

NPB Technology for Mixed MSW Treatment

“Versatile Technology for Efficient Resource Recovery”

Presented By:



NPB Technology for Mixed MSW



Solution Key Remarks :

- Technology Developed after 10 years of meticulous research & numerous field trials.
- 2000 - Being used for Farm Yard Manure (FYM).
- 2007 – Municipal Solid Waste to Compost.
- 2012 - **100% Processing & Disposal solution** of Municipal Solid Waste (**MSW**) with Energy Generation with multiple product options.
- 2012 - **IPR** Filed (Indian & International) for **Microbial Treatment of MSW and Processing**.



NPB Technology for Mixed MSW

Proximate MSW Composition in Developing Countries:-

- | | |
|--|------------------|
| • Organic Matter: | 30 - 50 % |
| • Moisture | 30 - 70 % |
| • Recyclables (Plastics, Metals, Glass etc) | 5 – 15 % |
| • Non Recyclables (Plastics, Textiles, Leather, Rubber) | 5 – 10 % |
| • Inert | 5 – 30 % |

NPB Technology for Mixed MSW



Challenges in MSW Management in Developing Countries:-

- Seasonal Variable Compositions of MSW.
- Moisture is biggest hurdle to implement MRF (Material Recovery Facility).
- Recyclables Plastics contaminated with food has no sustainable revenue model.
- For incineration, waste composition become a limiting factor for Steam Pressure and hence, cost of power generation is higher.
- Inert contents vary with C&T mechanism, which reduces efficiencies of segregation and quality of RDF.

NPB Technology for Mixed MSW



Renerzyme Mixed Microbial Inoculum:-

- **Renerzyme** is a Mixed Microbial Culture of GRAS (Generally Recognized As Safe) species of **Lactobacillus (LAB) & Saccharomyces Cerevisiae**. It employs a unique '**Bio-Drying**' technique, which controls MSW pH, foul odour & fly in 24 hours.
- Based on knowledge of advanced microbiology, **Renerzyme** is a consortium of highly active, and functionally competent microbes - anaerobes, aerobes and facultative anaerobes - which are judiciously chosen and co-cultured using a proprietary media and process.

NPB Technology for Mixed MSW



Renerzyme for MSW Management in Developing Countries:-

- **No segregation of non-biodegradable prior to processing.**
- Organic Mixed Microbial Culture **Renerzyme** initiates Rapid & Controlled Decomposition of Food Waste to Stable forms – Amino acids, Humus etc.
- pH of MSW is brought down to less than 7.00 in 24 hours, to control microbe who produces Ammonia, Hydrogen Sulfide etc.
- **Odour & Fly control in less than 24-48 hours** from application.
- Utilization of Free Moisture & food for Rapid Microbial growth increases mass temperature and crosses 700 degree centigrade in 3- 4 days. Moisture of MSW can be brought down below 20% in less than 2 weeks time.

NPB Technology for Mixed MSW



Renerzyme Benefits:-

- Variable MSW composition can be handled.
- 40% of input mass can be Recovered as Usable Resources. Quality of all Recovered Resources remain identical from different MSW composition.
- **Renerzyme** application reduces the requirement of energy for drying of MSW.
- Clean & hygienic Recovered Resources provide opportunity to integrate different technologies for Sustainable Operations.

