FICCI | Centre for SUSTAINABILITY LEADERSHIP

Founding Members

Hindustan Unilever Limited | HSBC

FICCI 100 IOO YEARS OF BUILDING TOMORROW

Presentation on

"Introduction to Zero Waste to Landfill – Roadmap Preparation and Certification"

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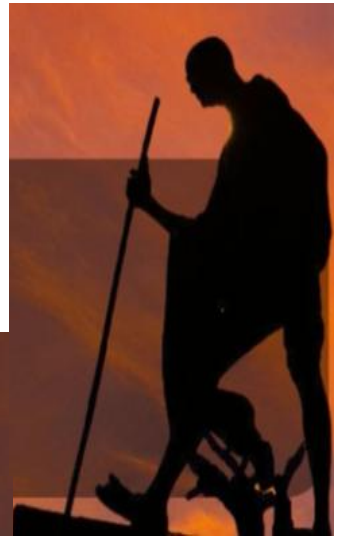
Presentation coverage

- About FICCI
- Waste Generation Scenario and Regulatory Framework in India
- Introduction to Zero Waste to Landfill (ZWTL)
- ZWTL – Benefits, Scope and Methodology
- FICCI ZWTL Certification Process
- Circular Solutions for Waste Minimization and Resource Recovery

About FICCI

- Established in **1927, largest and oldest** apex business organization in India
- **Non-government, not-for-profit** organization
- Serves members from **Indian private and public corporate sectors**, as well as multinational companies and draws strength from **diverse regional chambers of commerce and industry** across states
- Engages with over **250,000 companies**
- Provides **platform for networking and consensus building** within and across sectors
- Primary **liaison** for Indian industry, policymakers, and international business community





About FICCI's Centre for Sustainability

The FICCI Centre for Sustainability Leadership Serves as a **strategic platform to guide Indian industry towards sustainable growth, climate resilience, and long-term competitiveness.**

Acts as a catalyst for **translating sustainability into business value, enabling organisations to integrate sustainable practices into core business strategies**.

Through policy advocacy, capacity building, industry consultations, and innovation-led initiatives, it **supports businesses in addressing climate risks, regulatory requirements, and evolving market expectations.**

Over the past two years, the Centre has delivered measurable outcomes, including the **upskilling of over 5,000 professionals, ESG and BRSR-related guidance to more than 2,300 enterprises, and sensitisation of 500+ MSMEs** to sustainable, circular, and climate-responsive business practices.

Focus Area



1. Institutionalizing Sustainability

Serve the needs of business and industry, helping them and their value chains achieve climate neutrality and meeting their SDGs

2. Fostering Innovations

Addressing technology needs of industry by supporting partnerships for deployment of CleanTech and enabling visibility for green startups

3. Partnering for Policy Action

Engaging with government stakeholders – SEBI, RBI, MoEFCC and ecosystem partners to shape pro climate policy

4. Creating Network of Sustainability Practitioners

Build capacity of professionals through trainings, dissemination of best practices, knowledge reports, e-learning programs

OUR Objectives

To support Indian Industries and other stakeholders to



ENHANCE RESOURCE EFFICIENCY



IMPROVE ENVIRONMENTAL PERFORMANCE



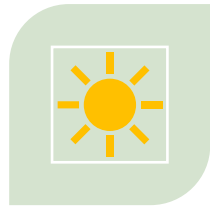
MEET ENVIRONMENTAL COMPLIANCE



IMPROVE PRODUCTIVITY AND COST REDUCTION



PROMOTE OVERALL SUSTAINABILITY AND ACHIEVE SDG GOALS



DECARBONIZE THROUGH ENERGY TRANSITION

FICCI Government Accreditations

- An ***Empaneled Accredited Energy Auditing Organization*** with Bureau of Energy Efficiency (BEE), Ministry of Power, Government of India for Conducting Mandatory Energy Audits and M&V Audits under Energy Conservation Act 2001
- ***Accredited Carbon Verifier (ACV)*** under Carbon Credit Trading Scheme (CCTS) with BEE, MoP
- ***Empanelled Auditor for Renewable Consumption Obligation (RCO)*** Verification & Reporting in Designated Consumer Industries, with BEE, MoP
- An ***Empaneled Accredited Water Auditing Organization*** by Central Ground Water Authority (CGWA), Ministry of Jal Shakti, Government of India
- FICCI has been Empaneled by Ministry of Steel, Government of India for **Green Steel Certification**
- FICCI has been Empaneled by CPCB for Conducting Audit under **Extended Producers Responsibility (EPR) for Various Types of Wastes** like Plastic Waste, E-Waste, Waste Tyre Management etc.

Sectors served

The team has successfully accomplished energy and water conservation and waste management studies for more than 1300 industrial units covering following sectors:

• Beverage	• Oil & Gas Exploration
• Building Complex	• Oil Refinery
• Cement	• Petrochemical
• Chemical	• Pharmaceuticals
• Fertilizers	• Power plants and Solar Plants
• Iron & Steel	• Pulp & Paper
• Mining	• Textile
• MSME sector industries	• Zinc, Aluminium etc.

Preparing Zero Waste to Landfill (ZWTL) Roadmap

ZWTL Roadmap prepared for:

1. **Tata Power Delhi Distribution Company, New Delhi**
2. **Tata Power Solar Limited, Tamil Nadu**
3. **PPGCL, Prayagraj**

Zero Waste to Landfill refers to a policy of diverting as much waste as possible away from landfill sites through sustainable practices such as reducing waste generation, reusing materials, and recycling, adopting **circular economy** solutions etc.

The main point is that companies aim towards reducing their landfill usage significantly, with at least 90% to 100%. of waste diverted from landfill.



Diversion Rate:

$$\textbf{Diversion Rate}(\%) = \left(\frac{\textbf{Waste Diverted (WD)}}{\textbf{Total Waste Generated}}\right) \times \mathbf{100}$$

Saving Potential

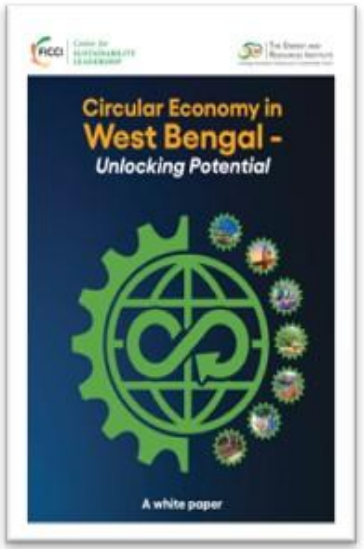
Energy Studies: Energy Saving potential of up to 5-20% with payback periods less than 3 years.

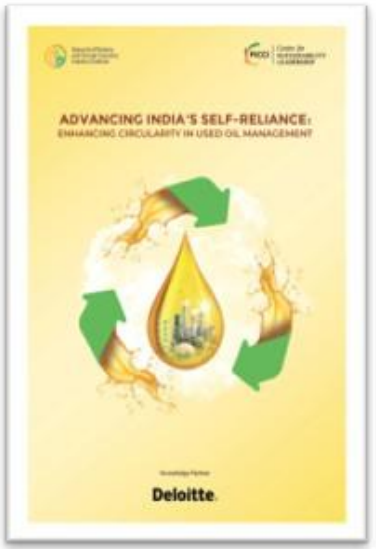
Water Studies: Water use efficiency by 10-50 % with a discounted payback period < 2 years and Reduction in operating costs (like energy, chemical consumption) by 5-20%.

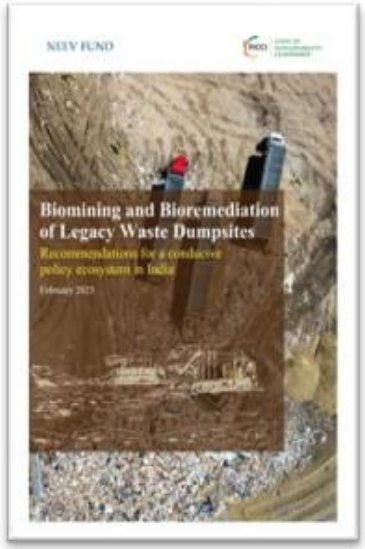
Waste Studies: 90-100% waste landfill diversion potential with in 2-3 years, circular solution opportunities with revenue generation with payback period <2 years.

