

Issues in Municipal Waste to Energy

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सत्यमेव जयते

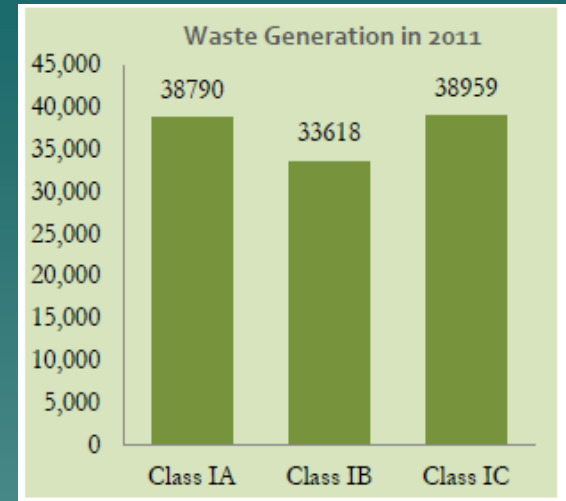
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Status

Generation - As per Central Pollution Control Board report of 2012, 1,30,562 TPD of MSW is generated in the country. Of this, 70% i.e 91,383 TPD is collected and 11,377 TPD i.e 12.45% is only processed or treated.

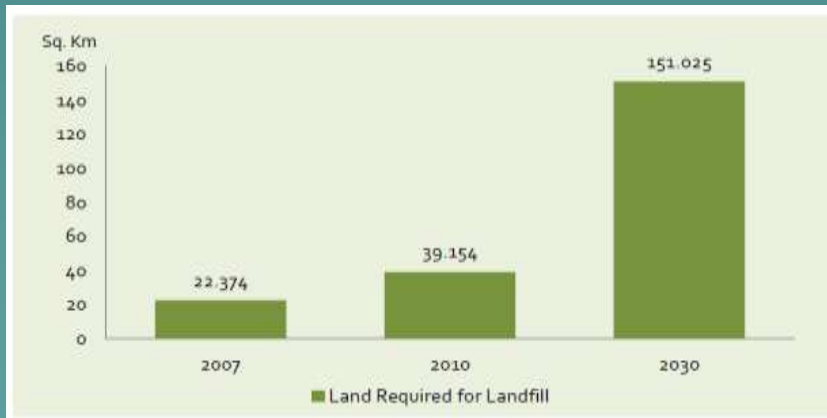
Composition - Major component are compostable (48%) , inerts & others 29% and moisture content which varies between 45% to 55%.

Land Issue – Land requirement for dumping of MSW is estimated to increase many folds if scientific waste management practices are not adopted.



