Developing and Implementing Sub-National Level Circular Economy Action Plan

Case Study from Gujarat

Knowledge Partners for Gujarat State Action on Circular Economy:
Environmental Management Centre Pct Ltd (EMC) and Gujarat Cleaner Production Centre (GCPC)

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Why Circular Economy Matters at Sub-National Level

Why Circular Economy Matters for Indian States

- States and Cities face mounting pressures from rapid urbanization, industrial growth, and resource scarcity.
  - Circular economy offers solutions to multiple challenges simultaneously - reducing waste generation, creating employment opportunities, minimizing environmental impact, and enhancing resource security.
- Circular economy models can significantly reduce material footprint while creating new economic opportunities.
  - Economic benefits include reduced material costs, new revenue streams from waste valorization, job creation in green sectors, fostering of resilient supply chains and enhanced competitiveness of local industries.
  - Environmental benefits encompass reduced greenhouse gas emissions, decreased pollution, conservation of natural resources, and improved ecosystem health.
  - Social benefits include improved public health, enhanced quality of life, skill development opportunities, and strengthened community resilience.
- Given the vastness and diversity of a country like India, developing sub-national Circular Economy Action Plans presents a vital opportunity to localize national priorities into region-specific pathways for sustainable growth.
- State and city-level CE strategies can address local resource flows, waste management challenges, industrial ecosystems, and socio-economic conditions more effectively than a one-size-fits-all approach.
- **By grounding CE principles in sub-national contexts, these action plans can position sub-national entities as pivotal accelerators in India's circular economy transition.**

Implementation Framework

- Successful circular economy implementation requires a structured approach encompassing policy frameworks, institutional mechanisms, financing arrangements, and stakeholder engagement.
- States and Cities need to develop comprehensive action plans with clear targets, timelines, and accountability mechanisms.
- The framework should include regulatory reforms, incentive structures, capacity building programs, technology adoption support, and monitoring systems.
- Public-private partnerships and multi-stakeholder collaborations are essential for scaling circular economy initiatives effectively.
- States and Cities must begin with baseline assessments to understand current resource flows, waste generation patterns, and circular economy potential. This foundation enables development of targeted interventions and measurable outcomes.
- Implementation challenges include institutional coordination gaps, unclear responsibility allocation across departments, financing constraints, and inadequate data flows for tracking material consumption and resource recovery. These barriers stem from fragmented governance structures where multiple agencies oversee different CE aspects without clear integration mechanisms.

Case of Gujarat

About Gujarat

8.2%
of National GDP

31.75%
of India's Exports

3rd highest (10.09%)
FDI inflow in India

72%
of the world's processed diamond production

80%
of the India's diamond exports

62%
of India's petrochemical production

53%
of India's chemical output

45% in 2022-23
of India's pharmaceutical production

Highest (45912 MW)
Installed Capacity of Power

Highest (28.30%)
Hazardous Waste Generation in 2021

10373.79 Tons Per Day
Solid Waste Generated in 2021

Total Hazardous Waste Generation 56,54,264 MT (in 2023-24)

Good practices at all levels of governance in Gujarat

- **Atul village in Valsad, Gujarat –**
  - Successfully altered its waste disposal techniques to address the problem and has set an example of successful waste management at the local level

- **Surat Municipal Corporation (SMC) Tertiary Treatment Initiative** –
  - Recycles ~33% of 1,400 MLD sewage, supplying treated water to Pandesara Industrial Estate.
  - Operates 11 STPs with a 1,072 MLD capacity, including a 40 MLD Tertiary Treatment Plant at Bamroli using advanced filtration.
  - Expanding with an additional 40 MLD TTP at Dindoli due to rising demand for treated water by industries.
  - Surat has pioneered textile waste recycling through industry-waste processor collaboration.