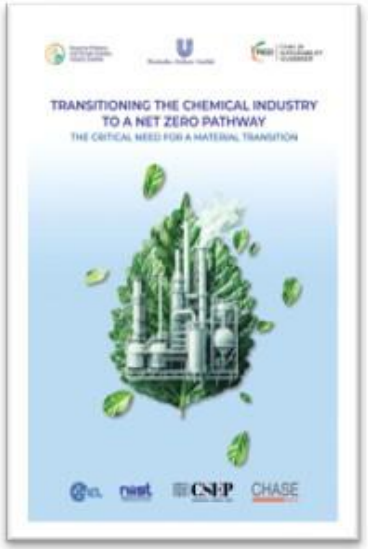
KNOWLEDGE PAPERS



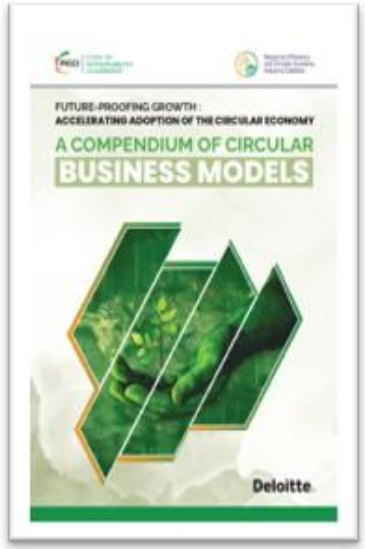













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3rd ESG Summit


Roundtable
Building a Sustainable


FICCI
MSME XCELERATE 2025
Innovation I Technology I Sustainability


SUSTAINABLE
BUSINESS FUTURES




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Startup Showcase
Enabling MSME Competitiveness
through Sustainable Solutions

FICCI Clients (Member Organizations)



































FICCI Clients (Member Organizations)





























FICCI Key Clients



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A division of Timken India Limited

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EESL

KAM KENYA ASSOCIATION OF MANUFACTURERS Driving Global Competitiveness

PCRA

SHAKTI SUSTAINABLE ENERGY FOUNDATION

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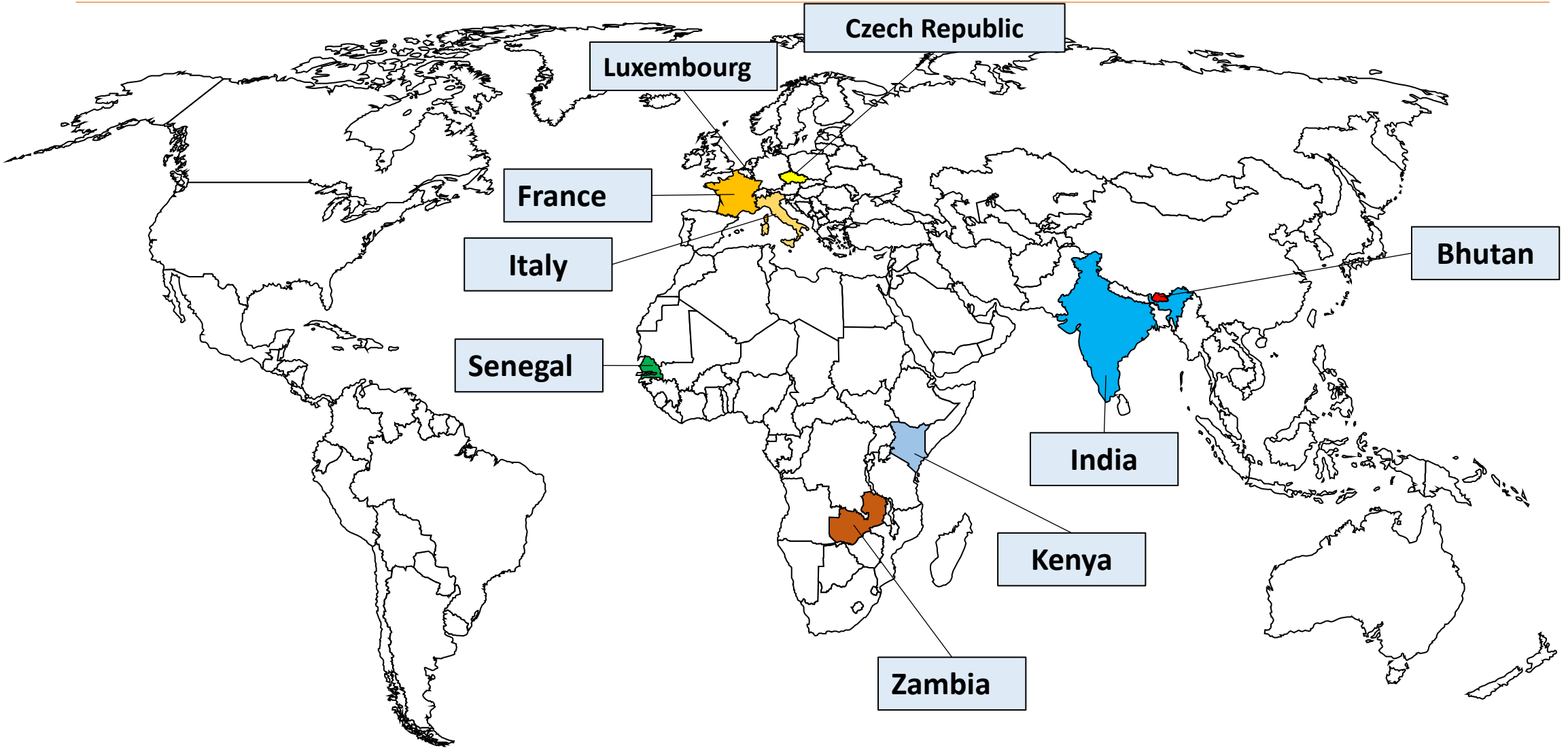
THE WORLD BANK

WWF

UNDP

UNIDO UNITED NATIONS INDUSTRIAL DEVEL(

RCM Services- Global Footprint



Waste Generation Scenario and Regulatory Framework in India

What is Waste?

“Waste is a product or substance which is no longer suited for its intended use.”

The Basel Convention defines waste as “substances or objects which are disposed of, intended to be disposed of, or required to be disposed of by national law.”

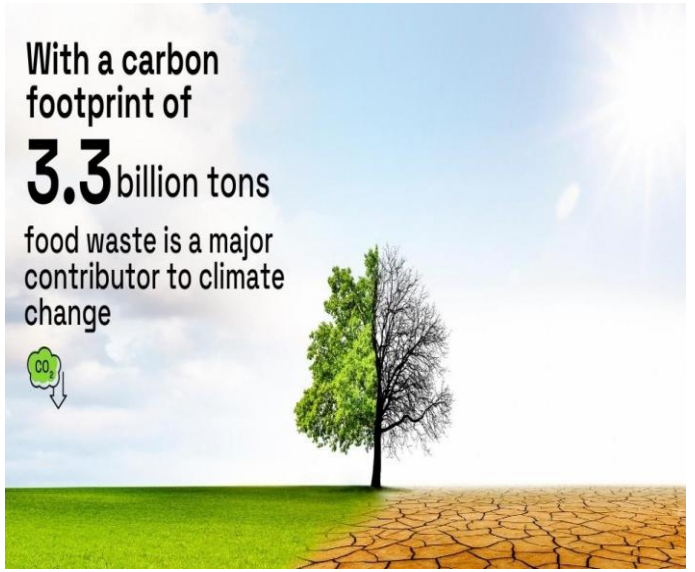


How waste is generated?

Waste generation stems from the extraction of natural resources, the production of goods and services, and the consumption of those goods and services.







What are the different type of Waste?

Different activities generate different types of waste like:

- **Municipal Solid Waste**
- **Industrial Waste**
- **Biomedical Waste**
- **Agricultural Waste**
- **Plastic Waste**
- **C&D Waste**
- **Packaging waste**
- **E-waste**
- **Hazardous Waste etc.**



