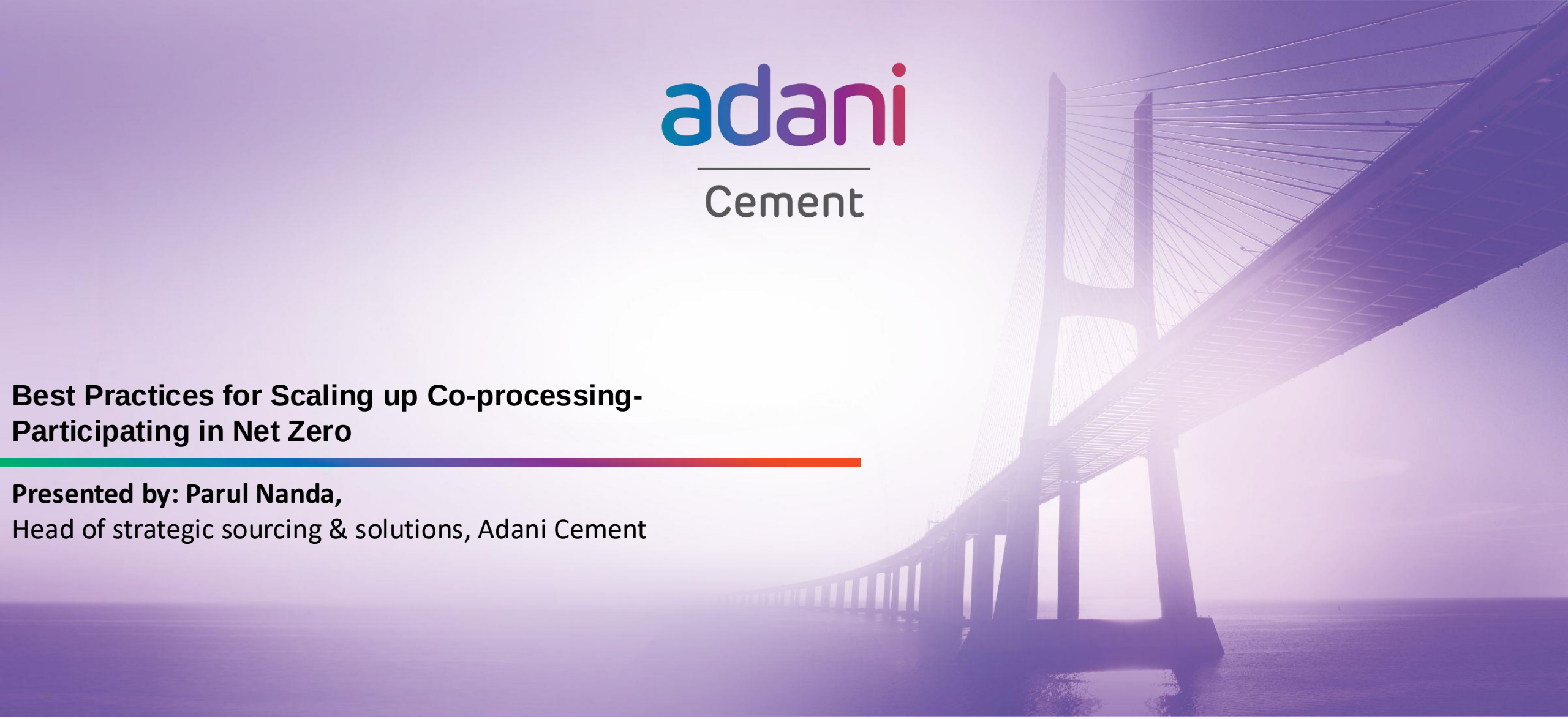

Best Practices for Scaling up Co-processing- Participating in Net Zero

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Overview

- The Cement Industry and the Net Zero Race for Sustainable Development
- Co-processing
- About Geoclean
- Best practice- Customer centricity
- Best Practice- Community Engegement
- Prioritizing safety across our operations- Best Practices

The Cement Industry and the Net Zero Race for Sustainable Development

- India is the second-largest producer of cement in the world.
- The current emphasis on infrastructure development in the country is expected to drive cement demand further.
- The Indian cement industry has established itself as one of the frontrunners in driving efficiency measures and setting ambitious net-zero targets.
- Cement Industry is a key link in the circular economy through:
  - Co-processing of end-of-life waste in cement kilns
  - Utilizing cementitious industrial byproducts in cement
  - Using recycled/secondary aggregates in concrete
- With its growing capacities, Indian Cement Industry is working to provide sustainable solutions to the increasing volumes of waste in the country, thereby supporting the move towards a circular economy.