- **Surat Clean Air Market** –
  - World's first market for particulate pollution in Surat launched in 2019.
  - 24% measured pollution reduction, 36% projected plant savings vs. abatement equipment, 8.6 lakhs average projected increase in industry profits per year

Good practices at all levels of governance in Gujarat

- **Gujarat Waste Exchange Centre (WEC)** –
  - Set up by Gujarat Environment Management Institute (GEMI) to manage and lead a virtual platform for waste exchange.
  - Aggregates waste generators, users, processors, and disposal agencies, reducing waste disposal, preventing virgin material extraction, and offering cost-effective resources to consumers.

- **Vatva GIDC Waste Exchange Bank** –
  - Focuses on recycling spent acid from gypsum washeries for use in textile units and processing chemicals for the cement industry in industrial estates of Odhav and Naroda.

- **eXtended Green Node (XGN) Hazardous Waste Cell 2020** –
  - Offers services related to online environmental clearance, prevention, control, and pollution abatement.

- **Across the State**
  - Success in co-processing plastic waste in cement kilns and promoting circular economy

Specific circular economy relevant work/projects by Gujarat Cleaner Production Centre (GCPC)

Projects

- Implementation and management of eco-industrial parks in India
- Eco-Industrial Park in Naroda industrial estate of Gujarat with technical cooperation of GIZ under IGEP
- Industrial Symbiosis project in Dahej and Panoli regions

Resource Efficient Cleaner Production Practices

- Application of cleaner production practices in dairy, chemical, textile, etc. Industries
- Resource efficiency in steel Re-rolling mills, Electroplating, Fisheries and Stone Quarrying
- Project for implementing Environment Friendly Techniques in Textile and Pulp & Paper Sectors in industrial estates of Gujarat
- Water efficiency projects in industries such as chemical, textile, and dyeing
- Energy efficiency options for Industrial parks