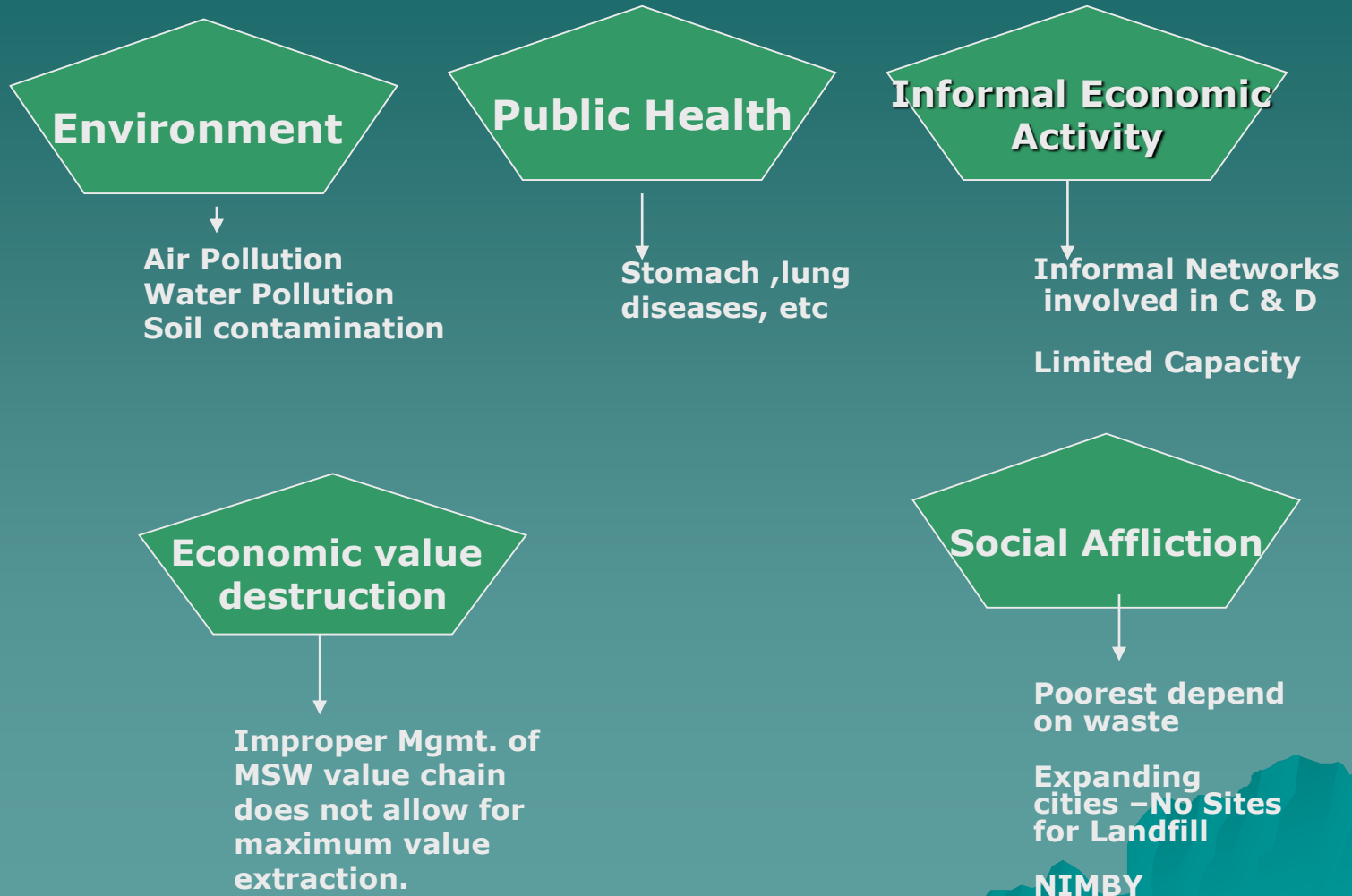
Population > 5 million - Class IA;
Between 1 & 5 million -Class IB; 0.1 & 1 million - Class IC

