

Co-Processing: Holcim's Solution for Environmentally Sound Recovery Option for Waste

Rethinking Plastic Consumption: An Overview on
the Efforts to Beat Plastic Pollution
June 30, 2021

Mike Tagarao, ChE
Marketing

Co-Processing: Holcim's Solution for Environmentally Sound Recovery Option for Waste

Overview:



1

LafargeHolcim & Geocycle Philippines

2

On Co-Processing

3

Geocycle: Operations & Solutions

Co-Processing: Holcim's Solution for Environmentally Sound Recovery Option for Waste



In 2015, two construction giants, **Lafarge** and **Holcim** merged globally giving birth to **LafargeHolcim** – resulting in a combined experience of **180** years.

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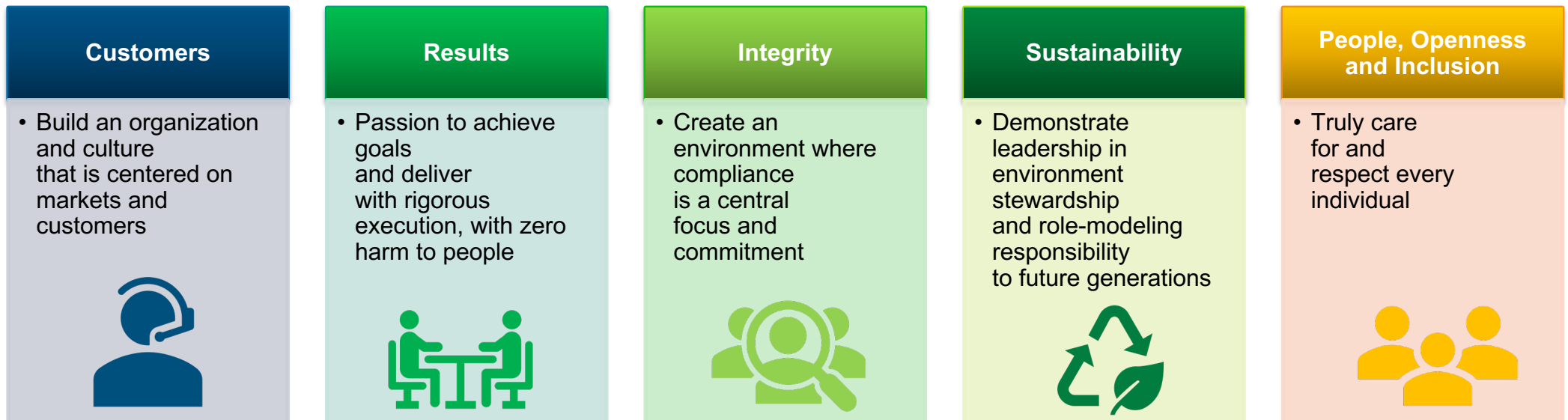
**In the Philippines, the business name
Holcim Philippines, Inc. (HPI),
a member of the LafargeHolcim Group, was retained.**

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Our Core Values

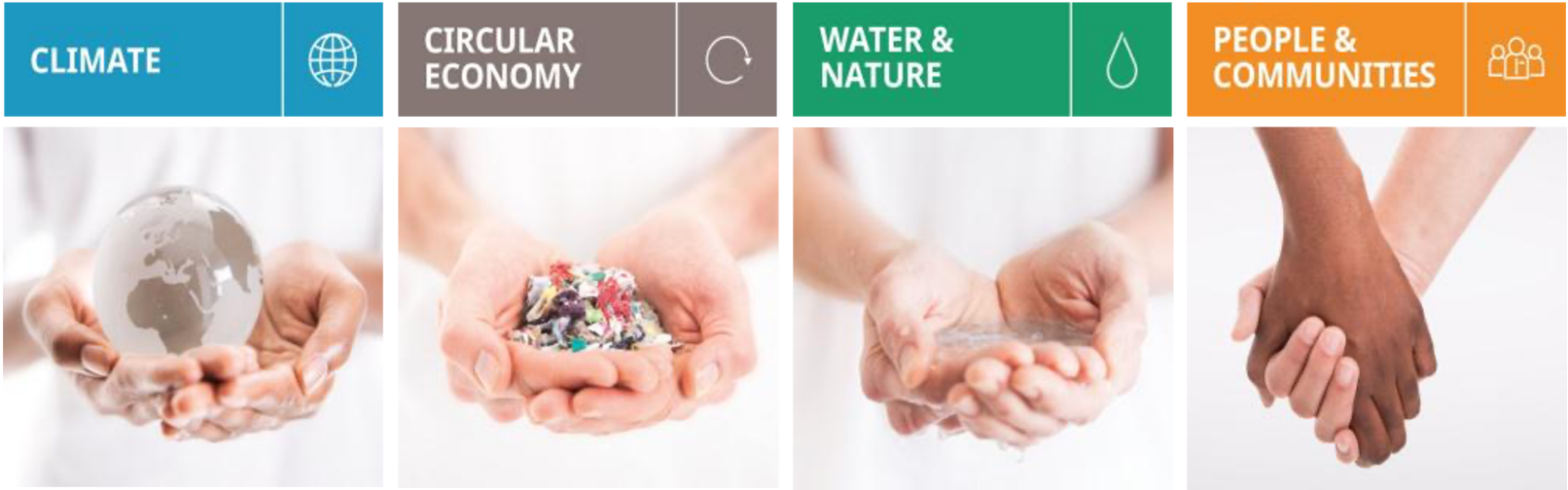
Health and Safety is our overarching value and embedded in everything we do.