Industrial Waste Generation In India

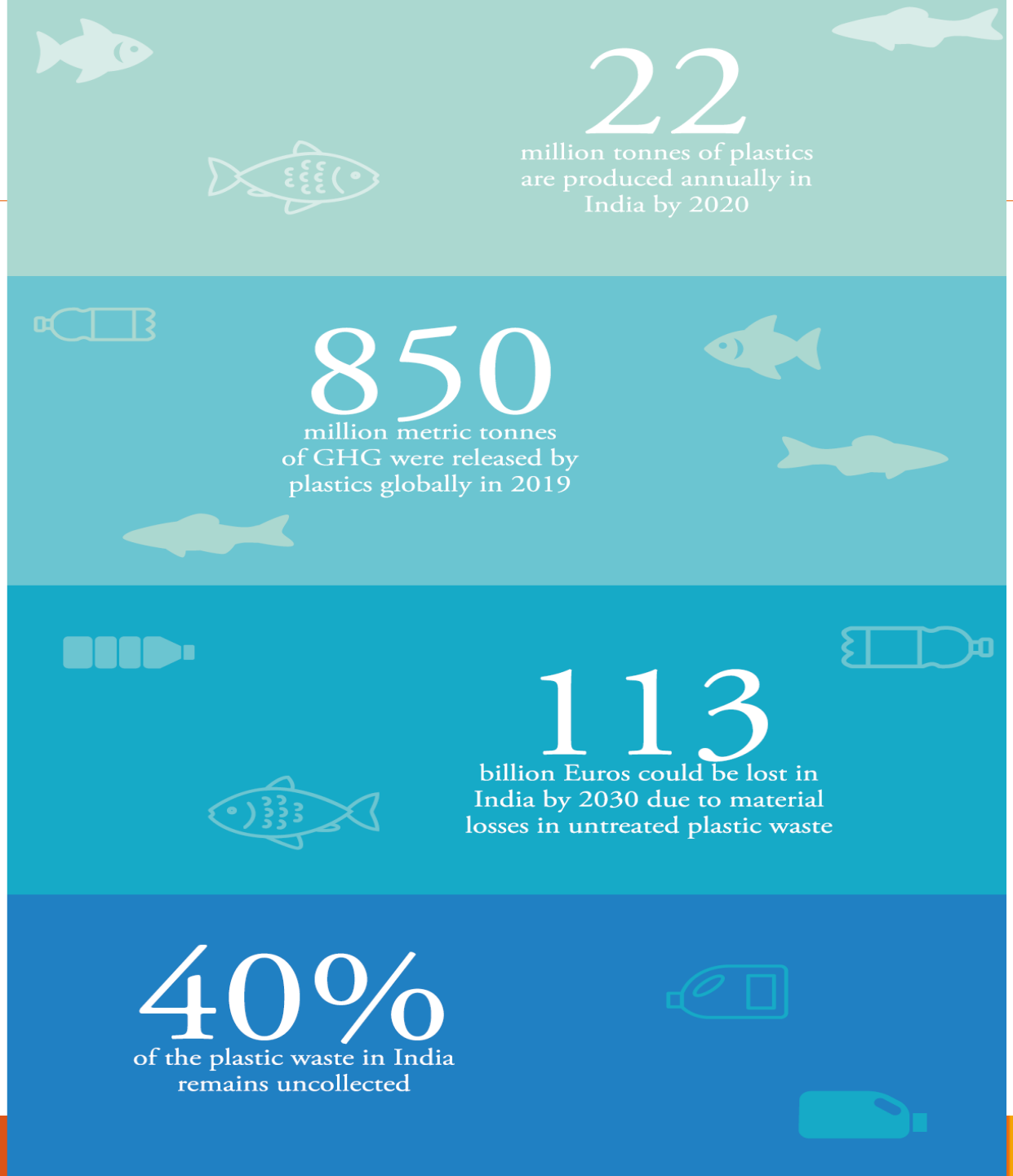
- India generates over **500 million tonnes of industrial waste annually**, driven by rapid manufacturing growth, with hazardous waste reaching approximately 7.9 million tonnes per year with **significant contribution from MSME sector.**
- **Major Contributing Sectors**
  - **Textile Industry:** 150 million tonnes from cotton, silk, and synthetic fibre production.
  - **Steel Industry:** 120 million tonnes from iron ore processing.
  - **Pharmaceutical Industry:** 80 million tonnes of chemical waste annually.
  - **Mining:** 70 million tonnes from coal and mineral extraction.
- **Only about 20-30% of this waste is currently recycled, leaving a massive challenge for management, disposal, and environmental safety.**



Municipal Waste Generation In India



Plastic Waste



Bio Medical Waste

Biomedical Waste Production in Hospitals

Hospitals, including AIIMS Delhi, generate a significant amount of waste from their medical activities. In 2018, AIIMS Delhi produced 74,500 kilograms of waste per month, or close to 2,500 kilograms each day. This included:



24,000 kilograms of yellow waste

23,500 kilograms of plastic and rubber waste

500 kilograms of sharp waste

26,200 kilograms of glass waste

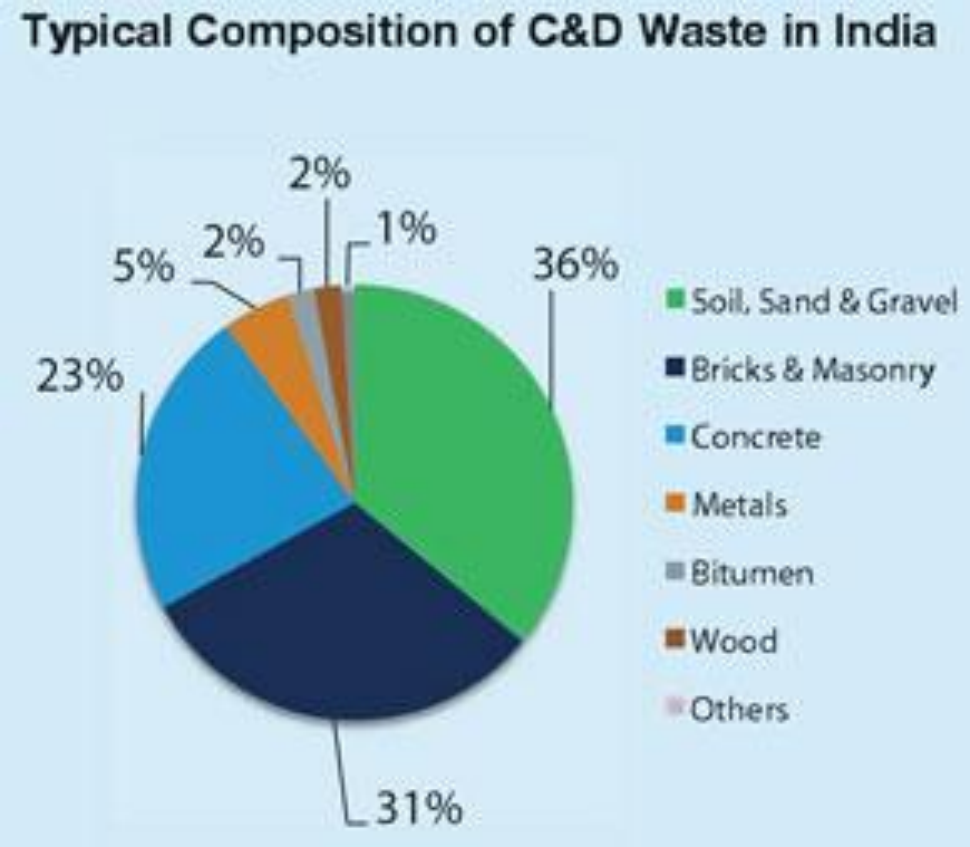


E-Waste


INDIA'S E-WASTE PROBLEM
3RD LARGEST E-WASTE GENERATOR GLOBALLY, AFTER CHINA AND THE US
E-WASTE GENERATED IN FY 2023-24:
1.7 MILLION TONNES
MORE THAN DOUBLE SIX YEARS AGO
CONSUMER ELECTRONICS GROWTH ESTIMATED AT $62 BILLION IN 2025
ONLY
43%
RECYCLED
COMPARATIVELY HIGHER RECYCLING RATES IN THE US & CHINA

C&D Waste Generation and Composition

According to the Building Material Promotion Council (BMPTC), India generates an estimated 150 million tonnes of construction and demolition (C&D) waste every year. But the official recycling capacity is a meagre 6,500 tonnes per day (TPD) -- just about 1 per cent.



Landfill Disposal of Waste in India

- According to a report by the Central Pollution Control Board (CPCB), India generates around 62 million tonnes of municipal solid waste annually, of which only 43 million tonnes are collected and 11.9 million tonnes are treated. The remaining waste is either dumped in landfill sites or left uncollected, leading to severe environmental and health hazards.

- Due to financial constraints and lack of technology, **many industries dump hazardous and toxic waste in open spaces, landfills,** and water bodies, leading to significant environmental degradation and public health hazards.

- **Nearly 20% of methane gas emissions in India is caused by landfills.** The trash dumped in the landfills are prone to catching fire due to the heat generated by the decomposition of waste.