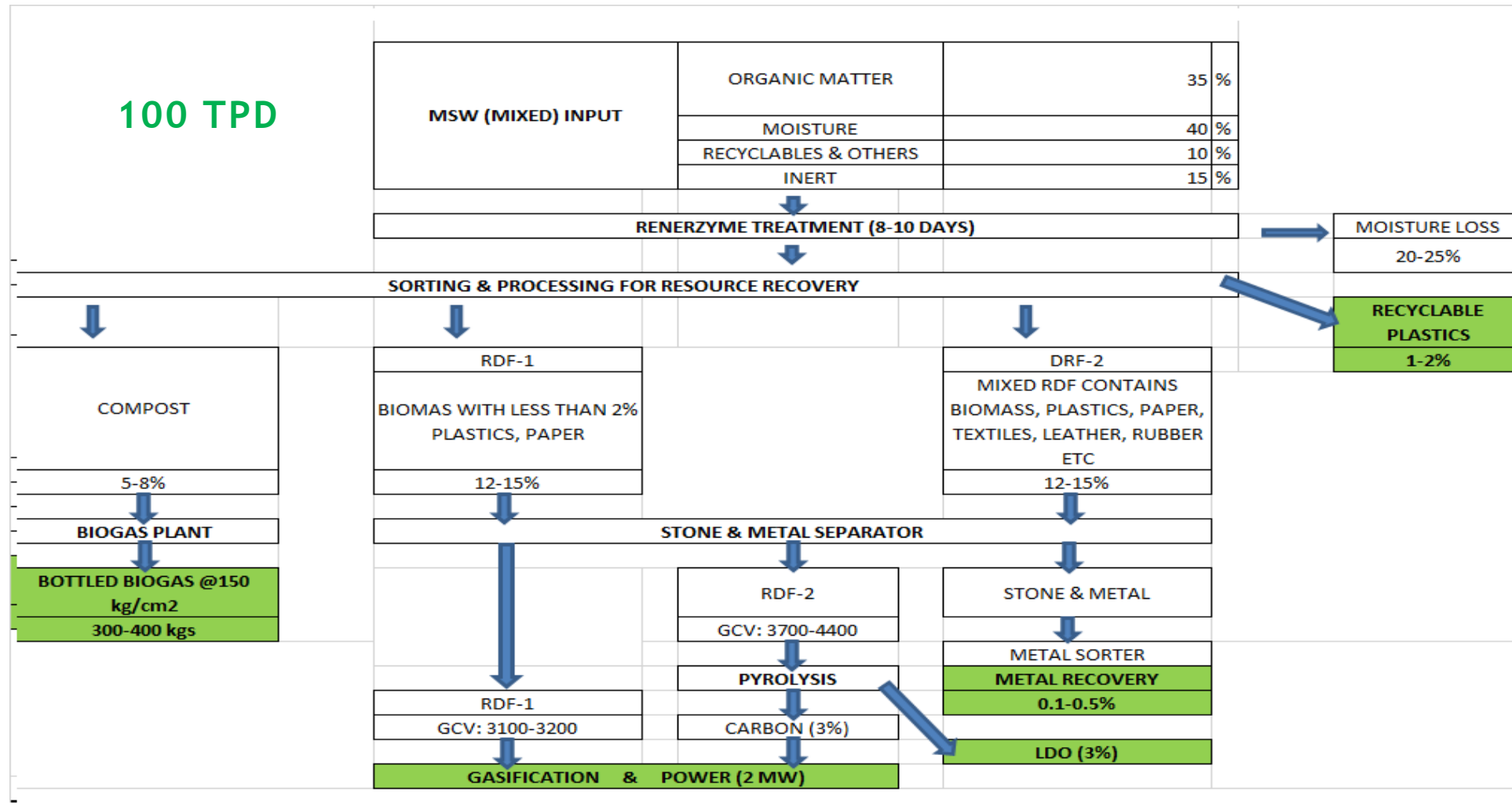
Statistical Comparison of Resource Recovery:-



Sr. No.	Particulars	Conventional Processing, %	NPB Processing, %
1	Compost	8 - 22	5 - 10
2	Biomass Fuel (GCV: 3100-3400)	0	10 - 15
3	RDF (Refused Derived Fuel – GCV: 4000-4400)	10 - 20	10 - 15
4	Recyclables (Plastics, Metal, Paper etc)	2 - 5	2 - 5
5	Non Recyclables (Plastics, Leather, Textiles, Rubber, Paper etc)	8 - 10	8 - 10
6	Inert (Stone, Silt, Clay etc)	0	10 - 20
7	Moisture Loss	10 - 15	15 - 40
8	Rejects from Process (Plastics, Textile, Leather, Stone, Silt etc)	50 - 60	0
9	Rejects from Process (Silt, Clay etc)	0	3 - 5

Note: At least 40% Resource Recovery is possible.

