

# Watrec

Waste to Energy Solutions

FRUSH

18.9.2019

*Biogas trends in Finland*



# Watrec

## Full Service Biogas House

*Finnish company providing waste to energy solutions, especially to organic waste treatment*

Designing and  
Constructing Plants



Consultancy



Operation and  
Aftersales



Watrec



## A little bit of history

Watrec was founded in 2003 as a consultancy company. Watrec has participated to multiple projects in different roles, starting from the project manager, and all the way to plant operation. During the years, Watrec has gained experience from all the different stages of biogas plant's life.





# History

Watrec foresaw that Finland will see lots of biogas projects in the future. Due to the experience from consultancy, Watrec was able to develop own plant solution.

In 2009, Watrec started the Finland's first privately financed biogas plant, VamBio. The project was the first BOO-project for Watrec.

Since 2009, Watrec has developed to be the market leader in Finnish biogas sector.





YEAR  
2003

The company is founded,  
and the first industrial-  
sized biogas plant project  
begins



YEAR  
2009

First BOO-project in  
Finland, VamBio Ltd.  
(Build-Own-Operate)



YEAR  
2006

Sitra joins the company with  
the purpose of developing  
the consultation firm into  
technology delivery business





YEAR  
2012

Cooperation with a private equity fund, which bought the VamBio Plant and ordered four new turnkey-deliveries.



YEAR  
2018

The first international design projects.



YEAR  
2016

A network of biogas plants was ready in Finland.







# Watrec in Finland

Wastewater Treatment Sludge	100 000 tn/a
Organic Waste From Food Industry	80 000 tn/a
Industrial Sludges	96 000 tn/a
OFMSW	40 000 tn/a
<b>TOTAL</b>	<b>316 000 tn/a</b>
Biogas Production	175 GWh/a = 20 MW
Recycled Phosphorous	> 500 tn/a
Recycled Nitrogen	> 1 500 tn/a
<b>Investment</b>	<b>50 MEUR</b>





# Watrec in Finland

1 960

GWh

of Renewable Energy



556k

tons

of reduced CO2 emissions



4.2 mil

tons

of treated waste



4 648

households

receives electricity  
annually



17 525

vehicles

receives fuel annually





2003

## Reference Plants

---

Watrec has built a network of biogas plants in Finland. The plants treat annually over 300 000 tn of biodegradable waste and produce over 20 MW of energy.



2004-  
2005

## Vehmaa

- The first centralized biogas plant in Finland
- Capacity: 120 000 tn/a | 4 MW
- Different consultancy works for Watrec
  - Plant Design
  - Environmental Impact Procedure
  - Project Management
  - etc.
- Investment: 6,5 million €



2008

## Topinoja Biogas Plant

- Capacity: 90 000 tn/a | 4 MW
- EPC Contract + Automation Supply
- Materials:
  - Sewage Sludge
- Investment: 9,0 million €





2009

## VamBio

- First privately financed biogas plant in Finland
- Watrec's first turnkey project
- Capacity: 60 000 tn/a | > 3 MW
- Materials
  - Sewage Sludge
  - Food Industry Waste
  - Agriculture waste
- Investment: 7,5 million €



2014

## Kuopio Biogas Plant

- Capacity: 60 000 tn/a | > 3,5 MW
- Turnkey Project
- Materials:
  - Sewage Sludge
  - Organic Waste
- Investment: 8,5 million €



2014

## Honkajoki Biogas Plant

- Capacity: 60 000 tn/a | > 3,5 MW
- Turnkey Project
- Materials:
  - Animal by-products
  - Organic Waste
  - Turnkey Project
- Investment: 9,0 million €.