Technical Assistance

- Best Available Techniques Reference (BREF) document for textile sector in Indian Context
- Project for implementing Environment Friendly Techniques in Textile and Pulp & Paper Sectors in industrial estates of Gujarat
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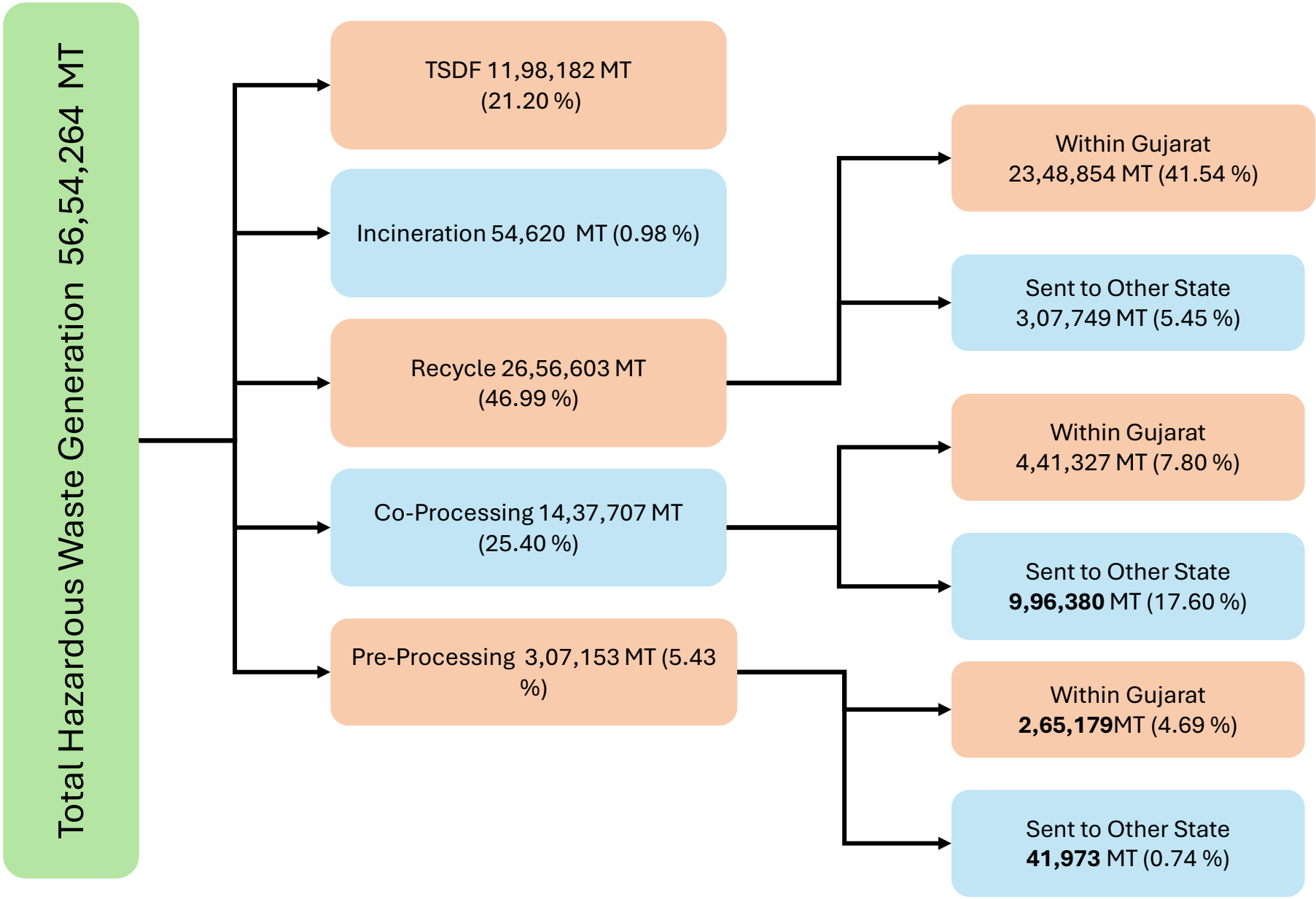
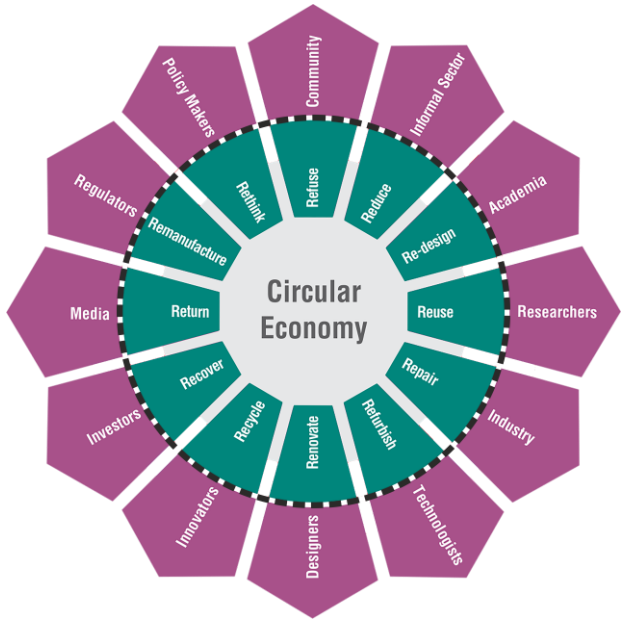
Capacity Building

Circular economy workshops and training

Waste management in Gujarat: Case of Hazardous Waste in 2023-24



Circular Economy Action Plan envisioned to greatly help to accelerate Gujarat's progress towards the SDGs and help in enabling contribution of the State to India target of NetZero by 2070.