Regulatory Framework

- Environment Protection Act (1986)
- Solid Waste Management Rules (2026)
- Plastic Waste Management Rules (2016) and Amendments
- Hazardous Waste (Management and Transboundary Movement) Rules (2016)
- Bio-medical Waste Management Rules (2016)
- Battery Waste Management Rules, 2022
- E-Waste Management Rules, 2022
- Construction and Demolition Waste Management Rules (2025)



Solid Waste Management Rules, 2026 (effective from 1st April 2026)

- **Bulk waste generator - covers the following** entities, if they satisfy at least one of the following criterion;

(i) buildings with floor area of 20,000 sq.m. or above; or
(ii) water consumption of 40000 litres per day; or
(iii) solid waste generation of 100 kg per day, namely:

A. Institutional users including buildings occupied by the,-

(i) Central Government departments or undertakings, State government departments or undertakings;
(ii) local bodies;
(iii) public sector undertakings or private companies;
(iv) schools, colleges, universities, other educational institutions; and (v) community places or like;

B. Commercial users including,-

(i) commercial establishments including railways, bus stations or depots, airports, ports;
(ii) industrial units and industrial areas;
(iii) malls, multiplexes;
(iv) hotels; (v) hospitals, nursing homes;
(vi) hostels;
(vii) wholesale markets, including “Mandis”, for agricultural and horticultural produce, fish and meat;
(viii) Stadium, sports complexes;
(ix) Community halls, convention halls, auditorium; (x) Marriage or banquet halls;
(xi) conference centres, Expo centres, exhibition areas; and
(xii) tourist spots.

C. Residential societies.

SWM Rules 2026 - Duties of Bulk Waste Generator

- Register themselves with the concerned local body through the centralised online portal.
- make necessary arrangements for collecting and handing over of **dry waste, sanitary waste, special care waste,** to the local body or agency authorised by it;
- make necessary arrangements to collect and process **wet waste or horticulture waste** if applicable, generated by them, in a decentralised manner through composting or biomethanation or any other approved technology;
- set up and operate wet waste processing facility of adequate capacity, including for horticulture waste to ensure processing of complete wet waste generated by them, in case of all new bulk waste generators.
- In case of existing bulk waste generators, who are not able to set up and operate decentralised wet waste processing, they shall get the exemption from the local body, and such bulk waste generators shall procure **Extended Bulk Waste Generator Responsibility certificates** from local body concerned for processing of wet waste equivalent to complete wet waste generated by them.
- not engage with any entity not having registration mandated under these rules;
- submit annual returns by 30th June every year on the centralised online portal in respect of the Extended Bulk Waste Generator Responsibility obligation Etc……..

Introduction to Zero Waste to Landfill (ZWTL)

Concept of Zero Waste to Landfill (ZWTL)

Zero Waste to Landfill refers to a policy of diverting as much waste as possible away from landfill sites through sustainable practices such as reducing waste generation, reusing materials, and recycling.

The main point is that companies aim towards reducing their landfill usage significantly, with at least 90% to 100%. of waste diverted from landfill.

Diversion Rate:

$$\textbf{\textit{Diversion Rate}}(\%) = \left(\frac{\textbf{\textit{Waste Diverted (WD)}}}{\textbf{\textit{Total Waste Generated}}}\right) \times \mathbf{100}$$



Achieving net-zero through ZWTL

Zero Waste to Landfill (ZWTL) plays a pivotal role in helping industries transition toward **net-zero emissions** by minimizing the environmental impact of waste.

By diverting waste from landfills through strategies like reduction at source, reuse, recycling, and responsible disposal, ZWTL significantly lowers greenhouse gas emissions—particularly methane, which is a major contributor to climate change.

It aligns with **circular economy principles**, promoting the recovery of materials such as metals, plastics, and wood, which reduces the need for virgin material extraction and energy-intensive production processes.

For industries, **the ZWTL approach reduces operational waste management costs, enhances brand reputation, ensures compliance with environmental regulations, and contributes to carbon footprint reduction across the value chain**. Ultimately, ZWTL is a strategic and measurable pathway to achieving **net-zero targets**, integrating environmental stewardship with inclusive, community-driven development.



Waste minimization

- Waste minimization is a crucial aspect of sustainable business practices that focuses on reducing the amount of waste generated by different companies.
- By implementing effective waste minimization strategies, companies can not only contribute to environmental conservation but also achieve significant cost reductions



Five Key Principles of Zero Waste to Landfill (ZWTL)



Benefits of Achieving ZWTL and Certification



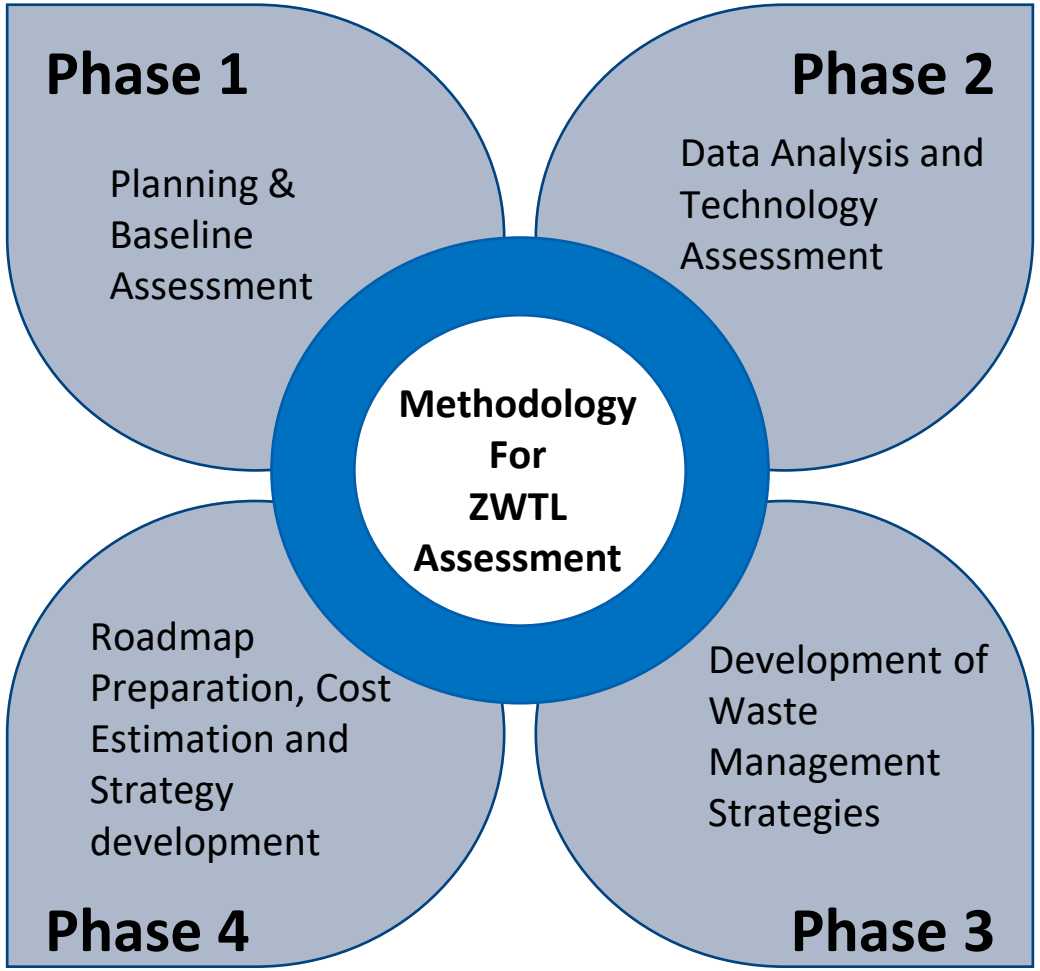
ZWTL is not just an Environmental initiative but a business strategy for long-term resilience

Scope of ZWTL Assessment and Roadmap preparation

- **Identification and quantification** of different waste streams within facility and all categories of waste at all locations.
- Drafting effective implementation of **site-specific waste management technologies**
- Prioritizing and Formulating site specific technologies depending upon **quality and quantity of major waste streams**.
- Suggestion of appropriate programs for **waste segregation, minimization, and recycling**.
- Preparation of **roadmap for Zero waste to landfill**, as well as indicative **implementation costs**.
- Suggestions on **overall Strategy** to Industries for Sustainable Waste Management.