2015

## Oulu Biogas Plant

- Capacity: 19 000 tn/a | 1.8 MW
- Turnkey Project
- Materials:
  - Sludge
  - organic waste
  - food industry waste
- Investment: 8,0 million €





2016

## Riihimäki Biogas Plant

- Capacity: 75 000 tn/a | 6 MW
- Turnkey Project
- Materials:
  - OFMSW
  - Sludge
  - Food Industry Waste
- Investment: 14,5 million €



2017

## Expansion of Oulu BGP

- Capacity expansion
  - 19 000 tn/a -> 60 000 tn/a
  - 1.8 MW -> 4 MW
- Turnkey Project
- Investment: 1,2 million €





2018

## Sulkavuori wastewater treatment plant

- Complete engineering work for sludge management
- Largest inland wwtp in Nordics



2019

## Mäntsälä biogas plant

- Capacity: 20 000 tn/a | 2 MW
- Turnkey Project
- Materials:
  - Biowaste
- Investment: 12 million €





2020

## First plant in Asia?

---

Watrec has designed couple of plants to Vietnam but has not yet built own plant.



# Why to choose biogas?

All the organic waste from different sources goes into the same process, which treats them simultaneously. Reliable and efficient operation enables a profitable investment.

**ECONOMIC**  
Turning waste into profit.



**ECOLOGIC**  
Significant reduction on greenhouse gas emissions.



**EFFICIENT**  
Cost-efficient and reliable solution.







# Why Watrec?

## FLEXIBILITY



- Customized solutions
- Upgrading possibility
- Co-digestion

## FEASIBILITY



- Construction schedule guaranteed
- Cost efficiency
- High biogas production rate

## RELIABILITY



- 100% automation
- 24/7 operation
- <2% downtime
- Operation does not stop while maintaining

## SCALABILITY



- Biogas plants chain
- Capacity upgrading



# Why Watrec?

## Economic

At a biogas plant, waste can be turned into renewable energy and to profits. Meanwhile solving our clients' waste-related problems, we are able to produce extra revenue streams. Watrec's state-of-art technology allows converting waste into valuable resources that can provide a competitive advantage.

## Ecologic

Without proper treatment organic waste causes greenhouse gas emissions. Watrec's biogas technology will reduce these emissions significantly. While managing the waste problem for the client, we produce clean energy and therefore mitigate the climate change and reduce emissions to the environment.

## Efficient

Biogas process is an efficient way to generate extra revenue from organic waste. Our flexible solutions and services allows to combine multiple feed materials and to scale the capacity to meet the customer needs. We can also help to enhance the efficiency of a biogas plant's operation.





# TRENDS IN FINNISH BIOGAS

More and more the attracted materials are:

- Organic fraction of municipal solid waste (OFMSW)
- Manure

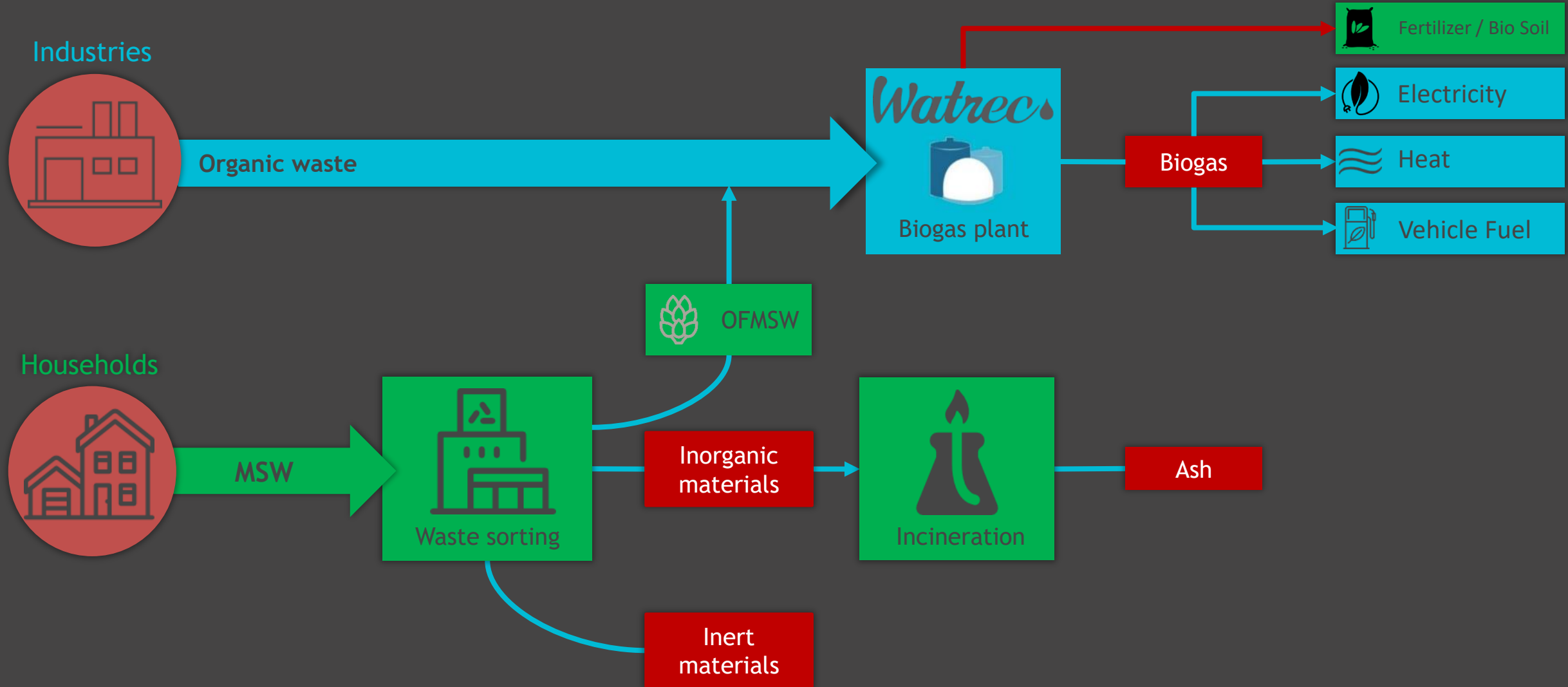
That is, two characteristically very different streams and with huge difference in the treatment principles.

OFMSW 'steals' the incineration capacity (very poor energy potential in incineration due to high water content).

The challenge with manure is economical – the income from the biogas is still too low to enable the digestion of manure.



