Welcome to your CDP Climate Change Questionnaire 2022

C0. Introduction

C0.1

(C0.1) Give a general description and introduction to your organization.

Company Profile

PT Semen Indonesia (Persero) Tbk (SIG) is one of the largest company in building material sector in Southeast Asia. It is providing building material solutions, which are cement, readymix, and other building material solutions. SIG is an Stated Owned Enterprise with 51% of it shares owned by the Government of Indonesia and it was established in 1957. SIG cement production capacity is 52.6 million tons per year in 8 locations in Indonesia (50.3 million tons) and Vietnam (2.3 million tons). SIG is a holding company with subsidiaries conducting cement related business activities, from production, distribution, manufacturing downstream cement products/services, and other supporting business. Cement production segment of SIG contribute more than 75% of SIG revenue in 2020.

Cement manufacturing begins with mining and then grinding raw materials that include limestone, silica stone, iron sand and clay, to a fine powder, called raw meal, which is then heated to a sintering temperature in a cement kiln. In this process, the chemical bonds of the raw materials are broken down and then they are recombined into new compounds. The result is called clinker, which then ground to a fine powder in a cement mill and mixed with other additional materials to create cement.

In cement business, emissions are produced mostly during the process of clinker production & electricity generation from our power plant (scope 1), and electricity from national grid (scope 2).

Sustainability Strategy

As a part of our long term strategy, Sustainability issue become our concern which is part of pillar in strategy implementation. As a prove of that commitment SIG design the future of sustainability strategy on SIG Sustainability Roadmap 2030. As part of State-owned Enterprise, SIG carries the mandate to deliver the greatest benefit for the society as well as the country. The company's commitment that is explained on the roadmap are our commitment to develop and support 3 pillars such Driving Sustainable Solutions & Innovations, Protecting The Environment, and Creating Value For Peoples & Communities. These three pillars are supported by Board Commitment and supervision, Governance, Sustainability Policy and Risk Management.

These three pillars describe more details into 11 topics which are Sustainable Product & Services and Sustainable Procurement (Pillar : Driving Sustainable Solutions & Innovation), Climate & Energy, Circular Economy, Air Emission, Water, and Biodiversity (Pillar : Protecting The Environment), Employment, Occupational Health & Safety, Ethics & Compliance, and Community Development (Pillar : Creating Values for Peoples & Communities)

SIG supports Indonesia’s commitment to COP21 through emission reduction and reduction of energy consumption.

SIG committed to use all materials in a responsible manner by using raw materials efficiently through product development and utilizing renewable resources (waste-derived) as alternative fuels.

And as we value our people and community highly, we committed to promote health and safety for employees and contractors as well as creating shared values for community

C0.2

(C0.2) State the start and end date of the year for which you are reporting data.

	Start date	End date	Indicate if you are providing emissions data for past reporting years	Select the number of past reporting years you will be providing emissions data for
Reporting year	January 1, 2021	December 31, 2021	Yes	2 years

C0.3

(C0.3) Select the countries/areas in which you operate.

Indonesia

C0.4

(C0.4) Select the currency used for all financial information disclosed throughout your response.

IDR

C0.5

(C0.5) Select the option that describes the reporting boundary for which climate-related impacts on your business are being reported. Note that this option should align with your chosen approach for consolidating your GHG inventory.

Financial control

C-CE0.7

(C-CE0.7) Which part of the concrete value chain does your organization operate in?

Limestone quarrying
Clinker production
Portland cement manufacturing
Blended cement
Alternative 'low CO2' cementitious materials production
Aggregates production
Concrete production

C0.8

(C0.8) Does your organization have an ISIN code or another unique identifier (e.g., Ticker, CUSIP, etc.)?

Indicate whether you are able to provide a unique identifier for your organization	Provide your unique identifier
Yes, a Ticker symbol	SMGR

C1. Governance

C1.1

(C1.1) Is there board-level oversight of climate-related issues within your organization?

Yes

C1.1a

(C1.1a) Identify the position(s) (do not include any names) of the individual(s) on the board with responsibility for climate-related issues.

Position of individual(s)	Please explain
Other, please specify Sustainability Committee	As a commitment, SIG published its governance structure to manage strategically and tactical - operational. At strategic level, sustainability committee has been assigned to direct, monitor, and evaluate the implementation of climate-related initiative that has been stated in SIG Sustainability Roadmap 2030. This committee ensure all initiative well implemented. This committees are consisted of Board of Director who acted as Steering committee who directing the implementation sustainability roadmap. Beside steering committee, there are also organizing committee who are lead by GM of Sustainability that is responsible to implementing all related sustainability initiative, especially climate-related issue.
Chief Operating Officer (COO)	COO is actively directing operational of production in all plant. This directive is mitigating the impact of production emission. With its accountability, COO can directly involved managing climate-related issue such as reducing clinker factor (as a main factor of GHG emission within the process), made process as efficient as possible on energy usage, etc. COO is also directly involved in oversee the issue of climate risk. As Department of Sustainability under its coordination, COO also monitoring directly on implementation of SIG Sustainability Roadmap
Other, please specify GM of Sustainability	GM of Sustainability acting as a leader on tactical-operational on managing sustainability issues. GM of Sustainability coordinated all related function to implement SIG Sustainability Roadmap that has been approved by Board of Director. As a strategic arm of Sustainability Committee, GM of Sustainability monitor and evaluate periodically every sustainability initiative and indicator. This monitoring record, will eventually be presenting in Sustainability Committee meeting

C1.1b

(C1.1b) Provide further details on the board's oversight of climate-related issues.

Frequency with which climate-related issues are a scheduled agenda item	Governance mechanisms into which climate-related issues are integrated	Please explain
Other, please specify Scheduled monthly	Reviewing and guiding strategy	SIG has dedicated committee with a specific responsibility on Sustainability-related issues. The committee consist of all Board of Director

	Reviewing and guiding major plans of action Reviewing and guiding risk management policies Reviewing and guiding annual budgets Reviewing and guiding business plans Setting performance objectives Monitoring implementation and performance of objectives Overseeing major capital expenditures, acquisitions and divestitures Monitoring and overseeing progress against goals and targets for addressing climate-related issues	(as Steering Committee) and Top Level Management (Organizing Committee). This committee's mission is to provide advice on strategic direction of sustainability related issues, as well as climte related issue. The roles & responsibilities of this committee has developed year by year as we committed to integrate all specific sustainability issue embedded to SIG strategy and operational.

C1.1d

(C1.1d) Does your organization have at least one board member with competence on climate-related issues?

	Board member(s) have competence on climate-related issues
Row 1	Not assessed

C1.2

(C1.2) Provide the highest management-level position(s) or committee(s) with responsibility for climate-related issues.

Name of the position(s) and/or committee(s)	Responsibility	Frequency of reporting to the board on climate-related issues
Sustainability committee	Both assessing and managing climate-related risks and opportunities	More frequently than quarterly
Chief Operating Officer (COO)	Both assessing and managing climate-related risks and opportunities	More frequently than quarterly

Other, please specify GM of Sustainability	Both assessing and managing climate-related risks and opportunities	More frequently than quarterly
Chief Executive Officer (CEO)	Both assessing and managing climate-related risks and opportunities	More frequently than quarterly

C1.2a

(C1.2a) Describe where in the organizational structure this/these position(s) and/or committees lie, what their associated responsibilities are, and how climate-related issues are monitored (do not include the names of individuals).

1. Sustainability Committee / Board of Directors (BoD)
Sustainability Committee was lead by BoD. The BoD oversees the overall performance of the Company, including climate related performance. The BoD reported to the Board of Commissioners (BoC) regularly on monthly BoD and BoC meeting regarding overall execution of the Company strategi initiatives including climate related initiatives and achievement. BoC will conduct supervision and monitoring as well as provide advice to the BoD on the performance against key indicators. BoD also have authority to approve capex up to certain amount, and for capex with amount more than the BoD threshold will be approved by BoC.

2. Chief Executive Officer (CEO)
CEO acting as a leader in directing implementation of SIG Sustainability Roadmap 2030. CEO advising and overseeing the best way and overall implementation of Sustainability across the company. As well as Corporate Strategy, Sustainability strategy also was monitored regularly, specifically for the issues that related to the big risk of the company. ESG has been identified as one of the corporate risk that the company should be monitored and mitigated. All indicator related to the success of the strategy evaluate by time to time

3. Director of Production/Chief Operating Officer
Director of Production is member of Board of Directors. Specific initiative execution related to climate issue is become the responsibility of Director of Production. Director of Production conduct oversight across SIG operating unit Operating companies) on the implementation of climate related initiatives in each operating company under SIG. Director of Production then reports to the Board of Directors regularly on monthly perfomance meeting regarding the execution of climate related strategy and other sustainability aspect under his responsibility (other sustainability strategy executions lie under other member of Directors).

4. GM of Sustainability (GMS)
GM of Sustainability (GMS) acting as a leader of operational strategy. GMS coordinate across all function that related to all pillar in SIG Sustainability Roadmap 2030. As an operational leader, GMS make sure that all related initiative are performed on time, on budget, and on scope. In Sustainability Committee, GMS acting as a lead of Organizing Committee, The member of sustainability committee that implement sustainability strategy. Before deciding to the BOD level, GMS make sure deadline and the performance.

C1.3

(C1.3) Do you provide incentives for the management of climate-related issues, including the attainment of targets?

	Provide incentives for the management of climate-related issues	Comment
Row 1	Yes	The appraisal results of the overall performance of the Board of Directors (BOD) and the performance of each member of the BOD are a means of assessing and increasing the effectiveness of the BOD as well as being an integral part of providing compensation schemes for the Directors. The BOD performance appraisal is carried out by the Board of Commissioners based the BOD's collective and individual Directors' performance towards the company's achievements in accordance with the criteria set and KPIs approved by the Board of Commissioners, including KPIs related to sustainability and climate aspects. The achievement of KPI is one of the indicators used in the proposed amount of remuneration for the Board of Directors that will be proposed at the GMS.

C1.3a

(C1.3a) Provide further details on the incentives provided for the management of climate-related issues (do not include the names of individuals).

Entitled to incentive	Type of incentive	Activity incentivized	Comment
Board/Executive board	Monetary reward	Company performance against a climate-related sustainability index	As described earlier, we are designing performance review as collectively all member of Board of Director. One of the indicator that has been measured and monitor related to the performance of reducing GHG emission. This indicator also will determined how many incentive that the BOD will get depends on their performance controlling climate-related risk.

C2. Risks and opportunities

C2.1

(C2.1) Does your organization have a process for identifying, assessing, and responding to climate-related risks and opportunities?

Yes

C2.1a

(C2.1a) How does your organization define short-, medium- and long-term time horizons?

	From (years)	To (years)	Comment
Short-term	0	1	
Medium-term	1	3	
Long-term	3	10	

C2.1b

(C2.1b) How does your organization define substantive financial or strategic impact on your business?