Co-Creation Approach to preparation of the Action Plan

Circular Economy Policy formulation- *Objectives, Vision and Guiding Principles*

- Recognizes the potential of CE in addressing environmental, economic, and social goals
- Highlights the key sectors that merit particular attention in the state to foster circularity
- Analyzes existing policies, practices, and initiatives

Interaction with stakeholders and collection of inputs

- Stakeholder Workshops: May 2023, July 2023
- Use of a semi-structured questionnaire to guide the collection of inputs through interactions and emails, with focus on:
  - *Existing policy interventions /schemes /programs/ projects, Plans for upscaling/Replication of initiatives, Enablers required- technology, financial, policy, institutional; Received inputs from more than 20 stakeholders*

Synthesis of stakeholder inputs and research to prepare the draft Action Plan

- Identification of actions integrating life cycle perspective
- Actions taken by State Government in response to the CE Action Plans developed for the 11 identified waste streams by NITI Aayog and addressing gaps
- Drawing learnings from good practices elsewhere in India and outside of India

Action Plan presentation to the stakeholders to seek further inputs and feedback and next steps

- Through a large stakeholder workshop in August 2024
- Discussion on draft actions and identifying additional actions
- Prioritizing Actions, Deciding Timelines, Roles and Responsibilities
- Working group-suggestive constitution and role

Integration of the stakeholder's feedback/suggestions/inputs to Finalize the Action Plan

- Roll out Plan including Institutional and Governance Mechanism

Policy to Action

Circular Economy Policy- provides the vision and guiding principles that the Gujarat Government aims to follow

Principles of the CE policy and its focus got translated into **formulation of strategies and goals for the Circular Economy Action Plan** .

Strategies guided the **determination of actions**- legislative and non-legislative actions **needed to achieve the identified goals** . Priorities on actions to be determined by stakeholders.

Circular Economy Policy Statement

Key Objectives	*Achieve leadership in sustainable management of resources for a resource efficient economy*	*Promote green growth through sustainable consumption and production patterns*	*Promote GHG reduction measures/ decarbonization efforts*	*Promote entrepreneurship and job creation through innovation*	*Deliver positive economic, social, and environmental outcomes*	
Vision Statement	*"To promote sustainable development, green growth, and net zero economy that minimizes waste production, adopts clean energy sources and increases resource efficiency. This policy will encourage collaboration, knowledge sharing, and the adoption of sustainable practices across sectors, driving environmental stewardship."*					
Guiding Principles	*Reduce primary resource consumption to 'sustainable' levels, towards achieving the SDGs*	*Promote high quality, consistent recycling*	*Create employment opportunities beneficial to the cause of environment protection, social welfare, and restoration*	*Create SMART common circular infrastructure*	*Capture value from recycling resources designing out waste and pollution*	*Set sectoral benchmarks of performance and efficiency to ensure compliance with competitiveness*	*Create research and technology development ecosystem across sectors and institutions*

About the Circular Economy Action Plan for Gujarat

- Based on **life cycle thinking** as the foundation for identifying key actions- **NOT JUST A RECYCLING ACTION PLAN**
- Recognizes the need to follow the **waste hierarchy for managing waste**
- Focus on **waste avoidance**
- Focuses on **certain priority sectors and key waste streams** identified by NITI Aayog.
- Implementation of the Plan will require **cross-departmental cooperation** in the government departments, and **non-governmental stakeholders** including industry, academia, informal sector, R&D institutes.
- Adopts a **phased approach** for the Vision to Actions, with actions distributed over Short-Term (2024-25), Medium-Term (2026-28) and Long-Term (2029-33).
- Actions under strategies have been structured using a '**4P' (Policy, Plan, Project, and Program) perspective** where possible. The '4P' perspective enables one to look at each strategy comprehensively

Close the Loops

Integrate with Informal Sector or be **I**nclusive

Regenerate resources and ecosystems

Coordinate, catalyse and leverage partnerships

Utilise waste as a resource

Lessen consumption of virgin resources

Augment product lifespans

Rethink

Goals of the Action Plan

- Increase the **circular use of materials** and promote reuse, repair, remanufacture, and recycling across products and waste streams.
- Reduce harm from **waste and pollution** and improve **residual waste management**.
- Promote **innovation, infrastructure, and skill**.
- Collaborate to create **systemic change** toward a circular economy.
- Enable the conditions needed to **develop and scale circular outcomes** - financing, capacity building and entrepreneurship.