FICCI Methodology for ZWTL assessment and Roadmap preparation

1. Project Kick-off
2. Waste Assessment Planning
3. Conduct Waste Assessment field studies

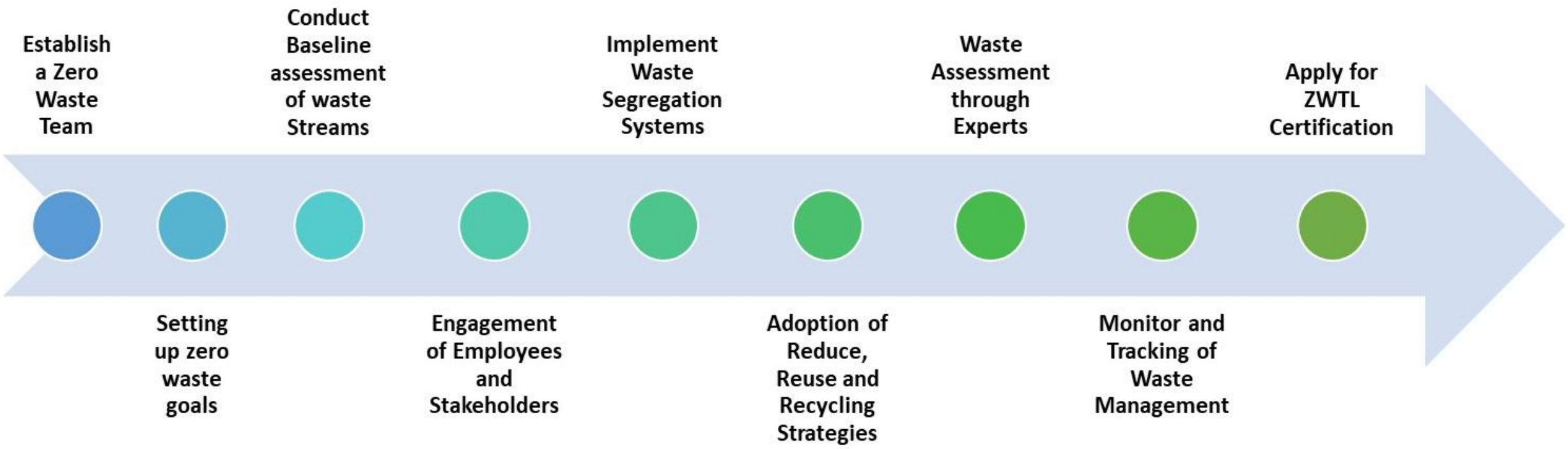


1. Data Analysis for key waste generation and pattern
2. Technology identification & recommendation
3. Stakeholder Engagement method identification

1. Roadmap Development
2. Cost Estimation
3. Final Report Preparation

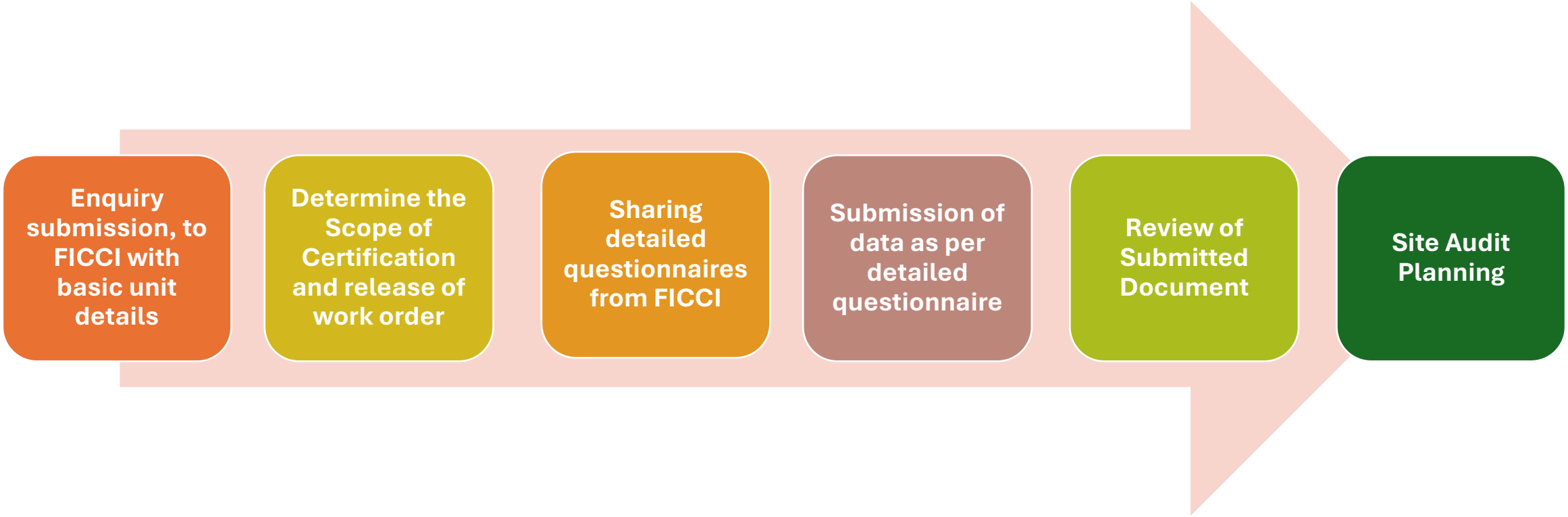
1. Develop site specific Waste Management Strategies
2. Design waste segregation, minimization and recycling Programs
3. Prepare Implementation Plan

Process to achieve Zero waste to Landfill and Certification

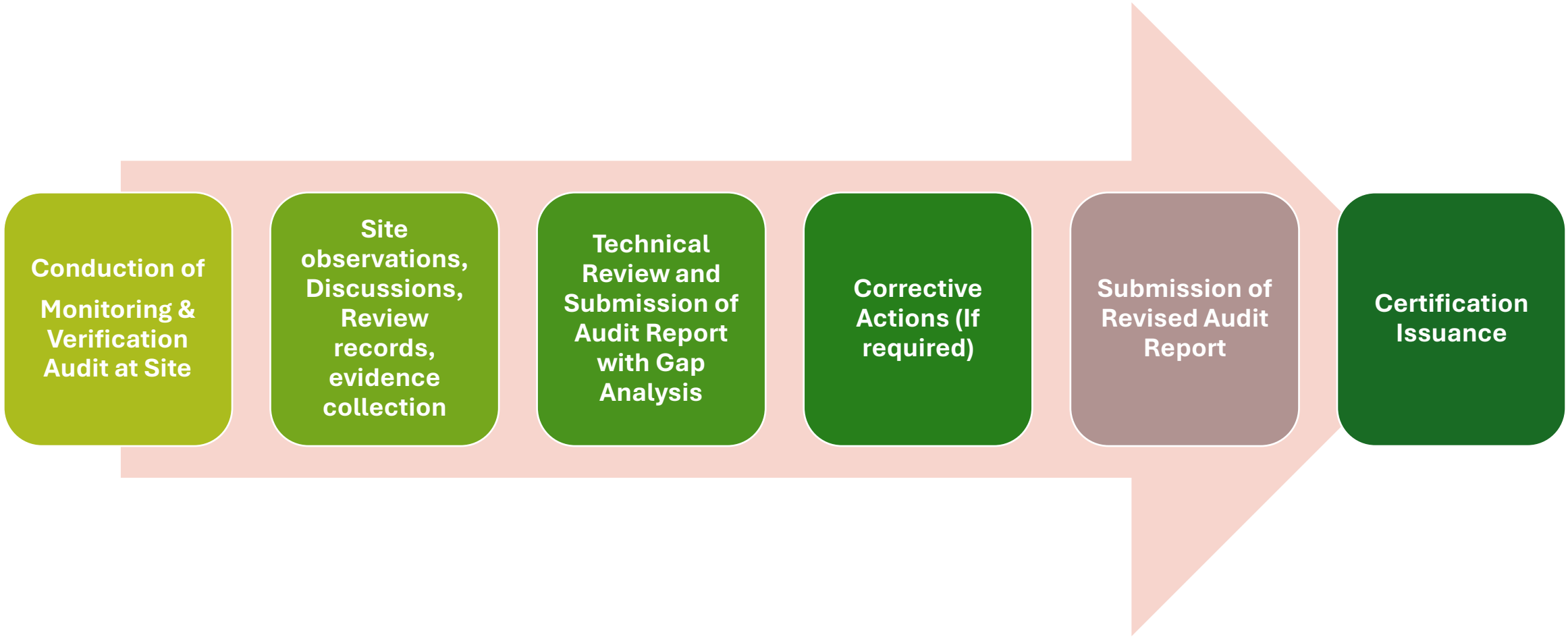


FICCI ZWTL Certification Process

FICCI provides end to end service and support in preparing ZWTL Roadmap, its implementation and Certification.



FICCI ZWTL Certification Process (contd.)

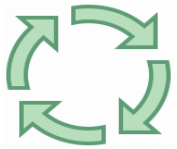


Step wise Action plan for Applying for Achieving ZWTL Certification

Circular Solutions for Waste Minimization and Resource Recovery



Reduce



Reuse



Recycle

1. Provide Waste Source Segregation infrastructure

- A clear waste segregation system will help reduce waste sent to landfills. In the residential areas, bins for organic waste, recyclables, and non-recyclable waste should be set up to make sorting easy.
- Training employees and residents on how to segregate waste properly is key. Simple instructions and regular reminders will help them understand their role in the initiative.
- Engaging everyone will make waste segregation a part of their daily habits, ensuring the success of the ZWTL goal.

