**Schicksal Engineering Pvt Ltd**

www.schicksalgroup.com
www.schicksalengineering.com

**CALL US :- 8700613321 | 9711453321**

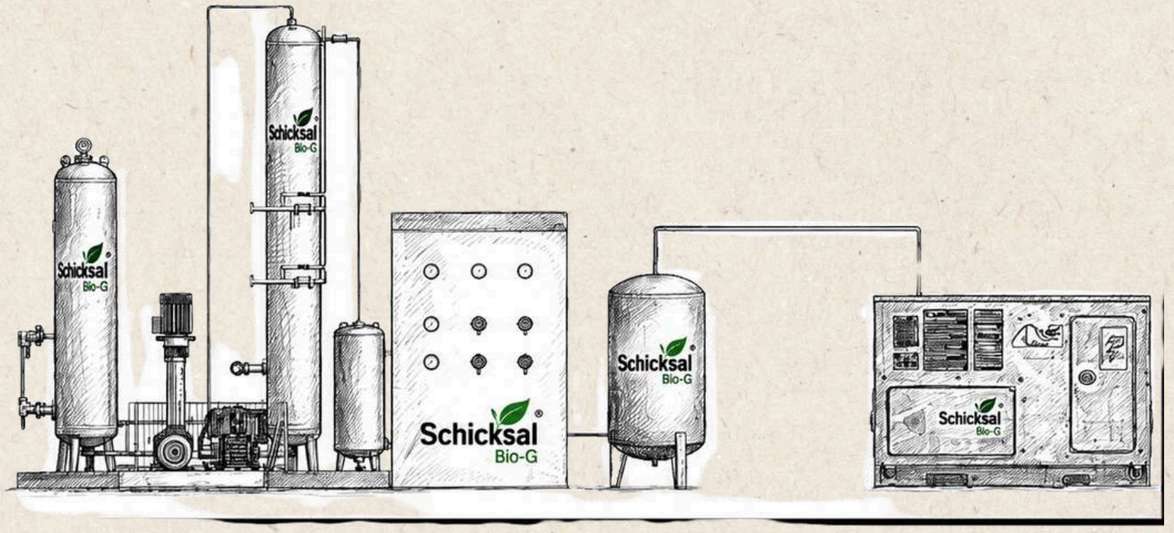
# BIO GAS

"Convert Waste into Wealth with Advanced Biogas Technology."

## An introduction to the importance of organic waste to fuel

Presented By Schicksal Group

HO:- Main Pusta Road ,Sec 121
Noida 201301 INDIA.


# What Are Organic Waste?

**Food Waste**
- Vegetable peels
- Fruit waste
- Leftover food
- Hotel/kitchen waste
- Bakery waste

**Agricultural Waste**
- Crop residue
- Sugarcane bagasse
- Paddy straw
- Wheat straw
- Corn stalks

**Animal Waste**
- Cow dung
- Poultry litter
- Pig manure
- Goat waste

**Industrial Organic Waste**
- Dairy waste
- Distillery waste
- Slaughterhouse waste
- Food processing waste

**Garden & Green Waste**
- Dry leaves
- Grass clippings
- Tree branches
- Flower waste

**Best materials for biogas:**
- Food waste
- Cow dung
- Poultry waste
- Kitchen waste
- Vegetable market waste
- STP sludge (organic content)