PROCESS FLOW DIAGRAM with MASS BALANCE



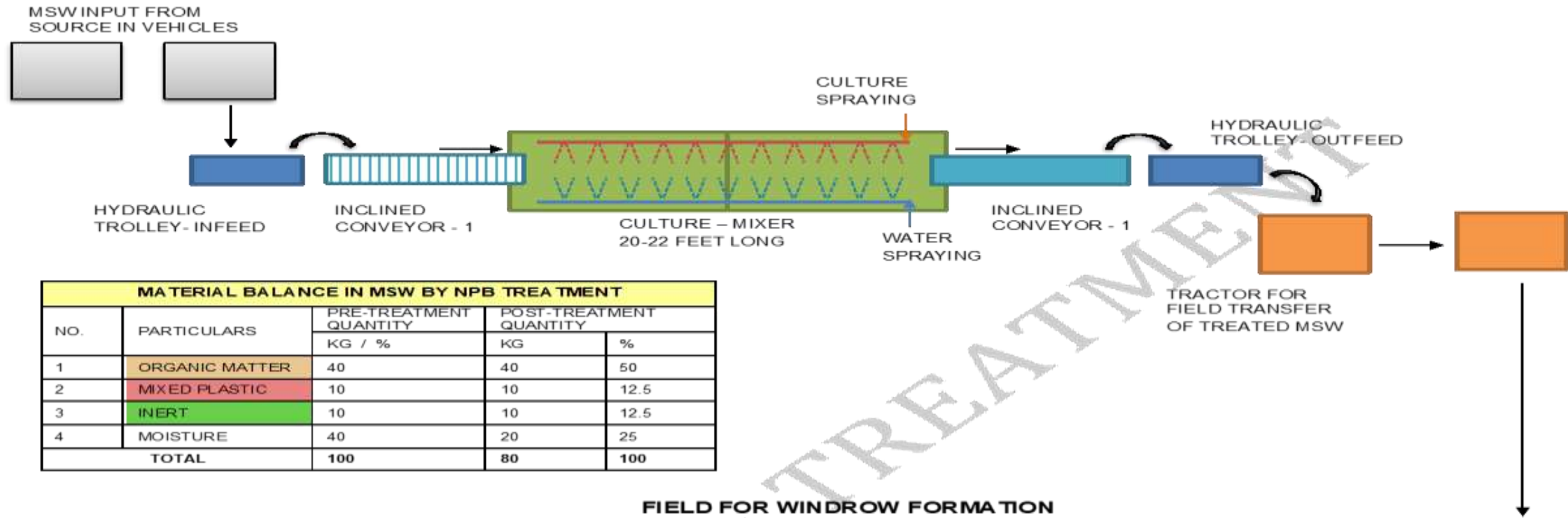
Gassifier Photograph



Power Generation Technologies for MSW-TO-POWER

Sr. No.	Route	Incineration	Plasma Gasification	Microbial Treatment + Thermal Gasification
1	Minimum Size of Project, TPD	650	35	15
2	Power Generation Capacity, Minimum	5 MW	1.5 MW	0.25 MW
3	Scalability, in the Multiple of	5 MW	1.5 MW	0.25 MW
4	MSW / MWhr	70-125 MT	35 MT	50 MT
5	CAPEX / MWhr, INR Cr	15 - 25	25 - 50	13 – 18
6	OPEX/ kwhr, INR	7.00 +	8.00 +	5.00 +
7	Revenue Model	Sale of Power	Sale of Power	Sale of Power, Bottled Biogas, Recyclables, Concrete/ Paver Blocks
8	Internal Power Consumption (Auxiliary Power)	15-22 % of installed capacity	30 - 40 % of installed capacity	6-10 % of installed capacity
9	Stack Emmission	Chances of Dioxin & Furan generation, if heterogenous mass with variable moisture contents is fed	As the reaction temperature is above 1000 deg centigrade, it does not generate Dioxin & Furan	As the reaction temperature is above 1000 deg centigrade, it does not generate Dioxin & Furan
10	Bottom Ash	Hazardous due to heavy metal presence. Adds cost to OPEX	Hazardous due to heavy metal presence. Adds cost to OPEX	Non-Hazardous, can be utilized for other applications like Concrete/ Paver Blocks, agriculture etc.

