

# Minimize Waste Disposal and GHG Emissions

Tools and Technology to Minimize Waste Disposal and  
Support Circular Economy

8th Annual WMABC Conference  
February 21, 2019



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# Objectives

- Zero Waste
- Emission Reduction from Landfills
- Material Recovery / Replacement of Natural Resources
- Economically Feasible



# Challenges / Problems

- Climate Change
- China's Plastic Ban
- Landfill Revenue
- Quality of Recyclables
- Source separation is too complicated
- Total Waste Generation – Disposal and Recyclables - increasing
- Regulatory Requirements



# Where do we go from here?

Education/Awareness

Waste Processing

Review and Update  
of Regulatory  
Requirements



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# Regulatory Requirements

## Objectives:

Provide the regulatory framework to

- Set the goals for the Circular Economy and timelines for regulatory or technical requirements coming into effect.
- Establish criteria to most effectively move the waste management to a Circular Economy
- Minimize waste disposal in landfills
- Minimize GHG – Emissions from landfills



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# Regulatory Requirements

## Tools:

- Definition waste quality for disposal in landfills to minimize emissions and reduce the long-term liability and treatment requirements as applicable
- Definitions of a waste hierarchy
- Definition of recycling
  - Material recycling
  - Thermal recycling, if natural fossil fuels can be replaced



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# Regulatory Requirements

## Tools: continues

- Definition of requirements and responsibility for waste management co-ordination such as
  - Waste management commission
  - Waste management co-ordinator
  - Training requirements
  - Consultation requirements
- Monitoring, recording and reporting requirements



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# Education / Awareness

## Objectives:

- Raise awareness and motivation for waste reduction and diversion
- Acceptance of the waste management system - Waste management should become part of the daily routine-
- Waste management must become a topic
- Good quality of recyclables
- Maximum diversion



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# Education / Awareness

## Tools / Requirements - Residential:

- School programs and workshops with kids – Train the kids and the kids train their parents-
- School award program – Involvement of students in waste management activity – learning by doing
- Understandable and manageable waste management system
- Information / communication strategy for all ages
- Compliance checks



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# Education / Awareness

## Tools / Requirements - Commercial:

- Provide waste management consultation for businesses – Make it a Win-Win for economy and environment.
- Internal training and information programs – implementation of waste management / circular economy in staff meetings-
- Establish an award program
- Compliance checks



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# Waste Processing Technology

Mechanical Treatment  
Tailored RDF - System



- Max yield of tailored RDF for CFB-WTE-systems
- Yield of Recyclables

Mech.-Biological Treatment  
Tailored RDF – System/Recyclables



- Max. yield of RDF & Recyclables
- Tailored systems for
  - Co-combustion
  - Advanced WTE-technologies
- Min. landfill disposal