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Our Sustainability Commitment



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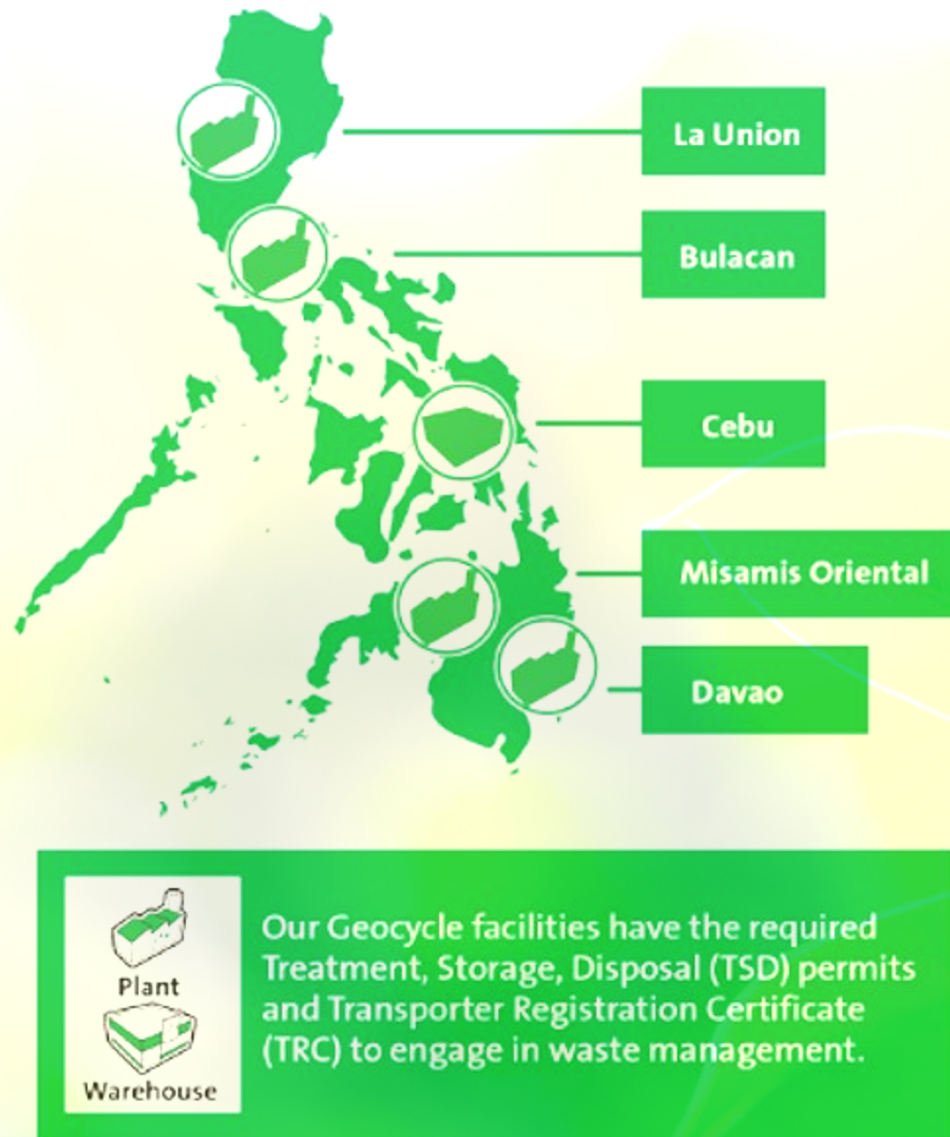


The Global Waste Management Brand of LafargeHolcim



**Our Sustainability Commitments and Contribution
To the Fight Against the Waste Challenges**

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11.5% of thermal energy
from alternative fuels (2020)



185 K Tons of
co-processed waste (2020)



8 Mio Tons of Net CO₂
emission saved (2020)

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In November 2019, Senate Economic Planning Office released an article on the state of the environment:

40,087 tons of MSW is generated on a daily basis in 2016



0.4 kg per capita
generation on average



100 Olympic sized
swimming pools

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Collection rate varies from 40% to 85%

