Our Environmental Impact

1

RAW

75%
total raw materials

2

25% total materials recycled

3

NOx

NOx Intensity

23% ↓*

0.00125 (tonne per '000 HKD turnover)

4

SOx

SOx Intensity

85% ↓*

0.00005 (tonne per '000 HKD turnover)

5

CO_2 CO_2 Intensity

Scope 1

20% ↓*

2.19 (tonne CO_2e per '000 HKD turnover)

Scope 2

24% ↓*

0.14 (tonne CO_2e per '000 HKD turnover)

6

Coal

38% ↓*

8.4603 (GJ per '000 HKD turnover)

7

Diesel

26% ↓*

0.0182 (GJ per '000 HKD turnover)

10

Hazardous Waste Intensity

13% ↓*

0.00005 (tonne per '000 HKD turnover)

8

Electricity

14% ↓*

251.2 (kWh per '000 HKD turnover)

9

Water

61% ↓*

0.63 (cubic metre per '000 HKD turnover)

11

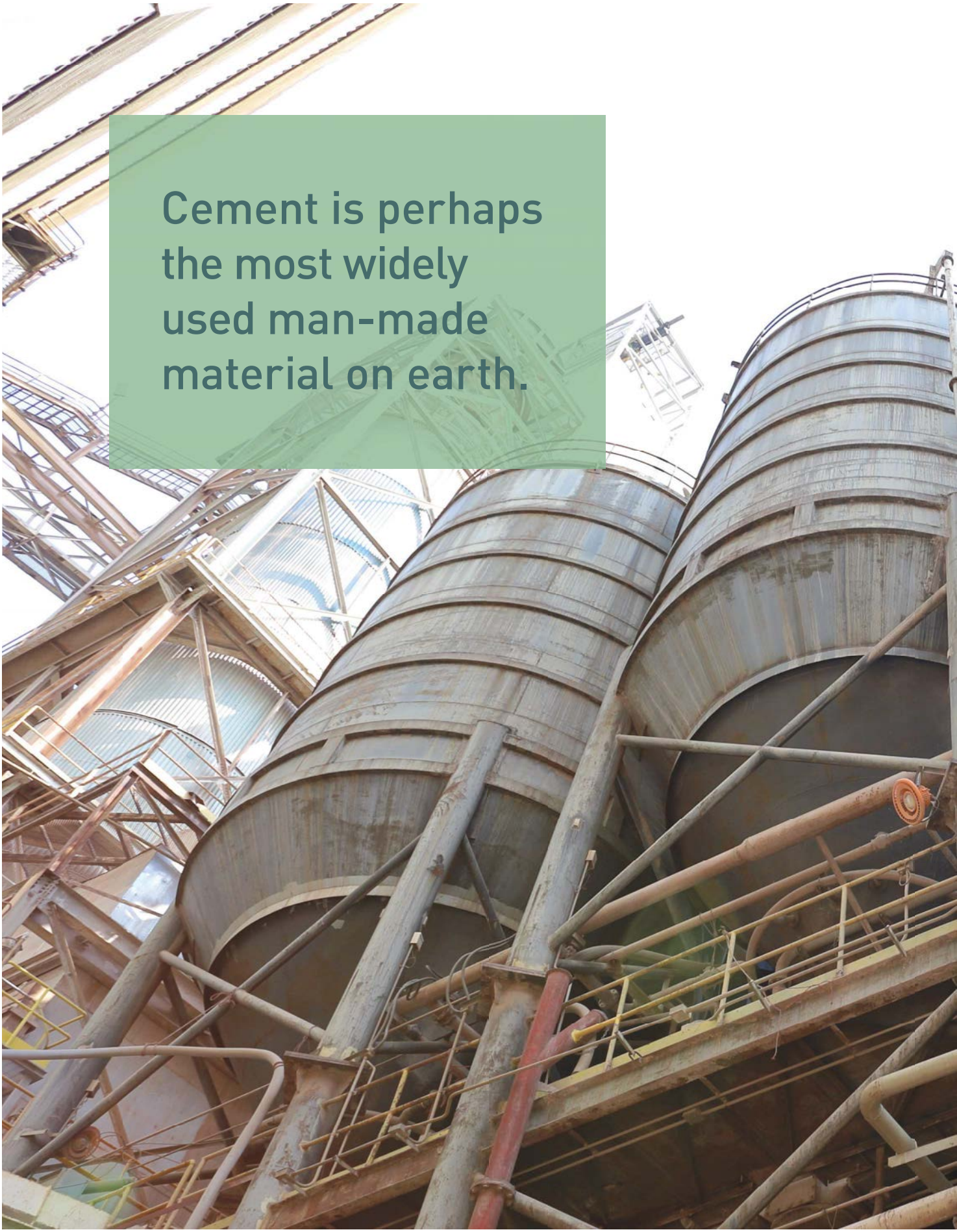
Non-hazardous Waste Intensity*

23% ↑*

0.00236 (tonne per '000 HKD turnover)

*100% recycled

*compared to last reporting period


Cement is perhaps
the most widely
used man-made
material on earth.