AD-IVC Systems  
Digestate / Compost

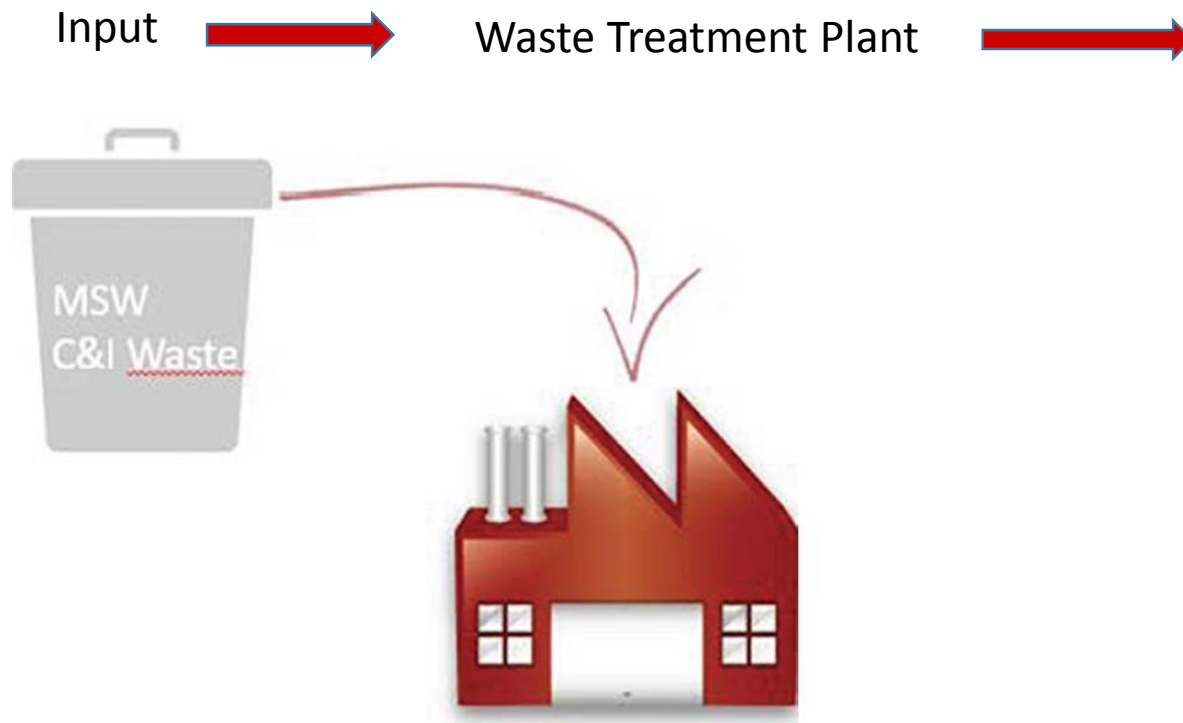


- Proven technology
- Composting of digestate
- Composting of SSO (high grade)
- Most efficient odour control



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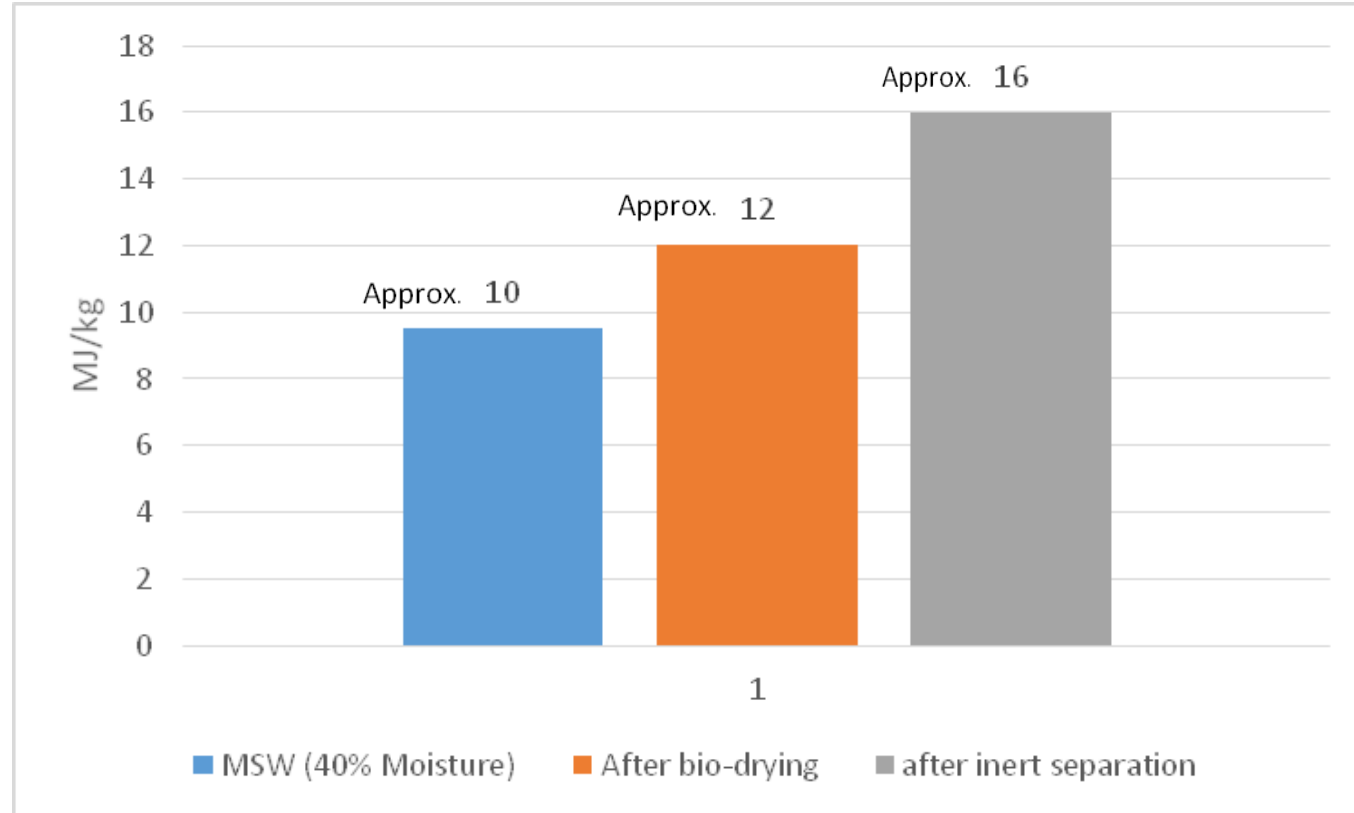
# Mechanic Biological Treatment Plant



