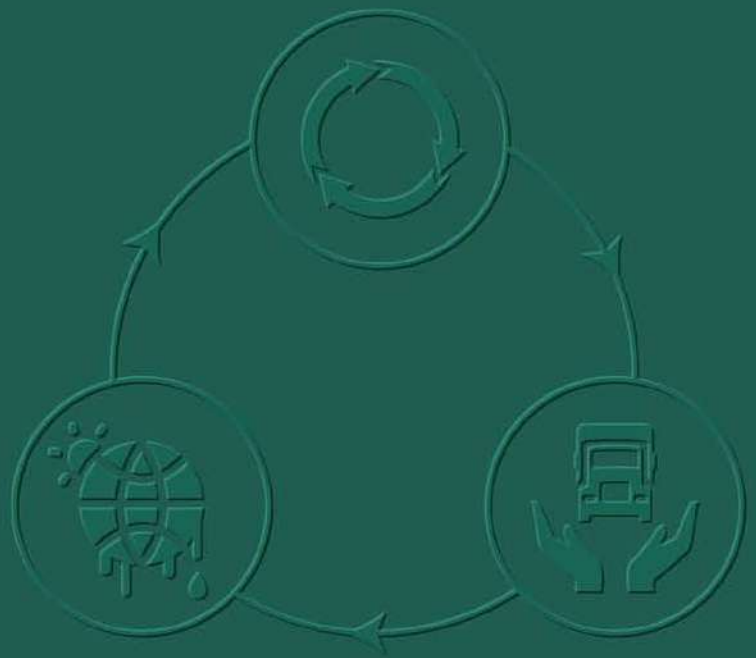
THE SIAM CEMENT PUBLIC COMPANY LIMITED

SUSTAINABILITY REPORT 2019



COLLABORATION

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FOR ACTION

SCG

Collaboration
for Action

SCG is confident that multi-sectoral collaboration, business-public-private-civic, is the key driver of sustainable development. Together we can bring about better living, riding out the global crisis and restoring the balance according to the Circular Economy principles.

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Message from President & CEO,
and Sustainable Development Committee, SCG

SCG's business involves manufacturing of products, services and solutions to deliver better living. The broad scope of our activities ranging from modular housing, construction solutions, building materials, polymer, plastic, paper, including packaging for industry, business and consumer. It means that we interact with various people, with natural resources use throughout the business value chain from upstream to downstream. SCG is committed to conducting our business with social and environmental responsibility. We stand ready to foster innovation and collaboration with stakeholders, and to apply international standards to build sustainable value to the Thai society and the region.

Roongrote Rangsiyopash

Tanawong Areeratchakul

Raising Our Commitment

As climate impacts accelerate to the extent of Climate Emergency, countries are called upon to do their parts in attaining the Paris Agreement target of keeping global temperature rise to below 2 degrees Celsius above pre-industrial levels. At present, we are also attempting to be in line with the targets of no more than 1.5 degrees Celsius.

To achieve our long-term target of reducing greenhouse gas emissions by 28% in 2030 (compared with business-as-usual at the base year in 2007), SCG in 2019 pledged our commitment by setting intermediate target of 20% in 2025 to ascertain that we get there in the long term. We also joined WBCSD's Natural Climate Solutions working group, which advocates for natural methods of reviving forest for carbon storage. For a number of years, SCG has consistently done just that through projects on check dam construction, afforestation, mangrove and seagrass afforestation.
In management, we now use Internal Carbon Pricing (ICP) to make investment decisions in projects deemed to contribute to greenhouse gas emissions cut. We also disclosed climate-related risk and opportunity according to the Task Force on Climate-related Financial Disclosures (TCFD) guidelines.

Collaboration for Action

SCG stands firmly committed to applying Circular Economy principles across our organization with the Make-Use-Return concept and innovation as key driver. We set up a Circular Economy Committee to provide oversight and foster success factors, particularly collaboration with multiple entities at all levels to drive circular economy in action.

Our efforts include hosting the SD Symposium 10 Years "Circular Economy: Collaboration for Action" in 2019 and strengthen our partnership with 45 organizations within Circular Economy. We join with 14 leading organizations of construction industry to set up Circular Economy in Construction Industry (CECI) network; and we join as members of Circular Economy for Flexible Packaging (CEFLEX). SCG is also one of the founding members along with top 30 multinational corporations in the Alliance to End Plastic Waste (AEPW) to help reducing and managing to end plastic waste in the environment, especially in the ocean.

Back Home with Happy Smile

In 2019, we prioritize safety by appointing a committee on occupational health and safety with two sub-committees dealing separately with Workplace Safety and Transportation Safety committee, to tighten oversight and effectiveness. We intend to work harder towards achieving the ultimate target of zero lost time accident by 2022 and zero fatality case of employees and contractors each year. We have improved our safety performance so far but we are stepping up the effort to reach our challenge targets.

Another milestone for us in 2019 is the Goods Transportation Safety Standard which have been enforced across our organization. All business units shared most effective measures and good practices and agreed upon a single guideline for transportation to be implemented by the entire organization. We also encourage our carriers to adopt the guideline, and support their capacity for compliance and self-regulation.

Conduct Business with Responsibility

SCG is committed to protection of human rights, labor practices, environment and anti-corruption action, at both national and international levels in compliance with the UN Global Compact since 2012. In 2019, SCG retains its membership in Dow Jones Sustainability Indices for 16th consecutive year in Construction Materials Industry.

In 2019, we set clear target to drive Sustainable Development Goals (SDGs) while balancing three aspects of our business: economic, social and environment. Specifically, the five SDGs we prioritize are Goal 3 on Good Health and Well-being, Goal 8 on Decent Work and Economic Growth, Goal 9 on Industry, Innovation and Infrastructure, Goal 12 on Responsible Consumption and Production and Goal 13 on Climate Action.

SCG is pleased to present this Sustainability Report of 2019, which showcases parts of work in sustainable development, with commitment to conduct business with social responsibility. We are confident that collaboration for action can bring about the transformation and resilience we need to ride out global challenges we are facing.

Roongrote Rangsiyopash

President & CEO, SCG
Chair, Sustainable Development Committee

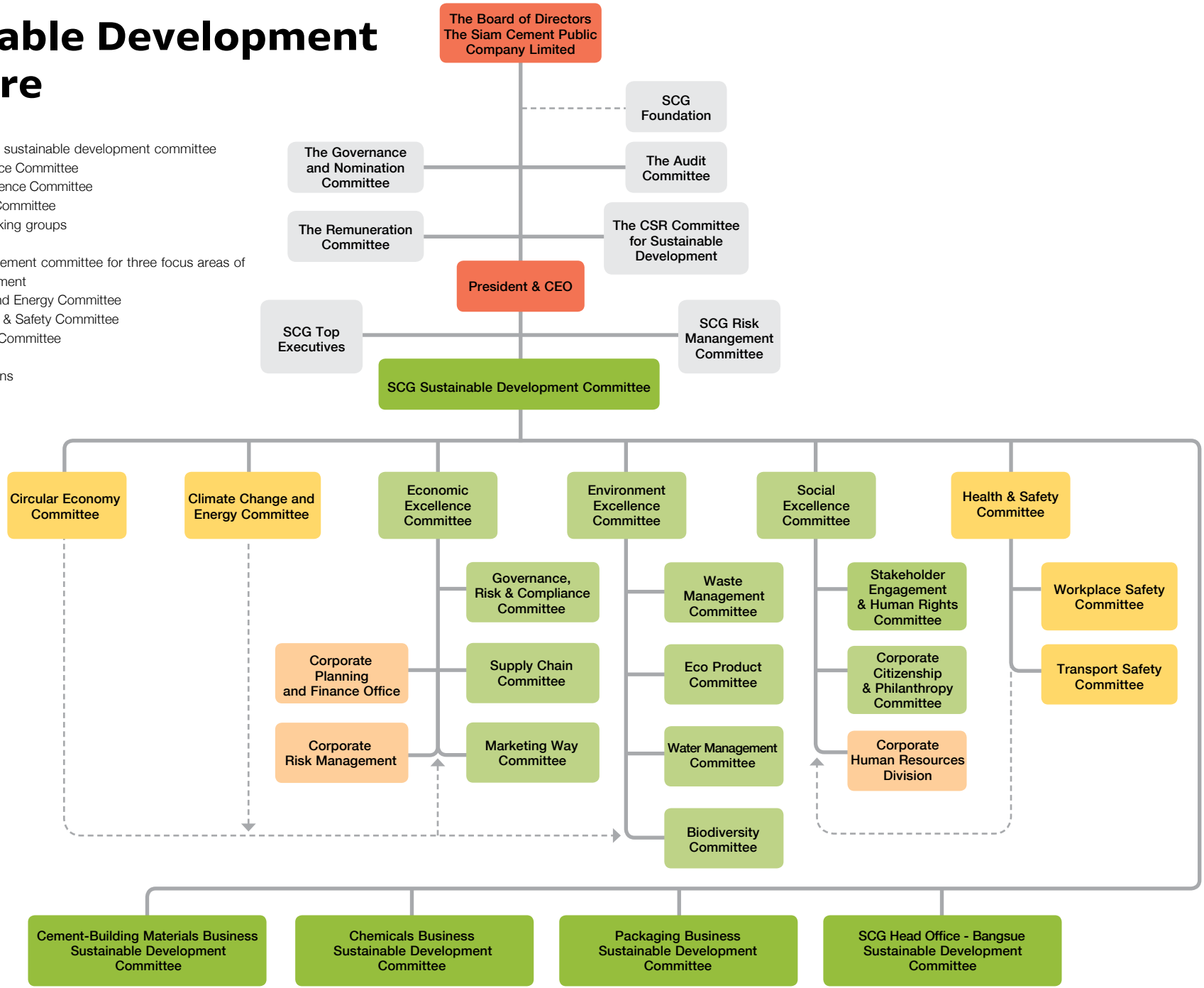
Tanawong Areeratchakul

President, Chemicals Business
Co-Chair, Sustainable Development Committee

Sustainable Development Structure

- Three dimensions of sustainable development committee
  - Economic Excellence Committee
  - Environment Excellence Committee
  - Social Excellence Committee

  Committee and working groups
- Strategy and management committee for three focus areas of sustainable development
  - Climate Change and Energy Committee
  - Occupation Health & Safety Committee
  - Circular Economy Committee
- Responsible Functions



Cement-Building Materials Business

Challenges and Goals

The advancement of new technology, scarcity of natural resources, climate and environment change including global economic fluctuation are posed as challenges for the operations of Cement-Building Materials Business.
We, therefore, strives to raise the standard of construction and total living solution under the Circular Economy principles to create products and innovation that satisfy to lifestyles and customers' needs with the least impact on the environment.

Sustainable Change

- Transforming business model from manufacturer to a creator to complete solutions and innovations in living products and services that meet the needs of customers.
- Using technology to support data analytics to create new business model that reach diverse customers in a rapid manner.
- Encouraging employees to develop knowledge and skills, having working approach and having capabilities to find true customers' needs through the Design Thinking process.

Recycled Material

2.9% Cement Business

14.7% Building Materials Business

Recycled Water

39.9% Building Materials Business

Alternative Energy

17.5% Cement Business

Achievements and Progress

- Launching the new business model of Construction Solution using Building Information Modeling (BIM) technology to help the virtual building development before construction, reduce material loss in construction, including budget and operation period control to be in accordance with plan.
- Establishing CPAC Solution Center, as center for knowledge exchange and sharing, counseling and providing construction related solutions in form of Open Innovation for construction technicians and contractors. With CPAC's strength in exclusive information and innovation and also the construction industry alliances' technology, the center's 9 branches have been officially opened in 9 big provinces.
- Partnering with leading construction industry companies as founding members of Circular Economy in Construction Industry (CECI) to find the way solving construction waste management in sustainable way.

Chemicals Business

Challenges and Goals

Amidst the global economic fluctuation and chemicals market slowdown, and geopolitical tensions, we place full emphasis on creating and developing High Value Added, safety and environmentally friendly products and services to meet consumers' needs with responsible products and services and also Circular Economy principles. We applied technology and digital systems to enhance operational efficiency throughout the value chain. We implement Process Safety Management (PSM) and Industrial Hygiene Management System to accidents, injuries prevention and to be prevent without occupational illness. We are ready to expand production capacity and aim to be the sustainable leader in ASEAN region.

Sustainable Change

- Transforming from a regular commodity chemical products producer to a creator of innovative High Value Added products and services and moving forward to become Service Solution Provider.
- Research and development of products by focusing on vastly increasing recyclable resource raw materials into the system and reducing natural resources materials.
- Driving the Circular Economy principle through continually educating and providing information on resources consumption and waste management to employees and communities.
- Investing in Startups and Venture Capital Funds relating to in-depth technology to address Circular Economy.
- Developing employees' potential through Digital Platform to enable them to be organizational leaders in preparation for future business expansion in the ASEAN region.

SCG eco value Products and Services

49%

Fatality and Lost Time Injury Case

0

Achievements and Progress

- RIL Industrial Estate has been certified as Eco-World Class, which is the first industrial estate in Thailand to achieve the highest honorary status, from the Industrial Estate Authority of Thailand.
- Build the prototype of "Community Like (No) Garbage" by encouraging the community engagement at Khao-Phai Village, Rayong Province and developing the application named "Koomkah" to manage the waste banks, in 2019, the application has been used in more than 23 areas.
- Collaborate with Department of Marine and Coastal Resources to develop 24 sets of "floating litter trap" to be installed in the estuaries and canals in 13 seaside provinces. In 2019, the floating litter traps reduce the amount of waste entering the sea by at least 30 tonnages.
- Become the joint founding member of Alliance to End Plastic Waste (AEPW) in collaboration with a group of the world's leading companies to solve ocean plastic waste in the sustainable way.

Packaging Business

Challenges and Goals

As the consequence of the economic slowdown from trade war, include changing customers' behavior by digital technology advancement and the trend of customers to pay more attention to the environment. We, therefore, emphasize on finding new packaging solutions in response to consumers diverse and different needs under the Circular Economy principles and strive to become the leader of packaging solutions in ASEAN region.

Recycled Material

50.2%

Recycled Water

12.0%

Alternative Energy

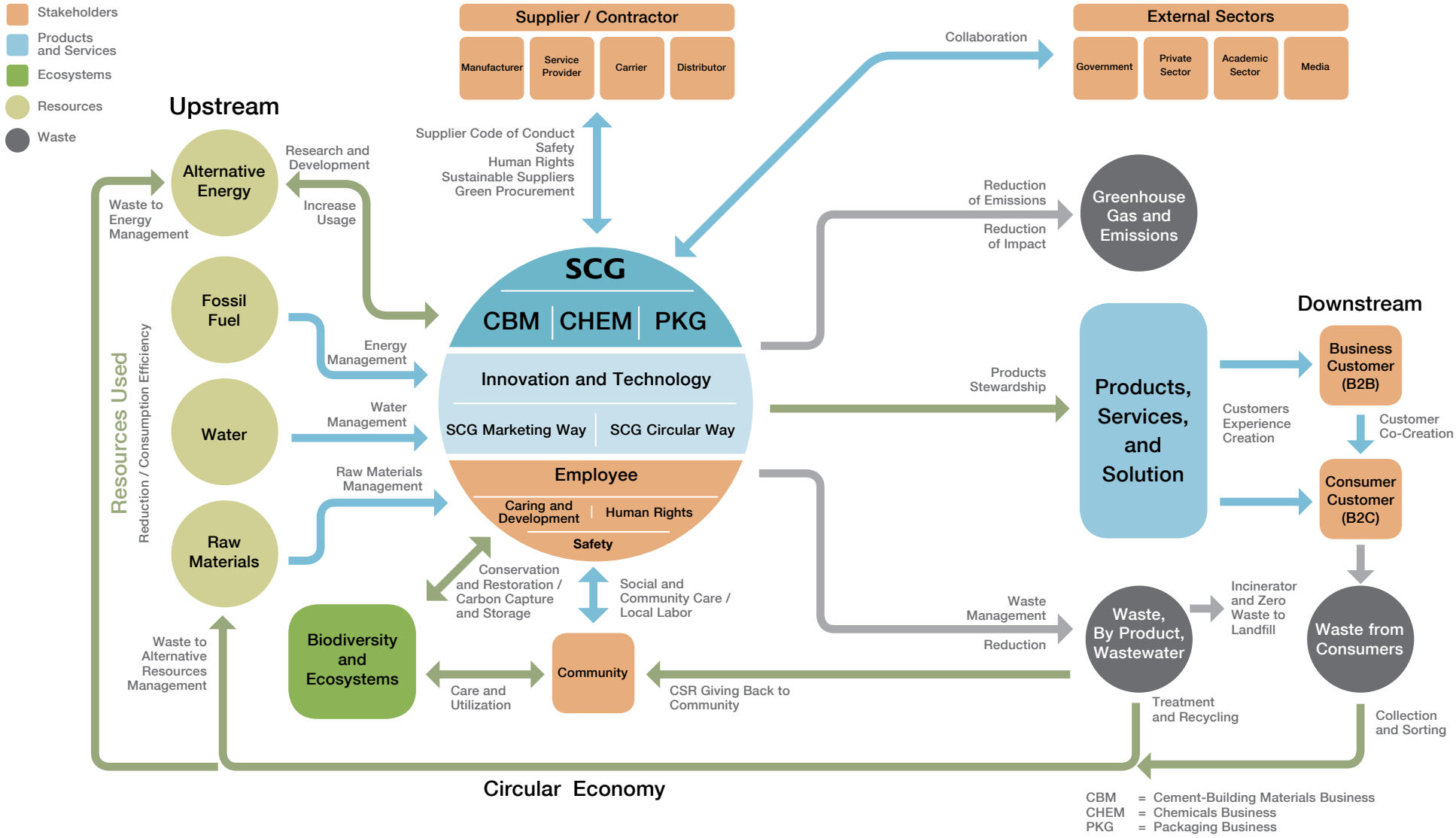
30.6%

Sustainable Change

- Adjust to be aligned the rapid growth business by becoming Packaging Solutions Provider, particularly in the high growth potential of ASEAN Market.
- Apply digital technology and automation in the production process to reduce production time, reduce minimum production lot size, and be able to fulfill more needs of customers.
- Maintain leading position through packaging solutions accordance with the Circular Economy principles to meet the needs of consumers in terms of environmental friendliness and gain the competitive advantages.
- Modify the organizational management structure and enrich employee development for more capabilities, competence consistent with sustainable development with good leadership skills and new capabilities on digital technology to create value that meets the customers' needs.

Achievements and Progress

- FEST BIO, a biodegradable and non-chemical hazardous food packaging made from natural eucalyptus membranes from commercially afforestation.
- FEST Chill, a recyclable and non-chemical hazardous food packaging made from natural eucalyptus membranes from commercially afforestation.
- The production of packaging with Digital Printing technology shortens the lead time of printing plate preparation and production process, enables to print on variety of materials, and reduce minimum production lot size.
- The "Sharing is Caring, FEST Giving Back to the Environment" Project is the collaboration with 9 partners to promote the use of safe and environmentally friendly food packaging and contribute for purchase the fertilizer production machine from food waste to the Sirindhorn International Environmental Park Foundation under the patronage of HRH Princess Maha Chakri Sirindhorn.
- Collaborate with Tesco Lotus launching a campaign "Rethinking Packaging : New Think New Idea for Environment" to collect and recycle used paper packaging to be paper bags replacing plastic bags and to collect and transform plastic bottles into fabric bags.



Sustainable Value Chain

SCG incorporates Circular Economy principle in its entire value chain, from the stage of designing, procurement, manufacturing, sales and transport, usage up to recycling, by maximizing the utilization of limited energy and resources throughout the value chain including reducing, reusing, recycling, using alternative energy and reduce unutilized waste to minimum.

SCG is committed to producing the products, providing services and solutions that support the reduction of greenhouse gas emissions and energy consumption reduction and amount of waste and long lifespan, as well as caring for health and safety of our employees and contractors.
The collaboration with all entities comprising public and private sectors, and community is the key orienting the Circular Economy into real practice.

Stakeholders Engagement

Stakeholder Group	Objective	Engagement Approach	Action	Page
 Shareholder/ Investor/Creditor	• Disclose material information about the Company's performance in a clear and prompt manner	• Annual General Meeting of Shareholders • Quarterly Analyst Conference • Annual company visit/business unit • Two roadshows/year • Communicate the Company's performance through the Annual Report and the Sustainability Report • Regularly communicate the Company's activities in different areas **Channel** **Investor Relations**  **SCG News Channel**  **Corporate Secretary** Tel: +66-2586-6098 E-mail: corporatesecretary@scg.com **Investor Relations** Tel: +66-2586-4299 E-mail: invest@scg.com	• Sustainability Report 2019	
 Employee	• Recognize and facilitate employees' needs for happy workplace • Take care of working environment for employees' good health and safety • Promote continuous development of skills and potentials • Disclose and communicate business activities with employees • Promote a collaboration culture to work with other stakeholders	• Acknowledge issues and expectations through formal and informal channels • Encourage employees to learn more about new trends and development throughout the year • Initiate skill development projects in line with business changes • Quarterly Leadership Forum • Quarterly Meeting with Executives • Annual Employee Engagement Activity • Employee Engagement Survey / 2 years • Facilitate access to essential information through the mobile application Employee CONNECT • Keep employees informed of latest news and updates, such as Business Movement, Regional Movement, Inno Update, SD Update, and SCG Circular Way via e-mail as well as other channels • Promote awareness and behavioral changes for safe working culture **Channel** **SCG News Channel**  **SCG Fanpage**  **Whistleblowing System** https://whistleblowing.scg.com	• Climate Resilience • Circular Economy • Health & Safety • Promoting Innovation-Driven Culture in the Organization • Sustainable Value towards Supplier • SCG Marketing Way • Employee Caring and Development • Community and Social Involvement	27 37 45 60 61 71 108 115

Stakeholder Group	Objective	Engagement Approach	Action	Page
 Supplier	• Reassure business environment and safety at work for suppliers • Create value for the operation of suppliers • Advance the operation of suppliers and enrich knowledge to maximize operational efficiency • Develop collaborative projects for business growth and expansion	• Support knowledge and management of environmental, social, and governance (ESG) to enhance the operation of suppliers and reduce operational and reputational risks • Share knowledge and new trends that may affect the operation of suppliers • Foster safety awareness and promote behavioral change to create a culture of workplace safety **Channel** Tel: +66-2586-4444 Website: www.scg.com	• Health & Safety • Transportation Safety • Sustainable Value towards Supplier • Human Rights	45 52 61 103
 Customer	• Respond to the needs of customer in various dimensions • Co-create products with business customers • Provide channels through which customers can offer suggestions, seek advice, receive troubleshooting assistance, and file complaints • Promote collaboration among business customers to create sustainable products and services	• Integrate services and solutions to meet a complete range of customer needs • Provide around-the-clock consultation for home construction, repair, renovation, and extension through the mobile application Home Buddy • Receive complaints, suggestions, and other feedback through various channels around the clock • Co-create products with business customers **Channel** Tel: +66-2586-2222 E-mail: contact@scg.com Line ID: @scg.contact.center **SCG Contact Center**	• Climate Resilience • Circular Economy • Innovation and Technology • Customers Experience Creation • Product Stewardship	27 37 55 70 76
 Community	• Be a part of community, respect community rights, and conserve the environment in the vicinity • Enhance quality of life and promote integrity of society in Thailand and other ASEAN countries where SCG operates • Listen to the opinion of communities • Develop collaborative projects to enhance community competence for society benefits	• Monthly dialogue with local community to get suggestions, feedback, and their needs • Annual community satisfaction survey • Serve as partner and consultant and leverage the Company's capability to help develop various aspects of communities **Channel** Tel: +66-2586-4444 Website: www.scg.com **SCG Fanpage**	• Climate Resilience • Circular Economy • Waste Management • Water Management • Biodiversity and Ecosystem • Human Rights • Community and Social Involvement	27 37 81 87 93 103 115

Stakeholder Group	Objective	Engagement Approach	Action	Page
 Government Agency	• Be a role model for other organizations in terms of operational transparency and excellence • Collaborate with public sectors and present approach and good practices for Sustainable Development • Participate in collaborative projects that seek to achieve sustainable development goals (SDGs)	• Listen to opinions and suggestions from the government sector • Offer opinions and suggestions towards the rules and regulations issued by the government • Foster engagement and share good practices with the government sector to expand their adoption **Channel** Tel: +66-2586-4444 Website: www.scg.com	• Circular Economy • Transportation Safety • Waste Management • Water Management • Human Rights • Community and Social Involvement	37 52 81 87 103 115
 Media	• Disclose information fully, promptly, accurately, and in a timely manner • Foster engagement and good relations with the media	• Quarterly operating results announcement • Occasional site visit and CSR activity • Annual Thank Press **Channel** Tel: +66-2586-4444 +66-2586-2974 Email: info@scg.com SCG News Channel SCG Fanpage		
 Civil Society Sector, Academia, and Opinion Leaders, NGOs	• Disclose information with completeness and transparency • Seek opportunities to create partnership and drive issues related to sustainability • Foster public awareness and understanding on key sustainable development issues • Leverage the expertise of specialists to support collaborative projects	• Listen to opinions and suggestions from civil societies, scholars, and opinion leaders to improve the Company's operations • Participate in projects that promote social sustainability **Channel** Tel: +66-2586-4444 Website: www.scg.com	• Opinion Panel • Circular Economy • Biodiversity and Ecosystem • Community and Social Involvement	13 37 93 115

2019 Opinion Panel

- SCG Sustainable Development Committee organizes an Opinion Panel on an annual basis to listen to stakeholders' perspectives, opinions, and suggestions, which are used to elevate SCG's operations.

- In 2019, SCG organized the 10th Opinion Panel on Business & Human Rights and featured experts from the government sector, the labor sector, academia, and a private development organization.

"It takes listening to each other to solve human rights issues sustainably."

Prakairatana Thontiravong
Commissioner, National Human Rights Commission of Thailand (NHRC)

"Compliance with Thai laws on human rights and labor rights alone is not sufficient. International rules must also be observed."

Assoc. Prof. Lae Dilokvidhyarat
Distinguished Professor, Faculty of Economics, Chulalongkorn University

"We must have the courage to the truth to work towards solutions."

Sawit Kaewvarn
President, Thai Labor Solidarity Committee

"Clear grievance channel and mechanism for issues such as human rights, products & services, environment, and communities, must be provided and announced to the public"

Sor. Rattanamanee Polkla
Lawyer, Community Resource Center Foundation

Summary of Recommendations

SCG's Human Rights Due Diligence

• A comprehensive human rights risk assessment manual should be compiled to serve as a guideline for conducting human rights due diligence and to prevent any risks that may arise from activities related to SCG's domestic and overseas businesses throughout the supply chain.

• Grievance channels should be provided for cases of human rights violations related to social and environmental issues.

• Employees, stakeholders, and external parties should be informed of SCG's grievance channels, procedures, and transparency of management, covering possible impacts in all dimensions.

• Human rights due diligence and management must be conducted on a principle of respect. Employees and stakeholders should get an opportunity to take part in formulating rules and designing management approach, following the principle of participation, to ensure fairness to all parties and reporting credibility of human rights performance.

• SCG should track performance on human rights issues through such tracking processes as grievance mechanism, satisfaction surveys, level of employee participation in internationally-recognized labor union or labor relations.

• Key performance indicators on human rights should be developed to establish an operational standard, goal setting, and performance effectiveness and development.

Business and Human Rights Practices

• SCG should adopt the UN Guiding Principles on Business and Human Rights (UNGP), which expects businesses to conduct human rights due diligence to identify, prevent, alleviate, and remedy human rights impacts relating to business activity.

• As labor rights and human rights practices are global concerns, human rights protection should not be limited to only employees but should also cover those who may be affected along the supply chain in any country where SCG operates. Furthermore, when conducting investment risk assessment, human rights issue should be taken into consideration in addition to social and environmental impact assessment.

• Human rights standards and best practices should be appropriately applied to SCG's business alongside legal compliance, especially in countries where special attention is on legitimacy, equality, and human rights.

• Sincere listening to the opinions of stakeholders or those impacted can sustainably prevent and solve human rights issues.

SCG's Role in Promoting Human Rights Practices

• SCG should utilize its potential to promote and foster a better understanding of human rights among small businesses both in Thailand and countries where SCG has investments so that they are capable to implement human rights practices. This not only enhances the operations of small business but also mitigates human rights issues in the supply chain.

• SCG should share best practices on human rights to raise social awareness and also serve as a role model for society.

2019 Highlights

Actions towards Achieving UN Sustainable Development Goals (SDGs)

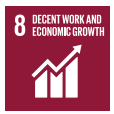
In 2019, SCG has set up the United Nations Sustainable Development Goals (SDGs) which must be responded seriously through the 3 core dimensions of the implementation of sustainable development strategies and various sustainable development issues which have the significant goals as follow :

Good Health and Well-being

SCG has implemented the Health and Safety, and Human Rights policy for all employees, contractors, and communities, develop the innovative products and services to provide good quality of life for the customers, together with formulating sustainable development strategies for safety.

0
target of Fatality case in transportation

0
target of occupational illness rate



Decent Work and Economic Growth

SCG has implemented the Human Rights Policy, the Customer Experience, as well as the Innovation and Technology.

0
target of Fatality case in workplace

0
target of Human Rights Violation Case

Industry, Innovation and Infrastructure

SCG has implemented the Customer Experience, the Innovation and Technology, as well as the responsibility for the products and services.

2%
target of R&D spending compared with the revenue from sales

50%
target of total revenue from High Value Added products and services compared with the revenue from sales

66.7%
target of total revenue from SCG eco value products and services in 2030 compared with the revenue from sales

Responsible Consumption and Production

SCG has implemented the Innovation and Technology and the responsibility for products and services.

13%
target of energy consumption reduction in 2025 compared with BAU at the base year of 2007

23%
target of water withdrawal reduction in 2025 compared with BAU at the base year of 2014

9%
target of domestic sale of single use product of the Chemicals Business in 2025

100%
target of products of the Packaging Business to be recyclable or reusable in 2025

Climate Action

SCG has implemented the Innovation and Technology, the energy and greenhouse gas emissions management, the responsibility for products and services, and the sustainable development strategies for climate resilience.

28%
target of greenhouse gas emissions reduction in 2030 compared with BAU at the base year of 2007

Sustainability Performance in 2019

GHG Emissions Reduction

(compared with BAU at the base year of 2007)

million tons carbondioxide	percent
2.43	9.2

High Value Added Products and Services

percent

41

of revenue from sales

Green Procurement Purchased

7,852

million baht

Research and Innovation Spending

million baht	percent of revenue from sales
5,663	1.3

"SCG eco value" Products and Services

percent

29

of revenue from sales

Carbon Label Certified

472

items

Environmental Expense and Investment

million baht	percent of revenue from sales
4,785	1.1

Hazardous/Non-Hazardous Waste to Landfill

percent

0.0/14.4

Alternative Energy

percent

13.6

Energy Consumption Reduction

(compared with BAU at the base year of 2007)

petajoules	percent
15.31	7.5

Suppliers Being Conducted Environment Social and Governance (ESG) Risk Assessments

percent

100

of suppliers with procurement spending over 1 million baht

Recycled Water

percent

10.6

Water Withdrawal Reduction

(compared with BAU at the base year of 2014)

million cu.m.	percent
12.17	10.5

Lost Time Injury Frequency Rate

(case per 1,000,000 man-hours)

Employee	0.239
Contractor	0.279

Logistics Drivers Trained from "SCG Skills Development School"

18,224

persons

Number of Check Dam

91,405

units

Sharing Opportunities, Drawing the Future Program

projects	million baht
241	24

Social Contribution

719

million baht

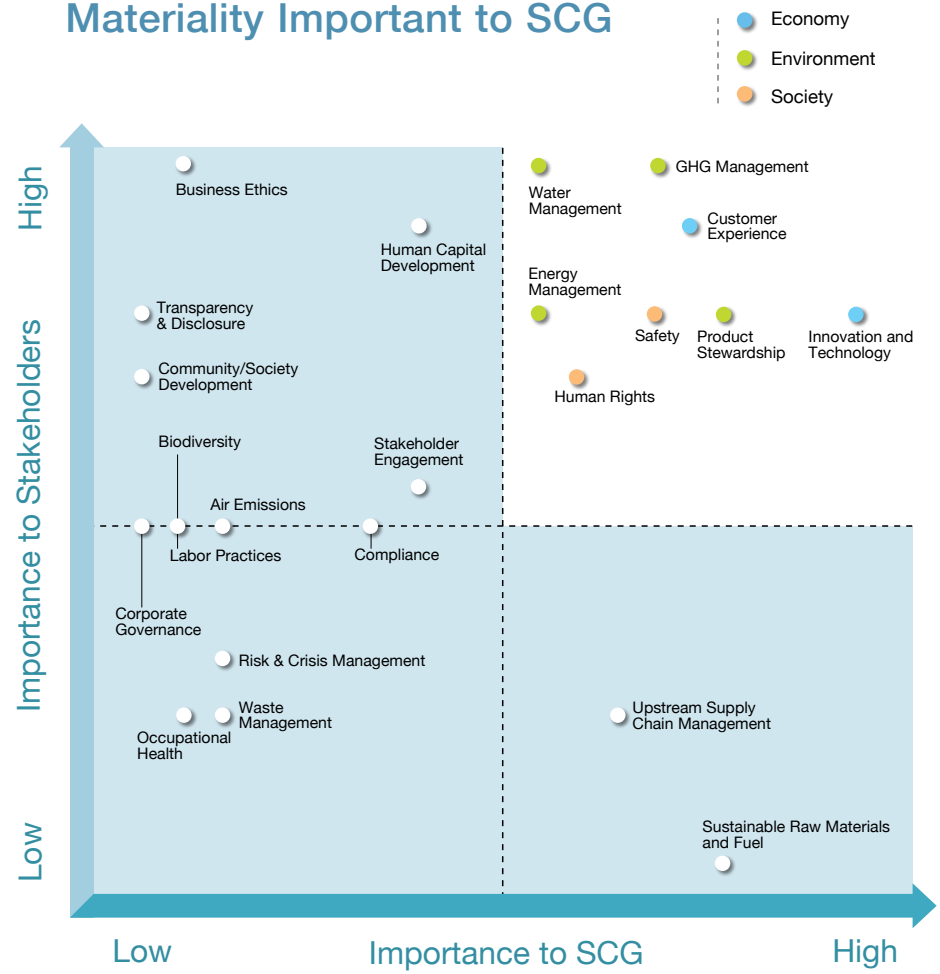
Materiality

Process of Materiality Assessment

1. Analyze sustainability issues along the value chain, covering the phase of raw material procurement to production, transport, distribution, utilization of products and services, together with the analysis of sustainability issues in related industries
2. Analyze the issues that matter to the stakeholders through various means comprising survey, panel discussion
3. Analyze the alignment with the enterprise risk management framework
4. Validate the material issues and improve continually

The Process of Materiality Assessment and Prioritization in Accordance with the Global Reporting Initiatives (GRI) Standards

Materiality Important to SCG



Sustainable Development Approach

Economy

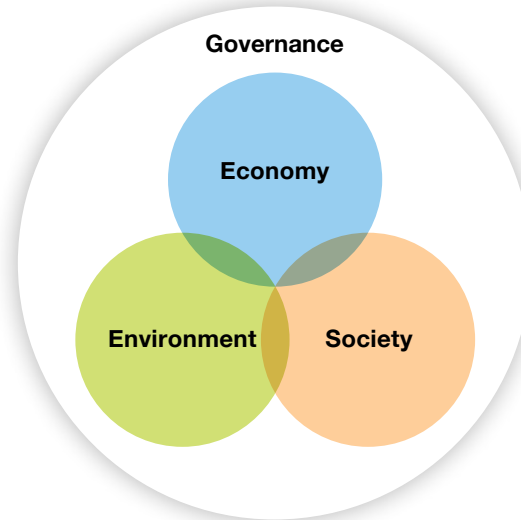
Create values not exclusively for profitability, but for mutual benefits for all stakeholders

Environment

Commit to conservation of the environment and natural resources, recognition of consumption value of resources, and sustainable preservation of ecological balance

Society

Adhere to ethical business conduct, social responsibility and life quality improvement in communities where SCG operates



Dimension	Sustainability Issue	Risk	Opportunity
Economy	Innovation and Technology	• The world is facing the megatrends in technology advancement that the traditional pattern of activities has become outdated under the intense competitive and volatile setting	• Become an innovation leader who is agile and adaptable to dynamic changes including increased investment in research and development of new business models
	Customer Experience	• The speedup of digital disruptive technology and online social media have changed customers' behaviors with more varied and diverse needs	• Be the first choice of brand for customers by fostering customer intimacy to develop innovation and deliver value that creatively meet the customer expectations
	Sustainable Supplier	• Supplier's key operations in the supply chain including manufacturers, service providers, carriers, and distributors could cause SCG's business interruption	• Select suppliers on the basis of ethical business conduct and the spirit of collaboration to raise the suppliers' capability for the mutual sustainable growth

Dimension	Sustainability Issue	Risk	Opportunity
Environment	Energy Management	• Oil price volatility and limited availability of natural resources, as well as the increasing impacts of fossil use on climate change	• Research and develop alternative energy technology by embracing the Circular Economy principles as the key strategy and continual improvement to increase energy efficiency
	Greenhouse Gas Management	• Escalating global warming and climate change has led to the international cooperation to ultimate target of greenhouse gas emissions in line with the Paris Agreement to control the global average temperature rise to well below 2 degrees Celsius	• Develop products and services that help reduce GHG emissions, control GHG emissions and restore the ecosystem to increase carbon capture area in conformity with the Paris Agreement
	Product Stewardship	• The speedup of digital disruption technology has changed customers' behaviors and causes the traditional pattern of activities to become outdated while the climate change issues draw global attention	• Utilize the strength of being the innovation-oriented organization to develop products, services and solutions that meet the needs of customers, elevate better living, reduce resource and energy consumption and minimize emissions and waste to the environment
	Water Management	• Climate change is the cause of unseasonal rain and drought in the upstream watershed leading to decreased water input to reservoirs and the risk of water stress for factory use	• Enhance the integrated water management ability and construct water reservoir within the factory's area through a collaboration with public and industrial sectors to apply international tools to assess water situations, increase water usage efficiency, and develop products that consume less water
	Waste Management	• The depletion of natural resources from industrial growth and pollution from improper waste management have adverse impacts on the environment and communities	• Research and develop innovation to reuse/recycle raw materials and waste as well as to add value to waste, in line with the 3Rs principle for waste management and Circular Economy principles
	Biodiversity and Ecosystem	• Higher expectation from the stakeholders and society towards business conduct with environmental concern and stringent law on conservation of biological resources in domestic and international levels	• Be a role model in biodiversity conservation through sustainable development and the application of international index to evaluate the quality of management

Dimension	Sustainability Issue	Risk	Opportunity
Society	Human Rights	• Human Rights violations, occurred in SCG's direct business activities, the business value chain, and in joint ventures where SCG has no authority in management, have entirely impacts on SCG's business operations	• Announce Human Rights Policy to demonstrate SCG's commitment to achieve being the role model of human rights respect and protect, by directly and indirectly promoting and advocating those involved in its value chain to conduct business with respect to human rights
	Health & Safety	• Tendency on accidents of employees and contractors has not yet reduced as targeted. Fatality cases of the contractors remain higher than target. Safety management system is to be implemented regionally to ensure the conformity with SCG standards	• Create change for practical and continual practices by applying digital technology as the monitoring tools to elevate safety standards and management
	Human Capital Development	• Dynamic change and intense business competition as well as varied needs of customers result in the lack of proper knowledge and skills of employees to cope with such change	• Redesign courses and training programs to equip the employees with knowledge and skills to promptly adapt to present and future circumstance
	Social and Community Involvement	• Business operations, locally and regionally, might affect neighboring communities, coupled with higher expectation from stakeholders and society towards our business conduct in terms of social and environmental concern	• Develop a role model community to achieve its sustainable, self-reliant, and higher quality of life by drawing the involvement of all stakeholders and employing knowledge and competency of SCG and other related entities

Sustainable Development in Action

Economy

Innovation and Technology

41%

revenue from sales of High Value Added products and services of total revenue from sales

Target

50%

- **DoCare Project** Innovation that helps monitor and provide special care at home, particularly for elderly, by the installation of the motion detector within bedroom or bathroom and submission of data processing on activities, along with the transmission of a distress signal to the Care Center for 24 hour on-call support available to coordinate with the hospital in case of emergency.
- **AddVentures** Investment in the startup companies worldwide by either investing indirectly through the leading investment funds, which increased from 2 to 4 investors in 2019, or investing directly in the startup, increased from 9 to 14 investors. Examples of the startups by category are Logistics startup: Giztix (Thailand), and Logivan (Vietnam), Agriculture Technology startup: Adatos, HG Robotics.
- **Hatch-Walk-Fly** Internal Startup Project. In 2019, entering the Fly phase with the increase of customer base and the rapid expansion of business totaling 5 companies, namely Rudy, Dezpax, Mez, Agcura and Urbanice: Platform.

Sustainable Value towards Supplier

100%

of suppliers with procurement spend over 1 million baht, passed the Environment, Society and Governance risk assessments

Target

100%

- **PP Woven Bag** The determination to develop business potential of its suppliers led to the successful innovation development of plastic woven sack for white cement by Lucky Star Co., Ltd. by reducing material consumption while maintaining mechanical properties in terms of strength and load.
- **Good Business Conduct** organizing the seminars for 39 of the suppliers' companies with the emphasis on Anti-Corruption and Circular Economy.
- **Sustainable Procurement Framework** organizing the training programs for related employees to foster the understanding concerning Sustainable Procurement Framework to allow the employee to manage risks and start the collaboration with suppliers to improve operational efficiency.

Customer Experience

100%

of overall customer satisfaction based on surveys via SCG Contact Center

- **SCG Marketing Way** Marketing guidelines, developed by SCG, has been implemented to enhance customers' satisfaction of all business units in 2019.
- **HDPE S111F** Plastic resin that Chemicals Business has joined hands with Betagro Group to develop a plastic flexible packaging for fresh food with the same resistance to high impact.
- **World Star Winner 2018** Packaging Business and Chao Phraya Abhaibhubejhr Hospital worked in a collaboration to add value to the products by redesigning the hospital's packaging, of which had been awarded the Packaging Design Award.

Environment

Energy Management

7.5%
energy consumption reduction compared with BAU at the base year of 2007

Target
13%
in 2025

- **Excellence Award, Thailand Energy Awards 2019 and 2nd Runner-up, ASEAN Energy Awards 2019** SCG Ceramics Public Company Limited implemented "Solar Floating and Solar Rooftop Project" to increase efficiency of tap water production within Nong Kae Industrial Estate, reducing energy consumption by 14%, lowering Greenhouse Gas Emissions by 134 tons CO_2 per year.
- **Excellence Award, Thailand Energy Awards 2019** SCG Paper Energy Co., Ltd., Siam Kraft Industry Co., Ltd. and Thai Paper Co., Ltd. launch the Biogas from Wastewater Treatment System Project at Wangsala plant to substitute fuel oil and coal, energy of which had been used as fuel in the lime kiln of Thai Paper Co., Ltd. to substitute fuel oil at approximately 3.3 million liters per year and in Siam Kraft Industry Co., Ltd. to substitute coal at approximately 4,500 tons per year.

Greenhouse Gas Management

9.2%
greenhouse gas emissions reduction compared with BAU at the base year of 2007

Target
28%
in 2030

- **Internal Carbon Pricing (ICP)** Adoption of Internal Carbon Pricing Scheme worth 18 USD per ton CO_2 as criteria for approval of project that reduce greenhouse gas emissions.
- **Task Force on Climate-related Financial Disclosures (TCFD)** Applying guidance of the TCFD to assess risks, impacts, and opportunities relating to climate change to plan SCG's business operations.
- **Natural Climate Solutions (NCS)** Establishing the Natural Climate Solutions Committee to take care for the capture of carbon dioxide with nature solutions conforming to international standards under the collaboration with both domestic and international entities such as WBCSD.

