



**advaitaa**<sup>TM</sup>  
green energy

MBT



## VISION



यत्र योगेश्वरः कृष्णो यत्र पार्थो धनुर्धरः ।  
तत्र श्रिविजयो भूतिर्धुवा नीतिर्मतिर्मम ॥

“Where there is vision and acumen along with readiness to act with conviction; there would be fortune, victory, power & virtue.”



### Environmental

Closing the environmental cycle and producing renewable energy.

### Economic

Sustained financial performance using proven and competitive technology

### Social

Contributing to livelihoods, communities and the upliftment of the disadvantaged.



# TRANSFORMING WASTE INTO ENERGY



Dealing with garbage is one of the most complex problems we face today as our garbage is a combination of many different things. This includes paper, plastics, metals, glass, organic wastes and other miscellaneous trash.

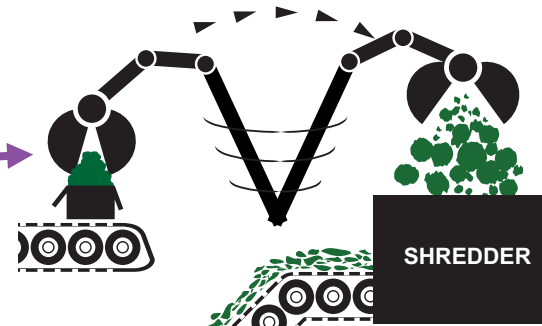
The garbage story begins when you and I throw something away...



A garbage truck collects the garbage, which it then transfers to a Advaitaa Green Energy Collection Centre.

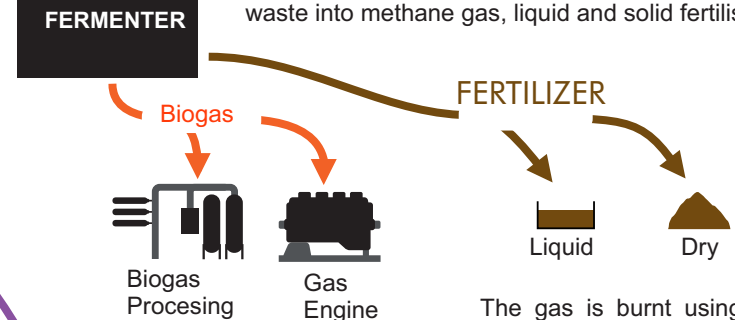


The garbage is sorted accordingly by Advaitaa Green Energy Waste Treatment Plant, into various streams. (Sections for glass, plastics, metals, paper and organic wastes)



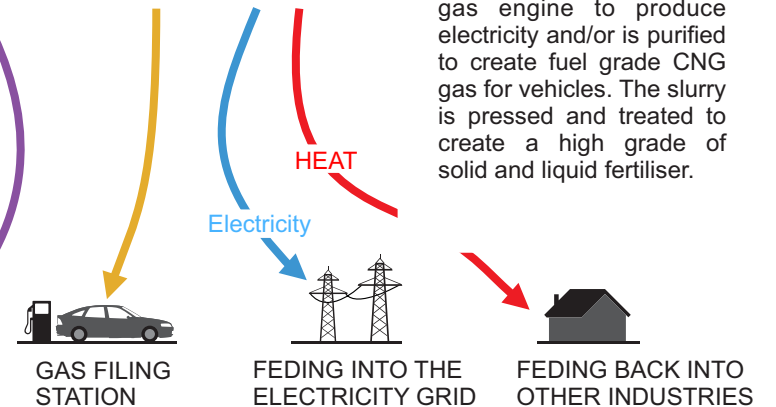
An automated crane lifts the organic waste into a bunker, any metals are removed and the organic waste is shredded for processing.

After shredding, the organic waste is put into a fermenter, where the bacteria breaks down the waste into methane gas, liquid and solid fertiliser.

