CO-PROCESSING SUCCESS STORY

HUNGARY - HOLCIM

Title: 90% co-processing rate and investments for lower carbon emissions

Location: Királyegyháza, Hungary

Contact person: Ms. Zsanett MAYER, zsanett.mayer@geocycle.com

Summary: Holcim Hungary Ltd. has embarked on a committed journey to become carbon-neutral by 2050, investing HUF 4.5 billion (11 million €) to environmental protection efforts and achieving an impressive **90% replacement of fossil fuels with alternative sources**. This has led to a significant 45% decrease in **net CO_2 emissions** per tonne of cement since the early operation of the Királyegyháza Cement Plant.

Key investments have included the development of the **alternative fuel storage hall** and **closed feeding line** at the Királyegyháza Plant, and the implementation of **innovative flash-dryer technology** to optimise fuel efficiency. This technology is used to enhance the calorific value of fine-shredded (below 30mm, 2D) alternative fuel, known as Refuse-Derived Fuel (RDF). By improving the calorific value, more energy can be extracted from the waste, thereby reducing the need for traditional fossil fuels and supporting lower carbon emissions.

Holcim Hungary Ltd. has conducted environmentally conscious operations as strategic priority since the beginning. In recent years, it has implemented environmental protection investments that worths more than HUF 4.5 billion, through which the company can also

provide solutions for local waste management. Thanks to this, Holcim Hungary Ltd. can now replace 90% of fossil fuels with alternative fuels, and as a result, compared to the early years, the plant's net CO2 emissions for 1 ton of cementitious products have already decreased by more than 45%.

In terms of products, the company's second green cement product (called "ECOPlanet Super") was released in spring 2023, promising a 30% lower environmental footprint compared to CEM I cement type products. In addition to production technology, the company keeps sustainable solutions in mind throughout its entire operation. Therefore, it launched the "Office Goes Green" campaign, whose purpose is to make the offices "greener" and background processes (e.g. eliminating PET bottles, prioritising digital solutions during administration and communication). As a socially responsible company, in addition to shaping the attitudes of its employees, Holcim Hungary places great emphasis on the development of environmentally conscious lifestyles in local communities. Its perspective-shaping activities include lectures on various environmental protection topics, and factory visits. These actions are complemented by the "Green Thursday" tip series published on Holcim Magyarország's Facebook page and the discussions about sustainability in the "betOn" podcast.

The company's aim is to become a net-zero company by 2050. The next steps include:

- replacing limestone by construction and demolition waste (limestone is responsible of the 2/3 part of our CO2 emission)
- increasing the alternative raw material ratio in the cement production
- widening alternative fuels "portfolio" (like biomass etc.)
- using renewable energy and improving energy efficiency (the construction of a new solar park next to the cement plant in 2024)
- further developing the green cement portfolio

Environmental investments for reaching the 90% total substitution rate

- **First investment – starting the co-processing and the Geocycle brand**

  After two years of preparation, the Királyegyháza Cement Plant's alternative fuel storage hall and the closed feeding line were built in 2014 with an investment of nearly HUF 700 million. Thanks to the investment, it has become possible to recycle materials as alternative fuels during cement production that are treated as a waste by other industries (like: whole rubber and rubber textiles, shredded and sorted communal and industrial waste, agricultural waste etc.).

  The fuels are burned in the same air space as the other raw materials used at approximately 2000 ˚C, so they form an insoluble bond in the clinker, i.e. there are practically no by-products of the process that means **100% of the materials are recycled**.

  The use of alternative fuels has a positive impact on the environment as well. With this solution the plant is able to provide a solution for the local waste-management problem, and in this way it contributes in the local circular economy. Moreover, it managed to decrease net CO2 emission per 1 ton cementitious product by 25% between 2014-2018 with the total thermal substitution rate of 60%.

- **2nd milestone regarding co-processing: chlorine-bypass investment**

The 2 billion HUF value environmental investment's aim was to decrease the carbon dioxide emission rate of Királyegyházi cement plant. The chlorine-bypass technology allowed the plant to **increase the ratio of alternative fuel materials from 60% to above 80%**, hence lowering its carbon dioxide output by an additional 10%, aligned with Holcim Group's international group level mission.

Perhaps the most spectacular components of this latest development were the **1000 tonnes silo** built beside the pre-heater tower, and the **100 tonnes silo** located near the cement mills.

- **3rd milestone: twin-docking station and flash-dryer system application**
  In 2021 Holcim Hungary implemented some new investments that aim to further optimise CO2 emissions. One of the investments is developed by the Holcim Group, and it is called: **flash-dryer technology**. With this drying process, it increased the calorific value of fine-shredded (below 30 mm, 2D) alternative fuel (RDF).

  The other main project was in 2023. The twin docking station was built with the best available technology (BAT). In this case, there was no need to build extra storage. It used trailers with moving floors as storage, which provides flexibility in terms of material flows – i.e. it is easier to switch from one flow to another (no need to clean the storage later, etc.). This also **increased the production efficiency**.

More highlights regarding the cement production's energy efficiency:

- Holcim Hungary is using the heat that is generated during clinker production for grinding cement. An innovation at Holcim, it is using 100% waste heat to heat the cement mills. The heat is generated during the production of clinker and instead of being released into the air, the rotation enables more energy-efficient operation.

Read more about Geocycle circular activities HERE