Changing composition of Waste in India

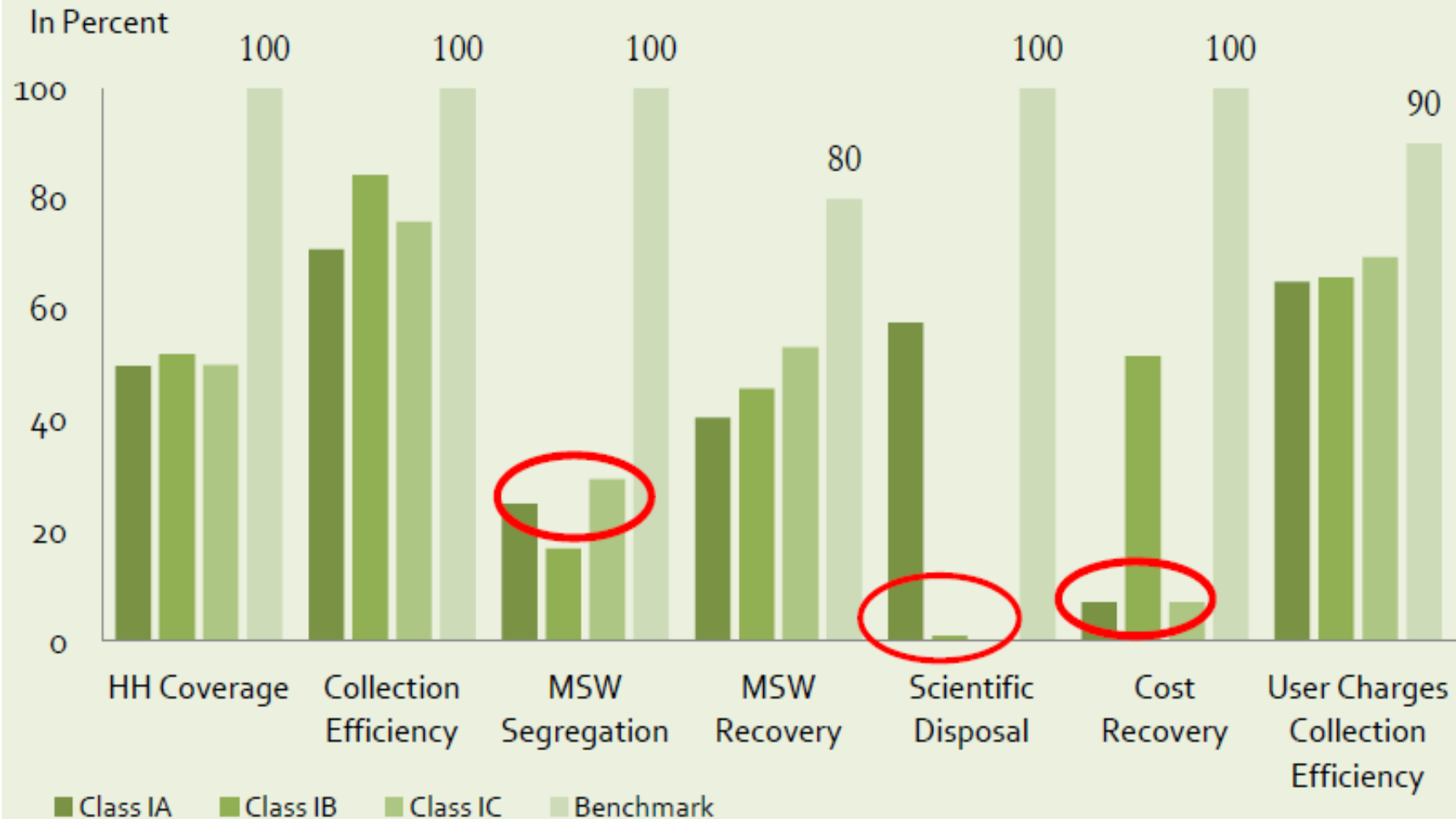


Item	Composition in %		
	1995	2005	2011
Compostable Matter	43.1	47.44	48.00
Paper	4.04	8.14	8.00
Plastic, Leather, Rubber	0.60	9.27	13.00
Glass	0.60	1.00	1.00
Metal	0.52	0.496	1.00
Inert + others	51.14	33.65	29.00