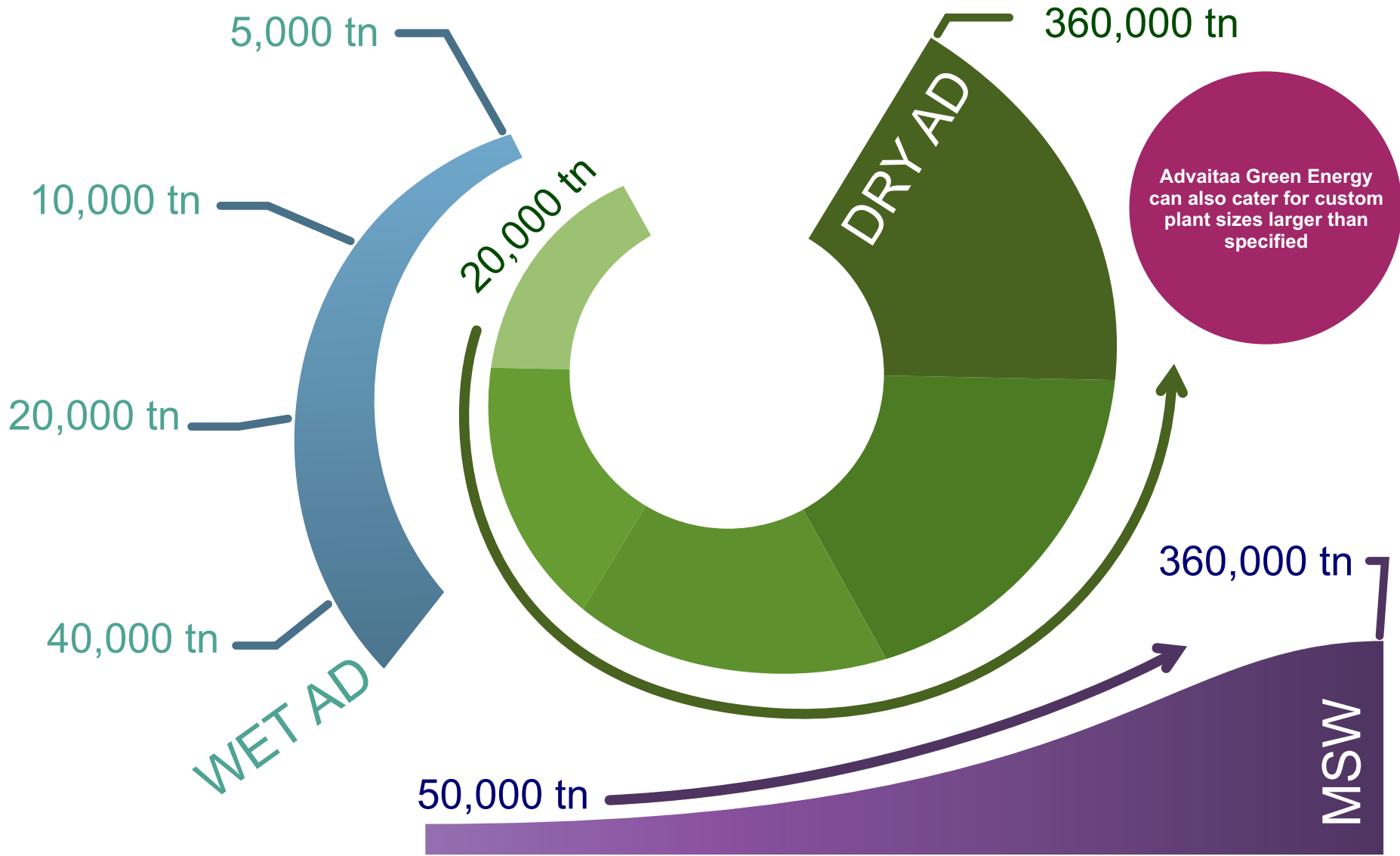


Biogas Processing Gas Engine

The gas is burnt using a gas engine to produce electricity and/or is purified to create fuel grade CNG gas for vehicles. The slurry is pressed and treated to create a high grade of solid and liquid fertiliser.



# ADVAITAA GREEN ENERGY KOMPOGAS PLANT CAPACITIES (PER ANNUM)







# CORE BENEFITS

## Agricultural Efficiency

Compost and liquid fertiliser generated can be incorporated back into the soil, reducing the depletion of soils. This “completes” the ecological cycle and saves on the use of chemical fertilisers.

