

**KANKYO** *bert*

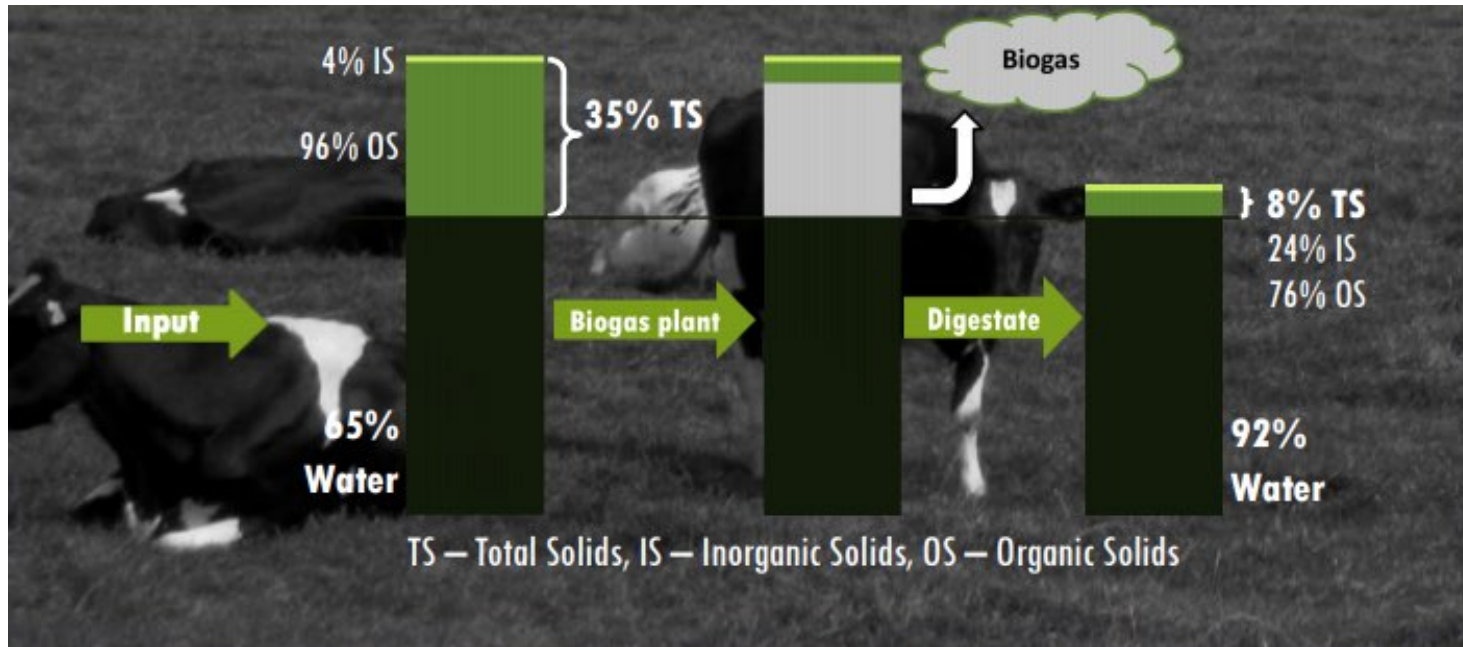
**DIGESTATE TREATMENT &  
NUTRIENT RECOVERY SYSTEM**

TOWARDS SUSTAINABILITY

DIGESTATE AS FERTILIZER

# DIGESTATE

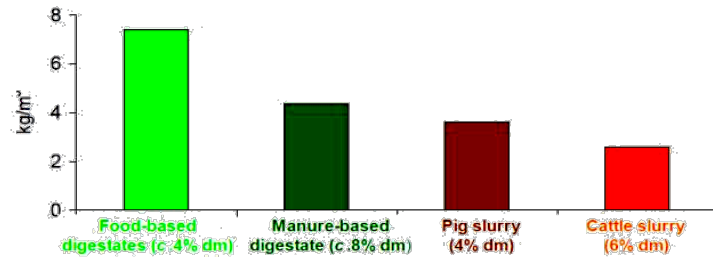
The Effluent of Anaerobic Digestion with rich in nutrients



# NUTRIENT CONTENT

High Nutrient Content in the digestate upon treatment can be used as liquid fertilizer

## Total N in Digestate based on Feed (kg/m<sup>3</sup>)



Typical slurry values taken from "Fertiliser Manual (RB209)"