In order to achieve its goals and maintain optimum and sustainable growth effectively, since 2005 SIG consistently developed a professional and responsible corporate governance practice by, among others, implementing the Integrated Enterprise Risk Management (ERM) system, which also continuously improved, in the group's management system. Thus in SIG, ERM system has also been consistently implemented in all business processes as well as strategic and operational decision-making which covers strategies, market, reputational, environmental, climate change, logistic, legal, financial, sustainability, compliance, governance, and so on.
The risk assessment process is carried out throughout the group, including but not limited to cement producing companies to gain a comprehensive view on SIG's success factors in achieving its goals. These assessments are updated annually and submitted and analyzed by the management and commissioners. To support the ERM system implementation, the Company assigned a Risk Officer in each business process, responsible for management and monitoring of risks. Aside from that, ERM department's personnel were tasked to operate the system, equipped with training and certification in risk management.
In the ERM system, SIG define substantive financial or strategic impacts of risks those might occur in the company's activities which would affect the achievements of goals and optimum and sustainable growth where climate also holds an important role in those risks that needs to be mitigated. The risk horizon of SIG ERM system where risks are assessed in three different terms, such as short term (1-year period), medium term (1 to 5-year period), and long term (5 to 10-year period).
Scope of value chain stages

In the assessments of climate related risks we considered risks in upstream process, direct operations, and downstream operations based on cement production and solution providing process as the core operations.
Definition of likelihood
SIG define likelihood as the probability of occurrence of climate related risks in the following year as:
• Almost Certain > 90%
• Most Likely between 60% and 90%
• Likely between 40% and 60%
• Less Likely between 10% and 40%
• Unlikely <10%
Definition of consequence
SIG define consequence (substantive financial impacts) based on:
a. The overall financial impact of the respective risk on the following year's (yearly average if the horizon is not short term) EBITDA:
• Impacts below 1% EBITDA are considered as Very Low
• Impacts between 1-2.5% EBITDA are considered Low
• Impacts between 2.5-4% EBITDA are considered Medium
• Impacts between 4-5% EBITDA are considered High
• Impacts above 5% EBITDA are considered Very High
A consequence would be considered as substantive as soon as it reaches high or very high.
b. Furthermore consequence could also be considered substantive impact based on corporate image (reputation), legal aspects, and/or SHE standards (OHSAS & Indonesian SHE Standards ("SMK3")).

C2.2

(C2.2) Describe your process(es) for identifying, assessing and responding to climate-related risks and opportunities.

Value chain stage(s) covered

Direct operations
Upstream
Downstream

Risk management process

Integrated into multi-disciplinary company-wide risk management process

Frequency of assessment

Annually

Time horizon(s) covered

Short-term
Medium-term

Description of process

Risk Assessment Process were implemented by using the framework of ISO 31000:2018. The assessment process was done by the coordination of ERM Unit and Risk Taking Units who are the risk owner (business process owner). The risk assessment is focused on (1) identifying risks those will affect the business process on achieving its target and varied in direct and indirect impacts, (2) analyzing risks those have been identified by calculating the likelihood and consequence, the complexity and connectivity of the risks, and the effectiveness of controls, and other factors that will define the characteristics of the risk, (3) evaluating the risks to support the decision needed to treat the risk so that the risk could be beneficial to the companies and stakeholders alike.
After all the risks were assessed and mapped into the corporate risk heatmap, they will be evaluated and treated considering its 'position' and urgency so that the additional action could be decided by the RTU and authorized personnel whereas the high-valued risks and extreme-valued risks will be followed up by BOD and the leader of related units (bottom up risk assessment). After the bottom up risk assessment were completed, ERM will conduct top down risk assessment by analyzing strategic decisions document such as SIG Long Term Plan both business and sustainability, Yearly Work & Budget Plan, KPIs, Bottom-up Risk Register and other strategic documents so that later it will be used as basic consideration to conduct FGD among leaders of RTU and BODs to reach the SIG Corporate Risk & Mitigation Plan for the following year, including but not limited to climate related risks. Corporate Risk might contain several Key Risks that were related among each other and has interconnected value chain process.
After obtaining Corporate Risks & Mitigation Plan, it will then be reported from BOD to BOC to be finalized. Furthermore, to enable a more concise discussion process, BOC will be represented by Risk Management & Investment Strategy Committee (RMIS Committee). Monitoring & Reporting is conducted on quarterly basis that will focus on the Key Risk's status and mitigation plan reports. It will also be conducted between RTU and BOD which later be conducted with BOC consecutively.
Later on, Risk Register, Corporate Risk, & Mitigation Plan will also be needed by Group Internal Audit to develop the Annual Audit Plan. The Annual Audit Plan will then be submitted by Group Internal Audit to Audit Committee (BOC's Committee) to be approved and conducted.
The auditing activity will then be performed independently by Group Internal Audit to assess the effectiveness of mitigation plan and internal controls, risk assessment process including but not limited to the validity of risk identification, and the potential of risk management improvements.

C2.2a

(C2.2a) Which risk types are considered in your organization's climate-related risk assessments?

	Relevance & inclusion	Please explain

Current regulation	Relevant, always included	SIG operates in several locations in Indonesia and the local governments have their own regulation on climate and environmental issues. Furthermore, Indonesia Ministry of Environmental and Forestry also has jurisdiction over SIG operation such as emission threshold, sociall license to operate, environmental impact licence, and other policies that must be complied. Regarding to Carbon Tax and Emission, it is being regulated recently but the implementation is limited to power plants company and will be implemented to cement company in 2025
Emerging regulation	Relevant, always included	Indonesia is currently considering to implement carbon tax regulation that will affect the SIG operation as cement companies are among the high carbon emission factories. This surely will raise a key risk in SIG operation both direct and indirect. It is already regulated in Indonesia but the implementation is still limited to power plants and will be implemented to cement company in 2025.
Technology	Relevant, always included	Innovation based on technology is one of the most important aspect in surviving the competition and gaining opportunities to reduce carbon emission and other climate related beneficiaries in the product solution SIG provided. Recently SIG initiate strategy to implement technologies to raise its waste heat powered energy as competitive advantage in the attempt to support a greener operation in various factories under the group.
Legal	Relevant, sometimes included	Currently in Indonesia, legal litigation on the environmental and climate change case is low in number and only happened mostly when corporates try to obtain environmental license to operate through AMDAL license. Furthermore SIG as a state owned enterprise has a very strict sets of regulatory compliance needed to be complied, therefore the likelihood of legal litigation case on environmental and climate change case is very low.
Market	Relevant, always included	The raising awareness of environmental and green aspect of products in Indonesia market is causing change in the market demands. Thus it was needed to gain reputation that cement and concrete products shall be green and environmental friendly. For example the strategic initiatives to change cement bags from paper based into woven based, that will lower risk of broken bag, was recently canceled since the raising awareness in plastic waste that would takes a long time to be decomposed is affecting customer behavior.
Reputation	Relevant, sometimes included	Reputation is one of the main aspect that potentially affect customer's behavior. It also become one of the aspects used to analyze the consequence of a risk. Ignoring and retaining current operation without adopting a more environmental friendly process would affect stakeholder's perspective of the company. SIG has renew its vision and reputation in 2019 to not only become cement manufacturing company but to lead in providing building material solution to create

		sustainable living for the future. Sustainable living SIG is in line with the company's strategic goals and will provide economic benefits through the development of environmentally friendly products and services, including the production of environmentally friendly cement and the use of waste as alternative raw materials. Thus, SIG anticipates future customer needs for new construction methods or derivative product requirements. In addition, sustainability can build a company's competitive advantage among similar companies. Some activities that can maximize SIG competitive advantage in the market are expanding waste management solutions through our unit business: Nathabumi and improving production processes to optimize existing technologies to become more energy efficient.
Acute physical	Relevant, sometimes included	SIG operating area mostly located in inner side of Indonesia archipelago having a low probability of cyclone occurrence. Rather than climactic disaster, SIG face a higher probability in facing the tectonic and volcanic based disaster since Indonesia is located in the ring of fire making it more of a priority for SIG to mitigate.
Chronic physical	Relevant, sometimes included	Geographically located in the equator, SIG operation and market area experience dry season and rainy season. Since the raising issue of global warming affecting extreme variability in weather patterns, as such the rain could fall continuously even in dry season period. And since the humidity and wetness could affect raw material, clinker, and cement quality thus affecting the production process and customer satisfaction.

C2.3

(C2.3) Have you identified any inherent climate-related risks with the potential to have a substantive financial or strategic impact on your business?

Yes

C2.3a

(C2.3a) Provide details of risks identified with the potential to have a substantive financial or strategic impact on your business.

Identifier

Risk 1

Where in the value chain does the risk driver occur?

Direct operations

Risk type & Primary climate-related risk driver

Emerging regulation

Carbon pricing mechanisms

Primary potential financial impact

Increased direct costs

Company-specific description

Cement production emits a significant amount of CO2 from raw materials, not only fuels (direct) but also electricity (indirect). As a result, existing and emerging carbon pricing mechanisms are an important part of our risk management process and are used on a regular basis to inform our strategy and financial planning. Currently as there is an emerging regulation in Indonesia to control carbon emission by initiating an imposition of CO2 taxes generates a high level key risk that will disrupt cost transformation program being held by SIG. Based on current carbon tax regulations, SIG could have been to pay IDR 30,000 every metric ton of CO2 emitted.

Time horizon

Long-term

Likelihood

Very likely

Magnitude of impact

High

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

720,000,000,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

Based on current carbon tax regulations, SIG could have been to pay IDR 30,000 every metric ton of CO2 emitted. The production report confirms that SIG has had produced around 24 million metric ton. Hence the expected financial impact would be close to IDR 720 billion annually (less than 1% of EBIT).

Cost of response to risk

1,151,000,000,000

Description of response and explanation of cost calculation

SIG acknowledges that additional emission reduction activities are required to mitigate the financial impact of rising fossil fuel costs. Response on the risk is based on the strategic initiative to reduce carbon emission by the usage of alternative fuel and raw material, optimization of WHRPG Utilization.

Comment

Identifier

Risk 2

Where in the value chain does the risk driver occur?

Upstream

Risk type & Primary climate-related risk driver

Chronic physical

Changing precipitation patterns and types (rain, hail, snow/ice)

Primary potential financial impact

Increased direct costs

Company-specific description

The uncertainty of weather patterns in Indonesia due to the natural causes ignites new risk source that makes it more difficult to maintain the quality of raw material and coal. A wet raw material and coal might cause a blockage inside machines that could lower production rate and adding the needs of additional maintenance actions. But since the current market condition experience an oversupplied capacity, it still did not affect the availability products in the market and disrupts sales and revenue significantly. But in the long term it might provide competitive advantage as SIG cost efficiency program.

Time horizon

Short-term

Likelihood

About as likely as not

Magnitude of impact

Medium

Are you able to provide a potential financial impact figure?

No, we do not have this figure

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

The uncertain weather patterns which would affect raw material & coal quality wetness will reduce kiln feed quality and reduce production rate. However, random rainfall occured, sometimes even no rain for a full year, makes it hard to estimate how

significant this risk would affect factories performance. Furthermore, the supplier's coal quality also plays a significant factor in this risk's potential impact. Raw material with higher water content will affect kiln feed quality thus reducing production rate.

