultation with the TFT and outside experts.

### Materiality Test



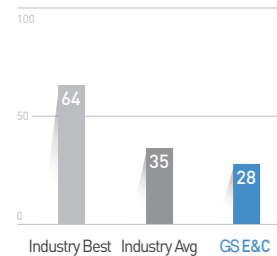
## 2018 DJSI Assessment



Value created by GS E&C	Critical issue	GRI aspect	Relevant UN SDGs
Stable Financial Base	1	Economic performance	8, 17
Industrial Value	1	Economic performance	8, 17
Intellectual Value	7	Energy	7, 9
Environmental Value	3, 7, 10	Effluents and waste, environmental compliance	9, 13, 15
Human Value	4, 8, 11, 12	Occupational safety and health, labor and management relations, diversity and equal opportunity, human rights assessment	8, 10
Social Value	2, 5, 6, 9	Anti-corruption, anti-competitive behavior, indirect economic impacts, socioeconomic compliance	4, 11



2018 DJSI Assessment  
Corporate Governance



Established to reflect stakeholder opinions, GS E&C's sustainable governance structure is centered on the Board of Directors (BOD), the highest decision-making body. To fulfill sustainable management, GS E&C manages economic, environmental and social issues through the Sustainability Management Committee.

**Governance System**  
**Governance Operations**

GS E&C has designated the BOD and Sustainability Management Committee as the highest decision-making body to ensure sustainable management. The Chair of the BOD is the Chairman of GS E&C, and the Sustainability Management Committee is composed entirely of outside directors. The Sustainability Management Committee operates the Sustainability Management Task Force, in which various related departments participate, and covers the headquarters, domestic and overseas branches, as well as worksites and subsidiaries.

**Sustainability Management Committee**

GS E&C operates the Sustainability Management Committee to review its sustainability management activities while striving to effectively share the outcome with stakeholders. The Sustainability Management Committee convenes annually to review and provide support for yearly sustainability management activities. In addition, under the supervision of the Planning & Analysis Team, the related departments communicate with each other to publish integrated reports and to engage in various practical activities to respond to CSR evaluations including the DJSI.

**Committees**

Subcommittee title	Major tasks
Audit Committee	Supervising accounting and major work
Outside Director Candidate Recommendation Committee	Recommending external director candidates at shareholders' meeting
Sustainability Management Committee	Reviewing and support for sustainability management activities
Committee on Internal Transactions	Reviewing and evaluating internal transactions, and suggesting corrections

**Board Composition**

GS E&C has a total of seven board members, consisting of two inside directors, four outside directors and one non-executive director, with the roles of Chang-Soo Huh, chairman of the board, and Byeong-Yong Lim, CEO of GS E&C, being separated. The composition and final appointment of outside directors is determined based on their expertise and professional experience in accounting/finance, law, business management, and construction industry, and gender, ethnicity and nationality are considered in the composition stage of the candidate pool to promote diversity. Moreover, outside directors are refrained from holding more than two jobs to better concentrate on their duties.

**Board Functions & Operations**

BOD meetings are divided into regular general meetings and temporary extraordinary meetings. BOD meetings and committees must be held with the attendance of the majority of fixed seats and resolutions passed with the approval of the majority of the attending directors. Regular meetings are held seven times a year, while extraordinary meetings as needed. Board members contribute to mid- to long-term value creation by accounting for ESG factors in their decision-making. Furthermore, a subcommittee is established to supervise major business affairs and provide management advice, thereby fulfilling the responsibilities of the board. The management committee, which is operated alongside the BOD, handles safety issues with sustainability as a conference system with the highest decision-making authority of the company's divisions, headquarters, and offices. The ESG agenda deliberated in 2018 included various initiatives, including the shorter hours to the 52-hour workweek system and implementation plans, as well as improved distribution methods for subcontracting documents.

**BOD Members** (As of March 2019)

Category	Name	Date of Appointment	Major career titles
Internal Directors	Chang-Soo Huh	2017.03	Chairman of GS E&C, GS Holdings
	Byeong-Yong Lim	2019.03	CEO & President of GS E&C
Non-executive Director	Tae-Soo Huh	2017.03	Vice-chairman & CEO of GS Home Shopping
External Directors	Jai-Hoon Han	2018.03	Former CEO of LS Industrial Systems Co.
	Sang-Myung Choung	2018.03	Former 35th Public Prosecutor General
	Kyung-Sik Kim	2019.03	Former Vice Minister for Land & Infrastructure
	Jin-Bae Kim	2019.03	Professor at Korea University Business School (Present)

\*Average BOD tenure: 5.0 years (as of December 2018)

**Ensuring BOD Independence & Efficient Operations**

GS E&C ensures BOD independence pursuant to Article 382 of the Commercial Act. In compliance with Paragraph 8 of Article 542 under the Commercial Act, GS E&C elects a majority of the board directors as independent directors. External director candidates are selected from the candidate recommendations of the nominations committee before term expiration and then elected through the general shareholders meeting, ensuring fairness, objectivity and independence through final election procedures. Independent senior external directors participate in the company's decision-making process for management policies and play the important role of supervising and supporting the management.

BOD schedules are announced in advance to increase the board members' attendance rate and agenda materials are provided for review before the meeting. Additional briefings for board members can also be held whenever necessary. In 2018, 12 internal training sessions were held to brief on the company's current status and agenda materials. GS E&C also occasionally provides information on major issues of the company to ensure BOD expertise.

**BOD Performance**

**Governance Evaluation**

GS E&C's ESG evaluation is conducted by the Korea Corporate Governance Service's ESG index which evaluates and analyzes company environmental and social performance as well as governance, excluding financial performance. GS E&C has maintained ratings higher than B in the comprehensive evaluation since 2011. In 2018, GS E&C received a B+ rating in categories of corporate governance (B+), social (B+) and environment (A)

**ESG Ratings Evaluation** (Unit: Rating)

	2016	2017	2018
Comprehensive ESG Rating	B+	A	B+
Governance Evaluation Rating	B+	B+	B+

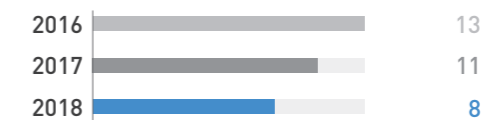
\*Evaluation agency: Korea Corporate Governance Service

**BOD Performance Evaluation & Remuneration**

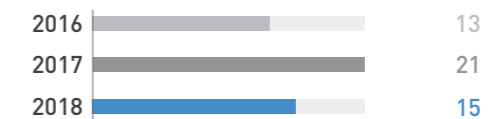
GS E&C conducts annual self-evaluations on BOD operations and committee activities to enhance BOD efficiency. Elements of the evaluation include the role of the board, as well as its responsibilities, obligations, composition and independence. The maximum for BOD remuneration is determined at the shareholders' meeting pursuant to Article 388 of the Commercial Act and company regulations. The company announces the remuneration status of all directors and auditors in its annual business report and the amount of extraordinary remunerations exceeding KRW 500 million per individual. In 2018, the average and the median annual salary of executives and employees came at 11.51% and 12.13% of the annual CEO compensations, respectively.

**BOD Operations & Performance** (Unit: meetings, cases, %)

**BOD meetings**



**Agenda deliberated by BOD**



**Average attendance rate of external directors**



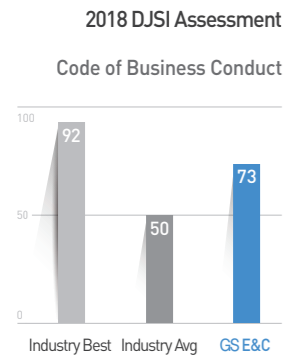
**BOD Self-Evaluation** (Until points, out of 5)

**Self-evaluation score**





# Ethics Management 102-16, 103, 205-2



GS E&C has laid the foundation for ethical management by establishing and enforcing a Code of Ethics since 1994 to become a company trusted by customers and society through transparent and fair management. GS E&C aims to cultivate a sound culture of ethical management through ethics education, improvement of ethics policies and systems, supervision of the work ethics of employees.

## Ethics Management System

The Ethics Committee and the Compliance Department ensure that ethical management practices are implemented properly. The Ethics Committee deliberates and resolves ethics policies and standards, reviews ethics management promotion activities and monitors the results. As for the Compliance Department, it is an organization under the direct management of the CEO and responsible for re-organizing ethical management/systems and monitoring and auditing of misconduct and unethical practices. In addition, ethics education and programs are carried out to build consensus over ethics management among employees and encourage voluntary participation.

### GS E&C Ethics Management System

Goal
A company trusted by customers and society through transparent and fair management practices
Directions
1. System: Continuous ethical management policies and system improvement
2. Education and Promotion: Education and promotion to raise ethical awareness
3. Supervision: Management and supervision of employees to guarantee sound work ethics
4. Culture: Establishment of a new culture of stiffening punishments for unethical behavior

### Operation of Ethics Committee

GS E&C operates an Ethics Committee to assist the CEO in the making of ethical decisions. The committee reviews and reaches a resolution on issues that require strategic decision-making accompanied by ethics management activities and takes actions such as checking implementation statuses of ethics management. The Ethics Committee consists of a chairperson and a steering committee. The CFO acts as the chairperson and the steering committee members are executives in charge of project planning and supporting divisional departments. In 2018, the Ethics Committee was held twice in the first and the second half of the year to discuss preventive activities and audit activities related to ethics management.