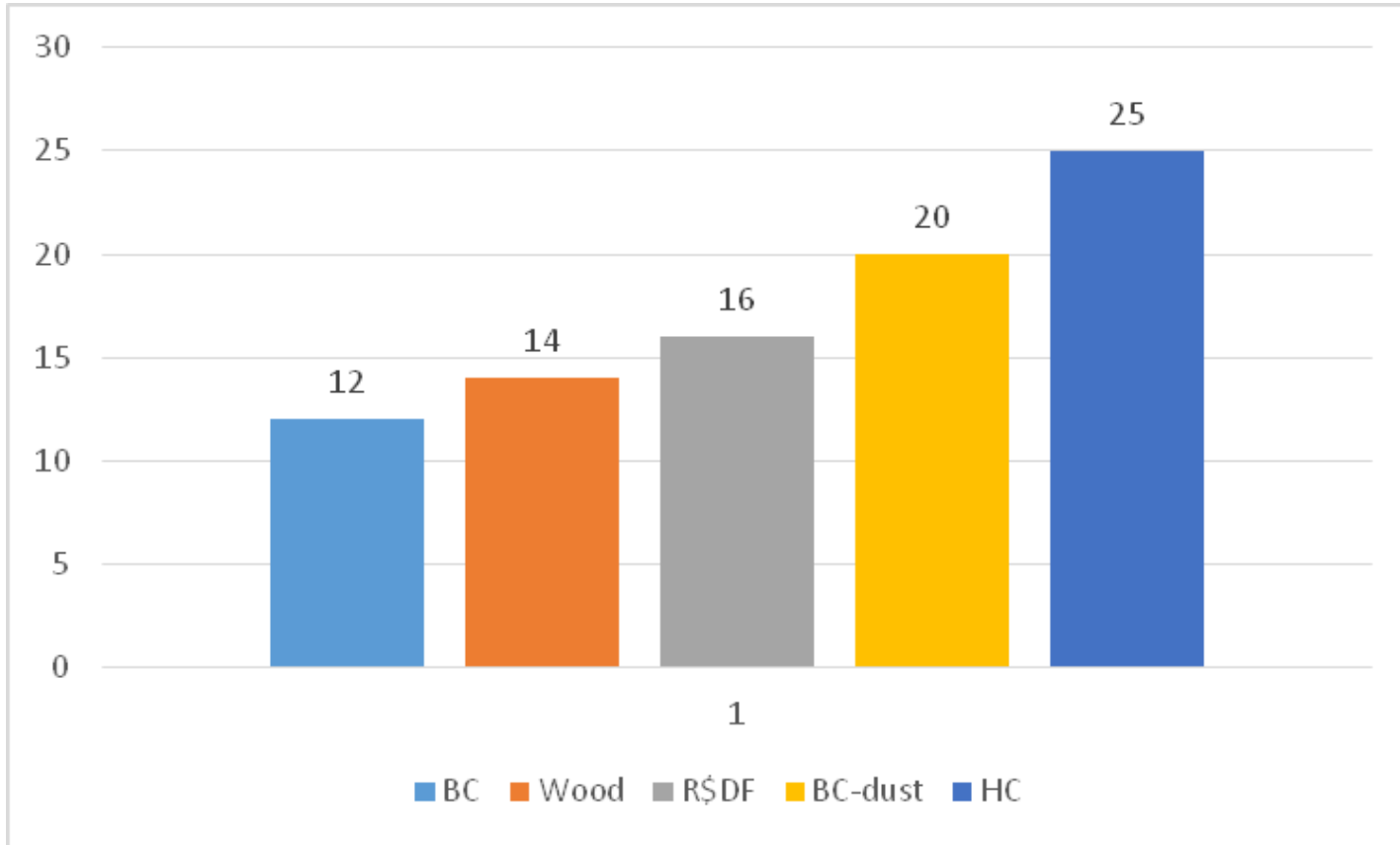
- High CV RDF
- H<sub>2</sub>O (evaporated water)
- Recyclable plastics (e.g. HDPE, PET, mixed plastics)
- Cardboard and paper
- Ferrous metal
- Non-ferrous metal