Cost of response to risk

0

Description of response and explanation of cost calculation

Currently each of SIG facility already has regular internal control to prevent and minimize this risk to happen by implementing closed raw material storage and system so that the rate of production could be utilized with better raw material sourcing and planning. Furthermore, to handle the event of this risk, currently SIG implement Total Productive Maintenance to maintain production rate and quality.

Comment

Response to this risk depends on the priority and urgency of each production site.

Identifier

Risk 3

Where in the value chain does the risk driver occur?

Downstream

Risk type & Primary climate-related risk driver

Chronic physical

Changing precipitation patterns and types (rain, hail, snow/ice)

Primary potential financial impact

Increased direct costs

Company-specific description

Uncertain weather could affect the port condition that will affect sea related transportation (of products and/or supplier goods). One of the highest calculatable impacts in increasing direct cost is caused by demurrage fee that would have happened if the ship stayed longer in port and blocked one another.

Time horizon

Short-term

Likelihood

About as likely as not

Magnitude of impact

Medium

Are you able to provide a potential financial impact figure?

Yes, an estimated range

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

1,983,542,400

Potential financial impact figure – maximum (currency)

6,095,716,800

Explanation of financial impact figure

The minimum financial impact figure is the demurrage realization of the year 2020 which is Rp 1.983,54 million. While the maximum potential figure is calculated with the assumption of 2 days demurrage per vessel rated 12.000 USD/day whereas the total of vessel in 2021 is used as a basis which is 178 vessels a year. The potential maximum financial impact figure were calculated as follow : (12.000 USD/day x 14.269 IDR/USD) x 2 days demurrage x 178 vessels/year x 10% [max likelihood of risks] = Rp 6.096 million

Cost of response to risk

0

Description of response and explanation of cost calculation

Response to the risk was included in SIG existing control. SIG has developed an integrated realtime application to generate optimum scenario of rerouting. This app uses cost to serve as parameter to obtain optimum scenario (holding-wise). As an additional mitigation, every vessel transaction also includes a dispatching bonus calculation so that it could support cost transformation program.

Comment

C2.4

(C2.4) Have you identified any climate-related opportunities with the potential to have a substantive financial or strategic impact on your business?

Yes

C2.4a

(C2.4a) Provide details of opportunities identified with the potential to have a substantive financial or strategic impact on your business.

Identifier

Opp1

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type
Products and services

Primary climate-related opportunity driver
Development and/or expansion of low emission goods and services

Primary potential financial impact
Returns on investment in low-emission technology

Company-specific description
SIG is commited, as stated in one of SIG sustainability pillar: "Sustainable Economic Growth", to provide sustainable solutions with innovative products and services as stated in point C4.5a. With the various sustainable solutions that we have and continue to develop, in line with the global and Indonesia commitment towards climate risk and commitment, will create a value proposition for SIG as a leader in building material solution provider.

Time horizon
Medium-term

Likelihood
Likely

Magnitude of impact
Low

Are you able to provide a potential financial impact figure?
No, we do not have this figure

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure
The financial impact is calculated based on the revenue estimated to be obtained from the sustainable products/solutions offered to the market. The increasing portion of revenue from such solution is estimated to be improved gradually, and the numbers stated above is expected to be achieved in 2030.

Cost to realize opportunity
0

Strategy to realize opportunity and explanation of cost calculation
The cost to realize the opportunity is mostly related to the R&D and marketing cost to educate the market.

Comment

N/A

Identifier

Opp2

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Energy source

Primary climate-related opportunity driver

Other, please specify

Resource Substitute/Diversification

Primary potential financial impact

Returns on investment in low-emission technology

Company-specific description

SIG, through its waste management unit called Nathabumi is providing industrial and municipal waste treatment solutions through co-processing methods where the waste is burned inside our kiln which can then be used as a source of heat energy in the cement production process replacing the use of coal. In addition, some types of industrial waste such as fly ash, bottom ash, copper slag etc, can be used as an alternative raw material for cement. Currently the implementation of waste management is being duplicated as best practice into SIG facilities. This initiatives is being treated as one of the main focus and corporate risk in SIG to gain more efficiency.

Time horizon

Long-term

Likelihood

Very likely

Magnitude of impact

Medium

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

414,000,000,000

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure

This impact figure represent the Gross Added Value (efficiency on production and coal substitution value) generated by the use of alternative fuel in SIG Group in 2021 and expected to continuously increase in the future

Cost to realize opportunity

1,600,000,000,000

Strategy to realize opportunity and explanation of cost calculation

The cost to realize the opportunity is related to the capex for the expand the waste management facility, increasing the feeding capacity, storage facilities, etc. The capex is assumed to be spent gradually within 10 years to increase Thermal Substitution Rate (TSR)

Comment

The huge investment on capital expenditure basically for the improvement of our facility. In term of increasing alternative fuel usage, the consequence within the process is need to be recalibrate all related process & technology. SIG plan to realize this advancement of our technology because the huge opportunity as result of replacing coal with alternative fuel

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Identifier

Opp3

Where in the value chain does the opportunity occur?

Direct operations

Opportunity type

Resilience

Primary climate-related opportunity driver

Other, please specify

Ability to diversify business activities

Primary potential financial impact

Reduced indirect (operating) costs

Company-specific description

ex Lafarge-Holcim's facilities acquisition provides several opportunity for improvement regarding the best practice in SIG business process. The study and adoption of multinational company's business process including climate change initiative is also being organized in SIG facilities so that the initial strategies needed could be accessed and implemented more efficiently.

Time horizon

Long-term

Likelihood
Very likely

Magnitude of impact
Medium-low

Are you able to provide a potential financial impact figure?
No, we do not have this figure

Potential financial impact figure (currency)

Potential financial impact figure – minimum (currency)

Potential financial impact figure – maximum (currency)

Explanation of financial impact figure
integration program is currently being implemented in SIG and being continuously improved to get efficency opportunities through synergy between facilities in SIG. To realize this opportunity several capex to duplicate and improve SIG facilities is being spent gradually while also being aware of current financial & global macro economy condition impacted by Covid and Russian war.

Cost to realize opportunity
0

Strategy to realize opportunity and explanation of cost calculation
The cost to realize the opportunity is related to the capex for the expand the waste management facility, increasing the mixing, feeding capacity, etc. The capex will be spent gradually within 10 years to increase the use of Alternative Raw Material gradually

Comment
N/A

C3. Business Strategy

C3.1

(C3.1) Does your organization's strategy include a transition plan that aligns with a 1.5°C world?

Row 1

Transition plan
No, but our strategy has been influenced by climate-related risks and opportunities, and we are developing a transition plan within two years

Explain why your organization does not have a transition plan that aligns with a 1.5°C world and any plans to develop one in the future

Regarding SIG commitment on mitigating transition risk, SIG has been volunteered to design scenario using Science Based Target Initiative (SBTi). We've already giving the scenario to the SBTi committee. In addition, we are on the process of developing and validating the target to the SBTi Committee.

C3.2

(C3.2) Does your organization use climate-related scenario analysis to inform its strategy?

	Use of climate-related scenario analysis to inform strategy
Row 1	Yes, qualitative and quantitative

C3.2a

(C3.2a) Provide details of your organization's use of climate-related scenario analysis.

Climate-related scenario	Scenario analysis coverage	Temperature alignment of scenario	Parameters, assumptions, analytical choices
Transition scenarios IEA 2DS	Company-wide		SIG has defined its target on climate-related risk by using 2DS. This scenario basically has been derived from existing capability within company wide as well as our strategy to reduce GHG emission. SIG alwalys having a commitment to go beyond the business as usual because we believe that tackling the climate issues need extra effort to make it come true. As a form of committment, SIG has been establishing a solid governance structure by defining Sustainability Committee as a strategic body who oversee the target performance and Dept. of Sustainabilty who tactically handling the issue on operational on monitoring and evaluation the achievement of the target.

C3.2b

(C3.2b) Provide details of the focal questions your organization seeks to address by using climate-related scenario analysis, and summarize the results with respect to these questions.

Row 1

Focal questions

Reducing GHG emission scope 1 by conducting various kind of inisitiative such :
1. Clinker Factor substitution
2. Alternative fuel substitution
3. Energy efficiency

Results of the climate-related scenario analysis with respect to the focal questions

As a result, SIG redefining its target to be 515 Kg CO2 / Ton cement Equivalent. This target is depends on the successful of the initiative that been defined before (Clinker factor, Thermal Substitution Rate, Energy Efficiency)

C3.3

(C3.3) Describe where and how climate-related risks and opportunities have influenced your strategy.

	Have climate-related risks and opportunities influenced your strategy in this area?	Description of influence
Products and services	Yes	SIG has transformed not only as a cement producer, but also as a provider of building material solutions to create sustainable living. We understand and support the importance of environmental management, including risks related to climate change which has been a concern for the government and the community. One of our commitments in the sustainability pillar, in particular the "Sustainable Economic Growth" pillar, is to provide sustainable solutions with innovative products and services to mitigate the increasing demand for limited resources. SIG gradually increases the portion of cement products with low clinker factor by developing and introducing various special types of bag and bulk cement that can be selected and are more suited to the characteristics of each type of construction project, so that the emission intensity per cement product can be reduced while mantaining the construction quality. SIG has also developed various types of readymix concrete that are more environmentally friendly, such as SpeedCrete, a Concrete solution that dries in short time, effectively reducing congestion during road construction or repair, ThruCrete is a type of concrete solution which can absorb water into the ground and become water catchment areas to prevent flood. SIG also produces Ground Granulated Blast

		Furnace Slag which can be used as a cement mixture in large construction projects such as ports, bridges, toll roads, and high-rise buildings, thereby reducing the use of cement products.
Supply chain and/or value chain	No	N/A
Investment in R&D	Yes	As a part of transformation process, SIG build its capability on delivering sustainable products & services. SIG has been proved to be the largest cement product provider to customer. SIG continue to reducing carbon footprint inside the product. This commitment has been marked by reducing clinker factor within the product. SIG also get involved on campaigning low carbon cement product by sending continuous advocacy to all stakeholder
Operations	Yes	SIG is committed to continuously reduce the intensity of CO2 emissions through various approaches, both by developing products that are more environmentally friendly, and also through various operational initiatives, including: 1. Reduce clinker factor. Lower average clinker factors will result in lower emission intensity since most of the GHG emission produced during burning process to produce clinker. Our initiatives include lowering the clinker composition by referring to the SNI (Indonesian National Standard) and utilizing alternative raw material from waste. We are also developing and producing more non-OPC product type which is in line with our initiative in developing more building material solutions to our customers. 2. Shift to Lower Carbon Fuel. We have implemented solar power installation for the lighting in Tonasa, Tuban, and Rembang plants and increase the use of Alternative Fuel and Raw Material-AFR (biomass & non biomass) to reduce coal as source of heat energy. We have develop a special unit called Nathabumi to increase our capability in providing AFR from industrial waste as well as municipal waste. 3. Use of Clean Energy. We produce clean energy using Waste Heat Recovery Power Generator which comes from the flue gas of the production process to turn it into electricity and reduce the use of coal generated electricity from 3rd party.

		4. Conduct Energy Efficiency Program. We have implemented ISO 5001 in managing energy efficiency and refer to Government regulation No. 70/2009 regarding energy conservation as well as conduct energy audit internally every year and externally every three years. We continuously improve process and conduct various innovation to achieve lower energy consumption.