## Ethics Management Activities

### Expanded Ethics Education

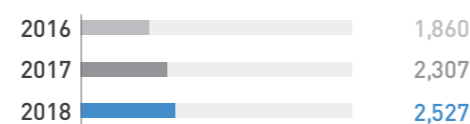
Through ethics education, GS E&C employees can familiarize themselves with individual roles and responsibilities and learn how to respond appropriately to possible ethical dilemmas they may face. Ethics education is divided into online education, group education, and on-site education. At the same time, ethics pledges are submitted by all employees as a reminder of ethics management and encourage voluntary practice.

### Ethics Education Curriculum

Online training	Required for all employees, Once a year
Group training	New employees and major job positions/ departments
On-site visit training	Employees and partners

### Ethics Education (Unit: persons)

#### Group course trainee



#### Online course trainee



### Ethical Management for Partners

GS E&C has established an ethical management system for the prevention of unfair business practices among partners. The commitment to the establishment of sound transaction practices with subcontractors is part of the Code of Ethics and the related regulations, while partners are required to submit the Corporate Integrity Pledge when signing a transaction contract with us. In addition, GS E&C operates an Online Company Reporting & Ethics Misconduct Channel via its webpage, to receive reports on unfair demands and irregularities committed by the employees of GS E&C.

## Management & Monitoring of Work Ethics

### Project Inspection & Issue Diagnosis

GS E&C conducts "Patrol Inspection" and "Issue Diagnoses" to prevent ethics management violations and threats. Specifically, the "Patrol Inspection" serves to prevent unethical conduct and raise awareness throughout business operations through project progress reports, identification of non-compliances with work processes and worksite issues. Likewise, "Issue Diagnosis" identifies unreasonable business practices and business processes that require improvement, thereby preventing losses and improving efficiency. At the end of the diagnosis process, necessary corrective and improvement measures are taken at the worksite, and the relevant HQ departments cooperate to identify improvement methods. In 2018, 22 cases of patrol inspection and 11 cases of issue inspection were conducted.

### Unethical Conduct Reporting Channel

GS E&C operates a reporting channel for witness of unethical conduct to report or provide information. GS E&C secures various reporting channels, including the Online Company Reporting & Ethics Misconduct Channel, as well as phone and fax lines to improve the convenience and facilitate reporting; likewise, the Informant Protection System encourages reporting. Once a report is submitted, the Compliance Department immediately initiates an investigation and the reported employees are required to fully participate in the investigation process. In 2018, 55 reported cases were investigated.

### Reported Investigations (Unit: cases)

	2016	2017	2018
Factual	11	7	24
False	24	24	31
Reports	35	31	55

\*Standard of reported investigations was adjusted, and previous data was reclassified to this new standard

## Ethical Violation Cases

GS E&C enforces disciplinary action against unethical behaviors committed by employees and partners, in accordance with relevant regulations. Disciplinary actions are taken for unethical conduct in accordance to HR policies and regulations. In the case of unethical conduct by partners, disciplinary actions are taken in accordance with the internal review standards. If partner employees report unethical conduct of GS E&C employees, and this report is corroborated, the partner company is designated as an exemplary partner company to boost the effectiveness of the misconduct reporting system. In 2018, several violation cases were reported, including the misuse of company property, abuse of power, abusive language/physical abuse, etc., resulting in disciplinary actions on the reported subject, taking into degree into account; further, their superior manager was penalized for their responsibilities as well.

### Individual Conduct Violation (Unit: cases)

	2016	2017	2018
Dismissal	7	10	9
Recommended resignation	1	5	1
Suspension	4	7	10
Salary deduction	16	14	8
Total	28	36	28

\*Standard of individual conduct violations was adjusted, and previous data was reclassified to this new standard

\*One case of Code of Ethics violation regarding solicitation over a reconstruction deal is excluded from the above status report as the individual involved resigned after the penal actions were taken. HR policies were fortified, and training/inspection/monitoring systems were reinforced to comply with the related laws.





The recent global economic crisis has made long-term asset management and effective risk management ever more important. Inherently, value creation in the E&C industry is always linked to high risks, especially with the rise in overseas mega-scale projects. GS E&C operates an Integrated Risk Management System in order to detect internal and external risks and respond accordingly.

### Risk Management System

#### Risk Management System Operations

Since establishing company-wide RM Committee in 2011, GS E&C has been preemptively managing company risks. The RM Committee performs an independent analysis of business environment and operation risks under the management of the New Business Development Department. Analysis results are reported to the CEO by the head executive of the company-wide business support group and the executive in charge of the Compliance Office. Particularly, significant risks with a level considered to have a critical impact on business operations are reported to the CEO and the Board of Directors immediately, to make prompt decisions regarding risk investigation and action plans.

### Business Environment &

#### Implementation Risk Management

GS E&C separates the risks associated with business environment from those with business promotion for management. As for the business environment risks, GS E&C focuses intensively on major items by analyzing the importance, likelihood of occurrence, and impact level of direct and indirect factors. Business execution risks include all the risks that are predicted from the beginning of the project to the completion of the project and across the entire post-project after-sale services, as well as unexpected counterparts. To assess business feasibilities, Business Review Committees, both company-wide and by business division, conduct financial evaluations, and non-financial risk assessments are also carried out during each stage of the project.

#### Business Environment Risk Management

##### Key Management Items

Major financial indicators, financial risks, signs of bad management, etc.

##### Risk Factors

Global economic fluctuations, rising commodity prices, unstable exchange rates, socio-economic instability in the target market, change in policy and regulations, shortage of water, environmental pollution, energy/fuel crisis, etc.

### Preemptive risk management system

#### RM Conferences

GS E&C holds RM Conferences, a network of risk management collaborations by sector, to strengthen risk management activities. The RM conferences, held on a weekly, monthly, and quarterly basis, are operated across five major fields and utilized to share risk issues and seek for optimal solutions through preemptive risk management.

### Integrated Risk Management System

In 2012, GS E&C developed an enterprise-wide integrated risk management system (IRMS) to identify the correlation between individual risks by integrating the risks managed by sector, thereby proactively responding to risks through the detection of the cause of the occurrence in advance. 51 items regarding the financial and non-financial risks affecting GS E&C were classified into 10 sectors: business performance, process cost management, bond management, financial indicators, financial risk, safety management, bad signs management, litigation, housing customer service, subsidiaries, and major indicators. GS E&C improves the efficiency and effectiveness of its risk management system by identifying and analyzing the status of risk on a monthly and quarterly basis.

#### RM Committee

Category	Key Risk Management
Compliance	<ul style="list-style-type: none"> <li>Disputes, litigation, company reputation</li> <li>Legal risk</li> </ul>
Resource	<ul style="list-style-type: none"> <li>Risks inherent to business performance</li> <li>Liquidity management</li> <li>Procurement of raw materials</li> </ul>
Fraud	<ul style="list-style-type: none"> <li>Failure to comply with the integrity management</li> <li>Risks in organizational culture</li> </ul>
HR	<ul style="list-style-type: none"> <li>Recruitment, retention, cultivation</li> <li>Manpower surplus and labor-management risks</li> </ul>
Macro Index	<ul style="list-style-type: none"> <li>Risk of key indicators, fluctuations in the economic and financial markets</li> </ul>

### Long-term Risk Response Strategy

Environmental and social risks should be managed proactively to achieve long-term sustainable management. GS E&C responds proactively to long-term environmental and social risks associated with its business environment, business management and project operations. Based on the company's internal capabilities and technology development, GS E&C has identified megatrends in the E&C industry, such as water scarcity, energy shortages, and aging populations, and have developed business opportunities and countermeasures accordingly.

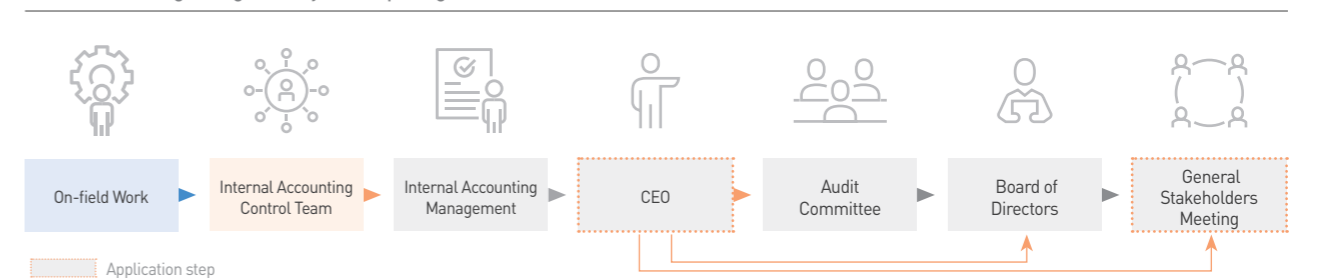
#### Responses to Long-term E&C Industry Risks