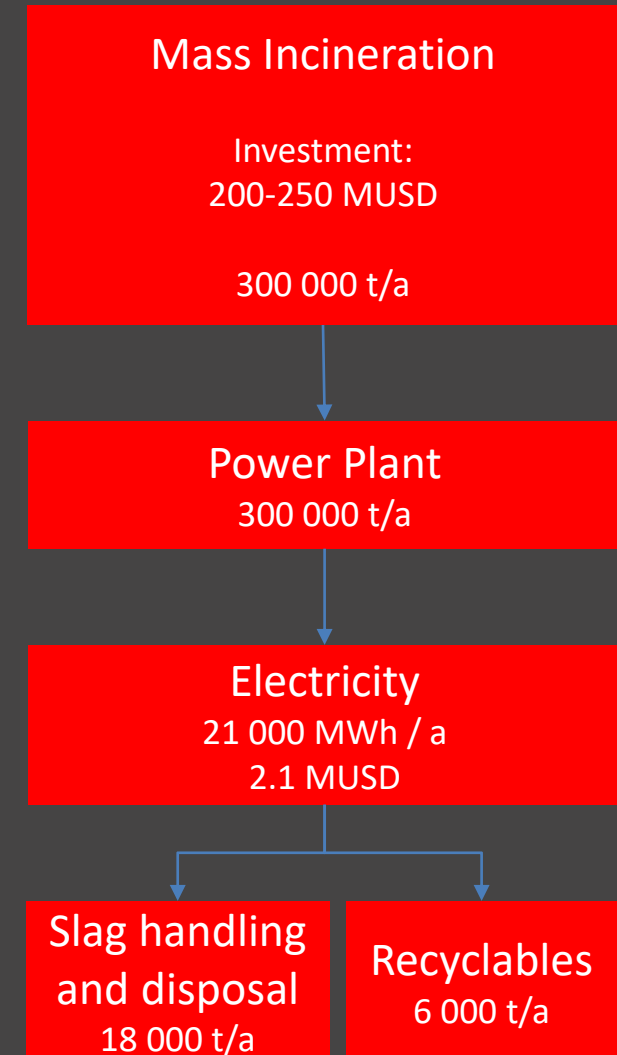
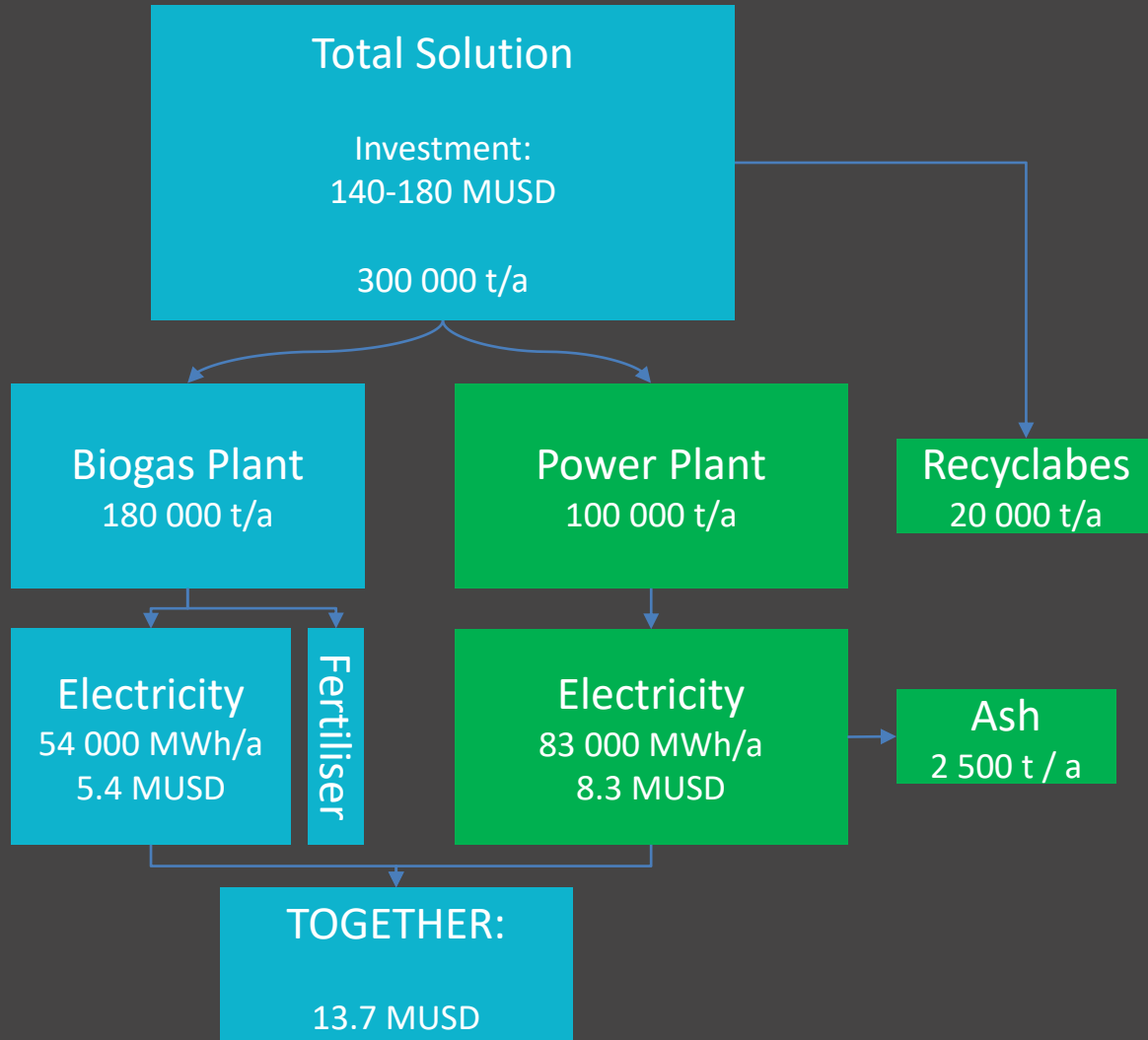
# Total Solution for Municipal Solid Waste