C3.4

(C3.4) Describe where and how climate-related risks and opportunities have influenced your financial planning.

	Financial planning elements that have been influenced	Description of influence
Row 1	Revenues Direct costs Capital expenditures	One of SIG strategic pillars in its long term plan is Industry Greenefication to leverage good sustainability practices throughout the group, including practices to manage environment and climate related risks & opportunity. Such strategy has been cascaded into Annual Business Plan in form of strategic activities and the budget related. One of the strategy to increase the revenue is to improve the revenue portion from sustainable solutions, including increase the sales portion of non-OPC products, which not only can mitigate the shift in customer preferences but also become our value proposition to win the competition. On cost site, SIG is focusing on various initiatives, including reducing the clinker factors, produce more non OPC cement and various innovative products, shift to lower carbon fuel (ie solar power, increase the use of Alternative Fuel & Raw Material).The capex required to implement those strategic initiatives has been stated in long term plan and approved annually through annual business plan.

C4. Targets and performance

C4.1

(C4.1) Did you have an emissions target that was active in the reporting year?

Intensity target

C4.1b

(C4.1b) Provide details of your emissions intensity target(s) and progress made against those target(s).

Target reference number
Int 1

Year target was set
2019

Target coverage
Company-wide

Scope(s)
Scope 1

Scope 2 accounting method

Scope 3 category(ies)

Intensity metric
Other, please specify
Net Specific Ton CO2 per ton Cement Equivalent

Base year
2019

Intensity figure in base year for Scope 1 (metric tons CO2e per unit of activity)
0.633

Intensity figure in base year for Scope 2 (metric tons CO2e per unit of activity)

Intensity figure in base year for Scope 3 (metric tons CO2e per unit of activity)

Intensity figure in base year for all selected Scopes (metric tons CO2e per unit of activity)
0.633

% of total base year emissions in Scope 1 covered by this Scope 1 intensity figure
100

% of total base year emissions in Scope 2 covered by this Scope 2 intensity figure

% of total base year emissions in Scope 3 (in all Scope 3 categories) covered by this Scope 3 intensity figure

% of total base year emissions in all selected Scopes covered by this intensity figure

100

Target year

2025

Targeted reduction from base year (%)

11.53

Intensity figure in target year for all selected Scopes (metric tons CO2e per unit of activity) [auto-calculated]

0.5600151

% change anticipated in absolute Scope 1+2 emissions

0

% change anticipated in absolute Scope 3 emissions

0

Intensity figure in reporting year for Scope 1 (metric tons CO2e per unit of activity)

0.59376967

Intensity figure in reporting year for Scope 2 (metric tons CO2e per unit of activity)

Intensity figure in reporting year for Scope 3 (metric tons CO2e per unit of activity)

Intensity figure in reporting year for all selected Scopes (metric tons CO2e per unit of activity)

0.59376967

% of target achieved relative to base year [auto-calculated]

53.7512965011

Target status in reporting year

Underway

Is this a science-based target?

Yes, we consider this a science-based target, and we have committed to seek validation of this target by the Science Based Targets initiative in the next two years

Target ambition

2°C aligned

Please explain target coverage and identify any exclusions

In 2021 SIG reduced its CO2 intensity to 593kgCo2/ton cement equivalent, which decreased 2.3% compared to the 2020 performance and such performance in 2020 is 6,32% lower compared to the 2019 baseline. The decrease in emission intensity was resulted by the various initiatives including reducing the OPC cement portion and introduce more non OPC and sustainable solutions to customers, increasing the use of alternative raw material to reduce average clinker factor and increase the use of alternative fuel to reduce the use of coal from improving the waste management unit as well as improve the production process.

Plan for achieving target, and progress made to the end of the reporting year

We're on progress on optimization various initiative such increasing the utilization of alternative fuel and material, reducing clinker factor, and optimizing energy usage within the process.

On the context of utilization of Alternative fuel, we're engaging with various stakeholder such municipal government that build Refused Derived Fuel in which solving municipal waste in one regional area. In line with this initiative, we're also build feeding facility to optimize processing the waste into the process.

In addition, we're also intensifying clinker usage by substituting raw material with alternative raw material such as fly ash and bottom ash. We're provoking and promoting advocacy to regulator to lower its cement standard in case of reducing GHG emission which is align with the governance's objective

Finally, we're also optimizing the process by installing advance technology to reduce the energy consumption. This advance technology consist of advancing process control using AI and Smart Plant and installing technology that saving and using less energy

List the emissions reduction initiatives which contributed most to achieving this target

Target reference number

Int 2

Year target was set

2019

Target coverage

Company-wide

Scope(s)

Scope 2

Scope 2 accounting method

Location-based

Scope 3 category(ies)

Intensity metric

Other, please specify

Net Specific Ton CO2 per ton Cement Equivalent

Base year

2019

Intensity figure in base year for Scope 1 (metric tons CO2e per unit of activity)

Intensity figure in base year for Scope 2 (metric tons CO2e per unit of activity)

0.067

Intensity figure in base year for Scope 3 (metric tons CO2e per unit of activity)

Intensity figure in base year for all selected Scopes (metric tons CO2e per unit of activity)

0.067

% of total base year emissions in Scope 1 covered by this Scope 1 intensity figure

% of total base year emissions in Scope 2 covered by this Scope 2 intensity figure

100

% of total base year emissions in Scope 3 (in all Scope 3 categories) covered by this Scope 3 intensity figure

% of total base year emissions in all selected Scopes covered by this intensity figure

100

Target year

2025

Targeted reduction from base year (%)

10.44

Intensity figure in target year for all selected Scopes (metric tons CO2e per unit of activity) [auto-calculated]

0.0600052

% change anticipated in absolute Scope 1+2 emissions

0

% change anticipated in absolute Scope 3 emissions

0

Intensity figure in reporting year for Scope 1 (metric tons CO2e per unit of activity)

Intensity figure in reporting year for Scope 2 (metric tons CO2e per unit of activity)

0.064

Intensity figure in reporting year for Scope 3 (metric tons CO2e per unit of activity)

Intensity figure in reporting year for all selected Scopes (metric tons CO2e per unit of activity)

0.064

% of target achieved relative to base year [auto-calculated]

42.8890032596

Target status in reporting year

Underway

Is this a science-based target?

Yes, we consider this a science-based target, and the target is currently being reviewed by the Science Based Targets initiative

Target ambition

2°C aligned

Please explain target coverage and identify any exclusions

The coverage of this measurement are all process within cement production, exclude the process outside integrated plant.
SIG has a wide coverage of Packing Plant and Grinding Plant which is located outside the main plant.

Plan for achieving target, and progress made to the end of the reporting year

As a commitment of reducing Scope 2 emission, SIG plan to executing some initiative such :
1. Optimizing process with digitalization and automation of production facilities
2. Equipment replacement & improvement
3. Installing solar panel across the Group
4. Using renewable energy such Waste Heat Recovery Power Generator (WHRPG)

List the emissions reduction initiatives which contributed most to achieving this target

C4.2

(C4.2) Did you have any other climate-related targets that were active in the reporting year?

Target(s) to increase low-carbon energy consumption or production
Other climate-related target(s)

C4.2a

(C4.2a) Provide details of your target(s) to increase low-carbon energy consumption or production.

Target reference number
Low 1

Year target was set
2021

Target coverage
Company-wide

Target type: energy carrier
Heat

Target type: activity
Consumption

Target type: energy source
Low-carbon energy source(s)

Base year
2019

Consumption or production of selected energy carrier in base year (MWh)
30,946,261

% share of low-carbon or renewable energy in base year
2.96

Target year
2025

% share of low-carbon or renewable energy in target year
11

% share of low-carbon or renewable energy in reporting year

5.5

% of target achieved relative to base year [auto-calculated]

31.592039801

Target status in reporting year

Underway

Is this target part of an emissions target?

Yes. One of the SI initiatives to reduce CO2 emission is through the utilization of waste as alternative fuel to replace the use of coal as SIG main source of heat energy. Therefore we targeted to increase the Thermal Substitution Rate

Is this target part of an overarching initiative?

Science Based Targets initiative

Please explain target coverage and identify any exclusions

This indicator measure how many fuel that can be replaced by alternative fuel. The number describe how many thermal energy substitute by alternative fuel.

The coverage within this number measure all alternative fuel that being replaced by all Cement Subsidiaries

Plan for achieving target, and progress made to the end of the reporting year

SIG committed to enlarge the substitution of fuel by increasing capacity of alternative fuel processing.

List the actions which contributed most to achieving this target

C4.2b

(C4.2b) Provide details of any other climate-related targets, including methane reduction targets.

Target reference number

Oth 1

Year target was set

2019

Target coverage

Company-wide

Target type: absolute or intensity

Intensity

Target type: category & Metric (target numerator if reporting an intensity target)

Resource consumption or efficiency

Other, please specify

Clinker Factor (Ration of Clinker Consumption)

Target denominator (intensity targets only)

Other, please specify

Ton Clinker / Ton Cement

Base year

2019

Figure or percentage in base year

0.7225

Target year

2025

Figure or percentage in target year

0.66

Figure or percentage in reporting year

0.7019999998

% of target achieved relative to base year [auto-calculated]

32.80000032

Target status in reporting year

Underway

Is this target part of an emissions target?

Yes. The more clinker can be subtituted by other alternative raw material, the less clinker that needed to produce cement.

As a result, when less quantity of clinker that being needed, the more GHG emission that emited to the air. As we know, calcination process is the most part of the cement production process that emits GHG emission

Is this target part of an overarching initiative?

Science Based targets initiative - other

Please explain target coverage and identify any exclusions

SIG committed to produce product that emits less GHG emission. The coverage of this indicator is the all integrated cement plant in Indonesia.

Plan for achieving target, and progress made to the end of the reporting year

SIG plan to continoue delivering less carbon product. As a commitment, SIG plan to develop product that required less clinker. Meanwhile, this product also still comply to government regulation

List the actions which contributed most to achieving this target

Target reference number
Oth 2

Year target was set
2019

Target coverage
Company-wide

Target type: absolute or intensity
Intensity

Target type: category & Metric (target numerator if reporting an intensity target)
Energy consumption or efficiency
Gcal

Target denominator (intensity targets only)
metric ton of product

Base year
2019

Figure or percentage in base year
0.8444088284

Target year
2024

Figure or percentage in target year
0.818

Figure or percentage in reporting year
0.8257296427

% of target achieved relative to base year [auto-calculated]
70.7308382526

Target status in reporting year
Underway

Is this target part of an emissions target?
Yes. By making the process more efficient, the process will consume less energy. As a result, the GHG emission will also decrease

Is this target part of an overarching initiative?

Science Based targets initiative - other

Please explain target coverage and identify any exclusions

The coverage of this measurement is all the process within integrated plant.

Plan for achieving target, and progress made to the end of the reporting year

As mention before, the utilization of less and saving energy technology will reduce the usage of energy within the process. SIG continue to saving more energy by installing more advance technology that will reduce the consumption of energy. As a result, the GHG emission will reduce accordingly.