	Risk	Response strategy
	<b>Water depletion</b> Due to a 40% increase in water demands 25% of the world's population will suffer water shortages (UN Secretary-General)	<b>Development of Water Treatment Technology</b> <ul style="list-style-type: none"> <li>Seawater desalination technology</li> <li>Smart Waterworks System</li> <li>Wastewater treatment system</li> <li>Sewage treatment water reuse system</li> </ul>
	<b>Energy shortage</b> By 2040, the demand for primary energy worldwide will increase 25% compared to 2017 (IEA)	<b>Development of Resource Recycling Technology</b> <ul style="list-style-type: none"> <li>Resource recovery and waste-to-energy technology</li> </ul> <b>Development of Low-carbon Energy-efficient Technology</b> <ul style="list-style-type: none"> <li>ESS optimized operation simulator</li> <li>Carbon reduction through green concrete</li> </ul>
	<b>Aging Population &amp; Reduction of Workhours</b> By 2050, people aged 65 and above will account for 37.4% of the total population (OECD)	<b>Development of Smart Construction Technology</b> <ul style="list-style-type: none"> <li>Establishment of BIM-based project operation</li> <li>Reduction in project period through pre-construction</li> <li>Use of ICT devices such as drones</li> </ul>
	<b>Demand for efficiency and competitiveness in the wake of the 4th Industrial Revolution</b> Omnidirectional change is expected in all industries based on ultra-automation, super-connectivity, and super intelligence (Korea Institute for Industrial Competitiveness)	<b>Establishment of Smart Home Platform</b> <ul style="list-style-type: none"> <li>Smart Home service through collaboration with Amazon and Kakao Corp</li> <li>Development of Sys Clean</li> </ul> <b>ICT-based On-site Management</b> <ul style="list-style-type: none"> <li>Environmental solutions by construction type based on big data</li> </ul>

### Internal Accounting Management System

With the amendment to the Act on External Audit of Stock Companies enacted in November 2018, verification procedures have toughened as the certification of the internal accounting control system now requires an "audit" level inspection, which is more rigorous than a "review." In this regard, GS E&C has appointed the CFO as its Internal Accounting Manager and created an Internal Accounting Control Team under the Compliance Department to specialize in internal accounting management duties. Within the Internal Accounting Control Team, control procedures and management documents are created according to shifts for work process, organization and accounting standards, and its management undergoes regular audits in terms of risk assessment, focusing on financial information, company-level control and the code of ethics. The establishment of the Internal Accounting Management System is expected to strengthen the responsibilities of the CEO and the Audit Committee, while further refining the risk management system.

#### Internal Accounting Management System Reporting Process





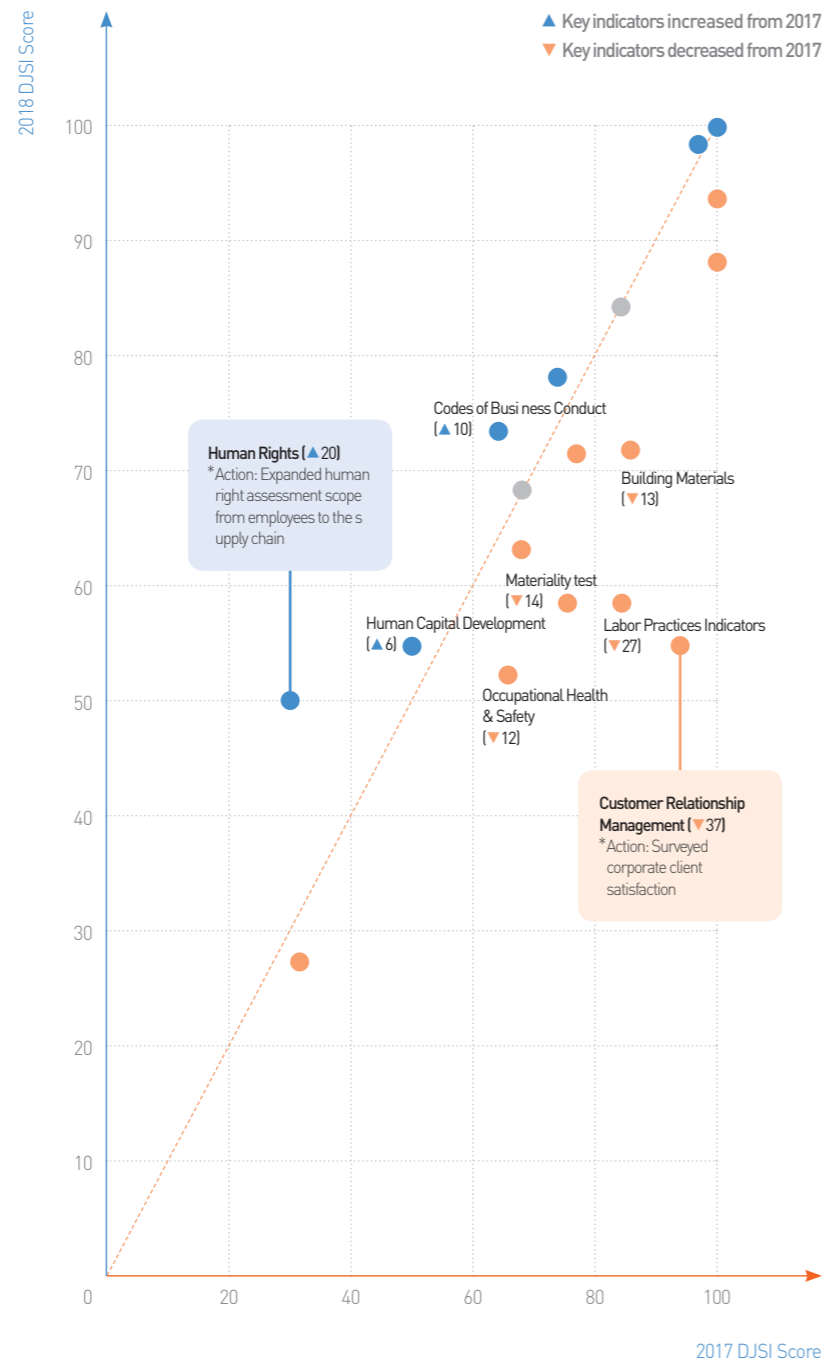
## Company-wide Sustainability Risk Management based on Dow Jones Sustainability Index (DJSI)

Every year, global leading companies respond to the Dow Jones Sustainability Indices (DJSI) assessment as part of sustainability management integration efforts. GS E&C views the DJSI assessment as an opportunity to review company-wide sustainability management of the company, and ensures that all departments take measures to respond to the results, which are used as the basis for system maintenance. GS E&C has been admitted into the DJSI Asia Pacific Index for the 9th consecutive year since its first participation in 2010. As of 2018, GS E&C is ranked the 6th out of 30 global E&C companies and exceeds the industry average in all areas of economy, environment and social dimensions.

### GS E&C DJSI Assessment Results (2017 - 2018)

(Unit: score, out of 100)

	2017	2018
<b>Economic Dimension</b>	64	61
Corporate Governance	32	28
Materiality	73	59
Risk & Crisis Management	79	71
Codes of Business Conduct	63	73
Customer Relationship Management	94	57
Policy Influence	100	100
Supply Chain Management	69	69
<b>Environmental Dimension</b>	92	87
Environmental Reporting	100	100
Environmental Policy & Management Systems	100	93
Operational Eco-efficiency	76	79
Building Materials	85	72
Climate Strategy	100	88
Resource Conservation & Efficiency	100	100
<b>Social Dimension</b>	71	66
Social Reporting	87	78
Labor Practice Indicators	86	59
Human Rights	30	50
Human Capital Development	50	56
Talent Attraction & Retention	84	84
Corporate Citizenship & Philanthropy	97	99
Occupational Health & safety	65	53
<b>Total</b>	<b>75</b>	<b>71</b>



\*As of 2018, results reflect a major scoring methodology update. For year on year comparison, 2017 results have been recalculated.

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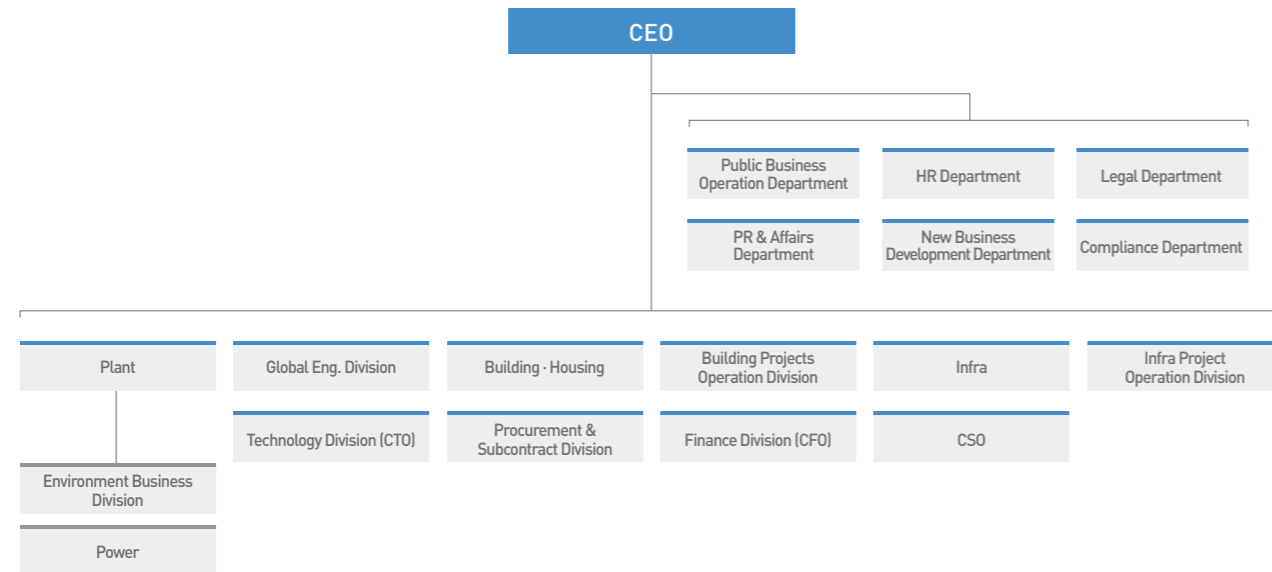