Sustainable Products and Services

29%
revenue from sales of SCG eco value products and services of total revenue from sales

Target
Two-third or
66.7%
in 2030

- **Energy Smart Solution** New business that provides service solution to save building energy consumption and converting the building into a Smart Building through leading technologies from worldwide startups.
- **Building Information Modeling (BIM)** Cement-Building Materials Business implements BIM technology to use with building construction project to precisely estimate the material use in production, reduce the construction materials waste, and enhance operation efficiency.
- **OptiBreath™** Packaging developed by Packaging Business with characteristics to control the rate of respiration and extend the shelf-life of fruits and vegetables for longer storage before consumption.

Environment

Waste Management

92%

reduction of waste disposal per unit of production, compared with the base year of 2014

Target

60%

in 2025

- **Concrete Waste Management** The CPAC Roof Tile Co., Ltd. conducts a research and development on roof tiles scraps from Nakhon Pathom plant to be used as substitute raw materials for sand in construction, civil work, and production. In 2019, the substitute materials for natural sand have been used within SCG and external at around 4,546 tons.
- **Map Ta Phut Eco-Energy Plant (MEE)** SCG build the industrial waste power plant located in Map Ta Phut Industrial Estate, with 8 MW capacity. It is the first plant with the ability to handle both hazardous and non-hazardous waste from industry as its feed at approximately 65,000 tons per year.
- **Waste Water Treatment Fuel Energy** Thai Polyethylene Co., Ltd. improves the process of catalyst production to reduce the volume of waste water for more than 5,000 tons yearly. By further recycling such waste water as an alternative fuel for cement kiln, the company reduces solid waste by 1,000 tons per year.

Water Management

10.5%

reduction of water withdrawal, compared with BAU at the base year of 2014

Target

23%

in 2025

- **WRI AQUEDUCT** Applying Water Resources Institute (WRI)'s Water Risk Atlas Tool to assess water-related risks. The tool is well accepted internationally for assessment of water stress situation. The data from the tool is used in integrated with data from governmental sector for further manage water in collaboration with all sectors.
- **Increase the Efficiency of Production Process to Reduce Water Consumption** Strive to improve the efficiency of all factories to reduce water usage and recycle the water. In 2019, recycled water was reused equaling to 12.3 million cubic meters or 10.6%.
- **Water Saving Product** Siam Sanitary Ware Industry Co., Ltd. continuously designs and develops water-saving sanitary wares such as water saving toilets, COTTO C10257 using water with only 4.8 liters per flush, and faucet, COTTO XPOSH series, controlling water flow with only 4.8 liters per minute.

Biodiversity and Ecosystem

1

number of quarry with Biodiversity Index in the limestone quarry rehabilitated area, compared with natural forest buffer zone of at least 60%

Target

4

by 2022

- **CSI : Methodology for the Net Impact Assessment of Biodiversity in Cement Sector** Apply the biodiversity assessment tool provided by Cement Sustainability Initiative (CSI) to assess the quarry rehabilitation activities at quarries in Kaeng Khoi and Ta Luang in Saraburi Province to bring about Net Positive Impact on the ecosystem in the post quarrying area.
- **Biodiversity of Birds in Lampang Quarry Rehabilitation Area** Success in Lampang Quarry Rehabilitation results in the constant finding of more bird species from 98 species found in 2002 to 172 species in 2019.

Society

Human Rights

0

Human Rights Violation Case

- **Opinion Panel 2019** Sustainable Development Committee organized the Opinion Panel of esteemed figure from government, private, and academic entities focusing on human rights.
- **SEDEX** Packaging Business joins hand with The Sedex Members Ethical Trade Audit or SEDEX to implement SEDEX standards in treating employees and contractors in the company and business partners.

Health & Safety

0.239 and 0.279

case per 1,000,000 man-hours

Lost Time Injury Frequency Rate of Employee and Contractor, respectively

Target

0

in 2022

- **SAFEsave** Packaging Business develops an innovative Security Management Platform, to manage safety of individual and property with digital technology and Artificial Intelligence (A.I.) such as utilizing surveillance cameras to monitor and notify of the entering of restricted areas.
- **Process Safety Management (PSM)** Continually applying the PSM and extend the results through the conduct of Contractors Safety Management system, which emphasizes the involvement of the contractors' executives together with making the joint commitment towards the sustainable Incident Free Operation.
- **Goods Transportation Safety** Raising the standards for goods transportation safety through the close collaboration among all business units to conduct standardized guideline for goods transportation safety for the entire organization and for further implementation with the carriers.
- **Driver Management System (DMS**) SCG Logistics develops the driving behavior monitoring system through innovation and technology for safety such as using "Kubdee" application.

Employee Caring and Development

68%

Employee engagement when compared to total employee (domestic only)

Target

70%

in 2022

- **Re Skill-Up Skill** equip the employees with the capacity to cope with changes through training and learning via various setups such as Digital Literacy, Business Model Canvas, Design Thinking, Data Analytics, etc.
- **Action Learning** redesign the learning styles of employees from classroom training to actual practice training including Project-Based Learning.

Community/Society Involvement

19

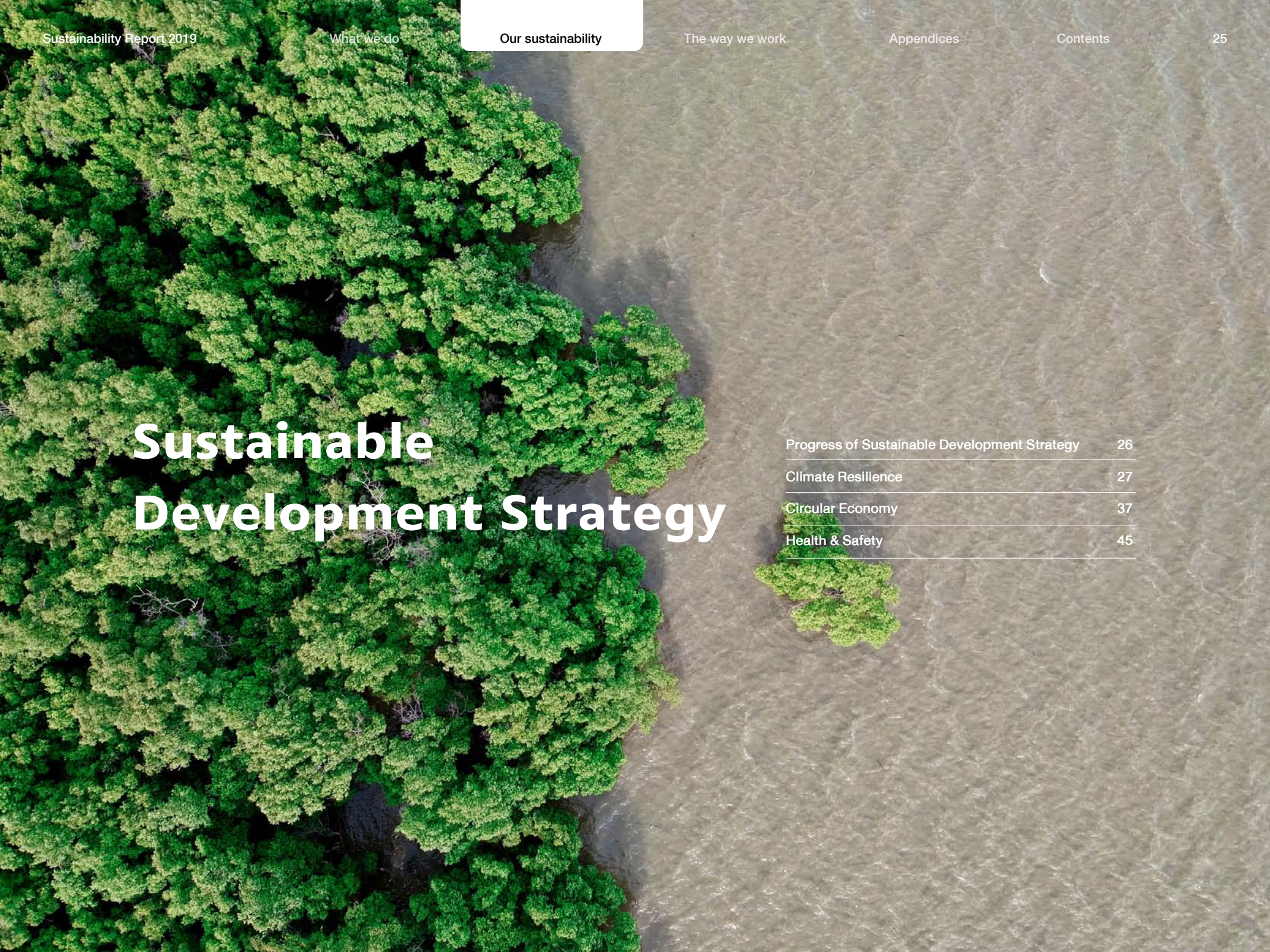
Community capable of managing water resources

Target

108

Additional community in 2021

- **Conserving Water from the Mountain to the Mighty Rivers Project** Encouraging communities to implement water management by adopting His Majesty King Bhumibol Adulyadej The Great's water management approaches as guidance using Information Technology to solve water issues and to ensure sufficient water for consumption, utilization and agricultural purposes.
- **SCG Smart Litter Trap and Floating Litter Trap** Chemicals Business develops 24 sets of "floating litter trap" to be installed in the estuaries and canals in 13 seaside provinces and "smart litter trap" to float in the river and use Artificial Intelligence to automatically sort waste and bring back to the dumping point.
- **Commemorate His Majesty the King, Volunteers Developing National Crown Prince Hospitals Nationwide** Cement-Building Materials Business and SCG Foundation jointly renovate the service areas of Crown Prince Hospitals, covering 21 hospitals nationwide, by using BIM technology to design and onstruct the buildings, which help reduce cost, time consuming, scraps of construction materials in alignment with the Circular Economy principles.



Sustainable Development Strategy

Progress of Sustainable Development Strategy	26
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Progress of Sustainable Development Strategy

Implementation Status

●●● Awards and Recognitions Extended Projects
●●○ Projects in Progress Ongoing Projects
●○○ New Projects/Initiatives

Develop Materials with Better Performance

●●○ Using SMX Technology developed by Chemicals Business to enhance special grade of polyethylene resin to develop a downgauging moldable plastic products with the same resistance to high impact

●●○ Advancing the Multilayer Laminated Mono Material, with a property for the multilayer plastic packaging products, which helps increase the recyclability of the packaging

Waste Collection and Recycling

●○○ Developing the application "Koomkah" to efficiently manage the recyclable garbage banks and facilitate recycling

●●○ Developing PaperX Digital Platform, the system that collaborates with retailers nationwide to facilitate more convenient and faster purchasing of recycling paper

●●○ Motivating employee behavior in sorting and dump garbage in Bangsue Model project by achieving target of zero waste from office to landfill by the year 2021

Create New Business under the Product as a Service Business Model

●○○ Developing the platform application "ALLRENT" to provide service of machines rental from the manufacturers that have unused machines capacity in order to foster the resources sharing efficiency

●○○ Applying the Building Information Modeling (BIM) with building construction project to help design system, precisely estimate size and volume of material use in production, and decrease the construction materials waste

Promote Alternative Energy

●○○ Introducing "SCG Solar Roof System" as the integrated solution for installation of solar power system on the residential roofs

●●○ Expanding solar rooftop project to other SCG's factories

●●○ Developing solar floating system to provide integrated solutions for customers with water reservoir

●●● Biogas project by SCG Paper Energy Co., Ltd. received Thailand Energy Award 2019 in the Off-Grid (Alternative Energy) Category

Improve Energy Efficiency

●●○ Continuously improving the efficiency of manufacturing process

●●● Rayong Olefins Co., Ltd. received an Outstanding Award for Energy Conservation from Thailand Energy Award 2019

●●● SCG Health Center Building received ASEAN Energy Award 2019 in the Green Building – Small and Medium Category

Adopt the International Standards and Collaboration with International Organizations

●○○ Enhancing the Internal Carbon Pricing (ICP) to help evaluate projects' potentials in the approval process

●○○ Formulating business plan to tackle climate change as per the recommendation of the Task Force on Climate-related Financial Disclosures (TCFD)

●○○ Joining the WBCSD for Natural Climate Solutions (NCS) in the assessment of carbon capture and carbon offset by natural methods

Circular Economy

MAKE
USE
RETURN

Climate Resilience

Safety

Workplace Safety

●●○ Develop SAFEsave Intelligent Safety Management as the safety measures in the factories of Packaging Business

●●○ Continue to operate and extend the results of Process Safety Management (PSM) to cover every company under Chemicals Business to ensure the Incident Free Operation

●●○ Monitor the application of SCG Safety Framework in combination with Safety Performance Assessment Program (SPAP) earnestly and continually

●●○ Encourage Safety Leadership behavior with constant monitoring as well as strictly enforcing the Life Saving Rules

Transportation Safety

●○○ Develop "Kubdee" application to link and has access to dual view camera installed in the vehicle's cockpit to detect the position of facial features in real-time to alert the driver before dozing off

●○○ Develop driver's training through virtual AR and VR technology to increase training hours and accessible anywhere anytime

●●○ Strictly use transportation management system covering from before commencing transport, during transport, and after transport by collaborating with the control center to monitor the driver's behavior with GPS

●●● Establishing Goods Transportation Safety Standards as the guideline for traveling and transportation to be implemented by the entire organization and further adapted by the carriers

Climate Resilience

As global warming and climate-related impact intensify, it is such an urgency that all sectors must step up and make efforts to implement greenhouse gas emissions reduction target according to the Paris Agreement of keeping the increase in global average temperature to well below 2 degrees Celsius, while trying to limit the increase to 1.5 degrees Celsius. On its part, SCG has demonstrated its commitment to the cause and has set the target of greenhouse gas emissions reduction by 28% within 2030 (compared with BAU at the base year of 2007), with interim goals of greenhouse gas emissions reduction and energy consumption reduction by 20% and 13% within 2025.

Target

2020

10%

2025

20%

2030

28%

greenhouse gas emissions reduction compared with BAU at the base year of 2007

2025

13%

energy consumption reduction compared with BAU at the base year of 2007

Strategy

1. Increase the share of biomass and clean energy in place of fossil fuel.
2. Improve or modify processes and equipment to increase energy efficiency.
3. Research and develop alternative energy technology according to Circular Economy.
4. Develop products and services that reduce greenhouse gas emissions.
5. Organize activities to drive energy conservation and climate resilience emergency among employees and contractors.
6. Restore and rehabilitate terrestrial forest, mangrove and seagrass to increase biodiversity for carbon absorption areas.

Management

- Set up measures aimed at achieving greenhouse gas emissions reduction targets with according to the Paris Agreement.
- Establish Internal Carbon Pricing (ICP) regime and apply it as one of the criteria of investment decision for projects that contribute to greenhouse gas emissions reduction.
- Prepare and disclose climate-related issues according to TCFD recommendations (Task Force on Climate-related Financial Disclosures).
- Establish the Natural Climate Solutions Committee and collaborate with WBCSD's Natural Climate Solutions.

2019 Performance

9.2%

greenhouse gas reduction in 2019 compared with BAU at the base year of 2007

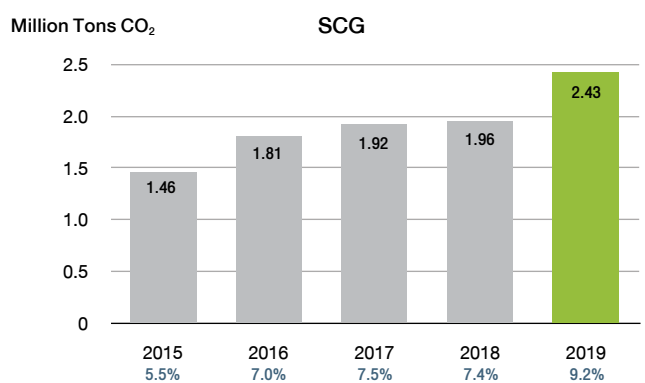
7.5%

energy consumption reduction in 2019 compared with BAU at the base year of 2007

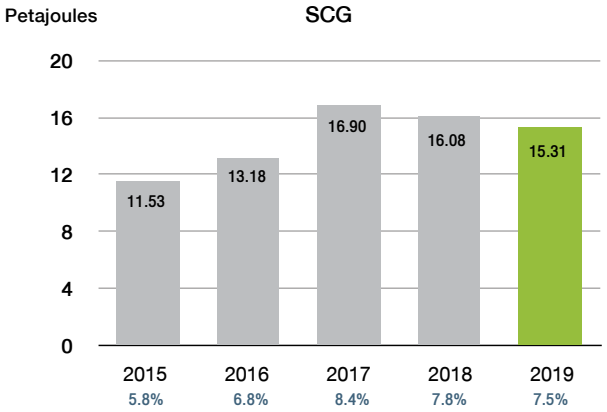
13.6%

alternative energy

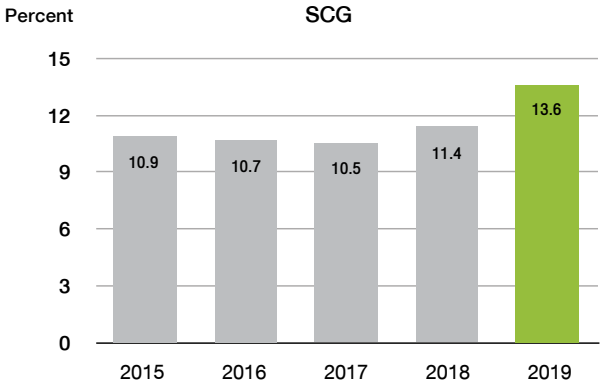
Greenhouse Gas Reduction



Energy Consumption Reduction



Alternative Energy



SCG Stepping Up Climate Actions in Line with International Standards

Internal Carbon Pricing (ICP)

In 2019, SCG initiated Internal Carbon Pricing arrangement, setting it at USD 18 per ton CO_2, and applying it as one of the investment decision-making considerations of whether a project contributes to reduce greenhouse gas emissions, and aims to achieve the following objectives:

- Drive low-carbon and energy efficiency investments.
- A tool for raising awareness and behavioral change among employees.
- Identify and seize low-carbon opportunities.
- Navigate future GHG regulations.
- Address stakeholder expectations on corporate climate actions.
- Stress test for investments.
- Supplier engagement on the application of Internal Carbon Pricing.
- Being a role model in climate change and sustainable energy management.

The Compliance with the Task Force on Climate-related Financial Disclosures (TCFD)

Task Force on Climate-related Financial Disclosures is an organization whose aim is to advise the business sector on climate-related financial and operational result disclosures. While disclosures benefit investors and stakeholders, the business sector also is benefitted from the advice and support on sustainability.

In line with TCFD recommendations, in 2019 SCG conducts a risk and opportunity assessment focusing on climate-related impacts and implications, accompanied by how to manage the corresponding risks and opportunities including issues such as governance, strategy, risk management, metrics and targets, a work plan that covers the associated compliance risk and business risk.

Expansion of Solar Energy Projects

Strategies 1, 3, 4

- SCG's solar energy system combining floating and rooftop approaches to increase efficiency of tap water production of Nong Khae Industrial Estate by SCG Ceramics Public Company Limited won the ASEAN Energy Awards 2019.

- SCG Solar Roof Solutions provide integrated power generation to customers who can track performance in real time through smart-phone applications.

Starting in 2014, SCG prioritized solar energy as clean energy source contributing to energy security and greenhouse gas emissions reduction, and it has pursued research and development focusing on Solar Farm, Floating Solar Farm and Solar Rooftop.

From 2014 to 2019, SCG has implemented a total of 22 projects with a combined capacity of 75.68 MW, generating electricity at 102.65 GWh/year and reducing greenhouse gas emissions by 48,272 tons of CO_2 per year.

Reduce greenhouse gas emissions

48,272

tons of CO_2 per year since 2014

- Floating and Rooftop Solar Energy Project to Enhance Water Supply Efficiency at Nong Khae Industrial Estate

Initially conceived as a part of new business opportunity exploration of SCG Ceramics Public Company Limited, the project won an Outstanding Award by Thailand Energy Awards 2019 and the 2nd Runner-up in the Off-Grid Category (Alternative Energy) by ASEAN Energy Awards 2019.

The project is located at the Nong Khae Industrial Estate. Environmental, and community engagement considerations characterized the conceptual framework.

The project uses Polycrystalline Silicon panel which is highly efficient in transforming solar energy into electrical power. Solar panels were installed on the building's rooftop, and on the water reservoir behind the office to utilize the idle space.

What sets this project apart is the dual function of rooftop and floating panels. The floating system is SCG's in-house innovation which can convert sun ray into energy more effectively compared with typical rooftop installation. Over all the project is able to generate electricity for production of tap water 236 MWh/year. As a result, energy consumption from grid is reduced by 14%, equivalent to greenhouse gas emissions reduction 134 tons of CO_2 per year.

Breakeven for the project stands in the range of 5-6 years. For its duration of 25 years, it can achieve a savings of 5.8 million units in energy consumption, equal to a bill of 20.4 million baht, and can reduce greenhouse gas emissions by 3,365 tons CO_2. It is therefore deemed as a highly efficient project, and a model that can be replicated elsewhere inside Thailand and beyond.

At present, a total of 5 similar projects are being implemented in Thailand and abroad. Total investments are 200 million baht, for the capacity to generate 199 million units of electricity per year, and saving electricity costs of 30 million baht per year.

Reduce greenhouse gas emissions

134

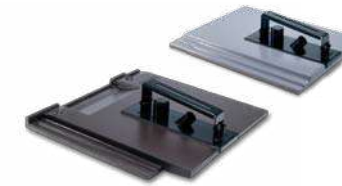
tons of CO_2 per year

Reduce greenhouse gas emissions

500

tons of CO_2 per year since 2019

• Energy Saving Home Solutions



Building on its expertise, SCG Solar Roof Solutions is a new business offering integrated service for household solar energy system. SCG Solar Roof Solutions delivers full range of service-advice, survey, cost estimate, inspection of rooftop quality prior to installation, to ensure efficiency and safety throughout the contracted period. Installation work is carried out by a team of professional technicians using Solar FIX innovation to prevent leakage and seepage. Real-time performance monitoring via applications can generate report of savings on a daily, monthly and yearly basis.

In 2019, we have serviced a total of 55 customers, for 600 kW, equivalent to greenhouse gas emissions reduction 500 tons of CO_2 per year.

Energy Conservation Commitment

Strategies 2, 5

• Rayong Olefins Co., Ltd. has been implementing energy conservation measures continually, along with rising of awareness among its employees. In recognition of these efforts, the company received the Thailand Energy Awards 2019 in Energy Conservation Category.

• SCG Health Center is intended to showcase the green building concept, which governs every step along the way from architectural design, engineering systems and landscaping and environment. SCG Health Center won the Winner by ASEAN Energy Awards 2019.

SCG has been implementing process improvement and equipment upgrade for higher efficiency across all its business units since 2010. It conducts self-monitoring of energy consumption, and investing in R&D in search of new ways to improve processes and equipment for efficiency.

Reduce energy consumption

10.7%

compared with 2015

At SCG, we believe that employees are the key driver in energy conservation effort. We never stop engaging into employee participation. One key engagement strategy is the Energy Award held since 2014, which is held in every two years to encourage employee to come up with creative and actionable initiatives on energy conservation and alternative energy. All awarded projects succeed in increasing energy efficiency, saving energy cost with small investment and being a model of sustainable energy conservation.

SCG continually organizes the Energy Day event every year to raise the employee's awareness of energy conservation under the concept "Close when not in use, Control to comfort, Change for better" or 3Cs' concept "Close, Control, Change".

In 2019, SCG has won an outstanding award for energy conservation from both national and ASEAN levels.

• Rayong Olefins Co., Ltd. received one of Thailand Energy Awards 2019 Rayong Olefins Co., Ltd. under Chemicals Business is committed to energy efficiency and has for years brought management processes in compliance with standards such as Total Productive Maintenance (TPM), Total Quality Management (TQM) alongside IBE system.

In addition, it consistently drives in an energy efficiency mentality among employees through 3C activities. Between 2016-2018, a total of 21 initiatives have been implemented, resulting in reduction of energy consumption and reduction of energy loss in equipment and processes, as well as turning excess gas waste to energy.

Efforts spanning in last three years have saved energy consumption by 1.058 GWh/year, or 10.7% compared with 2015. Energy cost has been saved by 384 million baht.

Furthermore, Rayong Olefins Co., Ltd. takes waste management and waste-to-energy framework seriously. It has implemented measures to turn waste into alternative energy and alternative raw material, and to measure wastewater quality prior to discharge into public drainage system. It is committed to Zero Waste to Landfill target.

From these projects which demonstrate excellence in environmental management, Rayong Olefins Co., Ltd. won Green Industry Award Level 5 (the highest level) by Ministry of Industry. It is also the first in Thailand to be certified an Eco Factory by Industrial Estate Authority of Thailand and the Federation of Thai Industries.

• SCG Health Center won the Winner by ASEAN Energy Awards 2019 for energy conservation, in Green Building Category. SCG Health Center was built as an expression of the Green Building concept, and taking into account employee's quality of life to enjoy working with strong commitment to the society and environment.

The building was designed to align with movement of the sun to shield impact of day heat, with the corporate headquarter buildings providing shade to westward and southward. The awning at the front of the building provides shade for building walls. For the building frames, insulated glasses are being used. The rooftop is lined with artificial grass and the running mill underneath is shielded by polystyrene foam to reduce heat intake into the building.

Energy efficiency is the focal point in selecting the equipment for electricity and air-conditioning systems, giving consideration to the maximization of natural light combined with LED lighting and highly efficient light sources operated by light

sensitivity and two-wire remote from central control. Air-conditioners and elevators are also energy-efficient. A solar energy system with 120 kW capacity enables the building to operate at 25% on renewable energy.

Outside the building, landscaping is designed to be green, with water reservoir and trees to reduce concrete area and to cool the building.

With these Green Building attributes, SCG Health Center was awarded Outstanding Award in the Green Building – Small and Medium Category by Thailand Energy Awards 2019. It was also nominated for ASEAN Energy Awards 2019: ASEAN Best Practices Awards for Green Buildings, and won the Winner prize in Small and Medium Building Category.

Alternative Energy Development

Strategy 3

• Biogas from Wastewater Treatment System Project of Siam Kraft Industry Co., Ltd. won an award in the Off-Grid Category (Alternative Energy) by Thailand Energy Awards 2019.

SCG has keened on alternative energy usage since 2001. Starting out by transforming industrial waste into alternative energy for cement production, SCG then proceeded with the installation of Waste Heat Power Generation, development of Refuse Derived Fuel (RDF) from municipal wastes transformation, and production of biogas from wastewater treatment, the processes of which not only reducing greenhouse gas emissions, but also adhering to the Circular Economy principles in terms of waste recycling.

• Biogas from Wastewater Treatment System Project at Wangsala Plant This project is a tripartite collaboration of SCG Paper Energy Co., Ltd., Siam Kraft Industry Co., Ltd. and Thai Paper Co., Ltd. They joined together in improvement of the wastewater treatment system which is an aerobic system, by adding anaerobic system to produce biogas. The other component of the project sought to improve fuel use system of Thai Paper Co., Ltd. and Siam Kraft Industry Co., Ltd. so that the two companies are equipped to use biogas energy.

Biogas is used as fuel in the lime kiln of Thai Paper Co., Ltd. As a result of this undertaking, biogas substitutes the fuel oil usage of about 3.3 million liters per year. The biogas also as fuels in boiler of Siam Kraft Industry Co., Ltd. substituting coal in the amount of 4,500 tons per year, depending on energy consumption at different hours of day. As a result, greenhouse gas emissions are reduced by over 17,000 tons of CO_2 per year.

In addition, the anaerobic wastewater treatment system relieves the burden of the incumbent system, and can reduce energy consumption by 5.6 GWh/year, as well as reducing volume of waste to be disposed of by 12,000 tons per year.

These numerous successes described effective executions, as the project won Thailand Energy Awards 2019, in the Off-Grid Category (Alternative Energy). This model can be applied at any factory with liquid waste, or wastewater from any type of production processes, in particular liquid waste or wastewater with organic matter or high COD value. These types of material can generate high volume of biogas.

Reduce greenhouse gas emissions by over

17,000

tons of CO_2 per year

Zero Burn Project
Reduce Agricultural Farm Waste Burning: From Waste to Energy

SCG's Cement-Building Materials Business collaborates with partners Siam Kubota Corporation Co., Ltd. and the Thai Chamber of Commerce and Board of Trade of Thailand in implementing Zero Burn Project, which sets up trading posts to buy rice straw, sugarcane leaf, corncob and other agricultural waste from farmers. The farm waste will be briquetted to be used as alternative energy in cement factories. This project aims at reducing pollution caused by land clearing burning, and to generate income for Thai farmers, and the maximization of resource use according to Circular Economy principles.

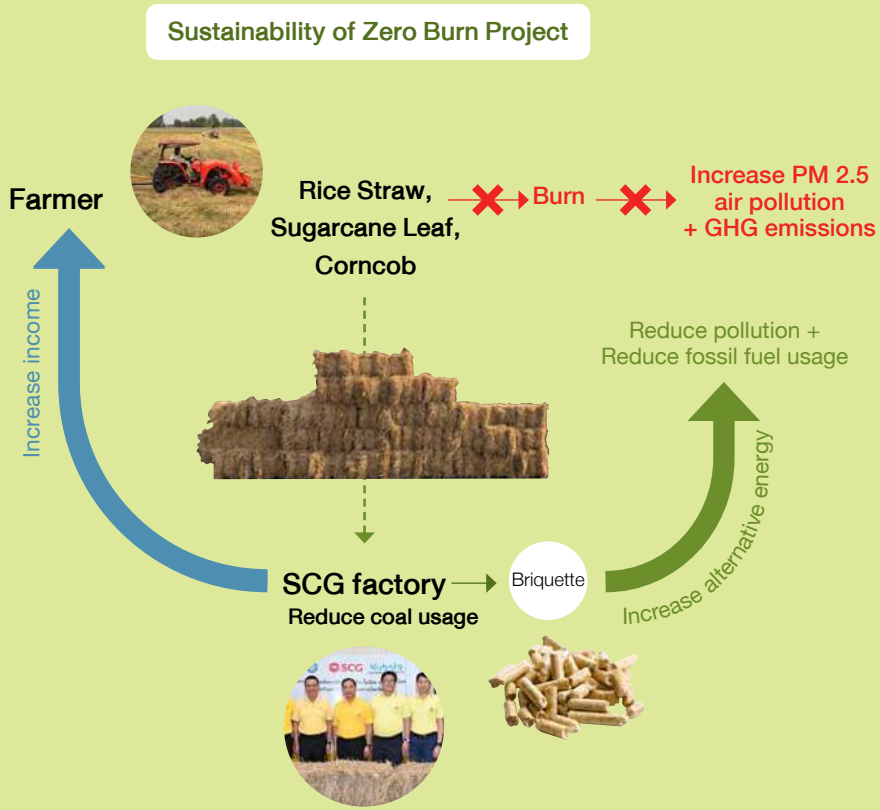
Across Thailand, typically in post-harvest season, there are plenty of farm waste such as rice straw, sugarcane leaves which are usually disposed of by burning. The practice produces Particulate Matter 2.5 (PM2.5) pollutants and haze while aggravating global warming. Thailand has been facing with this challenge.

Zero Burn Project began purchasing agricultural waste and output surplus bound for disposal towards end of 2019. Trading posts are located around 5 cement factories of SCG in Saraburi, Lampang and Nakhon Si Thammarat Provinces. In due time, more trading posts were added among the network of CPAC ready-mixed concrete factories. To date, a total of 14 trading posts are operational, focusing on purchase of rice straw, sugarcane leaf and corncob. These raw materials are compressed by machine to yield small briquette with density 3-4 times that of a typical straw briquette, therefore reducing transport fuel cost to factory.

Farm-waste fuel actually combusts perfectly in a cement kiln, without producing ash dispersal although cement factories do have dedusting system. Therefore, it does not pollute the environment.

Zero Burn Project helps mitigate environmental problem stemming from farm burning, one of the causes of global warming and PM2.5, while contributing to farmers' income and adding value to farm waste according to "From Waste to Wealth" principles of Circular Economy. SCG cement factories can reduce the use of coal and contributing to the national reduction of greenhouse gas emissions.

SCG is determined to develop the Zero Burn Project further towards greater efficiency, with plans to expand coverage of trading posts nationwide by 2020. It also sets the goal of producing biomass for other SCG factories, with next step being selling top quality biomass to power plants and other entities in the future.



Click Video

Natural Climate Solutions

Strategy 6

• SCG establishes a Natural Climate Solutions Committee to oversee carbon absorption using natural methods according to international standard and to collaborate with partners in Thailand and abroad including WBCSD.

• SCG has been implementing a wide range of conservation projects such as check dam construction, forest restoration alongside limestone quarry rehabilitation continuously as parts of climate-related solutions.

• Buffer Zone forest at Khao Wong Limestone Quarry in Saraburi Province received a certificate under “Low Emission Support Scheme” (LESS) of Thailand Greenhouse Gas Management Organization (TGO).

Natural Climate Solutions (NCS) revolves around using natural forest to address climate change. Scientific research findings show that natural forest can absorb and sequester carbon dioxide efficiently. It is estimated that up to 37% of carbon reduction required to attain the well below 2 degrees Celsius target can be absorbed by natural forests. Nevertheless, the world is using only 1% of it in addressing climate impact.

In 2019, WBCSD which brings together over 200 global corporations working towards sustainability actively promoted NCS.

• Establishing a Natural Climate Solutions Committee. SCG has joined WBCSD since 2000, and it has actively supported nature conservation and rehabilitation through various activities including limestone quarry rehabilitation, conservation and restoration of terrestrial forest, mangrove and seagrass meadows. Check dam construction as part of rehabilitation has served as an engagement platform with local communities for more than one decade under “Water Conservation: From Mountain to Mighty River” project. The direction and existing practices of SCG are therefore aligned with the NCS concept.

To integrate NCS as one of the strategies to achieve emissions reduction target, in 2019, SCG established a Natural Climate Solutions Committee.

It is in charge of formulating an NCS plan for forestation and conservation of natural areas as well as fostering collaboration with stakeholders in NSC actions both national and international. SCG also joined with WBCSD's Natural Climate Solutions (NCS) in evaluation of carbon absorption and offsetting using natural methods, which will lay the groundwork for an international Protocol for evaluation of carbon absorption through natural methods in the future.

• Planting forest as carbon sink. For over a decade, SCG has actively implemented projects aimed at conservation and reforestation. The scope of these projects covers check dam construction, planting terrestrial forest, in mangrove areas and seagrass meadows. By 2019, results of our efforts include the following:

• 221,000 trees planted to constitute forest areas in SCG limestone quarries and vicinity in many provinces such as Saraburi, Lampang, Khon Kaen, Kanchanaburi and Ratchaburi.

• 25,000 trees planted for mangrove and seagrass coverage in Trang, Surat Thani and Rayong Provinces.

• Partnership with local communities to rehabilitate prime forest in watershed area through construction of check dam to regulate water flow moisture level in provinces across Thailand totaling 91,405 check dams built.

SCG's commitment to tree planting activities has been consistent, and this is deemed contribution to Natural Climate Solutions. In 2020, we set the target of planting 25,000 trees to cover 100 rai of areas in and around quarry and factory facilities. For coastal area, we aim to increase mangrove forest zone the size of 20 rai by planting trees, and planting 160,000 seagrass trees in an area of 20 rai.

Trees planted

221,000

trees

Mangrove forest and seagrass planted

25,000

trees

Check dams constructed

91,405

units

Carbon being captured

86,557

tons of CO_2

• Forest rehabilitation for carbon absorption at Khao Wong Limestone Quarry received a certificate under LESS of Thailand Greenhouse Gas Management Organization (TGO).

In another project, SCG collaborates with the Forestry Research Center, Forestry Faculty, Kasetsart University in implementing a project on "Zoning of Quarrying Activity for Forest Conservation and Reforestation in Rehabilitated Quarry for Carbon Sink and Biodiversity Conservation" in Khao Wong Limestone Quarry of the Siam Cement (Ta Luang) Co., Ltd., located in Khao Wong Sub-district, Phra Phutthabat District, Saraburi Province. The project invests in survey and upkeep and prevention of disturbance to the forest ecosystem, check dam construction for moisture level, and additional tree planting. With these efforts, the buffer forest of Khao Wong Limestone Quarry covering an area of 2,197 rai absorbs 86,557 tons of CO_2 (for the period from 21 March 1992-15 August 2019). The project receives a certificate under the Low Emission Support Scheme (LESS) of Thailand Greenhouse Gas Management Organization (TGO).

Circular Economy

The global challenge of the impacts from waste problems on one hand and resource scarcity on the other reinforces the relevance of circular economy's Make-Use-Return concept in managing and coping with these problems. SCG adopts circular economy as one of its three core strategies in sustainable development. SCG actively seeks collaboration across sectors and stakeholders to realize efficient waste management, maximization of resource use and reducing wasteful use of new resource.

Target

2020

50%

revenue from sales of recyclable/reusable polymer from total revenue from sales of polymer packaging of Packaging Business

2021

0

waste from the Head Office in Bangsue to landfill

2025

100%

of products from Packaging Business to be recyclable and reusable

2025

9%

of domestic sales of single use product of the Chemicals Business

Strategy

1. Develop circular economy products and services to generate and retain their maximum core value of materials.
2. Collect and manage wastes for recycling.
3. New business model by transforming to Product as a Service.

Management

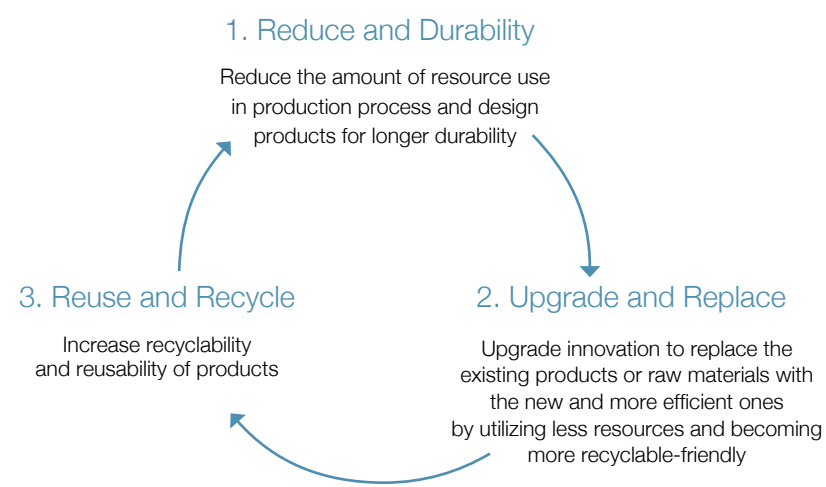
- Establish a Circular Economy Committee to provide oversight and build five kinds of success factors: awareness, collaboration, regulatory framework, innovation, management and evaluation.

2019 Performance

47%

revenue from sales of recyclable/reusable polymer packaging from total revenue from sales of polymer packaging of Packaging Business

SCG Circular Way



Product and Service Development with Special Quality Materials Innovation

Strategy 1

• Chemicals Business developed SMX Technology, an innovation to enhance production of special grade plastic resin to develop easier and downgauging moldable plastic products with the same resistance to high impact, achieving lighter products and higher recyclability potential.

• Packaging Business developed material technology for Recyclable Polymer Packaging that is light and recyclable.

SCG believes that an approach to reduce raw materials use and recycle more waste materials while maintaining the durability and long-lasting quality of the product is through the innovation of special quality materials that enable the use of its maximum value in the development of High Value Added Products & Services (HVA), which substitutes existing products and materials, reduce materials use, extend the lifespan, and foster the recyclability.

• SMX Technology Innovation that Drastically Changed the Plastic Industry Technology developed by Chemicals Business to enhance the production of HDPE (High Density Polyethylene) to develop easier and downgauging moldable plastic products with the same resistance to high impact that leads to lighter products and higher recyclability potential.

At present, SMX Technology is used to develop several types of products such as large chemical tank, electric appliance plastic cover film, film layers for transportation paper packaging, and lightweight soda cap.

SMX Technology help reduce the amount of plastic use in production by

10%

In 2019, SMX Technology originated the product research and development total of

8

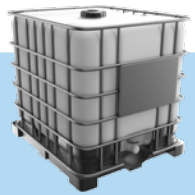
items

47%

Revenue from sales of recyclable/reusable polymer packaging of total revenue from polymer packaging of Packaging Business

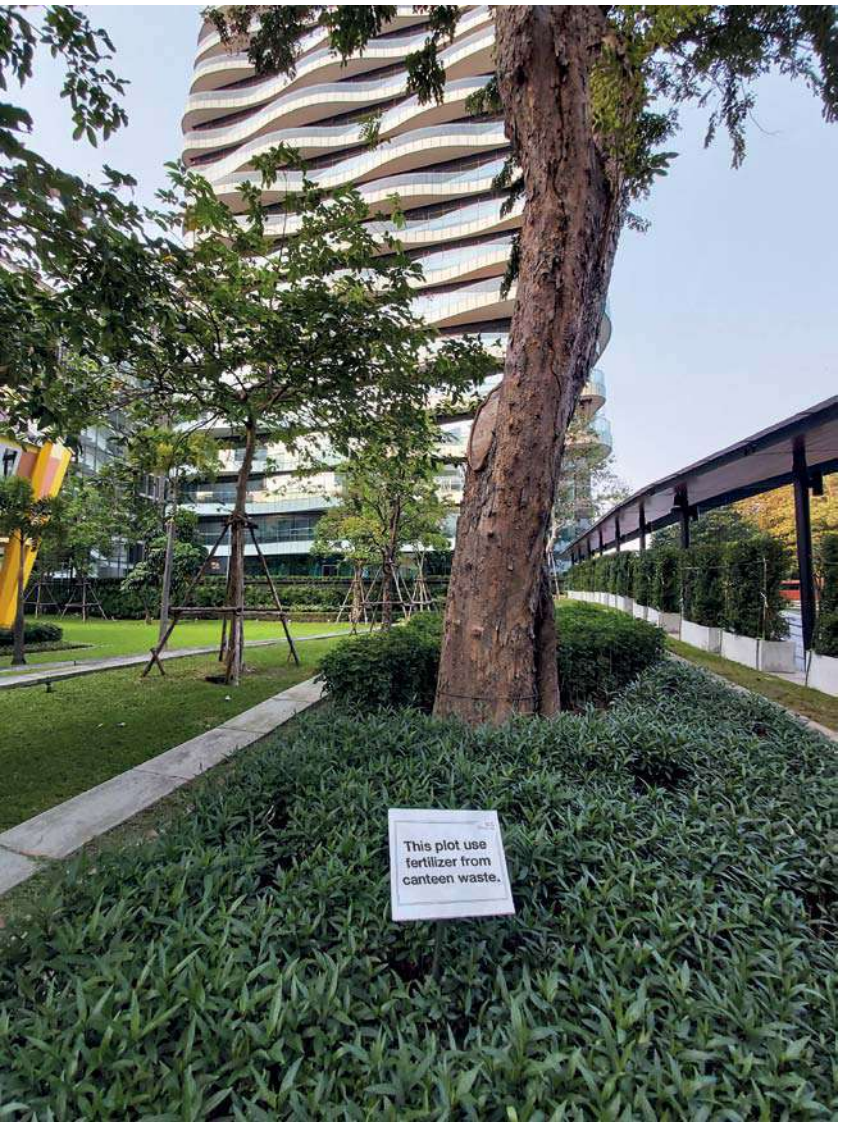
• Recyclable Polymer Packaging Packaging Business has adopted circular economy as its operation guideline by seeking ways to reduce waste from packaging through product designing, increasing the proportion of recyclable polymer materials such as thermoformed barrier food packaging, that obtains the characteristic of food preservation for as long as metal or glass packaging, lightweight and recyclable.