Fertiliser Manual (RB209) Defra June 2010 (<http://archive.defra.gov.uk/foodfarm/landmanage/land-soil/nutrient/documents/rb209-rev-100609.pdf>)

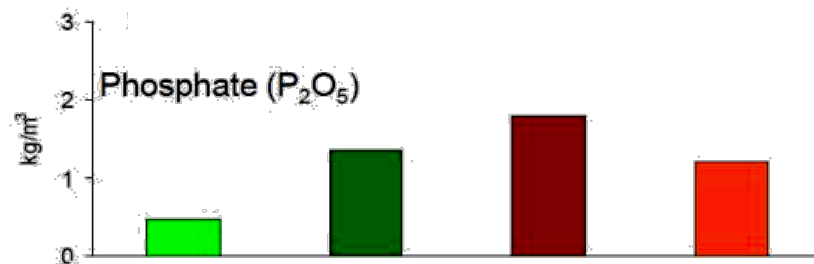
1. The characteristic of the digestate vary according to input material
2. Low dry matter
3. High water content
4. Undigested material
5. Inorganic nutrients
6. May contain potentially toxic elements
7. Contains fibre and liquid fractions

Nitrogen: 2.3 - 4.2 kg/tonne.

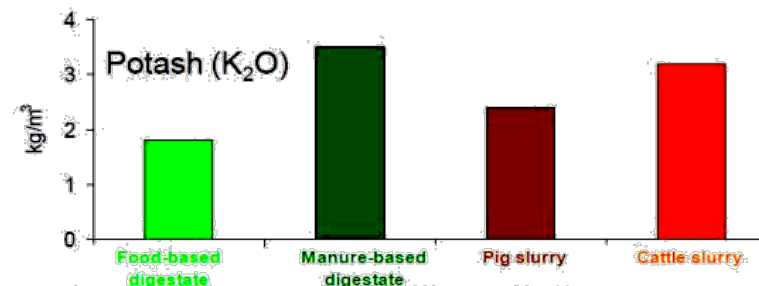
Phosphorous: 0.2 - 1.5 kg/tonne.

Potassium: 1.3 - 5.2 kg/tonne.

## Total Phosphorous in Digestate based on Feed (kg/m<sup>3</sup>)



## Total Potash in Digestate based on Feed (kg/m<sup>3</sup>)

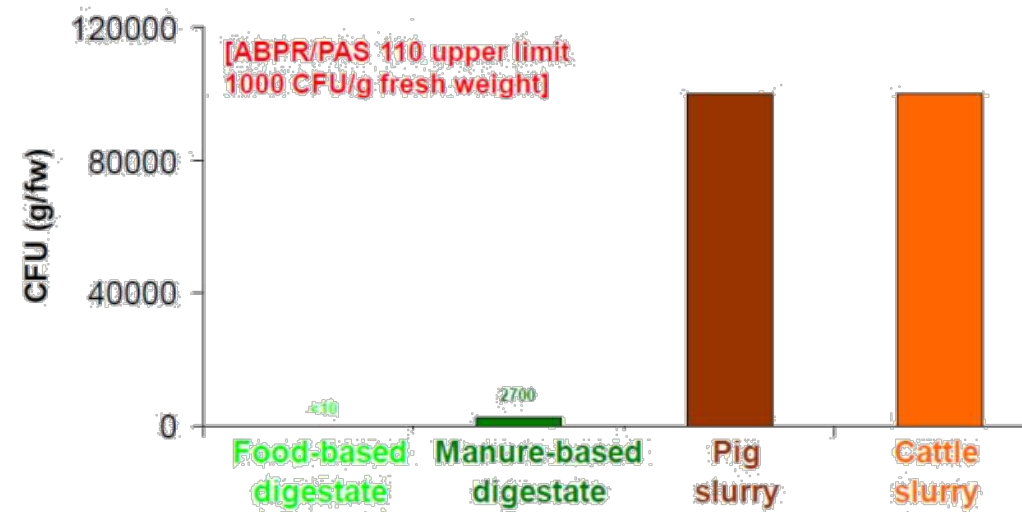


# NEED FOR DIGESTATE TREATMENT

1. To meet the compliance norms on digestate quality ( National & International)
2. To provide additional benefits by enhancing the digestate value
3. The microbes in the digestate can cause harmful effects on plants
4. The physical standards for the digestate includes appearance and odour. The raw digestate has the following odorous compounds