# How **STP** Sludge Helps in Biogas Production

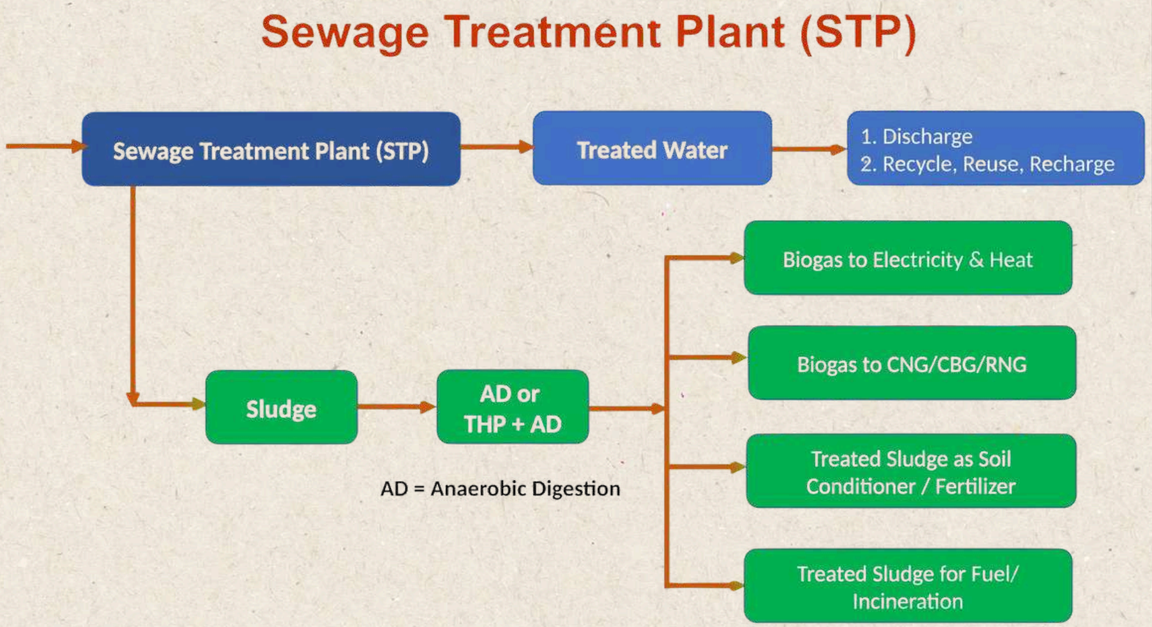
**During sewage/wastewater