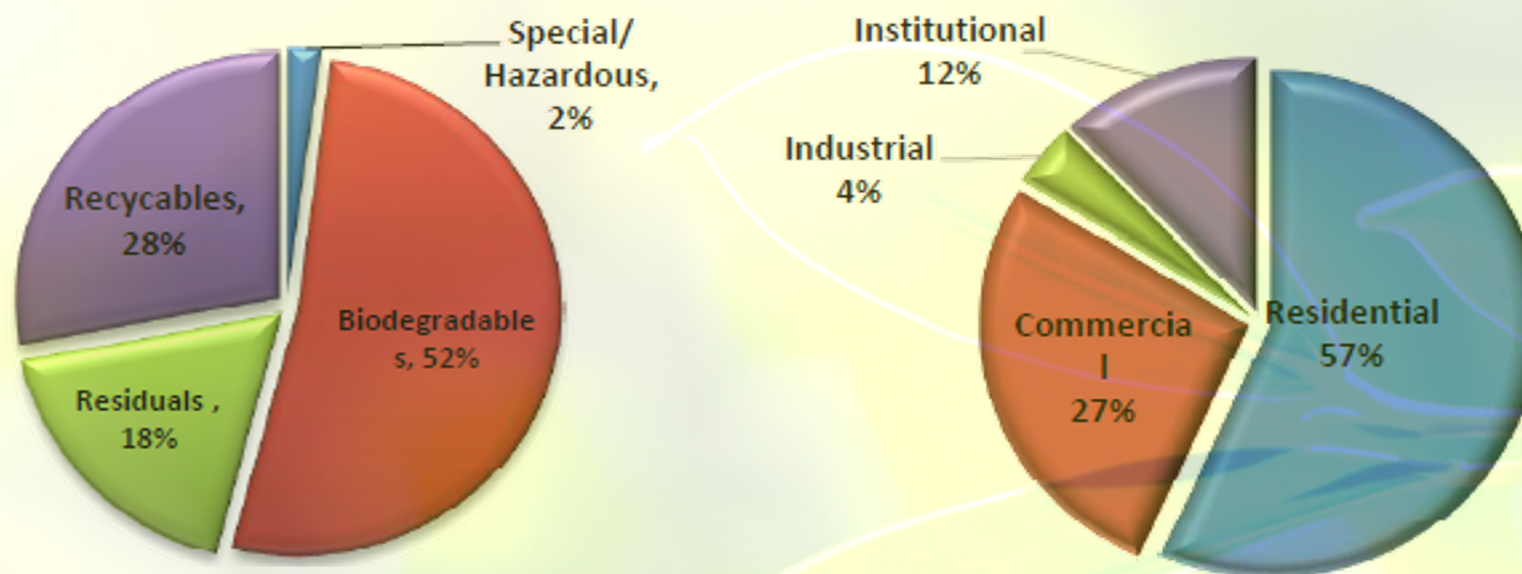


NSWMC reports diversion rates at 48% in Metro Manila and 46% Outside Metro Manila



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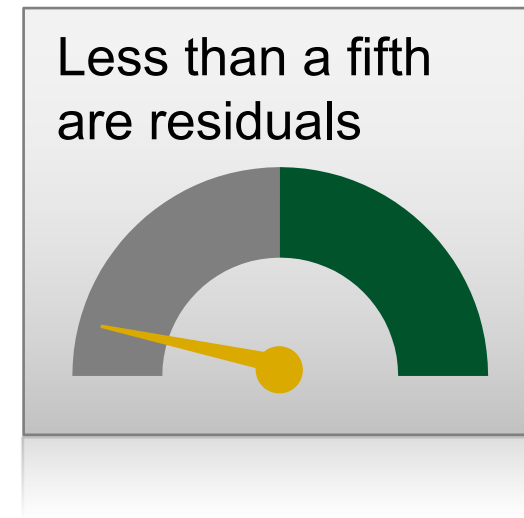
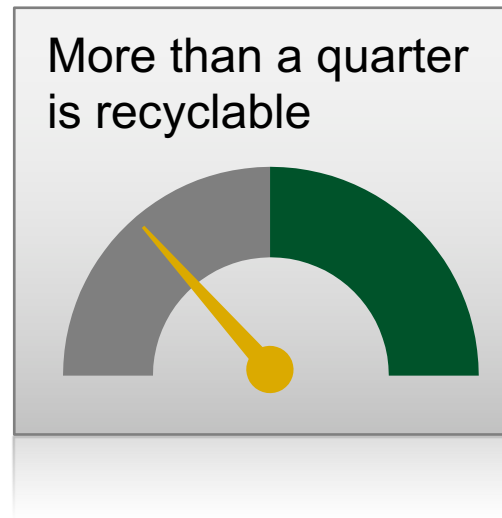
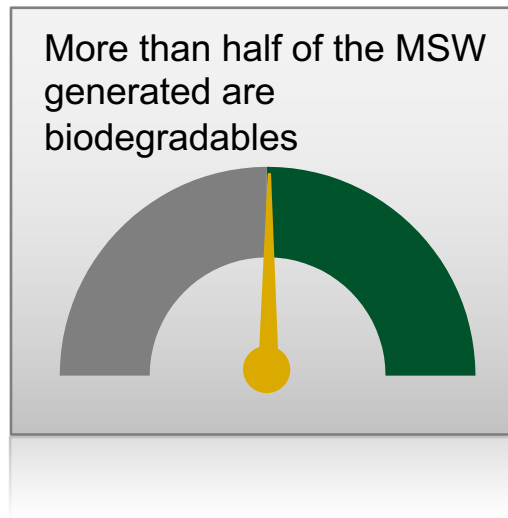
Based on NSWMC Data



Commercial and Residential contributes to 84% of the total waste generation wherein prevention and control could be implemented to manage properly the wastes.

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Based on NSWMC Data



This means that only **7,200 tons** of the 40,087 tons generated daily should end up in landfill if proper segregation is in place.

This does not consider efforts on waste minimization, resource recovery and treatment technologies

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Our Technology:

Cement Kiln Co-processing

- ✓ A Sustainable Waste Management solution
 - ✓ Conserves natural resources
 - ✓ Reduces emissions



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What is Co-Processing?

Co-processing is the use of **waste** as **raw material**, or as a **source of energy**, or both to **replace natural mineral resources** (material recycling) and **fossil fuels** such as coal, petroleum and gas (energy recovery) in industrial processes mainly in energy intensive industries such as cement¹.