Unscientific waste disposal leads to 5 types of problems



Status of MSW Management — Class IA, IB & IC Cities



Present Approach and issues

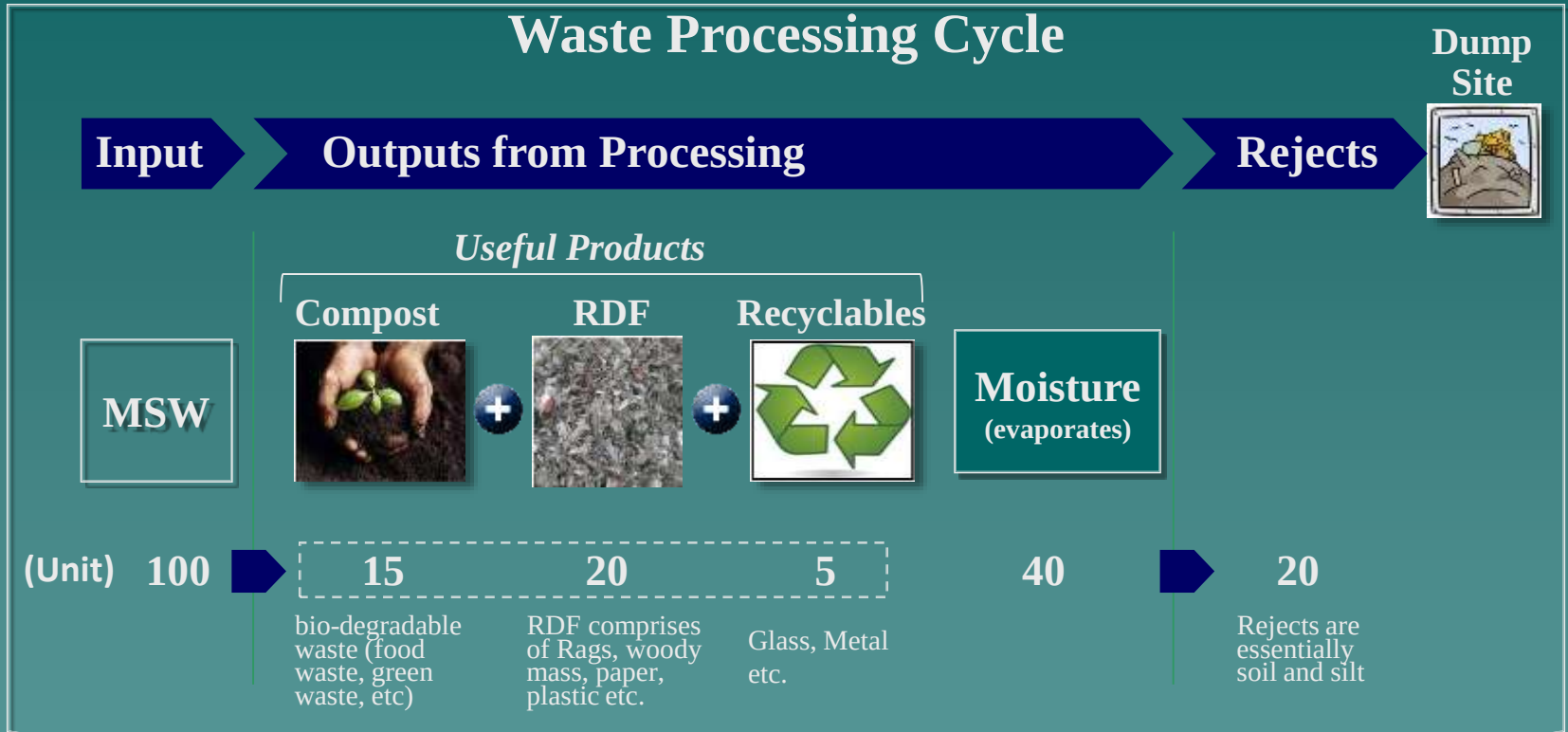
- ◆ **MSW management is totally left to the ULBs**
 - ◆ **Municipalities in the country are still experimenting with technologies , models for door to door collection , segregation of street sweeping , involvement of rag pickers and (PPP) Public private Partnership and Private sector Partnership(PSP).**
 - ◆ **Emphasis is on Composting and to some extent pelletisation .**
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- A stylized silhouette of a mountain range in a teal color, located in the bottom right corner of the slide.

Issues in Segregation ,Collection & Transportation

- ◆ **Lack of Segregation at source**
 - ◆ **Unplanned and variable city features**
 - ◆ **Inadequate equipment and inappropriate technology**
 - ◆ **Inefficient and untrained staff**
 - ◆ **Non-integration of informal workers**
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- A stylized, dark teal silhouette of a mountain range is positioned in the bottom right corner of the slide, adding a decorative element to the background.