## Reduced Air and Water Pollution

Lack of adequate sanitation is a cause of significant environmental and health issues.

Advaitaa Green Energy plants remove waste that is a cause of pollution and disease.

Exhaust fumes from the bio-waste fermenter are purified reducing odour by 95%.

The operating noise of a Advaitaa Green Energy plant is well below EU emission limits.

## Multi-Revenue Generation Model

Advaitaa Green Energy plants turn waste into profit through:

- Carbon Neutral Electricity.
- CNG (Compressed Natural Gas).
- High quality bio-digested solid and liquid fertilizers.
- Waste thermal energy to surrounding industries.

## Automated

The operations of the Plant are run on a computer system to enhance system operations and also lower operational costs

Systems can be monitored remotely if a wireless connection is available

## Reduced costs

Advaitaa Green Energy plants can reduce waste disposal costs for users, government and commercial bodies.

The modular structure of a Advaitaa Green Energy Plant enables us to add on components to an existing Advaitaa Green Energy plant easily and efficiently.

For a 100,000 tonnes/annum (t.p.a) plant land space of 0.7 hectares is required.

## Proven Process

Over 100 MBT Plants in operation around the world

Patented technology, process and a pioneer in the world of Municipal Solid Waste separation and Dry Anaerobic Digestion.

Plants that have been constructed to-date have processing capacities between 20,000t.p.a and 300,000t.p.a. The largest plant is in Doha, Qatar.





# WASTE TREATMENT PLANT

## Separation of MSW Waste

Advaitaa Green Energy Waste Treatment Plant is an automatic separation system that can separate household waste into 5 types of materials: organics, plastics, ferrous metals, combustibles and inert materials.

With Advaitaa Green Energy dry or wet Anaerobic Digester systems, Advaitaa Green Energy can transform organic waste derived into electrical energy, biogas, heat energy and high grades of organic solid and liquid fertilisers.

Advaitaa Green Energy can also couple this with a waste water treatment plant.



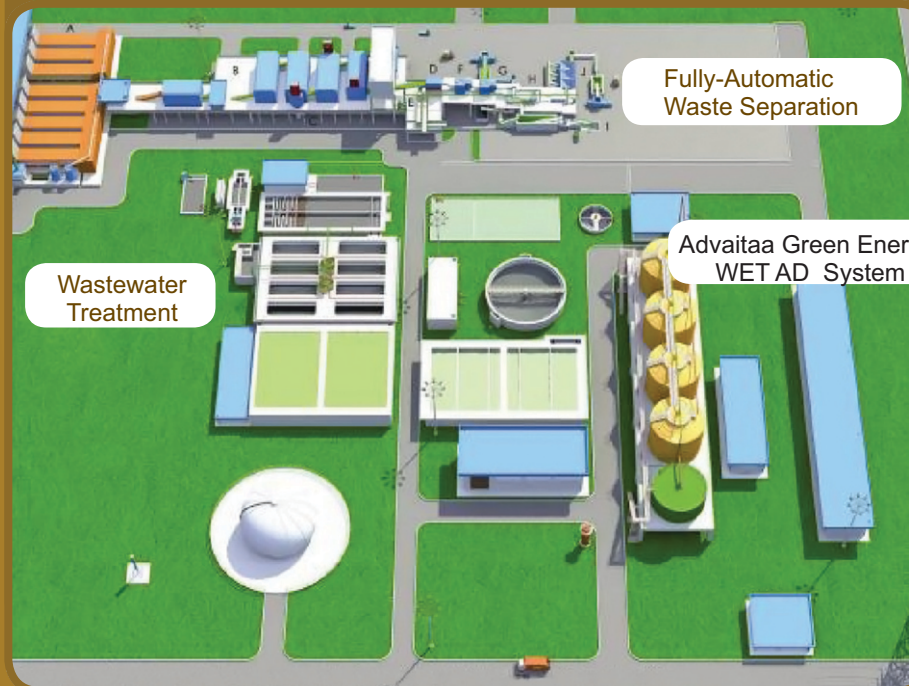
### Key Benefits:

- Near 100% recycling of waste which otherwise goes to landfill or incinerators
- Reduces volume of waste to be dumped and preserving the required land fill volume
- Reduces the biological activity of organic fractions and thus minimizes the amount of methane gas escaping into the environment
- Modular, standardized machine designs reduces construction times
- Options for producing different recycled products; thus maximizing the market values of the products in different countries

### Advaitaa Green Energy facility Compatible Waste:

Advaitaa Green Energy Waste Treatment Plant can process only household wastes. Any other wastes containing construction waste, industrial waste, chemical waste, dangerous waste, medical waste and/or bulky waste cannot be fed into the system.