- ✓ Hydrogen Sulphide
- ✓ Ammonia
- ✓ Amines
- ✓ Volatile Organic Acids
  - Propionic Acid
  - Butyric Acid
- ✓ Sulphur Compounds

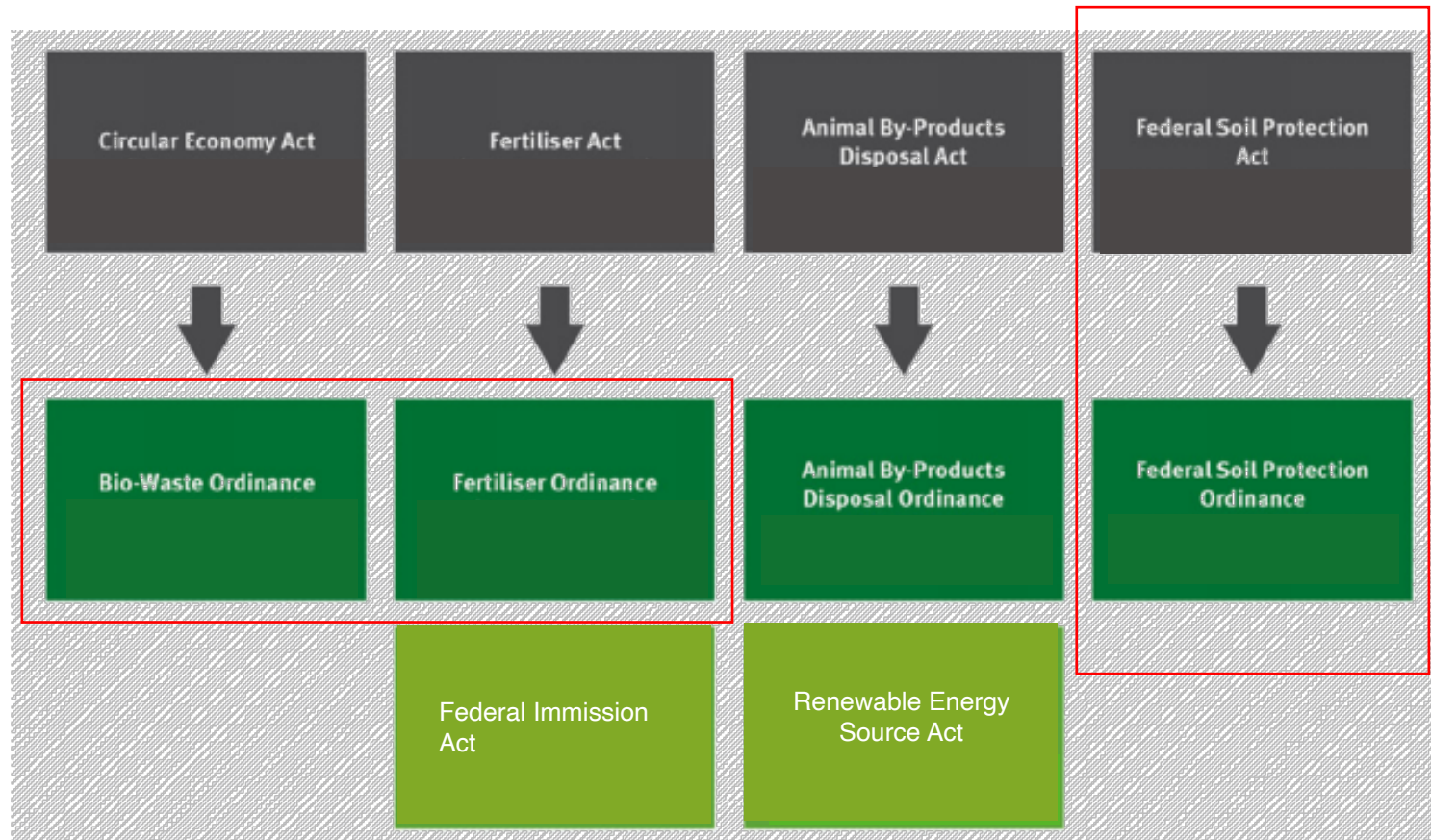
The Microbial range in digestate based on feed