In 2019, Performance and Polymer Packaging Business (PPP Business) recorded revenue contribution from recyclable polymer packaging at 47% of total revenue from PPP Business sales.



Chemical Intermediate Bulk Container: (IBC) SMX™

Intermediate Bulk Container the size of 1,000 liter-capacity is a requisite item industrial plants use for safe storage and transportation of chemicals and efficiency in containment per area including installation and transportation. Chemicals Business collaborated with customers that are leading IBCs manufacturers in a project to produce special-grade plastic resin using SMX Technology, dedicated to IBC production. The outcome is a new material which retains the shape and excellent resistance to chemicals, the same weight with higher resistance to impact. The new material is easier to molding and production control, while reducing cost of packaging as a result of less material use by up to 10% (depending on the shape of tank).



Collection and Management of Waste for Recycling

Strategy 2

- SCG has been driving implementation of the Bangsue Model to change the employee behavior in the organization. The efforts result in less waste generated and more waste to recycle. The goal is zero waste from the Bangsue Head Office to landfill in 2021.

- SCG developed “KoomKah” application platform that facilitates garbage bank management and waste recycling.

- SCG collaborates with external partners in waste recycling through programs such as buying used paper for recycling via PaperX application, collecting fiberglass waste from customers to be used as raw material in making new insulation fiberglass.

30%
waste reduction*

200%
increased in recyclable waste* (* compared data of September 2018 and December 2019)

A crucial factor in propelling Circular Economy forward is the appropriate and effective waste collection and management to take waste back to the recycling process as much as possible. In order to succeed in waste management requires the change in behavior and management system, right facility for efficient collection of waste, proper procedures in waste sorting and transporting, and reduction of contaminated waste to the minimum.

- Bangsue Model SCG has made serious efforts in implementing “Bangsue Model” to encourage employee in the Head Office at Bangsue and affiliated factories nationwide to change their behaviors in alignment with “Resource Maximization-Correct Sorting-Proper Disposal” concept. As correct waste sorting is the first key stage of waste management, SCG designed 6-color bins to address the problem, delivering an easy-to-understand and clear message by assigning bin color for each material waste.

After two years of Bangsue Model in practice, employee waste sorting has become more accurate.

The amount of total waste steadily decreases from month to month. Sorted waste has increasingly been recycled and properly managed. Paper and plastic waste have been recycled. Waste from food scraps is composted as soil improvement substances for planting. SCG target at reducing the amount of waste sent to landfill to zero (Zero Waste to Landfill) by the year 2021.

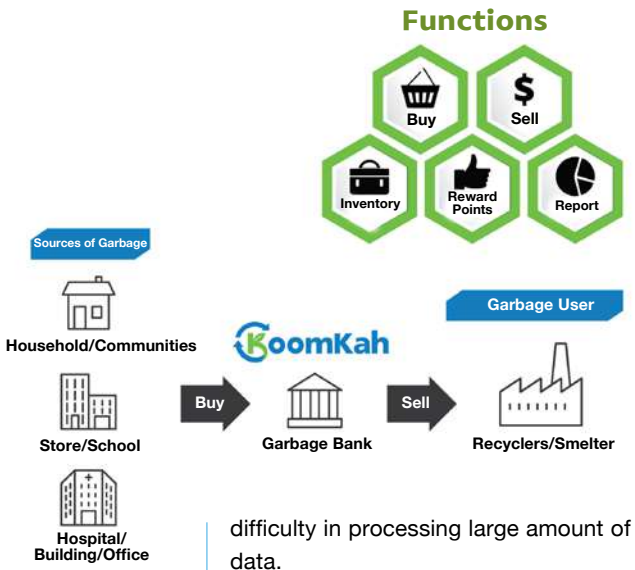
SCG aims at driving Bangsue Model towards success throughout the organization and further adapt to the factories, contractors, suppliers, customers, and society to generate positive impacts on national waste management.

• Garbage Bank Support

Garbage bank is considered a mechanism in the cycle of Circular Economy through the buying back of sorted waste from the members and passing them on to the recycling process of the factories. The hindrance of the garbage bank is the lack of proper management tool as most of them still record the transaction in the notebook, which delays and causes difficulty in processing large amount of data.

SCG therefore developed "KoomKah" application featuring five core functions essential to a garbage bank: 1. "Buy" to record waste volume and calculate transaction value, 2. "Membership Management" to manage members' profile, reward points and record of point redeem, 3. "Sell" to keep track of sales, calculate income and profit, 4. "Inventory Management" to organize waste by category, manage capital and points collected from buying, and use data to improve transaction strategy and 5. "Report" to generate analysis of transaction reports downloadable in Excel format.

In this way, "KoomKah" application enables garbage bank staff to systematically manage operation via mobile phone, as well as facilitating the setup of trading and transporting plan.



Target: in 2020, encourage the formation of garbage banks at

170

places nationwide

Click Video

Target: in 2024,

1,000

garbage banks use Koomkah application

From Bangsue Model to "Community LIKE (No) Garbage" "Zero Waste Community" and KoomKah Application

Building on the success of "Bangsue Model" in reducing volume of waste to landfill and increasing waste for recycling at SCG Head Office in Bangsue, in 2019 SCG extracted lessons learnt and replicated waste management model to communities around SCG factories in Rayong under "Community LIKE (No) Garbage" "Zero Waste Community" Project.

Volume of waste generated in Rayong Province totaled more than 306,000 tons in 2018, incurring a hefty disposal cost of 328 million baht, and only 7% of the waste volume were recyclable. SCG aims at increasing the ration of waste to recycle and reducing the waste to landfilled. Doing so requires behavior change along the line of Bangsue Model of "resource maximization-correct sorting-proper disposal" mindset and mobilizing community collaboration through the traditional Thai route of "Home, Temple and School" to ensure waste management right at first. Next is an efficient Garbage Bank management facilitated by KoomKah application. We hope this will generate a model or prototype of integrated Community-based waste management system.

In 2019, SCG embarked on a pilot project with communities in Map Ta Phut Municipality in Rayong: Khod Hin 2, Khod Hin Mitraphab and Khao Pai Community; Khod Hin Temple, Wat Khod Hin Mitraphab 42 School and Khao Pai

(continue on page 41)

Waste taken to recycling process

6,500

kilograms

Click Video

The application increases opportunity to distribute garbage to feed recycling factory and waste-to-energy generation plant. Currently, “Koomkah” is used by 23 community-based garbage banks.

• An Approach to Waste Recycling Collaboration

SCG realizes that to enhance waste collection to be successful in accordance with Circular Economy principles requires the involvement from a number of sectors outside the organization. SCG, therefore, steps up the effort to develop project and innovation as a tool. The important example in 2019 such as:

• PaperX Digital platform developed by Packaging Business to provide

service in buying back the wastepaper and returning them to the recycling process through PaperX application. At present, SCG promotes the use of PaperX application in the organizations that we form the collaboration with. In addition, SCG cooperates with Modern Trade stores in collecting scraps form paper packaging in their distribution centers and directing them to the factory for the production of the new products.

• Siam Fiberglass Co., Ltd., producer of insulation fiberglass wool, processed fiberglass waste reclaimed from its customer’s production process in manufacturing of insulation materials for household electrical appliances, as material for new insulation fiberglass wool production. The project increases usage of recycled materials by 4% and reduces the amount of waste disposal by the customer by over 435 tons per year. Besides, Siam Fiberglass Co., Ltd. processed Post Consumed Glass Cullet as substitute raw materials for Silica Sand, which reduces consumption of natural resources at 10,500 tons per year.

PaperX Digital platform recycle paper

68,000

tons per year

Garbage Bank. SCG informed and trained community members on wet and dry waste characteristics and how to sort them. Community leaders coordinate and facilitate selling of waste collected to the garbage bank. Inputs sessions were held with monks, novices and villagers volunteering for religious activities at Khod Hin Temple, because they play a role in in sorting plastic bags which contain food devotees offer in almsgiving. Khod Hin 2 community leaders volunteer to transport waste from the temple to be sold to the garbage bank. Sales proceeds are put in scholarship fund for needy pupils. With Wat Khod Hin Mitraphab 42 School, SCG conducted sharing sessions on circular economy in classrooms, and set up learning base on waste separation at school to encourage real-life practice.

SCG offered KoomKah application to Khao Pai garbage bank so that the manager can plan trading more effectively, while making it easier for members to participate. As a result, membership has doubled from 100 to 200.

Success of the “Community LIKE (No) Garbage” “Zero Waste Community” project is due to active participation between a strong network of home, temple and school which function as the community’s learning platform, and the garbage bank. Community leaders with commitment keep communicating the concept to members, breathing life into a practical model in real-life setting. The results inspire expression of interest by three other communities to join the next project phase in 2020 namely: Islam, Chak Lookyah Temple and Map Chalood-Chak Klang communities.

Over

80

households in three communities joining the project

In 2020,

700

more households in three original communities to join

Product as a Service: A New Business Model

Strategy 3

• SCG developed ALLRENT application platform offering rental of idle machines, in an efficient approach to sharing resource.

Technology and innovation advancement lead to a volatile economy and society. Business sector needs to adapt to consumer's behavior. The Circular Economy principles corresponds to various new businesses such as resources sharing platform and product as a service. SCG, then, began to alter its strategy to setup the new business in accordance with "product as a service" concept through the application of digital technology as a tool to develop efficient solution to maximize resources utilization.

ALLRENT rented out more than 990 customers for total sales revenue of

36

million baht

• ALLRENT SCG develop the application to solve the excessive procurement of machines for construction representing a waste of resource and cost increase for the company. ALLRENT, then, compile information about more than 3,000 items of unused machines in possession of managing and facilitating to offer the rental machines to the companies in need, instead of having to procure the new machines. This service is the way to efficiently allocate and make use of the existing resources and also helps customers to control cost with the effective management options.

Strengths of ALLRENT

1. Matching those looking to rent with machinery owners with idle capacity
   Utilization and maximization of machinery
2. Reduce unnecessary acquisition of machinery
   Reduce use of natural resource and energy in producing surplus product
3. Reduce fuel use
   In hauling machinery from a distant location to work site
4. Minimize state sector's obstacle in the way of realizing circular economy
   Supporting initiatives of Circular Economy for Construction Industry (CECI) Network

"The most vital element for change is starting primarily from ourselves. SCG initiated the dialogue of Circular Economy principles for the first time in 2018 and having formed the partnerships with over 40 organizations throughout the entire year. Construction industry switches up it approaches to the use of recycling materials and the waste disposal. Retail industry collaborated on the environmental friendly packaging designs and value creation from waste. SCG is delighted to collaborate with partners to ensure the sustainable future not only for Thai economy but also the ASEAN economies."

Roongrote Rangsiyopash

Collaboration Arising from SD Symposium 10 Years "Circular Economy: Collaboration for Action"

In 2018, SCG hosted the "SD Symposium on Circular Economy: The Future We Create," opening up a public dialogue on Circular Economy principles in Thailand's sustainable development. In 2019, SCG followed on the momentum with SD Symposium 10 Years "Circular Economy: Collaboration for Action".

Participating at the forum were 45 partners in the circular economy network consisting of five global allies, three government entities, 29 private sector corporations, and eight schools and communities. These partners reaffirmed their collaboration with SCG and others in driving circular economy focusing on:

1. Collaboration for Sustainable Business

• **Globally** SCG joins international and national alliances that pursue sustainable business practices namely WBCSD, the United Nations and the Thai Chamber of Commerce.

• **Construction Industry** SCG is a member of Global Cement and Concrete Association (GCCA), and a founding member of Circular Economy in Cement Industry (CECI) alongside 14 leading entities in the sector. SCG collaborates with Supalai Pcl. on Recycle Concrete Road Project; with Sansiri Pcl. on Construction Waste Reducing Project and with Magnolia Quality Development Corporation on R&D into value-adding of construction material scraps.

• **Packaging Industry** SCG joins as member in Circular Economy for Flexible Packaging (CEFLEX) and collaborates in cardboard box recycling with business organizations such as TESCO Lotus, CP ALL, MAKRO, CPN, DHL, LAZADA Express, KBANK, ThaiBev.

Click Video

• **Chemicals Industry** SCG collaborates with Bill & Melinda Gates Foundation in developing a prototype of sanitation system with waste recycling capability, with IKEA on a recycle center project, with Starboard in an environment-friendly material design project, with Dow Thailand in implementing Recycle Plastic Road, and with Bangchak Corporation (BCP) in Greenovative Lube Packaging.

2. Collaboration in Resolving Marine Trash Pollution

• **Globally** SCG joins the Alliance to End Plastic Waste, as founding member among 30 leading global corporations committed to reducing marine litter and plastic pollution.

• **Nationally** SCG is a founding member of Thailand PPP Plastic, a public-private-people sector alliance for sustainable management of plastic waste under the Federation of Thai Industries' Plastic Industry Club. The Club is pursuing the target of 100% recyclability and at least

50% reduction of plastic debris in Thai seawaters by 2027.

• **Public Sector** SCG joins the Department of Marine and Coastal Resources in developing a prototype of trash trap buoy to reduce debris flow into the sea.

3. Collaboration in Industrial Waste Management

• **Public Sector** SCG and the Industrial Estate Authority of Thailand implemented the Eco World Class with Circular Economy Concept, offering industrial waste management service at Map Ta Phut, Rayong.

4. Collaboration in Managing Community Waste

• SCG has been working with communities to develop community-based waste management model in many provinces across the country including Ratchaburi, Lampang, Rayong, Trang, Bangkok.

SCG CEO, Roongrote Rangsiyopash emphasized that in seeking collaboration with public, private and civic sector, the message has to be about how Circular Economy principles is key to a win-win situation for all sectors, with innovation as tool to resolve chronic, or unresolved problems.

At the symposium, participants also brainstormed on solutions to solve the pressing problem of waste management in Thailand. Outcome of the session is a four-point proposal to the prime minister calling for
1) total overhaul of waste management infrastructure, 2) incentivize businesses to design products that are easy to recycle, 3) public communication on circular economy to educate the public and schools, and 4) serious enforcement of waste-management related laws.

Health & Safety

With a variety of business activities from production, services providers, transportation, together with the important role of employees and contractors in the organization, SCG is highly attentive and driving the best effort towards accidents reduction with the ultimate goal for zero lost time accident by 2022, as well as zero fatality case of employees and contractors each year. Even though the target is not yet achieved, there is a tendency for SCG's effort to get closer to the goal.

Target

Every year

0

Fatality of employees and contractors

2022

0

Lost Time Injury Frequency Rate of employees and contractors

Every year

0

Occupational Illness Frequency Rate of employees

Strategy

1. Raise awareness and change working behavior to be a safety culture.
2. Promote managers or supervisors as Safety Leaders to demonstrate "Caring" for employees and contractors.
3. Implement safety management systems to raise safety standard in both domestic and overseas.
4. Develop digital technology as a supervision tool for more convenient and agility to reduce the risk of accident.

Management

- By forming the Occupational Health & Safety Committee with 2 subcommittees namely, Workplace Safety Committee and Transportation Safety Committee for stricter and higher efficient control.

2019 Performance

0

case of Fatality of employees

2

cases of Fatality of contractors in the workplace

0

case of Fatality of direct transportation contractor

4

cases of Fatality of other transportation contractor

0.239

case/1,000,000 man-hours Lost Time Injury Frequency Rate of employees

0.279

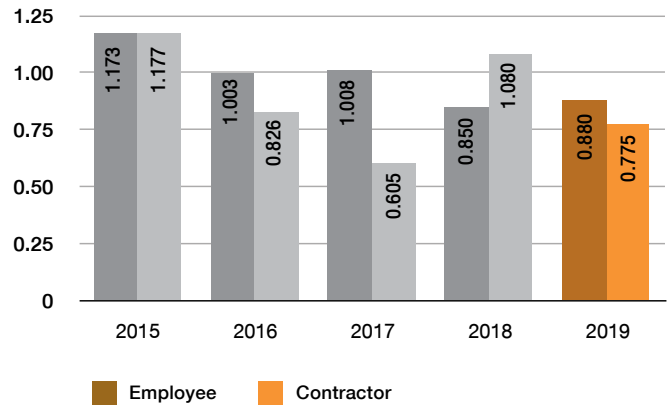
case/1,000,000 man-hours Lost Time Injury Frequency Rate of contractors in the workplace

0

case/1,000,000 man-hours Occupational Illness Frequency Rate of employees

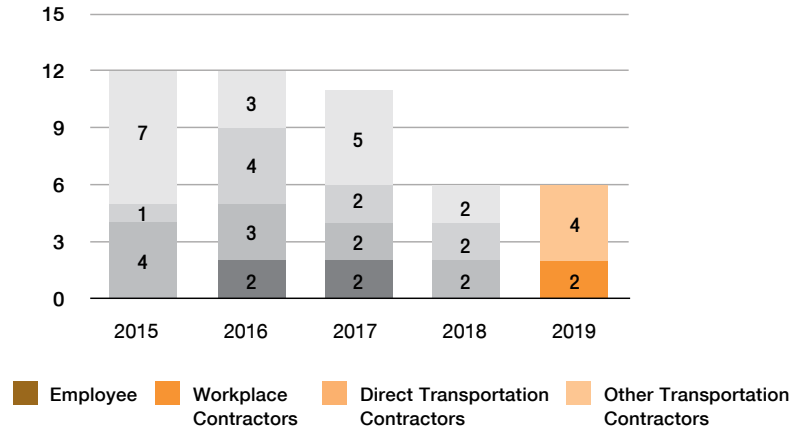
Total Injury Frequency Rate

Case/1,000,000 man-hours



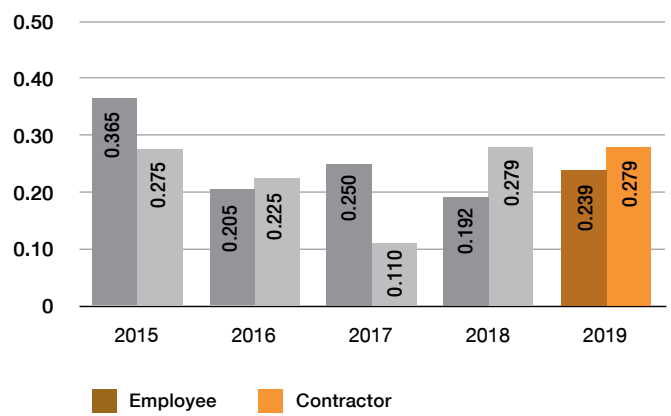
Total Number of Fatalities

Cases



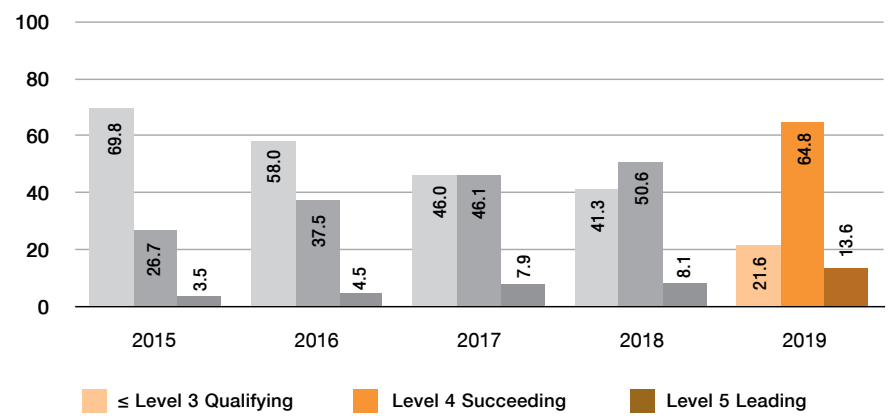
Lost Time Injury Frequency Rate

Case/1,000,000 man-hours



Number of SPAP Certified Companies in Thailand

Percent



Workplace Contractors: A contractor that works for the organization, and whose work and/or workplace is controlled by the organization (exclude transportation contractor).
Direct Transportation Contractors: Transportation contractor with operation under SCG's Brand.
Other Transportation Contractors: Other transportation contractor without operation under SCG's Brand.

Workplace Safety

Strategies 1, 2, 3, 4

• SCG has created high safety standard for seriously safety supervision and continued to develop innovation to reduce occupational risks while encouraging supervisors and managers to be a safety leader to embed safety into SCG organization's culture in every countries where SCG operates.

"Every Life has Value, Every Person shall get Home safely."

SCG is well aware of the company high risk activities such as working at height over 1.8 meters, working with moving machines, working with energy and electrical system, etc. Causes of accidents are the lack of knowledge and awareness of safe working and an inadequate of operation control.

SCG, therefore, announce SCG Safety Framework and supervise by Safety Performance Assessment Program (SPAP) since 2007, followed by the announcement of 9 Life Saving Rules in 2017, which is mandatory for all companies. Penalty will be strictly enforced in case of violation.

• Life Saving Rules, In 2019, total 258 cases of Life Saving Rules violations and punishments were found, which consisted of 26 employees and 232 contractors. Approximately 62% of the violation is from drinking alcohol before driving or working (The control level of alcohol

at SCG is 0 mg percent). The decrease in the total number of violations compared to the previous year could be partly attributed to more stringent verifying and controlling, which meant that more accidents arising from these risks were averted as well.

• SCG Safety Framework and SPAP The continuous implementation of SCG Safety Framework as safety management system incorporated with SPAP assessment tool, and the monitoring of interrelationship between SPAP assessment result and Total Injury Frequency Rate (IFR) of each company for the past 3 years demonstrate the finding that SPAP assessment level is significantly interrelated with the accident rates.

That is, the company achieves SPAP Level 4 (Succeeding) and Level 5 (Leading) has an accident rate for the past 3 years lower than Level 3 (Qualifying). Therefore, in a determined effort to raise safety standards for all SCG companies in Thailand and regional shall also be employed as the operating guideline to achieve the specified target of accident rate reduction.

• Safety Leadership Enhancement

SCG believes that an important key to workplace safety is the leaders and supervisors who show their leadership and be a committed role model on safety.

SCG develops guideline for supervisors such as Leader Standard Work that covers coaching, leadership line walk and safety performance visual board monitoring (Visualization). Safety Observation Program for supervisors to regularly observe the employees, show their caring and give a piece of advice for behavioral change when encountering unsafe actions together with awareness raising of employees to reduce risk by themselves, which ultimately lead to the creation of safety culture.

Sharing Experience in Elevating SPAP Safety Standards

"Everyone shares an understanding that safety is not the duty of the executives but it is everyone's responsibility"

Supakit Phucharoensilp

Operations Department Manager,
The Siam Cement (Kaeng Khoi) Co., Ltd.
SPAP Level 5 (Leading)

"Our plant has the highest capacity in the cement business and achieved Level 5 SPAP certification in 2016. The key to our success lies in safety leadership and the creation of a safety culture. As part of our long-standing practice, supervisors set a good example, while everyone shows their care and concern for one another and emphasizes on safety standards.

"To encourage everyone to help foster a culture of safety, we have given each internal unit the freedom to choose which aspect of safety to emphasize according to the nature of their functions. For instance, the Human Resources section might pay attention to Caring Picture, Operation section focus on task observation. This is so that everyone feels motivated as well as gets to work towards risk that are relevant to their work and enjoy the process. The result is a stronger system and a shared understanding that safety is not the duty of the executives or safety officers but it is everyone's responsibility. If everyone understands this, operational risks will be reduced. They will be safe, and so will their colleagues.

"All new recruits will also need to attend safety training called Safety DOJO, to learn where are risks and severity of accidents. These sessions simulate actual accidents so as to raise awareness of what can happen.

"We have also shared the story of our success in safety management with many other companies, including companies in our group across the region."

In addition, SCG encourages employees for safety expression through various campaigns such as “We share for love, We talk for care” by Cement-Building Materials Business, “The Lifesaver” by Chemicals Business that encourage employees to warn for each other when found unsafe, and “My Safety Commitment” by Packaging Business that employees are create a personal safety commitment motto. Including “Feel with Care and challenge to warn each other” by Corporate functions.

• Cement-Building Materials Business We gives precedence to limiting unsafe action and unsafe condition that are fundamental cause of accident, and focuses on participatory risk identification from employees and contractors via Line Walk and Safety Caring application that facilitate the identification and recording of risk for corrective actions. We focus on creating a Safety Caring Culture through various campaigns such as “SHARE=CARE” and “Hai-Jai” etc. that allows employees to pass their caring messages to their colleagues by admire for the safe behaviors and advice for unsafe behaviors. We enhance safety standard by apply the technology to reduce risks in production, maintenance, and projects. For instance, the Building Information Modeling (BIM) that help visualize the sequence of activities for the design and pre-planning phases and help reduce rework in process. We will achieve safety performance through the application of technology on high-risk job such as using drones to conduct roof inspections, etc.

“We did not hand out punishment. Instead, we helped them understand, so that they became determined not to make the same mistake.”

Nared Sangawong

Operation Director,
Kampot Cement Co., Ltd. Cambodia
SPAP Level 4 (Succeeding)

“Kampot Cement is the first SCG’s cement plant in overseas and began operation in 2007. We operate under the principle of governance and TPM (Total Productive Maintenance) as a management tool. As a result, we became the first company in Cambodia to receive a TPM Excellence Award in 2019.

“In 2019, we became a Level 4 SPAP certified company. Currently, we have been free of lost time accidents for 950 days, which is our best record so far. However, there are still minor accidents every now and then, which means that we still have to keep developing to achieve our zero accident goal. We have found that the system alone is not enough because there are two factors that cause an accident: employees have an incomplete grasp of the system and they do not understand what they are complying with the system for. Therefore, we have been trying to foster a mindset that safety is not for the company but for themselves and their families.

“Before we achieved Level 4 SPAP certification, the mindset of our employees was an arduous challenge. We tried to educate, observe, and talk to them whenever there was a case of non-compliance. We did not hand out punishment. Instead, we helped them understand, so that they became determined not to make the same mistake. Team leaders also had to involve ensuring full supervision. At first, some employees might feel that we were finding faults with them, but we showed that we cared for them. We asked about how they were protecting themselves and their colleagues and whether they had any suggestions or needed any help, so that the company could take care of them.”

• Chemicals Business In 2019, we has implemented the Process Safety Management (PSM) continuously to cover all factories and provide the System performance assessment which conducted by both internal and external parties, with no major finding, and later being extended to factories in regional and new mega green field projects for the efficient management from the start. In terms of workers safety, we enhances efficiency measures for hazards and injury prevention by carrying out the Incident Prevention Concept, start with risk assessment and define clear measures through safe operating procedures as the standard for the whole business unit to comply with, and control of high-risk job by required work permit from area owner. Encourage near-miss report, incident investigation, and follow-up measures for concrete solution. In addition, to promote caring in all level of employees we putting in place the Safety Observation Program to analyze behaviors and create control measures leads to zero Lost Time Accident and number of Medical Treatment Case decrease by 80% of Chemicals Business, particularly in Thailand in 2019.

"We use Process Safety Management or PSM, which is a safety standard implemented across the world."

Preeda Vatchratiensakul

Managing Director,
Thai Polyethylene Co., Ltd.
SPAP Level 5 (Leading)

"Thai Polyethylene Co., Ltd. achieved Level 5 SPAP certification in 2012, making it the first company in the Chemical Business to do so. The company has to renew its certification every three years, and in 2018, it successfully maintained the Level 5 SPAP status, demonstrating its capacity to maintain an excellent safety standard by comply with a world-class safety standard called Process Safety Management or PSM.

"The two key components of the PSM system are having a good operational standard and implementing that standard. A good operational standard encompasses everything from design, material selection and testing, plant supervision, management of change and investigation of risks and accidents to prevent future incidents as well as setting clear investigation procedures before implementation at each step of an operation.

"To implement a good standard, employees must be trained and informed of the rationale behind it through a why-what-how process as well as taught to be conscious of following the standard. In addition, they must help ensure safety not only for themselves but for fellow employees and contractors as well, through Safety Observation Tours (SOT). Furthermore, the company listens to their safety suggestions through Safety Networking.

"Supervisors also support and compliment their subordinates when they did a good job in complying with the safety standard and offer suggestions when there is room for improvement by giving constructive feedback, explaining the causes and possible impacts, and demonstrating that they care for them.

"As a result of adhering to PSM, the company has successfully maintained the Level 5 SPAP status and prevented lost time accidents. Most importantly, the employees are also proud to participate a role in keeping themselves and others to be safe."

• Packaging Business To upgrade safety standard in Thailand and regional, we develop safety system innovation through digital technology, namely “SAFEsave”, with advanced machine learning capabilities to alert danger in real time and administer centralize database instead of paper recording to timely control risk.

We has developed SAFEsave since 2018 and conducted trial at Wangsala and Ban Pong plant and at the Engineering Division of Packaging Business. In 2019, SAFEsave has successfully developed 14 out of 15 modules. The highlights of SAFEsave are People Classification – Using QR Code scanner to verify contractors whether they completed the operational high-risk training specified by law, Restricted Area for Security – Inspection of the restricted areas via CCTV which will send the alert and record the photo footage as evidence when detecting the abnormal activities in the area.

• Safety Leadership Program, Bangsue Head Office: This program was organized for the second consecutive year. In 2018, a Safety Leadership Assessment questionnaire was administered to all managerial employees. In 2019, the program was piloted in two offices, namely the Corporate Accounting Office and the Corporate Procurement Office attended the Diagnosis Phase and the Area Transformation Phase. In the Diagnosis Phase, in-depth interviews were conducted with managers and employees, and workshops were organized to encourage the managers to demonstrate their commitment to transform. The data from the in-depth interviews and the workshops was then used to formulate a transformation package. In addition, an activity entitled “Feel with Care and challenge to warn each other” under The Leader Standard Works Campaign was organized for 295 managerial employees in Corporate Administration and Finance and Investment, in which they pledged not to use cell phones while walking or driving, not to drive after drink, and to always wear a safety belt whether they were drivers or passengers etc.

“Instead of a hierarchical organization, we create an organization of brothers and sisters.”

Niwat Phusrisalap

Manufacturing Director,
Thai Containers Group Co., Ltd.
Nawanakorn Plant
SPAP Level 5 (Leading)

“Our Nawanakorn Plant was established in 1971 and was SCG’s first paper packaging factory. To achieve our zero-accident goal, we believe that it is necessary to foster a safety culture and encourage everyone to look out for their own safety as well as that of their colleagues without any supervision.

“The executives must regularly communicate with employees about safety, stay alert, and be proactive. Because employees are the mostly likely to be involved in an accident in the first six months of employment, we put a yellow strip on their cap to signal that they are new employees. When I visit the plant, I will tap on their shoulder and engage them in a conversation about safety to make them feel that this is a matter that the executives care about.

“We also organize a morning talk, which is a mandatory activity for all employees at the beginning of each work day. The talk begins with a session in which employees share their experience of an accident or a near miss. At first, the employees were shy and reluctant to share their stories, but once they are familiar with the activity, they start to feel proud when sharing their safety stories to their fellow employees. This activity keeps safety in the forefront of their mind all the time.

“I believe that a safety mindset is essential and plays a vital role in our success in achieving Level 5 SPAP certification last year.”

Transportation Safety

Strategies 1, 3, 4

• SCG Raising the standards for goods transportation safety through the close collaboration among all business units to conduct standardized guideline, namely Goods Transportation Safety Standard, for the entire organization and for further implementation with the carriers.

• SCG focus on driver development to have safe driving skill and responsible for society together with technology and innovation application for safety supervision such as 2 sides video recording cameras installation in truck, Kubdee application with the control center and driver monitoring 24 hours via GPS.

"Zero Road Accident" has been SCG's challenge that we continue to undertake, aiming at maximum road safety for SCG drivers, carriers, and other people on the road. SCG develops Driver Management System with safety supervision measures for goods transportation safety covering from prior to, during, and after transportation.

0.207
time/million kilometers of transport accident rate under SCG Logistics

66%
of trucks having 2 sides video recording cameras installed, both SCG's and contractors'

• Driver Development Fully aware that "driver" is the key to safety, SCG enhances driving standard and develop digital technology to be implemented for strict logistics management.

Since 2011, SCG established SCG Skills Development School as a non-formal private vocational school offering curriculum offering a truck driving course for interested parties and transportation contractors with standard driving training field and qualified trainers.

In 2019, SCG develops a truck driving program by mobile training through the Augmented Reality and Virtual Reality (AR & VR) to be launched in 2020. This training platform will increase the driver's training hours, allowing the training access anytime of their convenience and reducing traveling time to the training center.

• Logistics Command Center and Kubdee The Command Center of SCG Logistics that provides assistance and services 24 hours a day including real-time tracking of trucks that entirely have GPS installed and the alert to the driver when found unsafe behaviors such as driving excessive speed, parking on the pavements, driving over 4 consecutive hours, etc.

In 2019, SCG has started to strengthen safety measures by installing 2 sides video recording cameras in all trucks and develop Kubdee application to detect facial and eyes features of the driver for the sign of drowsiness or fatigue and alerts the driver in advance to prevent accident before it happens. The application will be officially launched in 2020.

In addition, the Advance Driver Assistance System (ADAS) is being developed to help maintain an optimum distance between vehicles, detect objects surrounding or in vehicle blind spot and sound the alarm. The system also analyzes driving log for road conditions and driving behaviors for further development of more effective safety supervision.

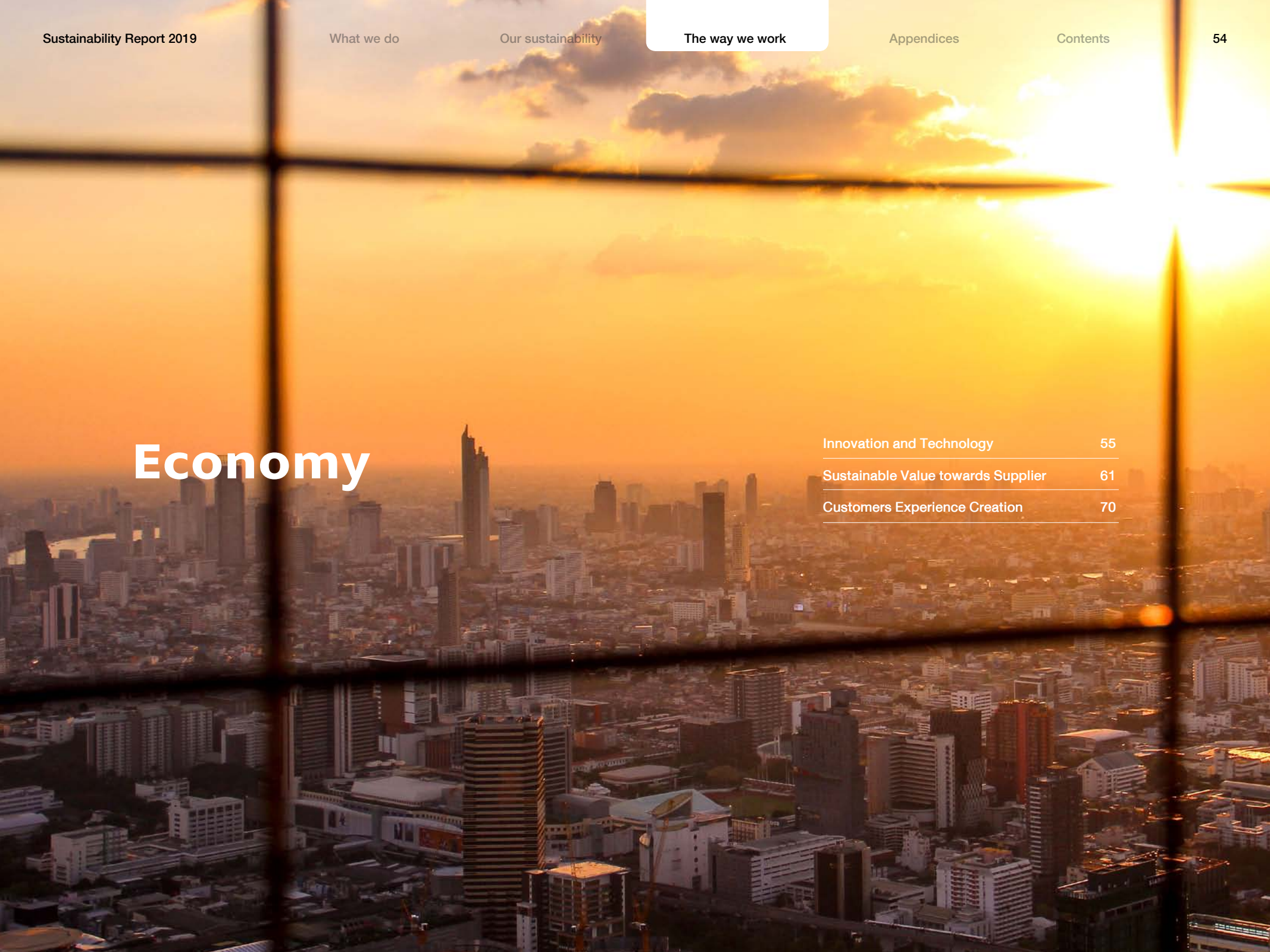
• Goods Transportation Safety

In 2019, all SCG Business Units conduct the meetings to exchange transportation safety practices and set the guidelines for transportation as a unified standard, namely Goods Transportation Safety Standard. The implementation of the standard has started with Chemicals Business and being further adapted by Cement-Building Materials Business, and Packaging Business, respectively. The standard applied to carriers, by promote the carrier to have ability on self-monitor safety.

• Cooperation with all sectors for Road Safety

• SCG Logistics has collaborated with The Department of Land Transport to develop Road Transport Safety, a road safety management system for all transportation types, such as fixed-route vehicles and non-fixed route vehicles and trucks, etc. SCG Logistics has also helped arrange for there to be road safety managers and develop manuals and training courses for them as well as improve relevant rules and regulations.

• SCG Logistics has collaborated with other private organizations and provided part of its accident and traffic data from the GPS system to The Intelligent Traffic Information Center (ITIC), which gathers traffic data from government agencies and private organizations to develop timely and accurate traffic information, reduce traffic problems, increase road safety, and enhance the efficiency of logistics in Thailand.



Economy

Innovation and Technology 55

Sustainable Value towards Supplier 61

Customers Experience Creation 70

Innovation and Technology

The world is facing major transformation with rapid advance of technology. Certain ways and activities have fallen out of date, as intense competition and uncertainty prevail. At SCG we are committed to change, and as innovation leader, we are agile and up to speed with quickly unfolding changes. We stand ready to expand research and development for innovation and innovative business model.

Target

50%
share of High Value Added Products and Services in total revenue from sales

Strategy

1. Digital technology as tool to enhance business efficiency, product development, transportation and customer service.
2. Expand R&D investment to come up with new business model, process and tool.
3. Build an ecosystem conducive to innovation and technology development, focusing on collaboration with external partners.
4. Promote innovation-driven culture wherein employee constitute the force in creating new forms of business.
5. Adopt and apply Circular Economy principles to drive innovation and new business model.

Management

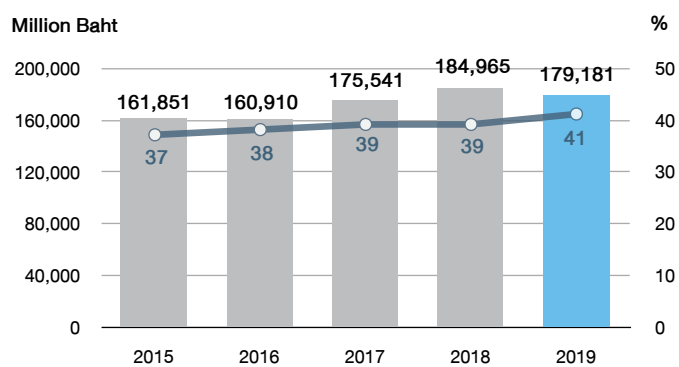
- SCG Innovation Committee sets direction, and promotes innovation and tech-driven culture.
- Innovation generation process applying Innovation Management System.

2019 Performance

1.3%
R&D investment compared to total revenue from sales

41%
share of HVA products and services in total revenue from sales

Sales Revenue from High Value Added Products and Services



Innovation and Digital Technology

Strategies 1, 2

• SCG is committed to lead in innovation and technology, ready to deliver value through new products, services and solutions such as DoCare Protect, a smart home system focusing on elder persons, inventory efficiency solution ANGEL, and Fortina, nanocellulose technology as high-performance paper packaging material.

Digital technology is changing the way people live and how business is conducted. At the same time, it opens up opportunity for SCG to offer value-added products, services and solutions in response to the transformation, with innovation and digital technology as key driver in so doing.

In 2019, SCG has developed a range of such products including:

• DoCare Protect, a smart home solution for safety and health. Driven by the commitment to better living, especially of older persons and people requiring special care, SCG's DoCare Protect offers 24-hour system of care. DoCare Protect operates through IoT-connected devices and sensors to detect movement and anomaly including falls in bedroom, bathroom. It is equipped with distress call button installed and mobile, health log to track vitals such as sugar level, blood pressure, temperature, sleep quality analysis and functional daily activity. Data can be sent online to the medical care provider for first aid advice or emergency response.

Click Video

DoCare Protect enables family members to track safety and wellbeing of older person who may stay home alone, new normal of an ageing society.

In 2019, SCG starts offering DoCare Protect to general customers, real estate developers, hospitals in greater Bangkok. Samitivej Hospital, for example, applies DoCare Protect for post-stroke clients. In the future, SCG plans to take it outside Bangkok, and adding on other services such as follow-up visit by certified nurse or family member.

• ANGEL for better inventory management. Inventory management requires high precision in the face of challenges like duplication of stock, locating or accounting for items in stock. Packaging Business has developed ANGEL by enlisting digital tech into delivering the type of precision, speed and accuracy required of inventory management. ANGEL is an application that can run on computer terminal or smart phone. It covers all steps involved starting with purchase order, receiving goods, stocking, and disbursing, and functioning alongside QR Code on goods. The solution can analyze and generate recommendation for appropriate inventory maintenance to allow for precise execution of purchase order, reducing unnecessary stock and cost.

ANGEL is an outcome of a policy to support startup incubation within the organization. It starts from understanding user's behavior, trial and learning to improve a prototype to a perfect system that enhances business operation, and achieving full digitization.

Packaging Business has plans to broaden the scope of ANGEL, upscaling it to other types of industry, and possibly further down the road as a material trading platform.

Click Video

Replace import of long fiber in the volume of

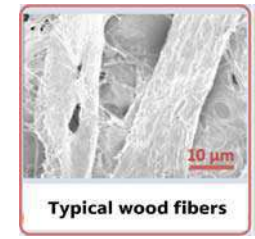
2,500-6,000

tons per year

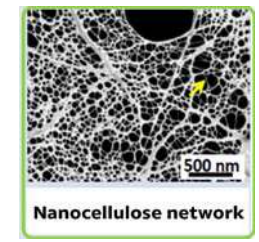
• Fortina nanocellulose technology. Packaging Business has developed nanotechnology innovation by liberating cellulose nanofibrils, which is 1,000 times smaller than typical size of wood fibers, from various sources of natural fibers. The result is nanocellulose fiber with the property of enlarging the surface and inter-fiber bonding. These features give paper packaging greater strength for use. It can also substitute imported long fiber, improving the efficiency of recycled paper as well as adding new attributes to packaging such as oil resistance and adhesive strength.

Fortina technology can produce nanocellulose from wide-ranging sources of natural fiber – wood pulp, recycled paper pulp, agricultural waste, in an approach that supports maximization of resource use aspect of circular economy.

In 2019, Siam Kraft factory at Wang Sala complex installed a system prepare Fortina as prototype for paper making machine, to replace import of long fiber in the volume of 2,500-6,000 tons per year with potential to expand for scaling up to other paper production sites of Packaging Business.



Typical wood fibers



Nanocellulose network

Expanding Investment in New Business Model

Strategy 2

• Chemicals Business organizes SPRINT Accelerator Thailand, supporting Deep Technology startup for three consecutive years, and in 2019 attracted projects from over 30 companies.