List the actions which contributed most to achieving this target

---

Target reference number

Oth 3

Year target was set

2019

Target coverage

Company-wide

Target type: absolute or intensity

Intensity

Target type: category & Metric (target numerator if reporting an intensity target)

Energy consumption or efficiency
kWh

Target denominator (intensity targets only)

metric ton of product

Base year

2019

Figure or percentage in base year

88.5291255563

Target year

2025

Figure or percentage in target year

80.8

Figure or percentage in reporting year

88.1996011463

% of target achieved relative to base year [auto-calculated]

4.2634112695

Target status in reporting year

Underway

Is this target part of an emissions target?

Yes, It is

Is this target part of an overarching initiative?

Science Based targets initiative - other

Please explain target coverage and identify any exclusions

The coverage of this measurement is all integrated plant within the operational plant of SIG

Plan for achieving target, and progress made to the end of the reporting year

Specific electrical energy is depends on the consumption electrical energy usage within the process. By replacing it with more renewable source, SIG will get a lower figure of electrical energy consumption. This result can be achieved by :

1. Optimizing process
2. Installing solar panel equipment across the group
3. Optimizing the source of others renewable energy such WHRPG

List the actions which contributed most to achieving this target

C4.3

(C4.3) Did you have emissions reduction initiatives that were active within the reporting year? Note that this can include those in the planning and/or implementation phases.

Yes

C4.3a

(C4.3a) Identify the total number of initiatives at each stage of development, and for those in the implementation stages, the estimated CO2e savings.

	Number of initiatives	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation		
To be implemented*		
Implementation commenced*		
Implemented*	3	1,760,367.28
Not to be implemented		

C4.3b

(C4.3b) Provide details on the initiatives implemented in the reporting year in the table below.

Initiative category & Initiative type

Energy efficiency in production processes
Fuel switch

Estimated annual CO2e savings (metric tonnes CO2e)

510,052.2

Scope(s) or Scope 3 category(ies) where emissions savings occur

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

221,130,942,847

Investment required (unit currency – as specified in C0.4)

50,000,000,000

Payback period

<1 year

Estimated lifetime of the initiative

Ongoing

Comment

This initiative is conducted by reducing the clinker consumption in producing a ton of cement product by substituting the clinker with additive & decarbonated material (ie. Limestone, gypsum, fly ash) while also maintaining the cement quality standard. Reduction in clinker consumption has a significant impact on reducing the CO2 emission from the limestone decarbonation and coal consumption during the combustion in clinker production process.

Initiative category & Initiative type

Non-energy industrial process emissions reductions
Process material substitution

Estimated annual CO2e savings (metric tonnes CO2e)

1,052,069.37

Scope(s) or Scope 3 category(ies) where emissions savings occur

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

155,573,491,946

Investment required (unit currency – as specified in C0.4)

60,000,000,000

Payback period

<1 year

Estimated lifetime of the initiative

Ongoing

Comment

This initiative is to decrease the fossil fuel consumption in clinker manufacturing process and substitute it with the alternative fuel from internal waste, other industrial and municipal waste. TO support the initiative, SIG has installed supporting equipment for alternative fuel treatment and feeding the alternative fuel into the combustion process. This initiative is able to directly reduce CO2 emission by substituting the coal consumption. Such initiative is a part of the solutions establish by SIG to support the environment through waste management.

Initiative category & Initiative type

Energy efficiency in production processes
Process optimization

Estimated annual CO2e savings (metric tonnes CO2e)

198,245.72

Scope(s) or Scope 3 category(ies) where emissions savings occur

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

87,187,593,403

Investment required (unit currency – as specified in C0.4)

0

Payback period

<1 year

Estimated lifetime of the initiative

Ongoing

Comment

Specific Thermal Energy Consumption

Initiative category & Initiative type

Energy efficiency in production processes

Smart control system

Estimated annual CO2e savings (metric tonnes CO2e)

4,042.26

Scope(s) or Scope 3 category(ies) where emissions savings occur

Scope 1

Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

4,890,165,166

Investment required (unit currency – as specified in C0.4)

10,077,656,000

Payback period

1-3 years

Estimated lifetime of the initiative

Ongoing

Comment

Plant Optimizer Installation

C4.3c

(C4.3c) What methods do you use to drive investment in emissions reduction activities?

Method	Comment
Compliance with regulatory requirements/standards	Based on the Government roadmap 2016-2020 for cement industry to reduce GHG emission, SIG has established initiatives to comply with the regulation, one of it was by increasing the utilization of waste as Alternative Fuel and Raw Material (AFR). Some investments derived by such initiative including installing kiln feed for feeding the alternative fuel to the combustion process as well as installing main baghouse filter to replace electric precipitator gradually in our plants to manage the air emissions better following the increasing use of AFR

Dedicated budget for low-carbon product R&D	SIG, as a building material solution provider, is continuously develop quality products and solutions, including sustainability products. In 2020, we have launched some products and solutions which support our commitment towards the sustainable living, such as masonry cement bag, various type of non-OPC cement, slag cement, slag product, as well as some type of concrete products and solutions (SpeedCrete, ThruCrete, DynaHome, DynaPump) that are created to support the effort towards sustainable living. Some of our sustainable products has certified as green label (PCC cement, PwrPro cement, and Slag product) from Green Product Council Indonesia (Associate Member of Global Ecolabelling Network) and Singapore Environment Council. SIG is continuously focus on developing more products and solutions that can meet the specific needs of our customers with lower environment impact yet economical. We have established Indonesia Cement Research Institute (now known as Indonesia Infrastructure Research & Innovation Institute) that collaborate with other SoEs in infrastructure and cement industry to share knowledge and efforts in research & development in construction and building material.
Partnering with governments on technology development	One of the Government program in the 2020-2024 National Mid-Term Development Plan is to improve waste management by increasing the amount of B3 waste that can be managed, reducing the amount of waste thrown into the sea, and increasing the amount of waste that is managed nationally by buidling integrated waste treatment facilities. SIG through its waste management unit called Nathabumi, continues to increase its capacity and capability in providing industrial and municipal waste treatment solutions through co-processing methods where the waste is burned inside our kiln which can then be used as a source of heat energy in the cement production process. In addition, some types of industrial waste such as fly ash, bottom ash, copper slag etc, can be used as an alternative raw material for cement.In 2020 we were officially collaborating with the Cilacap city government in handling municipal waste using the Refused Derived Fuel system to be used as an alternative fuel in SIG Cilacap plant.
Dedicated budget for other emissions reduction activities	Based on the Government roadmap 2016-2020 for cement industry to reduce GHG emission, SIG has established initiatives to comply with the regulation, one of it was by increasing the utilization of waste as Alternative Fuel and Raw Material (AFR). Some investments derived by such initiative including installing kiln feed for feeding the alternative fuel to the combustion process as well as installing main baghouse filter to replace electric precipitator gradually in our plants to manage the air emissions better following the increasing use of AFR

C4.5

(C4.5) Do you classify any of your existing goods and/or services as low-carbon products?

Yes

C4.5a

(C4.5a) Provide details of your products and/or services that you classify as low-carbon products.

Level of aggregation

Group of products or services

Taxonomy used to classify product(s) or service(s) as low-carbon

Other, please specify

OPC, Waste Management, Green Concrete

Type of product(s) or service(s)

Cement and concrete

Other, please specify

All related green cement & concrete and Waste management services

Description of product(s) or service(s)

SIG has range of product that are considered as low carbon products or solutions. Our PCC and PwrPro cement has been certified green label from Green Product Council Indonesia (Associate Member of Global Ecolabelling Network) due to lower CO2 emission. In 2020, we launched masonry cement that has even lower clinker content, translated into lower Co2 emission, which is suitable for non-structural applications in construction activities with more economical price.

We also produce concrete products using environmentally friendly concrete standards for the concrete production process that include saving the use of resources, especially raw materials and water.

SIG produces Ground Granulated Blast Furnace Slag which can be used as a cement mixture in large construction projects such as ports, bridges, toll roads, and high-rise buildings, thereby reducing the use of cement products as well as lowering the CO2 emission.

SIG, through its waste management unit called Nathabumi is providing industrial and municipal waste treatment solutions through co-processing methods where the waste is burned inside our kiln which can then be used as a source of heat energy in the cement production process. In addition, some types of industrial waste such as fly ash, bottom ash, copper slag etc, can be used as an alternative raw material for cement.

Have you estimated the avoided emissions of this low-carbon product(s) or service(s)

No

Methodology used to calculate avoided emissions

Life cycle stage(s) covered for the low-carbon product(s) or services(s)

Functional unit used

Reference product/service or baseline scenario used

Life cycle stage(s) covered for the reference product/service or baseline scenario

Estimated avoided emissions (metric tons CO2e per functional unit) compared to reference product/service or baseline scenario

Explain your calculation of avoided emissions, including any assumptions

Revenue generated from low-carbon product(s) or service(s) as % of total revenue in the reporting year

60

C-CE4.9

(C-CE4.9) Disclose your organization's best available techniques as a percentage of Portland cement clinker production capacity.

	Total production capacity coverage (%)
4+ cyclone preheating	93
Pre-calciner	93

C5. Emissions methodology

C5.1

(C5.1) Is this your first year of reporting emissions data to CDP?

No

C5.1a

(C5.1a) Has your organization undergone any structural changes in the reporting year, or are any previous structural changes being accounted for in this disclosure of emissions data?

Row 1

Has there been a structural change?

No

C5.1b

(C5.1b) Has your emissions accounting methodology, boundary, and/or reporting year definition changed in the reporting year?

	Change(s) in methodology, boundary, and/or reporting year definition?
Row 1	No

C5.2

(C5.2) Provide your base year and base year emissions.

Scope 1

Base year start

January 1, 2019

Base year end

December 31, 2019

Base year emissions (metric tons CO2e)

27,959,111

Comment

Scope 1 emission as reported in SIG Sustainability Report 2019 for all of our cement subsidiaries (PT Semen Gresik, PT Semen Padang, PT Semen Tonasa, PT Solusi Bangun Indonesia) and business unit (Tuban business unit) in Indonesia (exclude TLCC- cement plant/subsidiary in Vietnam)

Scope 2 (location-based)

Base year start

January 1, 2019

Base year end

December 31, 2019

Base year emissions (metric tons CO2e)

2,601,828

Comment

Scope 2 emission as reported in SIG Sustainability Report 2019 for all of our cement subsidiaries (PT Semen Gresik, PT Semen Padang, PT Semen Tonasa, PT Solusi Bangun Indonesia) and business unit (Tuban business unit) in Indonesia (exclude TLCC- cement plant/subsidiary in Vietnam)

Scope 2 (market-based)

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 1: Purchased goods and services

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 2: Capital goods

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 3: Fuel-and-energy-related activities (not included in Scope 1 or 2)

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 4: Upstream transportation and distribution

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 5: Waste generated in operations

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 6: Business travel

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 7: Employee commuting

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 8: Upstream leased assets

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 9: Downstream transportation and distribution

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 10: Processing of sold products

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 11: Use of sold products

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 12: End of life treatment of sold products

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 13: Downstream leased assets

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 14: Franchises

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3 category 15: Investments

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3: Other (upstream)

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

Scope 3: Other (downstream)

Base year start

Base year end

Base year emissions (metric tons CO2e)

Comment

C5.3

(C5.3) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate emissions.