Source Segregation of Waste



1.Provide Waste Source Segregation infrastructure (Cont.)

- Industries must prioritize 100% segregation at the source by strategically placing appropriately sized, color-coded containers at key points of waste generation.
- These containers should also be clearly labelled with concise and informative instructions to guide both staff and guests in properly disposing of their waste.
- Training employees and giving them easy-to-follow instructions on how to sort waste properly will be key to the success of this plan.

Segregated Compartments Dustbin



1. Provide Waste Source Segregation Infrastructure (Cont.)



BEFORE

Single Dustbin resulting in Mixing of Wet and Dry waste



AFTER

Well Labelled Colour Labelled bins for segregating Plastics, dry wet etc. can be provided to avoid comingling of waste

1.2 Implement Waste Source Segregation at Canteen / Pantry (Cont.)



BEFORE

Wet and Dry waste is getting mixed in the Pantry area



AFTER

Labelled bins for segregating Plastics, peels and cooked food, glass and metals etc. can be provided to avoid comingling of waste

2. Implement Waste Segregation in Residential Areas

It is recommended to implement Waste Segregation system like installing bins for Biodegradable, Non-Biodegradable, and Domestic Hazardous Waste at Residential Areas.

Biodegradable waste	Non Biodegradable waste	Domestic Hazardous Waste
• Kitchen Waste including: tea Leaves, egg shells, fruits & vegetable peels • Meat and Bones • Garden and Leaf litter, including flowers • Soiled paper • House dust after cleaning • Coconut shells • Ashes	Newspaper Paper, books &magazines • Glass • Metal objects and wire • Plastics • Cloth Rags • Leather • Rexene • Wood/Furniture • Polystyrene/ Packaging material	Aerosol cans • Batteries • Bleaches & household kitchen & drain cleaning agents & its container • Car batteries, oil filters & car care products & consumables • Chemicals and solvents and their container • Cosmetic items, chemical-based insecticides & their containers • Paints, oils, lubricants, glues, thinners, & their container • Pesticides, herbicides & their container • Photographic audio/video tapes & their containers,chemicals • Styrofoam & soft foam packaging of furniture, packaging & equipment • Thermometers and mercury-containing products • Discarded medicine and disposable syringes

Waste Segregation at Residential Area

Panaji Model of 16 categories of waste segregation

- It is recommended to introduce Panaji Model of 16 categories of waste segregation through which waste is segregated at source into 16 category of waste at Residential Colonies
- This system categorizes waste into 16 distinct categories including paper, cardboard, PET and hard plastic, soft plastic, coconut shells, clothes, glass, sharp objects, metals, ceramic and melamine, e-waste, tube lights, batteries, non-recyclables, sanitary and biomedical waste, expired used medicines
- The 16-way segregation model is cheaper, requires minimal manual or mechanical sorting, and reduces the burden on the environment.



16 Ways to Segregate Waste at Residential Colonies

Panaji Model of 16 categories of waste segregation (Cont.)



Storage Rooms for 16 categories of Waste



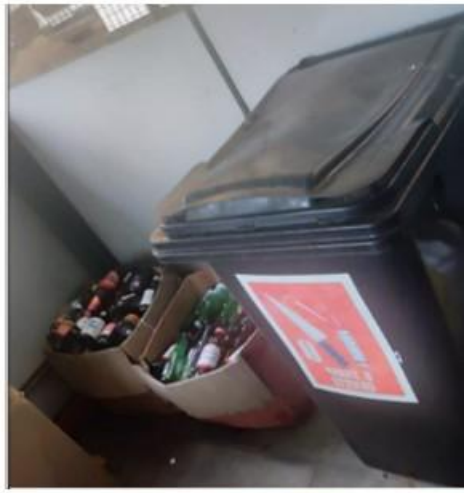
Rate Card for different types of Segregated Waste

Adoption of Panaji Model of 16 categories of waste segregation (Cont.)













Segregating different categories of Waste into well labelled bins and bags

3. Optimize Waste Segregation and Recycling

100% Segregation at Source	Clear Separation of Scrap Categories	Quantify and Segregate Scrap Items	Systematic E-Waste Segregation	Engage Different Vendors for Each Waste Type
• Place appropriately sized, color-coded containers at key waste generation points.	• Segregate metals, plastics, e-waste, hazardous waste, batteries, and other materials for proper recycling or disposal.	• Ensure sizeable lots of scrap are carefully segregated and individually quantified.	• Implement systematic segregation practices specifically for E waste.	• Collaborate with separate vendors for different type of waste to maximize value recovery.





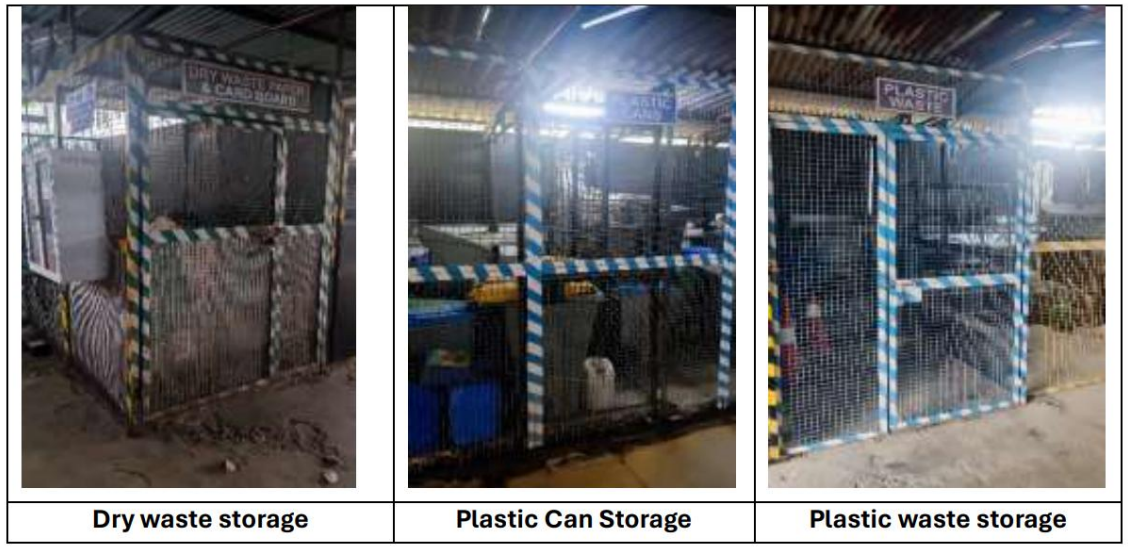
Separate Chambers for E waste

4.Separate labelled storage area for different types of waste



BEFORE

No labelling and Heaping of Paper waste, Plastic, Cardboard, Rigid Plastic



AFTER

Designated Separate labelled storage area for different type of waste.

5. Sustainable Eco-friendly Alternatives to Plastic Packaging



Honey Comp Packaging Paper



Sustainable Packaging



Recycled paper packaging



Compostable Bags

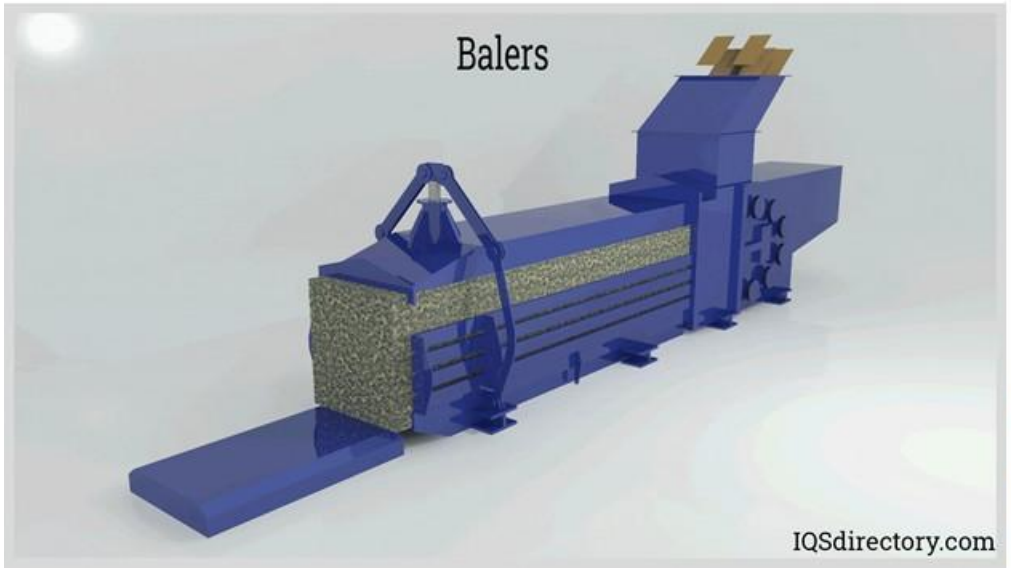


Eco friendly Food packaging

6. Circular Solutions for Packaging Waste (Plastic, Cardboard, Foam)

Installation of Baling Machine:

Install baling machines onsite for compaction to smaller volume in the form of bales resulting in easy storage and transportation. .