• AddVentures by SCG through its Fund of Fund Investment increased its investment from two to four in Deep Tech, and in direct investment from six to fourteen. These will contribute to SCG's sustainable development pursuit.

• Commercial partnership in 22 plus projects with technology and startup companies with a view to commercializing innovation to strengthen core business or develop new business for SCG.

Click Video

Startup was funded

7

companies 1 million baht

Social transformation and challenges in business scene posed by startup which creates new thinking and innovation in answer to emerging social activities mean that SCG must adapt up by promoting growth and investing more in startups to strengthen its long-term competitiveness.

• SPRINT Accelerator Thailand. Chemicals Business and Sasin School of Management Chulalongkorn University co-organized SPRINT Accelerator Thailand program to incentivize new generation of entrepreneurs and Deep Technology startups focusing on medical and wellness, material science, industrial IoT and technology for environment management. With their mission involved development of both hardware and software, research trial in lab and real setting, this group of startups need support from the program both in terms of technology knowledge, business and marketing knowhow, and seed capital.

In 2019, the program continues nurturing the third batch, with 30 companies participating. From among all entrants, seven were awarded 1 million baht in funding including PetStem Cell, a startup focusing on stem cell for pet, Edena Truck on waste collection and Systemstone focusing on managing industrial factory.

• AddVentures by SCG was established in 2017 as Corporate Venture Capital to foster collaboration with startups worldwide through different modes including Fund of Fund Investment, direct investment, joint venture partnership and Commercial Partnership.

In 2019, AddVentures increased its indirect investment from two to four via Fund in Fund Investment, and increased its direct investment from 6 to 14. The startups that SCG has invested in played the role in expanding sustainability outcome to SCG and the ecosystem in which SCG operates in Thailand and overseas as followed:

• **Logistics Platform**. Giztix from Thailand and Logivan from Vietnam operate in goods transportation services, and contributing to sharing economy and generating income for individuals. To date, up to 55,000 vehicles join the platform.

• **Agritech**. Adatos uses Artificial Intelligence and satellite imaging to

improve productivity and risk-forecasting in agricultural areas. HG Robotics makes drone and integrated technology to enhance cropping efficiency and safety, and pollution management. eFishery uses Internet of Things to increase efficiency of aquaculture of small and medium sized species.

Click Video

It also offers other aquaculture-centric solutions such as feed, trading platform and access to capital.

• **Prop Tech in the construction and property development sector**, Dekoruma creates technology that helps make interior decoration easier for homeowner. Baania made wave in the property sector by applying big data to enable entities to under consumers better. Builk brings technology to construction material manufacturers, building material distributors, which in turn enhances efficiency of construction contractors.

• **Fintech**. Singapore-based Validus operates P2P lending platform and supply chain financing for SMEs, using technology to process data for credit scoring which facilitates SMEs' access to credit.

Promoting Innovation-Driven Culture in the Organization

Strategy 4

• ZERO TO ONE by SCG has organized an Internal Startup project HATCH-WALK-FLY provides an avenue for employees to build new business model. To date, five business models from the project have entered into the FLY stage of commercializing with a broader customer base.

In addition to seeking collaboration with external partners, SCG targets its own workforce especially new generation employees keen on thinking outside the box and armed with entrepreneurship. An internal startup project HATCH-WALK-FLY provides a platform for SCG employees to present new business models catered to fast-changing customer's demand. SCG supports both the knowledge and seed capital, for a small team with agility in decision-making to pursue a project and willing to fail fast and learn fast along the road to success.

The three stages are:

HATCH: identifying problem and figuring out what customer wants.

WALK: development, trial and testing a business solution model with a limited group of customers, as well as testing prospect for commercialization.

FLY: expanding business outcome through broader customer base towards exponential growth.

Click Video

• In 2019, the following five businesses graduated from the trial of WALK stage and entering into FLY stage.

- Rudy: a sales automation and CRM solution to help building material shops boost sales at worksite and retail stores, as well as onsite delivery.
- DezpaX: eCommerce Platform of packaging, for customers of caterers that operate delivery service and for purpose of brand recognition.
- MeZ: Farm-to-Hand Platform connecting fruit farmers with buyers who can directly access top quality produce direct from farms.
- Agcura: IoT system to help farmers manage water resources accurately.
- Urbanice: An App Platform for residential property management both condominium and housing estate.

Sustainable Value towards Supplier

Supplier forms an important part in the sustainability of SCG's value chain. With SCG, supplier means manufactures, service providers and distributors. They figure prominently when it comes to operational and reputation risk which may impact or interrupt SCG's business in the event of ethical conduct, legal compliance, environmental friendliness, accidents and safety, anti-trust issues, among others. That is why SCG selects and assesses supplier with prudence, in order to manage business risk, while creating opportunity for mutual sustainability.

Target

2020

90%

of procurement spend comes from suppliers who committed to comply with SCG Supplier Code of Conduct

Annually

100%

of supplier in procurement spend pass Environmental, Social and Governance (ESG) assessment

Annually

100%

of operation contractors certified under SCG Contractor Safety Certification

Strategy

1. Select and assess supplier with capability in sustainable business conduct.
2. Conduct risk assessment and supplier segmentation to formulate strategy and supplier development plan corresponding with the risks.
3. Develop and advance supplier's capability towards sustainability.
4. Raise awareness and enhance employee's competency for efficient procurement.

Management

- Conduct risk assessment and certify all suppliers annually and continually, applying enterprise risk management framework which covers Environmental, Social and Governance issues, along with spend analysis.
- Segment supplier into 4 groups: general tier 1 supplier; critical supplier; high potential sustainability (ESG) risk supplier and critical non-tier 1 supplier.
- Formulate supplier development and capability enhancement plan, for consistency and efficiency.
- Establish a committee to enhance the knowledge and competency of employees in the purchasing, procurement and logistics groups while sharing knowledge, information and practices with procurement entities in both public and private sector.

Green Procurement Value and Products List in 2019

Green Procurement Value

7,852

million baht

201

suppliers;

84

products in the Green Procurement Product List

2019 Performance

8,632

active suppliers in 2019

5,920

suppliers committed to comply with SCG Supplier Code of Conduct, accounting for 93% of procurement spend

100%

suppliers of the procurement spend passed the assessment of environmental, social and governance (ESG) risks

54

suppliers with high potential sustainability (ESG) risk have been assessed, completing 100% coverage of suppliers with high potential ESG risk

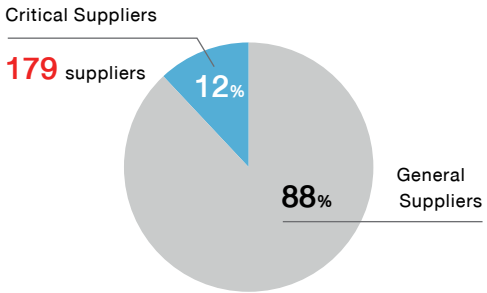
395

operation contractors certified under SCG Contractor Safety Certification System, accounting for 87% of total operation contractors

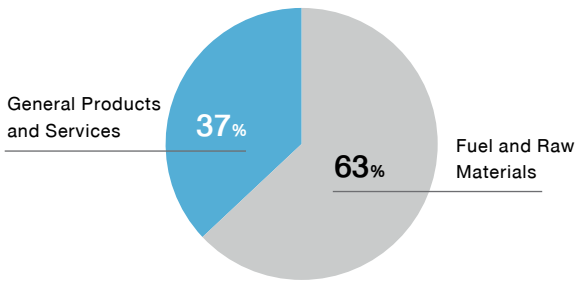
145

carriers have been certified under Fleet Carriers Standard, accounting for 100% of main carriers

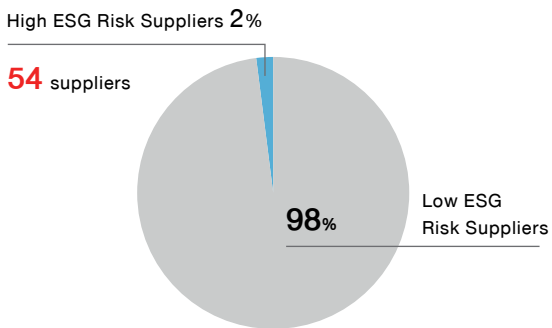
Ratio of Procurement Spend on Products and Services by Group of Suppliers in 2019



Ratio of Procurement Spend on Products and Services by Category in 2019

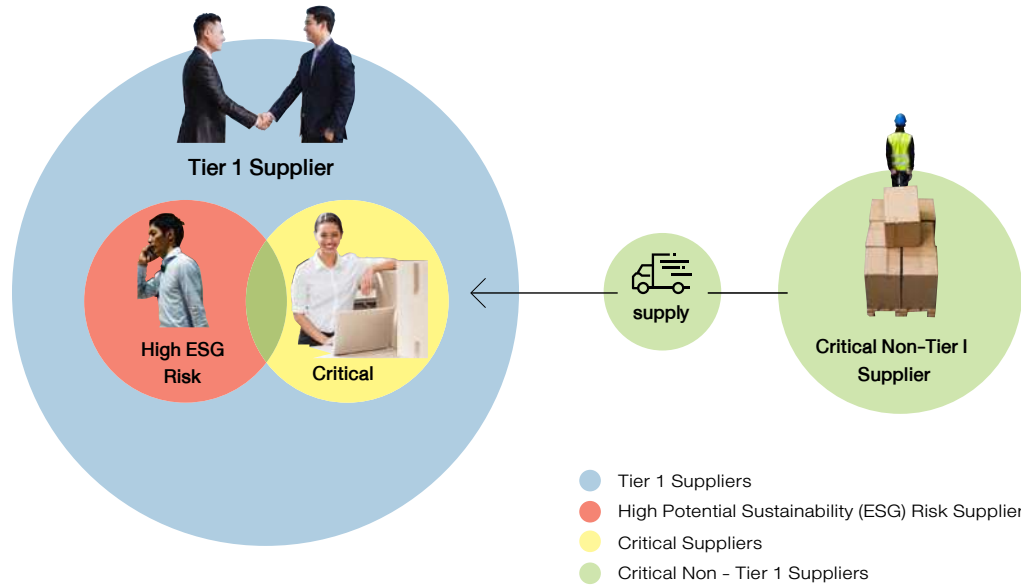


Ratio of Procurement Spend of High Potential Sustainability Risk Suppliers in 2019



Sustainability risk found relates to safety. Corrective actions have been monitored under the oversight of Sustainable Supplier Committee and Transportation Safety Committee.

Supplier Governance and Enhance towards Sustainability



Critical suppliers refer to manufacturers and distributors of products and services that are significant to SCG's business operations, such as high purchasing volume, critical component, or non-substutable products.

High Potential Sustainability (ESG) Risk Suppliers refer to manufacturers and distributors that are likely to cause negative impacts from their improper operations in the social (e.g. human rights, employee and labor care), environment (e.g. waste management) and governance (e.g. legal compliance) aspects.

Sustainability Risk	Number of Supplier	Examples of Corrective Actions
Work-related safety	7	• Training on safety issues • Sensitization on the compliance with safety standards
Travel and transport related safety	47	

Supplier Governance and Enhance towards Sustainability

	Strategy	Implementation	Measurement	2016	2017	2018	2019	Target
Economic	• Select and assess suppliers with the capability for sustainable business.	• Evaluate vendors in terms of quality, cost and delivery (QCD Supplier Evaluation).	• Evaluate suppliers under Approved Vendor List (AVL) with vendor evaluation (QCD Supplier Evaluation).	100%	100%	100%	100%	100% suppliers under Approved Vendor List (AVL) receive vendor evaluation (QCD Supplier Evaluation).
	• Assess risks and classify suppliers into groups in order to frame strategies and supplier development plan corresponding with the risks.	• Conduct a supplier assessment program and segmentation of critical suppliers with a systematic approach.	• Assess and classify critical suppliers.	100% procurement spend	100% procurement spend	100% procurement spend	100% procurement spend	
		• Conduct sustainability risk assessment and supplier segmentation since 2013.	• Assess sustainability risks (ESG Risk).	89% procurement spend	98% procurement spend	100% procurement spend	100% procurement spend	100% suppliers of the procurement spend pass the annual ESG risk assessment every year.
Environment	• Develop and enhance supplier's capability towards sustainability.	• Promote and audit suppliers for registration in the Green Procurement List. • Purchase products and services according to the Green Procurement List. 100%.	• Green procurement and products on the Green Procurement List.	9,936 million baht	10,909 million baht	9,698 million baht	7,852 million baht	-
				75 products	80 products	84 products	84 products	
		• Promote and support suppliers to participate in the assessment of Green Industry (GI).	• Suppliers achieve the Green Industry Level 2 certification.	-	777 suppliers	883 suppliers	1,053 suppliers	-

	Strategy	Implementation	Measurement	2016	2017	2018	2019	Target
Social	• Develop and enhance supplier's capability towards sustainability.	• Raise awareness and behavioral change to create safety culture. • Use safety management system to uplift contractors safety standard. • Having contractors informed and signed for Life Saving Rules in every access for work.	• Operation contractors certified under SCG Contractor Safety Certification System.	100%	89%	91%	87%	100% Operation contractors certified under SCG Contractor Safety Certification System every year from 2012 onwards.
			• Major transportation contractors certified under Fleet Carriers Standards.	100%	100%	100%	100%	100% major transportation contractors certified under Fleet Carriers Standards.
			• Lost Time Injury Frequency Rate (LTIFR) for contractors.	0.225 case/ 1,000,000 man-hours	0.110 case/ 1,000,000 man-hours	0.279 case/ 1,000,000 man-hours	0.279 case/ 1,000,000 man-hours	Reduce Lost Time Injury Frequency Rate in 2018 and 2019 to 0.023 and 0.016 respectively, and target for zero by 2022.
Governance	• Select and assess suppliers with the capability for sustainable business.	• Developed SCG Supplier Code of Conduct in 2013. • Started supervising new and main suppliers to commit to comply SCG Supplier Code of Conduct continuously since 2014.	• Suppliers committed to comply with SCG Supplier Code of Conduct.	-	48% procure-ment spend	83% procure-ment spend	93% procure-ment spend	90% of the procurement spend comes from supplier who commit to comply with SCG Supplier Code of Conduct by 2020.

Collaboration with Supplier to Enhance Safety Standards

Strategy 2

- Packaging Business joins with carriers to promote road safety according to SCG Goods Transportation Safety standards.

- Chemicals Business organized training workshops on Contractor Safety Management (CSM) to ensure safety in operation.

- Chemicals Business held Safety Day Award 2019 to raise safety commitment among SCG and suppliers.

SCG prioritizes supplier's safety, both workplace and transportation safety. Alongside compliance with SCG Supplier Code of Conduct, SCG implements a range of other safety measures to promote and foster partnership with supplier to strive for safety standards, and to reduce accident and business interruption.

- Packaging Business collaborates carriers in implementing Goods Transportation Safety Standards. In 2019 SCG harmonized transportation safety

48
suppliers passed transportation safety standard assessment. (Carriers directly procured by Packaging Business)

standards across all business units to achieve a unified guideline. Goods Transportation Safety Standards was first adopted by Chemicals Business, and has been adjusted to suit adoption by Cement-Building Materials Business and Packaging Business.

Towards end of 2019, Packaging Business started using it with its carriers. Carriers must pass all relevant standard assessments namely organizational management, driver, fleet and route management and emergency response. Carriers must score higher than 80% to pass.

The standard requires carriers to verify their preparedness of transport-related activities per trip, as well as monitoring driver's behavior through in-cab cameras whose log must be stored completely to allow for safety monitoring and management.

• Chemicals Business conducts safety training for operating contractors. Chemicals Business working with operating contractors manages safety standards rigorously through Contractor Safety Management, CSM, and has held a series of training workshop to ensure thorough understanding of compliance.

In 2019, Chemicals Business's safety training for contractors focused on working safely with valve, motor and water jet. The aim is to strengthen contractors' capability so that they can identify gaps and regulate safety practice by themselves. Working with valve, motor and water jet is ranked second most high risk after working-at-height.

118
suppliers trained

• Safety Day Award 2019. Chemicals Business organized Safety Day Award 2019 as part of its commitment to achieve maximum safety at work for SCG and suppliers. Several award categories are featured for both workplace and transport safety. For example, Contractor Safety Award is to commend contractors working with SCG with zero lost time injury and zero injury at L2-L3 level for one year, Distribution Safety Award recognizes carriers achieving over 90% score in transportation safety assessment, without serious accident and injury at L2-L3 level, and Improvement Excellence Award is for suppliers passing the benchmark and achieving higher score than the previous assessment.

In 2019, 5 general contractors and 8 carriers won the Safety Day Award.

Develop and Advance Supplier's Capability towards Sustainability

Strategy 3

• SCG supports and collaborates with suppliers in co-creation of innovation with enhanced performance and reducing resource use in line with Circular Economy principles. PP Woven Bag (Polypropylene Woven Bag) that is light and strong, and shrink film that is thin and strong are examples of the effort.

For supplier with potentials, SCG has plans to take them towards further growth and competitiveness so they grow alongside SCG sustainably.

• Light and Strong Plastic Woven Bag Innovation.
A supplier of Cement-Building Materials Business, Lucky Star Weaving Co., Ltd. which manufactures PP Woven Bag has come up with an innovation of making plastic yarn that is 25% lighter yet maintaining similar properties in terms of strength and load. Their innovation is called "Light & Strong," which aligns with Circular Economy principles of maximizing resource use, and also in line with co-creation with supplier that SCG is supporting. After a period of trial and passing quality criteria, at present Cement-Building Materials Business is using "Light & Strong" PP Woven Bag of Lucky Star Weaving Co., Ltd. for packaging of white cement around 200,000 bags per year. This means reduction of plastic use by 1,400 kilograms, with plans to expand use for other products in the future.

Less plastic use

150

tons per year

• Shrink Film Innovation. Shrink Film is plastic wrap used for goods packaging by blowing heat onto the film which would then shrink into shape of a product. Cement-Building Materials Business together with supplier co-developed a shrink film variety that uses less plastic as material for the same level of elasticity and durability. The co-created innovation is used in packaging of artificial wood Smart Board. The use results in less plastic use in the volume of 150 tons per year.

"'Light & Strong' is an innovation journey to realize the concept of an environmental-friendly product. Previously a cement bag weighs roughly 80 gram. We tried reducing it to 60 gram for the same strength and performance. Besides less plastic use by 25% implications are less energy consumption in manufacturing and in goods transportation as each trip can pack in more bags. We intend to work further in application of Circular Economy principles, so that bags can be 100% recyclable in the future."

Natthawat Suphantarida
Research and Development
Division Manager
Lucky Star Weaving Co., Ltd.

Employee and Supplier Development

Strategies 3, 4

• SCG held seminar to share and update supplier on anti-corruption and circular economy.

• Employee training on SCG Sustainable Procurement Framework, and preparation of anti-trust guideline for all business units.

Many aspects of risks are involved in business operations of supplier. At the same time, SCG has its set of policy and conduct, whereas at broader level there exist laws and regulations to govern business to ensure transparency and fairness. SCG held training sessions targeting employee as well as supplier to inform and familiarize them with SCG's policy along with relevant laws and regulations.

• Supplier Seminar on Good Business Conduct. SCG organized a seminar attended by 39 suppliers on 16 December 2019 to inform and invite them to join the Collective Action Coalition Against Corruption (CAC). The seminar also addressed Circular Economy principles with a view to enlarging collaborative network.

• Training for Sustainable Procurement Framework.

SCG organized a “Sustainable Procurement Framework” training workshop on 10 October 2019, attended by over 60 employees across business units. The purpose of the workshop is to inform staff on how to use the Framework to foster collaboration with supplier, which also involves risk management covering economic, environmental, social and governance aspects, and taking into account the quality, quantity and delivery of goods and services according to the customer’s needs. The workshop also featured a session on legal requirements, regulations and various quality management systems to enhance efficiency and create shared value with supplier over the long term.

SCG Sustainable Procurement Framework consists of 4 principal components: commitment, procurement process, measurement, and reporting and communication.

• Anti-trust Guideline.

SCG announced its anti-trust policy in 2017 in compliance with the Trade Competition Act B.E. 2560. The law deals with serious issue and prescribes severe penalty, and may pose reputational risk to SCG. SCG has thus developed and put in place an Anti-trust Guideline for business units, accompanied by an Anti-trust Checklist to sensitize our employee and for all business units to comply with.

Sustainable Procurement Framework

1. Commitment

↓

2. Procurement Process

Supplier Selection and Approved Vendor List
Spend Analysis
Supplier Assessment
Supplier Segmentation
Supplier Evaluation and Audit
Initiative & Improvement Plan*

↓

3. Measurement

↓

4. Reporting and Communication

* Improvement Plan & Corrective Action and Follow up

Customers Experience Creation

Digital technology and online media have changed consumers' behavior and demand. SCG is committed to driving the organization to ensure its competitiveness in this new landscape, and striving to be the top brand customers think about.
We apply SCG Marketing Way to strengthen our relationship with the customer and consumer, and to deliver experience creatively.

Target

100%

satisfaction expressed by customers surveyed via SCG Contact Center

Strategy

1 Foster B2B collaboration, leading to stronger B2B2C.
2 Engaging with the consumer (B2C).

Management

- An inter-disciplinary Marketing Way working group applies SCG Marketing Way to develop SCG's marketing, enhancing Customer Relationship Management, and improve result of customer satisfaction survey.

2019 Performance

100%

satisfaction expressed by customers surveyed via SCG Contact Center

SCG Marketing Way

Strategies 1, 2

• SCG equipped employee with the knowledge and knowhow to apply SCG Marketing Way, and how to conduct customer satisfaction evaluation accurately in all business units.

SCG Marketing Way evolved since 2014 and in 2017 it was fully applied. At present, it is being integrated into businesses in Thailand and abroad to establish SCG as a credible regional brand.

SCG Marketing Way aims at enhancing customer experience and improving standards on customer satisfaction evaluation, so that SCG can fully understand the rich range of what customer wants leading to delivery of experience to customer's satisfaction. We do this by cultivating and equipping employee with marketing knowledge and placing SCG Marketing Way at the heart of marketing strategy.

There are two aspects to cultivating the SCG Marketing Way among employee. We support getting together of marketers from all business units as a Marketing Community through activities to encourage participation and stimulate creativity. Marketing Capability aspect advances employee's capacity through training workshop, coaching, enhancing customer experience, and accurately measure customer satisfaction. These are important marketing tools to engage and broaden customer base.

• Customer Satisfaction Evaluation. SCG is in middle of developing method to evaluate customer satisfaction to replace the existing approach of survey through SCG Contact Center. The new method will expand areas and reach out to wider range of segments of customer. Satisfaction questionnaire for products and services will be categorized into that for B2B and B2C customer. Scoring is also adjusted; wherein % of satisfied customer equals to % of scorer giving more than 8 points (out of 10) and more than 4 (out of five) per number of all customers responding to the questionnaire. This method will be used in 2020.

Customer Journey

• SCG prioritizes creating good experience throughout a journey with customer-centric products, services and solutions.

Strategies 1, 2

Customer Journey	Packaging Business with Tesco Lotus: Corrugated Cartons Collection for Recycling Service 	Packaging Business with Big C Supercenter Ratchaprasong Branch: Packaging and Merchandising Display for Green Products 
1) Understanding What Customer Wants • Think from the customer's perspective and needs • Deep understanding of what customer wants for today and in the future • Understand the nuances that different customer needs different solutions	• Problem of waste management for big volume of corrugated cartons from goods delivery • Need to implement 3R strategy (Redesign, Reduce, Recover & Recycle)	• Need to attract attention to Made in Thailand goods • Need packaging and merchandising display designed for limited space
2) Creating Customer Experience • Develop and co-create products and services with customers • Deliver practical and value-added solution to customer's problem • Deliver an integrated, holistic set of solutions for customer's convenience	• Co-plan the system with customer. Tesco Lotus collects corrugated cartons from its stores and aggregates at its Distribution Center, from where SCG collects and transports back to its factory • Manufacture corrugated cartons and paper bags from recycled material, and return to Tesco Lotus to use	• Develop solutions for "Shelf-Ready" packaging to achieve dual purposes of shelf display and deliverable packaging • Design focusing on beauty, strength, ease of use, mobility, recyclability. Limited volume of production at reasonable cost • Design the Merchandising Display from recycled paper featuring Hanuman, the chief monkey character in Ramayana myth to attract customers and boost sales
3) Customer Satisfaction Survey • Evaluate customer satisfaction for every single experience • Use all channels, phone, online, questionnaire • Improve performance to increase customer satisfaction	• The customer is satisfied with the additional solution for the customer and consumer. The supply chain system developed facilitates rapid collection of used cartons which in turn makes for efficient inventory management. It also creates organizational collaboration to bring about social change, environmental care and changing behavior to waste less and use resources to their maximum value	• The customer is satisfied with packaging solutions which yield efficiency both in terms of image and sales volume. The customer uses the new package design to promote sales and to project Thai identity for foreign buyers to bring home as souvenir; and as tool for the store's branding

SCG prioritizes its B2B customer particularly in co-creation of products and services to answer consumer's needs. The co-creation process involves research, testing, improvement, market testing, and follow-up with professionalism, until the final outcome of solutions for better living and incentivizing innovation to reinforce business sustainability.

Product Co-creation for B2C Customer

Strategy 1

- Chemicals Business and Betagro Group co-developed SCG™ HDPE S111F plastic resin for production of plastic packaging that is thinner yet retaining the same level of strength and toughness, in response to functionality and resource maximization.
- Packaging Business collaborates with Chao Phya Abhaibhubejhr Hospital in redesign of packaging and logo to add value to herb-based goods, which won the excellent packaging prize at World-Star Packaging Awards 2018.

"This collaboration has created a bridge between our innovation processes and mutually synergized our businesses, enabling us to prosper and grow together. As we worked as a team right from the beginning, we have successfully developed high-quality packaging that meets Betagro's requirement."

Dr. Nukul Euaphantasate
R&D Director
(R&D Strategies & Packaging)
Betagro Group

• SCG™ HDPE S111F for High Impact Film, Packaging for Sustainable Food Industry. Chemicals Business collaborates with Betagro Group's R&D Center in developing SCG™ HDPE S111F plastic resin for packaging in the food industry according to Circular Economy principles. It started with Betagro Group conducting packaging analysis to identify the requirements of the plastic bag. Then Chemicals Business designed plastic resin according to utilization need. The two collaborated in development and production testing, until achieving the product thickness reduction from 35 microns to 25 microns, yet still retaining the strength, toughness and high puncture resistance. The material is suitable for raw chicken parts packaging, transferred through production line and delivery. As the thickness is reduced, larger number of bags can be manufactured from the same amount of material, resulting in cost efficiency as well as reducing greenhouse gas emissions and environmental impact.

• Adding value to traditional herbal product through packaging design. Packaging Business collaborates with Chao Phya Abhaibhubejhr Hospital to redesign packaging and logo, in modernizing the image of "Bua Phai Khao Cosmeceutical" product line. Along with achieving trendy look, the elegance and identity of Thai herbs must be projected for the product to be able to compete in shopping mall shelf space and exportable. The packaging must also be durable and practical. The redesigned packaging won the top outstanding packaging prize at the World-Star Packaging Awards 2018.

Environment

Product Stewardship 76
Waste Management 81
Water Management 87
Biodiversity and Ecosystem 93

Product Stewardship

The exponential development of digital technology and the impact of climate change have driven behavioral change among customers, and setting certain traditional pattern of activities out of date. SCG prioritizes leadership in innovation and in development of products, services and solutions that meet the needs of customer, enhance better living, reduce resource use and energy consumption, while seeking the minimization of emissions and waste in line with the Circular Economy principles.

Target

Two-third/or

66.7%

in 2030

Revenue from sales of SCG eco value products and services of total revenue from sales

One-third/or

33.3%

in 2030

Revenue from sales of SCG eco value - eco use products and services of total revenue from sales

Strategy

1 Develop products, services and solutions that meet consumer's needs, enhance well-being, taking into account the impact of climate change and the Circular Economy principles.

2 Develop business processes throughout the value chain according to the international standards.

3 Innovation-oriented approach in the development of products, services and solutions to generate new business opportunities.

Management

- Use innovation to accelerate products, services and solutions development.
- Use digital technology to enhance operational efficiency and reduce cost.
- Apply Circular Economy as a guiding principles in maximizing resource use, reducing energy consumption and waste.
- Review Capital Expenditures in products and services development to transform with speed.

2019 Performance

29%

Revenue from sales of SCG eco value products and services of total revenue from sales

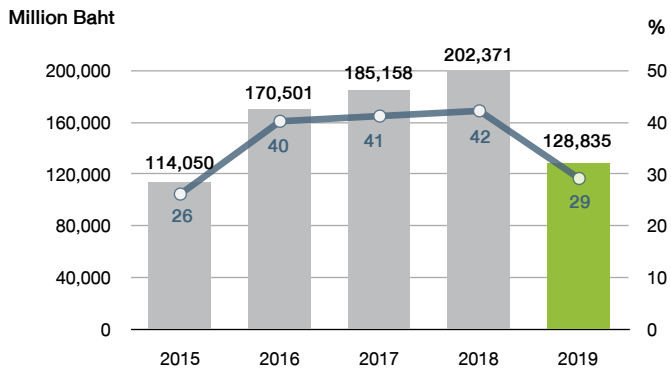
0.39%

Revenue from sales of SCG eco value – eco use products and services of total revenue from sales

70

products with SCG eco value label

Revenue from Sales of SCG eco value Products and Services



Certified Environmentally Friendly Products and Services

SCG eco value
70 products

Green Label
69 products

Carbon Footprint Label
426 products

Carbon Footprint Reduction Label
46 products

Carbon Reduction Label
62 products

High-efficiency Label
145 products

Solutions to Reduce Building Energy Consumption

Strategies 1, 3

• SCG is committed to develop energy-efficient products, services and solutions that mitigate climate-related impact.

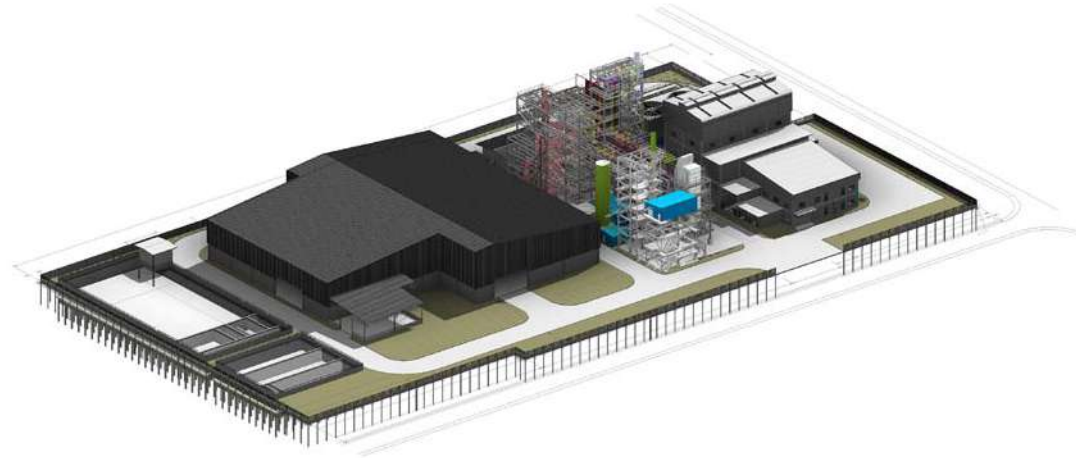
• Energy SMART Solution, a new business of SCG, delivers solutions to reduce building's energy consumption, and initiate Smart Building improvement project to achieve efficiency with technology from global startups.

With stifling heat brought about by climate change, building air conditioning system is an inevitable need which has become a major source of energy consumption. Our daily lives also involve lighting and increasing variety of electrical appliances. Consequently, the overall energy consumption of buildings is responsible for an upward trajectory of carbon emissions, which is accounted for 28% of total global emissions in 2018.

Energy-efficient building solutions can make significant contribution in mitigation efforts. SCG has in fact developed a number of building energy management solutions. These include: Total Home Ventilation Solution consisting of multiple innovations ranging from Active AIRflow™ System, SCG Roof Ventilation System, high-quality walls and insulation materials. In 2019, SCG launched Energy SMART Solution as a new business.

40%
reduction of building energy consumption

• Energy SMART Solution delivers one-stop service in building improvement project with the objective of a Smart Building. The target customer consists of buildings owned by hotel, hospital, office, university and school. The solution offers aggregated top-line technology from startups all over the world to regulate energy for optimum efficiency of HVAC (Heat, Ventilation and Air Conditioning), lighting system and appliances including elevator, escalator etc. Internet of Things (IoT) along with data storage and analysis through sensors installed at various points managing temperature, lighting in the rooms or spaces appropriately. The result is up to 40% reduction of energy consumption.



Waste Reduction Technology by the Circular Economy

Strategies 1, 2

- SCG takes into account the reduction of waste generated in manufacturing processes of products and services by adopting technology to improve efficiency and precision of operations.

- Cement-Building Materials Business applies Building Information Modeling (BIM) technology to reduce waste generated by construction work, use drone in combination with other innovations to reduce excess materials in roof repair and to extend the lifetime of roofing.

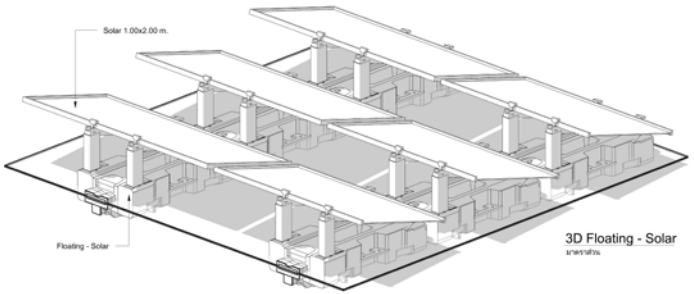
Waste from consumption excess or use-by date disposal we are familiar with. Another significant volume of waste is generated from the manufacturing processes of industries when the finite resource is being burnt fast, and with subsequent environmental impact. For instance, a building construction project typically disposes a certain volume of excess materials, because the building design stage prescribes materials just in case of possible contingencies.

Click Video

SCG applies the Circular Economy principles, and therefore its products and services are efficient. Waste reduction is a focus in all the processes, whereas technology and innovation are integrated.

• BIM Construction Solution

Cement-Building Materials Business developed a new business model: applying Building Information Modeling (BIM) to assist building design, from architecture to structural work, precise selection of material choice and calculation of materials required, with increasing overall efficiency as an overarching goal of the project.



The process starts with generating virtual variations of a building's design. The virtual models can be quickly adjusted until reaching to an outcome that matches the exact need. The process helps in communication among engineers, architects, contractors and customers so they see an image of a virtually complete building, being on the same page before construction work actually begins. This approach reduces the load of post-work adjustments which were wasteful in terms of both energy and resources.

Accurate calculation of materials being used and selection of proper materials help to reduce waste volume generated because of contingency cushions at the design step. This reduces unnecessary spend on material contingency, while promoting decision to choose environmentally-friendly products and equipment, including recycled materials.

Drone and smart application technology help reduce excess material supply at work sites by

5%

compared with the usual approach

Top up Roof service helps reduce waste generated by old tile removal at an average of 1 ton per house in commissions undertaken in May-December 2019, reducing

80

tons of waste

Click Video

• SCG Roof Renovation

The service integrates waste reduction consideration in every steps involved in implementing roof renovation project. Our approach starts with site survey using drone combined with smart application to take picture, simulate and analyze roofing space to come up with accurate calculation of materials required. The approach therefore minimizes excess materials typically forming waste to be disposed of such as roof tiles and other tools, and saves energy from transportation of excess supply. SCG Roof Renovation solution considers longer lifetime of materials used and waste reduction for services such as Roof Repaint and Roof Repair at the problematic points to avoid replacement of the entire roofing surface. Yet in case of the original roofing has many leakages and needs total replacement, for townhouse, Top up Roof will be laid over the original one without demolition, an approach that reduces waste generated by old tiles and prevents dust dispersal.

Better Living Product Development

Strategies 1, 2

• OptiBreath™ by Packaging Business, keeps fruit and vegetable fresh and tasty longer all the way from farm to consumer.

• COTTO Tiles Well Being Collection with falls prevention and anti-bacteria features enhance safety and wellbeing of residents at home.

As life style changes alongside technology progress, the quality of life is increasingly important. With better living as a priority, SCG continues its research and development to come up with new products that are safe and environmentally-friendly from upstream to downstream.

• OptiBreath™ for fruit and vegetable packaging. Keeping the "Keep Fresh & Tasty" framework in mind, Packaging Business researched and developed OptiBreath™ a flexible packaging with tiny holes to allow fruit and vegetable to breathe less, therefore prolonging their freshness along the journey from the farm to the kitchen. The packaging also prolongs the lifespan of fruit and vegetable so that they last longer for consumption. In addition, the packaging is easily recyclable. This is an innovative solution to reduce perishable waste in transportation and distribution, while keeping the products fresh and tasty for the consumers.

Click Video

Click Video

Anti-bacterial property at surface at least

90%

• COTTO Tiles Well Being Collection. Wellbeing and safety are fundamental requisites of good living. SCG Ceramics Public Company Limited developed and applied innovation to enrich the range of COTTO tiles to serve functional and aesthetic purposes.

• Anti-slip R11 COTTO tiles help reduce risk from falls, with the anti-slippery surface which is also not too rough for tactile contact. It is suitable for surfaces that require special care such as bathroom, washing area and parking space.

• Hygienic Tile contains silver nano mixture in color which arrests bacterial growth, reducing hygiene risk of family members. It is suitable for spaces in kitchen, dining room, living room and building entry spots. It has passed the anti-bacterial test according to JIS Z-2801 standard.

Waste Management

The trend of ever-increasing demand of products propels industrial growth, putting pressure on the utilization of limited natural resources to meet the production, thereby posing the risk of resource depletion as well as environmental impact due to inappropriate waste management. Against this backdrop, SCG has been researching and developing innovation to reuse and add value to waste, alongside managing industrial waste according to the 3Rs and Circular Economy principles.

Target

Every Year

0

waste from production process to landfill

60%

in 2025

reduction of waste disposal per unit of production, compared with the base year of 2014

Strategy

1. Reduce the amount of waste generation at source.
2. Strive to manage industrial waste according to the 3Rs and Circular Economy principles, both hazardous and non-hazardous waste within SCG.
3. Research and develop innovation to recycle and add the value to waste.
4. Manage industrial waste without sending to landfill.
5. Reduce waste disposal by incineration.

Management

- Reduce waste generation through prevention, starting from the stage of product design, acquisition of materials, and increase production efficiency.
- Reduce waste to be disposed outside SCG due to the risk of non-compliance or inappropriate disposal method.
- Managing chemical substances and all types of waste according to environmentally-friendly process stipulated in international cooperation agreements.

2019 Performance

14.4%

non-hazardous waste to landfill*

92%

reduction of waste disposal per unit of production, compared with the base year of 2014

* SCG reuses and recycles more than 85% of waste, and no hazardous waste is landfilled. However, in 2019, SCG used the leftover ready-mixed concrete from delivery, roof tile scrap, concrete scrap and plaster scrap which were non-hazardous waste for the land reclamation.

Waste Management for Recycling

Strategies 2, 5

• Siam Kraft Industry Co., Ltd. built a shredder plant to sort plastic and metal scrap from waste generated by pulp production process, for the purpose of recycling and reducing incineration which causes air pollution.

SCG has conducted R&D to come up with innovation to turn waste into alternative materials and fuel in order to reduce disposal through landfill or incineration. Industrial waste and community waste typically consist of a mixture of things which require sorting and modifying to suit various types of recycling. SCI Eco Services Co., Ltd. under Cement-Building Materials Business processes industrial waste into alternative materials and fuel. SCG Paper Energy Co., Ltd. under Packaging Business turns waste from paper production to fuel for power generation.

In 2019, the Packaging Business has stepped up with its waste management for recycling capacity through the shredder plant.

Sorted ragger wire over

860

tons per month

Recycled metal

430

tons per month

Recycled plastic

430

tons per month

• The shredder plant sorts plastic and metal wire scrap out of ragger from the pulp preparation process from recycled paper of Siam Kraft Industry Co., Ltd. In the preparation, contaminants have to be sorted off namely plastic and metal wire scraps which are usually bundled together as “ragger”. After sorting, the scraps would then be sent to factory that is licensed to sort plastic and pulp off leaving only metal scraps to be resold. This method however comes with risk of managing plastic scraps and excess pulp, as an unscrupulous buyer may not handle the materials properly. Siam Kraft Industry Co., Ltd. therefore built a shredder plant at its factory in Ban Pong District, Ratchaburi Province. The plant has the capacity to sort plastic and metal wire scrap out of ragger by shredding and magnetic belt, processes that do not impact the environment.

Metal wire scraps sorted off are then sold to a recycler whereas plastic scraps sent to SCG Paper Energy Co., Ltd. to be used as fuel for power generation.

The shredder plant can also handle industrial waste and community waste from external parties, in handling of plastic-pulp mixed garbage, rubber, wood, fabric, plastic, etc., to be further turned into alternative fuel for various industries.

Waste to Product

Strategies 3, 4

- SCG is committed to R&D to add the value to waste, turning waste into products to minimize disposal by landfill.

- Cement-Building Materials Business turns leftover ready-mixed concrete from delivery and roof tile scraps from production process into concrete products, substitute materials for construction and civil work. These materials from waste have been used within SCG and by external parties.

In addition to waste-to-alternative materials; and waste-to-alternative fuel, SCG's research and development pursues innovation on how to turn waste into value-added products according to the Circular Economy principles. Doing so, revenue can be generated, and benefits may arise for the enterprise, communities and other stakeholders, on top of reducing waste disposal by landfill.

Examples of what we have implemented previously include producing standard quality concrete from fly-ash mixture, sanitary ware and ceramic materials from scraps of ceramic products that not passed production standard test, production of fiberglass from insulation scraps collected from customers and production process, turning lime kiln dust from paper factory into materials for disinfectant used in livestock farm.

In 2019, SCG continued to generate creative waste-to-product projects such as:

- The Sustainable leftover Ready-mixed Concrete Management Project.

Production of ready-mixed concrete supplied to construction work typically generates waste after delivery. Cement-Building Materials Business applies Circular Economy principles into managing and value-added to these scraps by turning them into a variety of concrete products such as concrete slab, concrete garden planters and pots, foundation of electric pole and precast concrete fence. Scraps are also used in making composite products for construction activities such as

embankment materials, subbase materials, rock-substitute materials.

Furthermore, SCG collaborates with external partners of the government, private sector and civil society in the effort to make Circular Economy real and relevant. We joined with the Department of Industrial Works, Ministry of Industry to develop policy recommendation and management plan to scale up the project at broader level. We have also worked with local government body and community to deliver leftover ready-mixed concrete to be used in public good activities according to the community's need.

By the end of 2019, The Concrete Products and Aggregate Co., Ltd. succeeded in formalization a collaboration with Cube Real Property Co., Ltd. (developer of The Cube residential property) on the use of CPAC's leftover ready-mixed concrete in various construction activities of the company.

4,546

tons of sand-substitute materials

• Roof Tile Scrap to Sand-Substitute Materials. The CPAC Roof Tile Co., Ltd. applies R&D in turning roof tile scraps from production process at its Nakhon Pathom factory into sand-substitute materials. The materials are being used to replace natural sand in the production of concrete for civil work. The materials have passed product-licensing criteria to be used as substitute of sand by the Industrial Waste Management Division, Department of Industrial Works.

The Company has delivered the sand-substitute materials to other SCG affiliates including The Concrete Products and Aggregate Co., Ltd. (CPAC) and external partners such as the brick manufacturers, and for a CSR joint project with Hom Kred Sub-district Administrative Organization in Nakhon Pathom Province for road repair. Users' feedback says the materials can indeed function similarly to sand.