# Data Center

## Overview

### Organization Structure

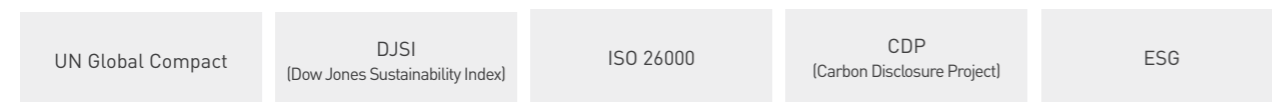


### Shareholders

Rank	Division	Ownership	Name	No. of Shares Owned	Ratio	
Ownership	1	Domestic Investors	46.6	Chang-Soo Huh	7,412,763	9.33
	2	Foreign Investors	26.8	Jin-Soo Huh	3,913,082	4.93
	3	Special Affiliated Investors	25.7	Jeong-Soo Huh	2,996,634	3.77
	4	Treasury Stock	0.9	Myung-Soo Huh	2,443,576	3.08
			Major Shareholders	Tae-Soo Huh	1,529,727	1.93
				National Pension Service	10,058,697	12.66

\*As of Dec. 2018

### Sustainable Management Initiatives 102-12



### Funding for Major Associations 102-13

Category	Unit	Funding	Membership Purpose
International Contractors Association of Korea		789.3	Amendment of regulations related to overseas construction
The Federation of Korean Industries		352.6	Improvement of rules and regulations related to domestic construction industry
Korea Federation of Construction Contractors	KRW Million	270.0	Improvement of rules and regulations related to domestic construction industry
Korea Chamber of Commerce and Industry		125.0	Improvement of rules and regulations related to domestic construction industry
Korea Employers Federation		104.0	Improvement of labor laws and employment policies

\*As of Dec. 2018

### \* Data Scope

A Headquarters B 155 Domestic Sites C 1 Technology Research Center  
 D 10 Overseas Branches E 42 Overseas Sites F 14 Overseas Subsidiaries  
 G 991 Partners

### Financial Value 102-45

FY 2018 : January 1 to December 31, 2018

FY 2017 : January 1 to December 31, 2017

FY 2016 : January 1 to December 31, 2016

Category	Unit	FY 2018	FY 2017	FY 2016
<b>Consolidated Statements of Income</b>				
Sales		131,394	116,795	110,356
Cost of Sales		115,118	108,762	105,474
Gross Profit		16,276	8,033	4,882
Selling and administrative expenses		5,631	4,846	3,452
Operating Profit		10,645	3,187	1,430
Other Operating income		2,591	3,006	4,719
Other Operating expenses	KRW 100 Million	3,185	7,579	5,004
Investment gain and loss		65	(61)	30
Financial income		1,064	2,888	2,919
Financial costs		2,830	3,048	3,881
Profit before income tax		8,350	(1,607)	213
Income tax expenses		2,476	30	417
Net income		5,874	(1,637)	(204)
<b>Consolidated Statements of Financial Position</b>				
Current Assets		78,282	95,823	97,365
Non-current assets		42,051	41,143	36,401
Total Assets		120,333	136,966	133,766
Current liabilities		63,597	85,813	72,250
Non-current liabilities	KRW 100 Million	20,489	18,756	27,984
Total liabilities		84,086	104,569	100,234
Issued capital		3,972	3,584	3,550
Capital surplus		8,118	6,272	6,109
Retained earnings and others		24,157	22,541	23,873
Total Equity		36,247	32,397	33,532

\* Data covers GS E&C, Xi S&D and other subsidiaries

### Industrial Value

Category	Unit	2016	2017	2018	Data Scope*
Proportion of Overseas Orders	%	44.9	21.9	22.2	
Rate of Overseas Projects Compared to Overall Overseas Projects of Korean Contractors	%	7.4	5.1	7.7	A-F
New Overseas Markets	Country	1	0	1	

### Intellectual Value

Category	Unit	2016	2017	2018	Data Scope*
R&D Expenses	KRW 100M	463	541	527	A, C
R&D Investment Rate	%	0.42	0.46	0.40	A, C
Technology Commercialization	KRW 100M	173.5	225.7	190.4	B, E
Sites technology applied	Sites	86	61	87	B, E
Technologies Developed	Cases	34	24	33	A, C



Environmental Value<sup>1)</sup> 302-1 306-2

Category	Unit	2016	2017	2018	Data Scope*	
Amount of Construction Materials Used	Ready-mixed concrete	m <sup>3</sup>	4,246,054	6,034,855	4,154,240	A-C
	Cement	ton	185,405	128,306	89,789	
	Aggregates	m <sup>3</sup>	340,199	313,313	187,926	
	Asphalt	ton	163,726	186,468	89,789	
	Sand	m <sup>3</sup>	120,403	38,137	25,670	
	Steel	Ton	470,264	556,349	346,283	
	Plaster boards	Ton	27,748	44,564	53,199	
Improvement Rate of Raw Materials Consumption by Unit	%	79	-4	-2		
Amount of Recycle Aggregates Used	m <sup>3</sup>	75,532	82,735	24,707		
Amount of Water Used	Total		2,762,239	2,698,668	2,687,953	A-F
	Service water	m <sup>3</sup>	1,840,577	2,013,403	1,935,270	
	Groundwater		517,883	307,813	426,384	
	River water		403,780	377,453	326,299	
Intensity of Building Water <sup>2)</sup>	m <sup>3</sup> /m <sup>2</sup>		2.69	2.00	2.67	
Amount of Energy used	Total	TJ	4,581	4,602	4,715	A-F
	Concrete waste		145	109	95	
	Asphalt waste		45	159	124	
	Sand and stone waste		2,760	2,560	2,653	
	Construction waste		103	111	80	
	Synthetic resin waste		1,502	1,636	1,743	
Intensity of Building Energy <sup>3)</sup>	MWh/m <sup>2</sup>		0.12	0.13	0.13	
Amount of Generated Waste	Total	Ton	293,037	259,329	664,663	A-C
	Concrete waste		169,219	94,917	531,363	
	Asphalt waste		15,146	16,905	21,891	
	Sand and stone waste		21,921	6,252	28,655	
	Construction waste		75,172	123,703	67,981	
	Synthetic resin waste		6,242	10,156	11,628	
	Timber waste		969	6,976	2,032	
Waste Disposal	Recycling	Ton	281,458	241,777	649,890	A-C
	Landfill		4,368	421	1,113	
	Incineration		7,211	17,132	13,660	
Amount of Debris Emission	Ton		33	547	451	
Amount of Wastewater Discharge	Ton		118,661	221,585	164,362	
Amount of Greenhouse Gas Emissions	Total	tCO <sub>2</sub> -e	286,412	285,234	291,233	A-F
	Scope 1 (direct emission)		68,597	63,959	71,547	
	Scope 2 (indirect emission)		72,951	79,473	84,631	
Greenhouse Gas Emissions Reductions	Scope 3 (other forms of indirect emission)		144,863	141,802	135,055	A-F
	Total emissions Reductions		50,517	37,586	9,014	
	Estimated cost reductions	KRW Million	9,685	8,487	2,392	
Intensity of Greenhouse Gas Emissions by Buildings <sup>4)</sup>	tCO <sub>2</sub> -e/m <sup>2</sup>		0.08	0.08	0.08	
Amount of Greenhouse Gas Emissions by KRW	tCO <sub>2</sub> -e/KRW 100 Million		2.63	2.47	2.24	
Green Procurement Costs	Total	KRW 100 Million	586.65	740.03	952.92	A-C
	HB certification		32.46	202.3	81.18	
	High energy-efficiency machinery		275.22	288.49	130.12	
	Energy consumption efficiency grades 1-2		84.89	52.58	132.57	
	Environmental certification		192.96	196.64	592.60	
	Other		1.12	0	16.45	
Proportion of High Energy-efficient Buildings	%		36	39	47	A-C

* Data Scope		
A Headquarters	B 155 Domestic Sites	C 1 Technology Research Center
D 10 Overseas Branches	E 42 Overseas Sites	F 14 Overseas Subsidiaries
G 991 Partners		

Number of Environmental Disputes	Cases	26	4	11	A-C
Number of Environmental Accidents	Cases	8	8	10	
Environmental Dispute Adjustment Costs	KRW 100M	24.2	38.3	31.6	A-C
Eco environment Course Completion Status	People (Cumulative)	937	944	247	

1) Data covers 100% domestic and overseas sites and buildings 2) Building water intensity = sum of annual water consumption / sum of floor area (11 buildings owned including HQ)  
 3) Building energy intensity = sum of annual electricity use / sum of floor area (11 buildings owned including HQ)  
 4) GHG emissions intensity from buildings = sum of annual ton CO<sub>2</sub> equivalent / square meters of floor space (11 buildings owned including HQ)