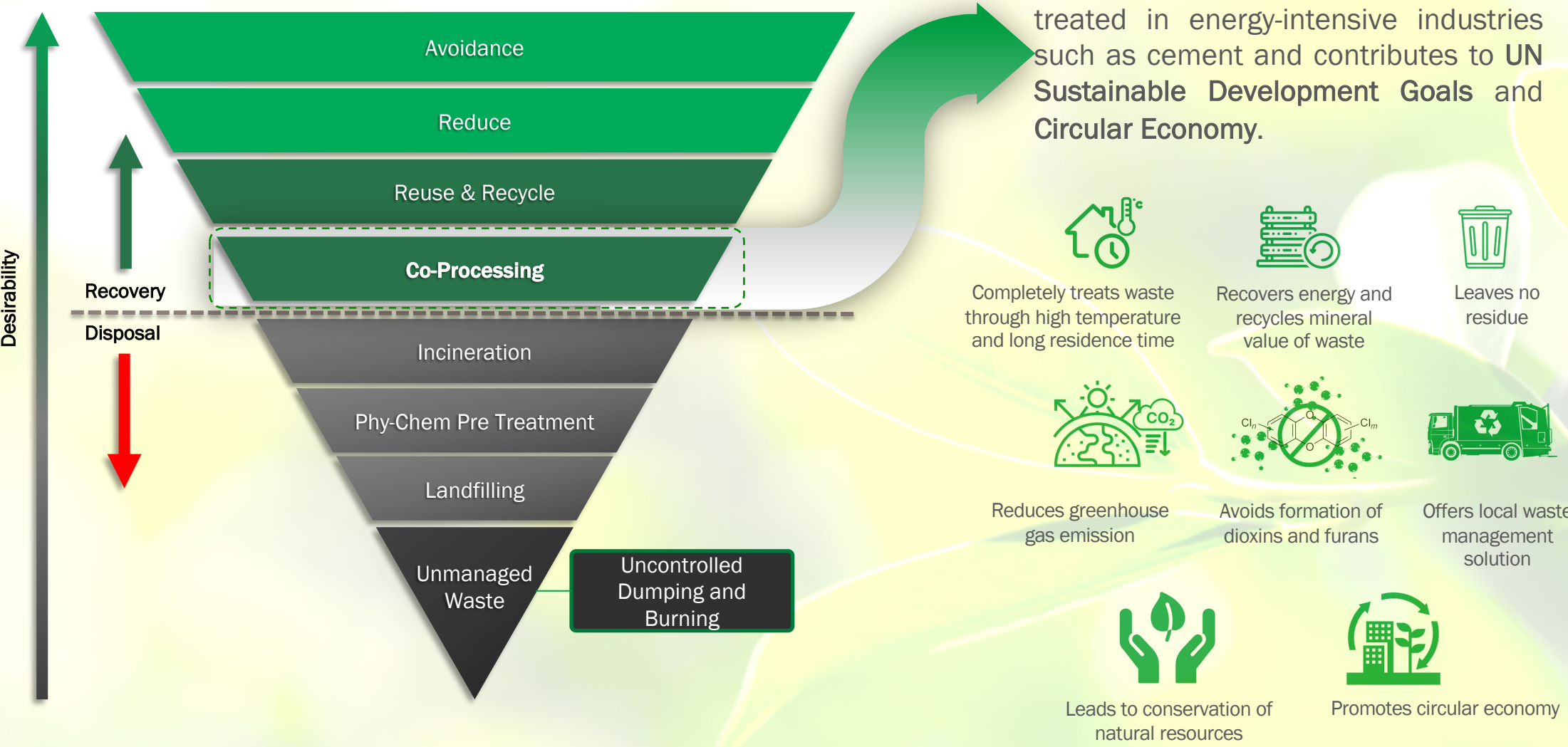


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Waste Management Heirarchy

Co-processing respects the waste management hierarchy and therefore does not hamper waste avoidance, reduction, reuse and recycling.

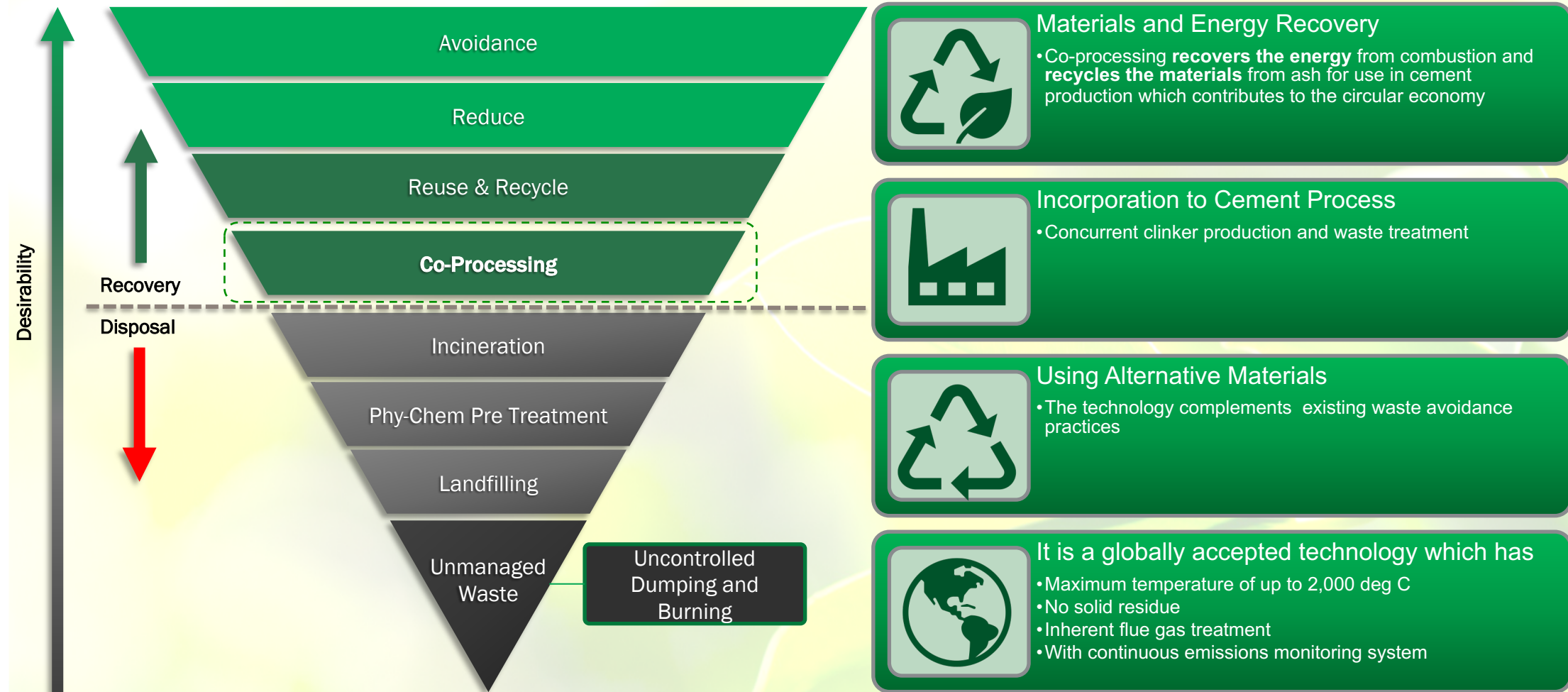
Co-processing is a globally recognized technology through which waste is treated in energy-intensive industries such as cement and contributes to **UN Sustainable Development Goals** and **Circular Economy**.