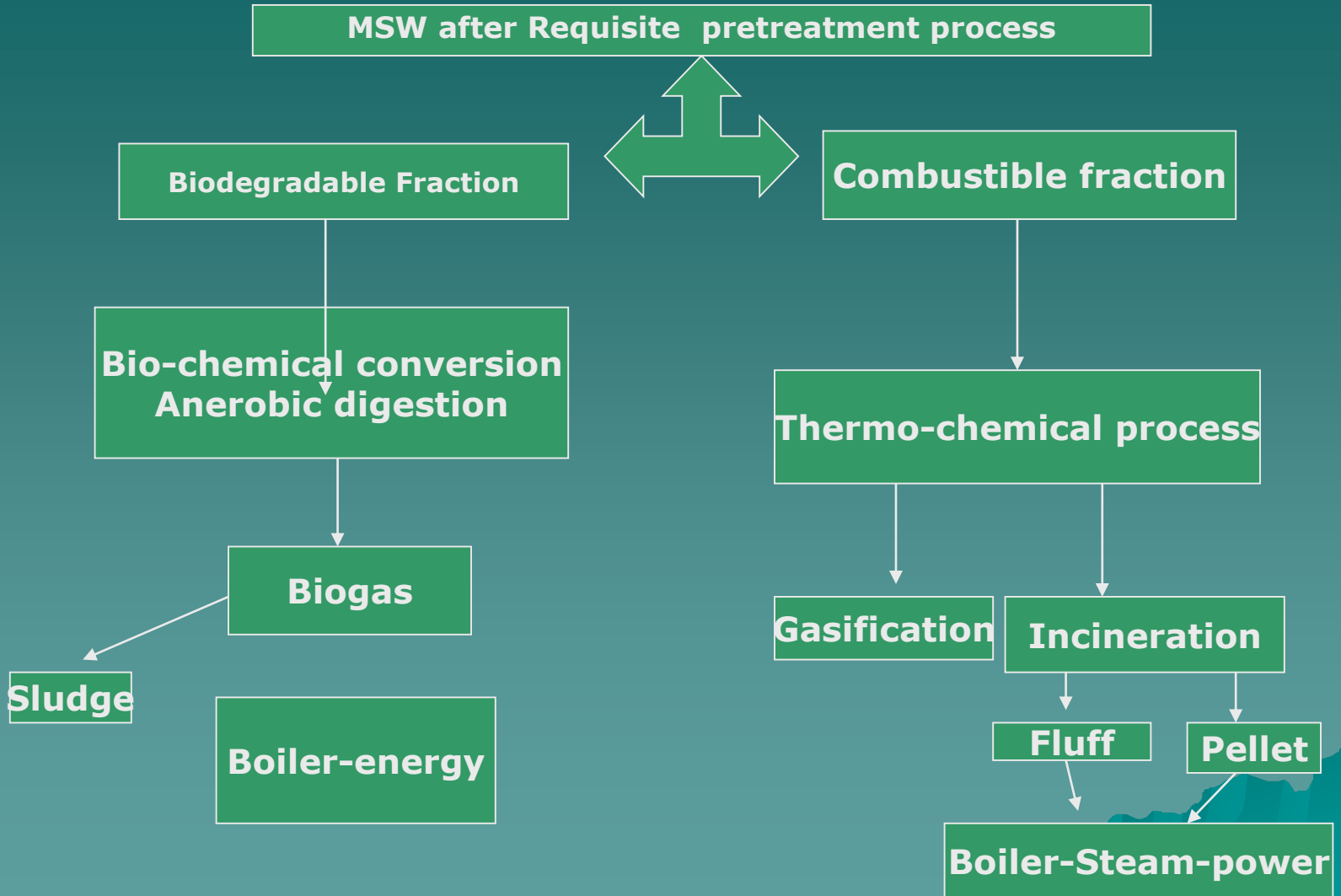
Integrated Waste Management

Waste Processing Cycle



Processing can reduce waste disposal by 80 % reducing pressure on scarce land

Possible options for energy recovery from MSW



WtE – Technology Issues

Issues	Details
Scale of operations	WtE Projects are smaller, --- 3 to 24 MW, resulting in higher cost per MW.
Fuel Preparation	Full scale pre-processing plant for conversion to Good quality waste derived fuel involves higher capital cost. For a 1300 TPD MSW to 12 MW power plant the approx cost is Rs75-100 Cr
Boiler	Waste derived fuel being low density fuel, generates more fly ash during combustion. Fly ash acts as catalyst (at 200-450 degrees) for production of dioxins & Furans. To reduce formation of dioxin & furan, maximum fly ash should be removed before gases cool to the range of 200-450 degrees. This requires multiple pass (triple) in radiative section of the boiler. This results in much bigger boiler for WtE plants

WtE – Technology Issues

Issues	Details
Flue Gas Treatment	Flue gases from WtE Plants have many pollutants which need to be treated before discharge through stack. The Flue Gas Treatment roughly requires Rs 1.5 to 2 Cr per MW.