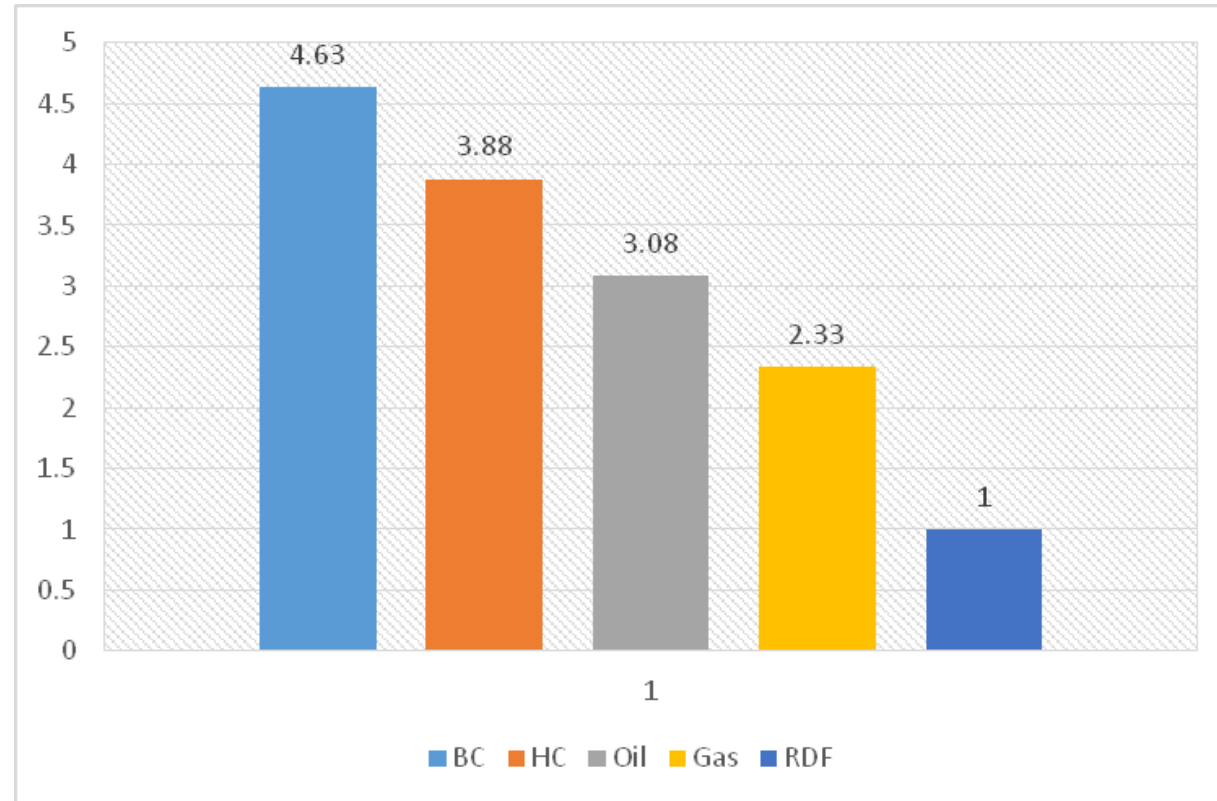
# Drying & Sorting – Effect on calorific value