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Waste Management Hierarchy

Resource Recovery including Co-processing as the most desirable waste management solutions



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What happens to the waste in the cement kiln?



The organic constituents are completely decomposed due to:



High temperatures



Long residence time



Oxidizing conditions in
cement kiln



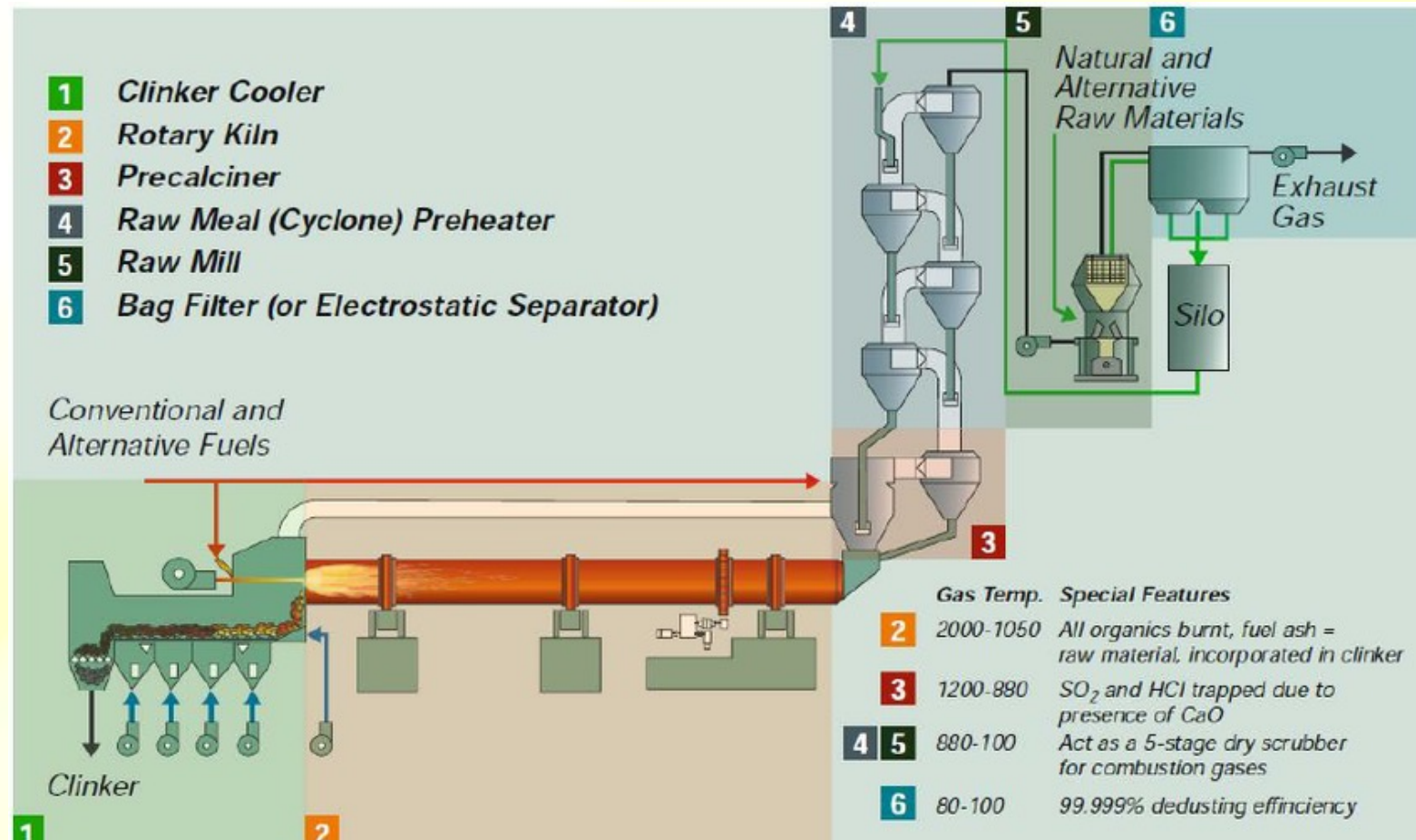
Acid gases such as HCl and SO_2 are neutralized by the lime and other alkaline materials within the kiln.



