

NEW HORIZONS WASTE TO ENERGY

ATHLONE MUNICIPAL AND
ORGANIC WASTE to ENERGY



VISION

Going **Zero to Landfill**.

Converting **Waste to Energy**.

Improving **Social and Environmental Resilience**.



PROJECT OBJECTIVE

- Produce **bio-CNG** for sale as gaseous fuel
- Produce **food grade liquid carbon dioxide**
- Produce recyclable **plastic, paper, metal and glass**
- Produce Refuse Derived Fuel (**RDF**)
- Produce **organic fertiliser**
- All from **organic and Municipal Solid Wastes**



HISTORY

Project originally developed by **Farm Secure**
Obtained by Clean Energy Africa (CEA) **7 years ago**
JV formed by **CEA** and **Waste Mart**

Waste Mart is waste contractor using 88 Trucks to collect general waste on a daily basis all over Cape Town

Project is **PRIVATELY** developed and project financed with debt from the **IDC**.

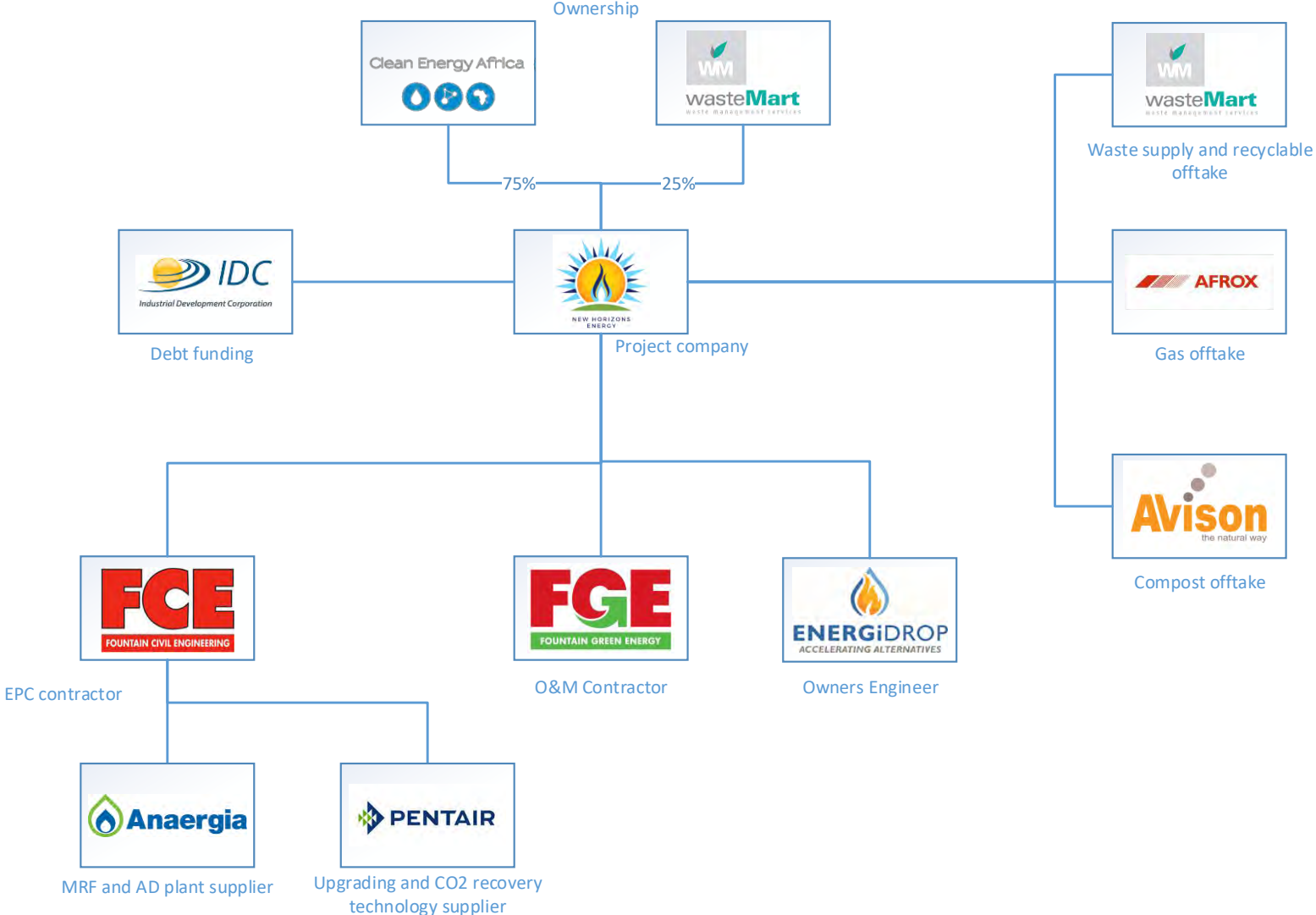


REGULATORY HURDLES

- ✓ Environmental authorisation for digestion
- ✓ Electricity production - NA
- ✓ Waste management license
- ✓ Fertiliser production – testing and certification
- ✓ Major Hazardous Installation registration
- ✓ Road transport of compressed gasses
- ✓ Registration as a biogas producing site with NERSA



PROJECT STRUCTURE



The Project Team



New Horizons Waste to Energy
Project Owner

Owned by Waste Mart and Clean Energy Africa



Waste Mart
Waste Supplier

Waste Mart is a 30 year old waste management contractor based in Cape Town and is contracted to supply the waste to the plant



Fountain Civil Engineering
EPC Contractor

The long term technical partner of the project and main turnkey Engineering , Procurement and Construction contractor for the project.



Fountain Green Energy
O&M Contractor

Subsidiary of Fountain Civil Engineering who are the EPC contractor on the project

The Offtakers



Avison
Compost offtaker

Owned by Waste Mart and
Clean Energy Africa



Afrox
Gas offtaker

Subsidiary of Fountain Civil
Engineering who are the
EPC contractor on the
project