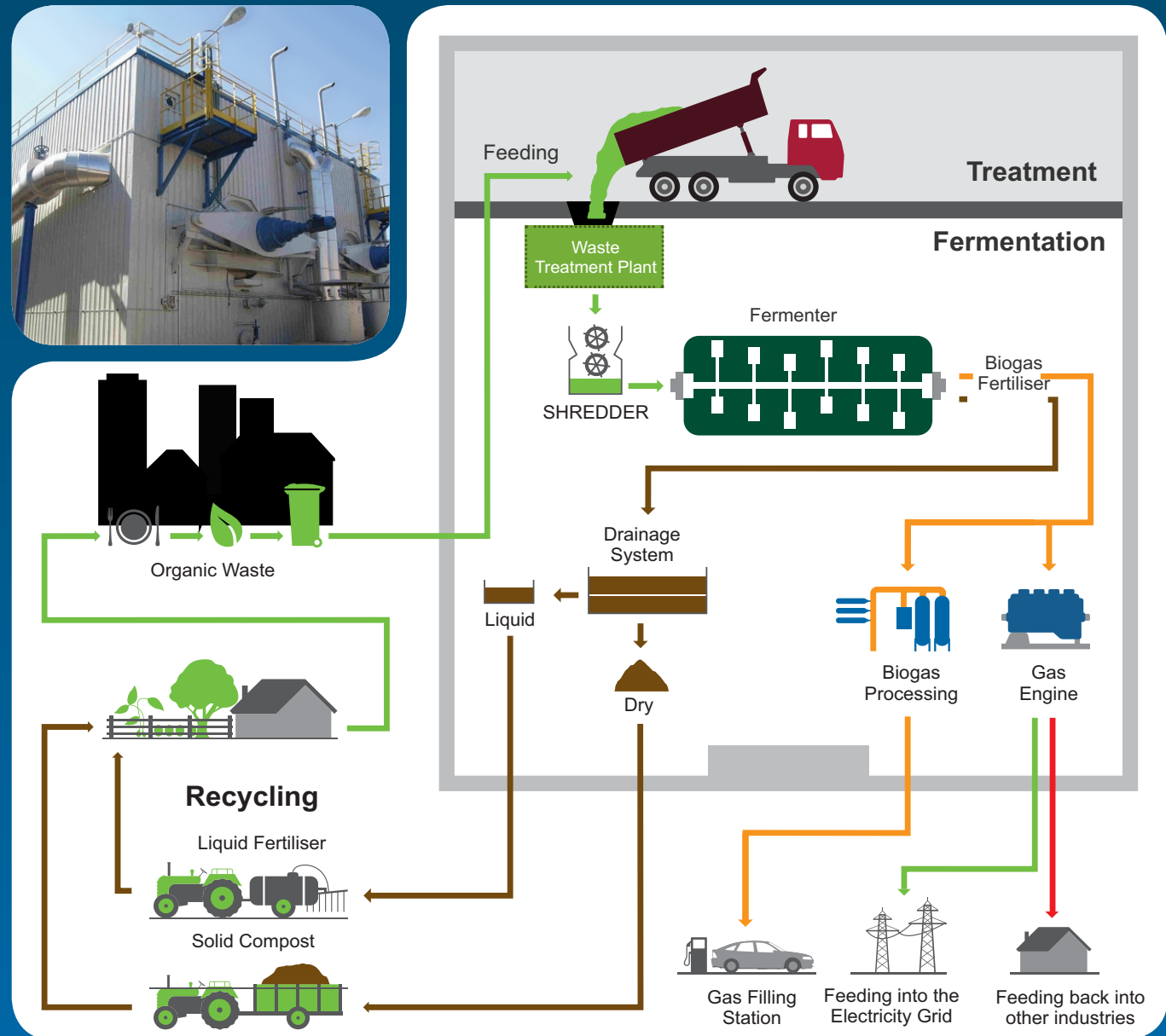
### OVERVIEW OF A WASTE TREATMENT PLANT



# DRY AD SYSTEM

Dry Anaerobic Digestion  
Turn-Key System

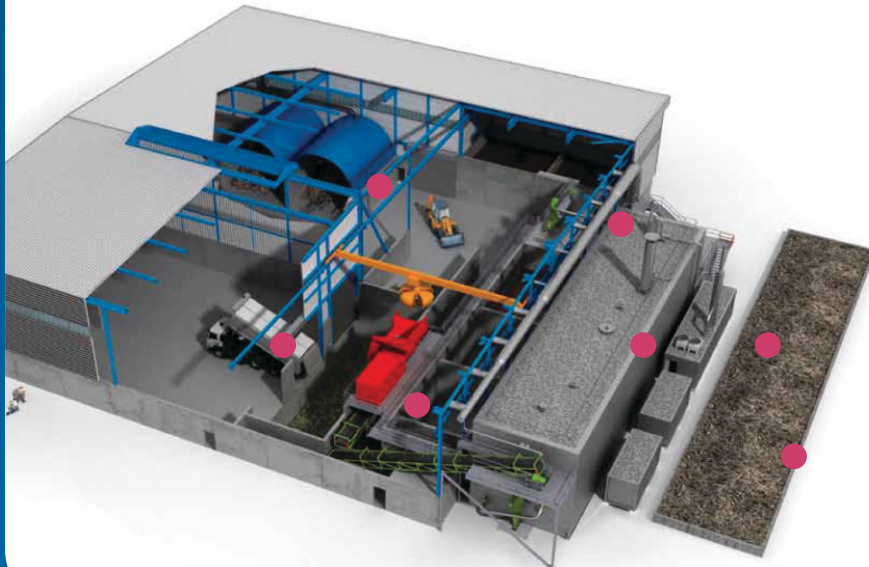
The biogas produced from Advaitaa Green Energy Dry AD system can be used to generate heat, electricity or both. This last option, combined heat and power (CHP) mode, is the most common. The electricity that is generated by the gas engine can be supplied to the electricity grid. The heat is utilised by the digester and the excess heat can be used by surrounding industries.



## System Description

72,000 tonne/ annum

- 8.7 million Nm<sub>3</sub> of Biogas, or 19,198 MW of green electricity/ annum
- 21,598 MW of heat energy / annum
- 25,200 tonnes of solid fertiliser/ annum
- 32,400 liquid fertiliser/ annum
- < 7,000 sq meter (< 0.7 hectare) Footprint



### Key Process Benefits:

- Guarantees environmentally friendly recycling of biogenic waste
- Generates significant quantities of energy
- Yields both energy and rich compost / liquid fertiliser
- Metals and plastics are sorted during the initial stage
- No odour emissions from fermentation
- Compact, low space requirements
- Produces carbon neutral fuel and energy

### ADVAITAA GREEN ENERGY FACILITY COMPATIBLE ORGANIC WASTE:

#### Green waste:

- Grass cuttings / tree clippings
- Mixed plant residues
- Mixed garden waste
- Cemetery waste
- Cutting from embankment mowing and fallen leaves

#### Domestic Waste:

- Vegetable and fruit waste
- Food preparation waste
- Food waste

#### Commercial and industrial waste:

- Foodstuffs industry
- Waste from food preparation

#### Other organic waste:

- Algae, grease trap wastes



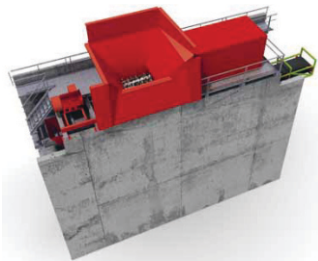
### 1. Deep bunker with crane

The collected organic waste is deposited in the deep bunker, passing an odour airlock. Sensors register the different materials and an automatic crane conveys the waste to be shredded and filtered. The combined system allows for automatic loading of the plant for 24 hours.