Manpower to operate	WtE Plant is manpower intensive, approx 50-60 persons per shift is required. Skill Development of the workers is necessary.
Corrosive nature of fuel	Heterogeneous nature of Waste and emissions being corrosive in nature, the equipment used in pre-processing has typically 7 years life and needs to be replaced.
Water Treatment Plant (WTP)	Treated waste water with high TDS results in more water requirement. This results in higher cost of WTP

Technology and Constraint

- ◆ A Number of technologies are currently available for Waste to Energy (WtE) but are yet to be adapted to Indian waste composition and large scale.
 - ◆ Calorific value of waste ranges from 2000–2500 Kcal or even lower due to non-uniform norms of segregation.
 - ◆ Lack of standardization of the complete waste disposal cycle is a major constraint.
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Best technology should fulfill the following criterion

- ◆ Lowest life cycle cost
- ◆ Least land area requirement
- ◆ Meet air , water and land pollution standards.
- ◆ Produce more power with less waste
- ◆ Result in Maximum volume reduction.

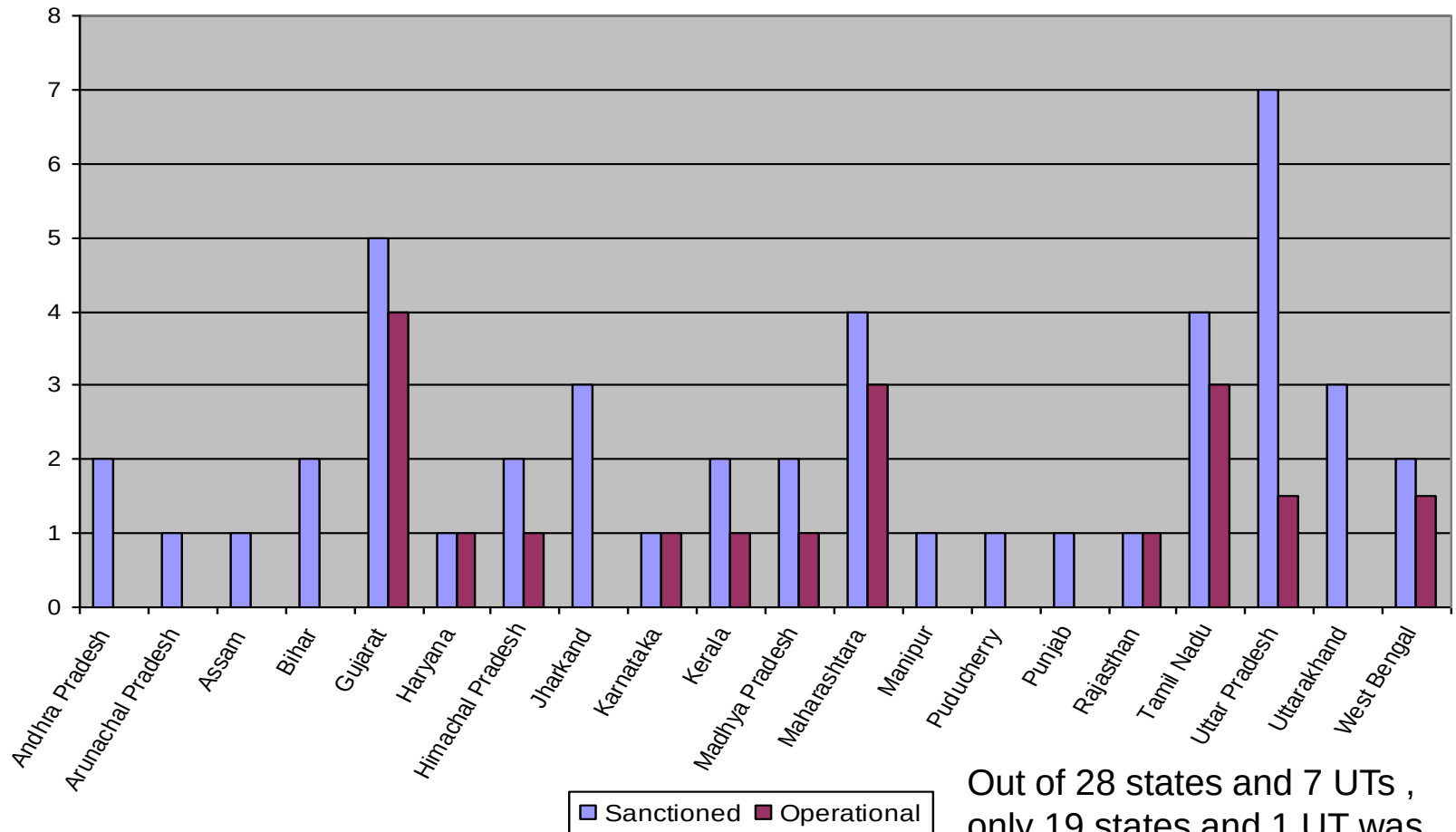
No one technology may satisfy all of the above criterion.