Bailing Machine for packaging waste

Estimated Investment: The pull back and segregation of packaging waste needs minimum investment. The cost of installing a plastic baler with a capacity of 2 tons per day is ₹3,45,000 per unit.

6. Circular Solutions for Packaging Waste (Plastic, Cardboard, Foam) (Contd.)



Collection and Segregation of the packaging waste



Installing baling machines onsite for easy storage and transportation

- Reduction in the volume of multiple waste streams
- Improved recycling value and better resource recovery
- Net Revenue: ₹ 70,28,289.5 per year resulting with payback period of less than 1 month



Authorized CPCB Recyclers

Proposed Packaging Waste Management Solution

7. Turning plastic waste into the Useful products such as Tree guard, Benches, Table etc.

Recommended Solution: It is suggested to Turn plastic into useful products like tree guards, benches, and tables by working with self-help groups as part of its CSR activities.



Turning plastic waste into the Useful products

Estimated Investment: It involves a investment of around ₹20-30 lakh, through which organizations can turn the plastic into useful recycled products by working with Self-help groups (SHG) as a part of its CSR Activities.

8. Converting wood waste into Biochar

Recommended Solution

- It is suggested to Install WasteX Carbonizer technology which is designed to process wood based materials into biochar.
- By Shredding scrap wood waste into wooden pellets before processing would help to achieve better efficiency during the conversion process.
- Converting wood to biochar offers numerous benefits such as Soil Enhancement, Cement Additive and generating carbon credit.

Estimated Investment: The total charges for installing and implementing WasteX Carbonizer technology is Rs 10,20,600.

8. Converting Scrap wood waste into Biochar (Contd.)





Easy to operate | Emission free | Environment friendly

BIOCHAR APPLICATION

Soil Amendment | Water Filtration | Livestock Supplement | Cement Additive

CARBON CREDIT

Conversion of scrap wood waste into biochar through WasteX Carbonizer technology

Monetary Saving

Net Revenue → Rs 6,27, 040/year for 100000 Kg/Year wood waste

Payback Period → 1.6 years

9 Food Waste Minimization

Food Waste Minimization:

- Meal Planning
- Take small portions
- Food waste accounting and Monitoring
- Awareness of staff and Employees



9.1 Turning Food Waste and Horticulture waste into Compost using Organic Waste Composter

Recommended Solution

- It is recommended to Install OWCS (Organic Waste Composters/Converters) for in-house processing of wet waste, including food and horticultural waste.
- The Organic Waste Composters converts organic waste into nutrient-rich compost, which can be used for gardening, promoting sustainability by reducing the need for chemical fertilizers.
- This approach ensures compliance, further reduces transportation and disposal costs, lowers greenhouse gas emissions.

Estimated Investment: The cost of a fully automatic composting machine with a capacity of 25 kg/day is Rs 2,00,000.

9.2 Turning Food Waste and Horticulture waste into Compost using Organic Waste Composter (Contd.)





Segregation of Wet waste





Compost

1. SHREDDING
2. MIXING
3. CURING

Turning Food waste and Horticultural Waste into Compost using OWC

10. Turning Food Waste to Biogas using Biogas Plant

Solution

- Install biogas plant for in-house processing of wet waste, including food and horticultural waste.
- 5 Star Hotel in New Delhi is generating biogas from its food waste and horticulture waste. The biogas is used in the restaurant kitchen area for cooking.



Turning Food waste into Biogas using Biogas Plant

11. Reuse and Handover Metal Waste to Authorized Vendor

- Metal waste generated from operations should be segregated and reused wherever possible within the facility to promote sustainability and reduce waste.
- Non-reusable metal scrap must be collected and stored in designated areas, ensuring no hazardous materials are mixed. The waste should only be handed over to authorized vendors who are certified by the appropriate environmental or pollution control authorities.
- Proper documentation must be maintained, including vendor licenses, quantity of waste handed over, and transfer records, to ensure compliance with environmental regulations and internal policies.



Repurposing of metal waste for decoration



Reuse of waste boiler tubes for making Fencing at Gate

12. Handover Other Waste to Authorized Vendor

- Each type of waste including Plastic, biomedical waste-waste, used batteries, hazardous waste and nonhazardous waste should be handed over only to government-authorized and certified vendors who are licensed to handle, transport, and dispose of such waste safely.
- It is essential to **verify the authorization status of vendors** and maintain records of waste quantities, handover dates, and transfer documentation to ensure full compliance with environmental laws and company policies.



13. Monitoring and Reporting

Digital Waste Management Systems

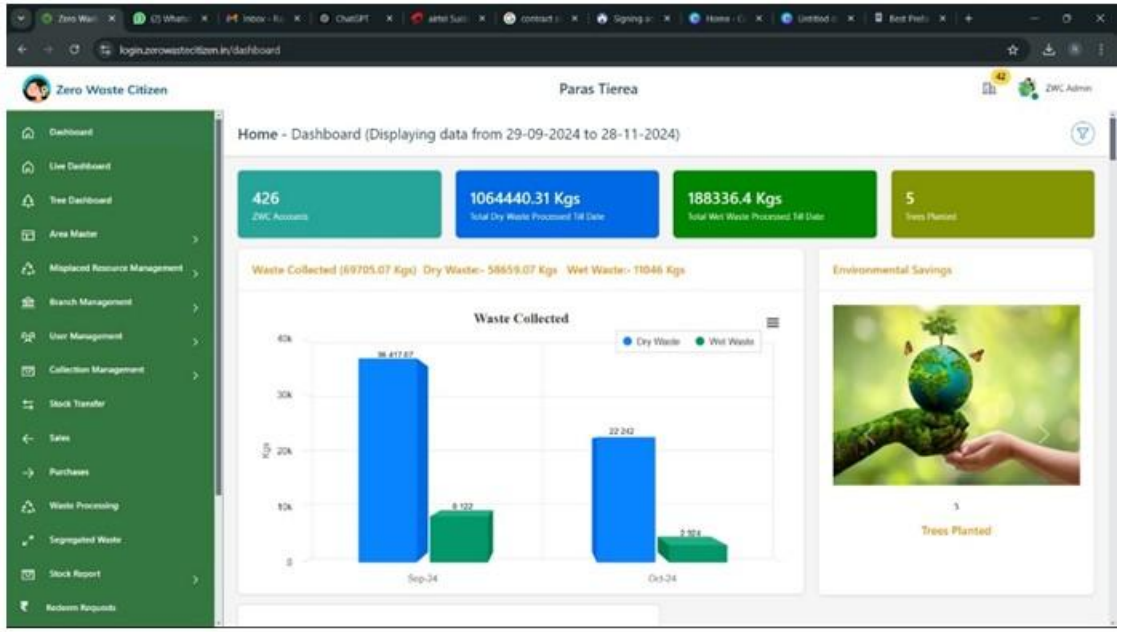
- Real-time tracking of waste generation, diversion, and recycling rates.
- KPI-based dashboards for management oversight.

Key Metrics

- Diversion percentage.
- Resource recovery rates.
- Compliance with regulatory requirements.

Regular Reporting

- Quarterly updates to stakeholders on ZWTL progress.
- Annual sustainability report with waste data.



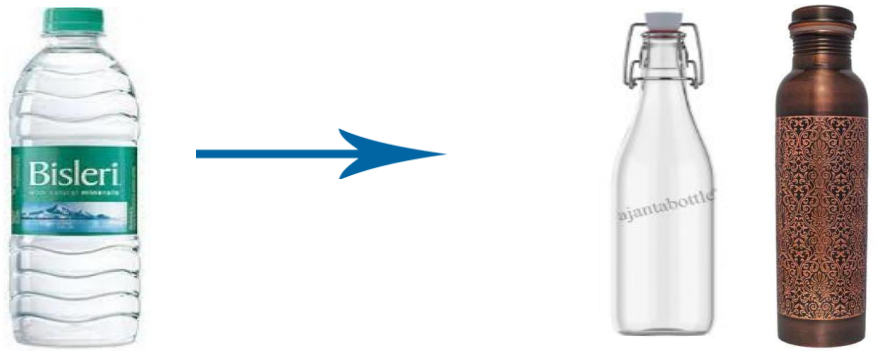
Centralized Data Waste Management

14. Adopt paperless processes to eliminate/reduce paper waste

- **Paperless Invoicing & Payments:** Shift to electronic invoicing (e-invoicing) and digital payment methods to eliminate paper bills, checks, and receipts.
- **Digital Forms:** Replace paper forms with online alternatives (e.g., Google Forms, JotForm) for surveys, HR requests, and customer data collection.
- **Automated Procurement:** Use digital platforms for purchasing, requisition, and approval to streamline operations **Print-on-Demand**
- **Policy:** Only print documents when absolutely necessary, encouraging digital viewing as the default.
- **Print-on-Demand Policy:** Only print documents when absolutely necessary, encouraging digital viewing as the default.