treatment, organic solids settle at the bottom as sludge.**

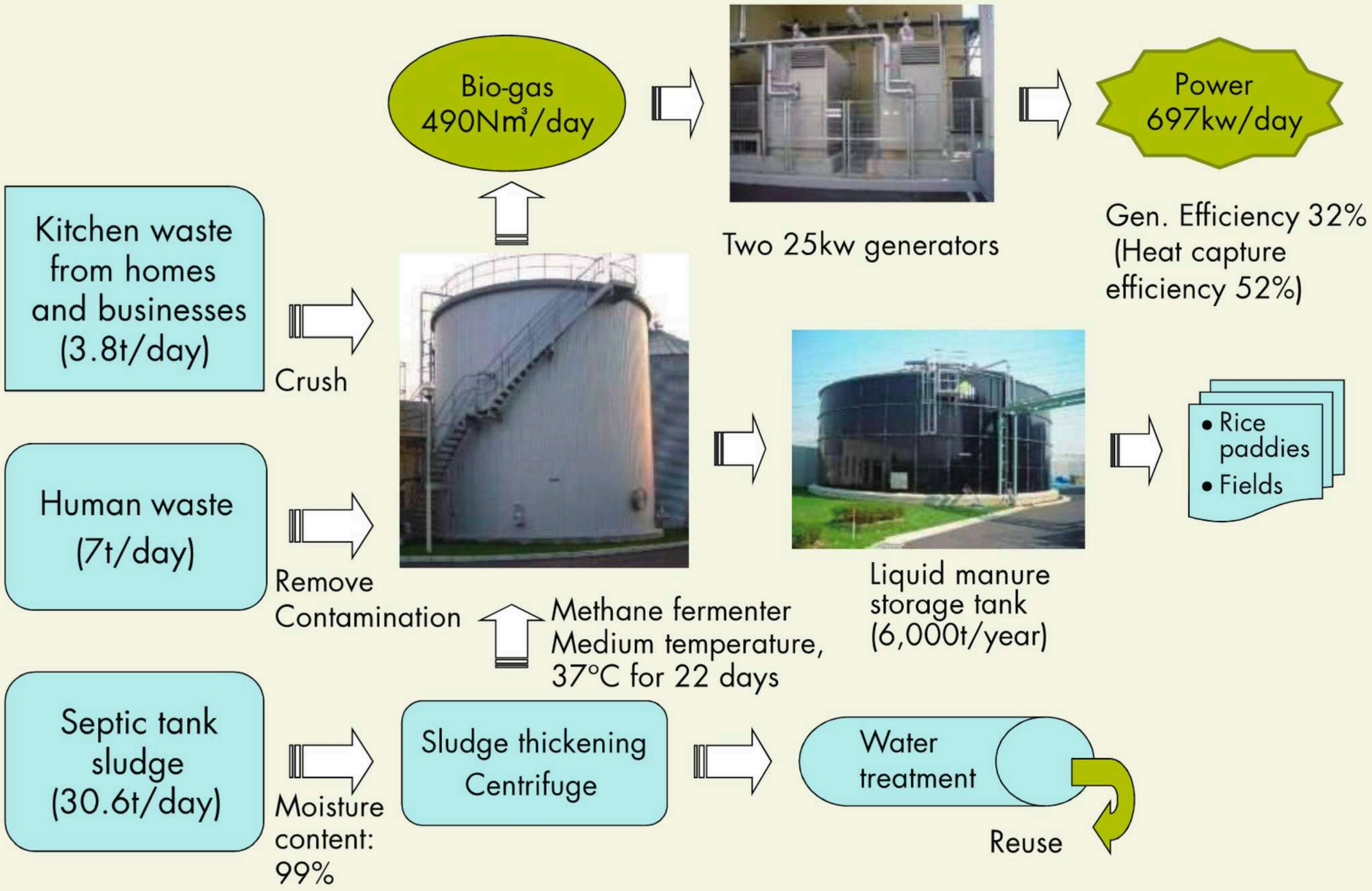
This sludge contains:

- Organic carbon
- Microorganisms
- Proteins
- Fats
- Carbohydrates

When this sludge is fed into an anaerobic digester (biogas plant), bacteria break down the organic matter and generate:

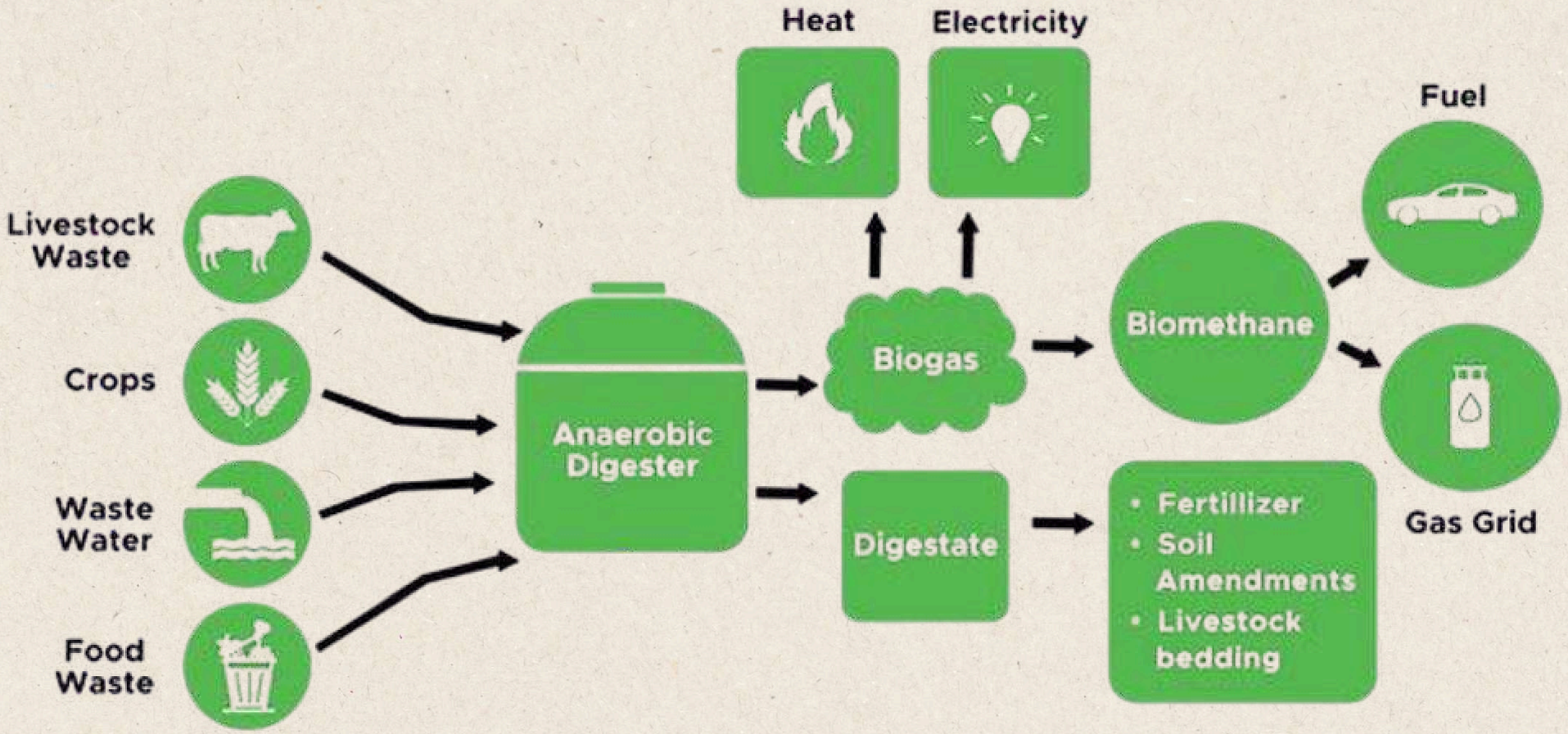
- Methane ($CH_4$)
- Carbon dioxide ($CO_2$)
- Bio-slurry (organic manure)




