# Decentralized Waste Solutions – Success Factors, Climate Impacts and its impact on Green Jobs Creation


***Presented by***

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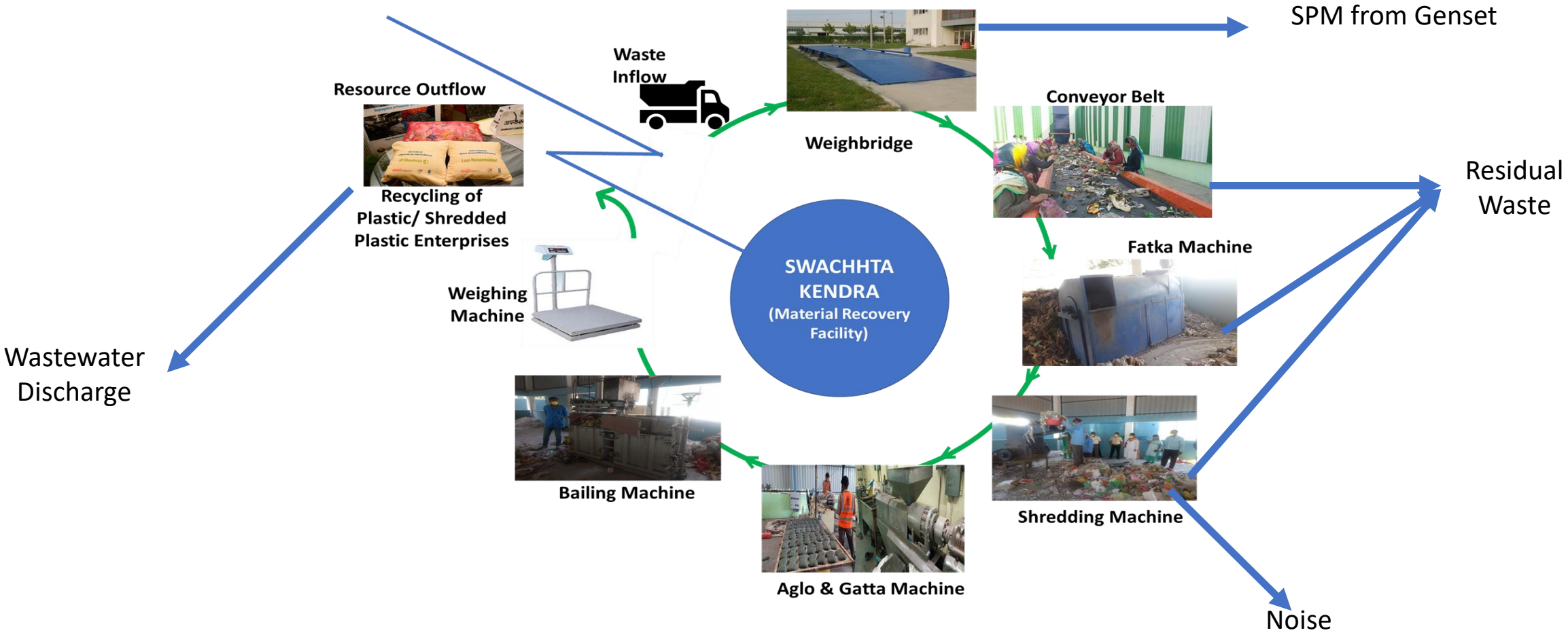
# Present Waste Challenges in India-Broad Observations

- Indian cities range from a population of 1 lac to 2 crores plus depending upon extent of Urbanization.
- Based upon geographical access, prevailing climate and waste compositions, planning are undertaken for ensuring sustainable urban waste management solutions.
- A cluster-based approach consisting of de-centralized waste processing and centralized disposal facility has been tried in the past by states like-Gujarat, Maharashtra and Tamilnadu for judicious use of land, but failed due to non-financial commitment of cities.
- Most cities have dwindling land-parcels due to indiscriminate dumping and face a serious challenge for ensuring space for establishing future landfills. Cities of Mumbai, Pune, Delhi, Chennai, Kochi are among the cities having no future land availability.
- With passage of time, dry waste in most cities has found its way through informal as well as formal sector engagement, creating lot of jobs in Urban dry waste management.
- Wet waste remains a challenge for ULBs due to its challenge in handling and processing, which is a time-consuming and resource intensive process.
- Country is witnessing a drastic change of approach towards waste management industry, but still has lot of challenges to face and reach at its epitome of success.