\* 2016 data on water use (total, service water) altered due to input errors

Human Value 102-8 405-1

Category	Unit	2016	2017	2018	Data Scope*	
Number of Employees	Total	Persons	6,262	5,961	6,822	A-F
	Male	Persons	5,879	5,599	6,187	
	Female	Persons	382	362	635	
	Female ratio	%	6.1	6.1	9.3	
	Regular ratio	%	85	88	73	
	Contract ratio	%	15	13	27	
Employee Diversity	Female ratio at all management levels	%	2.8	3.4	4.7	A-F
	Recruitment ratio of disabled *	%	1.5	1.8	1.6	
	Handicapped	Persons	96	112	110	
	Veterans	Persons	93	95	97	
	Foreigner	Persons	123	86	52	
	Discharged commissioners	Persons	227	216	211	
Retirement Rate	%	3.7	3.7	3.0		
Training Hours per Employee	Hours	55	38	54		
Employee Training Costs	KRW 100 Million	32.8	17.4	13.4		
Employee Performance Evaluation & Career	%	95.0	95.3	94.6		
Employee Satisfaction	%	57.1	58.4	58.9		
Organization Capacity Evaluation Response Rate	%	88.8	84.9	85.3		
Labor Union	Union membership rate	%	41.8	41.4	43.7	A-F
	Union membership	Persons	1,107	970	910	
Childbirth	Use of maternity leave	%	8.1	8.9	4.3	A-F
	Employees who used maternity leave	Persons	31	32	27	
	Employees who used childcare leave	Persons	33	50	51	
	Female employees who used childcare leave	Persons	24	31	30	
	Return rate after childcare leave	%	97	97	98	
On-site Employee Grievance Resolution	Total		10	13	10	A-F
	Korea (Domestic)	Persons	8	8	7	
	Overseas		2	5	3	
Safety Innovation School	Graduates	Persons	1,429	2,881	5,263	A-G
	Training Visits		55	98	155	
Partner Critical Casualties	Total fatalities		4	4	3	G
	Industrial accidents	Persons	4	4	2	
	Work & technological accidents		0	0	1	
Occupational Injury & Illness	Employee occupational injuries	Persons	0	0	1	A-F
	Employee LTIFR <sup>1</sup> (Lost-Time Injury Frequency Rate)		0	0	0.06	
	Partner occupational injuries	Persons	262	265	379	
	Partner LTIFR (Lost-Time Injury Frequency Rate)		0.94	1.15	1.31	
	Employee sick leaves	Persons	47	52	47	
	Employee OIFR <sup>2</sup> (Occupational Illness Frequency Rate)		3.13	3.63	2.87	

\* Employment rate of handicapped persons in 2016 and 2017 was modified

<sup>1</sup> LTIFR: (Number of lost-time injuries x 1,000,000) / (Total hours worked in accounting period)

<sup>2</sup> OIFR: (Number of occupational illness cases x 1,000,000) / (Total hours worked in accounting period)



\* Data Scope  
 A Headquarters B 155 Domestic Sites C 1 Technology Research Center  
 D 10 Overseas Branches E 42 Overseas Sites F 14 Overseas Subsidiaries  
 G 991 Partners

**Foreigner Workers**

Nationality	India	Philippines	Nepal	Bangladesh	Egypt	Vietnam	Other	Total	Data Scope *
People	2,289	877	326	482	428	184	531	5,117	A-F

**Social Relationship Value**

Category	Unit	2016	2017	2018	Data Scope*
No. of Suppliers	Company	1,106	1,063	991	G
Local Economy Revitalization (rate of purchase from domestic suppliers)	%	32.5	31.6	46.7	
Social Contribution Costs	KRW 100 Million	36	36	53	
Social Contribution Employee Participation	People	391	729	524	
Type of Social Contribution	Charitable donations	%	0.1	7.6	31.3
	Community investments	%	88.5	81.3	62.2
	Commercial initiatives	%	11.4	11.1	6.5
Contribution Costs (Total)	KRW 100 Million	35.98	39.76	56.85	A-C
Exposure to the media	Cases	35	31	62	
Benefit recipients	Persons	1,090	3,674	3,948	
College students' favorite workplace	Rank	5	4	3	
Recruits' retention rate	%	100	100	60*	
Educational Benefit Recipients	Persons	304	243	269	
External Awards & Recognition	Awards	1	1	1	
Cultural Support Beneficiaries	Persons	40,558	31,739	27,629	
Housing Customer Complaints	Cases	610	896	4,304	
VOC System Complaints	Cases	498	436	1,103	A-C
Xi Brand GCSI Score	Cases	73.0	73.3	73.4	
Substantive Association Funding	KRW Million	2,428	2,305	2,435	A-C




\*Two of five new employees resigned in 2018

**Other Performance**

Category	Unit	2016	2017	2018	Data Scope*
Individual Violations	Total		28	36	28
	Dismissal		7	10	9
	Resignation under instruction	Cases	1	5	1
	Suspension		4	7	10
	Salary reduction		16	14	8
Ethics Management Reported Case Investigations	True		11	7	24
	False	Cases	24	24	31
	Report		35	31	55
Ethics Education	Attendees of ethical management education (off-line)	Persons	1,860	2,307	2,527
	Attendees of ethical management education (on-line)		7,227	6,554	6,231

**GRI Standards / ISO 26000** 102-55

**Universal Standards**

GRI 102: General Disclosure								
Topic	Index	Disclosure	Page	Note	ISO 26000	Verification	SDGs	
Organizational profile	102-1	Name of organization	ABOUT THIS REPORT, 8			V		
	102-2	Activities, brands, products, and services	8, 10-17			V		
	102-3	Location of headquarters	ABOUT THIS REPORT, 8			V		
	102-4	Location of operations	ABOUT THIS REPORT, 8			V		
	102-5	Ownership and legal form	8			V		
	102-6	Market served	8		6.3.10/6.4.1/6.4.2/	V		
	102-7	Scale of the organization	8		6.4.3/6.4.4/6.4.5/6	V		
	102-8	Information on employees and other workers	77		8.5/7.8	V		
	102-9	Supply chain	54			V		
	102-10	Significant changes to the organization and its supply chain	8			V		
	102-11	Precautionary Principle or approach	70-72			V		
	102-12	External initiatives	74			V		
	102-13	Membership of associations	74, 91			V		
Strategy	102-14	Statement from senior decision-maker	3		4.7/6.2/7.4.2	V		
Ethics and Integrity	102-16	Values, principles, standards, and norms of behavior	68			V		
Governance	102-18	Governance structure	66-67		6.2/7.4.3/7.7.5	V		
	102-40	List of stakeholder groups	64			V		
	102-41	Collective bargaining agreements	44			V		
	Stakeholder Engagement	102-42	Identifying and selecting stakeholders	64		5.3	V	
		102-43	Approach to stakeholder engagement	64			V	
		102-44	Key topics and concerns raised	64			V	
	102-45	Entities included in the consolidated financial statements	75			V		
102-46	Defining report content and topic Boundaries	65,81			V			
102-47	List of material topics	65			V			
Reporting Practice	102-48	Restatements of information	ABOUT THIS REPORT		5.2/7.3.2/	V		
	102-49	Changes in reporting	65		7.3.3/7.3.4	V		
	102-50	Reporting period	ABOUT THIS REPORT			V		
102-51	Date of most recent report	ABOUT THIS REPORT			V			
102-52	Reporting cycle	ABOUT THIS REPORT			V			
102-53	Contact point for questions regarding the report	ABOUT THIS REPORT			V			
102-54	Claims of reporting in accordance with the GRI Standards	ABOUT THIS REPORT			7.5.3/7.6.2	V		
102-55	GRI Content Index	79			V			
102-56	External assurance	ABOUT THIS REPORT			V			



**Topic Specific Standards**

Topic	Index	Disclosure	Page	Note	ISO 26000	Verification	SDGs
<b>GRI 200: Economic</b>							
Economic Performance	103-1~3	Explanation, management approach (MA), and evaluation of the material topic and its Boundary	22-23,81			V	
	201-1	Direct economic value generated and distributed	9,18		6.8.1-6.8.2/ 6.8.3/6.8.7/6.8.9	V	
Indirect Economic Impacts	103-1~3	Explanation, MA and evaluation of the material topic and its Boundary	52-53, 54, 81			V	
	203-1	Significant indirect economic impacts	58		6.3.9/6.8.1-6.8.2/ 6.8.7/6.8.9	V	
Anticorruption	103-1~3	Explanation, MA and evaluation of the material topic and its Boundary	68,81			V	
	205-2	Communication and training about anti-corruption policies and procedures	68		6.6.1-6.6.2/ 6.6.3	V	
Anticompetitive Behavior	103-1~3	Explanation, MA and evaluation of the material topic and its Boundary	54,81			V	
	206-1	Legal actions for anti-competitive behavior, anti-trust, and monopoly practices		A	6.6.1-6.6.2/ 6.6.5/6.6.7	V	
<b>GRI 300: Environment</b>							
Energy	103-1~3	Explanation, MA and evaluation of the material topic and its Boundary	32-33,81			V	
	302-1	Energy consumption within the organization	76		6.5.4	V	
Effluents and Waste	103-1~3	Explanation, MA and evaluation of the material topic and its Boundary	32-33,81			V	
	306-2	Waste by type and disposal method	36,76		6.5.3	V	
Environmental Compliance	103-1~3	Explanation, MA and evaluation of the material topic and its Boundary	34			V	
	307-1	Non-compliance with environmental laws and regulations	34		4.6	V	
<b>GRI 400: Social</b>							
Labor and Management Relations	103-1~3	Explanation, MA and evaluation of the material topic and its Boundary	40-41,44,81			V	
	402-1	Minimum notice periods regarding operational changes	44		6.4.3/6.4.5	V	
Occupational Health and Safety	103-1~3	Explanation, MA and evaluation of the material topic and its Boundary	40-41, 46-49, 81			V	
	403-2	Types and rates of injury, occupational diseases, etc	44,49		6.4.6/6.8.8	V	
Diversity and Equal Opportunity	103-1~3	Explanation, MA and evaluation of the material topic and its Boundary	40-41,81			V	
	405-1	Diversity of governance bodies and employees	77		6.2.3/6.3.7/ 6.3.10/6.4.3	V	
Human Rights Assessment	103-1~3	Explanation, MA and evaluation of the material topic and its Boundary	45,81			V	
	412-2	Employee training on human rights policies or procedures	45		6.3.5	V	
Socioeconomic Compliance	103-1~3	Explanation, MA and evaluation of the material topic and its Boundary	68,81			V	
	419-1	Non-compliance with laws and regulations in the social and economic area		A	4.6/6.7.1-6.7.2/ 6.7.6	V	