Bio-gas
490Nm³/day
Power
697kw/day
Two 25kw generators
Gen. Efficiency 32%
(Heat capture
efficiency 52%)
Kitchen waste
from homes
and businesses
(3.8t/day)
Crush
Human waste
(7t/day)
Remove
Contamination
Methane fermenter
Medium temperature,
37°C for 22 days
Liquid manure
storage tank
(6,000t/year)
• Rice
paddies
• Fields
Septic tank
sludge
(30.6t/day)
Moisture
content:
99%
Sludge thickening
Centrifuge
Water
treatment
Reuse

# Bio-CNG

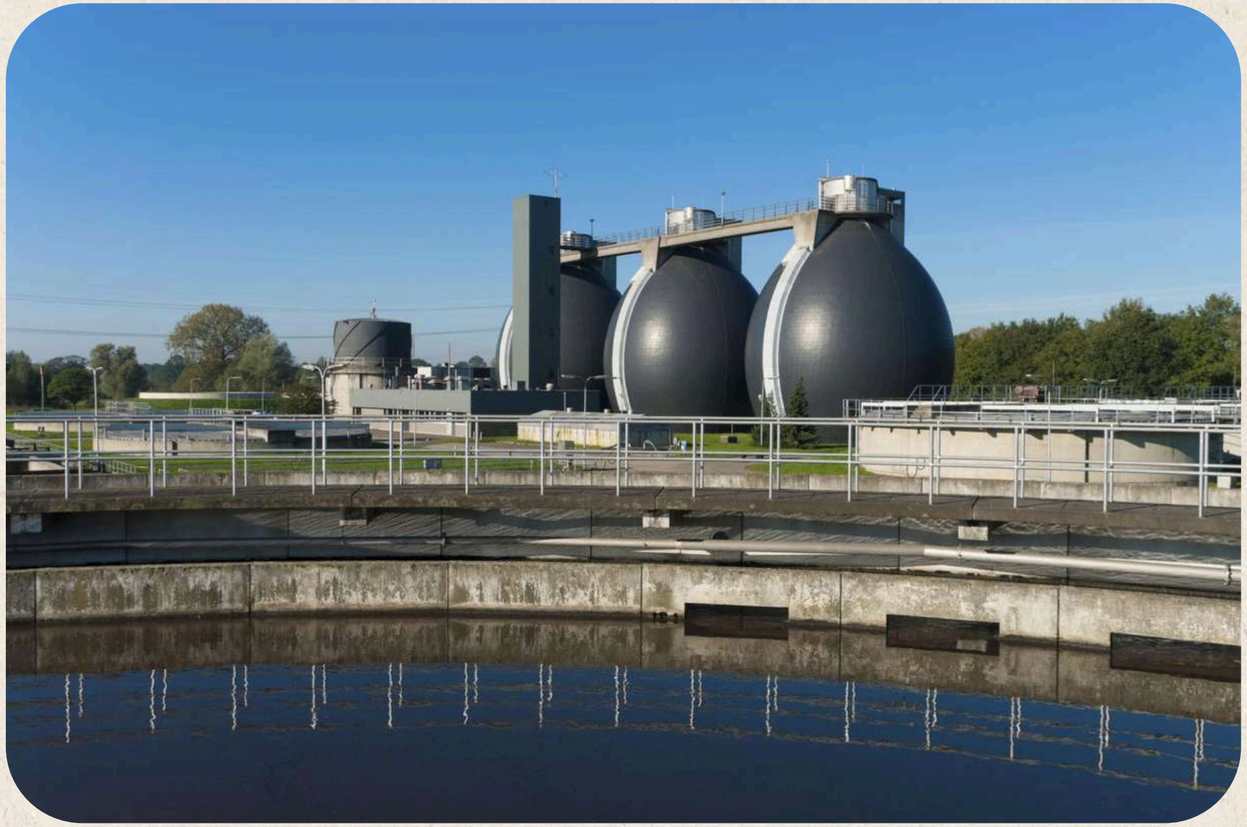
## From Municipal Waste And Sewage Sludge



# Why STP Sludge is Valuable

## High Organic Content Contains:

- Human waste
- Food particles
- Organic suspended solids
- These generate methane efficiently.
- Continuous Feed Availability
- STPs generate sludge daily, making biogas generation stable and continuous.
- Reduces Sludge Disposal Cost
- Instead of paying for disposal:
- sludge becomes fuel
- reduces transportation cost
- lowers landfill burden