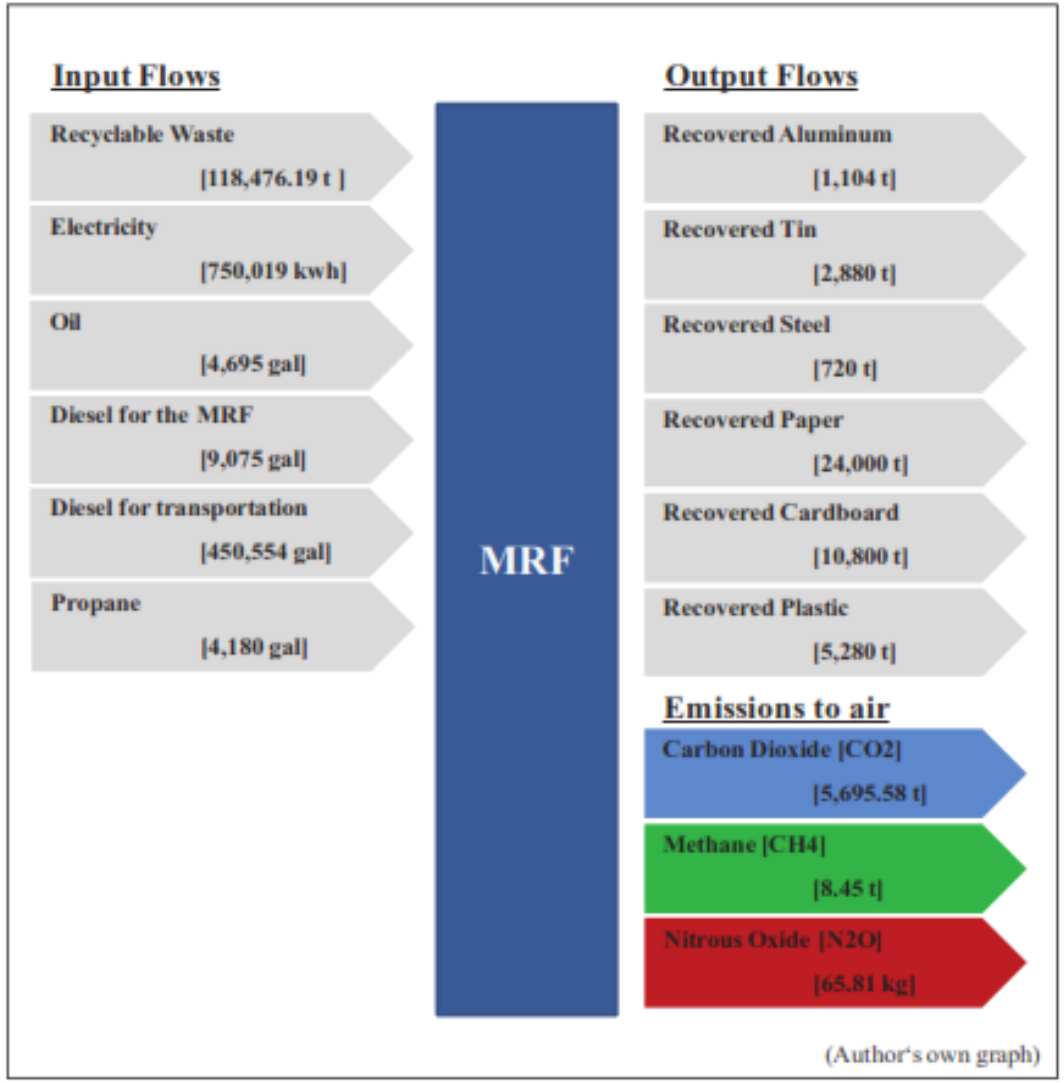
# ENVIRONMENTAL EMISSIONS & DISCHARGES PROFILING OF DECENTRALIZED DRY WASTE MRF



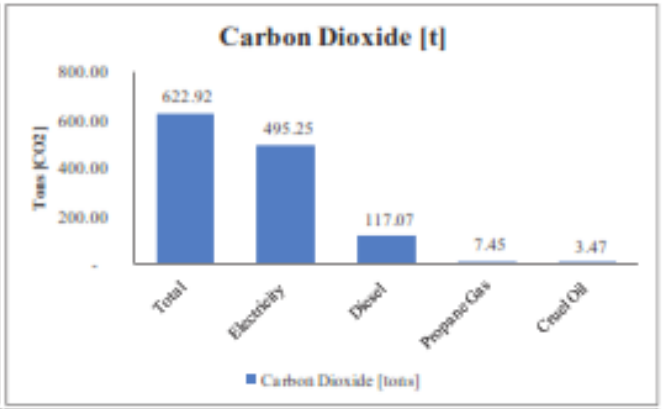
# PROSPECTIVE APPLICABLE LEGISLATION FOR MRF