**Boundary** 103-1, 102-46

- : Topic Boundary (stakeholders that influence and/or are influenced by the relevant GRI Standards topic)
- ◉ : Reporting Boundary (scope of data disclosed in this report according to GRI Standards topics)

Category	Internal Boundary						External Boundary		
	Headquarter	Domestic Sites (155)	Technology Research Center (1)	Overseas Subsidiaries (10)	Overseas Sites (42)	Overseas branches (14)	Supplier (991)	Customer	Local Community
<b>GRI 200: Economics</b>									
Economic Performance	◉	◉	◉	◉	◉	◉	◉		◉
Indirect Economic Impacts	◉	◉	○	○	○	○	○	○	○
Anti-corruption	◉	◉	◉	◉	◉	◉	○	○	○
Anti-competitive Behavior	◉	◉	○	○	○	○	○	○	○
<b>GRI 300: Environmental</b>									
Energy	◉	◉	◉	◉	◉	◉	○		○
Effluents and Waste	◉	◉	○	○	○	○	○		○
Environmental Compliance	◉	◉	○	○	○	○	○		○
<b>GRI 400: Social</b>									
Labor and Management Relations	◉	◉	◉	○	○	○	○		
Occupational Health and Safety	◉	◉	◉	○	○	○	○		
Diversity and Equal Opportunity	◉	◉	◉	◉	◉	◉	○		
Human Rights Assessment	◉	○	◉	◉	○	◉	◉		
Socioeconomic Compliance	◉	◉	◉	○	○	○	◉		



## Independent Auditor's Report



**GS E&C Corporation.**

The Board of Directors and Stockholders

### Report on Consolidated Financial Statements Audit

#### Opinion

We have audited the accompanying consolidated financial statements of GS Engineering & Construction Corporation and its subsidiaries (collectively referred to as the "Group"), which comprise the consolidated statements of financial position as of December 31, 2018 and 2017, and the consolidated statements of profit or loss, consolidated statements of comprehensive income, consolidated statements of changes in equity and consolidated statements of cash flows for the years then ended, and notes to the consolidated financial statements, including a summary of significant accounting policies.

In our opinion, the accompanying consolidated financial statements present fairly, in all material respects the consolidated financial position of the Group as of December 31, 2018 and 2017 and its consolidated financial performance and its consolidated cash flows for the years then ended in accordance with Korean International Financial Reporting Standards.

#### Basis of opinion

We conducted our audits in accordance with Korean Auditing Standards (KGAAS). Our responsibilities under those standards are further described in the Auditor's responsibilities for the audit of the consolidated financial statements section of our report. We are independent of the Group in accordance with the ethical requirements that are relevant to our audits of the consolidated financial statements in the Republic of Korea, and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

#### Key Audit Matters

Key audit matters are those matters that, in our professional judgment, were of most significance in our audit of the financial statements of the current year. These matters were addressed in the context of our audit of the consolidated financial statements as a whole, and in forming our opinion thereon, and we do not provide a separate opinion on these matters.

#### A. Uncertainty in estimating total contract costs

A majority of the Group's construction contracts are performed over a long period of time and total contract costs are estimated based on the future estimates of the components thereof. Therefore, there may be additional costs that were not estimable until the previous year due to the following reasons: Changes in macroeconomic and microeconomic variables that are the basis of the total contract cost estimation during the construction period, Various changes in the domestic and overseas regions in which constructions are ongoing; and Extension of construction period of some plant construction.

For these reasons, there is uncertainty in estimating total contract costs and a change in the total contract cost estimation will affect the profit or loss of the current or future years. Accordingly, we identified the uncertainty in estimating the total contract costs as a key audit matter.

■ We performed the following audit procedures regarding uncertainty in estimating total contract costs.

- Inquire and verify the related documents for projects with significant differences in total input costs and the estimated total contract costs of the contracts terminated during the year
- Inquire the reason for significant changes in total contract costs during the period for major contracts and confirm the supporting documents concerning reasons for the changes
- Inquire and verify the related documents showing the estimated total contract cost are properly reflected in the construction contracts for which there is a change in the contract during the current period
- Verify the document on whether the estimated total contract cost of the Group has been approved in an appropriate manner
- Inquire for the existence of major contracts with possible changes in the estimated total contract cost due to delays in construction and extension of construction period
- Inquire for the validity of total contract cost estimation on significant contracts in which there are no changes in total contract costs for a long period of time

#### B. Calculation of the percentage-of-completion of a construction

In the case of a construction contract where revenue is recognized based on the input method, the percentage-of-completion of the construction is a direct factor in the calculation of contract revenue. On the other hand, the calculation of the percentage-of-completion of the construction will be affected by the appropriateness of the total estimated construction costs and cumulative contract cost incurred. Accordingly, considering that the effect of uncertainty of the total estimated contract cost, timeliness of the total estimated contract cost, and reliability of the cumulative cost incurred is material to the current profit or loss, we identified the estimation of percentage-of-completion of the construction as a key audit matter.

■ The major audit procedures we performed are as follows.

- Inquire the calculation method of contract cost incurred, and changes in the system and control of the calculation of actual cost of individual construction contract and test the related internal control
- Test the approval of the occurrence amounts and accurate assignment on sites of incurred costs aggregated by major site
- Inquire construction contracts whose percentage-of-completion of the construction has changed significantly during the current year
- Inquire the occurrence of costs excluded from the calculation of percentage-of-completion as the progress of contract is not reflected and inquire the accounting thereof
- Independently recalculate the percentage-of-completion by contract for the analysis of the calculation of the percentage-of-completion
- Compare the difference between the percentage of progress used for the accounting purpose and the percentage of completion by observing the information available to the auditors in the work site and review the validity thereof

#### C. Recoverability of unbilled contracts

As described in Note 8 to the accompanying financial statements, unbilled construction recorded in the consolidated statement of financial position amounts to 1,727,306 million as of December 31, 2018 which increased by 206,370 million compared to the previous year, and accounted for 40% of the total trade and other receivables. Generally, unbilled construction can be claimed based on the conditions of the contract, such as the completion of the related process of construction and the customer's inspection of the project. Thus, there is a possibility of unavoidable fluctuation of the payment condition depending on the inspection results. A significant portion of the unbilled construction is from plant construction in the Middle East and a long-term global oil price decline has caused deterioration in customers' ability to pay, which subsequently increased industry risk. Accordingly, as management's judgment is significant in estimating the recoverability of unbilled construction, we identified it as a key audit matter.

■ The major audit procedures we performed are as follows.

- Review the payment terms of construction contract with significant unbilled construction amounts and check if there is any site with abnormally significant unbilled construction amounts
- Identify construction sites of which there exists significant difference between the percentage-of-completion and construction billing progress and inquire the reasons therefrom
- Identify significant construction contracts with unbilled contracts, and inquire the possibility of financial risk of the customer and verify other related information
- If there are significant sites in which there are no changes in unbilled construction for a long period of time, inquire for specific reasons such as lawsuit, etc.



## D. Accounting for variations in construction

Variations of construction refer to the change in the scope of the construction by the instruction of the customer. As described in Note 8 to the consolidated financial statements, the changes in the total estimated construction revenue amounted to ₩2,619,721 million. As majorities of the Group's construction contracts are performed over a long period of time, there exists possibility of variations in contract work. Also, the total revenue may increase or decrease due to variations in contract work. Accounting for variations in construction requires an estimate of possibility of a change the total revenue, and management's judgment on a reliable measurement of the changes. In addition, the changes in the total construction revenue and costs, caused by variations in contract work, will affect the profit or loss of the current or future years. Accordingly, we identified the accounting for variations in construction as key audit matter.

### ■ The major audit procedures we performed are as follows.

- Inquire the reasons for the changes in construction contracts with significant fluctuations in contract revenue
- Inquire the possibility of liquidated damages for delay for project which is overdue or will reach the due date soon
- Inquire as to whether the estimation of additional contract costs are reflected in the calculation of estimated total contract costs and percentage-of-completion

## Responsibilities of management and those charged with governance for the consolidated financial statements

- Management is responsible for the preparation and fair presentation of the consolidated financial statements in accordance with Korean International Financial Reporting Standards, and for such internal control as management determines is necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.
- In preparing the consolidated financial statements, management is responsible for assessing the Group's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Group or to cease operations, or has no realistic alternative but to do so.
- Those charged with governance are responsible for overseeing the Group's financial reporting process.