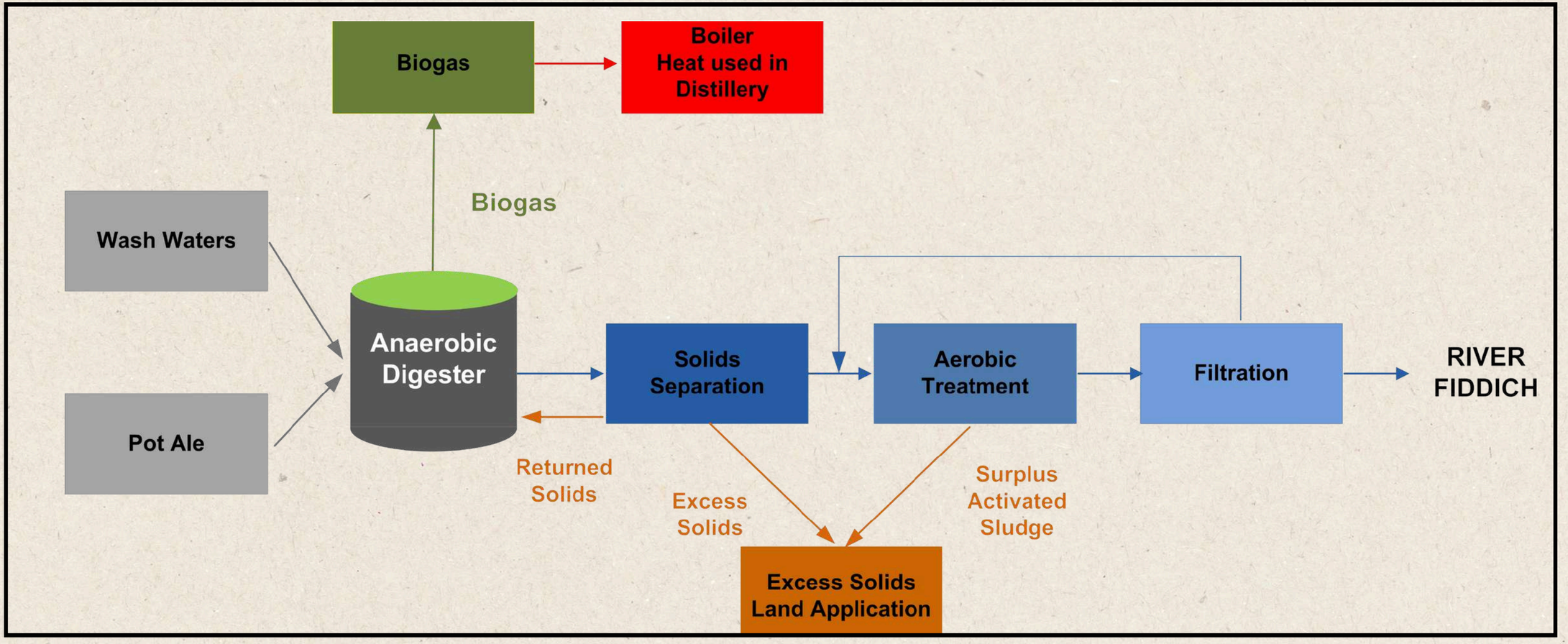
# ETP Sludge in Biogas Plants

ETP sludge can be used ONLY if it contains biodegradable organic matter.

**Suitable industries:**

- Food processing
- Dairy
- Distillery
- Brewery
- Paper mills
- Sugar mills

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum


Biogas
Boiler
Heat used in
Distillery
Biogas
Wash Waters
Pot Ale
Anaerobic
Digester
Solids
Separation
Aerobic
Treatment
Filtration
RIVER
FIDDICH
Returned
Solids
Excess
Solids
Surplus
Activated
Sludge
Excess Solids
Land Application

# ETP Sludge Limitations

## Some ETP sludge is NOT suitable because it may contain:

- Heavy metals
- Toxic chemicals
- Acids/alkalis
- Oil & grease
- Hazardous compounds
- These can kill anaerobic bacteria.

## Industries usually unsuitable:

- Electroplating
- Chemical plants
- Textile dyeing
- Paint industry

## Important Technical Parameters

| Parameter | Ideal Range |
|---|---|
| pH | 6.8–7.5 |
| Temperature | 30–38°C |
| Solid Content | 6–12% |
| C:N Ratio | 20:1 to 30:1 |



# Benefits

**Common Uses of Generated Biogas**

- Cooking fuel
- Boiler fuel
- Electricity generation
- Bio-CNG upgrading
- Heating systems

# Standard Biogas Power Packages

Optimised for food waste, dung, poultry waste, and mixed organic waste in East Africa.

**50 kVA** (a)
**Compact · Distributed · Entry-level**

- Electrical Output: 40 kW (b)
- Daily Feedstock Requirement*:
- Food waste: 4 – 5 TPD
- Cow dung: 9 – 12 TPD
- Poultry waste: 2 – 3.5 TPD
- Ideal for
- Hotels
- Markets
- Dairy & Poultry farmers
- Slaughterhouses

**125 kVA**(a)
**Balanced · Commercial · Scalable**

- Electrical Output: 100 kW (b)
- Daily Feedstock Requirement*:
- Food waste: 10 – 12.5 TPD
- Cow dung: 22.5 – 30 TPD
- Poultry waste: 5 – 9 TPD
- Ideal for
- Dairy & Poultry Industries
- Tea estates
- Food Factories
- Slaughterhouses