# REGULATIONS

## ANAEROBIC DIGESTION QUALITY PROTOCOL (ADQP) – EUROPEAN STANDARD

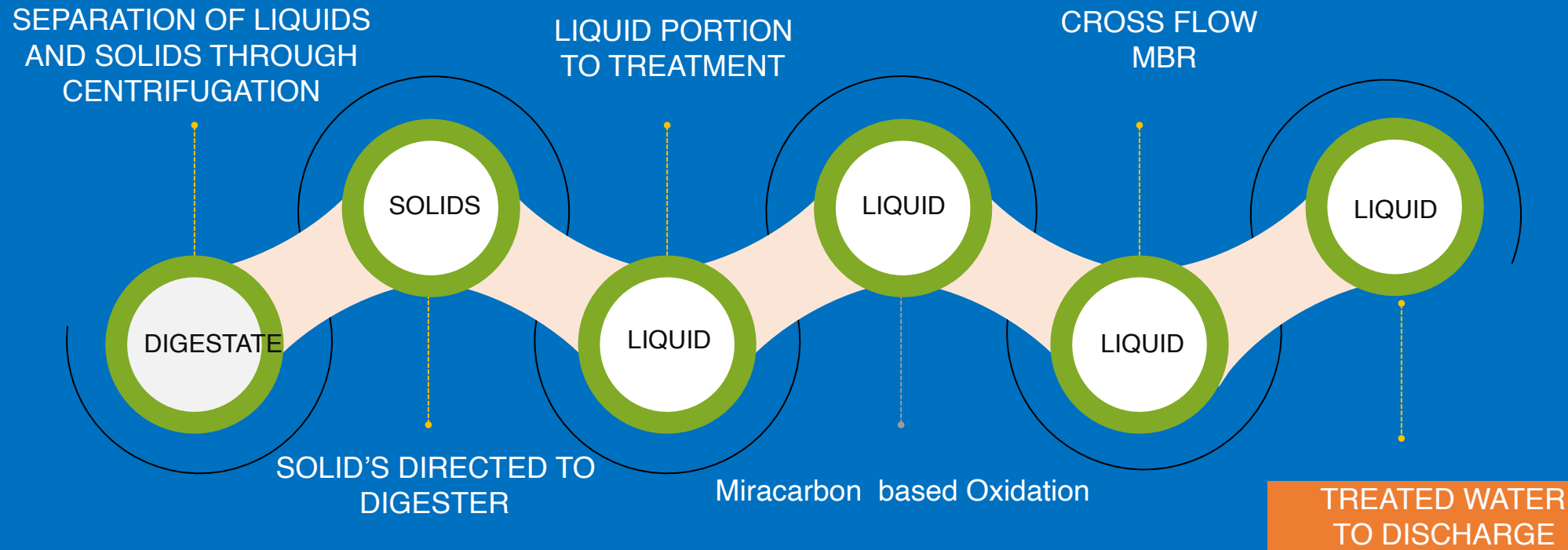
The highlighted Acts regulates the quality of digestate for using it as fertilizer.