### 2. Shredder with filter

The shredder cuts the waste to a maximum particle size of 60mm for fermentation. Larger particles are filtered out and returned to the deep bunker. The processed substrate is then weighed and conveyed to the fermenter.



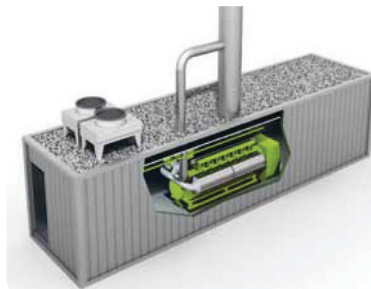
### 3. Fermenter

A fermentation reactor is the centrepiece of a Advaitaa Green Energy plant. Microorganisms ferment the organic waste in the fermenter. This process produces CO<sub>2</sub>-neutral biogas. The microorganisms work anaerobically, i. e. without the presence of oxygen. They are also thermophilic and work best at higher temperatures. The fermenter works at a temperature of 55° C and along with a fermentation time of 14 days ensures that the waste is free of germs and spores.



### 4. Power Station

The biogas from the fermenter is used to generate heat and electricity in combined heat and power plants (CHP). It can also be fed into the gas network. A small amount of the generated heat is used for heating the fermenter. Most of the residual heat can be distributed to other industries.



### 5. Press

The residue extracted from the fermenter is called the fermented product. A screw press separates it into solid and liquid components. After sieving, the solid fermented product is used in agriculture as a fertiliser and soil improver. The liquid component can also be used as an organic fertiliser.



### 7. Biofilter

The Advaitaa Green Energy plants are closed systems preventing unwanted emissions. The processing of organic waste generates process-dependent odours but to prevent these from escaping into the environment, exhaust emissions are extracted and cleaned in a biofilter.