## Auditor's responsibilities for the audit of the consolidated financial statements

Our objectives are to obtain reasonable assurance about whether the consolidated financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Korean Auditing Standards (KGAAS) will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these consolidated financial statements.

As part of an audit in accordance with Korean Auditing Standards (KGAAS), we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the consolidated financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit 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 Group's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Group's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the consolidated financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Group to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the consolidated financial statements, including the disclosures, and whether the consolidated financial statements represent the underlying transactions and events in a manner that achieves fair presentation.
- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Group to express an opinion on the consolidated financial statements. We are responsible for the direction, supervision and performance of the group audit. We remain solely responsible for our audit opinion.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

We also provide those charged with governance with a statement that we have complied with relevant ethical requirements regarding independence, and to communicate with them all relationships and other matters that may reasonably be thought to bear on our independence, and where applicable, related safeguards.

From the matters communicated with those charged with governance, we determine those matters that were of most significance in the audit of the consolidated financial statements of the current period and are therefore the key audit matters. We describe these matters in our auditor's report unless law or regulation precludes public disclosure about the matter or when, in extremely rare circumstances, we determine that a matter should not be communicated in our report because the adverse consequences of doing so would reasonably be expected to outweigh the public interest benefits of such communication.

The partner in charge of the audit resulting in this independent auditor's report is Lee, Tae Gon.

March 14, 2019

\* This audit report is effective as of March 14, 2019, the independent auditor's report date. Accordingly, certain material subsequent events or circumstances may have occurred during the period from the independent auditors' report date to the time this report is used. Such events and circumstances could significantly affect the accompanying consolidated financial statements and may result in modifications to this report.





# Statement of Greenhouse Gas Emissions Verification



**GS E&C Corporation.**  
33, Jong-ro, Jongro-gu, Seoul, Korea

## Introduction

KSA Certification, Ltd was commissioned by GS E&C Corporation. ("GS E&C") to verify the domestic GS E&C's Direct emissions (Scope 1 emissions) & Indirect emission (Scope 2 emissions) of Greenhouse Gas Inventory Report for the calendar year 2018 ("the report") based upon a reasonable level of assurance, to verify the overseas GS E&C's emissions (Scope1,2,3 emissions) & domestic GS E&C's Other indirect emissions (Scope3) of Greenhouse Gas Inventory Report for the calendar year 2018 ("the report") based upon a limited level of assurance

GS E&C is responsible for the preparation of the GHG emissions data on the basis set out within the WRI/WBCSD GHG protocol: 2004 and the principles set out in ISO 14064-1:2006. Our responsibility in performing this work is to the management of GS E&C only and in accordance with terms of reference agreed with them. KSA expressly disclaims any liability or responsibility for any decisions, whether investment or otherwise, based upon this assurance statement.

## Scope of Assurance

The emissions data covered by our examination comprise Direct emissions (Scope 1 emissions), Indirect emission (Scope 2 emissions) and Other indirect emissions (Scope3)

- Reporting period under verification: Calendar Year 2018
- Organizational boundary for reporting:

Organizational Boundary	Number of Sites / Buildings	Verification activity
Buildings	11 buildings : Gran Seoul, Elysian Resort etc.	Desk Review, Site visit, Activity data verification
Domestic construction sites	212 sites : in dept. of Architecture, Infra, Plant (including Environment/Power business division)	Desk Review, Site visit, Activity data verification
Overseas construction sites	20 sites : in dept. of Architecture, Infra, Plant (including Environment/Power business division)	Desk Review, Activity data verification

## Verification Approach

The verification has been conducted by KSA from 1st Mar. through 31st Mar. 2019 and performed in accordance with the verification principles and tasks outlined in ISO 14064-3:2006, IPCC Guideline : 1996/2006, Greenhouse Gas and Energy Management Scheme Guideline : 2016-255. We planned and performed our work so as to obtain all the necessary information and explanations to provide us with sufficient evidence to suggest a limited verification opinion concerning the completeness of the emission inventory as well as the reported emission figures in ton CO<sub>2</sub> equivalent. As part of the verification process :

- We have reviewed and verified the GS E&C's Green Information Management System
- We have reviewed the GHG Inventory Report
- We have reviewed and verified process to generate, aggregate and report the emissions data

## Conclusions

As a result of the work described above, in our opinion nothing has come to our attention that would cause us to believe that the GHG Emissions data set out in GS E&C's for the year 2018 were confirmed as below;

## Greenhouse Gas Emissions of GS E&C Corporation in 2018

(unit: ton-CO<sub>2</sub> equivalent)

Organizational Boundary	Direct emissions (Scope 1)	Indirect emissions (Scope 2)	Other indirect emissions (Scope 3)	Total emissions
Domestic	27,692	79,324	94,666	201,683
Overseas	43,855	5,307	40,388	89,550
<b>Total emissions</b>	<b>71,547</b>	<b>84,631</b>	<b>135,055</b>	<b>291,233</b>

\*In order to report the GHG emissions as an integer, the rounded number on the statement might be different from the number on the system with ± 1.0 tCO<sub>2</sub>

\*Total emissions = scope 1 + scope 2 +scope 3

May 13, 2019

**KOREAN STANDARDS ASSOCIATION**





## Third Party Assurance Statement

### Dear GS E&C management and stakeholders,

THE CSR (hereinafter the Assurer) was requested by GS E&C to conduct independent assurance on GS E&C Integrated Report 2018 (hereinafter the Report). The Assurer hereby presents its overall assessment results regarding the company's report content and reporting process. GS E&C takes full responsibility for all the information contained in the Report, and it shall not be provided to other organizations or for purposes other than the enhancement of the company's reliability.

#### Assurance Standards

The Assurer undertook this assurance task in accordance with AA1000AS (2008) and GRI Standards Guidelines.

- The principles of inclusivity, materiality and responsiveness of AA1000AS (2008)
- The principles for determining report content and quality of the GRI Standards Guidelines
- Reporting standards in accordance to the GRI Standards Core option
- The appropriateness of the application of the IIRC IR Framework
- The propriety of the public information production for the Report

#### Assurance Level

The Assurer carried out a moderate level of assurance centered on the application of AA1000AS (2008) as a standard. The Assurer conducted a limited level of data sampling and interviews. Its main assurance activities included the following:

- Review of the reasonability of the materiality test processes involved in the selection of reporting issues
- Review of the agreement of the disclosed information in the Report with GS E&C's audited disclosure data
- Review of stakeholder engagement processes through interview with relevant managers
- Review of data production management systems and processes

#### Assurance Limitations

The Assurer viewed the appropriateness of information production as a criterion and managed to secure a satisfactory level of reliability about the reported contents, although it does not mean a 100% reliability. As for financial performance, the Assurer confirmed the agreement of accounting auditors' audit reports and disclosure data. As for environmental performance, the Assurer checked a professional assurance institutions' assurance report.

#### Assurance Independence

The Assurer has no relations with GS E&C and presents this assurance statement having secured independence and ethics compliance as a third party assurance entity.

#### Assurance Conclusions

Through a series of processes designed to verify the company's compliance with the internationally recognized AA1000AS(2008) assurance standards and international guidelines, the Assurer presents its assurance opinions as follows:

##### Review of GRI Standards Application

The Assurer has confirmed that the Report has complied with the GRI Standards Guidelines-Core Option, and properly covered a DMA (Disclosure on Management Approach), general standards disclosure and 12 aspects of specific standard disclosure. The reporting aspects confirmed during the assurance process are as follows:

Category	Topic	
Economic	Economic Performance 201-1 Indirect Economic Performance 203-1	Anti-Corruption 205-2 Anti-Competitive Behavior 206-1
Environmental	Energy 302-1 Wastewater and Wastes 306-1	Environmental Compliance 307-1
Social	Labor & Management Relations 402-1 Occupational Health and Safety 403-2 Diversity and Equal Opportunity 405-1	Human Rights Assessment 412-2 Socioeconomic Compliance 419-1

##### Review of AA1000AS (2008) Application

Through a series of processes designed to verify the company's compliance with the AA1000AS (2008) assurance standards and internationally recognized guidelines, the Assurer presents its assurance opinions as follows:

##### Inclusiveness\_ Are stakeholders engaged in the value creation processes of GS E&C?

The Assurer confirmed that GS E&C implements stakeholder engagement through diverse channels in its sustainable value creation processes with stakeholders, and that no stakeholder group was purposely excluded from the stakeholder engagement processes.

##### Materiality\_ Does GS E&C make reports on its important sustainable issues?

The Assurer confirmed that GS E&C identified its sustainability issues through the reasonable procedures and that the issues are reported without any omission. In addition, the Assurer could not find any problems in the application of materiality test procedures.

##### Responsiveness\_ Did GS E&C respond reasonably to its stakeholders' expectations?

The Assurer confirmed that GS E&C carried out activities to identify material aspects that affect stakeholders' performance and respond to the outcomes and that the contents are appropriately described in the Report

#### Recommendations for Improvement

- The Assurer recommends that GS E&C strategically carries out sustainable management systems, goals and performance management to balance economic, environmental and social value creation through business activities.
- GS E&C should systematically derive material issues that reflect the global and construction industry environment, and social and environmental trends, and intensively manage top-priority issues and create results.
- Active performance management and response activities for vulnerable issues including governance, supply chain management, human rights and labor practice indicators that are deemed important in sustainability management are recommended.
- The Assurer recommends that GS E&C promotes sustainable management based on implementation and shares its contents with stakeholders.