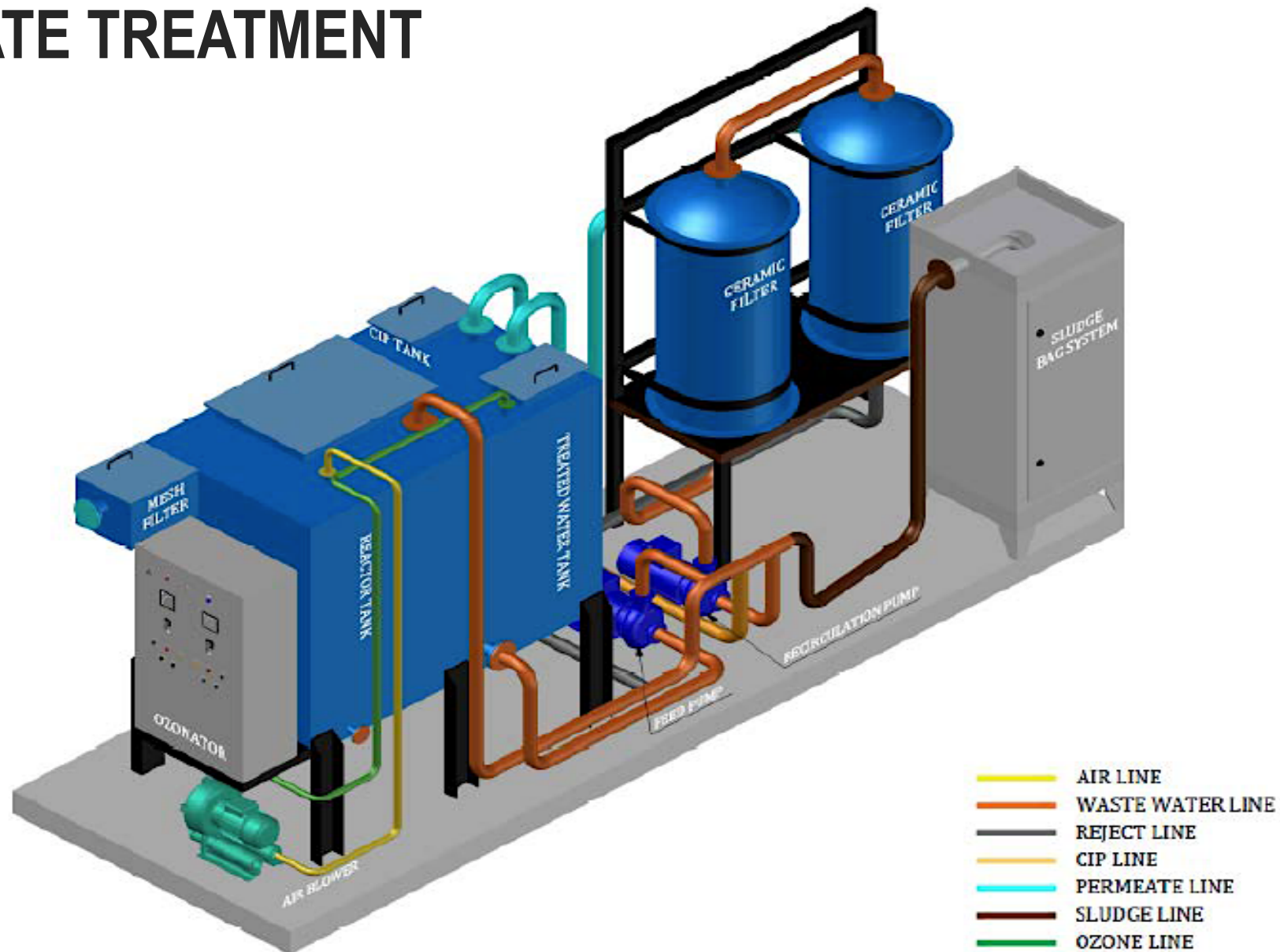
## IMPACTS OF FEEDING RAW DIGESTATE

- ✓ Affects the nutrient balance of the soil
- ✓ Risk of Photo toxicity
- ✓ Nitrate Leaching
- ✓ Risk of methane and ammonia emissions
- ✓ Odour
- ✓ Affects Microbial activity in soil