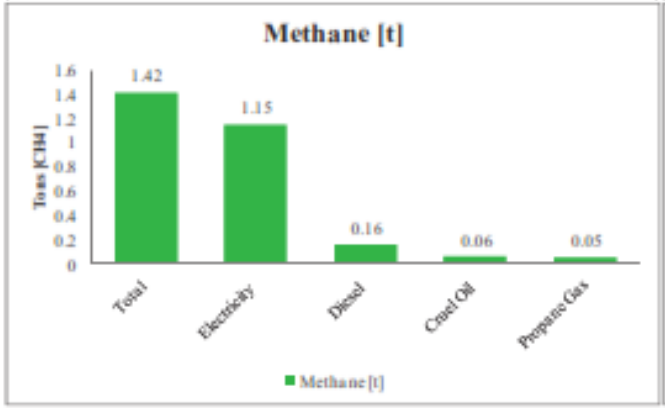
- Water (Prevention and Control of Pollution) Cess Act, 1977
- The Water (Prevention and Control of Pollution) Rules, 1975
- The Air (Prevention and Control of Pollution) Act of 1981MSW Rules 2016 & subsequent amendments.
- The Noise Pollution (Regulation and Control) Rules, 2000
- Plastic Waste Mgt. Rules 2016 & & subsequent amendments
- Code on Wages, 2019
- The Industrial Relations Code, 2020
- The Code on Social Security, 2020
- The Occupational Safety, Health and Working Conditions Code, if Employees exceed 10.
- Legal Metrology Act 2009
- Worker Compensation Act, 1923
- Consent to Operate

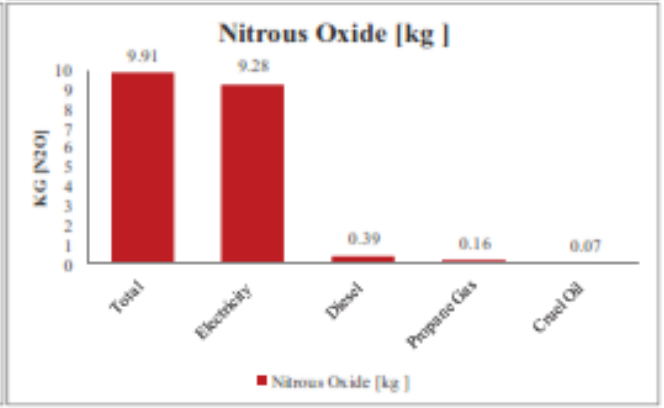
# Climate Foot-Print Profiling of Decentralized Dry Waste Facility




| Energy and Fuel consumption | Carbon Dioxide [t] | Methane [t] | Nitrous Oxide [kg ] |
|---|---|---|---|
| Diesel | 117.07 | 0.16 | 0.39 |
| Propane Gas | 7.45 | 0.05 | 0.16 |
| Electricity | 495.25 | 1.15 | 9.28 |
| Cruel Oil | 3.47 | 0.06 | 0.07 |
| Total | 622.92 | 1.42 | 9.91 |




- **Climate foot-print of MRF in USA with one year data.**
- **The highest emissions are from power consumption and fuel consumption for captive power generation.**

# MSW Recycling Status as Reported in India (2021)

| Type of Recycling Facility | Total Capacity (TPD) | Leading States with Processing Capacity Share | | Total Number of Processing Units | States with Leading Units | |
|---|---|---|---|---|---|---|
| Material Recovery Facility (Decentralized Units) | 31436 | Name of States | Number | 4519 | Name of states | Number of MRF |
| | | Maharashtra | 91422 | | Tamil Nādu | 925 |
| | | Gujarat | 3901 | | Maharashtra | 510 |
| | | Madhya Pradesh | 3136 | | Haryana | 441 |
| | | Telangana | 2214 | | Chhattisgarh | 358 |
| Composting Plants | 55199 | Gujarat, Maharashtra, Karnataka, Tamil Nadu, U.P. have adequate capacity | | 782075 | Max in Kerala – 776543 (including decentralized waste management facilities) | |
| Biomethanation Plants | 2608 | 811 in Maharashtra | | 76722 | 76451 Decentralized in Kerala | |
| Refuse Derived Fuel | 19431 | Maximum in Kerala | | 807 | 444 in Haryana | |