The inorganic constituents react with the raw materials in the kiln and are incorporated in the clinker matrix.

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What happens to the waste in the cement kiln?



Schematic diagram of a cement industry using alternative fuel and raw materials (GTZ and Holcim, 2006).

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Circular Economy

- An economic system designed to benefit businesses, society and the environment.
- In contrast to the "take-make-waste" linear model, a circular economy is regenerative by eliminating waste and continual use of resources.

Source: Geocycle
https://www.linkedin.com/posts/geocycle-us_circulareconomy-sustainability-activity-6746742934495916032-t43_



Based from: <https://srp-circular-economy.eu/>

More information and trivia are available at
Geocycle Philippines Facebook and LinkedIn Pages.

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Co-processing compared to Incineration and Landfilling



Co-processing:

A "2 in 1" process

- Treats the waste while producing cement
- Recycles the mineral content
- Recovers 100% energy content
- Thermal treatment with temperatures up to 1450 °C
- Zero residue



Incineration:

An elimination process

- Heavy investment
- No recycling
- Recovers part of the energy
- Thermal destruction at 800 °C
- Residue 20% ashes



Landfilling:

A disposal practice

- No recycling
- No material and energy recovery

In case of open dumps: Strong impact on the environment (ground, water, soil) and local community (health & odour), risk of open fire, high GHG emissions due to release of methane

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Co-processing: A proven technology for waste management

Co-processing in cement kilns evaluated **globally** for more than **40 years**

It is an **approved technology** by **Basel Convention** for disposal of all kinds of Hazardous and Other Wastes

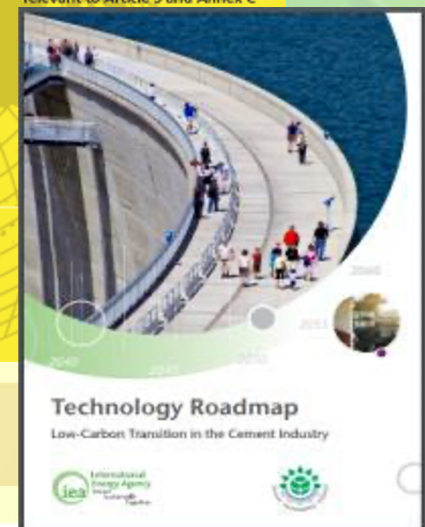
It is **recommended** for the destruction of POPs and ODS under **Stockholm Convention**

Trials conducted in cement kilns spread across the world have confirmed that wastes **do not impact** the cement kiln emissions or the product in any adverse manner

Co-processing is **fully recognized** by many countries such as India, Mexico, Brazil, US, Europe and many others

In its recent communication, **The European Commission** advised Member States to take a long-term perspective and consider co-processing as an **important lever for circular economy**

It is endorsed by several international bodies such as **UNEP, GIZ** and **SINTEF**



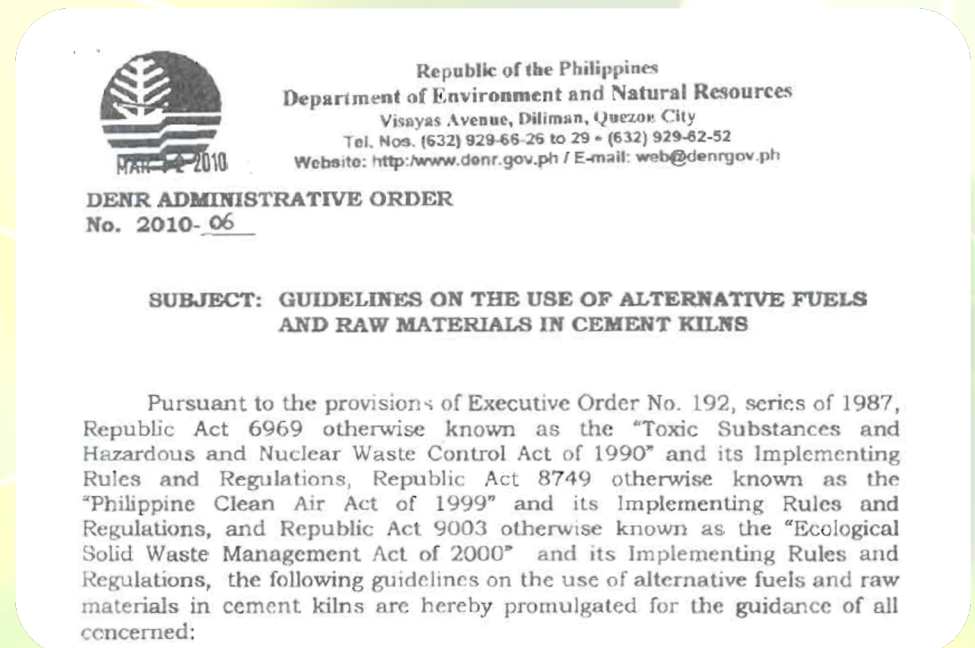
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Co-processing: A proven technology for waste management

- DENR supports and endorses co-processing and have released guidelines for the use of alternative fuels and raw materials in the cement industry: **DAO 2010-06 Guidelines for Cement Kiln Co-processing**



The screenshot shows a news article from Philstar Global. The headline is "DENR pushes alternative fuels, raw materials in cement making". The byline is "Marianne V. Go () - May 6, 2010 - 12:00am". The article text states: "MANILA, Philippines - The Department of Environment and Natural Resources (DENR) is promoting the use of alternative fuels and raw materials in the production of cement. The DENR has released the guidelines for the registration and the issuance of permits for the processing of waste materials in cement production."