#### Assurer Eligibility

THE CSR, requested to conduct assurance on the Report, is a global sustainability management agency. It has acquired an AA1000AS (2008) assurance certification accredited by Account Ability, UK and also obtained the status of gold community member at Global Reporting Initiative (GRI). THE CSR Expert Committees have full knowledge of sustainability and expertise in verification and are composed of global experts from Korea, as well as the US, UK and Germany, equipped with research achievements regarding CSR.

May 31, 2019

THE CSR



THE CSR CEO  
Se-woo, Jung



# UNGC Advanced Level

Category	Principle	Page	GRI Topic	
1	This integrated report (IR) describes the discussions at the level of the CEO and the BOD regarding the strategic aspects of the implementation of the UNGC.	2	102-14	
2	This IR explains the company's decision-making processes and corporate governance to achieve its sustainability.	66-67	102-18, 21	
3		64	102-43	
4	UN Goals and Issues	This IR describes activities designed to support comprehensive goals and issue of the United Nations.	4,74	102-12
5	Human Rights	This IR describes the company's strong commitment, strategies and policies in the area of human rights.	40-41,45	103-1
6		This IR describes an effective management system designed to integrate its human rights principles.	43,45	103-2
7		This IR describes effective monitoring and evaluation mechanisms about human rights principles.	45	412-2
8	Labor	This IR applies standardized performance indices (including GRI) about human rights.	72	405-1
9		This IR describes the company's strong commitment, strategies and policies in the area of labor.	40-41, 44,46	103-1
10		This IR describes an effective management system designed to integrate its labor principles.	43,44	103-2
11		This IR describes effective monitoring and evaluation mechanisms about labor principles.	43,44	103-3
12	Environment	This IR applies standardized performance indices (including GRI) about labor.	77	402-1 403-2 405-1
13		This IR describes the company's strong commitment, strategies and policies in the area of environmental management.	32-33	103-1
14		This IR describes an effective management system designed to integrate its environmental principles.	34	103-2
15	Anti-Corruption	This IR describes effective monitoring and evaluation mechanisms about environmental management.	34-35	103-3
16		This IR applies standardized performance indices about environmental management.	34,76	302-1 306-2 307-1
17		This IR describes the company's strong commitment, strategies and policies in the area of anti-corruption efforts.	68	103-1
18	Strategies, Governance and Engagement	This IR describes an effective management system designed to integrate its anti-corruption principles.	69	103-2
19		This IR describes effective monitoring and evaluation mechanisms in the area of anti-corruption efforts.	68	205-2
20		This IR applies standardized performance indices about anti-corruption efforts.	68	205-2
21	Strategies, Governance and Engagement	This IR explains about the implementation of Global Compact Principles within the company's value chain.	58,78	-
22		This IR offers information on the corporate profile and operational environments.	3,8-19	102-1~10
23		This IR includes a high level of transparency and disclosure.	ABOUT THIS REPORT, 3	102-50~56

# Membership Status & Awards

## Membership Status 102-13

Division	Name of Association
Plant	Korea Plant Engineering Association, Construction Industry Institute, International Contractors Association of Korea, Korea Institute of Plant & Engineering, Korea Plant Industries Association, Korea PDS, AACE International, Gasification Technology Council, IRCA (International Register of Certificated Auditors), Korea Gas Union, Korean Society for Fluid Machinery
Power, Plant and Environment	Korean Society of Water and Wastewater, Korean Society of Environmental Engineers, The Membrane Society of Korea, Korean Society on Water Quality, Korean Society of Water Science and Technology, The Korean Society of Combustion, Korean Society of Thermal Environmental Engineers, Korean Organic Resource Recycling Association, Korean Society of Waste Management, Society of Odor Research and Engineering, Korea Associate Council of Incineration Technology, The Korean Institute of Electrical and Electronic Material Engineers, Korea Association of Waste to Energy Technology, Korea Water and Wastewater Works Association, Korean Institute of Chemical Engineers, Korean Society of Atmospheric Environment, Korean Society of Soil and Groundwater Environment, Korea Municipal Waste Engineering Association, Korea Electric Association, KEPIC, Korea Institute of Project Management Technology, Korea Wind Energy Industry Association, Korea District Heating & Cooling Association, Korea Atomic Industrial Forum, Korea Nuclear Society, Korea Nuclear Association for International Cooperation, KRSEA, KRETA, Korea Information & Communication Contractors Association, Korea Software Industry Association,
Civil Engineering	Korean Society of Transportation, Korea Urban Railway Association, Korea Water Resources Association, Korean National Committee on Large Dams, Korea Geosynthetic Society, Korea Society of Road Engineers, Korea Road Association, Korean Society of Coastal and Ocean Engineers, Korea Port & Harbour Association, Korean Society of Coastal Disaster Prevention, Korean National Committee on Irrigation and Drainage, The Korea Railway Association, Korean Society for Railway, Korean Railway Construction Association, Korea Rail Engineering Association, Korean Society of Civil Engineering, Korean Society for Rock Mechanics, Korean Geotechnical Society Korean Tunneling and Underground Space Association, Korea Concrete Institute, Korean Society of Steel Construction, Korea Society of Disaster & Security
Architecture & Housing	The Korean Institute of Illuminating and Electrical Installation Engineers, Korea Institute of Construction Engineering and Management, Korea Institute of Building Construction, The Society of Air-conditioning and Refrigerating Engineers of Korea, Korea Green Building Council, Korean Association of Air Conditioning Refrigerating and Sanitary Engineers, Korea Society of Geothermal Energy Engineers, Korea Council of Tall Building and Urban Habitat, Korea Air Cleaning Association, Korea Institute of Ecological Architecture and Environment, Korean Association for Energy Service Companies Korean Institute of BIM, Korea Institute of Architectural Sustainable Environment and Building Systems, The Korean Institute of Landscape Architecture, Korea Housing Association, Korea Remodeling Association, Architectural Institute of Korea
Technology	Korea Engineering & Consulting Association, Korea Industrial Technology Association, The Korea Construction New-Technology Association, Building SMART Korea, Korean Geo-environmental Society, Korean Society of Hazard Mitigation, The Korean Society for Noise and Vibration Engineering, Earthquake Engineering Society of Korea, Korean Society of Ecology and Infrastructure Engineering, Korea Wind Energy Association, Computational Structural Engineering Institute of Korea
Management	Korea Business Council for Sustainable Development, Korea Federation of Construction Contractors, UN Global Compact Network Korea, The Federation of Korean Industries, Korea Chamber of Commerce and Industry, Korea IR Service, Korea Listed Company Association, Seoul Patent Attorney Association, American Bar Association, Competition Federation, KOSHA18001 Society, Construction Safety Manager Committee, Construction Safety Manager Association, Korea Society for Construction Quality, Korea Construction Quality Association, The Society for Environmental Construction, Construction Association of Korea, Korea Construction Engineers Association, Korea Specialty Contractors Association, Korea New & Renewable Energy Association, Korea Fire Construction Association, Korea Facilities Maintenance Association, Korea Mechanical Construction Contractors Association, Korea Electrical Contractors Association, Korea Information Communication Contractors Association, The Korean Society for Human Resource Development, Korea Organization Management Development Association, Korea International Trade Association, Construction & Economy Research Institute of Korea

## Awards

Area	Award Description
Economic	2018 Civil Engineering Day Award- Grand Prize in Construction Sector - GS E&C [03.30]
	2018 Hankook Economy Housing Culture Awards in the first half of the year- Grand Prize in town house - Xi the Village [07.05]
	2018 Korea Premium Housing Award - Grand Prize - Sky City Xi [08.23]
	2018 Korean International Contractors Competition - Minister of Land's Award-Doha Link [11.16]
	2018 Dr. Apartment-Brand Power & Best Apartment Brands Winner [11.14 / 11.27]
	2018 Railway Top Ten Technology Award - ART Girder Railway Bridge [11.21]
Environmental - Social	2018 Maeil Economy Civil Engineering Award - Grand Prize -Noryang Bridge [12.12]
	2018 Eco-friendly Construction Industry Awards - Minister of Land's Award - Sky City Xi [07.18]
	2018 Asia Construction Industry Awards - Grand Prize in Shared Growth - GS E&C [09.18]
	2018 Natural Environment Awards - Minister of Land's Award - Misa Riverside Central Xi [11.23]
Global	2018 Artificial Ground Landscape Awards - Grand Prize - Seoul Forest Riverview Xi [11.23]
	DJSI Sustainability Awards- Admitted to Asia-Pacific Index 9th Consecutive Year [11.01]
	ASSE GCC HSE Excellence Award 2018 Kuwait Chapter [04.25]
	: Kuwait KOC Project (Grand Prize in Project, Gold Prize in Risk Management, Gold Prize in Environment)
	LTA Annual Safety Award - Singapore Thomson line T203 Project [09.06]
[Zero Accident Award, Project Safety Commendation Award, Construction Environmental Merit Award]	



## **GS E&C INTEGRATED REPORT 2018**

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**GS E&C is entrusted to build our world's values through  
creativity and passion**

GS E&C's vision is to become a partner and 1st ranking global company  
that creates value for prosperous lives through creativity and passion.

GS E&C will continue to create sustainable value with our stakeholders  
for both the company and society and build a brighter future by listening  
to everyone's voice.

**Publisher** | Byeong-yong Lim

**Publishing office** | GS E&C

**Date of publication** | June 2019



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