Process emissions contribute to ~56% of total emissions from the cement industry

Supply chain management of clinker substitution material is key to reducing the average clinker factor in India

The Indian cement industry is aiming for 25% TSR by 2030 while the average TSR in Austria is 79%

Co-processing: A proven technology for waste management

Co-processing is a globally recognized technology through which waste is treated in energy-intensive industries such as cement. The technology is referred to as co-processing as the safe destruction of waste occurs parallel to the cement manufacturing process, at high temperatures and long residence time existing in cement kilns

- **Safe elimination of harmful substances** that cannot be kept in the loop of a circular economy
- **Best use of residual waste** which reached its end-of-life status and can't be recycled anymore
- **Conservation of natural resources** by replacing them with secondary resources
- **Energy recovery** and **mineral recycling** from waste for which (closed-loop) recycling is not yet feasible
- **Use of existing cement plants** with moderate additional investments into pre-processing and co-processing facilities

Source: Concept of Circular Economy, European Commission 2014

Environmental, Social and Economic Benefits of Co-processing

Climate Change Mitigation

Recycling and Resource Efficiency

No additional public expenditure

Local jobs

About Geoclean

geoclean

The dedicated waste management brand of ACC and Ambuja Cement

What does Geoclean mean?

- Geo means ‘earth’ in Greek. Clean evokes elimination of waste.
- Geoclean aspires to create a greener and cleaner planet through sustainable solutions for managing various waste streams
- Our activities promote business growth and sustainable development. The broader process implies co-processing of waste to build a circular economy

What is Geoclean’s vision?

- We work relentlessly to bring society a step closer to a zero-waste future.
- We leverage our extensive network of facilities, embrace new ideas, and develop innovative solutions and approaches to waste management.

What does Geoclean believe?

- We believe in a healthier and cleaner future without waste, one that humanity can realize by minimizing and repurposing waste.
- Our dedicated experts and partners work persistently toward this goal.
- We take the extra step to solve waste challenges for our customers and the society.