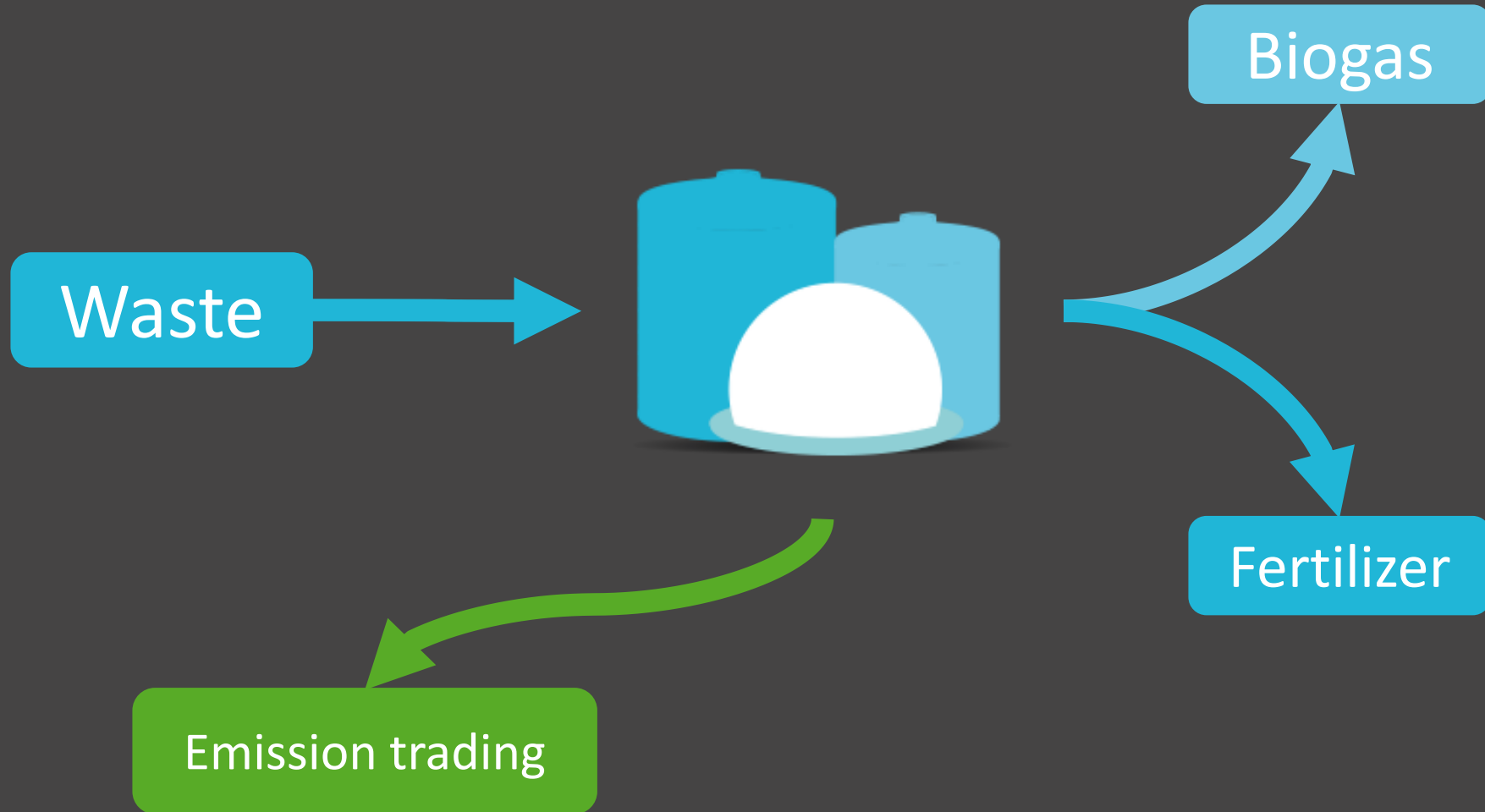


# Comparison of two main methods in waste treatment





# Business Model of Biogas Plant





# Watrec

Waste to Energy Solutions

THANK YOU!