In 2019, the Company utilized a total of 4,546 tons of sand-substitute materials from waste, achieving the cost saving of waste management in the amount of 3,983,000 baht (for sending to Kaeng Khoi cement factory) as well as reducing environmental impact of stocking scrap heaps inside the factory. The Company is on the verge of setting up similar undertaking in the other factories within the business. It is also exploring opportunity with other partners for wider use of the materials, for example in the production of lightweight concrete and paving block.

Waste to Energy

Strategies 2, 4, 5

- SCG is committed to research and development work on the theme of waste-to-energy with the aim of reducing unproductive waste disposal practice and increase alternative energy usage to replace fossil fuel.

- SCG built the industrial waste power plant in Map Ta Phut Industrial Estate (Map Ta Phut Eco-Energy Plant - MEE). It is the first plant in Thailand with the ability to handle both hazardous and non-hazardous waste from industry as its feed.

- Thai Polyethylene Co., Ltd. has improved its catalyst production processes, resulting in reduction of waste volume for incineration, and at the same time obtaining waste water with heating value which can be used as alternative energy.

65,000
tons of industrial waste disposal per year

8
MW of power generation capacity

Expansion of industrial operations inevitably generates more waste from the production processes. Inappropriate industrial waste management impacts the society and environment. SCG is committed to find ways of efficient waste management in particular waste-to-energy according to Circular Economy principles. SCG's affiliates, SCI Eco Services Co., Ltd. and SCG Paper Energy Co., Ltd. are the key drivers in the pursuit of waste-to-energy outputs.

In 2019, SCG expanded its waste-to-energy projects as followed:

- Map Ta Phut Eco-Energy Plant (MEE) is the industrial waste power plant. SCG has conducted a feasibility study of power generation from industrial waste in collaboration with the Industrial Estate Authority of Thailand and the Department of Industrial Works. Located in Map Ta Phut Industrial Estate, the plant will take up waste generated from factories inside the Estate and surrounding areas. Waste will be fed into incineration that

produces heat for power generation, serving the purpose of proper industrial waste management and meeting demand for electricity power. MEE will be the first of its kind of power generator in Thailand to dispose of both hazardous and non-hazardous waste such as contaminated scrap, polymer scrap and rubber scrap, oil sediment, spray can, plastic waste. It has the capacity up to 65,000 tons of waste per year and to generate electricity 8 MW, of which 7 MW to be sold into the grid of Provincial Electricity Authority and 1 MW for internal use.

With top of its class technology, emission of all kinds of pollutant from hazardous waste incineration is therefore well below legal standards. For example, dust at 35 mg/m^3 against the standard of under 320 mg/m^3, Sulphur dioxide at 24.5 ppm. against the standard of 60 ppm.

Waste from the power plant such as fly ash, non-combustible materials, will be sorted and reused as substitute materials inside SCG as appropriate.

• Wastewater Treatment Fuel Energy. The R-1 Catalyst Production Unit of Thai Polyethylene Co., Ltd. is committed to reducing thousands tons of waste for incineration through efforts in research and improvement of various processes in the production of the R-1 catalyst. This has been an ongoing relentless endeavor from 2013 until 2019 when the company finally is able to reduce the volume of wastewater and lime sludge destined for unproductive disposal. Heat recovered from wastewater is now utilized as fuel in cement kiln.

3,000
tons per year of wastewater from R-1 catalyst production unit recovered as fuel for cement kiln

4,700
tons of waste disposal by incineration per year

2013

Reduction of wastewater volume

Adjustment in the usage of water, wastewater volume has been reduced by over 2,000 tons per year.

2017

From wastewater to fuel

Wastewater with heat recovered has been used as fuel mix for cement kiln.

•

Reducing over 3,000 tons of wastewater to be disposed per year.

2018

Zero solid waste

Use caustic soda to treat wastewater, instead of using lime in order to avoid generating lime sludge that was needed to be sent for disposal which amounted of 1,000 tons per year.

•

As a result, Liquid Slurry with heating value has been generated, and sent as fuel mix in cement kiln.

•

Reduction of over 4,000 tons of waste disposal per year.

2019

Wastewater reduction

Improvement in the water usage to the extent that an additional 700 tons of Liquid Slurry can be reduced per year.

Water Management

The main challenge in water resources management stems from climate change which causes unseasonal and erratic patterns of rainfalls. Droughts, depleted water volume in dams, along with increasing demand for water in the future in all geographical areas and sectors including at the Eastern Economic Corridor area constitute risk of water shortage for factories. SCG has therefore sought to improve its capacity in integrated water resources management in collaboration with government and industrial sectors. Efforts include development of water storage facilities within the factory area, increase water usage efficiency and develop products that consume less water.

Target

23%

reduce water withdrawal within 2025 compared with business as usual (BAU) at the base year of 2014

Strategy

1. Water-related risk mitigation through integrated water resources management.
2. Increase water usage efficiency in production processes and in products.
3. Bring the recycled water after treatment to be used.
4. Capability building of the person who involves in water management.
5. Rehabilitate the ecosystems related to water sources, and support water to communities and farmers.

Management

- Water Management Committee collaborate in developing the direction and strategy to manage water-related risk and water usage efficiency.
- Conduct water-related risk assessment; participate in public-private sector water management meetings and collaborate in integrated water resources management effort.
- Increase water usage efficiency in production processes and increase the use of recycled water.

2019 Performance

10.5%

reduction in water withdrawal compared with BAU at the base year of 2014

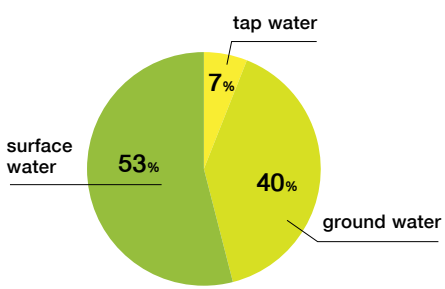
10.6%

proportion of recycled water

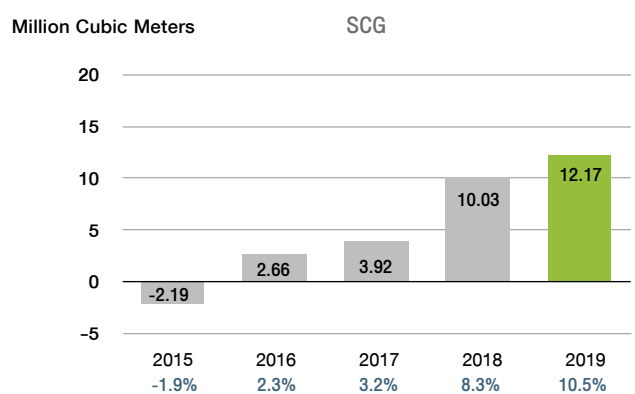
0.24

liter/baht, proportion of water usage per revenue from sales

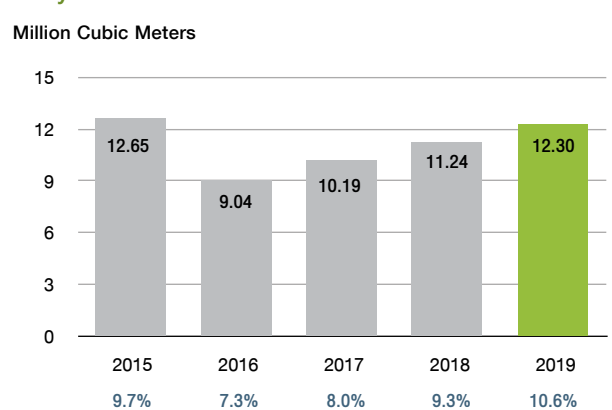
Ratio of Water Withdrawal by Sources

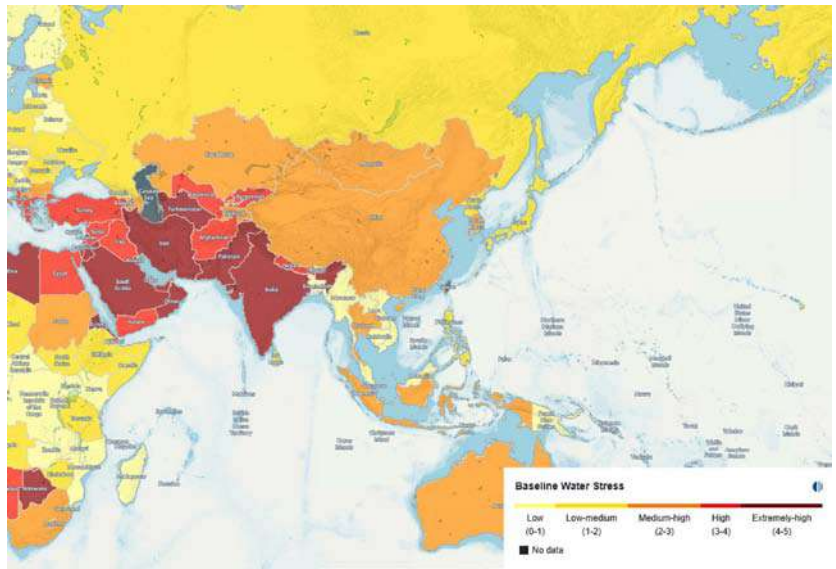


Water Withdrawal Reduction



Recycled Water





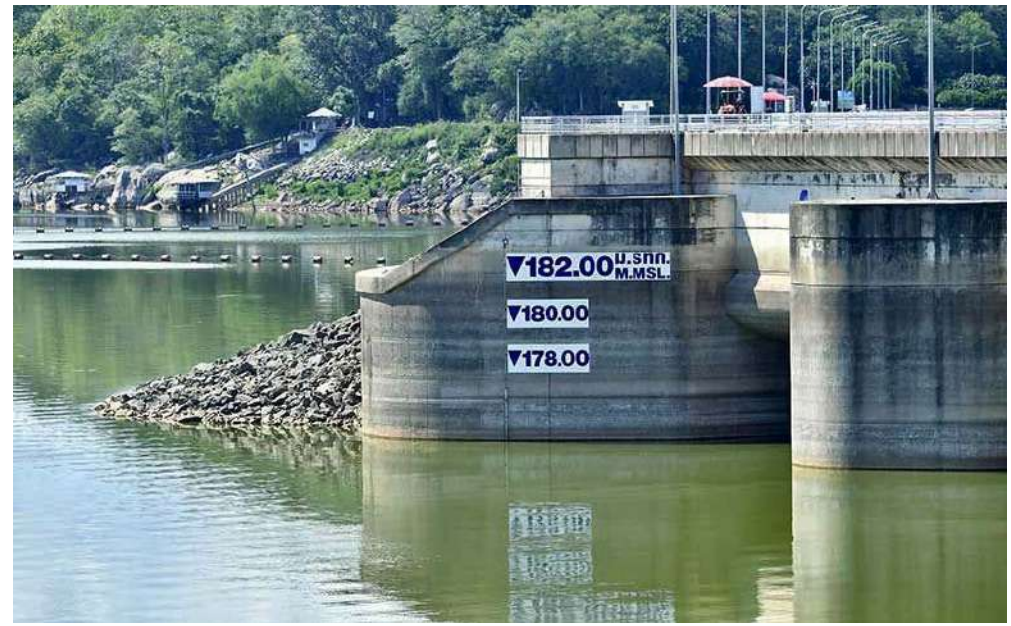
Risk Mitigation through Integrated Water Resources Management

Strategy 1

- Use “Aqueduct Water Risk Atlas”, a risk assessment tool of World Resources Institute (WRI) to assess Water Stress Area, and integrate it with local water data sets in order to manage water-related risks.
- Chemicals Business participate in the meetings with public and private sectors in the eastern region and at national level to formulate water resources management plan for the zone.
- Packaging Business participate in the meeting with Water Working Committee to plan responses to drought crisis in Khon Kaen Province, and prepare risk management plan dealing with drought in various scenarios.

SCG applies “Aqueduct Water Risk Atlas”, risk management tool of World Resources Institute in areas where it operates throughout ASEAN. Water Stress assessment forecasts likelihood of water shortage at national level, as well as at local level and water source. Water stress data are integrated with other sets of data available locally to assess of water-related risks in many aspects: quantity & quality, regulatory changes and pricing structure and stakeholder conflicts. These are conducted along with a scenario analysis for all-rounded risk assessment to formulate water resource management measures.

The picture on the right shown the community area at Ban Sa Phae, Lampang province in northern of Thailand near by the product plant. The area face with both drought and flood problem. The integrated water management is need for making all sectors to live together. This is one example of the water problem before and during the company constructed the stop log and water path way to connect interconnected pond project for the community.



Chemicals Business

From 2013, Chemicals Business has been working with stakeholders in public and private sector in the eastern region of Thailand to establish the Water War Room to closely monitor water situation and collaborate in formulation of responses. They hold regular monthly meeting.

Currently Chemicals Business has also been participating in meetings of the water situation trend monitoring and analysis sub-committee led by Royal Irrigation Department and other key institutions including Office of the National Water Resources, Hydro Informatics Institute (Public Organization), Electricity Generating Authority of Thailand, and Regional Irrigation Office Unit 1-17. These agencies conduct joint data analysis of water situation in different parts of Thailand bimonthly.

The committee has short-term and long-term plans for the eastern region. Short term measures include water diversion from Prasae reservoir as contingency. Going forward, long term plan calls for development of new water sources to increase the volume available for management.

Packaging Business

In 2019, drought affected the northeast of Thailand in particular Khon Kaen Province where Phoenix Pulp and Paper Plc. is located, posing risk of water shortage. The company representatives attended meetings of the water situation trend monitoring and analysis sub-committee, and as a result the company was able to use various data sets to assess situation and plan responses.

Water shortage response plans include raising awareness on water usage within the factory, preparation of groundwater wells and reserved wells, risk management plan to scale down water usage in production processes in the face of drought. These preparations have enabled the company to handle the 2019 drought without impact on business operation, and without causing water resource conflict with other stakeholders in the area.

Increase Water Usage Efficiency in Production Processes and in Products

Strategies 2, 3

• SCG prioritizes reduction of water withdrawal, through enhancing efficiency in production processes and increasing recycled water.

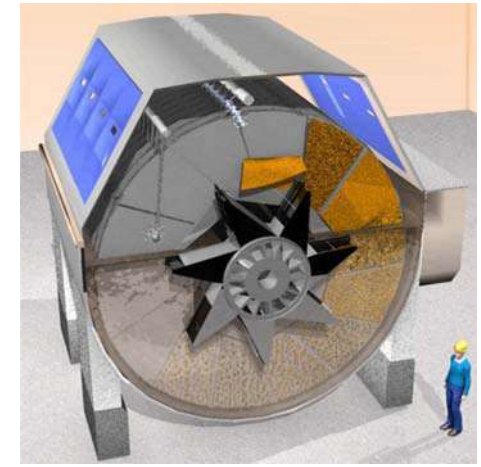
• In 2019, Packaging Business implemented water reduction project, leading to reduce 5.2 million cubic meters of water withdrawal per year.

• COTTO designed XPOSH series faucet with water-saving features at the rate of 4.8 liters per minute.

SCG is committed to reduce water withdrawal, through replacement of equipment to achieve higher efficiency and using new technology machines that require less water use in production processes. We also have water

5.2

million cubic meters per year reduction of water withdrawal by Packaging Business



treatment system to recycle water from the processes for maximum usage.

Packaging Business

• Implement a project to boost efficiency of water usage in product processes: e.g. increasing efficiency of filter system to reuse recycled water, increasing efficiency of the shower system in paper machines, improvement of the water cooling system. The projects result in reduction of water usage by 5.2 million cubic meters per year.

• Recycle treated water for use as the other purposes such as machine cleaning,

floor cleaning, plant watering, resulting in reduction of water usage by about 50,000 cubic meters per year

Chemicals Business

• Implemented measures to reduce water withdrawal by applying the principle of maximum recycling of water in production process. A study conducted in 2019 identified an opportunity of recycling water from the cooling system to achieve zero water blowdown. The approach is under study and procuring for technology for implementation.

• Thai MMA's Factory 1 and Factory 2 have installed chemical kits to improve water quality for the cooling blowdown system, resulting in reduction of water usage for wastewater treatment system by 120,000 cubic meters per year.

Cement-Building Materials Business

• The cement factory in Khao Wong improved efficiency of its dust removal system, by circulation of outflow air in the process instead of using water for spraying. This results in less water usage by 16,000 cubic meters per year.

• Building Materials Business improved its water management system to recycle the water, achieving reduction of water withdrawal by 15,300 cubic meters per year.

151,300

cubic meters per year, water usage reduction of Chemicals Business and Cement-Building Materials Business

Water-saving Products

Siam Sanitary Ware Industry Co., Ltd. has continually developed products that helped consumers use less water. In 2019, it has added the following designs to its water-saving products:

Click Video

• COTTO XPOSH water-saving faucet that regulates flow at the rate of 4.8 liters per minute. It also saves energy through dedicated hot water dispenser valve that operates only when user intent to open hot water. The design won a Red Dot Design Award 2019.

• C12507 Optimum Integrated Toilet that is water-efficient, using just 4.8 liters per flush, saving water usage by 20% compared with standard of 6 liters.

Rehabilitate the Ecosystems Related to Water Sources and Support Water to Communities and Farmers

Strategy 5

- Packaging Business organized check dam construction activity for community, and treatment of water after used for distribution to farmers.
- Cement-Building Materials Business built check dams in watershed areas and in communities, and built series of interconnected ponds and monkey-cheek ponds as sustainable water sources for community. It also supports water for agriculture, forest fire prevention and dust pollution control.

Besides reduction of water withdrawal in consideration of equitable resource sharing among all stakeholders, SCG prioritizes rehabilitation of ecosystems linked to water sources to ensure the water sustainability and supply of water from the organizations in SCG to support community and agricultural area.

4.5

million cubic meters per year of water supplied to agricultural areas

Packaging Business

• Organized joint check dam construction activity among employee, supplier, community, student, and government agencies in provinces including Kanchanaburi and Ratchaburi. A total of 1,006 check dams to increase moisture levels in localities have been built.

• Coordinated a project to supply treated water with good quality and nutrients fit for farming to agricultural area the size of 3,338 rai, at the volume of 4.5 million cubic meters.

Cement-Building Materials Business

• Build totally 6,424 check dams in watershed areas by joining with communities around quarry, 6,098 units in Lampang Province, 185 units in Khao Phrabat Noi in Saraburi Province and 113 units in Kraow Mountain in Saraburi Province, these make conservation of soil, forest and water to be fertile.

• In Lampang Province, built interconnected ponds and monkey-cheek ponds, repair dike and water gate to increase water retention efficiency. In all, volume of water retained totals 568,000 cubic meters. It also supports water for agriculture and for forest fire and dust pollution control purposes to the tune of 7,600 cubic meters per year.

Biodiversity and Ecosystem

The importance of biodiversity and ecosystem in global sustainability has re-emerged prominent in recent years due to biodiversity losses resulting from human activities and impacting the equilibrium of nature and livelihoods of mankind. On our part, SCG has relentlessly implemented efforts in biodiversity and environmental conservation, through sustainable management approach and applying international indicators to benchmark what we have done, with a view to making SCG a role model in biodiversity conservation.

Target

Net Positive Impact after closure of the first quarry in

2052

2022

Similarity Index in rehabilitated quarry area must equal to buffer zone at higher than

60%

Having biodiversity conservation area certified by FSC standard of at least

10%

of agroforestry area

Strategy

1. Sustainable management of biodiversity benchmarked to international indicators.
2. Be a role model of biodiversity conservation and extend the effort to other areas.
3. Engage communities and stakeholders on the cause of biodiversity conservation.

Management

- Launch of the Policy on Quarry Rehabilitation and Biodiversity in 2018.
- Establish a Biodiversity Committee with a mandate to supervise compliance with international standards on bioresources management.
- Achieving Net Positive Impact in all related processes.
- Communicate and engage with community and external partners to raise awareness and enhance the company's sustainable approach.
- Establish a limestone quarry rehabilitation fund for research, rehabilitation and handover of rehabilitated sites after closure.

2019 Performance

FSC certified area of 6,048 rai, equivalent to

23.75%

of agroforestry area

Birdlife Diversity in Lampang Quarry

Strategy 1

- Rehabilitation of Lampang limestone quarry started in 1992 and has since been implemented in earnest. Bird species variety is one of the indicators of improved ecosystem within the target area.

- Evidence collected shows an increase in birdlife diversity in the rehabilitated area: from 78 species documented at baseline survey in 1992 to 172 species counted at the latest round of survey in 2019.

In its commitment to operate quarry in parallel with rehabilitation, Siam Cement (Lampang) Co., Ltd. has implemented steps including: allocation of area for natural forest buffer zone, forestation in plots under rehabilitation, construction of check dams to increase moisture level. As a result of these efforts, a wide range of flora and fauna, wildlife and birdlife species has been flourishing in recent years.

As part of its Environmental Impact Assessment in 1992, 78 bird species were documented. Forest rehabilitation work began in 1994, enacting the leadership's vision that "where the factory is, where the green is." Check dams were built in 2003 and by 2006, evidence shows increase in moisture level, with 120 bird species present. Subsequently bird species survey has become an annual exercise.

In 2019,

172

birdlife species were found

1

endangered species Green Peafowl, listed in the IUCN Red List, an indicator of the forest health ecosystem.

Certain features at Lampang quarry site were adjusted to make it amenable as biodiversity sanctuary. These include installation of a 24-hour dripper well system consisting of six wells within the conservation zone, and two on the quarry's edge. Two artificial saltlick sites as food source had been added, one in the forest and the other on the quarry's edge.

A bird-watch handbook detailing species present at Lampang quarry has been prepared for visitors and bird watchers who can observe from six blinds stationed in the forest zone and two on the quarry edge. Facilitating such public engagement is aimed at communicating the value of biodiversity and ecosystem the forest offers, in line with the vision of "where the factory is, where the green is", which the Lampang quarry takes to heart for nearly three decades.

A Chronology of Bird Species Biodiversity Work at Lampang Limestone Quarry

1992	• Baseline survey identified 78 bird species. • Lampang Province was undergoing the threat of frequent forest fires, destroying and degrading forest cover.
1994-1997	• Implementing forest fire protection measures, forest rehabilitation, planting an additional 1,000 rai of forest surrounding the factory and quarry.
1997	• Planting trees as birds' food source and building suitable habitat.
1999	• The survey found only 32 bird species.
2000	• Academics and Lanna Bird and SLP Nature Conservation Club joined the bird survey at factory and quarry. The survey counted 81 species, on par with baseline finding.
2002	• Lanna Bird and SLP Nature Conservation Club found 98 bird species.
2003	• Construction of check dams and awareness-drive among factory staff on the importance of conservation as wildlife habitat.
2006	• Comparative study of sites with and without check dam applying indicators of healthy deciduous forest. More similarity is found for areas with check dam. • The survey found 120 bird species and 30 butterfly species.
2007	• The first of what to become an annual undertaking of forest survey.
2019	• A total of 172 bird species were found in the annual survey.

Worapoj Boonkwamdee
Researcher, life scientist, and lead surveyor of birdlife in Lampang quarry

Since when have you surveyed bird species at the quarry? Please share with us survey results.

We carried out the first survey around 2006-2007. At that time, the company had implemented wildfire prevention measures for some time. Most parts of the forest were transitioning from bamboo grove towards mixed deciduous forest. Most bird species we found then were typical residents of mixed deciduous forest. However, the variety was limited, especially larger birds.

We surveyed two sites namely the conservation area and the immediate vicinity outside the factory. We found a richer variety and consistency of bird species present in the inner conservation zone than in outlying area. We also found a sizeable population of Blue-winged Pitta nesting in the forest.

In 2012-2013, my team and I researched on reproductive health of Blue-winged Pitta. We found marked preference in the choice of Blue-winged Pitta nesting in inner conservation area than the outer section, because the inner area is well-insulated from fires and has higher level of moisture. We also found an additional four birds migrating back to the conservation site.

Is there evidence that rehabilitation of Lampang quarry results in attracting more birds to nest?

Forest rehabilitation, wildfire defense, hunting ban and maintaining moisture level, contribute to the ecosystem health. The forest fire buffer and water sources attract animals seeking drink and cool shade in dry season. Limestone hills characteristically don't retain water, therefore drought-prone and vulnerable to fire. Providing water and safe space means having an oasis for birds and other species.

Lampang quarry also built small water sources and observation sheds. It is found that besides lots of birds and owls, other mammal species such as leopard cat, porcupine, large Indian civet come to use these water sources, proof that water sources do attract animals.

Which bird species are indicators of healthy ecosystem?

The original forest on the site had been destroyed, so we do not find any threatened species. Yet comparing with the outlying area, this forms a crucial bird sanctuary. For example, we have a very small population of Blue-winged Pitta in northern Thailand. Yet we found many of them right here. We also found Shikras nesting. At the top of predators' chain, Shikras living and nesting here is an indicator that this forest is healthy.

Why is this forest inside the Lampang quarry important?

Managing a designated conservation area and wildfire defense ring has transformed an ecosystem from that of a limestone mountain into a mixed deciduous forest. This area benefits bird population as well as providing sanctuary for multiple plant and animal species, for they have shelter from potential wildfire and drinking water source.

International Indicators for Quarry Rehabilitation

Strategy 1

- SCG uses Net Impact Assessment tools of Cement Sustainability Initiative (CSI) to evaluate quarry operation and rehabilitation in Kaeng Khoi and Khao Wong.
- SCG undertakes an Ecosystem Service Review in collaboration with external experts.

SCG's quarry rehabilitation aims at achieving highest possible level of similarity prior to mining operation. SCG's quarrying operations use Semi Open Cut technology, a proprietary innovation, in which mines would be opened in small-scale pits, and the surrounding areas designated as buffer zone. As soon as smaller pits is complete, the worksite would promptly be rehabilitated through tree-planting.

To measure outcome of rehabilitation effort, internationally recognized indicators are required. SCG has studied and developed a range of indicators for the purpose.

Siam Cement (Lampang) Co., Ltd. Won ASEAN Mineral Award 2019

With mineral ore sector contributing to economic growth of many member countries, ASEAN has an ASEAN Mineral Cooperation Action Plan (AMCAP) and holds an ASEAN Senior Officials Meeting on Minerals (ASOMM) once every two years. To promote sustainable mining practices, the forum launched ASEAN Mineral Awards in 2017.

In the second ASEAN Mineral Awards 2019, a total of 16 companies from across ASEAN were entered. Siam Cement (Lampang) Co., Ltd. was nominated by the Ministry of Industry to represent Thailand. Cited for its track on environmental protection focusing on biodiversity and ecosystem restoration, Siam Cement (Lampang) Co., Ltd. won second place in the Best Practices in Sustainable Mineral Development, Non-Metallic Minerals Mining category.

• CSI Net Impact Assessment of Biodiversity. One of the most crucial indicators of quarry rehabilitation is net impact on biodiversity. In 2019, Cement Sustainability Initiative (CSI) introduced a Methodology for the Net Impact Assessment of Biodiversity in the Cement Sector, as guideline for corporations to measure impact both positive and negative in a streamlined manner, and paving the way for appropriate management to improve on plans and actions geared towards positive net impact.

SCG in collaboration with the Faculty of Forestry, Kasetsart University, applies the Methodology to assess quarry rehabilitation at Kaeng Khoi and Khao Wong. As a result, SCG is able to measure Net Biodiversity Value Impact, while systemically monitoring rehabilitation work until post-quarry closure, to ensure handover of quarry site with net positive impact back to the community. SCG aims at complete coverage of quarries within 2020.

• Ecosystem Service Review. SCG undertakes a research project on "Value and Service of Ecosystem in the Cement Sector" to develop analytical tools for Ecosystem Service Review (ESR) and Payment for Ecosystem (PES) derived from limestone quarry rehabilitation. Results of the study inform the design of quarry rehabilitation plans for maximum benefit of the locality, as well as informing land-use proposal upon site handover after expiry of mining permits. The research will also generate knowledge applicable to the sector and related industries.

The research brings together external experts from renowned entities including Faculty of Environment and Resource Studies, Mahidol University; the silviculture department of Forestry Faculty, Kasetsart University; the environmental science department of Faculty of Science, Silpakorn University; Fisheries Department, Department of Groundwater Resources, and National Institute of Development Administration. The experts collaborate in framing the research questions, establishing methodology of assessment, valuation of ecosystem service and economic value.

SCG has plans to integrate Ecosystem Service Review and Payment for Ecosystem approaches into work process, with the intention to study, prevent, mitigate and monitor impact in a holistic manner to address biodiversity in all dimensions.

• SCG's quarry rehabilitation through Biodiversity Management Plan achieved the outcome of restoring the ecosystem back to its original health, and delivering ecosystem service in multiple ways – as source of water, aquaculture, food, herbal plants; functioning as control mechanism such as in dust controlling, minimizing soil erosion; and culturally, as learning center and tourism.

The study and evaluation of ecosystem finds that in 2019, 16th year into rehabilitation, the Benefit Cost Ratio stands at 2.6.

Benefit-Cost Ratio is an economic indicator demonstrating benefit from investment cost in a project. The score above 1 means the project yields the benefit from investment.

Ecosystem Service

means relations between human beings and the environment, or benefit that humans or an economic system can receive from the ecosystem such as fresh water, tree, marine life, plants as food source or fuel, habitat of animals and plants, climate regulation, natural disaster prevention, aesthetics, or recreation.

Progress of Biodiversity Management Plan

Strategy 2

• SCG has prepared a 15-year Biodiversity Management Plan for Kaeng Khoi quarry in collaboration with external experts.

Limestone quarrying operation disrupts nature and environment inevitably. SCG has thus drawn up a Biodiversity Management Plan as guideline to mitigate impact from operation, to restore and manage the ecosystem in such a way that biodiversity resources comprising plant, animal species and other living organisms can carry on during active operation and beyond closure.

The Biodiversity Management Plan focuses on conservation, rehabilitation, protection of biodiversity and genetic resources, mitigation of harm, management of alien species, knowledge generation. The Plan consists of operational guideline, workplan/project, agencies in charge, alignment with development policy and orientation, at regional and global levels, as well as with the corporation's orientation.

SCG collaborates with external experts and agencies to attain the biodiversity goal, in relations to quarry rehabilitation plan, assessment of biodiversity impact of operation, and coordinating a Biodiversity Management Plan (see page 99).

• Kaeng Khoi quarry has prepared a Biodiversity Management Plan consisting of short-term plan on baseline data collection; intermediate plan aimed at recovery and evaluation of recovery effort by experts and long-term plan focusing on a corridor linking the rehabilitated zone, along with effective monitoring and evaluation for improvement and corrective action.

Biodiversity Management Plan, Spanning 15 years, of Siam Cement (Kaeng Khoi) Co., Ltd.

2016	• Formulating and finalizing the BMP.
2016-2017	• Developing and adjusting annual assessment. • Developing format for periodical assessment.
2016-2022	• Developing efficient steps of rehabilitation.
2016-2017	• Managing and eliminating alien plant species.
2016-2030	• Consistently implementing biodiversity rehabilitation work.
2023-2024	• Managing and eliminating alien plant species.
2023-2025	• Building corridor linking rehabilitated areas.
2025-2030	• Improving plant species mapping.
2029-2030	• Managing and eliminating alien plant species.
2029-2030	• Building corridor linking rehabilitated areas.

Networking with External Partners on Biodiversity Commitment

Dr. Sakhan Teejuntuk

Dr. Sara Bumrungsri

Dr. Stephen Elliott

Dr. Suthathorn Chairuangsri

Mr. Aroon Sottikul

1. Faculty of Forestry, Kasetsart University. SCG has been collaborating with the team led by Asst. Prof. Dr. Sakhan Teejuntuk, expert in advanced silviculture, forest rehabilitation, monitoring of forest health, and biodiversity expert for limestone quarry, in research projects on Biodiversity Baseline Data, Biodiversity Management Plan, Closure Plan and quarry rehabilitation at Kaeng Khoi and Khao Wong for over 15 years.

2. Faculty of Science, Biology Department, Prince of Songkla University. For over six years, SCG has worked with the team led by Asst. Prof. Dr. Sara Bumrungsri, an expert in forestry biology, forest ecosystem, and biodiversity expert for limestone quarry in collecting Biodiversity Baseline Data, formulating Biodiversity Management Plan, Closure Plan and rehabilitation of Thung Song quarry.

3. Forest Rehabilitation Research Unit (FORRU), Faculty of Science, Chiang Mai University. SCG has been collaborating with the team led by Dr. Stephen Elliott, Dr. Suthathorn Chairuangsri, expert in tropical plant ecosystem and wildlife conservation, and biodiversity expert for limestone quarry for over eight years in rehabilitation of Lampang quarry. The academic partners also held training workshops on quarry rehabilitation technique for staff and executives who supervise rehabilitation of all quarries.

4. Agricultural Technology Research Institute, Rajamangala University of Technology Lanna. SCG has collaborated with Mr. Aroon Sottikul, expert of insect species in ecosystem, in researching insect diversity at Lampang quarry since 2018.

Biodiversity Study Fish Home in Trang Province

Strategy 1

• SCG collaborates with the Excellence Center for Biodiversity of Peninsular Thailand, Prince of Songkla University, in conducting a biodiversity study in the Fish Home vicinity, Trang Province. Findings show a significant increase in fish species and invertebrates.

Located near the mouth of Trang River, Ban Mod Tanoy and Koh Libong in Trang Province are rich wetlands designated Ramsar Site. The fertile ecosystem has provided livelihoods to residents many of whom make a living as fishers. During monsoon season between May to November however villagers could not weather the storm to fish, therefore deprived of both income and food.

In recognition of the situation, SCG has joined with the local communities in a Fish Home Project in Hat Chao Mai Canal since 2018. To date, a total of 810 fish homes have been laid on in the canal, which serve as nursery for small marine life, provide shelter and food source for marine species in general. They also constitute a safe fishing ground for villagers during monsoon stretch. In 2019, SCG and community members planted an additional 3 rai of mangrove forest and 2 rai of seagrass as feedstock for dugong.

SCG works with the Excellence Center for Biodiversity of Peninsular Thailand, Prince of Songkla University on “Biodiversity Research at Ban Mod Tanoy and Koh Libong in Trang Province,” with the objective of monitoring results of the Fish Home Project.

• A survey of Fish Home Project site in 2019 tracked an increase in numbers and variety of fish species. The first few months of the survey found 18 species, and ten months into the research period, a total of 47 fish species were found.

• Types of fish living and taking shelter include cardinalfish, puffer, gobies, soldierfish, lionfish, demselfish, groupers. Fish feeding here include butterflyfish, wrasses, red and white snappers.

• Fish homes attract a wide range of invertebrate residents including barnacles, polychaetes, isopods, amphipods. Their presence enriches the nutrients that sustain the aquaculture and food sources for the local community.

Sustainable Forest Management Training for Farmer Members of FSC

Strategies 1, 3

• Packaging Business promotes agroforestry according to sustainable forest management standards of the Forest Stewardship Council (FSC). It has continually organized capacity-building training for small-scale farmers. As a result, the area of biodiversity conservation zone is higher than required by FSC standard.

Packaging Business promotes agroforestry among farmers to supply raw material for pulp making in accordance with the sustainable forest management guideline of the Forest Stewardship Council, which mandates at least 10% of the agroforest area must be preserved for biodiversity purposes.

From sustained efforts, coverage of biodiversity conservation within agroforestry commissioned by the Packaging Business has increased steadily. In 2019, the conservation zone totals 6,048 rai, equivalent to 23.75% of agroforestry area (10% higher than standard).

Packaging Business has been training small-scale farmers participating in its Sustainable Forest Management Program. In 2019, the approach was adjusted. Instead of training large group at the company, smaller group training sessions were held at district level quarterly. The program now also emphasizes house and eucalyptus plantation visits of members.

The training curriculum has been customized to suit socio-economic contexts of different areas. The focus remains consistently though on the theme of sustainable forest management which covers conservation of indigenous plant and animal species, managing invasive alien plant species, reduction of chemical use in pest management; local forest conservation, etc. SCG also provides up-to-date contents on FSC guideline, requirements and standards, tending to and managing eucalyptus plantations, output evaluation and income forecast.

In 2019, a total of 52 member farmers were trained. From 2010 when the program started, we have trained 425 farmers to date.

23.75%
the proportion of biodiversity conservation coverage compared with agroforestry coverage (higher than 10% required by FSC)

425
small-scale farmers trained since the program began in 2010

Society

Human Rights 103

Employee Caring and Development 108

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Human Rights

While business operations drive economic and social growth and create employment, they can have direct and indirect impacts on humans. SCG, therefore, has attached great attention to human rights practices across the supply chain to ensure that all stakeholders are treated equitably, fairly, and with dignity and respect in accordance with the Universal Declaration of Human Rights (UDHR), the United Nations Global Compact (UNGC), the United Nations Guiding Principles on Business and Human Rights (UNGP), the International Labor Organization (ILO) Declaration on Fundamental Principles and Rights at Work, and SCG Human Rights Policy. The aforementioned stakeholders encompass all potentially affected groups of people, including employees, children, women, people with disabilities, ethnic minorities, local communities, labor of suppliers, foreign labor involved in SCG's direct business activities, in the business value chain, and in joint ventures not managed by SCG.

Target

Being a role model in human rights, both directly and indirectly through business activities, by providing support and encouraging suppliers in the value chain and joint ventures to recognize, protect, and respect human rights in their business operation

100%

of identified risks are well managed through mitigation and preventive plans as well as remediation actions

0

case of human rights violation

Strategy

1 Comply with SCG Human Rights Policy as well as the law of each country and the treaty each country has commitment to.

2 Consistently carry out human rights due diligence processes.

Management

- SCG has announced the human rights policy, based on the United Nations Global Compact (UNGC), the International Labor Organization (ILO) Declaration on Fundamental Principles and Rights at Work, and other international standards.
- SCG has continuously implemented its human rights due diligence process, consisting of four steps: (1) Identifying human rights risk issues, (2) Identifying vulnerable groups, (3) Formulating preventive and mitigation plans and remediation actions, (4) Monitoring results.

2019 Performance

0

case of human rights violation

Female employees account for

21.9%

of all employees and

24.7%

of all managerial level

Supported people with disabilities by hiring

39

as permanent employees and promoting

280

people to pursue self-employment in their local communities

SCG's Activities on Key Human Rights Risks

SCG's Activities on Key Human Rights Risks

Scope	Salient Human Rights Issues	Potential Impacts on	Mitigation Plans and Remediation Actions	Result Monitoring
SCG's Own Operations	**Labor rights** Compliance with labor laws amended in 2019 • Change of employers • Revised severance pay rates • Business leave and maternity leave • Paying employees within periods required by the law • Workplace relocation	All companies in Thailand	• Set implementation guidelines and communicate the amendments to all companies to ensure strict compliance	All companies in Thailand strictly complied with the amended laws
	Occupational Health and Safety Lost time injury and fatality	Subsidiaries	• Communicate to raise awareness of safety culture through the Occupational Health and Safety Management System or the SCG Safety Framework • Communicate and run campaign to raise awareness and continuously monitor the compliance and violation of the Life Saving Rules • Enhance safety standards and evaluate performance through SCG Safety Performance Assessment Program (SPAP)	79% of the Company's subsidiaries passed SPAP assessment as required 14 cases of lost-time accidents were reported by subsidiaries
	Community rights Impacts from issues related to water, pollution, resource consumption, and safety	Communities	• Conduct surveys and dialogue to get opinion from communities • Initiate activities and projects that address the needs of communities and enhance quality of life. Activities are implemented through collaborative approach to foster community engagement • Be prudent and preventive on potential impacts on communities	Communities in all areas in which SCG operates

Scope	Salient Human Rights Issues	Potential Impacts on	Mitigation Plans and Remediation Actions	Result Monitoring
Operations of Contractors and Suppliers	**Labor rights** Compliance with labor laws amended in 2019	All contractors and suppliers in Thailand	• Select contractors and suppliers by taking into consideration their determination to comply with SCG Supplier Code of Conduct, which includes the protection of labor rights and human rights • Promote compliance with amended labor laws	All contractors and suppliers in Thailand strictly complied with the amended laws 93% of suppliers signed for SCG Supplier Code of Conduct 100% of suppliers with procurement spend of over 1 million baht, passed ESG assessment
	Workplace Safety and Transportation Safety Lost time injury and fatality from workplace and transportation	SCG's contractors	• Officially inform business partners of safety rules that SCG enforces and request them to sign an agreement acknowledging their willingness to comply with SCG Life Saving Rules • Clarify all relevant safety rules prior to each bidding and clearly include them in the employment contract • Implement screening and control measures for contractors before entering the on-site area as well as clarify and review risks to workers • Appoint a Transportation Safety Committee to establish transportation safety standards and control transportation contractors to ensure that they comply with prescribed regulations and standards • Encourage transportation contractors to comply with the law and constantly monitor their drivers through GPS and in-cab cameras • Encourage contractors to continuously improve their safety standards and develop relations towards business partnerships	100% of contractors passed safety standard assessment 31 cases of lost-time accidents were reported by business partners 2 cases of fatality in workplace were reported by business partners
Operations of Joint Ventures	**Labor rights** Compliance with labor laws amended in 2019	All joint ventures in Thailand	• Demonstrate SCG's commitment to conducting business with companies that comply with human rights principles and laws • Take part in the formulation of employment and labor rights policy to ensure compliance with SCG's policy implementation • Promote compliance with amended labor laws	All joint ventures in Thailand strictly complied with the amended laws

Reaching a Role Model in Human Rights

Strategy 1

- The Packaging Business has joined the Sedex Members Ethical Trade Audit (SEDEX) and begun insisting on compliance with SEDEX standards on labor treatment, business ethics internally and across the supply chain.

- SCG Sustainable Development Committee held an opinion panel in 2019 on human rights in which perspectives and suggestions of experts from government sector, labor sector, academia, and a private development organization were taken into consideration for SCG's improvement to reach its goal of becoming a role model organization on human rights.

- SCG has assigned Ethics e-Testing to its domestic and international employees and provided training on human rights for the fifth consecutive year.

6
companies in the Packaging Business became members of SEDEX

SCG places great emphasis on human rights protection, as stipulated in SCG Code of Conduct, and has announced SCG Human Rights Policy since 2017 in compliance with the United Nations Global Compact (UNGC), the International Labor Organization (ILO) Declaration on Fundamental Principles and Rights at Work, and other international standards. The Policy is enforced in every country where SCG operates and is applicable to the Board of Directors, executives, management and employees for human rights respect in all their activities.

In 2019, SCG carried out the following activities in pursuit of becoming a role model in human rights.

- The Packaging Business joined SEDEX: The Sedex Members Ethical Trade Audit (SEDEX) is an organization whose members consist of business organizations around the world. It requires the members to comply with SEDEX standards in four areas; labor

standards, health and safety, business ethics, and environment, applicable the member's own operations and their business partners.

In 2019, six companies in the Packaging Business, domestic and overseas, implemented SEDEX's regulations. Having been assessed by external auditors, these companies were accepted as members of SEDEX, reflecting SCG's unwavering commitment to human rights.

• 2019 Opinion Panel on Human Rights: SCG Sustainable Development Committee organized the 10th Opinion Panel, focused on human rights and featured experts from the government sector, the labor sector, academia, and a private development organization, who provided various suggestions on the development of human rights.

• Human rights due diligence should involve internal and external stakeholders into the process to increase credibility of auditing system.

• Representatives and labor unions can serve as additional auditors of human rights practices.

• Employees should be able to express their opinion through arranged channel and take part in the formulation process and enforcement of rules that may impact their rights.

• Human rights protection must cover employees of SCG and its business partners, both in Thailand and overseas.

• Human rights risks should be included in business risk assessment.

• Grievance mechanism should be provided to deal and manage cases of human right violations and other social and environmental issues.

The Opinion Panel provided SCG Sustainable Development Committee with numerous useful suggestions, which would be used for improvement and planning of SCG's human rights practices (Read more under Opinion Panel 2019 on page 13).