Mid scale industries

**250 kVA**(a)
**Industrial · High-throughput · Centralised**

- Electrical Output: 200 kW (b)
- Daily Feedstock Requirement*:
- Food waste: 20 – 25 TPD
- Cow dung: 45 – 60 TPD
- Poultry waste: 10 – 18 TPD
- Ideal for
- Municipal sites
- Large estates
- Centralized food factories
- Slaughterhouses
- Mid/ Large scale industries
- Large dairy & poultry farms

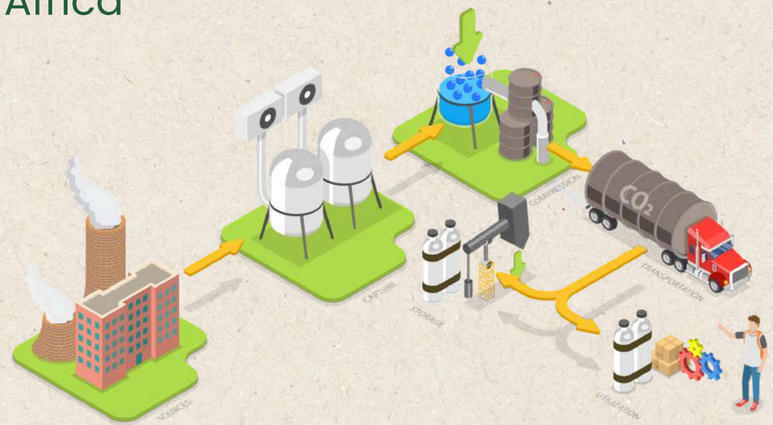
All packages include biogas generation, gas conditioning and power generation in an integrated system

# Waste Compatibility & Feedstock Flexibility

**Designed for Real-World Waste Conditions**

- Handles **mixed organic waste**
- Operates with **variable moisture content**
- No requirement for fine shredding
- Minimal pre-sorting required
- Suitable for seasonal waste variation

Designed for Uncontrolled, Real-World waste streams and mixed organic streams common in East Africa




**Compatible Organic Waste Streams (Typical)**

***Food & Market Waste:***

Cooked food waste · Vegetable & fruit waste · Market waste (mixed organic) · Hotel & canteen waste

***Agricultural & Animal Waste:***

Cow dung · Poultry litter / poultry waste · Dairy farm waste · Slaughterhouse organic waste

***Agro-industrial Waste:***

Tea dust / tea waste · Food processing waste · Organic factory residues

# Economics & Return on Investment

Power generation economics based on local electricity and waste availability.

### Cost of Electricity (Kenya – Indicative)

| Source | Cost |
|---|---|
| Grid electricity | ~ KES 28 / kWh |
| Diesel generator | ~ KES 40 / kWh |
| Biogas power (Liderorg) | ~ KES 8-12* / kWh |

### Typical Annual Savings

| | | |
|---|---|---|
| 50 KVA | Grid: | ~ KES 3.8 – 4.4 Million/year |
| | Diesel: | ~ KES 6.3 – 7 Million/year |
| 125 KVA | Grid: | ~ KES 9.5 – 11 Million/year |
| | Diesel: | ~ KES 15.75 – 17.3 Million/year |
| 250 KVA | Grid: | ~ KES 19 – 22 Million/year |
| | Diesel: | ~ KES 31.5 – 34.7 Million/year |

# Economics & Return on Investment

Power generation economics based on local electricity and waste availability.

## Typical Annual Savings & ROI in India

| Plant Type | Approx. Investment | Annual Savings/Revenue | ROI / Payback |
|---|---|---|---|
| Small Institutional (25–50 kg/day waste) | ₹3–8 lakh | ₹1–3 lakh/year | 2–4 years |
| Hotel / Hostel / Temple Plant | ₹10–25 lakh | ₹4–10 lakh/year | 2–3 years |
| Commercial Food Waste Plant | ₹25–75 lakh | ₹10–30 lakh/year | 2–4 years |
| Dairy / Gaushala Plant | ₹15–50 lakh | ₹5–20 lakh/year | 2–5 years |
| Bio-CNG Plant (2–5 TPD) | ₹4–12 crore | ₹1–5 crore/year | 3–6 years |