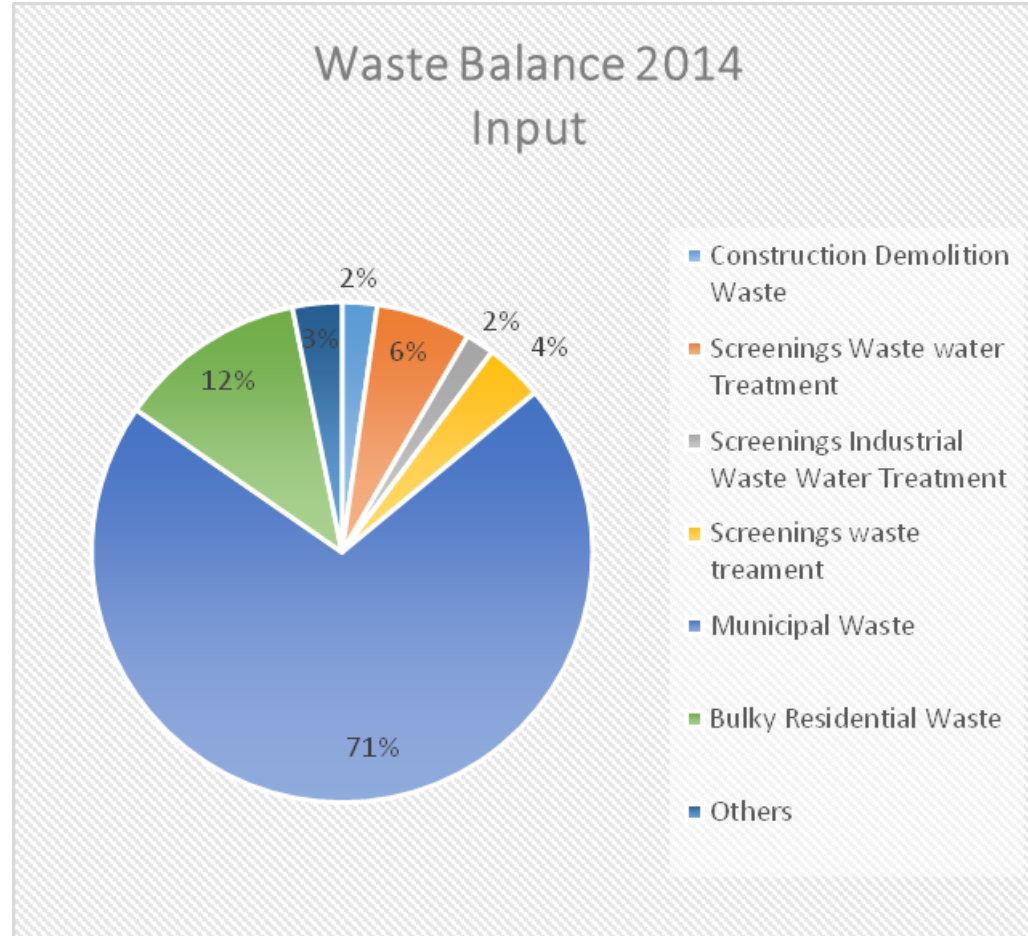
# Comparison of calorific values (average value in MJ/kg)



# Comparison of energy related CO<sub>2</sub>-emissions (generating 1 MW el.)



# MBT Nuthe Spree, Germany



Annual Report 2014

Total Input:

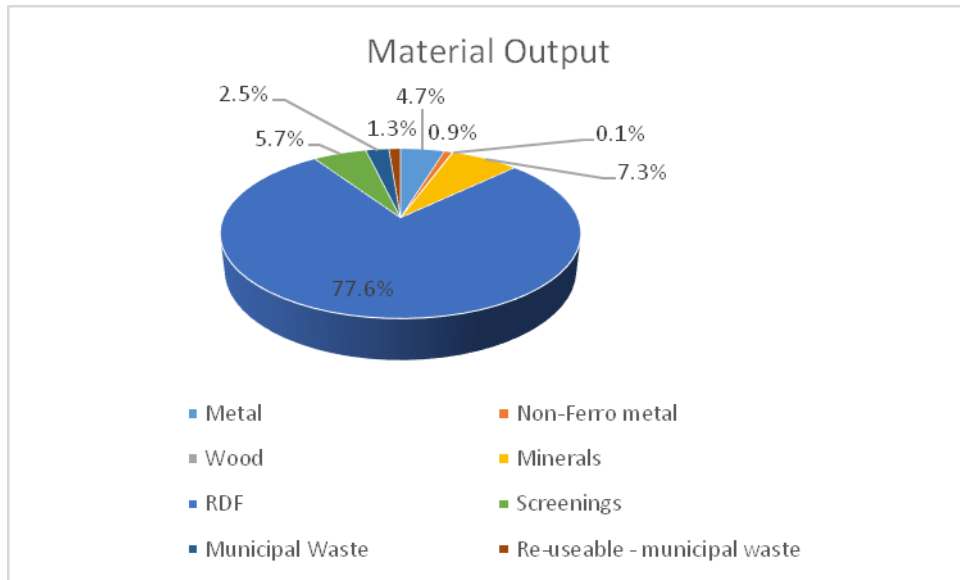
129,341.08 tonnes

281 kg/capita



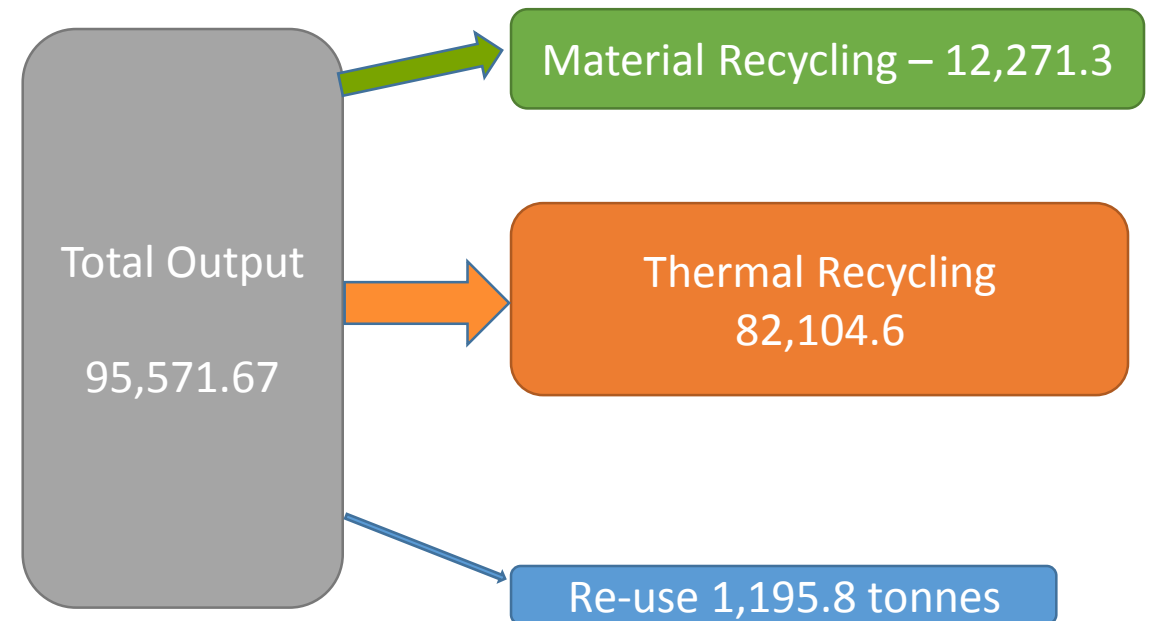
# MBT Output

Total: 95,571 tonnes solids



Note: plus 33,769.41 tonnes water

Material Flow (tonnes)



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# Benefits of MBT

- Reduction / Elimination of GHG Emissions from Waste Disposal
- High degree of waste diversion / recycling (Fe, Plastic > 90%)
- Flexible towards variations in waste composition and waste quantities, achieved by using a modular system – Drying boxes can be used for composting as well
- High energy efficiency, based on metal recycling and utilization of high caloric Refuse Derived Fuel (RDF)
- “Decoupling” of waste treatment and energy production, and storability of Refuse Derived Fuel (RDF)
- Benefits existing industrial infrastructure by providing an alternative fuel source



# Thank You

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