

## CIRCULAR ECONOMY BUSINESS CASE STUDIES IN SOUTHEAST ASIA



## Holcim Philippines

- Manila, Philippines
- Cement/Construction Materials
- [www.holcim.ph](http://www.holcim.ph)
- Analysis period: 2021-2022

## Decarbonising Cement through Efficiency and Alternative Fuels and Materials

## Business Spotlight

Holcim Philippines is committed to decarbonizing building at scale by supplying low-carbon and circular solutions for the Philippine building and construction industry. Holcim Philippines aims to become net zero by 2050 and accelerate the use of recycled materials.

Current key initiatives include:

- Decarbonizing Holcim: making operations more efficient, use alternative fuels and renewable energy, and switch to low-carbon formulations;
- Build Better With Less: enabling partners to be more efficient in using building materials through innovative solutions and designs;
- Making Buildings Sustainable: providing solutions for decarbonizing cities such as nature-based solutions; and
- Circular Construction: facilitate reuse of construction and demolition waste for new construction

Since 2018, Holcim Philippines reduced its carbon footprint by close to 20%. The company has also reduced water usage by almost 70% during this period and is approaching its goal to be water positive by 2030.

The company has also stepped-up engagements with government agencies, building professional organizations, academia, customers and the general public on the value of its sustainability path and the need for more partners to accelerate the transition.

**Keywords**

Building materials, Building solutions, Cement, Decarbonisation, Alternative fuels, Alternative materials, Construction Demolition Materials, CDM

**Innovation**

Product/service design, Manufacturing, End-of-life management, Resource circularity, Resource efficiency, Resource substitution



# Analysis of Holcim Philippines

## Context and baseline

Holcim Philippines, Inc. is a member of the Holcim Group, a Swiss-based global leader in innovative and sustainable building solutions. It has been operating for over five decades in the Philippines and supplies essential materials for building structures. It has four cement manufacturing plants, an aggregates business and a network of distributors throughout the country.

Fresh off the pandemic, the company had to contend with an unprecedented 39% surge in energy and a staggering 68% increase in fuel costs due to supply chain disruptions and global energy price hikes driven by geopolitical tensions, while competition continued to intensify from imports.

## Innovation

The manufacturing of building materials is an energy intensive industry with significant fuel and power cost components. Holcim Philippines decarbonised its plant operations by deriving 20% of raw materials from waste (instead of limestone, silica and shale from quarries) to produce clinker (which is the main ingredient of cement) and ramping up the use of alternative fuels (such as municipal and solid wastes, biomass) to replace coal and other fossil fuels. In 2022, the company reduced its use of fossil fuels by 8% compared to 2021.

Holcim Philippines has adopted digitalisation and automation across the business through its Plants of Tomorrow Program, which increases efficiency thereby lowering operational costs, improves operational safety, enhances services and data analysis for faster decision-making. Efficiency gains translated into lower power consumption thus reducing electricity costs as well as CO<sub>2</sub> emissions.

While blended cement has been in use and available in the Philippines for decades, Holcim Philippines has expanded its product range with blended cements with lower clinker components and 20-30% lower CO<sub>2</sub> emissions than traditional limestone-based cement, that maintain or even improve performance compared to conventional building materials (e.g. Solido, AquaX and ECOPlanet). These blended cements comprised 78% of all sales in 2022. Holcim partnered with 35 local governments to manage their wastes (following guidelines provided by the company); and reduced water consumption from its operations by more than 50% and thus helped to conserve this resource.



## Circular Economy impact

In pursuit of its sustainability strategy, Holcim follows the principles of Reduce, Reuse and Recycle to build more with less and preserve ecosystems and the environment. The specific initiatives are measured based on the total volume of waste-derived resources (metric tonnes) which are co-processed in cement kilns as alternative fuel or raw material and used as mineral components (MIC) or additives in cement products. In 2022 Holcim achieved a 7% reduction in its carbon emissions per cementitious product from the previous year.

Holcim's initiatives support more circular and efficient use of materials, energy and water (resource circularity and resource efficiency), and substitution of non-renewable by renewable energy (resource substitution).

**Resource Circularity** is aimed to increase and repeat recovery and reuse of materials, energy and/or water. One of its plants has already installed a closed loop water circuit to recover water used in its production process and to reintroduce this back in the production process. Other plants will follow suit. The use of recycled and reused water increased in 2022 to 588,261 m<sup>3</sup>. Waste heat is recovered from the cooler in the kilns, and used for the drying of raw materials.

In 2022, Holcim derived 11% of the required raw materials from industrial wastes such as fly ash and slag that are byproducts of other industrial processes (instead of using quarried limestone, silica and shale) to produce cement. Holcim Philippines has expanded its product range with the introduction of more blended cements such as Solido, AquaX and ECOPlanet that have lower carbon emissions but demonstrate the same or better performance as conventional building materials. Holcim's Solido



cement has 20% lower CO<sub>2</sub> emissions than traditional limestone-based cement. ECOPlanet cement is one of Holcim Philippines' most sustainable products with more than 30% lower carbon emissions. The Philippines is among the first markets where this is available. Combined with other energy efficiency measures, the company reduced its specific kg CO<sub>2</sub> per metric tonne of cementitious product by 7% in 2022 compared to 2021. The CO<sub>2</sub> reduction from every 1% clinker replacement in blended cements is estimated at 6 kg CO<sub>2</sub> per metric tonne. The company targets to reduce its CO<sub>2</sub> emission to 475 kg CO<sub>2</sub> per metric tonne of cementitious product by 2030.