we need to identify the best ---
compromise.



Status of Waste Management Projects under JNNURM

Total MSW management projects approved under JNNURM- 46 (cost Rs. 2048 cr). Approximate allocation for all JNNURM projects Total no. projects approved – 566 nos. (Cost Rs. 67,835 cr.) [Period 2006-2013]



Out of 28 states and 7 UTs ,
only 19 states and 1 UT was

Finance and Financing

- ◆ Investments in this sector is very low
 - ◆ Only some ULBs collect charges for Door to Door Collection , is also collected as part of property tax etc,
 - ◆ Tipping fee is a must for viability of the plant.
 - ◆ CSR funds can be utilised for Waste management.
 - ◆ PPP :- The rationale for bringing in private sector participation in this sector is primarily to; leverage private sector efficiency, expertise and technology and gauge the commercial potential of the operation and viability of tipping fee as O & M cost.
 - ◆ PSP :- Significant cost reduction can be done with private sector participation in MSW service delivery.
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Other Issues

- ◆ **There is a need for standardization. Standardization accelerates the PPP process**
 - (i) Process becomes replicable
 - (ii) Approval process gets streamlined
 - ◆ **The capacity building of the ULBs and urban development agencies for PPP is essential.**
 - ◆ **Most often absence of capacity is the hurdle in rationalizing Tariff and user charges in PPP.**
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- A stylized, layered mountain range graphic in shades of teal and blue, located in the bottom right corner of the slide.

Points for further deliberations

- ◆ **Integrated MSW Management -**
- ◆ **Collection and Transportation -**
- ◆ **Institutional Mechanism :**
 - ◆ MSW plants categorized as “red category” industry needs to be reviewed.
 - ◆ MSW industry should be treated at par with agriculture sector by Banks/financial institutions.
- ◆ **Processing and Disposal**
- ◆ **Marketing of Products**
- ◆ **Waste to Energy**

Suggestion

A National Mission for Waste Management be setup for Advising Municipalities, training, consultancy, skill development, public awareness, link to education system, policy options/policy articulation

THANK YOU..