WBCSD: The Cement CO2 and Energy Protocol

C6. Emissions data

C6.1

(C6.1) What were your organization's gross global Scope 1 emissions in metric tons CO2e?

Reporting year

Gross global Scope 1 emissions (metric tons CO2e)

24,638,442.683

Start date

January 1, 2021

End date

December 31, 2021

Comment

N/A

Past year 1

Gross global Scope 1 emissions (metric tons CO2e)

25,215,477.395

Start date

January 1, 2020

End date

December 31, 2020

Comment

N/A

Past year 2

Gross global Scope 1 emissions (metric tons CO2e)

28,120,083.63

Start date

January 1, 2019

End date
December 31, 2019

Comment
N/A

C6.2

(C6.2) Describe your organization's approach to reporting Scope 2 emissions.

Row 1

Scope 2, location-based
We are reporting a Scope 2, location-based figure

Scope 2, market-based

Comment
N/A

C6.3

(C6.3) What were your organization's gross global Scope 2 emissions in metric tons CO2e?

Reporting year

Scope 2, location-based
3,092,381.324

Start date
January 1, 2021

End date
December 31, 2021

Comment
N/A

Past year 1

Scope 2, location-based
3,492,190.603

Start date
January 1, 2020

End date
December 31, 2020

Comment
N/A

Past year 2

Scope 2, location-based
3,815,490.426

Start date
January 1, 2019

End date
December 31, 2019

Comment
N/A

C6.4

(C6.4) Are there any sources (e.g. facilities, specific GHGs, activities, geographies, etc.) of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure?
Yes

C6.4a

(C6.4a) Provide details of the sources of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure.

Source
Cement subsidiary in Vietnam with 2.3 million tons of capacity per year

Relevance of Scope 1 emissions from this source
Emissions are not evaluated

Relevance of location-based Scope 2 emissions from this source
Emissions are not evaluated

Relevance of market-based Scope 2 emissions from this source (if applicable)

Explain why this source is excluded
We exclude the emissions of our cement plant in Vietnam since the portion is relatively small to the total capacity, and the plant in Vietnam currently is not yet able to conduct the calculation

Estimated percentage of total Scope 1+2 emissions this excluded source represents

Explain how you estimated the percentage of emissions this excluded source represents

C6.5

(C6.5) Account for your organization's gross global Scope 3 emissions, disclosing and explaining any exclusions.

Purchased goods and services

Evaluation status

Relevant, not yet calculated

Please explain

The scope 3 calculation has not been conducted due to limitation in conducting the measurement.

Capital goods

Evaluation status

Not relevant, explanation provided

Please explain

Not relevant based on assessment conducted by refering to the material categories of the Cement Sector Scope 3 GHG in WBCSD

Fuel-and-energy-related activities (not included in Scope 1 or 2)

Evaluation status

Relevant, not yet calculated

Please explain

The scope 3 calculation has not been conducted due to limitation in conducting the measurement.

Upstream transportation and distribution

Evaluation status

Relevant, not yet calculated

Please explain

The scope 3 calculation has not been conducted due to limitation in conducting the measurement.

Waste generated in operations

Evaluation status

Not relevant, explanation provided

Please explain

Not relevant based on assessment conducted by refering to the material categories of the Cement Sector Scope 3 GHG in WBCSD

Business travel

Evaluation status

Relevant, not yet calculated

Please explain

The scope 3 calculation has not been conducted due to limitation in conducting the measurement.

Employee commuting

Evaluation status

Relevant, not yet calculated

Please explain

The scope 3 calculation has not been conducted due to limitation in conducting the measurement.

Upstream leased assets

Evaluation status

Not relevant, explanation provided

Please explain

Not relevant based on assessment conducted by refering to the material categories of the Cement Sector Scope 3 GHG in WBCSD

Downstream transportation and distribution

Evaluation status

Relevant, not yet calculated

Please explain

The scope 3 calculation has not been conducted due to limitation in conducting the measurement.

Processing of sold products

Evaluation status

Not relevant, explanation provided

Please explain

The scope 3 calculation has not been conducted due to limitation in conducting the measurement.

Use of sold products

Evaluation status

Not relevant, explanation provided

Please explain

Not relevant based on assessment conducted by refering to the material categories of the Cement Sector Scope 3 GHG in WBCSD

End of life treatment of sold products

Evaluation status

Not relevant, explanation provided

Please explain

Not relevant based on assessment conducted by refering to the material categories of the Cement Sector Scope 3 GHG in WBCSD

Downstream leased assets

Evaluation status

Not relevant, explanation provided

Please explain

Not relevant based on assessment conducted by refering to the material categories of the Cement Sector Scope 3 GHG in WBCSD

Franchises

Evaluation status

Not relevant, explanation provided

Please explain

Not relevant based on assessment conducted by refering to the material categories of the Cement Sector Scope 3 GHG in WBCSD

Investments

Evaluation status

Not relevant, explanation provided

Please explain

Not relevant based on assessment conducted by refering to the material categories of the Cement Sector Scope 3 GHG in WBCSD

Other (upstream)

Evaluation status

Not relevant, explanation provided

Please explain

Not relevant based on assessment conducted by refering to the material categories of the Cement Sector Scope 3 GHG in WBCSD

Other (downstream)

Evaluation status

Not relevant, explanation provided

Please explain

Not relevant based on assessment conducted by refering to the material categories of the Cement Sector Scope 3 GHG in WBCSD

C6.5a

(C6.5a) Disclose or restate your Scope 3 emissions data for previous years.

Past year 1

Start date

End date

Scope 3: Purchased goods and services (metric tons CO2e)

Scope 3: Capital goods (metric tons CO2e)

Scope 3: Fuel and energy-related activities (not included in Scopes 1 or 2) (metric tons CO2e)

Scope 3: Upstream transportation and distribution (metric tons CO2e)

Scope 3: Waste generated in operations (metric tons CO2e)

Scope 3: Business travel (metric tons CO2e)

Scope 3: Employee commuting (metric tons CO2e)

Scope 3: Upstream leased assets (metric tons CO2e)

Scope 3: Downstream transportation and distribution (metric tons CO2e)

Scope 3: Processing of sold products (metric tons CO2e)

Scope 3: Use of sold products (metric tons CO2e)

Scope 3: End of life treatment of sold products (metric tons CO2e)

Scope 3: Downstream leased assets (metric tons CO2e)

Scope 3: Franchises (metric tons CO2e)

Scope 3: Investments (metric tons CO2e)

Scope 3: Other (upstream) (metric tons CO2e)

Scope 3: Other (downstream) (metric tons CO2e)

Comment

Past year 2

Start date

End date

Scope 3: Purchased goods and services (metric tons CO2e)

Scope 3: Capital goods (metric tons CO2e)

Scope 3: Fuel and energy-related activities (not included in Scopes 1 or 2) (metric tons CO2e)

Scope 3: Upstream transportation and distribution (metric tons CO2e)

Scope 3: Waste generated in operations (metric tons CO2e)

Scope 3: Business travel (metric tons CO2e)

Scope 3: Employee commuting (metric tons CO2e)

Scope 3: Upstream leased assets (metric tons CO2e)

Scope 3: Downstream transportation and distribution (metric tons CO2e)

Scope 3: Processing of sold products (metric tons CO2e)

Scope 3: Use of sold products (metric tons CO2e)

Scope 3: End of life treatment of sold products (metric tons CO2e)

Scope 3: Downstream leased assets (metric tons CO2e)

Scope 3: Franchises (metric tons CO2e)

Scope 3: Investments (metric tons CO2e)

Scope 3: Other (upstream) (metric tons CO2e)

Scope 3: Other (downstream) (metric tons CO2e)

Comment

C6.7

(C6.7) Are carbon dioxide emissions from biogenic carbon relevant to your organization?

Yes

C6.7a

(C6.7a) Provide the emissions from biogenic carbon relevant to your organization in metric tons CO2.

	CO2 emissions from biogenic carbon (metric tons CO2)	Comment

Row 1	268,464.052	Biomass emission source mainly come from agricultural waste i.e. rice husk, cocopeat, tobacco waste, etc.

C6.10

(C6.10) Describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tons CO2e per unit currency total revenue and provide any additional intensity metrics that are appropriate to your business operations.

Intensity figure

0.0000007933

Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO2e)

27,730,824.01

Metric denominator

unit total revenue

Metric denominator: Unit total

34,957,871,000,000

Scope 2 figure used

Location-based

% change from previous year

3

Direction of change

Decreased

Reason for change

Although the pandemic COVID 19 still impacted the business, cement demand experienced 5,9% increased. Overcapacity situation still the most challenging factor in the industry, almost all players started to cut the selling price which then forced SIG to use multibrand strategy by also selling some SIG brand at the level of the economic players. To maintain the decrease in utilization rate due to weaker demand, SIG also sell its product to export market which known to have lower price compared to sell the product domestically. Those conditions resulting 0,6% decrease in SIG 2021 revenue, while sales volume increase only 1,6%

Intensity figure

0.673284001

Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO2e)

27,730,824.01

Metric denominator

Other, please specify

Ton Cement Equivalent

Metric denominator: Unit total

41,187,409.72

Scope 2 figure used

Location-based

% change from previous year

2.2

Direction of change

Decreased

Reason for change

N/A

C-CE6.11

(C-CE6.11) State your organization's Scope 1 and Scope 2 emissions intensities related to cement production activities.

	Gross Scope 1 emissions intensity, metric tons CO2e per metric ton	Net Scope 1 emissions intensity, metric tons CO2e per metric ton	Scope 2, location-based emissions intensity, metric tons CO2e per metric ton
Clinker	0.8723	0.8658	0.1095
Cement equivalent	0.5982	0.5938	0.0751
Cementitious products	0.6361	0.6314	0.0798
Low-CO2 materials			

C7. Emissions breakdowns

C7.1

(C7.1) Does your organization break down its Scope 1 emissions by greenhouse gas type?

Yes

C7.1a

(C7.1a) Break down your total gross global Scope 1 emissions by greenhouse gas type and provide the source of each used greenhouse warming potential (GWP).

Greenhouse gas	Scope 1 emissions (metric tons of CO2e)	GWP Reference
CO2	24,638,442.683	IPCC Fifth Assessment Report (AR5 – 100 year)

C7.2

(C7.2) Break down your total gross global Scope 1 emissions by country/region.

Country/Region	Scope 1 emissions (metric tons CO2e)
Indonesia	24,638,442.683

C7.3

(C7.3) Indicate which gross global Scope 1 emissions breakdowns you are able to provide.

By facility

C7.3b

(C7.3b) Break down your total gross global Scope 1 emissions by business facility.