As a key ingredient for concrete, cement is used in the construction of everything from buildings and bridges to roads and pavements and more. Having largely shaped the modern built environment, we recognize that cement production single-handedly accounts for about 7% of all global carbon emissions[1] The intense heating required to bind cement materials for production requires massive amounts of fuel and also causes one of the main ingredients - limestone - to chemically decompose, leaving behind a compound called calcium oxide, which releases large amounts of carbon dioxide as a by-product.

For over 20 years our systematic approach to environmental management has met or exceeded internationally-recognized standards. We seek to use finite resources efficiently, while reducing GHG emissions and minimising waste as best we can. Indeed, we are proud to operate in our long-time home of Hong Kong and consider the environmental performance of our company to be critical to helping preserve Hong Kong's delicate eco system and few natural resources.

At minimum, we operate under licences issued from the Environmental Protection Department (EPD) of Hong Kong and Ministry of Ecology and Environment of Mainland China. However, our efforts go beyond those required and our Environmental Management System has been implemented since 2005 to ensure that our environmental policies are effective and all environmental issues are addressed promptly. Additionally, our Integrated Policy of Quality, Environmental, Safety and Health; Integrated Management System (IMS); and especially our Environmental Policy help keep our team take ownership of our many environmentally considerate initiatives and programmes.

During this reporting period, we made two major improvements to our IMS Policy. Our Policy was migrated to ISO14001:2015 in May 2018 which will help enhance our environmental performance and prior to the migration, the Policy was carefully reviewed in January 2018 to better integrate environmental aspects across our operations. Various members of management and the Integrated Management Committee are empowered to periodically review objectives and targets according to this framework.

[1] According to estimates from the International Energy Agency.

Minimizing Our Use of Natural Resources

As one of our core values, we are dedicated to protecting the environment and extending the value of our resources. A big part of this is resource optimisation and as often as possible, we use by-products from other industries in our operations. This helps reduce natural or virgin resources from being extracted from the environment.

Three new initiatives launched during the reporting period that underscore our efforts:

- Using more than 4,000 metric tonnes of cleaned and shattered recycled glass to make cement in 2017 and 2018.
- Our Mainland China operations in Guangdong are testing opportunities to convert various types of industrial waste into energy, which would reduce our coal consumption and help divert waste from landfills. We expect to enter into a joint venture agreement by 2020 with a textile manufacturer in Haizhu to convert a targeted 83 tonnes of scrap textiles into energy. This is a relatively 'clean' process, resulting in the production of little to no emissions.
- A trial burn study on using wood derived fuel in our Hong Kong operation was completed in 2017. The use of alternative fuel enables us to less dependent on coal fossil fuel.

Simultaneously Reducing Emissions and Waste

As a responsible corporate citizen, reducing greenhouse gases (GHG) emissions is extremely important to us, and we do everything possible to radically reduce emissions in a variety of ways. This also ties in with our motivation to contribute to SDGs 12 and 14 by finding innovative ways to minimize our emissions as best we can.

Pending approval from the EPD, we will soon be able to replace about 40% of the coal used for cement production with alternative fuels by building a disposal facility designated to convert multiple types of high-calorific waste, such as wood derived fuels, into energy. Bringing this facility to life will not only add to our core business of cement manufacturing, it will also enable GIC to be a waste management solutions provider. A more stable revenue source compared to our cement revenue which is cyclical and seasonal will be provided.

We have several other pinnacle projects that aim to help decrease our GHG emissions during the cement production process and reduce waste by diverting materials that would otherwise be sent to landfills.

Bringing eco-friendly cement to Hong Kong

The Slag-grinding plant at Tap Shek Kok - which is slated to open in Q4 2020 - will grind slag[2] to produce ground granulated blast furnace slag as a partial replacement of cement in concrete. The design of the plant, which offers a unique approach to reducing the carbon footprint of our cementitious products, is being built inside our existing cement plant and uses waste heat from the kiln system to dry slag. With a lower carbon footprint than portland cement[3] and an excellent replacement material for Pulverized Fuel Ash (PFA)[4], slag is a more eco-friendly cementitious option, and is new to the Hong Kong market.