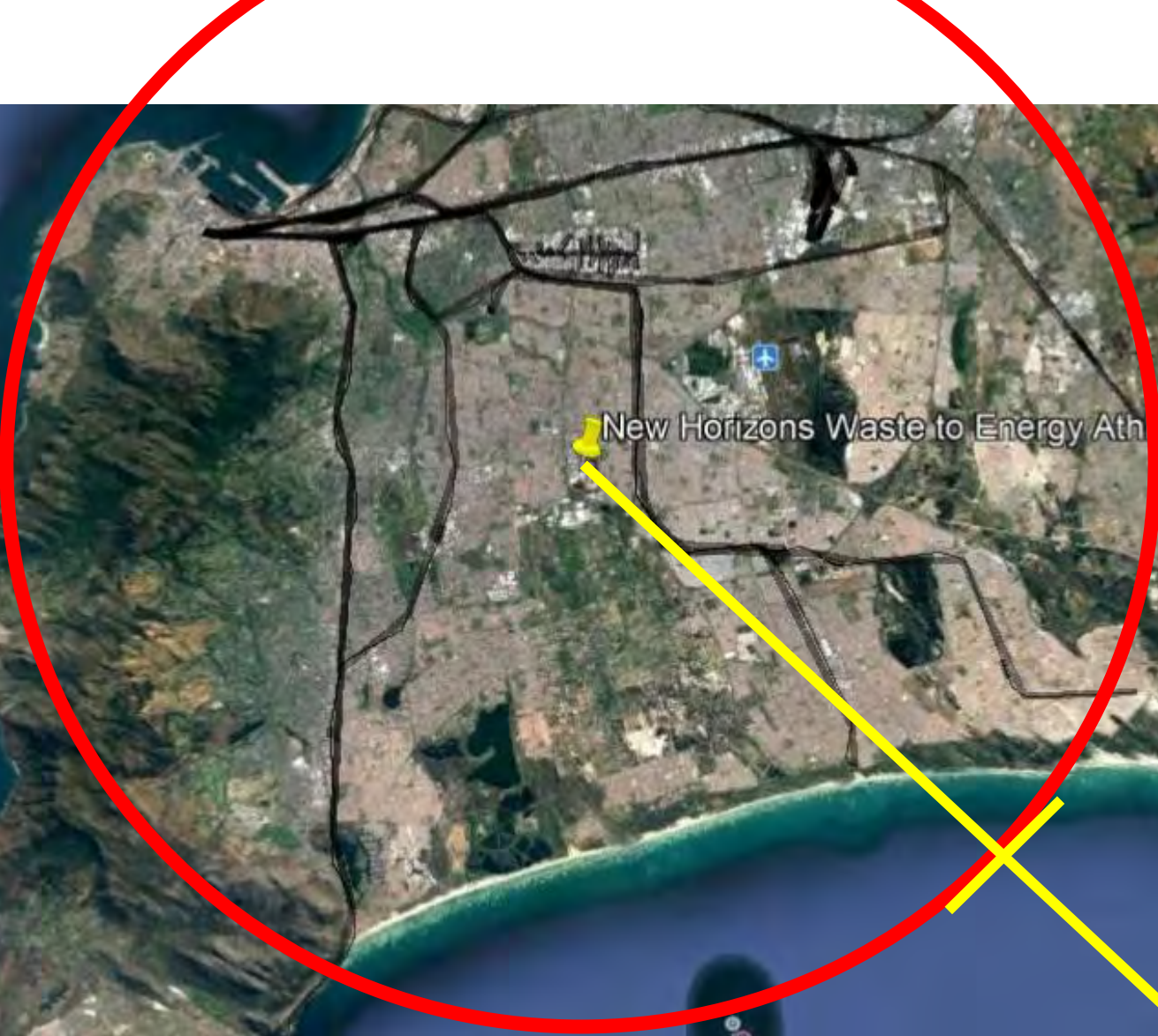
Waste Mart
Recyclable offtaker

Waste Mart is a 40 year old
waste management
contractor based in Cape
Town and is contracted to
supply the waste to the
plant



TBD
RDF offtaker

Cement kilns and thermal
project under
development. Currently
landfilled or stored



New Horizons Waste to Energy Athlone

17 km radius





NEW HORIZONS
ENERGY



Electricity vs Gas use

- Electricity
 - Generation license required over 1 MW
 - Energy sale price of 61.47 c/kWh in CoCT
 - REIPPP risks and process (100c – 77c/kWh)
- Technology choice
 - Thermal – heat, steam and electricity
 - MBT and AD – recyclables, commodity chemicals, solid fuel and compost
- Waste value dependencies
 - Calorific value
 - Putrescible organic concentration
 - Contamination



Electricity vs Gas use

- 1 Nm³ of biogas at 60% methane is 20 MJ or 5,6 kWh
- Conversion to electricity only converts 39% of this into usable energy. 1 Nm³ = 2.2 kWh.
- CHP allows for up to 85 % recovery
- 1 Nm³ of biogas equals
 - CH₄ = 0.02 GJ = 0.43 kg
 - CO₂ = 0.74 kg
- With a processing cost this can be converted into products that are worth more than the income through electricity sales.