Facility	Scope 1 emissions (metric tons CO2e)	Latitude	Longitude
Group Head of Plant Operation	6,871,562.618	-6.86099	111.916906
PT Semen Gresik	1,179,563.699	-6.861198	111.45929
PT Semen Padang	4,773,197.266	-0.94411	100.471005
PT Semen Tonasa	4,495,518.895	-4.47879	119.61439
PT Solusi Bangun Indonesia	7,318,600.205	-6.4562	106.93268

C-CE7.4/C-CH7.4/C-CO7.4/C-EU7.4/C-MM7.4/C-OG7.4/C-ST7.4/C-TO7.4/C-TS7.4

(C-CE7.4/C-CH7.4/C-CO7.4/C-EU7.4/C-MM7.4/C-OG7.4/C-ST7.4/C-TO7.4/C-TS7.4) Break down your organization's total gross global Scope 1 emissions by sector production activity in metric tons CO2e.

	Gross Scope 1 emissions, metric tons CO2e	Net Scope 1 emissions , metric tons CO2e	Comment

Cement production activities			

C7.5

(C7.5) Break down your total gross global Scope 2 emissions by country/region.

Country/Region	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
Indonesia	3,092,381.324	

C7.6

(C7.6) Indicate which gross global Scope 2 emissions breakdowns you are able to provide.

By facility

C7.6b

(C7.6b) Break down your total gross global Scope 2 emissions by business facility.

Facility	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)
Group Head of Operation Planning	727,596.763	
PT Semen Gresik	149,805.367	
PT Semen Padang	438,339.518	
PT Semen Tonasa	758,321.593	
PT Solusi Bangun Indonesia	1,018,318.083	

C-CE7.7/C-CH7.7/C-CO7.7/C-MM7.7/C-OG7.7/C-ST7.7/C-TO7.7/C-TS7.7

(C-CE7.7/C-CH7.7/C-CO7.7/C-MM7.7/C-OG7.7/C-ST7.7/C-TO7.7/C-TS7.7) Break down your organization's total gross global Scope 2 emissions by sector production activity in metric tons CO2e.

	Scope 2, location-based, metric tons CO2e	Scope 2, market-based (if applicable), metric tons CO2e	Comment
Cement production activities	3,092,381.324		

C7.9

(C7.9) How do your gross global emissions (Scope 1 and 2 combined) for the reporting year compare to those of the previous reporting year?

Decreased

C7.9a

(C7.9a) Identify the reasons for any change in your gross global emissions (Scope 1 and 2 combined), and for each of them specify how your emissions compare to the previous year.

	Change in emissions (metric tons CO2e)	Direction of change	Emissions value (percentage)	Please explain calculation
Change in renewable energy consumption				
Other emissions reduction activities	650,601.948	Decreased	3.3837	Reduction of Clinker Factor and Emission Efficiency in electricity consumption
Divestment				
Acquisitions				
Mergers				
Change in output	326,242.043	Decreased	3.441	Reduction of Cement and Clinker Production due to lower demand compared to previous year
Change in methodology				
Change in boundary				
Change in physical operating conditions				
Unidentified				
Other				

C7.9b

(C7.9b) Are your emissions performance calculations in C7.9 and C7.9a based on a location-based Scope 2 emissions figure or a market-based Scope 2 emissions figure?

Location-based

C8. Energy

C8.1

(C8.1) What percentage of your total operational spend in the reporting year was on energy?

More than 45% but less than or equal to 50%

C8.2

(C8.2) Select which energy-related activities your organization has undertaken.

	Indicate whether your organization undertook this energy-related activity in the reporting year
Consumption of fuel (excluding feedstocks)	Yes
Consumption of purchased or acquired electricity	Yes
Consumption of purchased or acquired heat	No
Consumption of purchased or acquired steam	No
Consumption of purchased or acquired cooling	No
Generation of electricity, heat, steam, or cooling	Yes

C8.2a

(C8.2a) Report your organization's energy consumption totals (excluding feedstocks) in MWh.

	Heating value	MWh from renewable sources	MWh from non-renewable sources	Total (renewable and non-renewable) MWh

Consumption of fuel (excluding feedstock)	LHV (lower heating value)	677,940.07	26,514,973.91	27,192,913.98
Consumption of purchased or acquired electricity			2,569,726.77	2,569,726.77
Consumption of self-generated non-fuel renewable energy				
Total energy consumption		677,940.07	29,846,642.46	30,524,582.52

C-CE8.2a

(C-CE8.2a) Report your organization's energy consumption totals (excluding feedstocks) for cement production activities in MWh.

	Heating value	Total MWh
Consumption of fuel (excluding feedstocks)	LHV (lower heating value)	27,192,913.98
Consumption of purchased or acquired electricity		2,569,726.77
Total energy consumption		30,524,582.52

C8.2b

(C8.2b) Select the applications of your organization's consumption of fuel.

	Indicate whether your organization undertakes this fuel application
Consumption of fuel for the generation of electricity	Yes
Consumption of fuel for the generation of heat	Yes
Consumption of fuel for the generation of steam	No
Consumption of fuel for the generation of cooling	No
Consumption of fuel for co-generation or tri-generation	No

C8.2c

(C8.2c) State how much fuel in MWh your organization has consumed (excluding feedstocks) by fuel type.

Sustainable biomass

Heating value

LHV

Total fuel MWh consumed by the organization

677,940.07

MWh fuel consumed for self-generation of electricity

MWh fuel consumed for self-generation of heat

677,940.07

Comment

Other biomass

Heating value

Total fuel MWh consumed by the organization

MWh fuel consumed for self-generation of electricity

MWh fuel consumed for self-generation of heat

Comment

Other renewable fuels (e.g. renewable hydrogen)

Heating value

Total fuel MWh consumed by the organization

MWh fuel consumed for self-generation of electricity

MWh fuel consumed for self-generation of heat

Comment

Coal

Heating value
LHV

Total fuel MWh consumed by the organization
28,282,400.48

MWh fuel consumed for self-generation of electricity
2,562,164.83

MWh fuel consumed for self-generation of heat
25,720,235.64

Comment

Oil

Heating value
LHV

Total fuel MWh consumed by the organization
227,594.52

MWh fuel consumed for self-generation of electricity
57,266.42

MWh fuel consumed for self-generation of heat
170,328.1

Comment

Gas

Heating value

Total fuel MWh consumed by the organization

MWh fuel consumed for self-generation of electricity

MWh fuel consumed for self-generation of heat

Comment

Other non-renewable fuels (e.g. non-renewable hydrogen)

Heating value

LHV

Total fuel MWh consumed by the organization

624,410.17

MWh fuel consumed for self-generation of electricity

MWh fuel consumed for self-generation of heat

624,410.17

Comment

Total fuel

Heating value

LHV

Total fuel MWh consumed by the organization

30,524,582.52

MWh fuel consumed for self-generation of electricity

3,331,668.55

MWh fuel consumed for self-generation of heat

27,192,913.98

Comment

C-CE8.2c

(C-CE8.2c) State how much fuel in MWh your organization has consumed (excluding feedstocks) by fuel for cement production activities.

Sustainable biomass

Heating value

LHV

Total MWh fuel consumed for cement production activities

677,940.07

MWh fuel consumed at the kiln

677,940.07

MWh fuel consumed for the generation of heat that is not used in the kiln

MWh fuel consumed for the self-generation of electricity

Other biomass

Heating value

Total MWh fuel consumed for cement production activities

MWh fuel consumed at the kiln

MWh fuel consumed for the generation of heat that is not used in the kiln

MWh fuel consumed for the self-generation of electricity

Other renewable fuels (e.g. renewable hydrogen)

Heating value

Total MWh fuel consumed for cement production activities

MWh fuel consumed at the kiln

MWh fuel consumed for the generation of heat that is not used in the kiln

MWh fuel consumed for the self-generation of electricity

Coal

Heating value

LHV

Total MWh fuel consumed for cement production activities

28,282,400.48

MWh fuel consumed at the kiln

25,720,235.64

MWh fuel consumed for the generation of heat that is not used in the kiln

MWh fuel consumed for the self-generation of electricity

2,562,164.83

Oil

Heating value

LHV

Total MWh fuel consumed for cement production activities

227,594.52

MWh fuel consumed at the kiln

170,328.1

MWh fuel consumed for the generation of heat that is not used in the kiln

MWh fuel consumed for the self-generation of electricity

57,266.42

Gas

Heating value

Total MWh fuel consumed for cement production activities

MWh fuel consumed at the kiln

MWh fuel consumed for the generation of heat that is not used in the kiln

MWh fuel consumed for the self-generation of electricity

Other non-renewable fuels (e.g. non-renewable hydrogen)

Heating value

LHV

Total MWh fuel consumed for cement production activities

624,410.17

MWh fuel consumed at the kiln

624,410.17

MWh fuel consumed for the generation of heat that is not used in the kiln

MWh fuel consumed for the self-generation of electricity

Total fuel

Heating value
LHV

Total MWh fuel consumed for cement production activities
30,524,582.52

MWh fuel consumed at the kiln
27,192,913.98

MWh fuel consumed for the generation of heat that is not used in the kiln

MWh fuel consumed for the self-generation of electricity
3,331,668.55

C8.2d

(C8.2d) Provide details on the electricity, heat, steam, and cooling your organization has generated and consumed in the reporting year.

	Total Gross generation (MWh)	Generation that is consumed by the organization (MWh)	Gross generation from renewable sources (MWh)	Generation from renewable sources that is consumed by the organization (MWh)
Electricity	604,561.03	494,717.37		
Heat	27,192,913.98	27,192,913.98	677,940.07	677,940.07
Steam				
Cooling				

C-CE8.2d

(C-CE8.2d) Provide details on the electricity and heat your organization has generated and consumed for cement production activities.

	Total gross generation (MWh) inside the cement sector boundary	Generation that is consumed (MWh) inside the cement sector boundary
Electricity	604,561.03	494,717.37
Heat	27,192,913.98	27,192,913.98
Steam		

C8.2g

(C8.2g) Provide a breakdown of your non-fuel energy consumption by country.

Country/area

Indonesia

Consumption of electricity (MWh)

Consumption of heat, steam, and cooling (MWh)

Total non-fuel energy consumption (MWh) [Auto-calculated]

C9. Additional metrics

C9.1

(C9.1) Provide any additional climate-related metrics relevant to your business.

Description

Other, please specify

Waste as Alt. Fuel

Metric value

Metric numerator

tons of waste

Metric denominator (intensity metric only)

% change from previous year

Direction of change

Please explain

Description

Other, please specify

Waste as Alt. Raw Material

Metric value

Metric numerator

tons of waste

Metric denominator (intensity metric only)

% change from previous year

Direction of change

Please explain

C-CE9.6/C-CG9.6/C-CH9.6/C-CN9.6/C-CO9.6/C-EU9.6/C-MM9.6/C-OG9.6/C-RE9.6/C-ST9.6/C-TO9.6/C-TS9.6

(C-CE9.6/C-CG9.6/C-CH9.6/C-CN9.6/C-CO9.6/C-EU9.6/C-MM9.6/C-OG9.6/C-RE9.6/C-ST9.6/C-TO9.6/C-TS9.6) Does your organization invest in research and development (R&D) of low-carbon products or services related to your sector activities?

	Investment in low-carbon R&D	Comment
Row 1	Yes	

C-CE9.6a

(C-CE9.6a) Provide details of your organization's low-carbon investments for cement production activities over the last three years.

