

Waste Pre and Co-processing in Cement Kilns: Concepts and Benefits

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Agenda

1. *Geocycle*
2. *Waste Management Hierarchy*
3. *Concept of Pre-processing*
4. *Concept of Co-processing*
5. *Pre-processing system design*
6. *Co-processing system design*
7. *Pre-processing facility at Kymore*
8. *Fire fighting facility at Geocycle PCPF*
9. *Questions and Answers*

Geocycle

Geocycle is waste management brand of Holcim, one of the world's leading supplier of construction materials



*Geo means “earth” in Greek, while Cycle calls to mind the cycle of life.
“Geocycle” refers to our ability to convert waste into a safe, useable resource*

Waste Management Hierarchy

3R+C



Figure 1: Waste management hierarchy

1. Reduce

2. Reuse

3. Recycle - Re-processing

- ▶ When prevention / reuse is not feasible
- ▶ Recycling of end-of life cementitious products

4. Resources Co-processing in existing EII's

- ▶ When re-processing is not feasible
- ▶ Process specific guidelines
- ▶ Pre-processing is key

5. Wastes disposal activities

- ▶ When Co-processing is not applicable
- ▶ For organics: Incineration
 - Wastes – to – energy programs
 - Energy efficiency is key
- ▶ For minerals: Land filling

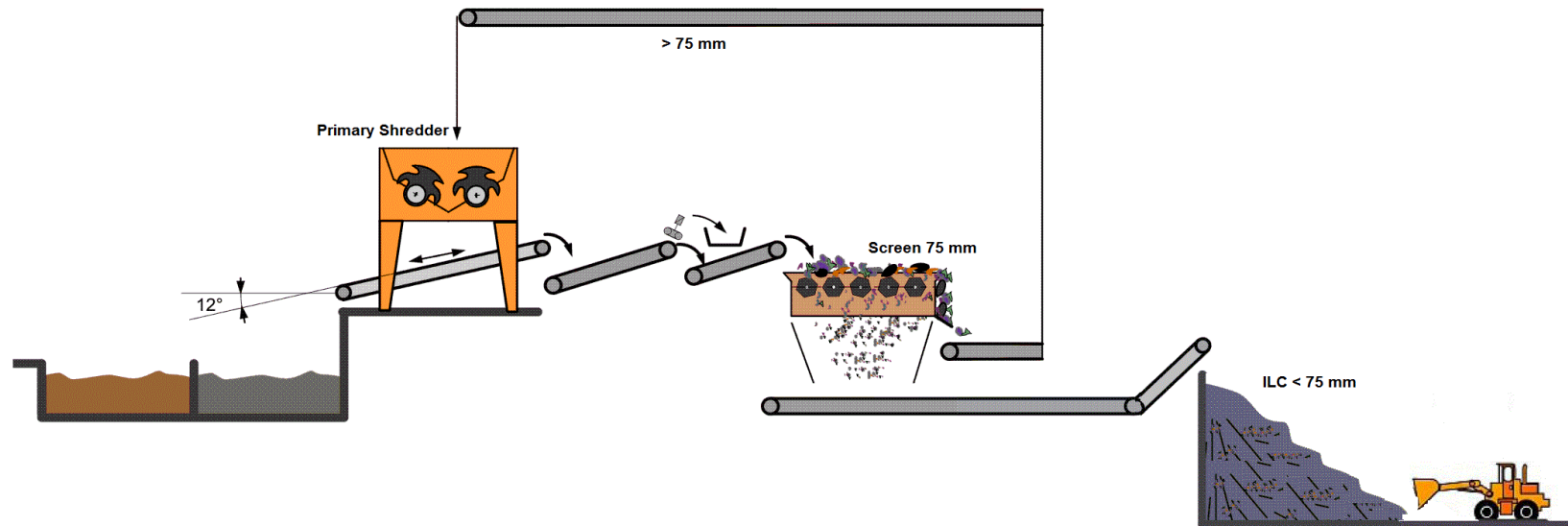
Concept of Pre-processing

Pre-Processing is...

... making the waste similar to fuel in properties by physical changes like size reduction, separation, segregation and preparing homogeneous mixture

Benefits:

- Reduce the waste volume
- Homogenize the waste
- Makes waste similar to fuel in properties
- Reduces the impacts on process
- Creates regional job in waste collection, pretreatment, etc.