Waste Streams and Sectoral Focus

Challenging and emerging waste streams

- Toxic and Hazardous Waste
- Used Oil
- Lithium-ion Batteries Waste
- Waste Tyre
- Gypsum waste
- Ferrous and Non-ferrous metal waste
- E-Waste

Key economic sectors with high circularity potential

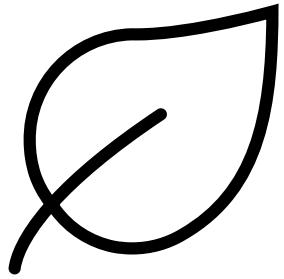
- **Plastics**
- **Textiles**
- **Building and Construction**
- **Chemicals and Pharmaceuticals**

Strategies for Circular Economy Guiding the Action Plan

Strategies	
S 1	Focus on challenging and emerging waste streams and applying principles of waste hierarchy
S 2	Mainstreaming circularity in key economic sectors with high circularity potential
S 3	Facilitating industrial symbiosis and strengthening common environmental infrastructure
S 4	Awareness raising, capacity building and entrepreneurship
S 5	Stakeholder engagement, partnerships, collaboration and networking
Crosscutting Strategy	Developing financing strategies for implementing the circular economy action plan

More than 200 **actions post discussions at the workshop,** multi-stakeholder (public and private sector) responsibility, and phased timelines (Short-Term, Medium-Term and Long-Term)

Key high priority actions identified across sectors and waste streams through the discussions at the workshop



Key Actions Identified for Enhancing Circularity in E-Waste in Gujarat

Infrastructure Development

- Recycling Units/Eco-Parks in Public-Private Partnership Mode
- Decentralized Micro-factories

Data and Inventorisation

- Conduct state-level e-waste generation inventory

Digital Solutions

- Online Marketplace connecting authorized collection centers, recyclers, and PROs