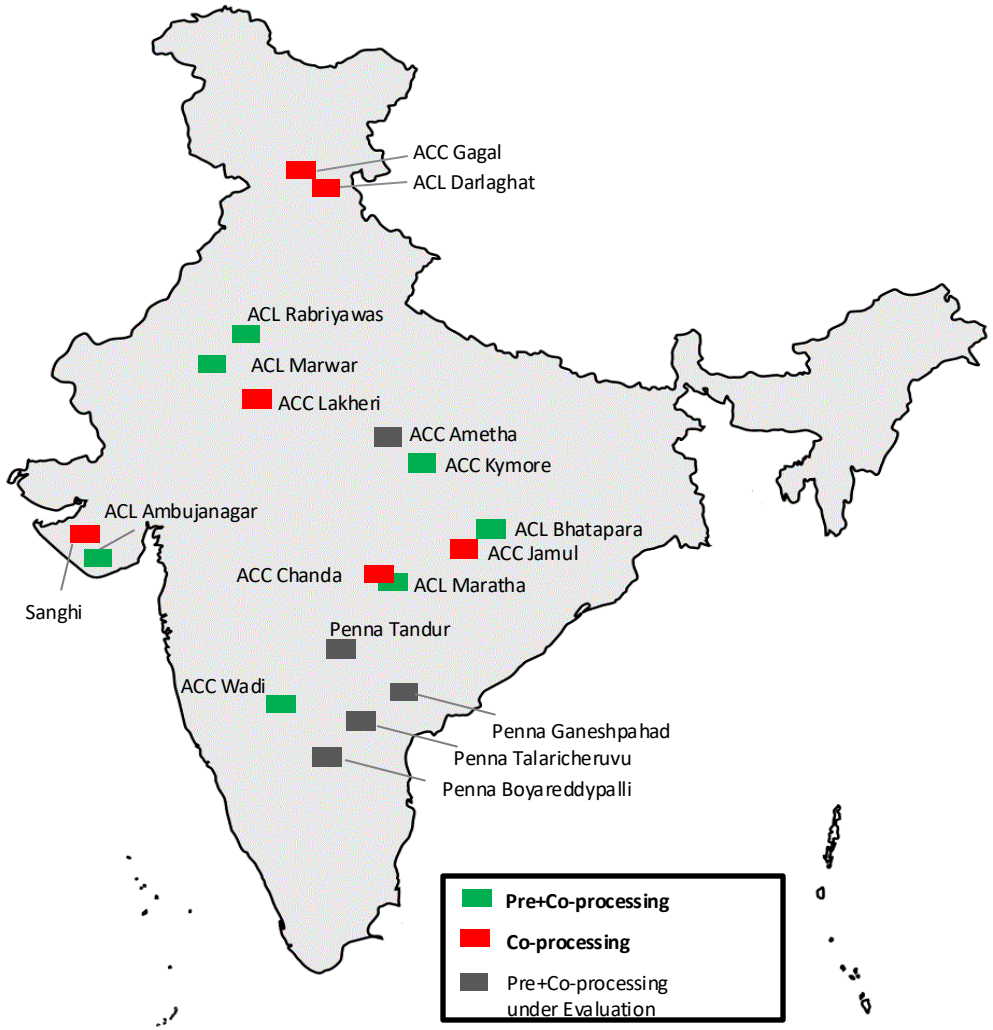
Our Footprint

7 pre-processing and 13 co-processing facilities

More than 17 lakh tons of waste safely co-processed in 2023-24

Partnered with 50+ municipalities and remediated 10+ dumpsites resulting in reclamation of 100+ acres of land

More than 1.01 million tons of natural resources conserved, and 0.72 million tons of CO_2 saved in 2023-24



Customers we serve

We work with our stakeholders to find the most sustainable solution for their waste, turning it into a circular resource and diverting it from landfills. Our approach ensures recycling and recovery of resource value inherent in waste.

Industrial & Service Companies

We offer dedicated solutions for industries and service companies.

We work with customers to ensure they receive the tailored solutions they need.

Agricultural Sector

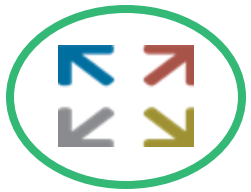
We work with farmers, plantations and agricultural processing units to safely and sustainably manage agricultural residue.

Our approach ensures that management of agricultural waste contributes to the prosperity and well being of local communities and is sustainable in terms of the environment & biodiversity.

Municipalities

Many municipalities face rising volumes of waste. At the same time, they also confront tighter budgets and increased expectations from stakeholders & regulators.

We offer them innovative solutions that eliminate the need for large public investments.



Waste Management Companies

Waste management companies require extensive capacity, flexibility and expertise in their waste management partners.

We create value for them and their customers by ensuring that waste is treated in a safe, compliant and responsible manner.

Geoclean Business Model : Creating a win-win solution

Market based approach

Regulatory landscape & advocacy
Waste market evolution
Solving customer challenges

Win-Win

Plant needs approach

Optimizing costs and quality
Improve performance
Drive for sustainability

Best Practices- Customer Centricity

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Strong systems and processes ensure complete peace of mind for Customers

We are working together with our partners for a cleaner planet

- Providing integrated solutions tailored to local challenges
- Helping divert waste from landfills
- Educating and building awareness to minimize waste