15.Replacement of Plastic Water Bottles with Glass Bottles

- It is recommended to Replace single-use plastic bottles with reusable glass/copper bottles.
- This system allows to refill and reuse glass bottles, reducing reliance on plastic and supporting the ban on single-use plastics (SUP)
- Continued Use of Refillable and Reusable Glass Bottles eliminates the need for constant purchasing and disposal of plastic bottles, reducing operational costs related to waste management and procurement.



Turning plastic bottles to Glass Bottles / Copper Bottles

16. Green Procurement Strategies for Waste Reduction

Waste Reduction Strategies

1 Reducing unnecessary packaging

2 Choosing products with lower toxicity

3 Avoiding overproduction and excess material usage

4 Using packaging materials that minimize spoilage and damage

5 Extending product life through maintenance and repair

6 Reusing existing materials, products, and packaging

7 Redesigning or modifying products for sustainability

8 Using sustainable alternative materials

9 Donating or selling items instead of discarding them

Green Procurement

Green procurement refers to the purchasing of goods and services that cause minimal adverse environmental impact. By partnering with vendors who prioritize sustainability, companies can reduce packaging waste and build a more efficient, eco-friendly supply chain. This partnership can lead to lower costs, reduced environmental impact, and improved innovation. **Evaluation Criteria for selecting Green Vendor w.r.t Packaging:**

- **Packaging Material Assessment**
- **Packaging Design**
- **Take-Back Programs**
- **Transparency**

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17. Key Initiatives taken toward Waste Reduction Identified in the Hospitality Sector



Installation of Bottling Plant



On-site Organic Waste Management unit



Source Segregation and weighing

Key Initiatives taken toward Waste Reduction Identified in the Hospitality Sector (Cont.)



Room amenities in paper packaging



Ceramics Dispensers (Shampoo, Bodywash, Conditioner)

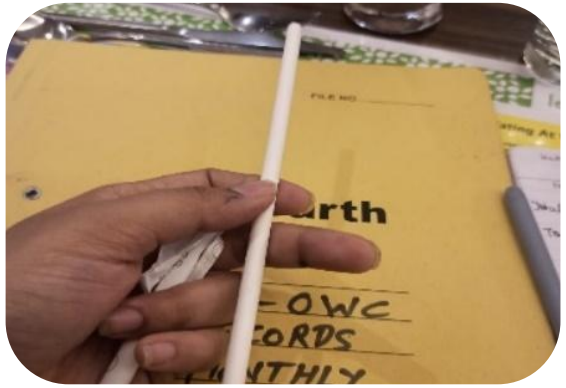


Use of biodegradable material for packing



Use of wooden hangers

Key Initiatives taken toward Waste Reduction Identified in the Hospitality Sector (Cont.)



Ban on SUP - Use of Paper Straw, wooden spoon etc. instead of plastic



Use of Butter paper food wrap instead of plastic layer



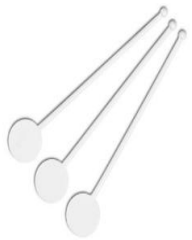
Reusable Glass Bottles instead of plastic water bottles



Paper based food packaging instead of plastics

18. Eliminating SUPs in daily operations

Eliminating SUPs in daily operations, such as plastic straws, cutlery, bottles, and packaging, pushing hospitality businesses to adopt eco-friendly alternatives like biodegradable, compostable, or reusable materials.

Plastic Items	Single Use Plastics (SUPs)		Example of an Alternative to SUPs (Recyclable, Biodegradable, Compostable and Eco friendly Material)
Straw			 Reusable Natural Bamboo Straws for Hot and Cold Drinks (7.8 Inch)
Stirrer			 Wooden Stirrers for stirring in Milk, cream, or sugar (4.5 inch)

Plastic Items	Single Use Plastics (SUPs)		Example of an Alternative to SUPs (Recyclable, Biodegradable, Compostable and Eco friendly Material)
Cups			 Disposable Paper Cups for restraunts,Cafetaria, Event (5W X 10H cm) with capacity- 200 mL
Spoons			 Disposable Wooden Spoons (110 mm) for eating ice cream, yogurt, dessert, Mousse, Pudding (100 % Food grade material)
Plates			 Compostable Plates (10 inch) with Bowl and Fork Durable, Versatile and Microwave resistant

19. Case study: 4 star Hotel in Aero city

Installation of Mineral Water Glass Bottling Plant to reduce plastic water Bottle

Before Bottling Plant Installation

1. The hospitality sector, particularly hotels, often provide drinking water bottles or glasses in guest rooms, restaurants, and banquets.

2. Typically, these bottles are made from PET plastic with HDPE caps or aluminum sealing lids, generating significant plastic waste.







Installation of Bottling Plant at Lemon Tree Aero city

After Installation of Bottling Plant:

To get rid of packaged plastic water bottles, Hotel has installed the bottling plant.

1. The capacity of the plant is 1000-1500 bottles/day. Glass Bottle breaking reported to be 10 %.

2. **Around 82% of the plastic has been reduced after installing Bottling Plants.**



20. Developing Onsite Treatment Facilities such as MRF and Repurposing Facilities

- Developing onsite facilities to repurpose materials like plastic, wooden pallets, and drums offers multiple benefits, including reducing the volume of waste sent offsite, cutting transportation costs, and lowering the carbon footprint.



Material Recovery Facility at Delhi

21. Training Programs for achieving ZWTL

Senior Management	• Concept of Circular economy and ZWTL • Misplaced resource management and innovation • ZWTL and legal compliance
Employees	• Introduction to Zero Waste to Landfill (ZWTL) Goals • Continuous Improvement and Innovation in Waste Management • Employee Engagement and Behavioural Change Workshops
Vendors	• Vendor and Contractor Waste Management
Procurement Team	• Circular Economy and Misplaced Resource Recovery • Sustainable Procurement
BA's, Employees in operations and Office Functions	• Understanding Waste Categories and Streams • Waste Segregation and Source Reduction • Waste Handling and Storage Best Practices

22. Communication & Awareness Campaigns

Key Component	Internal Communication Channels	Awareness Workshops and Training Sessions	Employee Engagement Campaigns	Supplier and Supply Chain Engagement	Innovation and Continuous Improvement Programs
Focus	Share ZWTL updates and success stories. Develop awareness on waste management.	Educate on ZWTL goals and proper waste segregation.	Encourage participation via challenges. Recognize outstanding contributions.	Collaborate on sustainable sourcing. Highlight roles in waste reduction.	Foster innovation for waste reduction. Encourage employees to propose ideas.
Strategies	Newsletters. Display posters and infographics near waste stations.	Conduct workshops and training. Include hands-on sessions tailored to departments.	Launch challenges like 'Reduce Your Waste Week.' Reward efforts with eco-friendly gifts.	Implement a 'Sustainable Procurement Policy.' Conduct workshops for suppliers.	Launch idea submission platforms. Host 'Innovation Days' for brainstorming sessions.

23. Key Activities for Employee Volunteerism



Plastic Waste Collection Drive



E-Waste Collection Drive



Upcycling Workshop



Community Cleanup Drive



Tree Plantation Drive

Waste Management – Way Forward

Optimize	Optimize Waste Segregation, vendor selection and Recycling	• Enhance Waste Segregation Practices • Vendor Selection • Upgrade Recycling Infrastructure • Invest in Advanced Recycling Technologies
Adopt	Adopt Waste Minimization solutions	• Process Optimization • Resource Utilization
Foster	Foster a Zero-Waste Culture Among Employees and Stakeholders	• Comprehensive Training Programs • Incentivize Waste Reduction • Transparent Communication • Community engagement
Implement	Implement a Circular Economy Approach	• Create Take-Back Programs • Resource Recovery Initiatives
Strengthen	Strengthen Monitoring and Reporting Systems	• Robust Data Management • Key Performance Indicators (KPIs) • Regular Reporting

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Thank you for your attention.

Together, let's pave the way for a greener and more sustainable future!

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