Public Engagement

- E-Waste Collection Drives
- Buy-Back Schemes

Green Certification

- GreenCo Rating System for e-waste processing units

Product Lifecycle Extension

- Incentives for Repair & Refurbishment

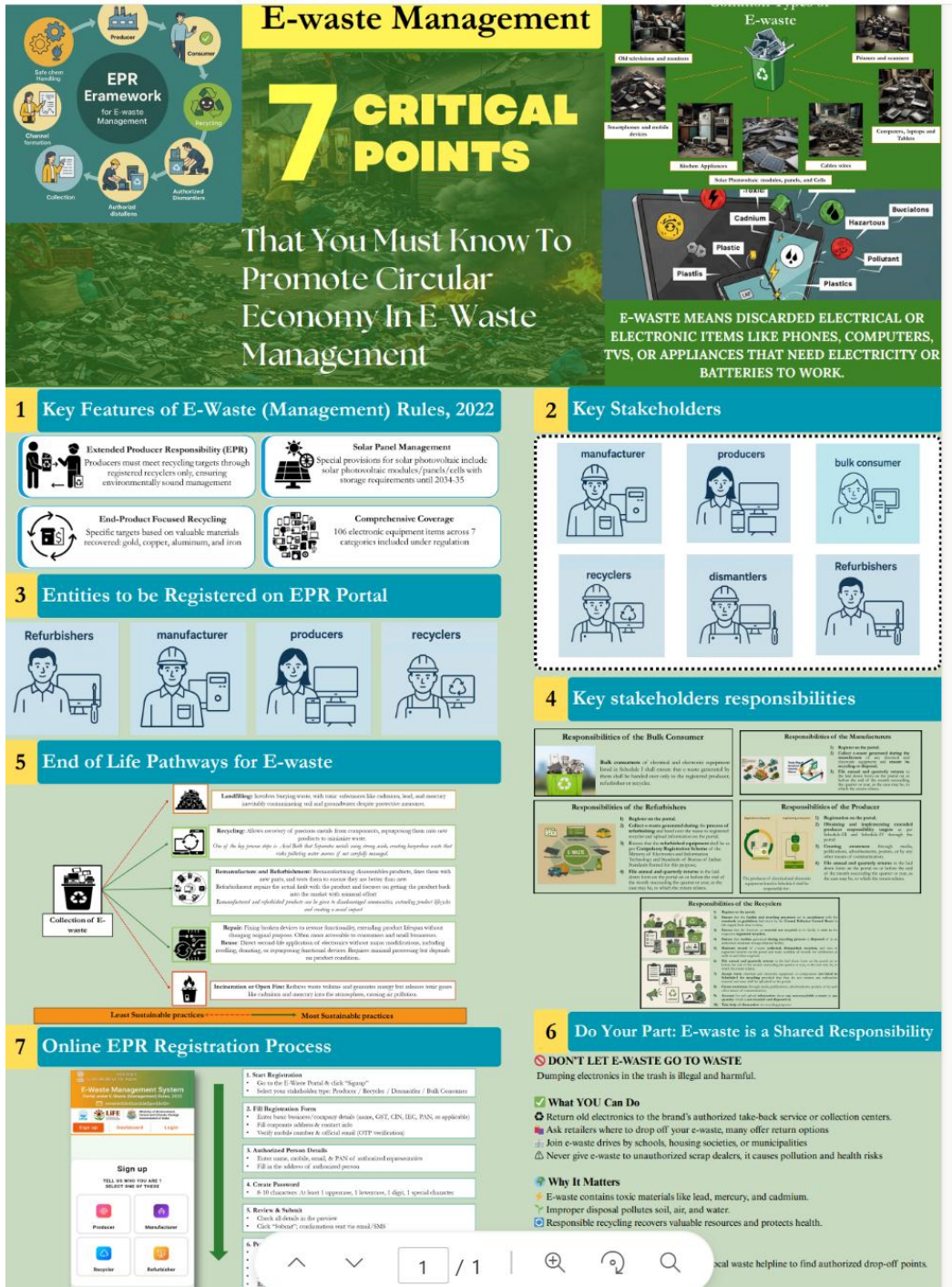
Remanufacturing Council

- State Remanufacturing Council

Some other highlights from the Actions

Institutional	Addressing gaps in waste management	Economic instruments	R&D and Innovation	Behaviour change	Digital Technology	Skilling
• Industry status to recycling • Expediate authorization process under Rule 9 • Training and Capacity building for relevant stakeholders • Setting up Material Recycling Zones/Parks • SoPs for utilization of new and emerging by-products and waste streams • Strengthening monitoring of recycling and processing units	• Complex and heterogenous wastes , new product wastes • Need for avoidance of contaminated materials usage in product manufacturing • Formalization of informal sector handling waste • Learnings /Projects from waste management plants in other states • Strengthening last mile connectivity for waste generated/collected to processing facilities	• GST Reduction • Financing schemes-subsides for capital set up • Strengthening corporate environmental responsibility • Financing R&D	• To identify alternatives to hazardous and toxic materials • Collaborate between academia and industry to drive technological innovation in waste management processes and technologies	• Individual behavior change needs to be guided • Awareness generation • Sensitization • Guidance and facilitation of potentially recoverable material- like aluminium from foils and medicine strips	• Market places • Stakeholder connect • Data flow • Knowledge exchange • B2B connect to facilitate industrial symbiosis	• Green skills-focus on Rs beyond Recycling • Handling new and complex waste streams • Tie-ups with vocational training institutes, Short courses steered by associations