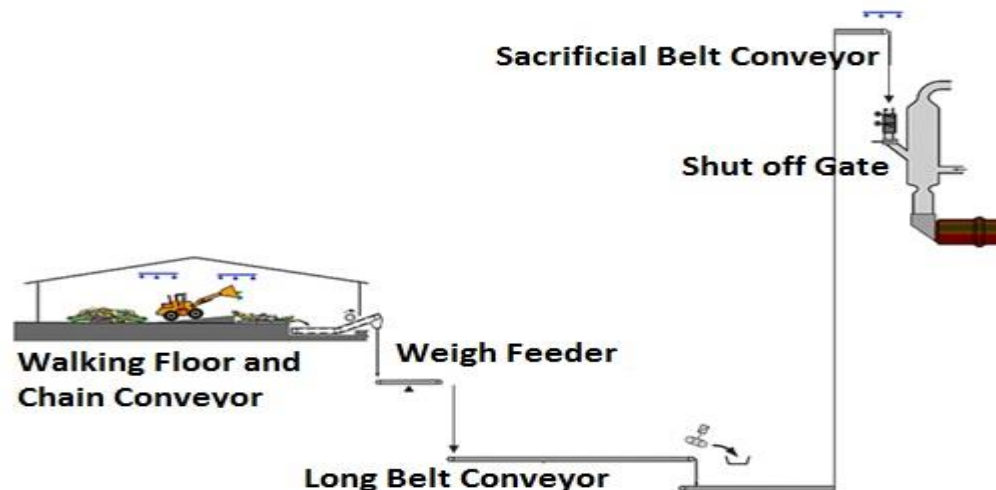
Concept of Co-processing

Co-Processing is...

...the use of waste materials/pre-processed waste in RII's (Resources Intensives Industrial processes) such as cement, lime, steel, glasses, power generation etc instead of using fossil fuels & natural resources.

Benefits:

- Upgrades waste management within the waste hierarchy
- Reduces global environmental impacts
- Decreases (largely) the costs of waste management
- Creates regional job in waste collection, pretreatment, etc.
- Is a zero-emission technology



Sources of Material for Pre and Co-processing

26 categories of industries that are sources of co-processable material worldwide have been identified by Holcim

1. Agricultural Production - Crops
2. Agricultural Production - Livestock
3. Agricultural Services
4. Metal Mining
5. Coal Mining
6. Oil and Gas Extraction
7. Mining and Quarrying of Nonmetallic Minerals
8. General Building Contractors
9. Heavy Construction Contractors
10. Special Trade Contractors
11. Food and Kindred Products
12. Lumber and Wood Products, Except Furniture
13. Furniture and Fixtures
14. Paper and Allied Products
15. Chemicals and Allied Products
16. Petroleum Refining & Related Industries
17. Rubber and Miscellaneous Plastic Products
18. Leather and Leather Products
19. Glass Products
20. Primary Metal Industries
21. Fabricated Metal Products
22. Indus. and Comm. Machinery and Computers
23. Electronic & Electrical Equipment
24. Transportation Equipment
25. Photographic Equipment and Supplies
26. Electric, gas, and sanitary services



But All Wastes Are Not Co-processable

List of “Banned Wastes”

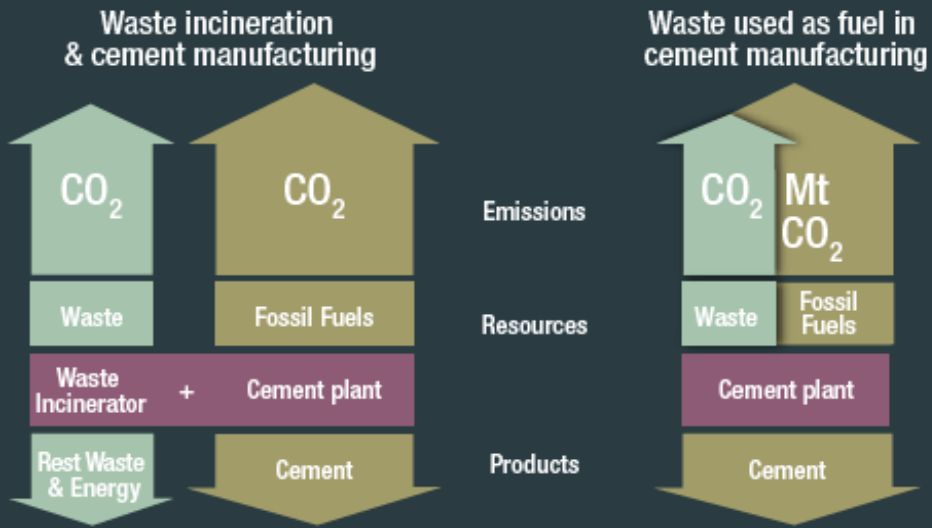
- Asbestos containing waste
- Anatomical hospital waste
- Bio-hazardous waste
- Electronic scrap
- Entire batteries
- Explosives
- High concentration cyanide waste
- Mineral acids
- Radioactive waste
- Unsorted municipal solid waste