The screenshot shows the official DENR Administrative Order. It is dated March 12, 2010, and is titled "DENR ADMINISTRATIVE ORDER No. 2010-06". The subject is "GUIDELINES ON THE USE OF ALTERNATIVE FUELS AND RAW MATERIALS IN CEMENT KILNS". The text states: "Pursuant to the provisions of Executive Order No. 192, series of 1987, Republic Act 6969 otherwise known as the 'Toxic Substances and Hazardous and Nuclear Waste Control Act of 1990' and its Implementing Rules and Regulations, Republic Act 8749 otherwise known as the 'Philippine Clean Air Act of 1999' and its Implementing Rules and Regulations, and Republic Act 9003 otherwise known as the 'Ecological Solid Waste Management Act of 2000' and its Implementing Rules and Regulations, the following guidelines on the use of alternative fuels and raw materials in cement kilns are hereby promulgated for the guidance of all concerned:

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Geocycle receives **WASTE**, and
converts it to **ALTERNATIVE RAW MATERIAL AND FUEL**
for **Cement Kiln Co-processing**



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Our Customers

- We offer dedicated solutions for industries and service companies.
- We work with customers to ensure they receive the tailored solutions they need.

Industrial & Service Companies



- We work with farmers, plantations and agricultural processing units to safely and sustainably manage agricultural residue.
- Sustainable solutions are viable for customers and the environment.

Agricultural Sector



- We offer them innovative solutions that eliminate the need for large public investments while ensuring maintained health of the general public.

Local Government Units



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Some industries that use the co-processing technology



FMCG



Petroleum



Semiconductor



Pharmaceutical



Automotive & Paint



Tire & Rubber



LGUs



Agricultural



Entertainment & Media

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Most common types of waste accepted for co-processing NON-HAZARDOUS



Non-recyclable Papers



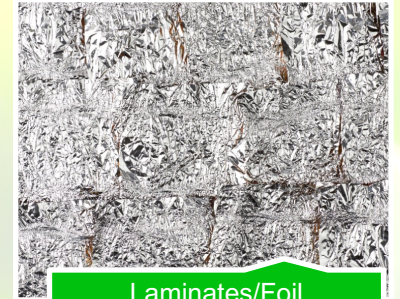
Non-recyclable Plastics



Rubber



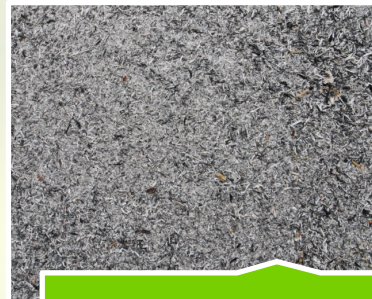
Textiles & Rags



Laminates/Foil
Wrapper/Packaging
Materials/Styrofoam



Trade returns



Bottom Ash/Fly Ash



Quality rejects



Sorted Municipal Solid
Waste

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Most common types of waste accepted for co-processing

HAZARDOUS



Waste Oil



Process Sludge



Expired Medicine



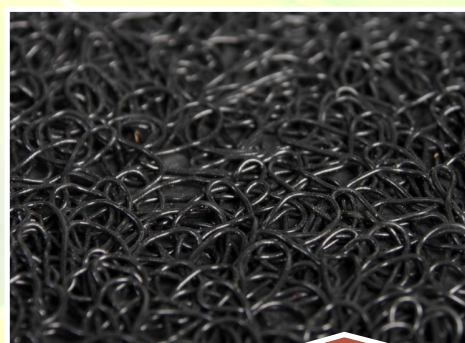
Adhesives



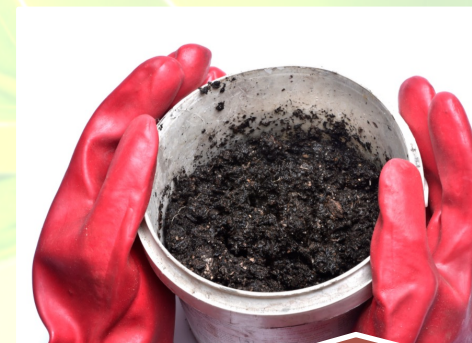
Pesticides



Agrichemical
Waste



Mold Runners



Polluted Soil

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Solutions we offer



**1 Waste
Prequalification**



2 Permitting



**3 Storage and
Transport**



4 Pre-processing



5 Co-processing



6 Certification

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Which wastes cannot be pre- & co-processed?



“Banned wastes” not to be pre-processed or co-processed:



Radioactive waste



Asbestos-containing waste



Explosives and ammunition / weapons



Anatomical medical waste

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Which wastes cannot be pre- & co-processed?



“Banned wastes” not to be co-processed:



Electronic fraction of electrical and electronic waste (e-waste)



Whole batteries as a targeted material stream



Waste of unknown or unpredictable composition, including unsorted municipal waste

These wastes however can be co-processed after pre-processing to remove the banned portion of the waste.