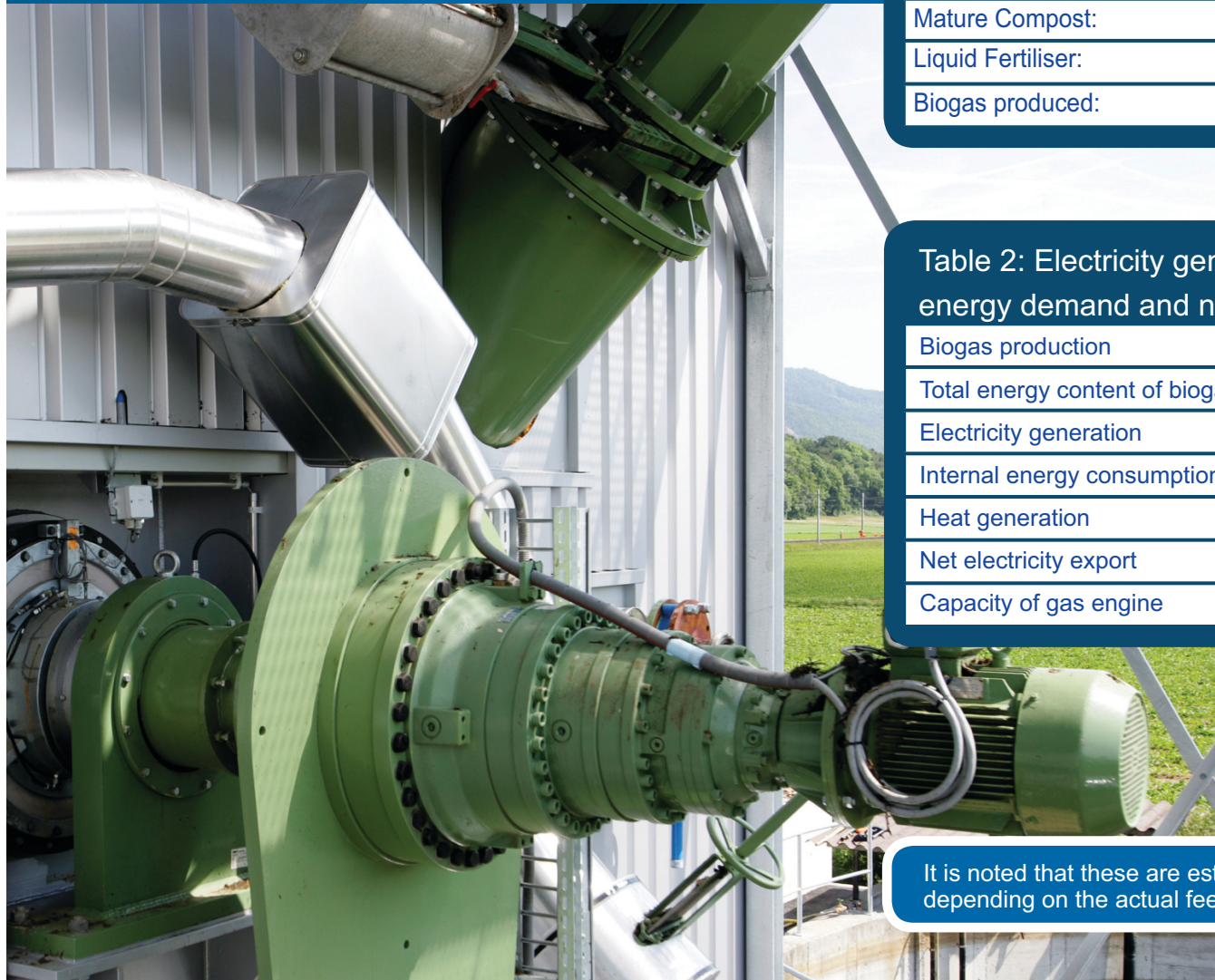


### 6. Tunnel Post Rotting

The solid fermented product can be further processed if desired. This refines the fermented product into compost using a closed, pressure-ventilated reactor process (tunnel rotting) stabilized with oxygen (aerobic).



# Dry AD 72,000 tonne System Fact Sheet



**Table 1: Mass Balance**

Fermenter Input:	72,000 tonnes / year
Fermenter Input / day:	197 tonnes / day
Mature Compost:	25,200 tonnes / year
Liquid Fertiliser:	32,400 tonnes / year
Biogas produced:	8,710,800 Nm <sup>3</sup> / year

**Table 2: Electricity generation, energy demand and net electricity export**

Biogas production	8,710,801 Nm <sup>3</sup> /yr
Total energy content of biogas	45,259,869 kWh/yr
Electricity generation	19,198,606 kWh/yr
Internal energy consumption	370,000 kWh/yr
Heat generation	21,598,431 kWh/yr
Net electricity export	19,198,606 kWh/yr
Capacity of gas engine	2100 kWh

It is noted that these are estimates which may change slightly depending on the actual feedstock composition.



# design engineering consulting



## DESIGN

Global climate change presents both challenges and opportunities. We tackle it head on by transforming waste into resources. Call it integration at the highest level. Our eco-designs integrate the use of recycled construction materials, greening technologies, efficient water recycling systems, solar power, electric and biogas powered transport and creation of landscapes that attract biodiversity.

## ENGINEERING & CONSULTING

Advaitaa Green Energy has considerable expertise in putting together waste management solutions tailored to our customer's needs. We understand that every community and project is different. Be it analyzing your local waste market, customizing a Waste Treatment Plant (WTP) or putting together a dry or wet Anaerobic Digester (AD) system, we can provide turnkey solutions.

Through our partners, we also offer high performance greening solutions like vertical green walls and rooftop gardens, solar parks, etc. There's so much to engineering when it goes hand in hand with design!

Advaitaa Green Energy offers the following Engineering and Consultancy services:

- Feasibility Studies
- Construction of dry / wet Anaerobic Digester (AD) systems
- Construction of Waste Treatment Plants
- Implementation of Solar Parks, Bio Fuel Plants / CNG systems
- Implementation of Vertical Green Farms
- Design and Development of Turn-key Eco-City Projects (Amoeba Project)
- Operations and Maintenance
- Engineering Designs
- Inspection and Reporting
- Project Management
- Maintenance Audits
- On-Site Inspections



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