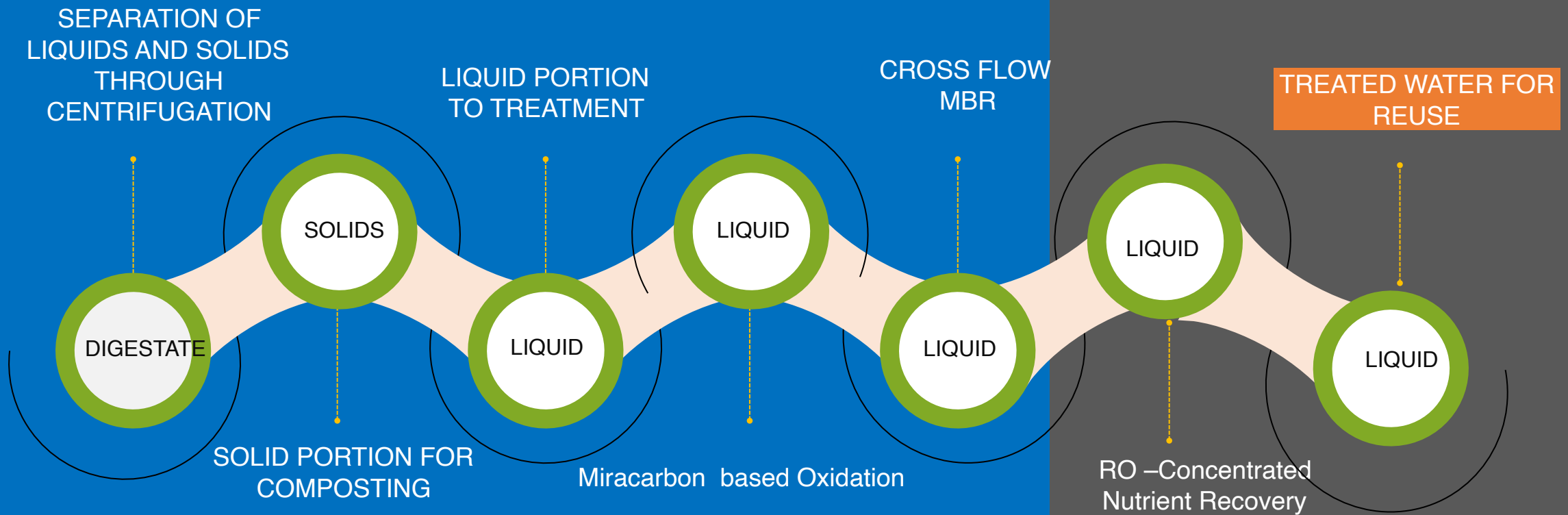
# WHAT IS DIGESTATE TREATMENT



# DIGESTATE TREATMENT



# NUTRIENT RECOVERY

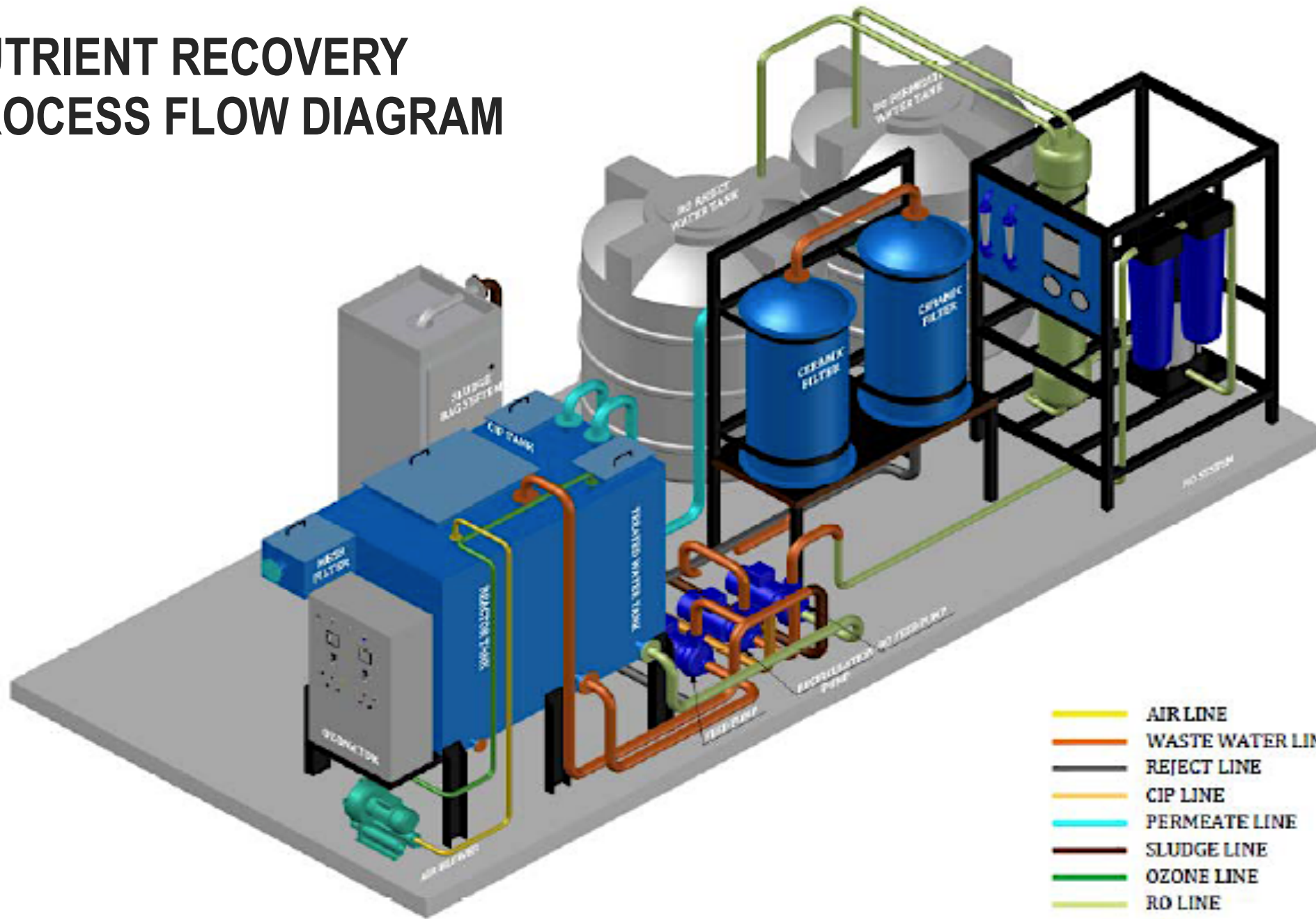


**DIGESTATE TREATMENT**

**NUTRIENT RECOVERY**

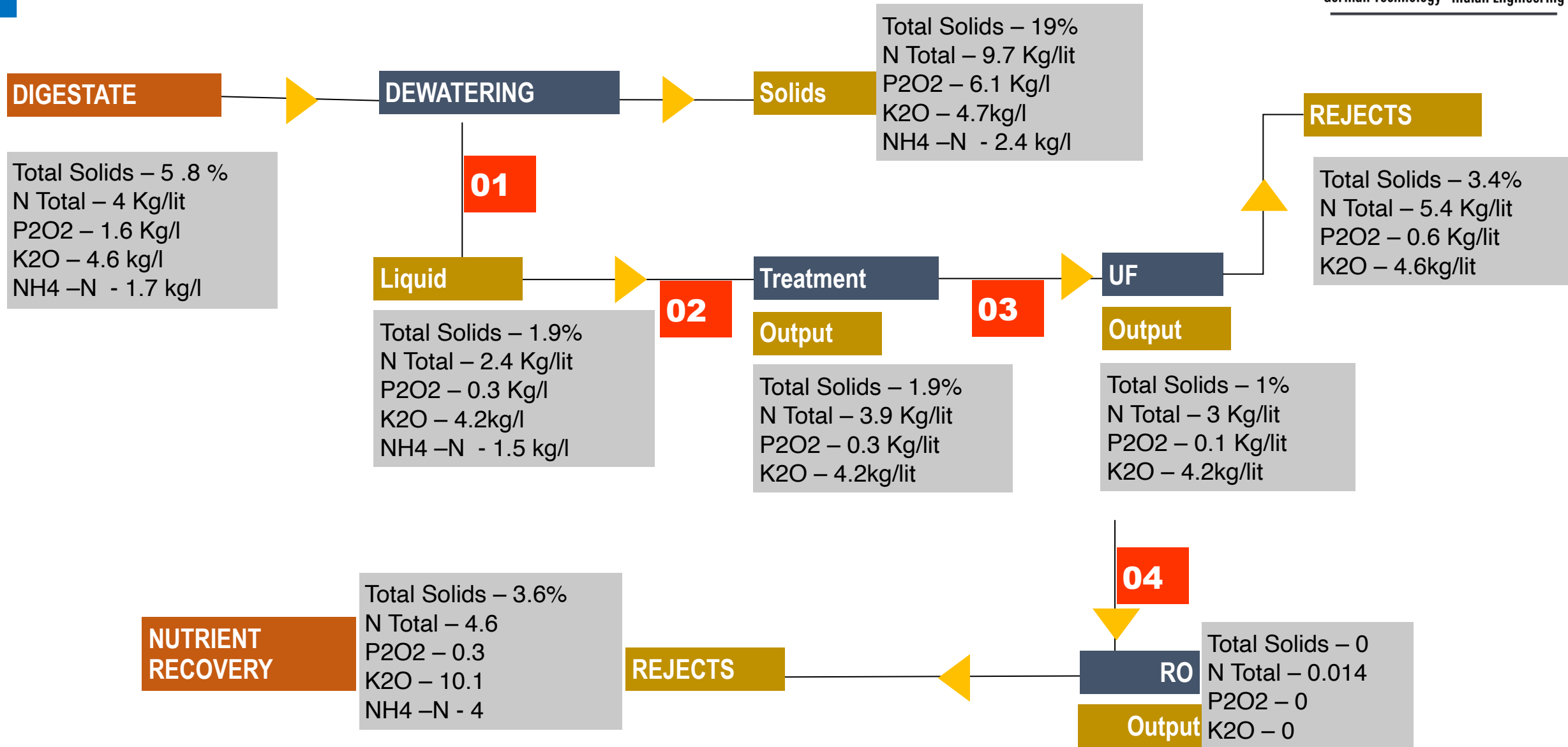


# NUTRIENT RECOVERY PROCESS FLOW DIAGRAM



- AIR LINE
- WASTE WATER LINE
- REJECT LINE
- CIP LINE
- PERMEATE LINE
- SLUDGE LINE
- OZONE LINE
- RO LINE

# MASS BALANCE



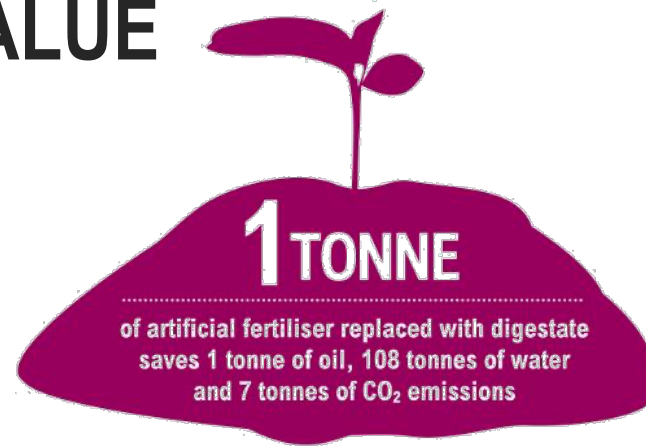
# DIGESTATE ENHANCEMENT VALUE

## USES

1. Increase the value of digestate;
2. Secure use of digestate;
3. Create new markets for digestate products;
4. Decrease the operating costs (OPEX) of the facility.
5. Ensure more secure and sustainable outlets for digestate products; and potentially reduce the operating cost of the facility.
6. Reduce the dependence on land application

## APPLICATION

1. Land Applications
2. Soil Conditioner
3. The solid portion can be converted to compost
4. Growth Medium for Plants
5. Land Regeneration Projects
6. Building Materials (Pressed into Blocks)
7. Drying and Pelletizing for use as a solid fuel or dried fertiliser



## ENVIRONMENTAL BENEFITS

- ✓ Replacing energy intensive mineral fertilizers