We bring peace of mind solutions

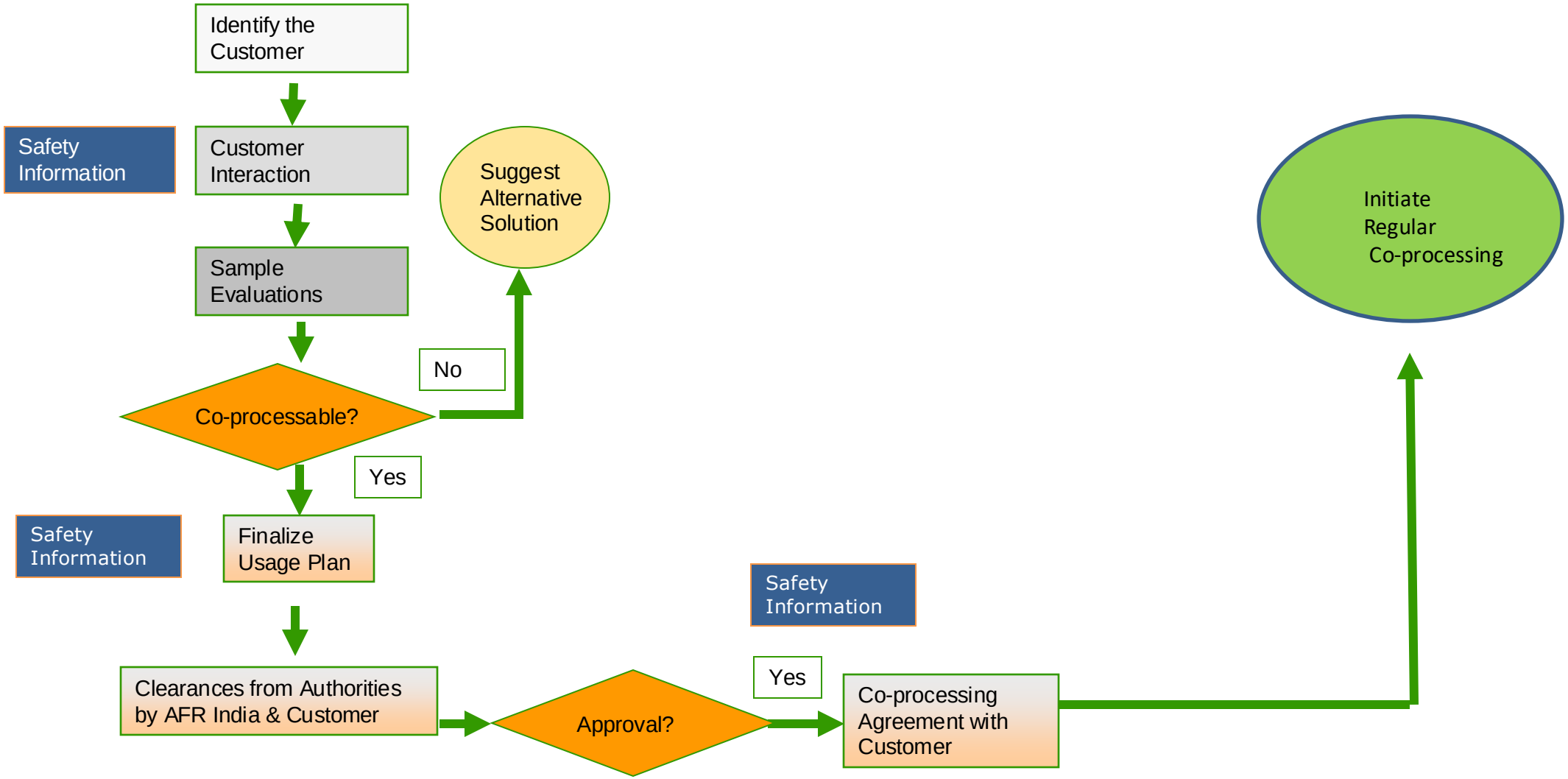
- Complete destruction of waste
- Guaranteed end-to-end transparency and traceability
- Highest standards in health & safety and regulatory compliance
- Capacity and scale from a pan-India network

We help our partners pursue their sustainability goals

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



Strong HSE processes are the pillar of our customer centricity



Safety begins at source : Incorporating strong HSE processes for every waste sample collected

Safety Information collected for every sample:

- Waste sample sheet – Basic information about waste, physical characteristics, source etc
- Waste general questionnaire/MSDS – Collection of information from existing waste analysis, details of waste characteristics
- Waste generating process – Overview of waste generation process to understand composition and possible hazards

Waste analysis of every sample:

- Proximate analysis and complete analysis – Every waste sample is analyzed for more than 40 components
- Latest testing protocols according to standard methodologies are followed
- Waste selected for co-processing based on a strict waste acceptance criteria - developed based on decades of experience, trials and studies.