Recyclable waste materials from Holcim Philippines' plants are either sold to accredited scrap buyers or sent to Geocycle, the company's sustainable waste management solutions business. Geocycle upcycles waste from industries and communities through a government-approved and globally recognised waste management technology called co-processing, that repurposes discarded materials (including hazardous waste from plants like used oil and grease) into low-carbon fuels and raw materials for the manufacturing process.

**Resource Efficiency** targets reducing the intensity of use of energy and water resources, and waste avoidance.

Energy consumption in the production process is monitored by total and specific electrical energy consumption (SEEC) in kWh/ metric tonne cement while specific thermal energy consumption (STEC) is measured in MJ/metric tonne clinker. These data are linked to the company's centralised technical information system for real time monitoring.

The company decreased its electricity consumption by 51,759 MWh in 2022 compared to 2021 through energy management measures which included efficient production planning, equipment modification and process modification, such as management of compressed air systems and of the idle running of equipment.

In 2022, freshwater withdrawal (551,995 m<sup>3</sup>) was 50% less compared to 2021 as a result of Holcim's rainwater harvesting facilities, stormwater management, automation of water systems (for cooling purposes) and regular maintenance to prevent leakages resulting in water savings worth PHP 35 million (around EUR 560,000).

Holcim made significant investments to improve air pollution control systems with a Continuous Emission Monitoring System (CEMS) where data is directly and automatically reported to the Environmental Management Bureau (EMB)

database as part of the monitoring requirements. In the coming years, as part of the industry push to comply with EU Taxonomy, investments will be made to further upgrade air pollution devices. This will happen mostly from 2028 to 2030, and will bring Holcim Philippines emission performance in line with the best operating plants in the world owing to the requirement of the EU Taxonomy for Air Emissions.

**Resource Substitution** is concerned with switching from non-renewable to renewable energy and materials.

In 2022, the Holcim plants reduced coal and other fossil fuels in its production by 8% compared to 2021 by using municipal and other solid waste as alternative fuel, thus enabling a decrease in fossil fuel consumption by 3,232 GJ in 2022. Also in 2022, the company used 941,000 metric tonnes of qualified materials such as biomass and municipal and industrial wastes (e.g. pet coke from refineries) as alternative raw materials and fuels. This represented a 20% increase in resource substitution from 2021.



## Business and market impact

In 2022, the company cut its fixed costs by 11%, increased the use of alternative fuels and raw materials by 20%, and pushed digitalisation to raise operational efficiency, all of which contributed PHP 1.4 billion (around EUR 22.3 million) in savings, and enabled the company to continue delivering profits with EBIT of PHP 2.3 billion (around EUR 36.6 million) and net income of PHP 1.6 billion (around EUR 25.5 million) excluding one-off costs. Cash generation also increased by 68% providing much-needed liquidity at that time. These improvements increased total production capacity by an amount equal to building another facility equivalent to an existing plant. It contributed to its business performance and to advancing its Net Zero commitments.

Holcim Philippines will also continue to advocate the use of blended cement in the country's infrastructure projects to lower the construction industry's carbon emissions. Sales of blended cement comprised 78% of all sales in 2022, with a targeted increase to 88% by 2030

## Stakeholders

Stakeholders include architects and engineering consultants, government leaders, civic organisations, builders, and academia who are partners in bringing in more innovative solutions to help the country build better by building more with less resources, building new with old materials and with smarter materials and design; and to highlight the value and urgency of building more sustainably. The company partners with coal power plants, steel manufacturers and other industries or suppliers to collect their respective byproducts for use in the production of building materials.

Holcim Philippines also worked closely with the Climate Change Commission in the development of the Nationally Determined Contributions (NDCs) of the industry sector in line with the Paris Climate Agreement to reduce CO<sub>2</sub> emissions, and thus help accelerate the industry's adoption of more sustainable building materials.

Holcim is a key contributor to economic growth by providing employment and taxes to its host localities, as well as income opportunities to various suppliers and service providers. Through its corporate citizenship program, it pursues projects for infrastructure, education, health and skills training.

## Implementation

Many local builders still use traditional limestone-based cement on the assumption that it offers better structural strength. Holcim Philippines is advocating more use of sustainable alternatives that offer the same building performance. However, there is little government incentive for the use of low-carbon cement products, and the company must therefore educate the market on new and sustainable construction practices based on international trends, and on using the right product for the right application for a low-carbon built environment.

## Takeaways

Holcim overcame a challenging period marked by the pandemic and subsequent price inflation, emerging as a stronger, more resilient organisation with a sharper understanding of the value of sustainability, and a growing customer base for its innovative offerings and services. It continues to pursue its net-zero journey by decarbonising its business, from operations to products and the built environment.



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## Disclaimer

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