Waste & Sustainability: The Challenge

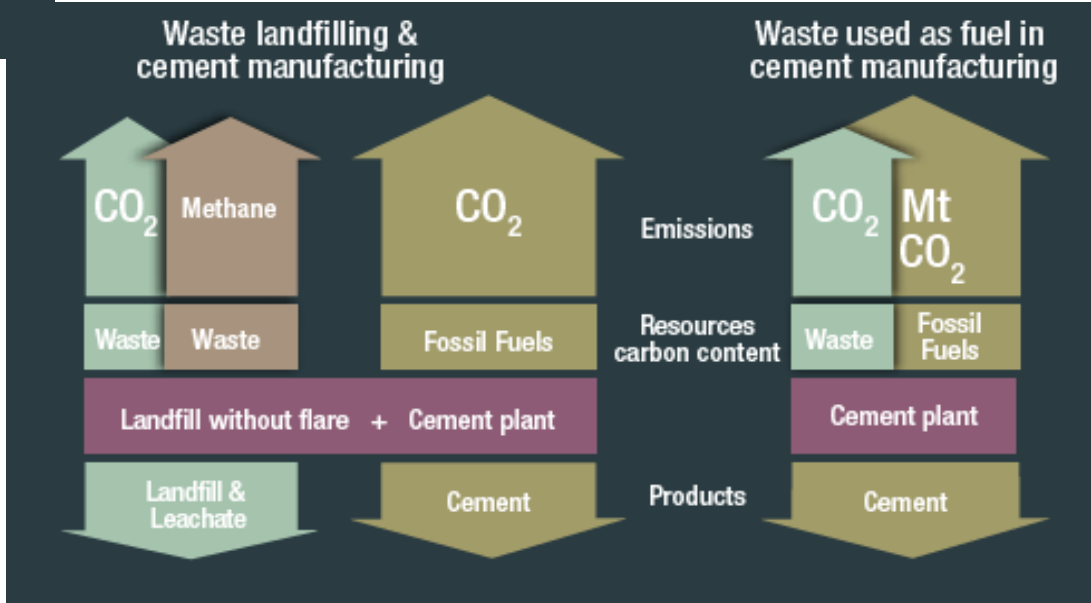


Reduction of GHGs



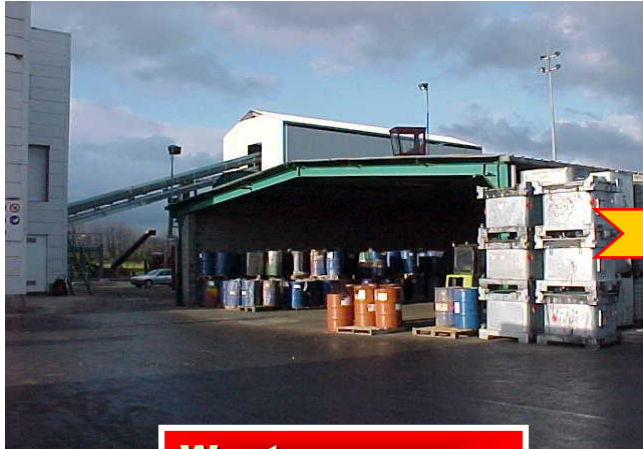
← **Co-processing and Incineration**
Reduction in CO₂ Emissions