• SCG has announced its commitment to gender equality and the elimination of discrimination, in line with the Gender Equality Act B.E. 2015. The Company strives to promote practices that exhibits gender equality and fair treatment by, for instance; allowing employees to dress up in a way that aligns with their sexual or gender identity; ensuring that facility arrangement is appropriate to the number of people, individual limitations, and sexual or gender identity; preventing and addressing sexual abuse or sexual harassment in workplace; and supporting a nomination of male, female, and other different sexual appearance to be a member of committee at all levels.

Ethics e-Testing was taken by 32,401 Thai employees, and the passing rate was

100%

• Ethics e-Testing: SCG assigned Ethics e-Testing to all Thai employees to test their knowledge and understanding on various aspects of ethics and human rights, such as human rights and labor, environment, health and safety, anti-corruption, trade competition, anti-money laundering, with the goal of raising awareness of these issues among employees and prevent potential violation. All employees are required to pass the test at 100%.

In 2019, Ethics e-Testing was conducted for the fifth consecutive year.

Employee Caring and Development

SCG recognizes the rapid changes and the fierce competition in the business world as well as a clear shift in customer needs. The Company, therefore, strives to develop employee learning to accommodate current and future changes by placing emphasis on digital learning as well as self-learning systems, which promote lifelong learning and will equip employees with knowledge and skills they require to promptly handle changes.

Target

100%

of employees in Thailand receive performance assessment and an Individual Development Plan (IDP) on the Learning Management System (LMS) continuously every year

70%

employee engagement rate in 2022 based on the total number of employees (domestic only)

Strategy

1. Create a culture of learning and coaching in which employees are responsible for their own learning and self development and are supported by supervisors.
2. Enhance employee competencies to meet the Company's competitiveness and develop leaders to have attitudes, knowledge and abilities, and be able to develop subordinates to have potential as an important force of SCG.
3. Create a fundamental learning system by using the Learning Management System (LMS), with the same quality and standards across the region, and offer learning opportunities through digital classrooms.
4. Create value for the organization to attract talents and competent prospective employees.
5. Ensure that employee caring is equitable and thorough to foster employee engagement.

Management

- SCG has appointed committees and responsible functions to oversee employee learning at the organization level (Learning Council), at the business unit level (BU Academy Committee), and for each specific professional field (Professional Academy Committee) to take care of competency development for all employees.

2019 Performance

100%

of SCG's employees in Thailand continued to receive performance assessment and an Individual Development Plan (IDP) on the Learning Management System (LMS) on a yearly basis

The total expenses of employee learning and development both internal and external

1,298

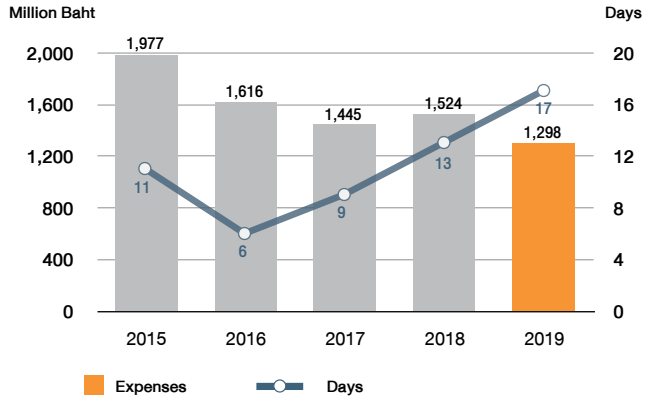
million baht

SCG achieved

68%

employee engagement based on the total number of employees (domestic only)

Expenses on Employee Learning and Development and the Average Training Days of Employees



Re-Skill – Up-Skill in Anticipation of Business Changes

Strategies 2, 4

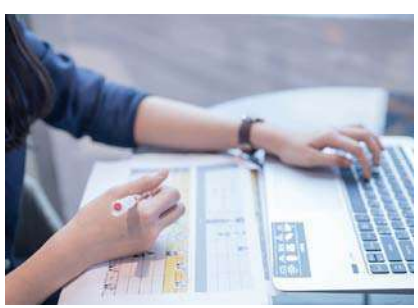
- SCG has equipped employees with ability to cope with changes through its courses that are geared towards re-skill and up-skill, such as Digital Literacy, Business Model Canvas, Design Thinking, and Data Analytics.

- SCG has shifted away from training-based learning towards action learning and experiential learning as well as project-based learning.

Faced with the rapid change in business competition and customer needs, SCG recognizes the significance of re-skill and up-skill, which would enable all employees to cope with changes that may affect the business. Therefore, SCG has been consistently developing its courses to ensure that the employees understand business factors and key business strategies and be adaptable to the change of learning behavior by adding new learning process to accommodate lifelong learning.

• Developing courses on digital literacy: Courses on digital literacy, such as Big Data, Digital Marketing, Robotic Process Improvement, Internet of Thing (IOT), and Structured Query Language (SQL), have been developed to prepare employees for the adoption of digital technology at work. The courses have been designed in collaboration with leading educational institutions, such as Kasetsart University and King Mongkut's University of Technology North Bangkok, to accommodate the industry's requirement for competence in innovation and customer insights.

• Shifting towards action and experiential learning: Greater emphasis has been placed on action learning and experiential learning, as evident in the Business Concept Development (BCD) course, in which participants learn about theoretical and fundamental knowledge in a digital classroom and then put what they have learned in practice for case study analysis and integrate all learnings into a project-based learning. Experiential learning is also incorporated into different courses, such as Business Concept Development, Young Leader with ABC, and Management Acceleration Program (MAP), in which managerial-level employees learn about operations of other companies overseas.



• Enhancing business knowledge: The content of the Business Model Canvas (BMC), Design Thinking, and Agile Mindset courses has been incorporated into various courses for employees at all levels through different learning activities, such as case studies, peer-to-peer knowledge exchange, and practice, to ensure that employees understand SCG's business landscape and the importance of customers.

• Cultivating the principles of circular economy: As part of its sustainable development strategy, SCG adheres to the principles of circular economy and have thus communicated and raise awareness about these principles to new employees.

• Expand course offerings for employees overseas: SCG has begun offering flagship programs, such as Business Concept Development (BCD), and various professional courses, such as human resources management, safety, environment, and marketing and sales, to overseas employees. SCG talents have also been granted an opportunity to learn and attend Flagship Program, such as Management Development Program (MDP), in Thailand.

• Developing skills for new working practices: SCG has introduced a new set of practices called "Test and Learn," which is commonly employed by startups who places emphasis on value for customers and customer insights.

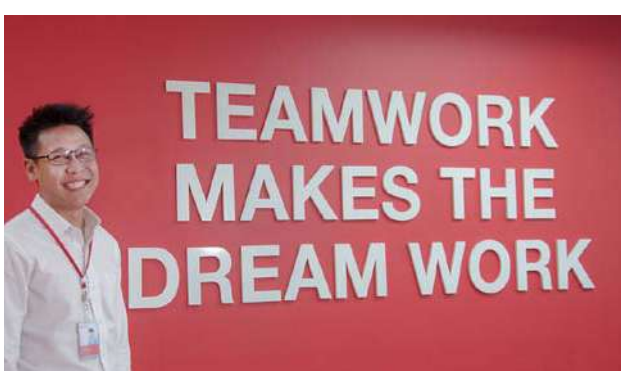
100%

of SCG's Flagship Programs have been improved to incorporate action experiential learning and project-based learning

The number of digital man-hour that learners spend on digital learning is equivalent to

24%

of the number of classroom man-day



Re-Skill Up-Skill

SCG Logistics Re-skill Program 2019

SCG Logistics has shifted its business direction by expanding customer base from those within SCG to customers in general. To restructure the organization from a function-based to a customer-based one, it is necessary to develop employees to accommodate this change by re-skilling those without sales experience, such as operational employees, analysts, and engineers, to equip them with sales and negotiation skills as well as by up-skilling sales officers to enhance their competence for sales efficiency.

In 2019, SCG Logistics held training sessions and simulations for five batches of employees, followed by sharing sessions led by experts to track their progress and allow them to learn from each other. In addition, SCG Logistics also organized a session that enhanced their marketing knowledge as well as an event entitled SCGL Best Practice 2019, where employees who demonstrate a good example of best practices were invited to share their success stories with others.

The re-skilled and up-skilled employees initiated projects that increased the revenue by 65 million baht per month on average and saved 3.1 million baht on investment per month.

Packaging Business – Black Belt Development Program

Recognizing problems arising from production losses, the Packaging Business has initiated the Black Belt Development Program to develop plant engineers and equip them with analytical skill and problem solving to diminish losses.

Employees are required to log a certain number of training hours, pass a knowledge test, and start a project that sets out to solve real production problems, using the Six Sigma method under the guidance of expert coaches. Employees who have completed two such projects will be certified as Black Belts.

Up until 2019, the program enrolled four batches of participants, totaling 52 employees, and led to the creation of 80 projects, decreasing expenses related to production losses by 329 million baht per year.

Chemicals Business – Up-skilling employees through IMP and IBE

The Innovation Management Process (IMP) and the Integrated Business Excellence (IBE) courses have been implemented for 3-4 years by the Chemicals Business to develop the employees of all its subsidiaries and have increased its revenue significantly every year.

IMP is a course on innovation development. The content includes innovation management systems, how to cultivate a collaborative culture for innovation development, and how to deliver innovative products rapidly for maximum value. Each year, the course generates over 400 innovative product ideas, with as many as 15 further developed into commercial products, which is 2-3 times higher than in the past. These ideas generate over 300 million baht in revenue for the business each year.

IBE is a course on production enhancement, process improvement, employee's attitude and behavior development that seeks to achieve effectiveness and efficiency sustainably. The course is applicable to every business function and has continuously increased the annual revenue from marketing and sales.

The course generated 3,300 million baht in 2016, and the number soared 7,340 million baht in 2019, more than doubling in a span of four years.

Adaptation of Human Resources Management

Strategies 4, 5

• SCG has improved its human resources management in anticipation of changes in both the business landscape and the behavior of the new generation in order to acquire key talents and prepare them for executive positions in the future.

SCG has actively been adding value to the organization in order to be recognized as the best company to work for and be able to attract talents across different professional fields at all levels where they have opportunities to for career advancement from operational to more supervisorial positions in accordance with their potential and career goals. As the business landscape and current lifestyles are changing, SCG has to adjust its human capital management to retain employees, who are the essential business capital in the future.

• Adjusting employee recruitment and selection: SCG has increased the proportion of mid-career recruits with experience and expertise in digital-related areas, retail, and logistics to accommodate future businesses.

• Researching other recruitment models: Because new generations of workers seek flexible hiring schemes, SCG has started studying various recruitment models other than regular employment, so that it can attract workers whose skills are in alignment with business needs and trends in labor markets.

• Preparing key talents: To ensure human resources preparedness for the business both at present and in the future, SCG has expanded its talent management to include Junior Management and Senior Management positions, which are considered critical positions for SCG. In 2019, about 4,000 SCG employees were included in this category.

• Redefining job value for executive positions: SCG has revised its job value assessment for executive positions to reflect the significance of their duties to the organization and to be used as criteria for human resources management, such as rewards management, learning development, and career management.

Cement-Building Materials Business

• Managing the organization and employees with understanding and fairness and creating a working environment that promotes learning agility through “Try and Learn” practice.

• Adjusting all working processes so that employees are grounded in customer needs and using design thinking as an employee development tool to ensure the organization is prepared to create new business models that better respond to customer needs.

• Provide employees with support and convenient access to both internal and external learning resources.

Chemicals Business

• Developing future leaders through the talent management system, career development, and succession plan, with emphasis on multiple skill improvement and managerial skills.

• Preparing workforce for business expansion in the ASEAN region, both for the plant construction and commercialization, to ensure that it meets the requirement in terms of size and quality.

• Introducing digital platforms to human resources management and development, such as automation systems, to save time and increase efficiency.

Packaging Business

• Revising the organizational structure and the roles and responsibilities of the executives and employees to become customer-centric organization.

• Putting in place employee management and development systems, connecting key talents to the succession plan to prepare them for executive positions in the future.

• Fostering cross-cultural management to encourage Thai and international employees to appreciate cultural diversity.

Employee Engagement Survey

Strategy 5

- SCG conducted an employee engagement survey among domestic employees and found that 68% of the respondents felt a sense of engagement with the organization.

SCG regularly conducts employee engagement surveys among employees both in Thailand and the countries where it operates in collaboration with Aon, an outstanding world-class consultant and expert on employee engagement and best employer surveys. The survey is conducted every two years so as to leave enough time for suggestions from the previous survey to be actively implemented.

68% of the domestic employees participating in the survey reported a sense of engagement with the organization

31,556 of the Company's 32,376 employees, an equivalent of

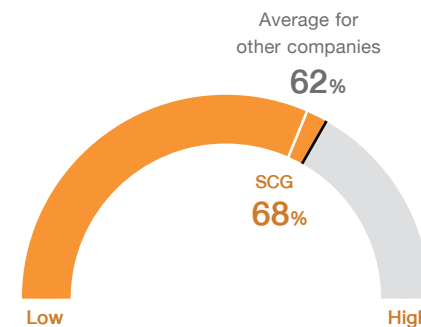
97% participated in the survey

Of this number,

21,524 employees reported a sense of engagement

The latest survey in 2018 found that the employee engagement rate stood at 67% based on all the respondents.

In 2019, SCG conducted an internal survey on domestic employees to obtain additional feedback from them. The overall score improved by 1% compared to that of the previous year. The suggestions and feedback were used to improve work plans at business, company, and business-unit levels.



Community and Social Involvement

SCG's business operations inevitably involve the use of natural resources for production and the risk of its operational activities impacting surrounding communities. Therefore, SCG is strongly committed to conduct socially-responsible business together with community and social development, placing priority on playing an active part in solving water and waste problems, improving health & safety and the quality of life, enhancing economic strength, and reducing social inequality. This corresponds with SCG's three sustainable development goals; climate resilience, circular economy, and safety, which SCG strives to achieve by fostering engagement with every sector and leveraging both expertise and innovation to materialize a change as well as to create model communities characterized by self-reliance and a better quality of life.

Target

2020

Assess the impact of SCG's community and social development activities on communities, society, and SCG

2021

108

communities capable of water management on their own

Strategy

1. Utilize expertise of SCG and external partners to enhance the resilience of communities and society.
2. Foster engagement among employees and all relevant sectors to create sustainable value for society.
3. Develop innovation that meets the needs of communities and solves social issues.
4. Develop models for sustainable social development and scale up to other community network.

Management

- "The CSR Committee for Sustainable Development", consisting of members of the Board of Directors and SCG top executives, is responsible for formulating policies and guidelines on sustainability-oriented social development activities.
- "SCG Foundation" carries out a mission to people development focus on maximizing human capability and having them equipped with knowledge and integrity.
- "Community Relations Unit" carries out activities that enhance the potential of the neighboring communities of SCG's operations to attain better quality of life and sustainable self-reliance.

2019 Performance

19

communities capable of managing their own water resources

82%

Community Satisfaction Index

50,000

plants, consisting trees, seagrass, and mangroves, grown across the country

7,139

additional check dams constructed to prevent drought and flooding and improve richness and abundance in forests

Social Contribution

587

million baht: cash contribution

132

million baht: the total value of products and services contributed to society

366,356

man-hours: employees' involvement in CSR activities, equivalent to

82 million baht

in value

34,000
trees in forest

16,000
seagrass
and mangroves

SCG strives to restore balance to and revitalize the ecosystem from watershed forests to coastal areas, solve drought and flooding in accordance with royal guidance, and enhance climate resilience by fostering engagement with communities and educating them about the sustainable management of water resources in their own area.

Climate Resilience Projects

Strategies 1, 2, 4

- SCG collaborated with communities to grow a total of 50,000 plants, consisting of trees, seagrass, and mangroves, across the country to revitalize the ecosystem from watershed forests to coastal areas.

- SCG worked with communities to construct check dams and revitalize water reservoirs to restore balance to the ecosystem, solve drought and flood problems sustainably, and create a body of knowledge with which communities can manage their own water resources.

Click Video

Click Video

- Forest cultivation in "Commemorate His Majesty the King, Volunteers Conserving Water": SCG planted trees around cement limestone quarry in Saraburi, Lampang, and every other area where SCG operates, such as Khon Kaen, Kanchanaburi, Ratchaburi, Rayong, Kamphaengphet, Samut Sakhon, and Bangkok.

Click Video

In this project, SCG shared its knowledge on quarry rehabilitation and propagation of local plants to communities and encouraged them to plant trees and conserve the forests around the plant sites. In addition, SCG promoted the cultivation of seagrass and mangroves in Trang, Surat Thani, and Rayong by creating a learning process in these communities from collecting young seagrass for breeding to a trial planting in a breeding center, so as to create bodies of knowledge among communities. Seagrass has ability to store carbon, provide shelter for young marine life and is a food source for dugongs, an endangered creature of Thailand.

• Check dam construction in "Conserving Water from the Mountain to the Mighty Rivers Project": SCG continued the Conserving Water from the Mountain to the Mighty Rivers Project and worked with communities to build check dams in watershed area to improve their fertility, restore natural food sources, and increase the biodiversity of the flora and fauna, all of which would enhance their preparedness against impacts of severe and volatile climate change. The project also enabled the local people to earn a livelihood through agriculture, improve their, life quality, and build up inner strength of communities.

To date, Conserving Water from the Mountain to the Mighty Rivers Project, in collaboration with communities and volunteers across the country, has constructed a total of 91,405 check dams.

• Water reservoir improvement and restoration in "Conserving Water from the Mountain to the Mighty Rivers Project": SCG promoted water management know-how and the application of science and information technology to enable communities to manage water resources by their own and develop their immunity against rapid climate change. In 2019, the project participated in the Governance Promotion Project in Commemoration of the Coronation of His Majesty the King.

The project involved restoring water reservoirs to collect water in rainy season and implementing systematic distribution of water during dry season of Ban Saphae Neua, Ban Sa Sob Hok, and Si Moo Ban Community in Ban Sa Sub-district, Chae Hom District, Lampang Province. The carried out activities included constructing subsurface dams to raise the level of underground water, creating a piping system in the mountains, digging new reservoirs, restoring old reservoirs, and digging waterways to connect water resources. The increase of 150,000 cubic-meter water volume was available for consumption and usage of communities during dry spells and benefited over 550 households.

The project also made use of science and information technology for water resource analysis and water planning in collaboration with Utokapat Foundation under Royal Patronage of H.M. the King and the Hydro-Informatics Institute (Public Organization) to help Pa Phu Tham and Phu Kratae communities in Waeng Noi District, Khon Kaen, which had been experiencing chronic drought for over 40 years, to increase the storage capacity of their water reservoirs and enhance the ability to control their storage and drainage. As a result, the storage capacity increased by 70,000 cubic meters, which provided all-year-round water supplies to 68 households and put an end to the chronic drought. The increased water supply was sufficient for consumption and farming for four years even in dry period.

In 2019, a total of

7,139

check dams were constructed to restore balance to the ecosystem

Click Video

The project benefited over

600

households and increased water storage by 220,000 cubic meters

Impacts for SCG

• These projects contributed to sustainable development efforts related to water management, particularly regarding the restoration of ecosystems related to water supplies, the provision of water to communities/farmers, and the risk mitigation of conflict arising from water consumption between the industrial sector and communities.

• These projects enhanced SCG's image of leadership in sustainable development and natural climate solutions.

Circular Economy Projects

Strategies 1, 2, 3, 4

• The Chemicals Business developed the Litter Trap, which was piloted in 24 locations across 13 provinces, and the A.I. enabled SCG Smart Litter Trap, which could collect and sort floating debris while operating on the water surface and bring the trash back to the collecting point.

• SCG initiated waste management projects in various communities so that local people are capable to manage their own waste and ultimately reduce community waste to zero through proper waste sorting and recycling, which in turn generated income and added value to their communities in accordance with the circular economy principles.

"The more we use, the more waste is created." The average amount of waste generated in Thailand each year has been climbing steadily, soaring from 41,000 tons per day in 2009 to 76,000 tons per day in 2018. This trend has resulted in severe pollution on land, in freshwater and the sea.

30
tons of waste prevented from being released into the sea in six months

Click Video

SCG has placed great emphasis on solving waste problems by adopting the circular economy principles and encouraging communities and every sector to cooperate in recycling to make the most of all resources.

• Litter Trap and SCG Smart Litter Trap 4.0: Ocean waste was ultimately originated from communities that released trash into rivers and canals, the Chemicals Business collaborated with the Department of Marine and Coastal Resources to develop the Litter Trap to collect waste along the water banks. The Litter Trap is designed to have a 2-way entrance system using the efficient water flow and pressure to collect wastes and prevent the leak influenced by the tides. Each unit has a maximum waste collecting capacity of 700 kilograms, and 24 units were piloted along canal banks in 13 provinces across the country.

However, the Litter Trap has to be installed along waterway edges to avoid obstruction of water transportation, it cannot collect trash in the middle of the river or canal. To tackle this

problem, SCG had innovated and developed SCG Smart Litter Trap 4.0 to be equipped with a high-resolution camera and machine learning, enabling it to discern floating debris from other objects and to trap the debris with accuracy. The machine is also outfitted with an IoT device and sensors that collect data on waste amounts, the movement of the litter trap, and malfunctions.

SCG Smart Litter Trap is solar-powered and propelled with aerators, which also add air and oxygen to the water. The pontoon is made of durable PE100. The machine can collect five kilograms of waste per trip. After each trip, it is navigated through a GPS-enabled system to take the trash to the collecting point on the bank, saving both time and labor for waste collectors. Once the collection point is filled up, a device will notify the control center for further actions of the waste management officers.

In the next phase, SCG seeks to encourage communities to take part in sorting the collected waste for recycling or upcycling as well as deploy these litter traps in more locations.

• Waste-free Communities:
SCG has initiated projects that promote sustainable waste management in various communities by sharing with the local people lessons and experiences from the “Bangsue Model”, which focuses on efficient waste management at source and circular economy principles. The projects

include setting up waste separation system, recycling and reusing waste in appropriate ways, and the management of hazardous waste. These initiatives place emphasis on fostering community involvement and teaching local people to generate income from sorting trash and creating value-added products from waste.

In 2019, SCG supported waste management in various communities, including Ban Sa Community in Ban Sa Sub-district, Chae Hom District, Lamgpang Province; Ban Rang Phlub Community in Ban Pong District, Ratchaburi Province; and Ban Mod Tanoi Community in Koh Li Bong Sub-district, Kantang District, Trang Province.

Key waste management activities initiated in these communities were as follows:

• Waste banks, which served as centers for waste trading and sorting for the communities.

35
households participated in the waste management initiatives

Ban Rang Phlub Community in Ban Pong District, Ratchaburi Province, won the first prize in the Zero Waste Community Competition 2019, organized by the Department of Environmental Quality Promotion

Click Video

• Campaigns against the use of plastic bags and Styrofoam boxes, which encouraged people to opt for lunch boxes, baskets and using plastic bags at their greatest value before throwing away.

• Organic fertilizer projects, in which organic waste is utilized to be a compost, bio-extracts and organic fertilizers and being used as soil improvement substances for gardening and farming of the communities.

• Product development projects from recycled materials, which encouraged communities to employ their creativity to add value to waste rather than sell it by weight.

These community waste management activities turned Ban Sa community to successfully reduce its waste to the point that no need for communal waste bins. SCG has planned to replicate this success to nearby communities and raise Ban Sa Community as the model for the circular economy in Chae Hom district, Lampang Province. Similarly, Ban Rang Phlub was transformed from a community with mountains of waste, which could potentially be pathogenic, into a model waste-free community with a learning center that could create added value from appropriate waste management, while Ban Mod Tanoi Community successfully got rid of waste accumulating on its coasts and household and become a 100% styrofoam-free community.

Impacts for SCG

• These projects contributed to sustainable development efforts related to the circular economy, particularly regarding waste management for reuse.

• These projects improved SCG's image of leadership in circular economy and innovation.

Health and Safety Projects

Strategies 1, 2, 3, 4

• The Cement-Building Materials Business, in collaboration with various organizations, renovated the service areas of Crown Prince Hospitals in four provinces in accordance with their Happiness Strategy. SCG utilized BIM technology in the designing and construction of the buildings, which not only saved time and expenses but also reduced leftover construction materials, in line with the principles of circular economy.

• The Chemicals Business collaborated with Noen Phayom Community in Rayong Province to promote road safety and successfully increased the rate of helmet use to 70%.

Health and safety is considered a fundamental need for a good quality of life. SCG has fostered engagement with experts, communities, and various sectors in order to initiate projects that help prevent, alleviate, or solve problems in areas where SCG operates and overall society, by utilizing innovation and expertise to ensure the success of these projects.

• Commemorate His Majesty the King, Volunteers Developing Crown Prince Hospitals Nationwide: SCG Foundation in collaboration with the Cement-Building Materials Business, the Foundation for the Crown Prince Hospitals, and the Built Environment for Health and Well-being Research Unit, Faculty of Architecture, Kasetsart University, improved the service area in Crown Prince Hospitals to elevate its health care system towards international standards and ensure good health for all Thais according to their vision, mission, and Happiness Strategy. The waiting areas for patient's relatives were transformed into recreational spaces for family activities, with roofs shielding visitors from sunshine and rain and universal restrooms for all ages. The simple yet beautiful and user-friendly design were intended to mesh with the lifestyle of each community and society.

To facilitate the designing and construction of these buildings, SCG utilized the Building Information Modeling (BIM) technology to simulate the structures, being adjustable until aesthetic and functional requirements are met. This not only helped reduce the number of adjustments during construction but also saved time and expenses. In addition, the accurate calculation on building materials of this technology helped reduce construction waste and thus promoted the circular economy.

In 2019, the pilot phase included the renovation of the facilities in four hospitals, namely “Ruen Suk Jai” in Bandung Crown Prince Hospital in Udon Thani Province, “Chan Suk Jai” in Nakhonthai Crown Prince Hospital in Phitsanulok Province, “Huen Suk Jai” in Kranuan Crown Prince Hospital in Khon Kaen Province, and “Lan Suk Jai” in Wiang Sa Crown Prince Hospital in Surat Thani Province. The current goal is to complete the facility renovation across 21 Crown Prince Hospitals by 2020.

Click Video

• The Lifesaver™ – Extending care to communities: The Chemicals Business launched the Lifesaver™ as an internal project to foster a safety culture and encourage its employees to become lifesavers and look out for each other’s safety, not only at work but also in their daily life. Because the project turned out to be a roaring success, SCG sought to replicate the results in local communities around its plants, especially in Rayong Province, which had the highest road fatality rate in the country.

LIFESAVER

Click Video

288
households participated in the project

“This is an excellent project. SCG is highly successful in this area and has been taking care of local communities very consistently. I have learned a lot from working with SCG: corporate standards, action plans, progress tracking, clear working processes, and collaboration. Because of all this, the project has produced tangible results.”

Sanya Saisamorn
Leader of Noen Phayom Community

The Chemicals Business chose to pilot the Lifesaver™ in Noen Phayom community in Map Ta Phut Sub-district, Muang District, Rayong because it had a strong community managementand worked in close collaboration with community members throughout the process, from formulating plans, surveying accident-prone locations, and carrying out awareness raising activities to holding general traffic safety training and safety training for motorcyclists. The Chemicals Business and the community also worked together to draw up the Seven Life Saving Rules: 1) Drink don’t drive, 2) No phone while driving, 3) Always wear helmets, 4) Wear seatbelts, 5) Respect speed limits, 6) Carry driver’s licenses, and 7) No driving against traffic.

SCG also gave each household two helmets, one for kid and the other for adult, and improved accident-prone spots by cutting down any tree blocking the driving vision and installing safety mirrors at sharp turns to increase visibility.

After the project was launched, Noen Phayom Community became more safety-conscious and changed their everyday safety behavior. The rate of helmet use, for instance, rose from 50% to 70%. SCG has planned to replicate the success in this pilot location to other surrounding communities.

Impacts for SCG

• These projects contributed to sustainable development efforts related to safety, particularly regarding road and transportation safety and road fatality reduction.

• These projects improved SCG's image of leadership in safety and earned SCG the trust of Rayong Administrative Office, appointing SCG as the leader in the road accident prevention and reduction project in Rayong Province. Also, SCG was entrusted with the task of creating models of road safety, fostering safety consciousness in communities for tangible results and reducing losses from road accidents.

Appendices

About This Report

SCG has published the sustainability report every year since 2001 by presenting the performance in 3 core business units, namely Cement-Building Materials Business, Chemicals Business, and Packaging Business.

The selection of Sustainability Performance information included in this report is based on what is determined by SCG's management to be responsible, relevant and of value for its stakeholders when measuring sustainability performance.

Reporting Scope

The reporting scope, particularly economic data, cover the performance of subsidiaries, joint ventures, associates and other companies both domestic and regional in line with the SCG Annual Report.

Environmental, health and safety data from all business units were included in the report using the combined criteria of equity share of 50% and over and controlled associates, except for overseas operations, the newly established companies (less than 3 years), the merging and acquisition companies (less than 4 years). Exclusivity of the data is as shown on page 141-147. The reporting period for the information in this report is from 1 January 2019 to 31 December 2019.

This Sustainability Report and its data were prepared in accordance with Global Reporting Initiative ("GRI Standards"): Comprehensive Option.

The information in this report disclosed the Communication on Progress - Advanced Level of United Nations Global Compact (UNCG) as shown on page 156, Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) as shown on page 157, the Action Toward Achieving the United Nation's Sustainable Development Goals (SDGs) as shown on page 15, as well as Operating Results of Cement Business in Accordance with Global Cement and Concrete Association (GCCA) as shown on page 139-140.

Sustainability Management System

To ensure the Sustainability Management System throughout the entire Company, subsidiaries under business units of SCG have been certified international standards like ISO 9001 - Quality Management System, ISO 14001 - Environmental Management System, OHSAS/TIS 18001/ISO 45001 - Occupational Health and Safety Management System, ISO 50001 - Energy Management System and ISO 14064 - Greenhouse Gases. In 2019, 100% subsidiaries have been certified for Quality Management System, 97% for Environmental Management System and 91% for Occupational Health and Safety Management System.

Reporting Assurance

Financial data was derived from financial management system similar to those presented in SCG Annual Report and is verified by certified accounting firm.

The integrity and the transparency of environmental, health and safety data in this report has been assured by an external party to verify and assess the selected data against GRI Standards as shown in details on page 160-161.

Environment

The environmental data cover those activities that could have a significant impact on the environment together with sites and production process while sites with activities considered not to have a significant impact are not included, for examples; sales offices, R&D laboratories, service and holding companies.

The environmental data sources, i.e. accounting evidence, meter reading, data from production system, and estimation with ground rule have been presented in absolute value. For the specific consumption/ emissions, since 2016 the disclosure of energy, greenhouse gas emissions and water withdrawal have been improved with greater visibility by comparing the absolute consumption/emissions of the current year with the business as usual (BAU)

of the base year prior to the reduction measures. The energy consumption and greenhouse gas emissions use the base year of 2007 and water withdrawal use the base year of 2014.

The report of Cement Business which is under Cement-Building Materials Business is in line with the Guidelines of Global Cement and Concrete Association (GCCA). Air emission and heat consumption effectiveness indexes are calculated from tonnage of clinker while greenhouse gas emissions and water consumption effectiveness indexes are calculated from tonnage of cementitious. Since 2016, Cement Business made a retrospective adjustment of cementitious production tonnage to reflect the inclusion of other alternative raw materials used in cementitious manufacturing, such as pulverized fuel ash (PFA), and limestone that are commonly used in production of cement and mortar cement.

Energy

Total energy consumption includes thermal energy and electricity used in the company/plant areas. For the details on thermal energy, the amount and ratio of alternative energy utilization is also presented, together with the addition of renewable energy and non-renewable energy from the year 2018.

Thermal energy consumption =
fuel weight or steam volume (estimated from volume purchased or stockpile change)
x heating value of each fuel type
(provided by laboratory test or suppliers)

Greenhouse Gas Emissions (GHGs)

GHGs data in this report represent the amount of GHG emissions from the operation based on the calculation according to “GHG Protocol Corporate Accounting and Reporting Standard” from WRI/WBCSD GHG Protocol as per the following scopes:

1. Reporting Scope

1.1 Direct GHG emissions (Scope 1): GHG emissions occur from manufacturing process or other activities that are owned, controlled, and managed by SCG, for example emissions from combustion of coal or natural gas in boilers, furnaces, vehicles, etc. In addition, this scope also includes GHG emissions associated with chemical reaction in production process such as calcinations in cement plant and lime kilns while excluding emissions from the combustion of biomass, alternative fuels, waste water treatment process and landfill.

1.2 Indirect GHG emissions (Scope 2): GHG emissions occur from the secondary energy, such as electricity, as well as purchased thermal energy, in form of steam and hot air.

2. Report of GHG Inventory:

2.1 Direct GHG emissions calculation (Scope1)

• From combustion

- The calculation based on quantities of fuel consumption (weight or volume) such as: amount of fuel oil or natural gas x emission factor which was referred to Thailand Greenhouse Gas Management Organization (Public Organization) (TGO). Apart from TGO emission factor, the Intergovernmental Panel on Climate Change 2006 (IPCC) emission factors can be referred.

- The calculation based on fuel consumption (based on heating value) such as: amount of coal x heating value x emission factor which was referred to TGO. Apart from TGO emission factor, the IPCC emission factors can be referred.

- The calculation will be based on carbon mass balance from fuel consumption.

• From chemical reaction in production process e.g. limestone and lime mud is calculated using mass balance.

• For Cement Business, refers to GCCA.

2.2 Indirect GHG emissions (Scope 2) will be calculated from purchased electricity, steam or hot air consumption x GHG emission factors based on TGO, manufacturers, or suppliers.

3. The type of GHG emissions report includes CO_2, CH_4, N_2O, HFCs, PFCs and SF_6 converted and reported as CO_2 equivalent by Global Warming Potential (GWP). Referred GWP factors are defined by IPCC. NF_3 will be reported in the future.

Air Emission

Air emissions are the quantity of air pollution such as NO_x, SO_x, and Particulate Matter deriving from combustions and being the components during the production process. Types of air pollutants depend upon each production process in which chemical substance is produced. The result and measurement method shall refer to method required by laws such as US EPA or equivalent standard.

Reporting of quantity of air emission will be calculated based on concentration measured from random spot check being conducted by laboratories which are certified and registered to the Department of Industrial Works, multiplied by hot air flow rate and production hours.

In addition, Chemicals Business and Cement Business measure their air emissions from stack using Continuous Emission Monitoring Systems (CEMs). Cement Business refers the measurements to GCCA's Guidelines (see details on page 139-140).

Water

Water management (comprising water withdrawal, treated water, water discharged, and recycled water) is the assessment of water usage efficiency and any risks that may arise from water withdraw from various sources.

Water withdrawal is the quantity of fresh water taken from external sources including water used in production process, offices, maintenance and utilities, information of which is obtained from accounting evidences or meter reading. Sources of water are divided into 3 sources comprising surface water, ground water and tap water.

Recycled water is the quantity of treated water returned to the process excluded non-treated reused water such as cooling water. Since 2018, the recycled water quantity of Building Materials Business has been included retrospectively from 2014 onwards.

Effluent Water Quality is the quality of water discharged to external sources such as BOD, COD and Suspended Solids with the quality of discharged water which is measured by standard test method and volume of discharged water.

Industrial Waste

Waste Management is considered in order to assess the efficiency of production process, improvement of product quality and a decrease of production cost. SCG has established "Waste Reporting Guideline" since March 2010 for waste data collection and calculation.

The quantity of industrial waste is the amount of waste being generated from production process excluding the waste that can be recycled in the production process (Work in process, WIP). Industrial wastes are divided into 2 categories comprising hazardous waste and non-hazardous waste as listed in the Ministry of Industry's 2005 Decree on the Disposal of Wastes and Unused Materials.

The disclosure of data on industrial waste being generated from production process and being treated by ways of recycle, disposal or landfill will be collected from the weighting scale or estimation in accordance with academic principles.

Health and Safety

Data on Number of Employees and Contractors

1. Employee is a full time employee according to an employment contract such as operational level, supervisory and technical staff level, and managerial level including intern (probationary) and special contracted employee.

• Operational level is a front line worker who uses their skills and technics in their daily operations.

• Supervisor and technical staff level is a front line manager who is responsible for daily management or having a control over subordinates.

• Managerial level is a manager who is responsible for addressing business strategies or policies, delegating, and controlling supervisor and technical staff level who implement policy and daily jobs.

• Special contracted employee is a temporary person being employed on a specific period.

2. Contractor is a person who has been consented to work or provide service or benefit to the company apart from the company's employee as per the definition specified above, which could be divided into 3 groups as follows:-

1) Workplace Contractor is a contractor that works for the organization, and whose work and/or workplace is controlled by the organization. (Exclude Transportation contractor)

2) Direct Transportation Contractor is a transportation contractor with operation under SCG's brand.

3) Other Transportation Contractor is other transportation contractor without operation under SCG's brand.

Workplace contractors data covered in the report will be calculated for number of man-hours. Data on transportation contactors under SCG Logistics Management Co., Ltd., will be reported in kilometer.

Third party is other people, not the employees and contractors, who are not working for the company and not covered in this report.

Calculation of Man-Hours

1. Data from clock-in system, HR database, accounting unit or relevant administrative unit.

2. In case the companies/plants do not have a clock-in system or HR database, the below formula shall be employed to estimate the man-hours.

Number of man-hours =
[Number of Employees/Contractors x
Number of working days x
Number of normal working hours (per day)]
+ Number of total overtime man-hours
(only operational employees and contractors)

Recording of Health and Safety Data

SCG records data on health and safety at work by dividing into 5 categories:

1. Number of fatality is number of work-related injury result in fatality regardless of suddenly death or suffering the consequences and dying later.

2. Total Injury Frequency Rate is total number of recordable work-related injury case (person) per 1,000,000 man-hours.

3. Lost Time Injury Frequency Rate is total number of recordable work-related lost time injury case (person) per 1,000,000 man-hours.

4. Injury Severity Rate is total number of lost workday (day) from recordable work-related lost time injury case (person) per 1,000,000 man-hours.

5. Occupational Illness Frequency Rate is total number of recordable occupational illness case (person) per 1,000,000 man-hours.

Since 2019 SCG change calculation rate from based on case or day/200,000 man-hours to case or day/1,000,000 man-hours to be suitable to the organizational size and the comparing with other companies within the same industry.

Lost Time Injury, Occupational Illness is a work-related injury, occupational illness that cause the injured absence from work on the next working day or the following shift, as well as the case that such injury, occupational illness and leads to the leave of absence as the person being incapable of returning to work after the incident.

The electronic file of this report and the previous ones can be downloaded from SCG website
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Sustainability Performance Data

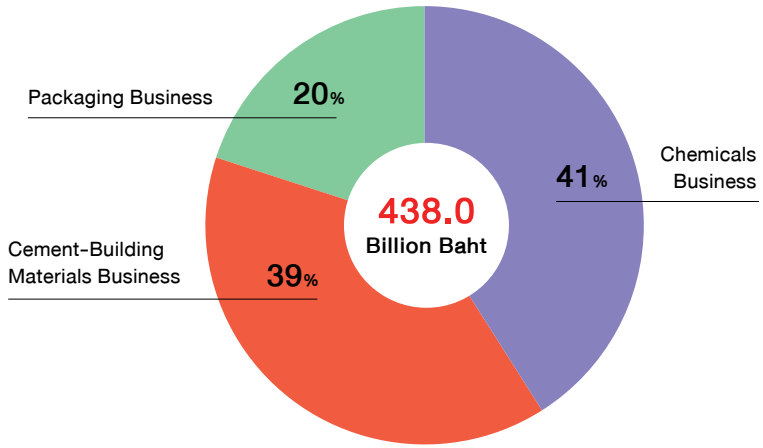
Economic Performance

Performance Data	2015	2016	2017	2018	2019	GRI Standards	DJSI
Revenue from sales (Billion Baht)	439.6	423.4	450.9	478.4	438.0	GRI 201-1	0.1
Profit for the year (Billion Baht)	45.4	56.1	55.0	44.7	32.0	GRI 201-1	
EBITDA (Billion Baht)	82.7	97.8	102.1	86.6	75.0	GRI 201-1	
Employee compensation comprising salary, wage, welfare and regular contributions (Million Baht)	40,172	42,458	43,674	43,960	48,139	GRI 201-1	
Divident to shareholders (Million Baht)	19,200	22,800	22,800	21,600	16,800	GRI 201-1	
Interest and financial expenses to lender (Million Baht)	9,076	7,572	7,112	6,836	6,442	GRI 201-1	
Taxes to government and local government authorities such as income tax, local maintenance tax, property tax and other specific taxes (Million Baht)	5,430	6,938	6,959	6,630	6,143	GRI 201-1	
Privilege tax and others from investment promotion, and research and development (Million Baht)	3,599	4,827	4,300	1,905	1,388	GRI 201-4	
Non-compliance case through SCG Whistleblowing System (Cases)	39	43	31	21	30	GRI 205-3	1.4.7
Customer Satisfaction - SCG Contact Center (%)	99	99	100	100	100		1.5.1
Average Customer Satisfaction - All business unit (%)	NA	NA	NA	93	94		1.5.1
Contributions to organizations (Million Baht)*	5.6	5.3	5.2	9.8	22.2		1.6.1 1.6.2
Suppliers that assessed Environmental, Social and Governance (ESG) Risks (% of procurement spending)	NA	89	98	100	100		1.7.4
Procurement Spending by Geography (% of procurement spending)							1.7.6
• Domestic	NA	NA	45	50	58		
• Regional	NA	NA	55	50	42		
Revenue from Sales of High Value Added Products and Services (Billion Baht)	161.9	160.9	175.5	185.0	179.2		
(%)	36.8	38.0	38.9	38.7	40.9		
Revenue from Sales of SCG eco value Products and Services (Billion Baht)	114.1	170.5	185.2	202.4	128.8		
(%)	25.9	40.3	41.1	42.3	29.4		
Revenue from Sales of Sustainable Construction Products and Services (Billion Baht)	NA	54.9	58.5	65.5	60.4		1.10.1
(%)	NA	13.0	13.0	13.7	13.8		

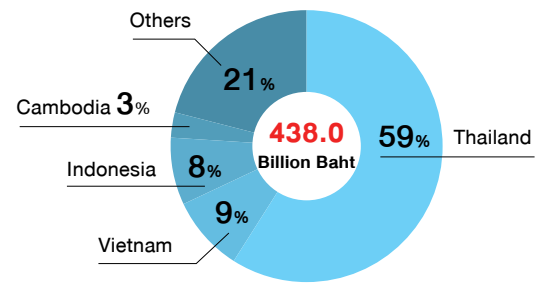
NA = Not Available

* The first eight organizations contributed by SCG are World Business Council for Sustainable Development (WBCSD), Alliance to End Plastic Waste (AEPW), Global Cement and Concrete Association (GCCA), The Federation of Thai Industries, Thailand Development Research Institute, Board of Trade of Thailand, Thailand Management Association and Thai Institute of Directors. SCG remains politically neutral, and give “Zero” financial support to any political party, political group, or candidates in local, regional or national levels or person with political influence or Lobbying or interest representation or similar and other categories (such e.g. spending related to ballot measures or referendums).