Technology area	Stage of development in the reporting year	Average % of total R&D investment over the last 3 years	R&D investment figure in the reporting year (optional)	Comment
Low clinker cement	Large scale commercial deployment	≤20%		One of our product, Masonry Cement, is made using lower clinker factor than PPC or PCC. Other products are in bulk cement category, such as PowerPro.
Fuel switching	Large scale commercial deployment	≤20%		

Waste heat recovery	Large scale commercial deployment	≤20%		
Other, please specify Solar Panel	Pilot demonstration	≤20%		
Other, please specify Plant Optimizer	Small scale commercial deployment	≤20%		

C10. Verification

C10.1

(C10.1) Indicate the verification/assurance status that applies to your reported emissions.

	Verification/assurance status
Scope 1	No third-party verification or assurance
Scope 2 (location-based or market-based)	No third-party verification or assurance
Scope 3	No emissions data provided

C10.2

(C10.2) Do you verify any climate-related information reported in your CDP disclosure other than the emissions figures reported in C6.1, C6.3, and C6.5?

No, we do not verify any other climate-related information reported in our CDP disclosure

C11. Carbon pricing

C11.1

(C11.1) Are any of your operations or activities regulated by a carbon pricing system (i.e. ETS, Cap & Trade or Carbon Tax)?

No, but we anticipate being regulated in the next three years

C11.1d

(C11.1d) What is your strategy for complying with the systems you are regulated by or anticipate being regulated by?

Currently there is no specific regulation imposed related to the carbon pricing system/mechanism. However, the Government of Indonesia is in the process of evaluating one and might implement carbon tax mechanism gradually per sector starting 2022.
As a state-owned enterprise, one of SIG purpose is to provide positive benefit for Indonesia national development. Towards becoming the leading building material solutions provider in the region, one of our missions is to maintain the sustainable environment and social responsibility in line with the Sustainable Development Goals (SGDs). What we are focusing now even before the Government issuing the plan to implement carbon tax, is how to manage our sustainability management and practices, including environment which has been embodied in our 4 pillars of Sustainability:

1st pillar is Sustainable Economic Growth, which is related to how we can provide sustainable solutions through various innovative products.
We have and continuously develop innovative products and solutions which support such commitment, such as:
- Non OPC bulk cement with lower clinker factor and more suitable to the specific characteristic of each project. Our PCC and PwrPro products has been awarded as green label from Green Product Council Indonesia.
- Speed Crete as a quick readymix solutions to road construction projects that has high fluidity to help the concrete flow and solidify in short time, so that the road can be used immediately and reduce traffic.
- ThruCrete: readymix product that can absorb water into the ground and become water catchment areas to prevent flood.
- Ground Granulated Blas Furnace Slag (GBBFS) which can be combined with OPC cement to be a solid and durable concrete to reduce cement consumption in producing concrete.
Most of our Non-OPC products and concretes have utilized alternative raw material to reduce the clinker or cement portion which can lower the CO2 emissions during the production.

2nd pillar is Climate & Energy, related to our commitment to reduce GHG emissions, air emissions, and energy consumption. The initiatives are through:
- Reducing the portion of OPC product and introduce more type of composite cement products
- Implementation of ISO 5001-Energy Management System to improve efficiency of energy management which refers to Government Regulation No.70 of 2009 concerning Energy Conservation.
- Switch to low carbon fuels by using WHRPG to reuse the waste heat from production process (which has reduce total emissions by 165,000 tons of CO2), install solar power for lighting in our plants, using biomass and non-biomass alternative fuel.
- Manage coal and raw material quality standards to achieve optimum coal and raw material index
- Install electrostatic precipitators, cyclones, conditioning towers and bag filters in plants for managing dust emissions.

3rd pillar is circular economy, related to our commitment to use materials in a responsible manner by using raw materials efficiently through our product development; and utilizing renewable/waste-derived resources as AFR. The initiatives related to this pillar are:

- Continuously improve our waste management unit (Nathabumi) to increase its capacity and capability in providing industrial and municipal waste treatment solutions through co-processing methods where the waste is burned inside our kiln which can then be used as a source of heat energy in the cement production process. In addition, some types of industrial waste such as fly ash, bottom ash, copper slag etc, can be used as an alternative raw material for cement. This waste management can also provide the government, industries and communities a solution to manage their waste and reducing the needs to treat the waste in ways that will produce more CO2 emission (ie. burn & dump carelessly).

4th pillar is People and Community, where we focus on promoting health and safety for employees and contractors as well as creating shared values for community. We expect to achieve Zero Fatality, low Lost Time Injury Frequency Rate, and giving benefit for more people through our community development programs.

C11.2

(C11.2) Has your organization originated or purchased any project-based carbon credits within the reporting period?

No

C11.3

(C11.3) Does your organization use an internal price on carbon?

No, but we anticipate doing so in the next two years

C12. Engagement

C12.1

(C12.1) Do you engage with your value chain on climate-related issues?

Yes, our customers/clients

C12.1b

(C12.1b) Give details of your climate-related engagement strategy with your customers.

Type of engagement & Details of engagement

Collaboration & innovation

Run a campaign to encourage innovation to reduce climate change impacts

% of customers by number

100

% of customer - related Scope 3 emissions as reported in C6.5

Please explain the rationale for selecting this group of customers and scope of engagement

SIG engage with its customer in 2 separated groups. 1st group is bulk cement customers who tend to choose OPC cement for their construction project (mostly infrastructure projects) as it is perceived to be the finest quality for any type of big projects. We introduce and educate the project contractors/owners about our various type of non-OPC products with lower clinker factor, low CO2 emissions, yet able to maintain the quality suitable to each project characteristics with more economical price. The 2nd group is bag cement customers who used to use one type of cement for all part (structural and non structural) of their construction. SIG introduce Masonry cement as a new type of cement that is suitable for non structural application, with lower clinker factor and more economical. SIG also has a digital solution called SobatBangun, a digital platform that is engaged with the mission of developing a better and more sustainable home building and renovation process for its customers, working together with trusted architechs, contractors, building material as well as financing providers. SobatBangun offers House 2.0 which is designed and built in a way that allows for future expansion using high quality, long-lasting and environmentally friendly materials. House 2.0 concept is also designed to be energy efficient through the use of alternative energy or by applying a design concept that allows for optimum natural light and air circulation to reduce energy use.

Impact of engagement, including measures of success

SIG was able to gradually decrease the average clinker factor which mostly resulted by producing and selling more non-OPC products since 2018. In 2017, the average clinker factor was 81% and it decreased to 70.6% in 2020 (and it will become 68,5% by 2030)

C12.2

(C12.2) Do your suppliers have to meet climate-related requirements as part of your organization's purchasing process?

C12.3

(C12.3) Does your organization engage in activities that could either directly or indirectly influence policy, law, or regulation that may impact the climate?

Row 1

Direct or indirect engagement that could influence policy, law, or regulation that may impact the climate

Yes, we engage indirectly through trade associations

Does your organization have a public commitment or position statement to conduct your engagement activities in line with the goals of the Paris Agreement?

No, but we plan to have one in the next two years

Describe the process(es) your organization has in place to ensure that your engagement activities are consistent with your overall climate change strategy

C12.3b

(C12.3b) Provide details of the trade associations your organization engages with which are likely to take a position on any policy, law or regulation that may impact the climate.

Trade association

Other, please specify

Indonesia Cement Association

Is your organization's position on climate change consistent with theirs?

Consistent

Has your organization influenced, or is your organization attempting to influence their position?

We have already influenced them to change their position

State the trade association's position on climate change, explain where your organization's position differs, and how you are attempting to influence their position (if applicable)

ICA activities are acting as a bridge and channel of communication, consultation, and information with the government and other relevant institutions at national, regional as well as international levels, in accordance to supporting the control of efforts to prevent damages and pollution to the environment. One of its goals is promoting energy saving and efficiency by among other things developing alternative and renewable energy

Funding figure your organization provided to this trade association in the reporting year, if applicable (currency as selected in C0.4) (optional)

Describe the aim of your organization's funding

Have you evaluated whether your organization's engagement with this trade association is aligned with the goals of the Paris Agreement?

Yes, we have evaluated, and it is aligned

C12.4

(C12.4) Have you published information about your organization's response to climate change and GHG emissions performance for this reporting year in places other than in your CDP response? If so, please attach the publication(s).

Publication
In voluntary sustainability report

Status
Complete

Attach the document

Page/Section reference
SIG Sustainability Strategy, Sustainability Governance

Content elements
Governance
Strategy
Emissions figures
Emission targets
Other metrics

Comment

C15. Biodiversity

C15.1

(C15.1) Is there board-level oversight and/or executive management-level responsibility for biodiversity-related issues within your organization?

	Board-level oversight and/or executive management-level responsibility for biodiversity-related issues	Description of oversight and objectives relating to biodiversity
Row 1	Yes, executive management-level responsibility	SVP of Sustainability Office responsible to designing and guiding sustainability strategy especially Biodiversity issue. In addition, SVP of Operation and Energy responsible to monitor and implementing strategy that been published by SVP of Sustainability Office. In order to make sure that

		implementation has been well executed, The unit monitor and evaluate periodically

C15.2

(C15.2) Has your organization made a public commitment and/or endorsed any initiatives related to biodiversity?

	Indicate whether your organization made a public commitment or endorsed any initiatives related to biodiversity	Biodiversity-related public commitments	Initiatives endorsed
Row 1	Yes, we have made public commitments and publicly endorsed initiatives related to biodiversity	Commitment to not explore or develop in legally designated protected areas Commitment to respect legally designated protected areas Commitment to avoidance of negative impacts on threatened and protected species	

C15.3

(C15.3) Does your organization assess the impact of its value chain on biodiversity?

	Does your organization assess the impact of its value chain on biodiversity?
Row 1	No, but we plan to assess biodiversity-related impacts within the next two years

C15.4

(C15.4) What actions has your organization taken in the reporting year to progress your biodiversity-related commitments?

	Have you taken any actions in the reporting period to progress your biodiversity-related commitments?
Row 1	No, we are not taking any actions to progress our biodiversity-related commitments, but we plan to within the next two years

C15.5

(C15.5) Does your organization use biodiversity indicators to monitor performance across its activities?

	Does your organization use indicators to monitor biodiversity performance?	Indicators used to monitor biodiversity performance
Row 1	No, we do not use indicators, but plan to within the next two years	

C15.6

(C15.6) Have you published information about your organization's response to biodiversity-related issues for this reporting year in places other than in your CDP response? If so, please attach the publication(s).

Report type	Content elements	Attach the document and indicate where in the document the relevant biodiversity information is located
In voluntary sustainability report or other voluntary communications	Content of biodiversity-related policies or commitments Governance Biodiversity strategy	

C16. Signoff

C-FI

(C-FI) Use this field to provide any additional information or context that you feel is relevant to your organization's response. Please note that this field is optional and is not scored.

C16.1

(C16.1) Provide details for the person that has signed off (approved) your CDP climate change response.

	Job title	Corresponding job category
Row 1	SVP of Sustainability Office	Chief Sustainability Officer (CSO)

Submit your response

In which language are you submitting your response?

English

Please confirm how your response should be handled by CDP

	I understand that my response will be shared with all requesting stakeholders	Response permission
Please select your submission options	Yes	Public

Please confirm below

I have read and accept the applicable Terms