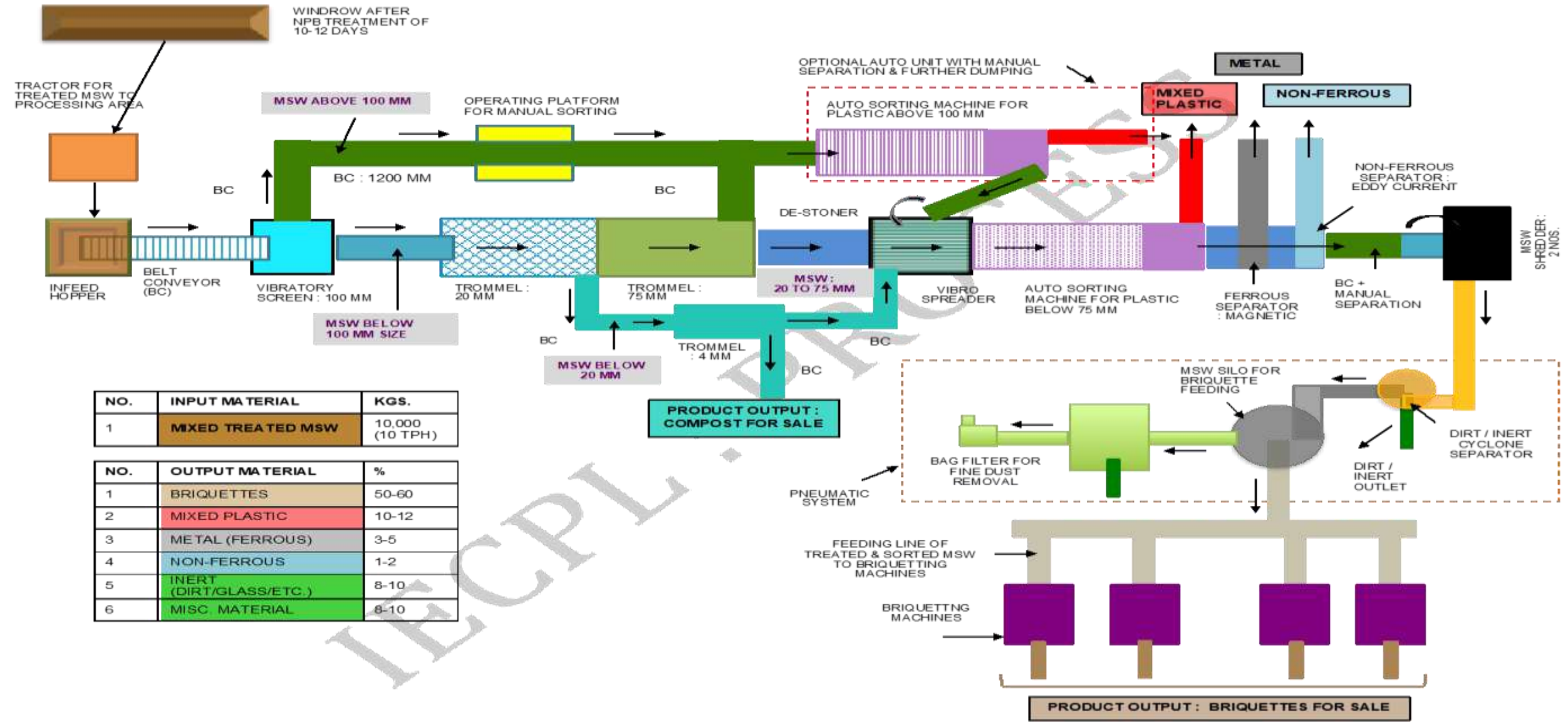
Unique MSW Treatment by NPB Technology: Flow Diagram



MATERIAL BALANCE IN MSW BY NPB TREATMENT				
NO.	PARTICULARS	PRE-TREATMENT QUANTITY	POST-TREATMENT QUANTITY	
		KG / %	KG	%
1	ORGANIC MATTER	40	40	50
2	MIXED PLASTIC	10	10	12.5
3	INERT	10	10	12.5
4	MOISTURE	40	20	25
TOTAL		100	80	100



Unique NPB Treated MSW Sorting: Process Flow Diagram



NO.	INPUT MATERIAL	KGS.
1	MIXED TREATED MSW	10,000 (10 TPH)

NO.	OUTPUT MATERIAL	%
1	BRIQUETTES	50-60
2	MIXED PLASTIC	10-12
3	METAL (FERROUS)	3-5
4	NON-FERROUS	1-2
5	INERT (DIRT/GLASS/ETC.)	8-10
6	MISC MATERIAL	8-10



Past Projects.....

Location	Input	Size (TPD)	Product	Status	Start Date
Ajinkya Biofert, Pune	MSW	200	Compost , RDF	Contract Over	10-Jul
Disha Waste Management, Pune	MSW	100	Compost	Contract Over	10-Aug
Ishita Associates, Durg	Distillery Solid Waste	*	Compost	Contract Over	10-Dec
Creative Eco Recycle Pvt Ltd, Ahmedabad	MSW	200	Compost, RDF	Operational	13-Mar
Ahmedabad Zoo, AMC	Zoo Solid Waste	1	Compost	Operational	13-Dec
Imphal, Manipur	MSW	60	Compost, Power	Operational (composting), Power in April '19	16-Dec

* = Installed Capacity 200 TPD. Manufacturing Capacity depends on orders for Compost.

NPB Technology is.....



- Scalable
- Adaptable
- With *GREEN TAG*
- Has more than one end-products
- Economically viable & sustainable
- Quick ROI

NPB - A Mixed Microbial Treatment

COME, LET'S JOIN HANDS TO CREATE
ECO-ENERGY WORLD

Thank You...



www.gurukrupainternational.com | info@gurukrupainternational.com