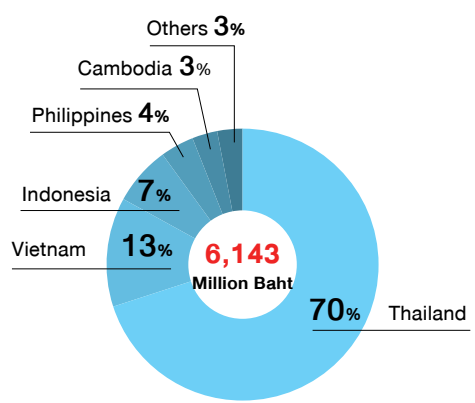
Revenue from Sales



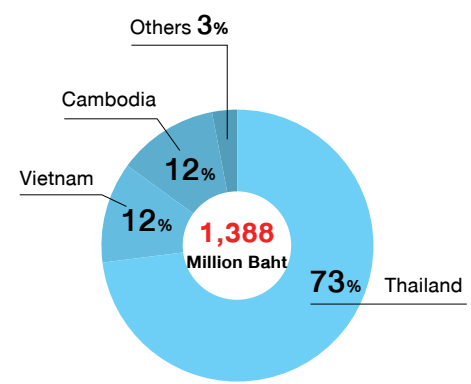
Revenue from Sales by Country



Taxes to Government



Tax Benefits

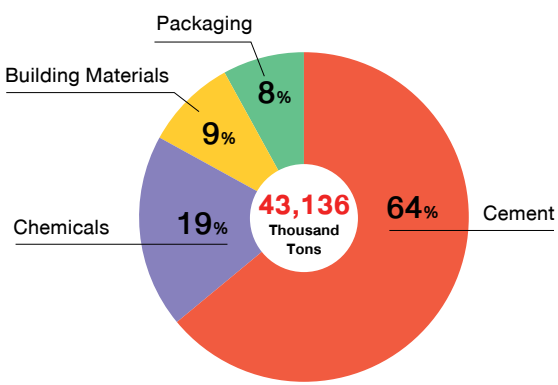


Environmental Performance

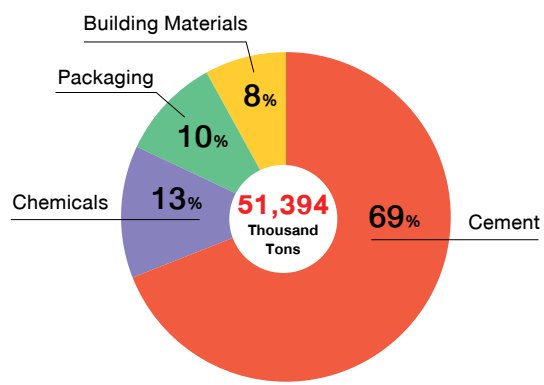
Production and Raw Materials

Performance Data	2015	2016	2017	2018	2019	GRI Standards	DJSI
Production (Thousand Tons)	40,770	39,506	42,048	43,224	43,136		0.1
Raw Materials (Thousand Tons)	49,432	49,684	48,787	50,981	51,394	GRI 301-1	
Recycle Materials (Thousand Tons)	3,253	3,438	3,877	3,733	4,251	GRI 301-2	

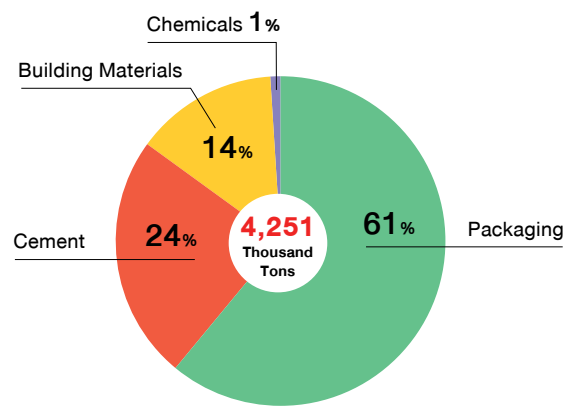
Production



Raw Materials



Recycled Materials

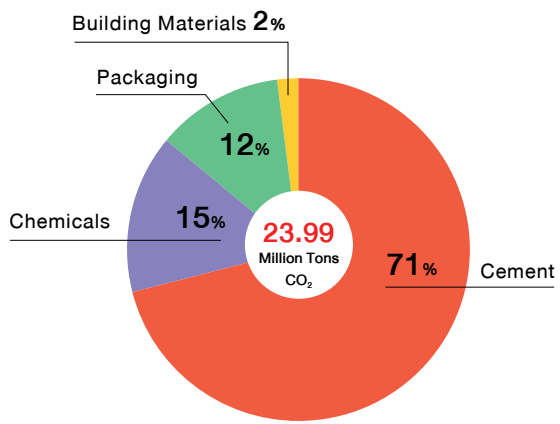


Greenhouse Gas Emissions

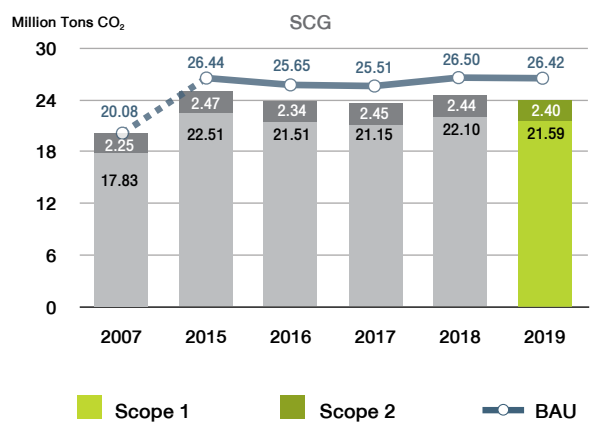
Performance Data	2015	2016	2017	2018	2019	GRI Standards	DJSI
GHGs Scope 1 and 2 (Million Tons CO_2)	24.98	23.85	23.60	24.54	23.99		
GHG Scope 1 (Million Tons CO_2)*	22.51	21.51	21.15	22.10	21.59	GRI 305-1	2.3.1
GHG Scope 2 (Million Tons CO_2)*	2.47	2.34	2.45	2.44	2.40	GRI 305-2	2.3.2
GHG Emission Reduction compare with business as usual (BAU) at base year of 2007 (Million Tons CO_2)	1.46	1.81	1.92	1.96	2.43	GRI 305-5	
(%)	5.5	7.0	7.5	7.4	9.2		

* Within KPMG's limited assurance scope (page 160)

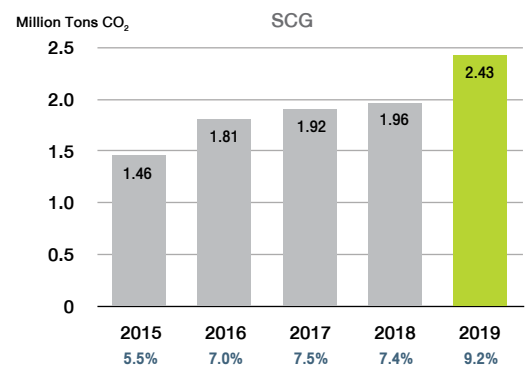
GHGs Scope 1+2



Greenhouse Gas Emissions



Greenhouse Gas Emission Reduction

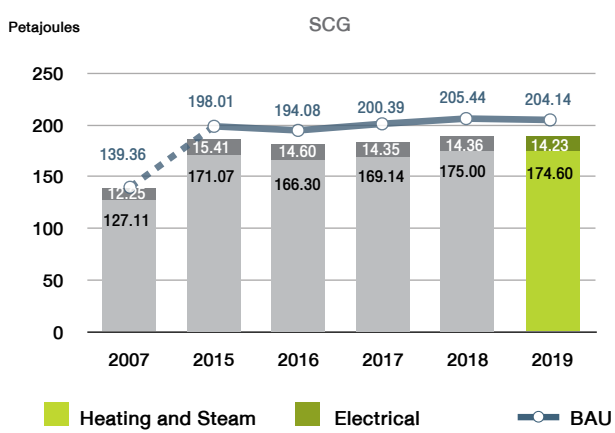


Energy Consumption

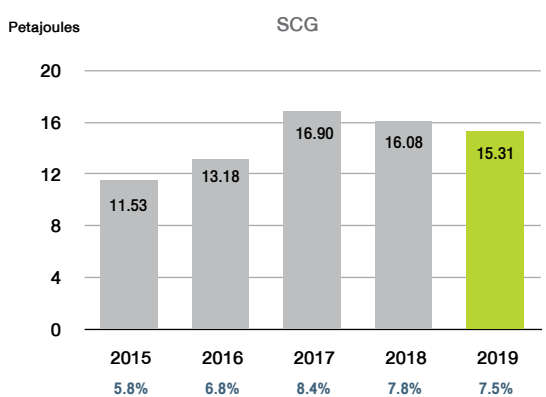
Performance Data	2015	2016	2017	2018	2019	GRI Standards	DJSI
Total Energy Consumption (Petajoules)*	186.48	180.90	183.49	189.36	188.83	GRI 302-1	2.3.3
Heating and Steam Consumption (Petajoules)	171.07	166.30	169.14	175.00	174.60	GRI 302-1	
Alternative Energy (Petajoules)							
• Renewable: Biomass	6.65	5.50	5.10	5.66	8.88	GRI 302-1	
• Renewable: Industrial Waste	11.99	12.37	12.64	9.80	9.81	GRI 302-1	
• Non-Renewable: Industrial Waste				4.42	5.08	GRI 302-1	
Portion of Alternative Energy (%)	10.9	10.7	10.5	11.4	13.6	GRI 302-1	
Electrical Consumption (Gigawatt Hours)	4,281	4,057	3,985	3,988	3,953	GRI 302-1	
Energy Consumption Reduction compare with business as usual (BAU) at base year of 2007 (Petajoules) (%)	11.53 5.8	13.18 6.8	16.90 8.4	16.08 7.8	15.31 7.5	GRI 302-4	

* Within KPMG's limited assurance scope (page 160)

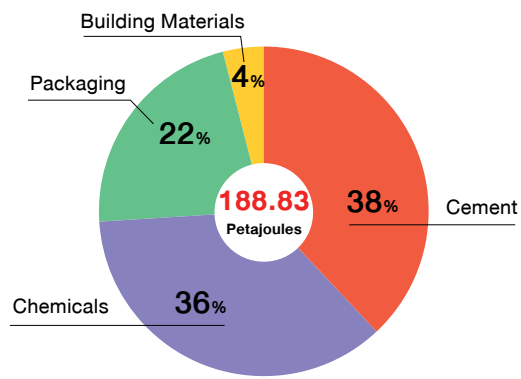
Total Energy Consumption



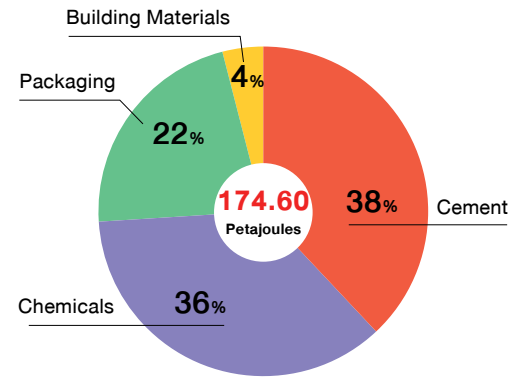
Energy Consumption Reduction



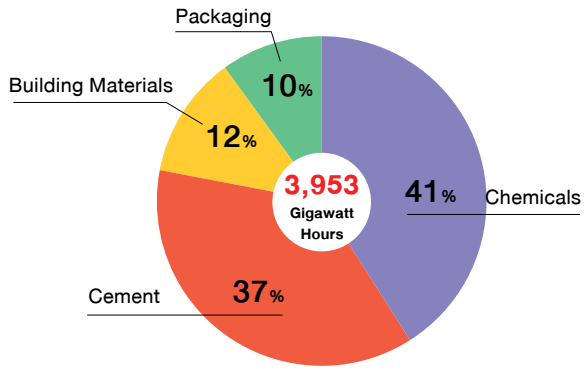
Total Energy Consumption



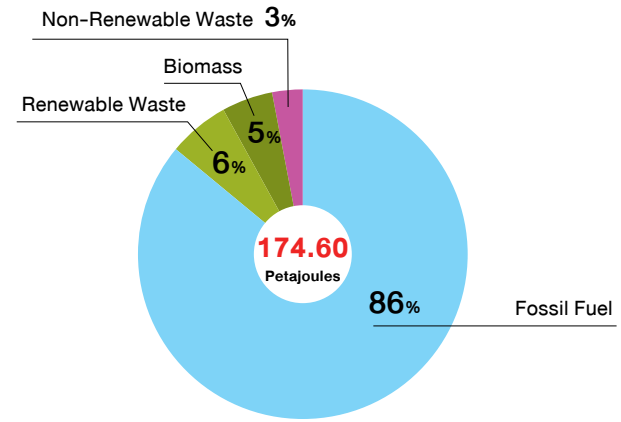
Heating and Steam Consumption



Electrical Consumption



Heating and Steam Source

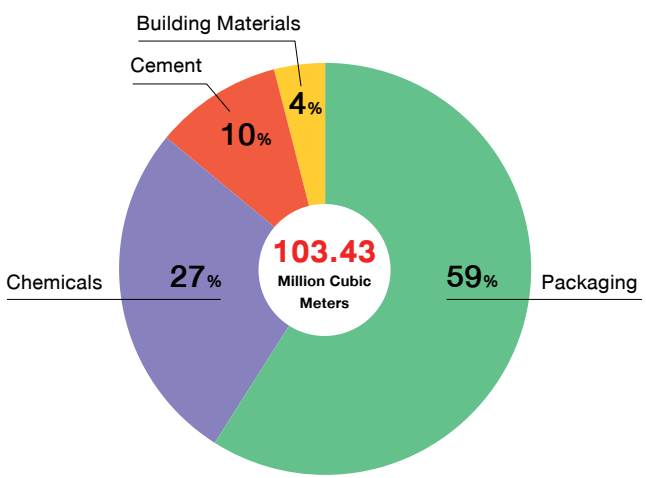


Water Withdrawal and Effluent Quality

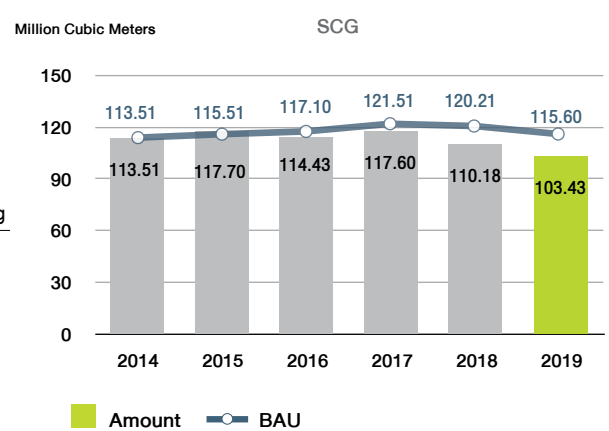
Performance Data	2015	2016	2017	2018	2019	GRI Standards	DJSI
Water Withdrawal (Million Cubic Meters)*	117.70	114.43	117.60	110.18	103.43	GRI 303-1	2.3.4
Water Withdrawal Reduction compare with business as usual at base year of 2014 (Million Cubic Meters)	-2.19	2.66	3.92	10.03	12.17		
(%)	-1.9	2.3	3.2	8.3	10.5		
Recycled Water (Million Cubic Meters)*	12.65	9.04	10.19	11.24	12.30	GRI 303-3	
Portion of Recycled Water (%)	9.7	7.3	8.0	9.3	10.6		
BOD (Tons)	415	457	387	240	165	GRI 306-1	
COD (Tons)	6,533	6,753	6,322	5,390	4,422	GRI 306-1	
TSS (Tons)	897	922	965	793	588	GRI 306-1	

*Within KPMG's limited assurance scope (page 160)

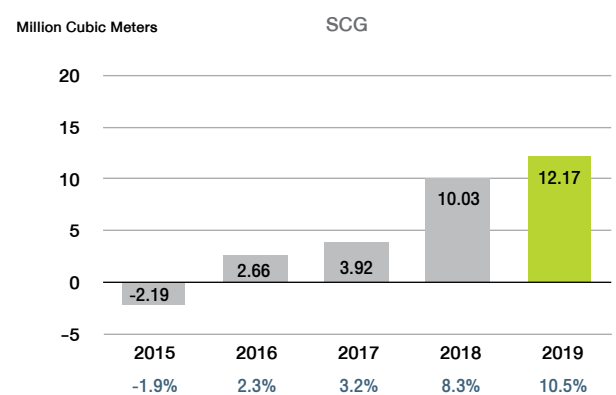
Water Withdrawal



Water Withdrawal



Water Withdrawal Reduction



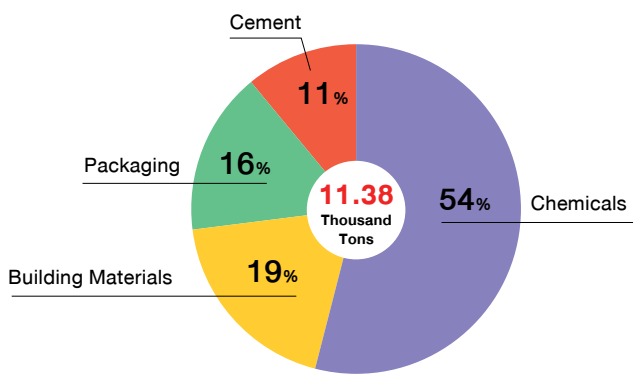
Waste Management

Performance Data	2015	2016	2017	2018	2019	GRI Standards	DJSI
Hazardous Waste Generation* (Thousand Tons)*	15.66	21.26	12.08	13.94	11.70		2.3.5
Hazardous Waste Management* (Thousand Tons)*	15.30	20.78	12.20	13.62	11.38	GRI 306-2	2.3.5
• Reuse/Recycled	10.91	17.24	9.95	12.31	11.00		
• Incinerated without energy recovery	4.39	3.55	2.22	1.31	0.38		
• Landfilled	0.00	0.00009	0.03	0.00	0.00		
Hazardous waste in the storage at the end of the year (Thousand Tons)	NA	NA	NA	NA	1.16	GRI 306-2	
Non-Hazardous Waste Generation* (Thousand Tons)*	1,373.36	1,348.19	1,394.45	1,414.24	1,527.06		2.3.5
Non-Hazardous Waste Management* (Thousand Tons)*	1,317.87	1,488.48	1,376.28	1,354.88	1,542.30	GRI 306-2	2.3.5
• Reuse/Recycled	1,284.29	1,475.39	1,372.58	1,172.79	1,318.96		
• Incinerated without energy recovery	30.69	13.08	3.70	2.11	1.36		
• Landfilled	2.89	0.01	0.00	179.98	221.97		
Non-Hazardous waste in the storage at the end of the year (Thousand Tons)	NA	NA	NA	NA	191.84	GRI 306-2	

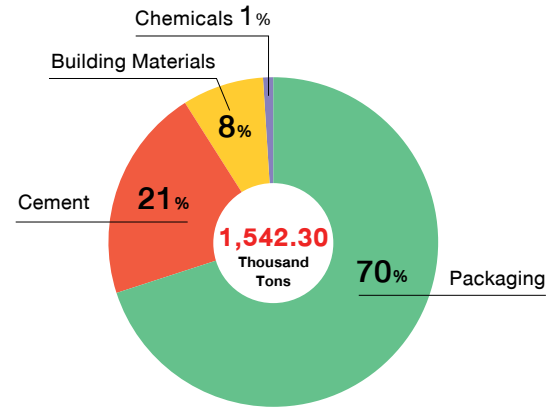
NA = Not Available

* Within KPMG's limited assurance scope (page 160)

Hazardous Waste



Non-Hazardous Waste

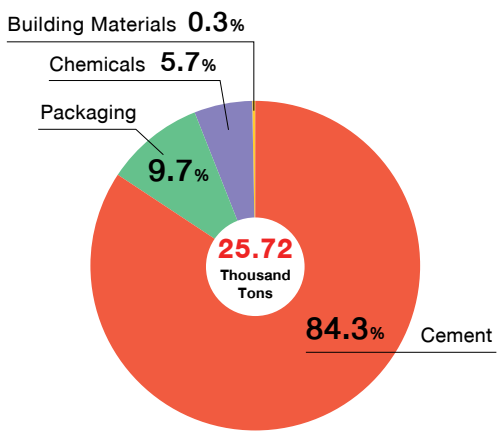


Air Emissions

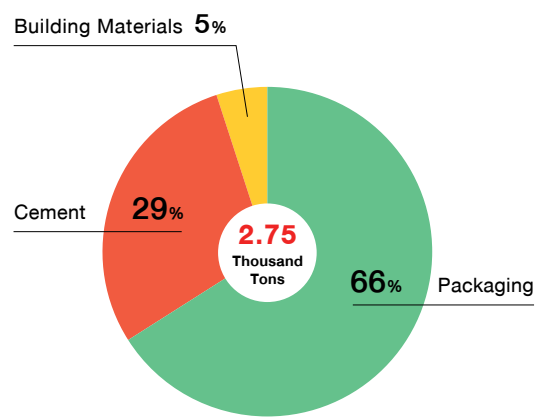
Performance Data	2015	2016	2017	2018	2019	GRI Standards	DJSI
Oxides of Nitrogen (Thousand Tons)*	25.45	22.16	25.48	27.23	25.72	GRI 305-7	2.3.6
Oxides of Sulfur (Thousand Tons)*	3.34	2.84	3.50	2.88	2.75	GRI 305-7	2.3.7
Particulate Matter (Thousand Tons)*	1.91	1.37	1.09	1.25	1.36	GRI 305-7	2.3.9
Mercury (Kilograms)*	16.51	14.95	14.53	112.39	84.21		2.3.8

* Within KPMG's limited assurance scope (page 160)

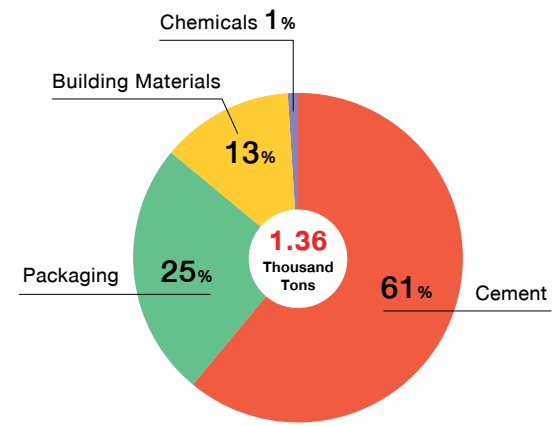
Oxides of Nitrogen



Oxides of Sulfur



Particulate Matter



Biodiversity/Environmental Expenditures and Benefits/Violations of Legal Obligations and Regulations

Performance Data	2015	2016	2017	2018	2019	GRI Standards	DJSI
Quarries with Biodiversity Management Plan in place (Number of Sites)	4	4	4	4	4		2.4.2
(%)	100	100	100	100	100		
Operating Expenses – Environmental (Million Baht)	939	1,124	1,462	2,190	2,192		2.2.3
Capital Investments – Environmental (Million Baht)	2,077	1,562	692	1,275	2,593		2.2.3
Savings, cost avoidance and tax incentives linked to environment investment (Million Baht)	800	450	210	278	546		2.2.3
Number of violations of legal obligations/regulations (Number of Cases)	0	0	0	0	0	GRI 307-1	2.2.4

Social Performance

Health and Safety

Performance Data	2015	2016	2017	2018	2019	GRI Standards	DJSI
Total Injury Frequency Rate* (Cases/1,000,000 Man-Hours)**							
• Employee	1.173	1.003	1.008	0.850	0.880	GRI 403-2	
• Contractor	1.177	0.826	0.605	1.080	0.775		
Lost Time Injury Frequency Rate* (Cases/1,000,000 Man-Hours)**							
• Employee	0.365	0.205	0.250	0.192	0.239	GRI 403-2	3.7.3
• Contractor	0.275	0.225	0.110	0.279	0.279		3.7.4
Injury Severity Rate (Days/1,000,000 Man-Hours)**							
• Employee	6.365	4.530	4.095	2.685	4.890	GRI 403-2	
• Contractor	7.150	6.670	1.690	6.000	5.714		
Total Number of Fatalities (Cases)*							
• Employee (Male : Female)	0:0	2:0	2:0	0:0	0:0	GRI 403-2	3.7.2
• Contractor (Male : Female) (Workplace and Direct Transportation)	5:0	7:0	4:0	4:0	1:1		
Number of Fatalities from Workplace (Cases)*							
• Employee (Male : Female)	0:0	1:0	1:0	0:0	0:0	GRI 403-2	3.7.2
• Contractor (Male : Female)	4:0	3:0	2:0	2:0	1:1		
Number of Fatalities from Transportation (Cases)*							
• Employee (Male : Female)	0:0	1:0	1:0	0:0	0:0	GRI 403-2	3.7.2
• Direct Transportation Contractor (Male : Female)	1:0	4:0	2:0	2:0	0:0		
• Other Transportation Contractor (Male : Female)	7:0	3:0	5:0	1:1	4:0		
Occupational Illness Frequency Rate* (Cases/1,000,000 Man-Hours)**						GRI 403-2	3.7.5
• Employee	0.000	0.000	0.000	0.000	0.000		
Number of Chemicals Spillage (Cases)							
• Level 1 : High Severity	1	0	0	1	1	GRI 306-3	
• Level 2 : Moderate Severity	1	4	0	1	0		
• Level 3 : Low Severity	0	8	4	4	7		

* Within KPMG's limited assurance scope (Page 160)
** Change calculation rate from based on case or day/200,000 man-hours to case or day/1,000,000 man-hours

Employee: A full time employee according to an employment contract such as operational level, supervisory and technical staff level, and managerial level including intern (probationary) and special contracted employee.
Workplace Contractor: A contractor that works for the organization, and whose work and/or workplace is controlled by the organization (Exclude Transportation contractor).
Direct Transportation Contractor: Transportation contractor with operation under SCG's brand.
Other Transportation Contractor: Other Transportation contractor without operation under SCG's brand.

Level 1 : High severity means that spills that causes of injury or spill to environment or the volume of chemicals spills is more than 2,500 kg (plastic powder or granule is more than 5,000 kg) can be contained (not reaching the environment).
Level 2 : Moderate severity means that spills with no injury occurred and the volume of chemicals spills is more than 500 to 2,500 kg (plastic powder or granule is more than 2,500 to 5,000 kg) can be contained (not reaching the environment).
Level 3 : Low severity means that spills with no injury occurred and the volume of chemicals spills is more than 50 to 500 kg (plastic powder or granule is more than 500 to 2,500 kg) can be contained (not reaching the environment).
The chemicals exclude flammable gas and utility chemicals, e.g. raw water, filtrated water, distilled water, nitrogen gas, instrument air, service air, or carbon dioxide.

Labor and Social Development

Performance Data	2015	2016	2017	2018	2019	GRI Standards	DJSI
Number of employees (Persons)	53,096	53,728	53,670	52,971	54,224	GRI 102-8	
Female share of total workforce (%)	23.1	23.1	22.6	22.8	21.9	GRI 405-1	3.2.1
Females in all management positions (%)	23.5	24.0	25.5	24.8	24.7	GRI 102-8	3.2.1
Females in junior management positions (%)	25.1	25.6	26.5	26.3	26.1		3.2.1
Females in top management positions (%)	11.2	11.3	14.2	13.3	13.1		3.2.1
Females in management positions in revenue-generating functions (%)*	18.0	18.0	19.2	19.2	19.5		3.2.1
Proportion of local senior management (%)**	0.30	0.34	0.31	0.32	0.45	GRI 202-2	
Number of employees with disability (Persons)***	34	41	41	40	39		
Remuneration of female to male							
Average salary of Executive Level (base salary only) (Baht)							
• Female	5,644,000	5,947,000	6,355,000	7,072,000	7,190,000		
• Male	6,173,000	6,470,000	6,987,000	7,106,000	7,086,000		
Ratio of average salary of female to male (base salary only)	0.914	0.919	0.910	0.995	1.015		
Average salary of Management Level (base salary only) (Baht)							
• Female	1,960,000	2,051,000	2,112,000	2,222,000	2,289,000		
• Male	2,160,000	2,276,000	2,372,000	2,441,000	2,486,000		
Ratio of average salary of female to male (base salary only)	0.907	0.901	0.890	0.910	0.921	GRI 405-2	3.2.2
Average salary of Management Level (base salary + other cash incentives) (Baht)							
• Female	2,613,000	2,735,000	2,815,000	2,963,000	2,956,000		
• Male	2,880,000	3,035,000	3,162,000	3,254,000	3,211,000		
Ratio of average salary of female to male (base salary + other cash incentives)	0.907	0.901	0.890	0.911	0.921		
Average salary of Non-management Level (base salary only) (Baht)							
• Female	411,000	447,000	475,000	523,000	554,000		
• Male	373,000	414,000	439,000	471,000	493,000		
Ratio of average salary of female to male (base salary only)	1.102	1.080	1.082	1.110	1.124		
Employees represented by an independent trade union or covered by collective bargaining agreements ****	NA	91.0	89.4	86.2	84.1		3.2.3
Proportion of Absence by Type (%)							
• Sick leave	15.6	14.4	14.0	14.0	12.7	GRI 403-2	3.2.3
• Work-related leave	0.2	0.1	0.1	0.1	0.1		
• Others	84.2	85.4	85.9	85.9	87.2		

* Revenue-generating functions, e.g., marketing, sales, production

** Calculate from percentage of overseas senior management and supervisor over total overseas staff

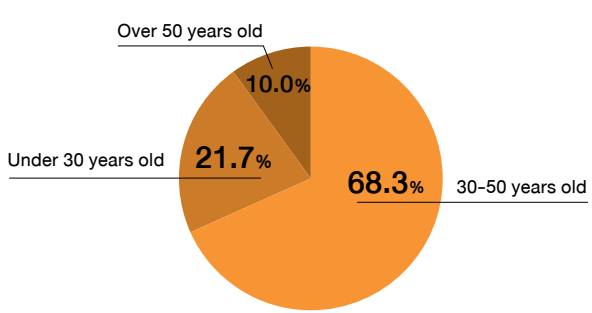
*** Visual and physical impairment and movement disability or other, e.g., hearing impairment, mental disability, communication disability

**** Employees joining trade union or working with companies covered by Welfare Committee

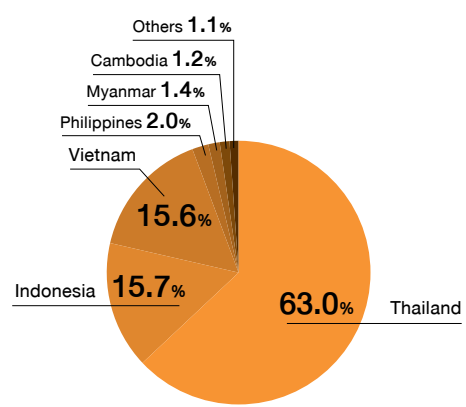
Performance Data	2015	2016	2017	2018	2019	GRI Standards	DJSI
Number of new employees hire (Persons)	2,631	2,088	1,659	855	927	GRI 401-1	
Ratio of new employees hire (%)	5.0	4.2	3.4	1.8	2.0		
Voluntary employee turnover (Persons)	1,568	1,487	1,825	1,599	1,560	GRI 401-1	3.5.3
Voluntary employee turnover rate (%)	2.9	2.8	3.4	3.0	2.9		
Total employee turnover (Persons)	2,089	2,128	2,437	2,340	1,880	GRI 401-1	3.5.3
Total employee turnover rate (%)	3.9	4.0	4.5	4.4	3.5		
Return to work after parental leave (Persons)*****							
• Number of employees taken parental leave	330	210	375	339	492	GRI 401-3	
• Number of employees returned to work after parental leave	325	203	358	311	461		
Employee engagement level (%)	NA	66	66	67	68		3.5.4
Average training and development of employee (Days/Person)	NA	6	9	13	17	GRI 404-1	3.4.1
Average cost of hiring a new employee (Baht/Person)	235,370	312,963	235,321	123,000	97,264		3.4.1
Number of sites where human rights risks have been identified with mitigation plans (Sites)	89	97	107	49	47		3.3.4
Contribution for social and community development (Million Baht)	591	710	689	748	719		
• Contribution by SCG	410	437	516	494	414	GRI 201-1	3.6.3
• Contribution by SCG Foundation	181	273	173	254	305		
Employee volunteering during paid working hours (Million Baht)	55	106	87	82	82		3.6.3
In-kind giving: product or services donations, projects/partnerships or similar (Million Baht)	38	21	39	46	132		3.6.3
Management overheads related to CSR activity (Million Baht)	231	264	291	233	152		3.6.3

***** Under Thai laws, only female employees can take parental leave

Proportion of Employees by Age



Proportion of Employees by Nationality



Operating Results of Cement Business in Accordance with Global Cement and Concrete Association (GCCA)*

	Unit	2015	2016	2017	2018	2019
Number of facilities adopting GCCA Cement CO_2 Protocol	number of factory	6	6	6	6	6
	%	100	100	100	100	100
Absolute CO_2 emissions-Gross	million tons of CO_2	16.04	15.24	14.92	16.17	15.74
Absolute CO_2 emissions-Net	million tons of CO_2	15.79	15.00	14.68	15.91	15.42
Specific CO_2 emissions-Gross	$kgCO_2$/ton cementitious	653	651	662	669	647
Specific CO_2 emissions-Net	$kgCO_2$/ton cementitious	643	641	651	658	634
Heat consumption	MJ/ton clinker	3,317	3,319	3,372	3,455	3,479
Alternative fossil fuel	% by heat	5.0	5.0	5.0	4.9	6.2
Biomass	% by heat	8.3	6.9	6.1	7.0	11.3
Alternative raw materials in clinker produced	%	1.5	0.9	0.9	1.3	1.4
Alternative raw materials in cement produced	%	9.6	13.5	13.4	13.8	9.6
Total alternative raw materials	%	3.4	3.9	3.9	4.5	3.5
Clinker factor (cementitious)	%	76.7	76.0	75.6	74.8	74.4
Clinker produced with monitoring of Dust, NO_x, SO_2, VOC/THC, Heavy Metal and Dioxin (PCDD/F) (KPI1)**	%	99.23	99.17	99.17	99.24	99.29
Clinker produced using CEMs measurement of Dust, NO_x and SO_2 emissions (KPI2)**	%	-	-	86.56	90.15	87.31
Dust emissions (KPI3)**	tons	925	603	498	635	767
Specific dust emissions (KPI3)**	g/ton clinker	49	34	29	34	41
NO_x emissions (KPI3)**	tons	20,222	16,919	21,015	22,631	21,602
Specific NO_x emissions (KPI3)**	g/ton clinker	1,064	941	1,205	1,201	1,155
SO_2 emissions (KPI3)**	tons	239	158	717	561	760
Specific SO_2 emissions (KPI3)**	g/ton clinker	13	9	41	30	41
Clinker produced with monitoring of Dust, NO_x, SO_2 (KPI4)**	%	100	100	100	100	100
VOC/THC emissions (KPI3)	tons	694	864	801	632	641
Specific VOC/THC emissions (KPI3)	g/ton clinker	37	37	46	34	34

	Unit	2015	2016	2017	2018	2019
Mercury emissions (KPI3)	kg	16.51	14.95	14.53	112.28	84.21
Specific Mercury emissions (KPI3)	mg/ton clinker	0.87	0.84	0.84	6.00	4.50
Clinker produced with monitoring of VOC/THC and Mercury (KPI4)	%	99.23	99.17	99.17	99.24	99.29
Dioxin emissions (PCDD/F) (KPI3)	mg	2,035	1,048	237	271	72
Specific Dioxin emissions (PCDD/F) (KPI3)	mg/ton clinker	107.84	63.96	18.64	14.47	4.81
Clinker produced with monitoring of Dioxin (PCDD/F) (KPI4)	%	99.23	91.08	72.96	92.14	79.86
Quarries with rehabilitation plan in place	number of site	4	4	4	4	4
	%	100	100	100	100	100
Quarries with community engagement plan in place	%	100	100	100	100	100
Quarries with Biodiversity Management Plan in place	number of site	4	4	4	4	4
	%	100	100	100	100	100
Total water withdrawal	million cubic meter	13.38	10.33	10.28	10.24	10.12
Specific water withdrawal	liter/ton cementitious	545	442	448	433	433
Health and Safety* **						
Number of fatalities						
• Employee**	cases	0	0	0	0	0
• Contractor**	cases	6	1	2	0	2
• Third party	cases	2	4	4	3	9
Fatality rate of employee	cases/10,000 employees	0	0	0	0	0
Lost time injury frenquency rate of employee	cases/1,000,000 man-hours	NA	NA	NA	NA	0.15
Lost time injury frenquency rate of workplace contractor	cases/1,000,000 man-hours	0.00	0.19	0.06	0.07	0.25
Injury severity rate of employee	days/1,000,000 man-hours	NA	NA	NA	NA	6.70

NA = Not Available

* Data of cement plant in Thailand and in Year 2019 apply the reporting scope in accordance with GCCA Sustainability Guidelines

** Within KPMG's limited assurance scope (page 160)

*** In 2019, the scope of reporting covered only domestic operations for the transport of cement and ready mixed concrete

Subsidiaries included in Sustainability Report 2019*

	Business / Company	Production	Environment												Safety	Occupational Illness
			Energy		Air				Water					Waste		
			Thermal	Electricity	Dust	SO_x	NO_x	GHG	Water Withdrawal	Recycled Water	BOD	COD	TSS			
SCG																
1	The Siam Cement Public Company Limited															
Cement-Building Materials Business																
	Subsidiaries															
1	SCG Cement-Building Materials Co., Ltd.														✓	✓
2	SCG Cement Co., Ltd.														✓	✓
3	The Concrete Products and Aggregate Co., Ltd.	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	✓	✓	✓
4	The Siam Cement (Kaeng Khoi) Co., Ltd.	✓	✓	✓	✓	✓	✓	✓	✓	NR	NR	NR	NR	✓	✓	✓
5	The Siam Cement (Ta Luang) Co., Ltd. (Ta Luang/Khao Wong)	✓	✓	✓	✓	✓	✓	✓	✓	NR	NR	NR	NR	✓	✓	✓
6	The Siam Cement (Thung Song) Co., Ltd.	✓	✓	✓	✓	✓	✓	✓	✓	NR	NR	NR	NR	✓	✓	✓
7	The Siam Cement (Lampang) Co., Ltd.	✓	✓	✓	✓	✓	✓	✓	✓	NR	NR	NR	NR	✓	✓	✓
8	The Siam Refractory Industry Co., Ltd.	✓	✓	✓	✓	✓	✓	✓	✓	NR	NR	NR	NR	✓	✓	✓
9	ECO Plant Services Co., Ltd.	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	✓	✓
10	SCI Eco Services Co., Ltd.	✓	NR	✓	NR	NR	NR	✓	✓	NR	NR	NR	NR	✓	✓	✓
11	Q Mix Supply Co., Ltd.														✓	✓
12	Silathai Sanguan (2540) Co., Ltd.														✓	✓
13	Green Conservation Solution Co., Ltd.															
14	Silasanon Co., Ltd.														✓	✓
15	SCG Building Materials Co., Ltd.														✓	✓
16	The Siam Fibre-Cement Co., Ltd.															

	Business / Company	Production	Environment												Safety	Occupational Illness
			Energy		Air				Water					Waste		
			Thermal	Electricity	Dust	SO_x	NO_x	GHG	Water Withdrawal	Recycled Water	BOD	COD	TSS			
17	Siam Fibre Cement Group Co., Ltd. (Saraburi/Ta Luang/Thung Song/ Nongkae/Lumpang)	✓	✓	✓	✓	NR	✓	✓	✓	✓	NR	NR	NR	✓	✓	✓
18	SCG Landscape Co., Ltd. (Khonkaen/Thung Song/Ladkrabang/Lamphun/ Sriracha/Nongkae)	✓	✓	✓	NR	NR	NR	✓	✓	NR	NR	NR	NR	✓	✓	✓
19	Siam Fiberglass Co., Ltd.	✓	✓	✓	✓	✓	✓	✓	✓	NR	NR	NR	NR	✓	✓	✓
20	Cementhai Gypsum Co., Ltd.															
21	Cementhai Ceramics Co., Ltd.															
22	SCG Distribution Co., Ltd.															
23	BetterBe Marketplace Co., Ltd.															
24	SCG International Corporation Co., Ltd.														✓	✓
25	SCG Logistics Management Co., Ltd.														✓	✓
26	Nexter Living Co., Ltd.															
27	Nexter Ventures Co., Ltd.															
28	SCG Experience Co., Ltd.														✓	✓
29	SCG Skills Development Co., Ltd.															
30	The CPAC Roof Tile Co., Ltd. (Saraburi/Saraburi Nuestile/Nakorn Prathom/ Chonburi/Nakorn Rajchasrima/Lamphun/Khonkaen/Nakorn Sri Thammaraj)	✓	✓	✓	✓	NR	NR	✓	✓	NR	NR	NR	NR	✓	✓	✓
31	Thai Ceramic Roof Tile Co., Ltd.	✓	✓	✓	✓	✓	✓	✓	✓	✓	NR	NR	NR	✓	✓	✓
32	MRC Roofing Co., Ltd.															
33	The Siam Sanitary Fittings Co., Ltd. (Pathumthani/Nakorn Rajchasrima)	✓	✓	✓	✓	✓	✓	✓	✓	NR	NR	NR	NR	✓	✓	✓
34	Saraburirat Co., Ltd.	✓	✓	✓	NR	NR	NR	✓	✓	NR	NR	NR	NR	✓	✓	✓
35	Siam Sanitary Ware Co., Ltd.														✓	✓
36	Siam Sanitary Ware Industry Co., Ltd.	✓	✓	✓	✓	NR	✓	✓	✓	✓	NR	NR	NR	✓	✓	✓
37	Siam Sanitary Ware Industry (Nongkae) Co., Ltd.	✓	✓	✓	✓	NR	✓	✓	✓	✓	NR	NR	NR	✓	✓	✓
38	Quality Construction Products Public Company Limited (Bang Pa-in/Nongkae)	✓	✓	✓	✓	✓	✓	✓	✓	NR	NR	NR	NR	✓	✓	✓

	Business / Company	Production	Environment												Safety	Occupational Illness
			Energy		Air				Water					Waste		
			Thermal	Electricity	Dust	SO_x	NO_x	GHG	Water Withdrawal	Recycled Water	BOD	COD	TSS			
39	Q-Con Eastern Co., Ltd.	✓	✓	✓	✓	NR	✓	✓	✓	NR	NR	NR	NR	✓	✓	✓
40	SCGT Automobile Co., Ltd.															
41	Panel World Co., Ltd.														✓	✓
42	Sosuco Ceramic Co., Ltd.	✓	✓	✓	✓	✓	✓	✓	✓	✓	NR	NR	NR	✓	✓	✓
43	SCG-Sekisui Sales Co., Ltd.														✓	✓
44	SCG Yamato Express Co., Ltd.															
45	Jumbo Barges and Tugs Co., Ltd.	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
46	SCG Ceramics Public Company Limited	✓	✓	✓	✓	✓	✓	✓	✓	✓	NR	NR	NR	✓	✓	✓
47	Nexter Digital Co., Ltd.															
48	Nexter Retail Co., Ltd.															
49	SCG Retail Holding Co., Ltd.															
50	SCG-Boonthavorn Co., Ltd.															
51	Rudy Technology Co., Ltd.															
52	SCG-PSA Holdings Co., Ltd.															
53	Thai Connectivity Terminal Co., Ltd.	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
54	Bangkok Interfreight Forwarding Co., Ltd.	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
	Joint Ventures, Associates and Other Companies															
1	Sekisui-SCG Industry Co., Ltd.	✓	NR	✓	NR	NR	NR	✓	✓	NR	NR	NR	NR	✓	✓	✓
2	Noritake SCG Plaster Co., Ltd.	✓	✓	✓	✓	NR	✓	✓	✓	NR	✓	✓	✓	✓	✓	✓
3	SCG Nichirei Logistics Co., Ltd.	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR

	Business / Company	Production	Environment												Safety	Occupational Illness
			Energy		Air				Water					Waste		
			Thermal	Electricity	Dust	SO_x	NO_x	GHG	Water Withdrawal	Recycled Water	BOD	COD	TSS			
Chemicals Business																
	Subsidiaries															
1	SCG Chemicals Co., Ltd.														✓	✓
2	Thai Polyethylene Co., Ltd.	✓	✓	✓	NR	NR	NR	✓	✓	✓	✓	✓	✓	✓	✓	✓
3	SCG Plastics Co., Ltd.														✓	✓
4	SCG Performance Chemicals Co., Ltd.														✓	✓
5	Rayong Engineering & Plant Service Co., Ltd.														✓	✓
6	Protech Outsourcing Co., Ltd.														✓	✓
7	RIL 1996 Co., Ltd.	NR	NR	✓	NR	NR	NR	✓	NR	NR	NR	NR	NR	✓	✓	✓
8	Texplore Co., Ltd.														✓	✓
9	Vina SCG Chemicals Co., Ltd.															
10	Rayong Pipeline Co., Ltd.														✓	✓
11	Thai Plastic and Chemicals Public Company Limited	✓	✓	✓	NR	NR	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
12	TPC Paste Resin Co., Ltd.	✓	✓	✓	NR	NR	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
13	Nawa Plastic Industries Co., Ltd. (Rayong/Saraburi)	✓	✓	✓	NR	NR	NR	✓	✓	NR	✓	✓	✓	✓	✓	✓
14	Nawa Intertech Co., Ltd.	✓	✓	✓	NR	NR	NR	✓	✓	NR	✓	✓	✓	✓	✓	✓
15	Total Plant Service Co., Ltd.															
16	SCG Ico Polymers Company Limited	✓	✓	✓	NR	NR	NR	✓	✓	NR	NR	NR	NR	✓	✓	✓
17	Map Ta Phut Tank Terminal Co., Ltd.	NR	✓	✓	NR	NR	NR	✓	✓	NR	NR	NR	NR	✓	✓	✓
18	Map Ta Phut Olefins Co., Ltd.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	NR	✓	✓	✓
19	Rayong Olefins Co., Ltd.	✓	✓	✓	NR	NR	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
20	Flowlab & Service Co., Ltd.														✓	✓
21	SMH Co., Ltd.															