Co-processing and Landfill
Prevention of CH₄* Emissions

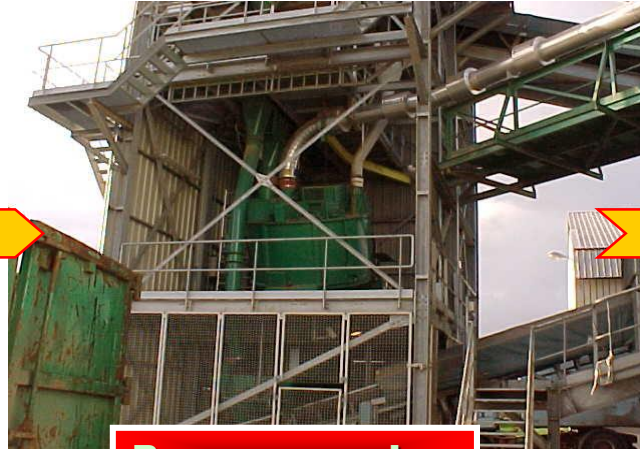


* CH₄ has 21 times more global warming potential than CO₂

Pre-Processing Platforms at a glance



Waste



Pre -processing



Processed Waste



Pre-Processing System Design

Equipment

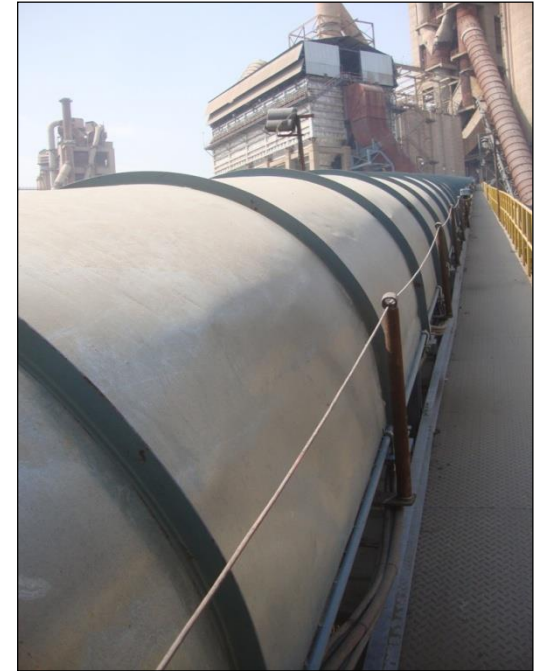
- Arm Handler and Pay loader
- Shredder and Belt conveyors
- Magnetic Separator
- Star Screen



Co-Processing System Design

Equipment

- Walking Floor
- Chain Belt Conveyor
- Weigh Feeder
- Long Belt Conveyor
- Sacrificial belt Conveyor
- Rotary Air Lock
- Safety Shut off Gate
- Feed chute at Calciner

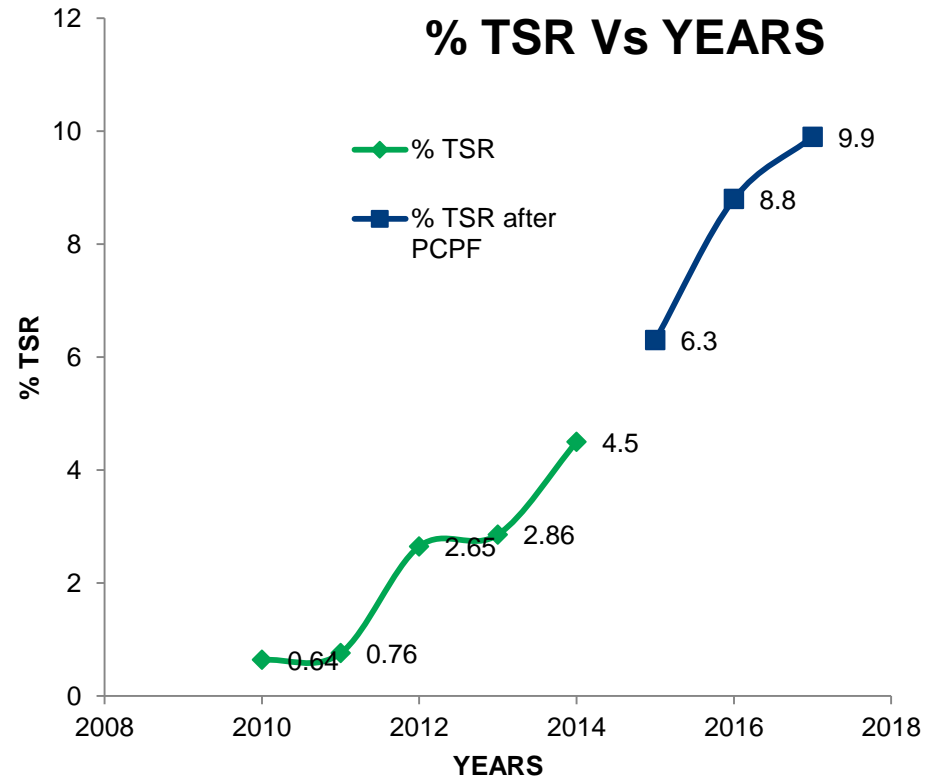


AFR at ACC Kymore

%TSR at ACC Kymore

1. RICE HUSK
2. SOYA HUSK
3. GRUM HUSK
4. SAW DUST
5. COWDUNK
6. PLASTIC WASTE
7. HUL TRADE REJECT
8. RDF
9. SRF WASTE
10. NIVIA WASTE
11. NESTLE TRADE REJECT
12. ETB BIO SLUDGE
13. SPENT CARBON
14. PAINT SLUDGE
15. CARBON BLACK
16. CADBOURY LAMINATES & TRADE REJECTS

17. OZONE DEPLETING SUBSTANCES – ODS (2012) FIRST TIME IN INDIA ACC KYMORE HAS COPROCESSED ODS WITH SPECIALLY DESIGNED FEEDING SYSTEM IN CEMENT KILN



Pre-Processing Facility at ACC Kymore



Fire Fighting facility at PCPF Kymore

- Fire water tank- 1200 M3
- Detection System - UV/IR Flame detectors and LHS cables
- Suppression System
 - ▶ Hydrant and Hose reel System
 - ▶ Medium velocity Water Spray System (MVWS)
 - ▶ Low expansion foam system
 - ▶ Early suppression fast response (ESFR) type sprinkler system
 - ▶ Portable Fire Extinguishers







geocycle