- ✓ Avoiding GHG emissions from open decomposition of organic matter
- ✓ Dedicated energy crops such as maize make GHG savings of over 50% compared with its fossil fuel comparator
- ✓ Biogas and biomethane are low GHG renewable energy carriers which replace fossil energy.
- ✓ Every ton of mineral fertilizer produced by this process emits an average of 9.7 tons of CO<sub>2</sub> equivalent

# SPECIFICATION

Model	Capacity (KLD)	Power Consumption/Day	Sludge Production (Kgs/day)	Area Required (Lx W)
KANKYO BERT C DTP 3000	3	180	100	10.0 m x 3.0 m
KANKYO BERT C DTP 6000	6	216	200	14.0 m x 3.0 m
KANKYO BERT C DTP 9000	9	240	300	20.0 m x 3.0 m



## FEATURES

1. Compact Design
2. Hybrid Process
3. Easy Operation
4. Less Maintenance
5. Low cost of operation

# SPECIFICATION

MODEL	KANKYO BERT C NRP 3000	KANKYO BERT C NRP 6000	KANKYO BERT C NRP 9000
PLANT CAPACITY	3 KLD	6 KLD	9 KLD
Total Operating Power (KW/day)	153 units/day	207 units/day	297units/day
Sludge Production (kgs/day)	100	200	300
Liquid fertiliser (Ltrs / day)	1500 – 2000	3000 – 4000	4500 – 6000
Area Required for Installation (L x W)	12.0 m x 3.0 m	20.0 m x 3.0 m	25.0 m x 3.0 m



## FEATURES

1. Compact Design
2. Hybrid Process
3. Maximum output recovery
4. Consistent Output Quality
5. Easy Operation
6. Less Maintenance
7. Low cost of operation

**KANKYO GROUP OF COMPANIES** is an established waste management solution provider worldwide for Water & Wastewater Treatment, Bioremediation, Waste to Energy, Air Pollution Control and Solid Waste Management. With our vast experience in handling different types of waste, we wish to introduce KANKYO as the leading solution provider for waste management



# Kankyo Bert

German Technology • Indian Engineering

## VISION

Kankyo Group will be the recognized leader for environmental solutions through excellence in Technology, Quality and Customer Service

## MISSION

Our mission is to make the world cleaner and more sustainable by creating valuable energy and resources from local, renewable waste. Our goal is to help our customers reduce disposal costs and become leaders in sustainability by delivering reliable sustainable solutions



BIOGAS GENERATION

37

m3 million



SOLID WASTE PROCESSED

18000

Tons



WASTEWATER TREATED

500

m3 million



WATER TREATED

600

m3 million



**Kankyo Bert**

German Technology • Indian Engineering

*Thank you*

## REGIONAL PRESENCE

### HEAD OFFICE

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## GLOBAL PRESENCE