Electricity vs Gas use

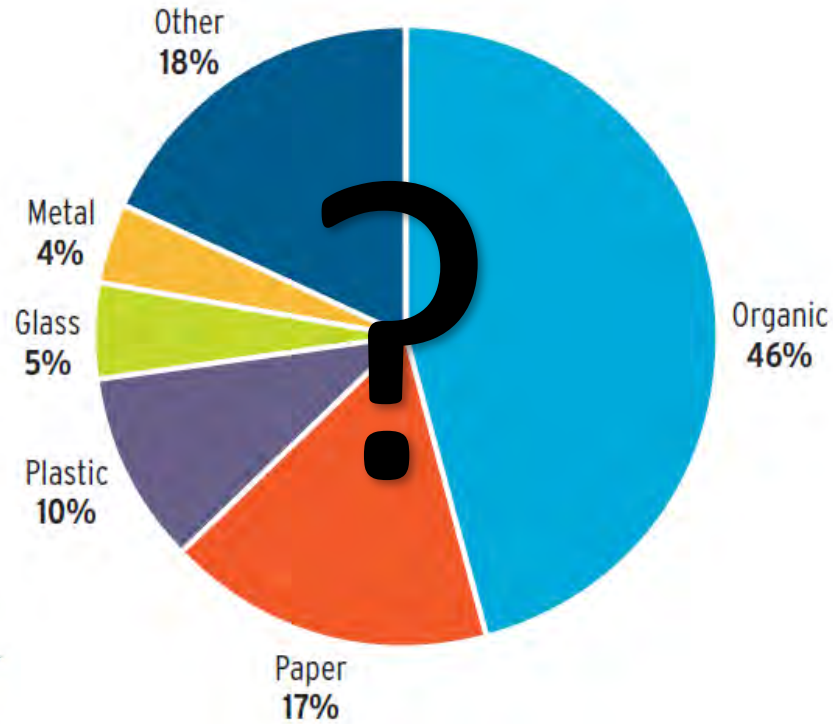


Commodity	Price	
Parafin	R233	R/GJ
LPG	R396	R/GJ
Electricity	R214	R/GJ
Natural gas	R160	R/GJ
Diesel	R349	R/GJ
Solid Fuel	R28	R/GJ
Charcoal	R120	R/GJ
Coal	R31	R/GJ



Inputs

- 480 tons of MSW and WTW per day.
- 63 tons of POW per day



World Bank international average



Income



- Waste tipping fees 40-50% of income



- Sales of gasses 35-45% of income
- Other 5-10%
 - Organic Fertiliser
 - Recyclables



Products

Organic fertiliser

- Degraded food material to form a compost like product.
- Dewatered to ~30% solids.
- 100 tons per day produced.
- Analysed on a frequent basis for macronutrients, micronutrients and contaminants.
- Perfect for soil remediation and lawn farming



Products

Bio CNG

- Compressed to 250 barg
- >95% methane
- Moved from site with compressed gas trailers
- Pressure reduction at clients for thermal use



Products

CO₂

- EIGA standard 99.998% CO₂
- 24bar, -17 deg C
- Bulk buffer storage capacity
- Used for dry ice, industrial cleaning, & refrigeration



 **AFROX**



Products

Recyclables

- Glass, Metals, Plastics, Cardboard and Paper – cleanliness is important



Products

Solid fuel - RDF

- Higher calorific value than unsorted MSW
- Reduced organics, metals, bulky material
- Mostly unrecyclable plastics, textiles and paper