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Our Commitment: Less Risk, More Rewards



We are working together with you for a cleaner planet

- Providing integrated solutions tailored to local challenges, based on global competence
- Helping you divert your waste from landfills
- Educating and building awareness to minimize waste



We bring you peace of mind

- Complete treatment of waste
- Guaranteed end-to-end transparency and traceability
- Highest standards in health & safety and regulatory compliance
- Competence, capacity and scale from a global network spread across 50 countries



We help you to pursue your sustainability agenda

- Supporting implementation of environmental programs
- Helping run sustainability processes in an efficient and compliant manner
- Active engagement and communication with all stakeholders



Donna Estrella

February 28 · 🌐

We don't need a handful of people doing zero waste perfectly. We need millions of people doing it imperfectly. 😊👍

#GeocyclePhilippines

#ForAZeroWasteFuture

#LowCarbonLifestyle



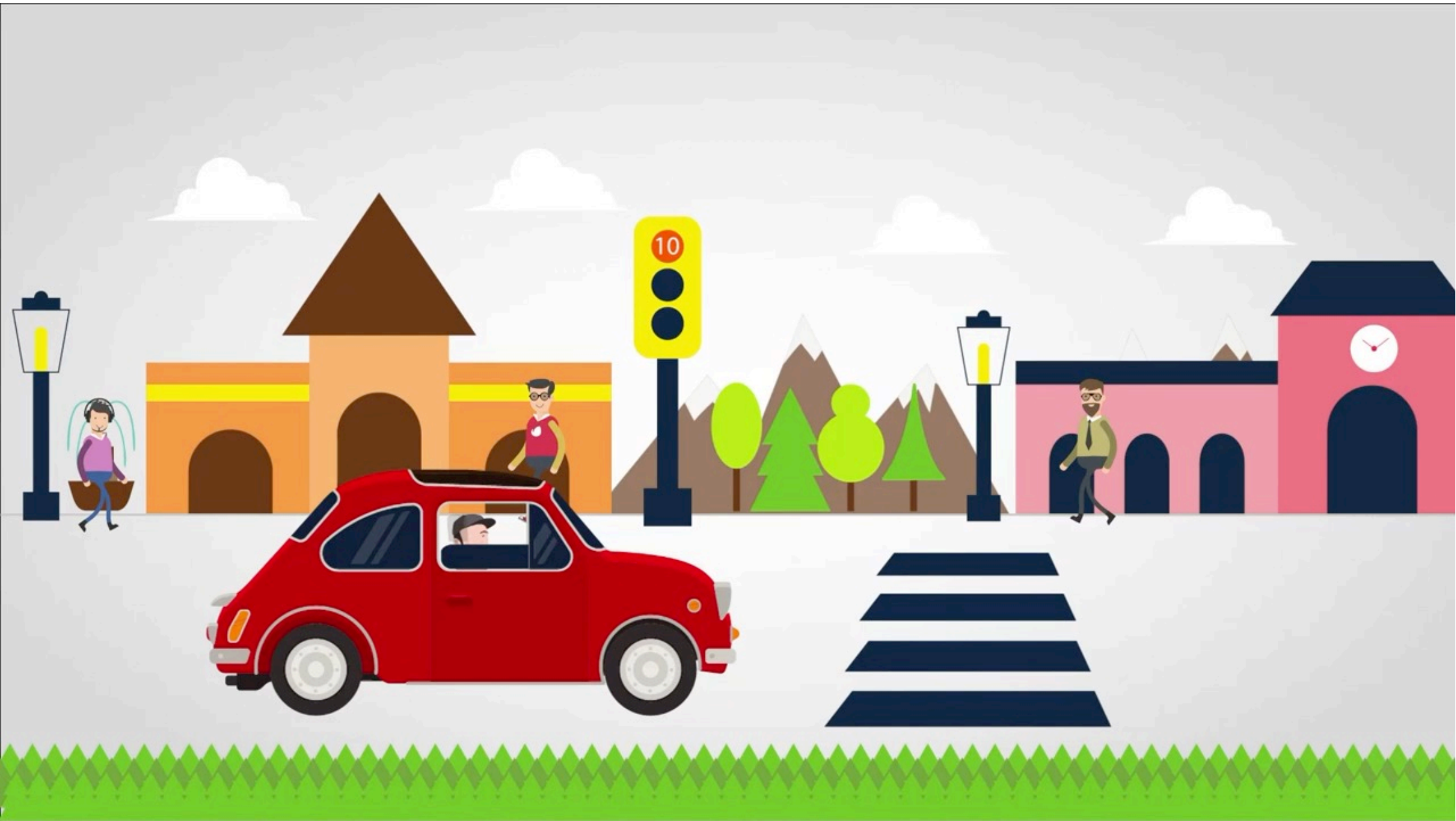
JANUARY IS ZERO WASTE MONTH

Presidential Proclamation no. 760, s. 2014



ZERO WASTE is an advocacy that promotes the reduction and elimination of quantity and toxicity of waste, and the conservation & recovery of resources. You may follow some simple tips below on how to

Geocycle Video





Be part of the solution

We, at Geocycle, fully commit to our partners our support in managing waste problems through co-processing.



 **geocycle**

For a zero-waste future

To know more about our services, you may visit:



GeocyclePh



Geocycle Philippines



www.Geocycle.ph



You may send your inquiries to:

Mr. Jon Alan Cuyno

New Developments Project Manager

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Info-phl@geocycle.com



Thank you.

You care about the future of
the planet— so do we.