	Business / Company	Production	Environment												Safety	Occupational Illness
			Energy		Air				Water					Waste		
			Thermal	Electricity	Dust	SO_x	NO_x	GHG	Water Withdrawal	Recycled Water	BOD	COD	TSS			
	Associates and Other Companies															
1	Rayong Terminal Co., Ltd.	NR	✓	✓	NR	NR	NR	✓	✓	NR	NR	NR	NR	✓	✓	✓
2	Thai MMA Co., Ltd.	✓	✓	✓	NR	NR	✓	✓	✓	NR	✓	✓	✓	✓	✓	✓
3	Grand Siam Composites Co., Ltd.	✓	✓	✓	✓	NR	NR	✓	✓	NR	✓	✓	✓	✓	✓	✓
4	Thai MFC Co., Ltd.	✓	✓	✓	✓	✓	✓	✓	✓	✓	NR	NR	NR	✓	✓	✓
5	Siam Tohcello Co., Ltd.	✓	✓	✓	NR	NR	NR	✓	✓	NR	✓	✓	✓	✓	✓	✓
6	Bangkok Synthetics Co., Ltd.	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
	Packaging Business															
	Subsidiaries															
1	SCG Packaging Public Company Limited														✓	✓
2	Thai Paper Co., Ltd.	✓	✓	✓	✓	✓	✓	✓	✓	✓	NR	NR	NR	✓	✓	✓
3	Siam Kraft Industry Co., Ltd. (Kanjanaburi/Ratchaburi)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4	The Siam Forestry Co., Ltd.	✓	✓	✓	NR	NR	NR	✓	NR	NR	NR	NR	NR	NR	✓	✓
5	Panas Nimit Co., Ltd.														NR	NR
6	Thai Panason Co., Ltd.														NR	NR
7	Thai Panadorn Co., Ltd.														NR	NR
8	Thai Panaram Co., Ltd.														NR	NR
9	Suanpa Rungsaris Co., Ltd.														NR	NR
10	Siam Panawes Co., Ltd.														NR	NR
11	Thai Panaboon Co., Ltd.														NR	NR
12	Thai Wanabhum Co., Ltd.														NR	NR
13	Phoenix Pulp & Paper Public Company Limited	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
14	Phoenix Utilities Co., Ltd.															

	Business / Company	Production	Environment												Safety	Occupational Illness
			Energy		Air				Water					Waste		
			Thermal	Electricity	Dust	SO_x	NO_x	GHG	Water Withdrawal	Recycled Water	BOD	COD	TSS			
15	SCGP Excellence Training Center Co., Ltd.	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
16	SCG Paper Energy Co., Ltd.															
17	Thai Cane Paper Public Company Limited (Kanjanaburi/Prachinburi)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
18	Thai Containers Group Co., Ltd. (Navanakorn/Pathumthani/Samutprakarn/ Ratchaburi/Songkhla/Chonburi/Prachinburi/Saraburi/Kamphaeng Phet)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
19	Thai Containers Khonkaen Co., Ltd.	✓	✓	✓	✓	✓	✓	✓	✓	NR	NR	NR	NR	NR	✓	✓
20	Thai Containers Rayong Co., Ltd.	✓	✓	✓	✓	✓	✓	✓	✓	NR	✓	✓	✓	✓	✓	✓
21	Invenique Co., Ltd.															
22	TC Flexible Packaging Co., Ltd.															
23	Dyna Packs Co., Ltd.	✓	✓	✓	✓	✓	✓	✓	✓	NR	✓	✓	✓	✓	✓	✓
24	Orient Containers Co., Ltd.	✓	✓	✓	✓	✓	✓	✓	✓	NR	NR	NR	NR	✓	✓	✓
25	Tawana Container Co., Ltd.	✓	✓	✓	✓	✓	✓	✓	✓	NR	✓	✓	✓	✓	✓	✓
26	D-In-Pack Company Limited	✓	✓	✓	NR	NR	NR	✓	✓	NR	NR	NR	NR	✓	✓	✓
27	Prepack Thailand Co., Ltd. (Samutsakorn/Samut Songkhram/Rayong)	✓	✓	✓	✓	✓	✓	✓	✓	NR	✓	✓	✓	✓	✓	✓
28	Precision Print Co., Ltd.															
29	Conimex Co., Ltd.															
30	Visy Packaging (Thailand) Limited															
31	SCGP Solutions Co., Ltd.															
32	SCGP-T Plastics Company Limited															
33	SCGP Rigid Plastics Company Limited															
34	SKIC International Company Limited															

	Business / Company	Production	Environment												Safety	Occupational Illness
			Energy		Air				Water					Waste		
			Thermal	Electricity	Dust	SO_x	NO_x	GHG	Water Withdrawal	Recycled Water	BOD	COD	TSS			
Associates																
1	Siam Nippon Industry Paper Co., Ltd.	✓	✓	✓	NR	NR	NR	✓	✓	NR	NR	NR	NR	✓	✓	✓
Other																
Subsidiaries																
1	Cementhai Holding Co., Ltd.															
2	Cementhai Property (2001) Public Company Limited															
3	Property Value Plus Co., Ltd.															
4	SCG Accounting Services Co., Ltd.															
5	SCG Legal Counsel Limited															
6	CTO Management Co., Ltd.															
7	Siam Innovation Product and Solution Co., Ltd.															
8	SCG Learning Excellence Co., Ltd.															
9	Bangsue Industry Co., Ltd.															
10	Add Ventures Capital Co., Ltd.															
11	Add Ventures Capital International Co., Ltd.															
12	Siam GNE Solar Energy Co., Ltd.															

* Economic performance covers all significant subsidiaries, joint ventures, associates and other companies according to Annual Report 2019

NR = Non Relavance

Office/Investment/Sales/Service where the collection of environmental, safety and occupational illness data is not necessary

Greenfield (less than 3 years) or newly acquired companies (less than 4 years) is not required to incorporate data into SCG

GRI Content Index

SCG follows the Global Reporting Initiative's (GRI) Sustainability Reporting Standards in our Sustainability Report.
This report has been prepared in accordance with the GRI Standards: Comprehensive option.
General and topic-specific disclosures with a reference to external assurance in the GRI content index have been externally assured by an independent third party KPMG Phoomchai Audit Ltd. The Independent Assurance Reports is available in SCG's Sustainability Report on page 160 and 161.
The index below shows where the GRI disclosures are addressed in the Annual Report (AR), the Sustainability Report (SR) on SCG's website.

Standard	Disclosure	Location (AR, SR, others)	Disclosure/Comment	Assurance
GRI 102: General Disclosures				
Organizational profile				
102-1	Name of the organization	AR Cover, AR329		
102-2	Activities, brands, products, and services	AR14-27		
102-3	Location of headquarters	AR329		
102-4	Location of operations	AR32-53		
102-5	Ownership and legal form	AR329		
102-6	Markets served	AR13		
102-7	Scale of the organization	AR13		
102-8	Information on employees and other workers	AR88, SR137-138		
102-9	Supply chain	SR61-69		
102-10	Significant changes to the organization and its supply chain	AR12		
102-11	Precautionary Principle or approach	AR147-154		
102-12	External initiatives	AR22, AR128-129, SR139, SR156-157		
102-13	Membership of associations	SR127		
Strategy				
102-14	Statement from senior decision-maker	SR3-4		
102-15	Key impacts, risks, and opportunities	AR147-154		

Standard	Disclosure	Location (AR, SR, others)	Disclosure/Comment	Assurance
Ethics and integrity				
102-16	Values, principles, standards, and norms of behavior	AR126-131		
102-17	Mechanisms for advice and concerns about ethics	AR126-131		
Governance				
102-18	Governance structure	AR117-118		
102-19	Delegating authority	AR105-107, AR110-114		
102-20	Executive-level responsibility for economic, environmental, and social topics	AR110-114		
102-21	Consulting stakeholders on economic, environmental, and social topics	AR96-103		
102-22	Composition of the highest governance body and its committees	AR117		
102-23	Chair of the highest governance body	AR117		
102-24	Nominating and selecting the highest governance body	AR117-118		
102-25	Conflicts of interest	AR95		
102-26	Role of highest governance body in setting purpose, values, and strategy	AR89-90		
102-27	Collective knowledge of highest governance body	AR63-72		
102-28	Evaluating the highest governance body's performance	AR109-110		
102-29	Identifying and managing economic, environmental, and social impacts	AR147-154		
102-30	Effectiveness of risk management processes	AR148		
102-31	Review of economic, environmental, and social topics	AR61-62	Frequency of the board's review of sustainability impacts, risks, and opportunities	
102-32	Highest governance body's role in sustainability reporting	AR2-5, AR10, AR89-90		
102-33	Communicating critical concerns	AR148		
102-34	Nature and total number of critical concerns	AR147-154		
102-35	Remuneration policies	AR85-86		
102-36	Process for determining remuneration	AR85-86		
102-37	Stakeholders' involvement in remuneration	AR85-86		
102-38	Annual total compensation ratio	AR85-86		
102-39	Percentage increase in annual total compensation ratio	AR86		

Standard	Disclosure	Location (AR, SR, others)	Disclosure/Comment	Assurance
Stakeholder engagement				
102-40	List of stakeholder groups	AR96-103, SR10-12		
102-41	Collective bargaining agreements	SR137	100% of employees are covered by collective bargaining agreements	
102-42	Identifying and selecting stakeholders	AR96-103, SR10-14		
102-43	Approach to stakeholder engagement	AR96-103, SR10-14		
102-44	Key topics and concerns raised	AR96-103, SR10-14		
Reporting practice				
102-45	Entities included in the consolidated financial statements	AR32-53, SR141-147		
102-46	Defining report content and topic Boundaries	SR123-126		
102-47	List of material topics	SR17-20		
102-48	Restatements of information	SR123		
102-49	Changes in reporting	SR123		
102-50	Reporting period	SR123		
102-51	Date of most recent report	SR123		
102-52	Reporting cycle	SR123		
102-53	Contact point for questions regarding the report	SR126		
102-54	Claims of reporting in accordance with the GRI Standards	SR126		
102-55	GRI content index	SR148-155		
102-56	External assurance	SR158-161		
GRI 103: Management Approach				
103-1	Explanation of the material topic and its Boundary	SR17-20		
103-2	The management approach and its components	SR17-20		
103-3	Evaluation of the management approach	SR17-20		
GRI 200: Economic				
GRI 201: Economic Performance				
201-1	Direct economic value generated and distributed	AR10, SR127		
201-2	Financial implications and other risks and opportunities due to climate change	AR149, SR27-36		

Standard	Disclosure	Location (AR, SR, others)	Disclosure/Comment	Assurance
201-3	Defined benefit plan obligations and other retirement plans	-	Under company rules and regulations	
201-4	Financial assistance received from government	SR127		
GRI 202: Market Presence				
202-1	Ratios of standard entry level wage by gender compared to local minimum wage	SR137		
202-2	Proportion of senior management hired from the local community	SR137		
GRI 203: Indirect Economic Impacts				
203-1	Infrastructure investments and services supported	SR127		
203-2	Significant indirect economic impacts	SR127		
GRI 204: Procurement Practices				
204-1	Proportion of spending on local suppliers	SR62	Share of General Products and Services Spend are Local Procurement Spend (suppliers in Thailand)	
GRI 205: Anti-corruption				
205-1	Operations assessed for risks related to corruption	AR129-130		
205-2	Communication and training about anti-corruption policies and procedures	AR129-130		
205-3	Confirmed incidents of corruption and actions taken	AR131		
GRI 206: Anti-competitive Behavior				
206-1	Legal actions for anti-competitive behavior, anti-trust, and monopoly practices	AR131		
GRI 300: Environmental				
GRI 301: Materials				
301-1	Materials used by weight or volume	SR129		
301-2	Recycled input materials used	SR129		
301-3	Reclaimed products and their packaging materials	-	Information of reclaimed products and packaging materials are collected by business unit for efficient production and quality improvement	
GRI 302: Energy				
302-1	Energy consumption within the organization	SR131-132		Yes
302-2	Energy consumption outside of the organization	-	Data was collected by SCG Logistics of it's inbound/ outbound but for internal use only	
302-3	Energy intensity	SR131-132		

Standard	Disclosure	Location (AR, SR, others)	Disclosure/Comment	Assurance
302-4	Reduction of energy consumption	SR27-36, SR131-132		
302-5	Reductions in energy requirements of products and services	SR76-77		
GRI 303: Water				
303-1	Water withdrawal by source	SR87	Rainwater is counted as part of surface water	Yes
303-2	Water sources significantly affected by withdrawal of water	SR88	No water sources significantly affected by withdrawal of water	
303-3	Water recycled and reused	SR87-92, SR133		Yes
GRI 304: Biodiversity				
304-1	Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas	SR93-101		
304-2	Significant impacts of activities, products, and services on biodiversity	SR93-101		
304-3	Habitats protected or restored	SR93-101		
304-4	IUCN Red List species and national conservation list species with habitats in areas affected by operations	SR94		
GRI 305: Emissions				
305-1	Direct (Scope 1) GHG emissions	SR27-36, SR130		Yes
305-2	Energy indirect (Scope 2) GHG emissions	SR130		Yes
305-3	Other indirect (Scope 3) GHG emissions	-	Data was collected by SCG Logistics of it's inbound/ outbound but for internal use only	
305-4	GHG emissions intensity	SR130		
305-5	Reduction of GHG emissions	SR130		
305-6	Emissions of ozone-depleting substances (ODS)	-	Data not available	
305-7	Nitrogen oxides (NO_x), sulfur oxides (SO_x), and other significant air emissions	SR135		Yes
GRI 306: Effluents and Waste				
306-2	Waste by type and disposal method	SR134		Yes
306-3	Significant spills	SR136		
306-4	Transport of hazardous waste	-	Information of waste transportation are reported directly to the Minister of Industry comply with the Notification of Ministry of Industry on Industrial Waste Disposal 2005	

Standard	Disclosure	Location (AR, SR, others)	Disclosure/Comment	Assurance
GRI 307: Environmental Compliance				
307-1	Non-compliance with environmental laws and regulations	SR135		
GRI 308: Supplier Environmental Assessment				
308-1	New suppliers that were screened using environmental criteria	SR62-64	Environmental, Social and Governance (ESG) risk assessment were conducted 100% of procurement spent, including new suppliers	
308-2	Negative environmental impacts in the supply chain and actions taken	SR63	Number and coverage of supplier identified as having high Potential Sustainability (including environmental) Risk	
GRI 400: Social				
GRI 401: Employment				
401-1	New employee hires and employee turnover	SR138		
401-2	Benefits provided to full-time employees that are not provided to temporary or part-time employees	-	Employment contract of temporaly or part-time employees	
401-3	Parental leave	SR138	Under company rules and regulations	
GRI 402: Labor/Management Relations				
402-1	Minimum notice periods regarding operational changes	-	Under Labor Protection Act	
GRI 403: Occupational Health and Safety				
403-1	Workers representation in formal joint management-worker health and safety committees	SR137	Under Thai OH&S Law, at least 50% of workers at operational level must join Safety Committees	
403-2	Types of injury and rates of injury, occupational diseases, lost days, and absenteeism, and number of work-related fatalities	SR136-137		Yes
403-3	Workers with high incidence or high risk of diseases related to their occupation	AR148-149, SR136		
403-4	Health and safety topics covered in formal agreements with trade unions	-	Health and Safety topics, i.e. PPE and health surviellance, are covered in formal agreements with trade unions	
GRI 404: Training and Education				
404-1	Average hours of training per year per employee	AR100, SR138		
404-2	Programs for upgrading employee skills and transition assistance programs	AR88, SR111		
404-3	Percentage of employees receiving regular performance and career development reviews	-	100% of employees	

Standard	Disclosure	Location (AR, SR, others)	Disclosure/Comment	Assurance
GRI 405: Diversity and Equal Opportunity				
405-1	Diversity of governance bodies and employees	SR138		
405-2	Ratio of basic salary and remuneration of women to men	SR137		
GRI 406: Non-discrimination				
406-1	Incidents of discrimination and corrective actions taken	-	No case found	
GRI 407: Freedom of Association and Collective Bargaining				
407-1	Operations and suppliers in which the right to freedom of association and collective bargaining may be at risk	-	No case found	
GRI 408: Child Labor				
408-1	Operations and suppliers at significant risk for incidents of child labor	-	No case found	
GRI 409: Forced or Compulsory Labor				
409-1	Operations and suppliers at significant risk for incidents of forced or compulsory labor	-	No case found	
GRI 410: Security Practices				
410-1	Security personnel trained in human rights policies or procedures	-	100% of security personnel were trained by contracted company in accordance with SCG Supplier Code of Conduct	
GRI 411: Rights of Indigenous Peoples				
411-1	Incidents of violations involving rights of indigenous peoples	-	No case found	
GRI 412: Human Rights Assessment				
412-1	Operations that have been subject to human rights reviews or impact assessments	SR103-107		
412-2	Employee training on human rights policies or procedures	SR103-107		
412-3	Significant investment agreements and contracts that include human rights clauses or that underwent human rights screening	SR103-107		
GRI 413: Local Communities				
413-1	Operations with local community engagement, impact assessments, and development programs	SR115-121		
413-2	Operations with significant actual and potential negative impacts on local communities	SR115-121	No case found	

Standard	Disclosure	Location (AR, SR, others)	Disclosure/Comment	Assurance
GRI 414: Supplier Social Assessment				
414-1	New suppliers that were screened using social criteria	SR62-64		
414-2	Negative social impacts in the supply chain and actions taken	SR63		
GRI 415: Public Policy				
415-1	Political contributions	SR127		
GRI 416: Customer Health and Safety				
416-1	Assessment of the health and safety impacts of product and service categories	-	All products and services are assessed regarding health and safety impact by using the SCG Product Hazard Analysis guideline.	
416-2	Incidents of non-compliance concerning the health and safety impacts of products and services	-	No case found	
GRI 417: Marketing and Labeling				
417-1	Requirements for product and service information and labeling	SR76-80		
417-2	Incidents of non-compliance concerning product and service information and labeling	-	No case found	
417-3	Incidents of non-compliance concerning marketing communications	-	No case found	
GRI 418: Customer Privacy				
418-1	Substantiated complaints concerning breaches of customer privacy and losses of customer data	AR100-101, SR70-74	SCG Code of Conduct (page 35)	
GRI 419: Socioeconomic Compliance				
419-1	Non-compliance with laws and regulations in the social and economic area	-	No case found	

United Nations Global Compact (UNGC) Communication on Progress - Advanced Level

Criteria of UNGC Advanced Level		Disclose	
		AR	SR
Implementing the Ten Principles into Strategies & Operations	Criterion 1: The COP describes mainstreaming into corporate functions and business units	1	3-4
	Criterion 2: The COP describes value chain implementation	-	9, 10-12, 61-69 70-74, 76-80
- Robust Human Rights Management Policies & Procedures	Criterion 3: The COP describes robust commitments, strategies or policies in the area of human rights	167-169	20, 103
	Criterion 4: The COP describes effective management systems to integrate the human rights principles	98-101, 130-131	103, 162
	Criterion 5: The COP describes effective monitoring and evaluation mechanisms of human rights integration	169	15, 24, 104-107
- Robust Labour Management Policies & Procedures	Criterion 6: The COP describes robust commitments, strategies or policies in the area of labour	6-9	20, 108
	Criterion 7: The COP describes effective management systems to integrate the labour principles		108, 162
	Criterion 8: The COP describes effective monitoring and evaluation mechanisms of labour principles integration		15, 24, 109-114
- Robust Environmental Management Policies & Procedures	Criterion 9: The COP describes robust commitments, strategies or policies in the area of environmental stewardship	28-31	15, 19, 22-23, 27-36, 37-44, 81-86, 87-92, 93-101, 129-135
	Criterion 10: The COP describes effective management systems to integrate the environmental principles		
	Criterion 11: The COP describes effective monitoring and evaluation mechanisms for environmental stewardship		
- Robust Anti-Corruption Management Policies & Procedures	Criterion 12: The COP describes robust commitments, strategies or policies in the area of anti-corruption	127-131	-
	Criterion 13: The COP describes effective management systems to integrate the anti-corruption principle		
	Criterion 14: The COP describes effective monitoring and evaluation mechanisms for the integration of anti-corruption		
Taking Action in Support of Broader UN Goals and Issues	Criterion 15: The COP describes core business contributions to UN goals and issues	-	15
	Criterion 16: The COP describes strategic social investments and philanthropy		20, 115-121
	Criterion 17: The COP describes advocacy and public policy engagement		6-9, 17-24
	Criterion 18: The COP describes partnerships and collective action		162
Corporate Sustainability Governance and Leadership	Criterion 19: The COP describes CEO commitment and leadership	-	3-4
	Criterion 20: The COP describes Board adoption and oversight		5
	Criterion 21: The COP describes stakeholder engagement		10-14

Task Force on Climate-related Financial Disclosures (TCFD)

Recommendations		Disclose	
		AR	SR
GOVERNANCE	Disclose the organization's governance around climate-related risks and opportunities.		
	a) Describe the board's oversight of climate-related risks and opportunities.	147-148	5
	b) Describe management's role in assessing and managing climate-related risks and opportunities.		
STRATEGY	Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material.		
	a) Describe the climate-related risks and opportunities on the organization has identified over the short, medium, and long term.	148-154	27-36
	b) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.		
	c) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.		
RISK MANAGEMENT	Disclose how the organization identifies, assesses, and manages climate-related risks.		
	a) Describe the organization's processes for identifying and assessing climate-related risks.	147-154	5, 27-36
	b) Describe the organization's processes for managing climate-related risks.		
	c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.		
METRICS and TARGETS	Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.		
	a) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.	-	27-36
	b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.	29	130
	c) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.	29	130-132

Assurance Statements

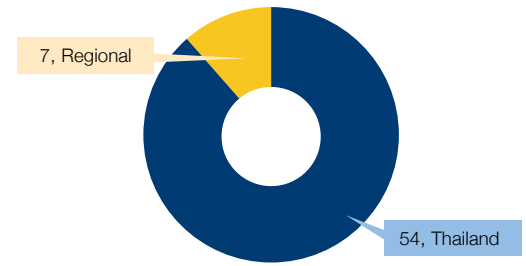
Environmental Performance Assurance Statement, 2019

SCG started implementing the Environmental Performance Assessment Program (EPAP) since 2001. Up to 2019, 61 subsidiaries in total have participated, which totals to 216 assessments conducted. The participating subsidiaries are those required by SCG criteria considering the business type, and activities with potential environmental impacts. Since 2013, the assessment criteria reference sustainable development framework, with relevance to the environment. This enables benefits to the assessed subsidiaries, drives for environmental performance improvement and ensuring the alignment with SCG's sustainable development policy. Notably, the scope of assessment comprises of 5 main elements: Governance, Supply Chain, Operations, Products and Services, and Stakeholder Relation and Communication. Each participating subsidiary is assessed every 3 years.

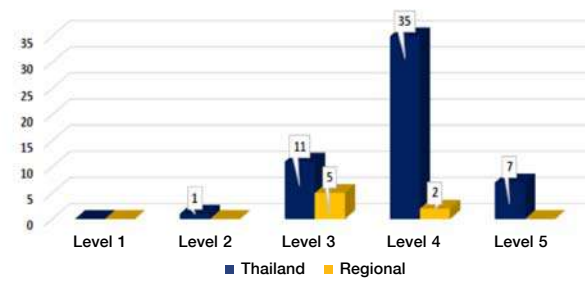
EPAP Level
Level 1: Denial
Level 2: Reactive
Level 3: Assurance
Level 4: Business Integration and
Level 5: Leadership

Assessment result from each company will be categorized into 5 levels, with considerations given to Management System, Compliance, Effectiveness, and Performance of the operations according to the assessment criteria.

Number of Subsidiaries in Thailand and Regional



EPAP Level



Past assessment results demonstrate that, for the most parts, each subsidiary in SCG has continuous improvement in environmental management. Until presently, there are 61 companies eligible for the assessment, with 54 companies basing in Thailand, and 7 other companies internationally. Overall, 11% (7 companies) has their environmental performance at level 5, 61% (37 companies) at level 4, 26% (16 companies) at level 3, and 2% (1 company) at level 2.

2019 Assessment results covers 4 companies in total. The overall management in each aspect and issue, which received an emphasis from SCG, in order to ascertain achievement of sustainable business goals, are as follows.

Governance

Top management of each subsidiary is involved in defining sustainability strategy, targets, and sustainable development plans, in establishing the organization and functions responsible for monitoring and reporting of environmental performance to achieve the defined targets. There are also risk assessment process, control measures, and mitigation measures, to ensure effectively management of key risks. Furthermore, the Company also gives priority to enhancement of knowledge, sustainable development capacity for companies basing outside Thailand. This is to ensure that the performance is consistent and alignment in the same direction throughout the entire Company. However, some subsidiaries should review non-technical risks, which may generate environmental impacts, such as new production line which may generate increasing of water consumption and exceeding the limit of water permit (international plant), etc. Some subsidiaries should enhance their emergency preparedness and response plans to be more comprehensive, such as conducting drill in the case of gas leak from gasifier, and coal gas piping (international plant) which may impact to the nearby communities and practice of emergency response for chlorine leak with communities (Thailand plant).

Supply Chain

There are risks management process and expansion of partnership opportunity with suppliers and contractors, in order to elevate environmental work of critical suppliers and contractors. The program is implemented in subsidiaries operating in Thailand and internationally, by applying the mentioned process in the selection and contract management systematically. This is because the implementation may differ for each business and subsidiary. Therefore, some subsidiaries should integrate environmental issues in supplier and business partner management to increase the efficiency, such as the integration of selection criteria and contracts to be thorough and specific to environmental and social risks, as well as the development and establishment of performance evaluation of suppliers and contractors, to infer to effectiveness of environmental performance.

Operations

There is a process of environmental risk analysis, to establish a control measure of critical risks. Mostly, the operations are in compliance of the law, a minimum standard. In addition, some subsidiaries enhance the improvement of working environmental conditions including installation of pollution control equipment in order to reduce environmental impacts and community concerns e.g. dust collector and desulfurizer for the tiles plant in overseas. However, most subsidiaries need to review and enhance the program to reduce energy consumption and GHG emission to achieve the defined targets. As well as, a few subsidiaries should review the program to control dust (lime mud) and water leak from machine and equipment to ensure ambient air quality and water reduction are well managed. Moreover, the effective environmental data verification should be extended to international companies.

Product and Service

Most subsidiaries implemented the new product research and development which is in lined with circular economy policy of SCG and some Business Units conducted Life Cycle Analysis (LCA) for the main product to assess key impacts from the products of BUs. Furthermore, subsidiaries have expanded the environmental label certification, SCG eco value, to international companies. However, some subsidiaries should clearly integrate environmental aspects in the new product development process and establish a guideline for the utilization of LCA's results, to facilitate the reduction of environmental impacts in the critical process or component of the products' life cycle, as well as creating business opportunities for these products, including data verification of impact assessment at an appropriate duration (such as every 3 years) by third party.

Stakeholder Relation and Communication

Stakeholder identification and prioritization are thoroughly conducted, including establishing strategic approach for collaboration with external parties, as well as surveying critical stakeholders' opinions for improvement in the subsidiary's stakeholder engagement. However, some subsidiaries should expand the scope of stakeholder survey to contractors to enhance the level of engagement. Some subsidiaries should expand the scope of complaint record apart from receiving the formal letter from stakeholders to ensure the corrective actions and engagement program are in place for all concerns raised from all key stakeholders.

Plerngtape Chamikorn
Country Managing Partner
ERM-Siam Co., Ltd., 28 April 2020

ERM

ERM is a global provider of environmental, social and corporate responsibility consulting and assurance services. We have worked with over half of the world's 500 largest companies, in addition to numerous governments, international organizations and NGOs.

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Independent Limited Assurance Report

To the Sustainable Development Committee of The Siam Cement Public Company Limited ("SCG")

Conclusion

Based on the procedures performed, as described below, nothing has come to our attention that causes us to believe that the selected subject matters ("Subject Matters") identified below and included in the Sustainability Report 2019 (the "Report") for the year ended 31 December 2019, are not, in all material respects, prepared in compliance with the reporting criteria (the "Criteria").

Our Responsibilities

We have been engaged by SCG and are responsible for providing a limited assurance conclusion in respect of the Subject Matters for the year ended 31 December 2019 to be included in the Report as identified below.

Our assurance engagement is conducted in accordance with the International Standard on Assurance Engagements ISAE 3000 Assurance Engagements other than Audits or Reviews of Historical Financial Information and ISAE 3410 Assurance on Greenhouse Gas Statements. These standards require the assurance team to possess the specific knowledge, skills and professional competencies needed to provide assurance on sustainability information, and that we plan and perform the engagement to obtain limited assurance on whether the Subject Matters are prepared, in all material respects, in compliance with the Criteria. We have complied with the requirements of the Code of Ethics for Professional Accountants issued by the International Ethics Standards Board for Accountants to ensure their independence. The firm applies International Standard on Quality Control 1 and accordingly maintains a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

We have not been engaged to provide an assurance conclusion on any other information disclosed within the Report.

Subject Matters

Subject Matters comprised of the following data expressed numerically or in descriptive text for the year ended 31 December 2019:

a) GRI Standards disclosure topics

- GRI 302-1 Energy consumption within the organization
- GRI 303-1 Water withdrawal by source
- GRI 303-3 Water recycled and reused
- GRI 305-1 Direct (Scope 1) GHG emissions
- GRI 305-2 Energy indirect (Scope 2) GHG emissions
- GRI 305-7 Nitrogen oxides (NO_x), sulfur oxides (SO_x), and other significant air emissions
- GRI 306-2 Waste by type and disposal method
- Types of injury, injury rate, lost day rate, occupational illness frequency rate, and work-related fatalities, for all employees, with a breakdown by region and gender, where appropriate
- Types of injury, injury rate, lost day rate, and work-related fatalities, for all workers (excluding employees) whose work, or workplace, is controlled by the organization, with a breakdown by region and gender, where appropriate

b) GCCA Sustainability Guidelines topics

- % of clinker produced by kilns covered by a monitoring system (dust, NO_x, Sulfur Dioxide (SO_2), VOC/THC, heavy metals, and PCDD/F) (KPI 1) (%)
- % of clinker produced by kilns covered by a continuous monitoring system (dust, NO_x, and SO_2) (KPI 2) (%)
- Dust emission (KPI 3) (tons)
- Specific dust emission (KPI 3) (g/ton clinker)
- NO_x emission (KPI 3) (tons)
- Specific NO_x emission (KPI 3) (g/ton clinker)
- SO_2 emission (KPI 3) (tons)
- Specific SO_2 emission (KPI 3) (g/ton clinker)
- % of clinker produced by kilns covered by a monitoring system (dust, NO_x, SO_2) (KPI 4) (%)

Criteria

The Subject Matters were assessed according to the following criteria:

- The Sustainability Reporting Standards of the Global Reporting Initiative ("GRI Standards"): Comprehensive Option;
- The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard issued by the World Business Council for Sustainable Development and World Resources Institute ("WBCSD/WRI-GHG"); and
- GCCA Sustainability Guidelines for the monitoring and reporting of emissions from cement manufacturing (November 2018).

Sustainable Development Committee's responsibilities

The Sustainable Development Committee of SCG is responsible for the preparation and presentation of the Subject Matters, specifically ensuring that in all material respects the Subject Matters are prepared and presented in accordance with the Criteria. This responsibility also includes the internal controls relevant to the preparation of the Report that is free from material misstatement whether due to fraud or error.

Procedures performed

In forming our limited assurance conclusion over the Subject Matters, our procedures consisted of making enquiries and applying analytical and other evidence gathering procedures including:

- Interviews with senior management and relevant staff at corporate and operating sites;
- Inquiries about the design and implementation of the systems and methods used to collect and process the information reported, including the aggregation of source data into the Subject Matters;
- Inquiries about managements practices and procedures related to identifying stakeholders and their expectations, determining material sustainability matters and implementing sustainability policies and guidelines;
- Visits to 8 sites, selected on the basis of risk analysis including the consideration of both quantitative and qualitative criteria;
- Agreeing the Subject Matters to relevant underlying sources on a sample basis to determine whether all the relevant information has been included in the Subject Matters and prepared in accordance with the Criteria.

The procedures performed in a limited assurance engagement vary in nature and timing from, and are less in extent than for, a reasonable assurance engagement and consequently the level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had a reasonable assurance engagement been performed. Accordingly, we do not express a reasonable assurance opinion.

Inherent limitations

Due to the inherent limitations of any internal control structure, it is possible that errors or irregularities in the information presented in the Report may occur and not be detected. Our engagement is not designed to detect all weaknesses in the internal controls over the preparation and presentation of the Report, as the engagement has not been performed continuously throughout the period and the procedures performed were undertaken on a test basis.

Restriction of use of our report

Our report should not be regarded as suitable to be used or relied on by any party wishing to acquire rights against us other than SCG, for any purpose or in any other context. Any party other than SCG who obtains access to our report or a copy thereof and chooses to rely on our report (or any part thereof) will do so at its own risk. To the fullest extent permitted by law, we accept or assume no responsibility and deny any liability to any party other than SCG for our work, for this independent limited assurance report, or for the conclusions we have reached.

KPMG Phoomchai Audit Ltd.

KPMG Phoomchai Audit Ltd.
Bangkok
30 April 2020

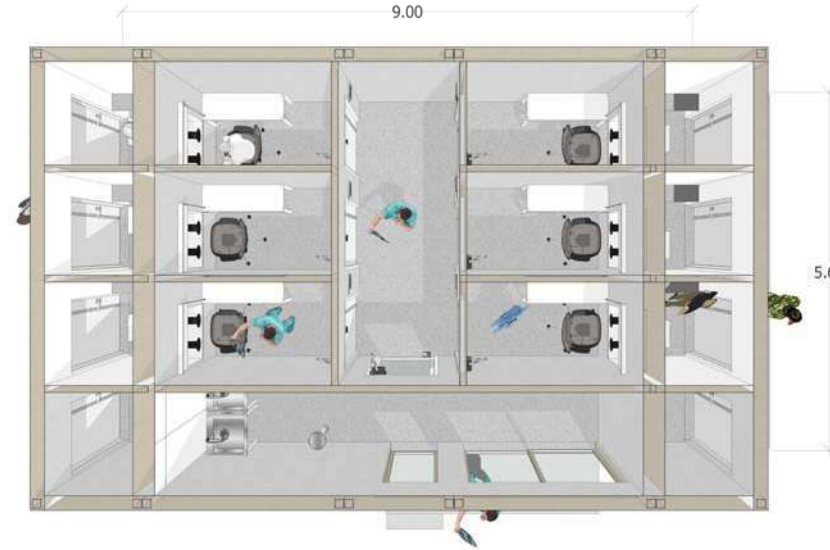
SCG Unites against COVID-19

Beginning in late 2019, the COVID-19 pandemic, caused by the novel coronavirus 2019, has created devastating and extensive impact across the world, with over two million cases of infection and over 100,000 deaths thus far. One of the key measures that will help stop the transmission is to track down infected individuals and place them in medical facilities with effective virus control. At the frontline in this combat against the coronavirus are healthcare professionals who are in contact with patients and, in the process, expose themselves to the risk of contracting the disease. This issue is further compounded by the fact that there are a limited number of specialists available while the total number of cases continues to rise every day. Therefore, any infection among medical professionals will be a serious setback to the efforts to control the situation.

SCG recognizes the importance of cooperating with all sectors in order to prevent the transmission of COVID-19 during the screening of suspected cases and the treatment of patients by introducing measures or equipment that can help protect doctors and nurses, who play an active role in driving down the number of new cases. Leveraging its innovation capacity, SCG has thus joined forces with medical institutes to design and develop innovations that help prevent COVID-19 transmission, such as modular screening units, modular swab units, isolation chambers for indoor use, and other medical equipment. As there is high demand for them, these high-quality medical innovations have been given to hospitals to enable them to efficiently carry out medical procedures, from testing and screening suspected cases to treating COVID-19 patients until they have fully recovered.

Modular Screening Unit

Assembled using the innovative modular system of SCG HEIM, each modular screening unit takes seven days to manufacture in the factory and only 2-3 days to install in hospitals. They are used for screening suspected cases. Carrying out procedures from inside these modular units, medical professionals can see people being



“Our victory over COVID-19 depends not on medication but rather on cooperation. This innovation can speed up testing processes. The faster we can detect an infection, the faster we can take care of the patient.”

Assoc. Prof. Surasak Leelaudomlipi, M.D.
Director of Ramathibodi Hospital

tested through glass panes and talk to them to take a medical history through intercom systems.

Each modular screening unit has a two-door anteroom. Inside, the air is pressurized to maintain positive pressure and prevent the air outside from flowing in, which helps maintain the quality and safety of the air in the room. Each unit is equipped with a ventilation system that consists of UV disinfection, HEPA filters, and a bio-polar ion disinfection system, while the person being tested will be on the other side, out in the open air.

The modular screening unit is offered in two sizes, namely the large unit, which has six testing rooms, and the small unit, which has three testing rooms, to suit different space sizes available in hospitals.

Modular Swab Unit

Taking swab samples is a high-risk procedure for medical professionals. Therefore, the modular swab unit is designed to be well-sealed and divided into two rooms to separate doctors from people getting tested, with each having its own entrance. The medical room is a sealed room with positive pressure to prevent outside air in and keep the air inside germ-free. The patient room, on the other hand, has semi-negative or negative pressure, which prevents viruses from dispersing out, and is equipped with a vent that is outfitted with UV light bulbs and HEPA filters to prevent the germs from getting out. The two rooms are connected through a glass pane with two glove ports, which enable doctors to collect nasal swabs. As a result, these modular swab units reduce not only contact with the germs but also the use of personal protective equipment (PPE).

The modular swab unit comes in two sizes: the large unit with has six testing rooms and the small unit with three testing rooms, enabling hospitals to select options that suit their spaces. It is assembled with SCG HEIM’s innovative modular system; each modular swab unit takes seven days to manufacture in the factory and only 2-3 days to install in hospitals.

"This equipment has allowed a large number of patients to get tested quickly and safely."

Assoc. Prof. Somboon Subwongcharoen, M.D.
Head of the General Surgery Unit,
Rajavithi Hospital

Negative/Positive Pressure Isolation Chamber for Indoor Use

Fast and easy to install and highly mobile, the isolation chamber is a mobile booth assembled from an aluminum alloy frame and PVC sheets. Each examination room consists of three isolation chambers for doctors or patients to get inside. The front part of each chamber is a clear plastic sheet, allowing the doctor or the nurse to communicate with the patient. The plastic sheet is outfitted with glove ports, allowing medical professionals to carry out procedures. Depending on the pre-production requirements of a hospital, each unit can be manufactured to have either negative or positive pressure. Air is either sucked out of or pumped into the chamber through a pressure regulator as well as HEPA air filters. Each unit is also mounted on top with a grille fitted with fillet filters that can capture germs.

SCG has also developed mobile negative pressure isolation chambers for outdoor use, which are constructed with sturdy metal frames and SCG Smartboards.

Negative Pressure Isolation Room for Indoor Use

The negative pressure isolation room is designed to prevent disease transmission while doctors and nurses are working in emergency rooms, intensive care units, or regular patient rooms, allowing them to treat the patient lying in bed without having to move the patient or other life-saving equipment. Consisting of a strong metal frame covered with canvas and clear plastic PVC sheets, the easy-installation isolation room takes only 30 minutes to assemble or disassemble. The negative pressure

"We have collaborated with SCG to develop an innovation of our dream. This dream is within the realm of possibility, which is to take care of our patients while ensure both their and our safety."

Pirapat Mokarapong, M.D.
Head of Cardiovascular Thoracic Surgery Unit, Rajavithi Hospital

prevents germs from leaking out, while HEPA filters help capture microscopic particulate matters, such as PM 2.5, bacteria, and viruses.

Each unit has double-doored where medical staff change and dispose of infectious waste in the first part and a second part with enough space for patient bed. The walls have openings for inserting equipment, such as breathing tubes, as well as glove ports, allowing doctors to carry out medical procedures from outside the isolation room.

Other Innovations

SCG has also contributed various innovations in support of healthcare practitioners:

• Patient Isolation Capsule and Small-sized Patient Isolation Capsule: For use with CT Scan.

• Telemonitoring equipment: It enables access to real-time online health data through the Internet of Things (IoT) for monitoring infected patients or those placed in quarantine and reducing contact between medical staff and patients.

• Aerosol boxes: These clear acrylic boxes are used for breathing tube insertion.

• Dent Guard: To prevent dispersion of germs in dental treatment.

• Modular bathrooms: Made from lightweight pre-fabricated concrete structures, these bathrooms are easy to disinfect and designed for both medical professionals and patients beting tested.

In addition, SCG has lent other forms of support to combat the COVID-19 outbreak. For instance, SCG Express, in collaboration with the National Institute of Emergency Medicine, helped deliver personal protective equipment and related supplies donated by the general public, such as face masks, alcohol-based hand sanitizers, and PPE suits to various networks,

foundations, and local administrative offices nationwide. SCG also donated alcohol-based hand sanitizers to Bangkok Metropolitan Administration for distribution to densely-populated communities and street cleaners as well as gave Fest, food container products, to public hospitals. The Company also granted CT scanners that can quickly test and screen patients to hospitals and recruited volunteers to make face shields and cloth face masks, which were then given to medical staff at various hospitals as well as the general public.

SCG strives to take care of everyone to help Thailand overcome this crisis.

Business Operation during the COVID-19 Outbreak

SCG has cooperated with the government in enforcing social distancing to stop the spread of COVID-19. To this end, it has implemented a work from home (WFH) policy, requesting employees to work from their places of residence and go to their office only when necessary. To facilitate this new practice, the Company has introduced an online employee scheduling system, provided teleconferencing tools and online training sessions to support them, and launched a daily health report system so as to keep track of their health and be able to give them assistance in a timely manner.

Every employee coming to work at their office is required to undergo temperature screening before entering the premises. Sanitizers are also provided across the area, while adjustments have been made to enforce social distancing in every part of the office, such as cafeterias. The Company has also offered a food delivery service that brings food right to their desks. Furthermore, the CEO communicates with the employees online every week to boost their morale, offer advice on how to navigate their personal and work lives during the COVID-19 situation, and unite everyone in the organization in preparation the impending global economic crisis.

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