## Example – Bio-CNG Plant

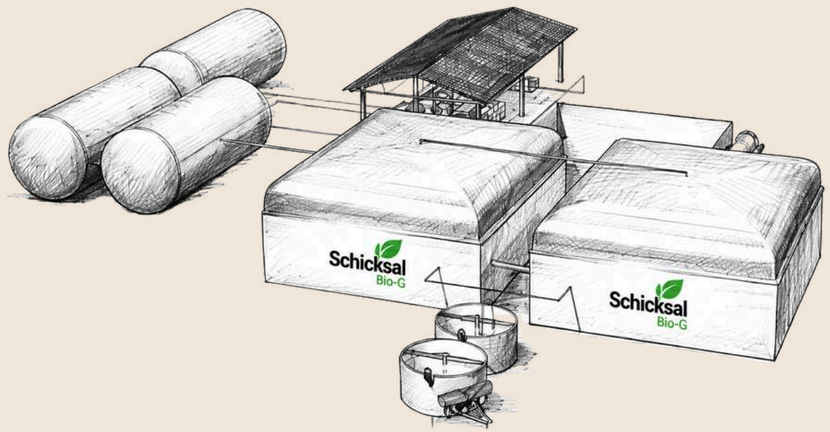
| Parameter | Value |
|---|---|
| Capacity | 5 TPD |
| Investment | ₹8–12 crore |
| Revenue | ₹14–15 crore/year |
| Operating Cost | ₹3–4 crore/year |
| Net Profit | ₹9–10 crore/year |
| Payback | 4–6 years |

## Example – Commercial Food Waste Biogas Plant

| Parameter | Value |
|---|---|
| Waste Input | 1 Ton/day |
| Plant Cost | ₹35 lakh |
| LPG Savings | ₹12 lakh/year |
| Manure Revenue | ₹2 lakh/year |
| O&M Cost | ₹3 lakh/year |
| Net Savings | ₹11 lakh/year |
| Payback | ~3 Years |

| Plant Size | **Payback Period for Diesel** | **Payback Period for Grid** |
|---|---|---|
| 50 KVA | **2.5 years to 2.7 years** | **4 years to 4.4 years** |
| 125 KVA | **2 years to 2.2 years** | **3.1 years to 3.6 years** |
| 250 KVA | **1.8 years to 2 years** | **2.8 years to 3.3 years** |

# Deployment, Operation & Support




**Modular Deployment**

- Skid-mounted and modular systems
- Factory-fabricated, site-assembled
- Suitable for phased expansion

Designed for local site conditions

**Operation & Maintenance**

- Designed for continuous operation
- Simple daily operation routines
- Periodic preventive maintenance
- Low operator skill requirement

Systems are designed to operate reliably under variable waste and operating conditions.

**Local Support & Training**

- On-site commissioning support
- Operator training at site
- Technical support through local partners
- Spares and service support availability

Local support provided through regional partners in India & Abroad..

Presented By SCHICKSAL. Engineering pvt ltd.

Schicksal Group
@schicksal BIO G

# Thank You


Call us :- +91-8700613321 | +91-9711453321
www.schicksalengineering.com
www.schiksalgroup.com
info@schicksalgroup.com

शिकसाल
Schicksal
Fortunate to Serve in Water Engineering
(ISO 9001:2015 Certified)

www.schicksalengineering.com

Schicksal Group

Sector 121, Main Pusta Road,
Near kali Mata Mandir, Noida 201301,India

+91-8700613321 | +91-9711453321

directorschicksalgroup@gmail.com
info@schicksalgroup.com

Prefab Compact STP | ETP | WTP | Commercial RO | ZLD | BioGas | Bio STP | Green Building | Fire Solution
Industrial Chemicals | Scrubbers | Ultra Filtration (UF) | DM-Water | Water Botteling Plants | Equipments
MEP DESIGN | CONSULTATION | FABRICATION | EPC | PROJECTS.