Source: CPCB Annual Report 2021-22

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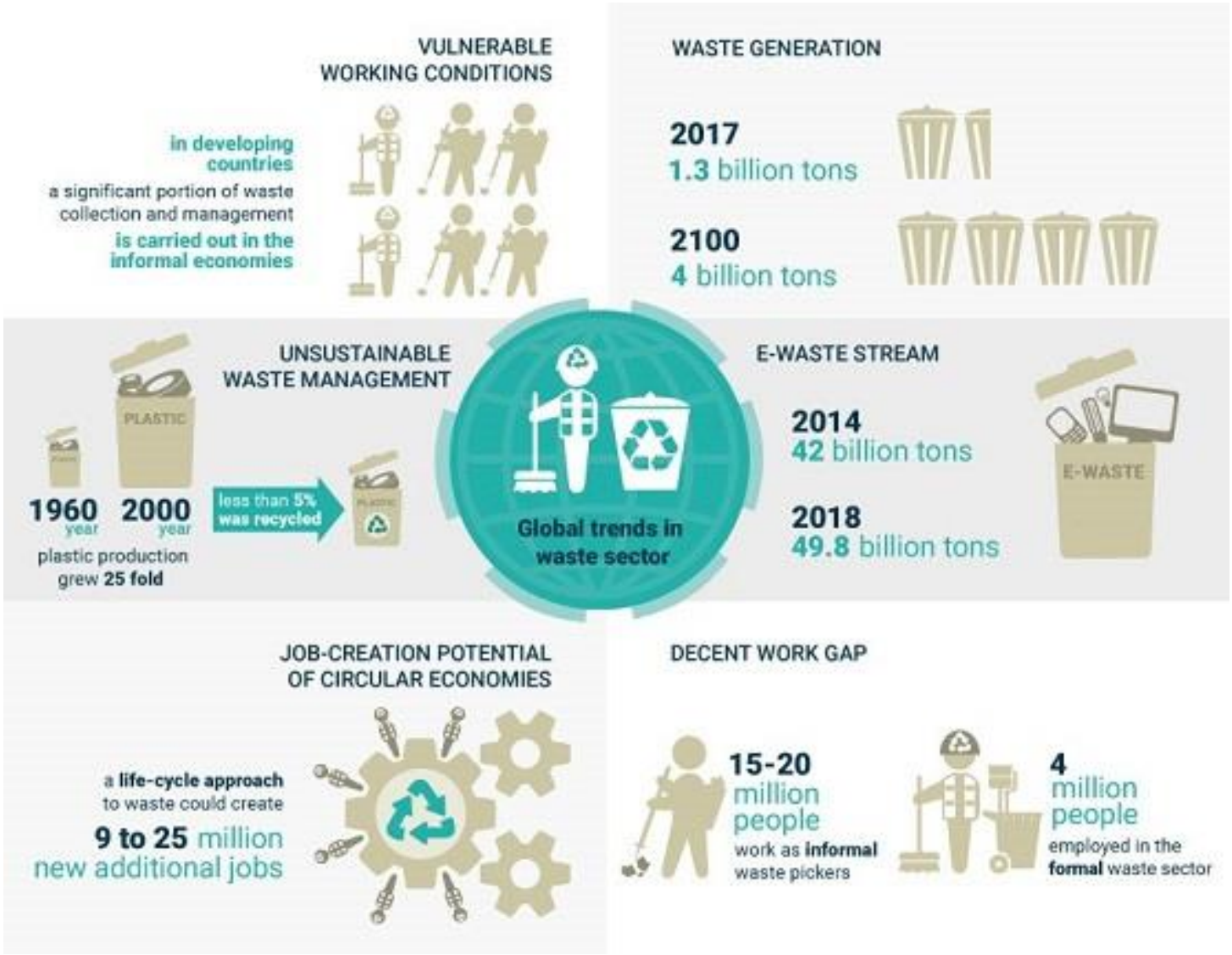
# MAPPING GREEN DECENT JOBS IN THE GLOBAL WASTE SECTOR IMPACTED BY DECENTRALIZED WASTE MANAGEMENT