Building Awareness and Sensitization



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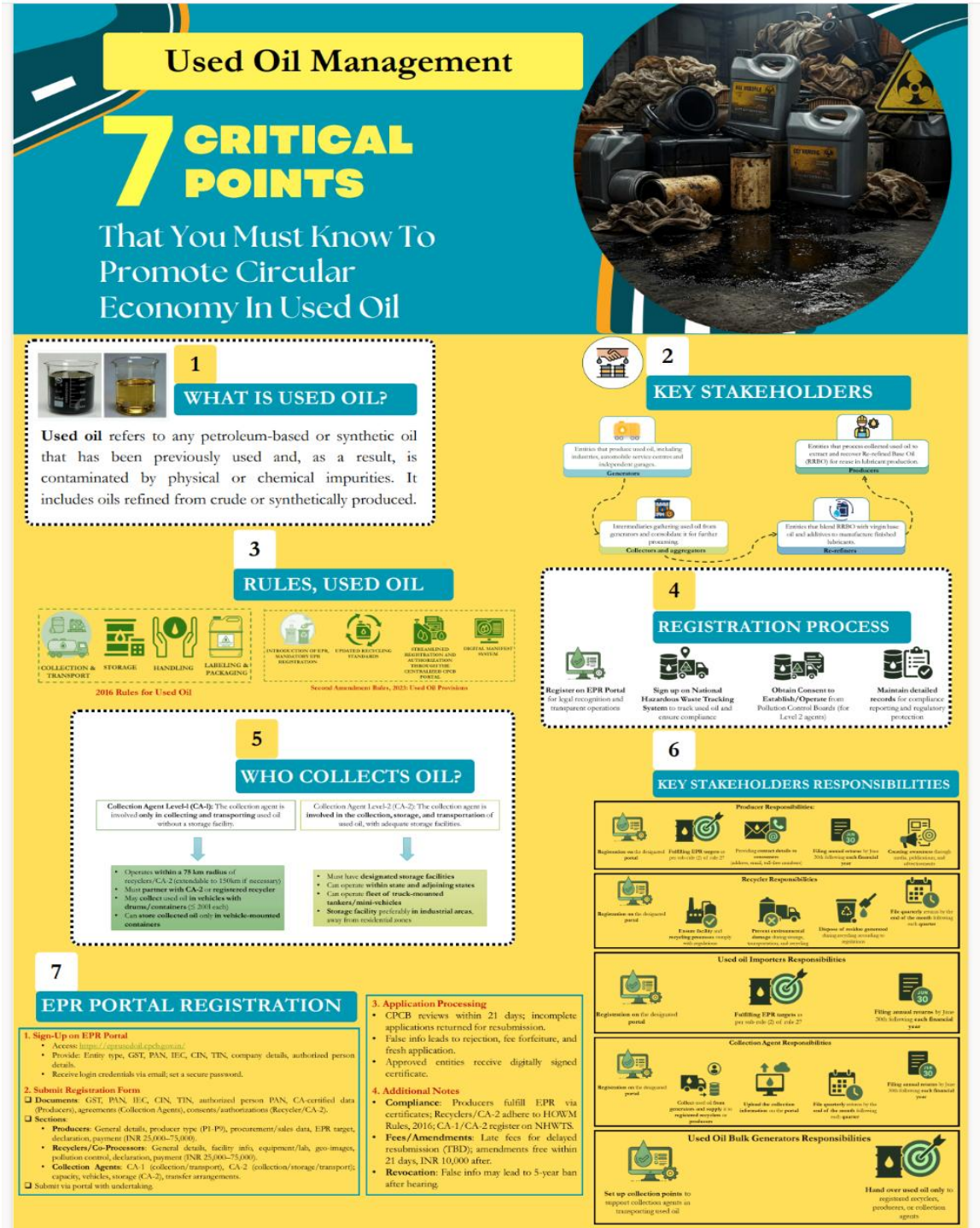
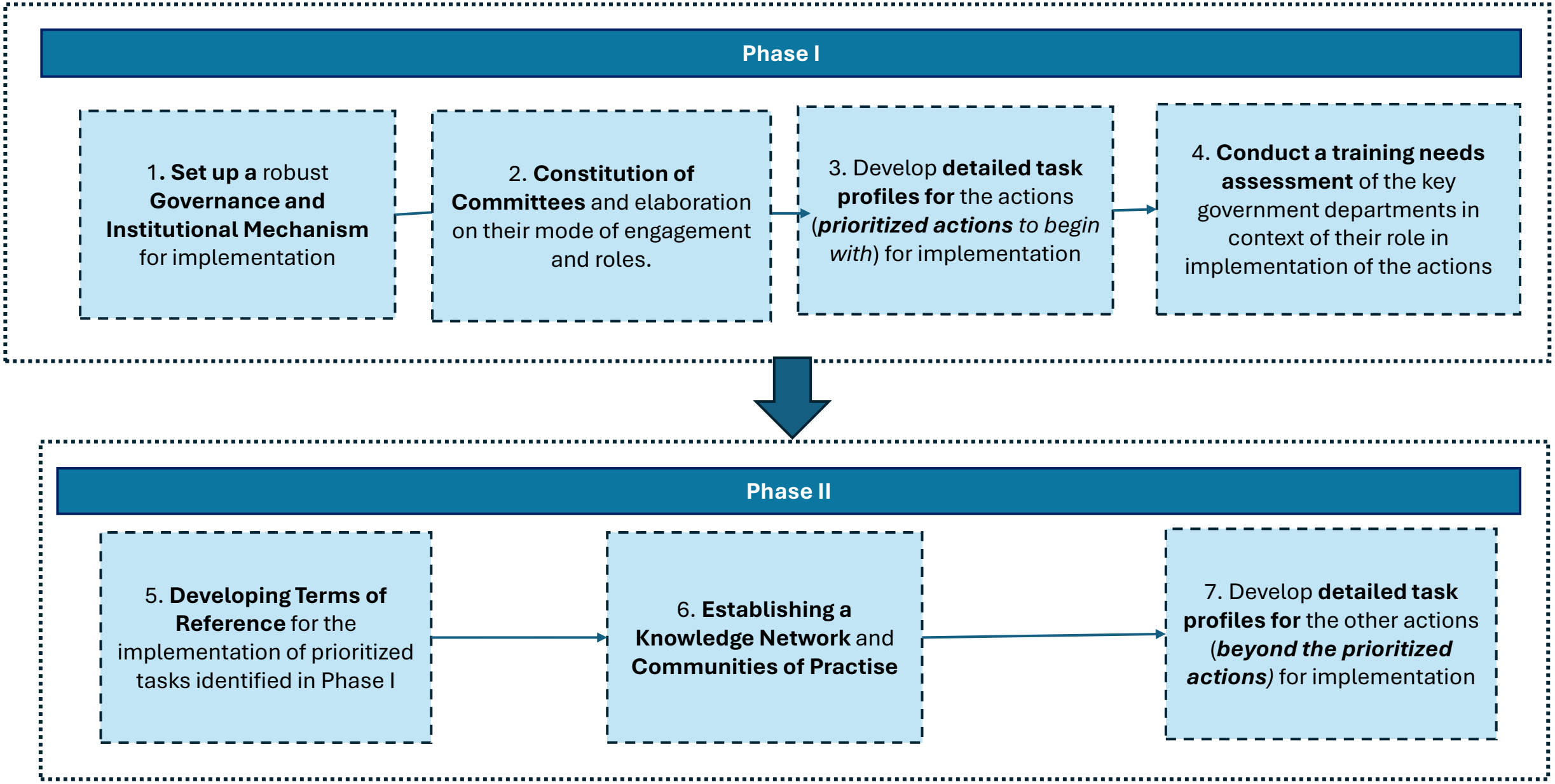


Roll out of the Action Plan



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Thank you!

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