The capital investment of the slag plant was approximately HK$200 million and is anticipated to prevent the release of around 284kt of carbon dioxide equivalent emissions per year. Additionally, as the slag plant was built inside the existing cement plant, only a few additional employees will be required to operate it and the environmental and community impact from noise and air pollution should be quite minimal. To ensure this, the air quality of the neighbouring community was assessed during the licencing process, and during the construction phase heavy machinery or oversize structures will be transported to the site either by barge or during off-peak hours.

With an expected upcoming shortage of PFA in Hong Kong due to local power plants adopting more natural gas and reducing their coal consumption, the slag plant will provide customers a consistently priced and stable product for years to come.

[2] Slag cement is a hydraulic cement formed when granulated blast furnace slag (GGBFS) is ground and is used to replace a portion of portland cement. Slag cement is commonly found in ready-mixed concrete, precast concrete, masonry, soil cement and high temperature resistant building products. It is a recovered industrial by-product of an iron blast furnace.

[3] The basic ingredient of concrete which is formed when cement creates a paste with water that binds with sand and rock to harden.

[4] Pulverized Fuel Ash (PFA), a.k.a. 'Fly ash' is a cement substitute and is a by-product of coal-burning power stations.

Using typhoon yard waste as an energy source

The use of cement substitutes is a common practice throughout the global cement industry. Another common methodology to reducing emissions in cement production is from using alternative fuels, such as biomass and other waste materials. We have always considered alternative fuel use a win-win solution as it increases our profitability and enhances competitiveness while reducing our carbon footprint.

Despite prevalence in other countries, in Hong Kong, it is an unusual practice for a cement company to target locally available waste. To demonstrate the environmental and economic value, we conducted a trial burn programme of wood derived fuel to prove how GIC can collaborate with local waste management groups and resolve the waste problem of Hong Kong in a responsible and accountable manner. Under a special permit granted by the EPD in October 2018 and after Typhoon Mangkhut, approximately 263 tonnes of fallen trees and twigs were collected and burned in our plant as an alternative energy source in 2018.

The trial burn exercise has proven to be successful in showcasing our capacity for providing a high-quality standard of cement that diverts waste from landfill and incinerators and has minimal emissions.

Recycling glass bottles

Hong Kong residents and companies use a lot of glass for food and beverage needs, and despite being endlessly 100% recyclable, without loss in quality or purity, very little of it is recycled. Always thinking resourcefully, in 2017 we saw an opportunity to help divert Hong Kong's waste glass from landfill by using glass cullet[5] as an additive during cement production. The glass cullet replaces between 1-2% of clinker[6] and in 2018 we handled 3,560 tonnes, which is equivalent to around 2,500 tonnes in CO_2 reduction while also diverting nearly 1,000 metric tonnes of glass from going to landfill every month. We target to convert around 16,000 tonnes annually (i.e. 1% of our clinker dosage) however achieving this goal is subject to the availability of glass supply and the logistics of working with waste glass collection service providers. The EPD supports this initiative as it is considered a viable solution that both diverts waste and reduces CO2 emissions.

[5] The industry term for furnace-ready recycled glass

[6] The main raw material used for cement manufacturing. Limestone powder, iron ore, alumina are all made into a powdery form which is then heated resulting in a lumpy solid substance called 'clinker'.

Enhancing Our Energy Efficiency

Energy efficiency is another critical aspect to minimizing our environmental impact. Several types of fuels are used for cement production and we are continuously improving our energy consumption. Highlights of initiatives to enhance our energy efficiency during the reporting period include the following aspects:

Grinding process improvements

- Launched a trial study on using ceramic balls in the grinding process to improve electricity consumption
- Employed a new grind aid to finish mill operation to fully utilize the clinker strength capacity and hence reduce its power consumption
- Upgraded the feeding of air separator to improve its separation efficiency and prevent overgrind, and hence reduce the electricity consumption of raw grinding operation

Equipment (such as feeders, fans, etc.) improvements

- Upgraded precal coal dust feeder to remove the process bottlenecks
- Vertex killer was installed to reduce the turbulence at fan inlets which reduces power consumption
- Replaced raw mill and kiln ID fans motors, feeders and controllers
- Replaced kiln main drives, motor, feeder and controller
- Replaced clinker cooler fans, motors and their feeders
- Replaced cooler bag house exhaust fan motor, its feeder and controller

Working Towards Our Water Goals

For over ten years we have had a goal to emit zero water discharge from our plants. We are committed to minimize discharge by reusing domestic waste water which we treat in an internal facility. The water is sterilized before being reused in our irrigating system. We also collect rainwater into a reservoir, which is then recycled and used to moisten dust particulates in the flue gas stream. This increases the efficiency of dust collection in the electrostatic precipitator. The recycled water is also loaded in our numerous water trucks for road water sprays and other applications.