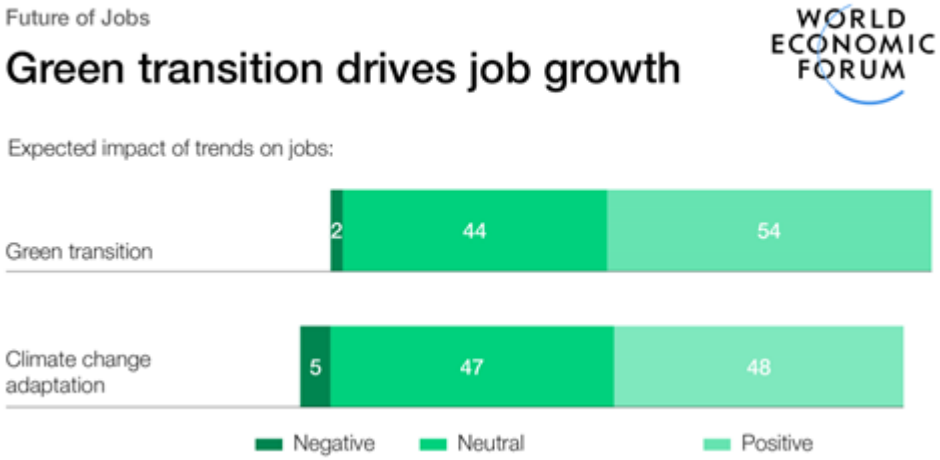




Source: ILO, 2017 (https://www.ilo.org/global/topics/green-jobs/events-training/WCMS_538802/lang--en/index.htmL

# Global Factors driving Green Jobs due to Decentralized Waste Mgt.






Ref: Global Waste Management Market Size Report, 2022 - 2030 (polarismarketresearch.com)

# Macro Measures - Improving Performance Measures for improving NCAP Plan focussing waste sector

- Urban air quality plan for waste management sector must be based upon understanding of fact that GHG emissions always impact and deteriorate air quality.
- Waste Transportation must be included as part of action points for waste sector. It should have focus upon optimization of fuel consumption and decarbonization of waste transportation via dual fuel mode adoption/ fuel switching by converting organic waste into BioCNG.
- State should focus upon targeting time bound dumpsite remediation and its closure/up-gradation into engineered landfill with processing facility.
- Decentralized waste management for bulk organic waste may be focused for Agri-markets with coverage provided to nearby hotels and other bulk waste generators.
- Waste burning reduction
- Source segregation – Mode of implementation ; IEC; Bin 3 cover system; SBM 2.0 support

**Additional Steps:**

- Improvement of Urban air quality monitoring infrastructure as per Airshed approach.
- Designing and implementation of Monitoring Review and Verification (MRV) system for waste sector related GHG emissions management.
- Scoping additional investment augmentation with focus upon GHG emission and decarbonization at existing overall waste infrastructure

# Micro Measures – Reducing Waste Burnings through Soft core approach

- A training need assessment may be undertaken at each level to understand existing gaps and reasons related to indiscriminate burning of waste by sanitation staff/public.
- IEC strategy and public awareness campaign may be prepared and implemented across the cities for reducing waste burning issues.
- Sanitation staff may be trained and made aware of waste burning consequences.
- Surveillance sanitation staff may be more equipped with penalizing authorities to tackle illegal waste burning.
- Improvement of waste collection service from household waste and horticulture waste should be improved in particular.
- Review of existing model municipal by-laws may be undertaken to scope out provision for minimizing waste burning; its monitoring; incentives for reducing and penal provisions may also be reviewed and suggestions may be shared with government.
- Intensive surveys of million plus cities  of state may be conducted to earmark waste burning vulnerable points across city with focus upon horticulture waste in spring season.
- Thermal imaging component integration with existing CCTV camera across city may be explored.
- Urban air-quality monitoring network may be improved to capture any shooting of local SPM concentration due to illegal waste burning in cities.

# Best Cities for Integrated Waste Management

1. Indore
2. Hyderabad
3. Surat
4. Navi Mumbai
5. Vijayawada

# Thank You