Produces 100 tons organic fertiliser per day

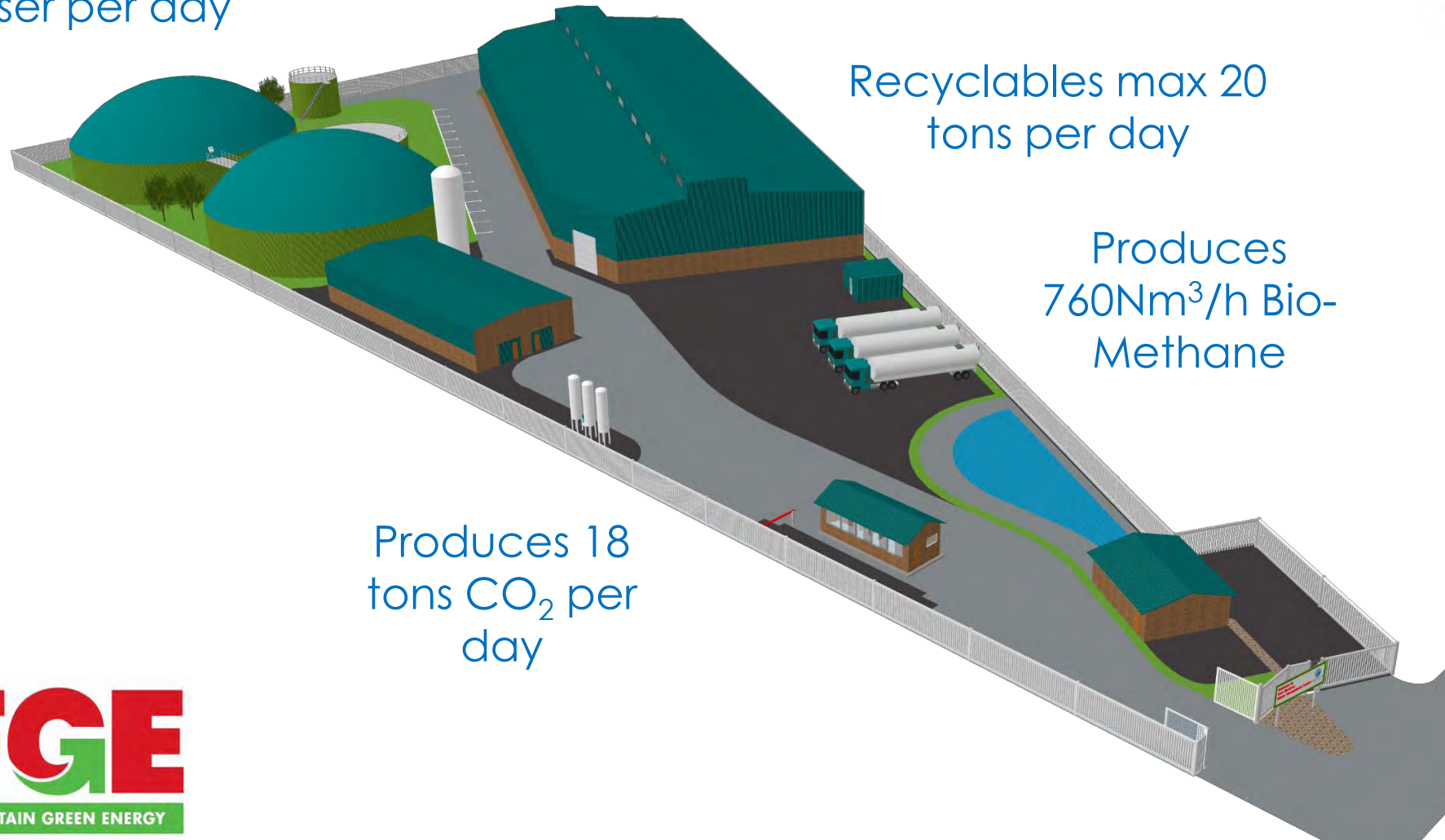
RDF solid fuel – Up to 200 tons per day

Recyclables max 20 tons per day

Produces 760Nm³/h Bio-Methane

Consumes 600 tons of waste per day

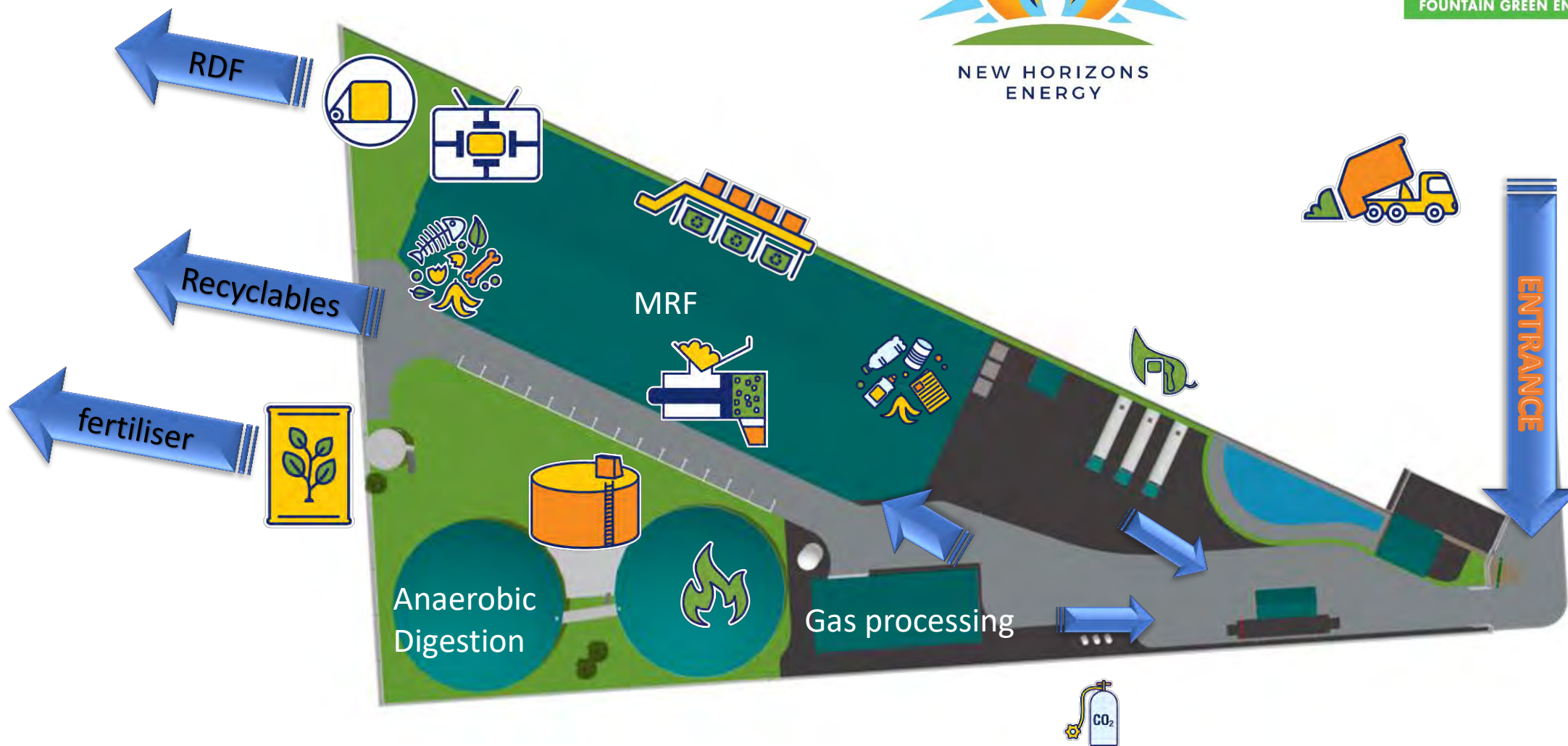
Produces 18 tons CO₂ per day







Plant sections















NEW HORIZONS
ENERGY

Project Timeline



Opportunity

Based on preliminary waste characterisation information and market pricing for commodities the opportunity is identified in 2010

Development

EIA's, offtake agreement negotiations and site visits to reference technologies are undergone.

Contracting

Contracts finalised with off-takers, suppliers and contractors

Construction

24 month construction window including tests after completion

Commissioning

As part of commissioning digester seeding, waste management optimisation and offtake initiation unveils some need for optimisation

Operations

Long term production for >20 years



Q&A