Best Practices- mmunity Engageme

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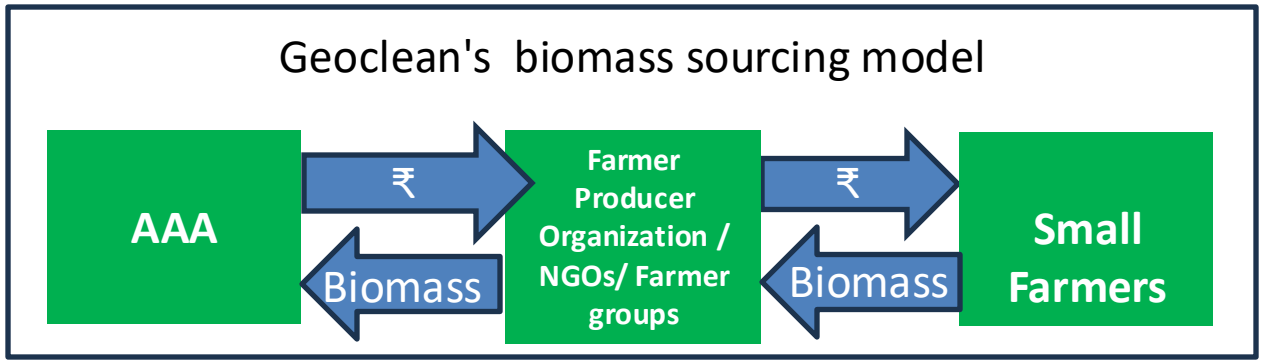
Geoclean's Business Model for Biomass- Enabling stronger community engagement



Geoclean model involves major direct sourcing (up to 80% of volumes) from Farmer Producer Organizations, biomass processors and large farmer groups

Strategy Implemented for Direct Sourcing of Biomass

Direct Sourcing from Farmers, Community & Plantation owners

- Serve community requirements better
- A win-win proposition model for farmers and Geoclean

Community

- Sustainable Livelihood source
- Support on agricultural activity & training

Geoclean

- Stronger relationship with the local community
- Sustainable source of AF (Business continuity)
- Reduction in GHG emission
- Conservation of natural resources

Community Engagement

- Open door policy at all facilities
- Regular interaction with community leaders, influencers, women groups, SHG's, etc.
- Support to schools and gram panchayat on key sustainability areas such as climate change, resource conservation, waste management.
- Facilitate and support SWM by communities and villages
- Involve and encourage community to aggregate biomass for co-processing in cement plant
- Farmers engagement through improved seeding and advanced agricultural techniques


Rabriyawas


Wadi


Bhatapara


Maratha


Kymore

Prioritizing safety across our operations- Best Practices

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Logistics Safety

- Strict Safety Protocols: Implements robust safety protocols for all logistics operations, ensuring compliance with national and international regulations.
- Driver Training Programs: Provides comprehensive training for drivers on safe driving practices, vehicle handling, and emergency response.
- Vehicle Maintenance: Ensures regular maintenance and inspections of vehicles to prevent breakdowns and accidents. - Mandatory 14 point checklist is followed for all vehicles. This included vehicle condition, driver training, PPE, etc
- Hazardous Material Handling: Implements specialized procedures for the safe handling, transportation, and disposal of hazardous materials.- No waste truck is allowed to enter the facility without all authorised documentation – Waste Label (form 8),TREM Card (form 9), Manifest (form 10)
- Only SPCB authorised transporters
- Personal Protective Equipment (PPE): Mandates the use of PPE for all personnel involved in logistics to minimize risk during loading, unloading, and transport.
- Emergency Response Plans: Develops and regularly updates emergency response plans to quickly address any incidents or accidents during transport.
- Collaboration with Authorities: Works closely with local authorities and emergency services to ensure preparedness for any logistical incidents or emergencies.
- These practices help maintain high standards of safety in logistics operations.

Fire Safety

- State of the art fire detection, alarm and suppression system
- NFPA (US) and FM Approved design
- Auto detection – UV-IR (building) IIIR (line), LHS cables(belts) and QBD(roof level), smoke detectors (Office)
- Auto Supression – ESFR sprinklers (roof level), MVWS systems (line), MEFS (shredder and pits)
- Alarm – AV alarm, Siren
- Interlocks – Pre-processing line interlocked with hydrant line pressure and fire pump ready mode condition
- Manual FF – Water hydrants, hose reels, portable fire extinguishers
- CCTV camera – Still and PTZ
- Manual Call Points (MCP)

Environmental Contamination

- Sealed concrete flooring with geo-membrane (leachate protection technology) throughout the floor area of the pre-processing building
- Concrete roads
- Spill control and response kits available throughout the facility
- Rain water collection drains
- Epoxy coated fire water collection drains connect to retention basin where water it let out to storm water only subsequent to testing and analysis
- Leachate collection sumps. Leachate is impregnated and re-utilised.
- Zero discharge facility. Complete material balance
- Odour suppression system – Internal and external
- Green belt development

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THANK YOU

udAAAn
Hum Karke Dikhate Hain

geoclean