WASE

BFBi X SDT symposium

# Effluent Treatment Opportunities

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We believe in building a sustainable world where our most precious resources are valued and protected.

# Dairy wastewater challenges

- High volume of wastewater (white waters, permeate etc.) & organic waste produced in production processes
- High-cost effluent disposal
- High energy running costs
- High thermal energy demand
- Difficulty disposing of high-strength waste
- Desire to be more sustainable
- Slurry management and emission challenges

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# Typical dairy wastewater treatment options


1. Disposal to sewer of low-strength wastewater
2. Collection of solids/liquids by tanker for off-site treatment
3. Slurry pits & land spread
4. Onsite anaerobic digestion & land spread digestate

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# What is the *utopian* solution?

- Treats all bio-residues on site.
- No additional land required
- Scalable
- Provides bioenergy for site energy requirements
- Dispose clean water locally
- Reduces carbon impact and transport emissions
- Lowers operating costs
- Increases profitability

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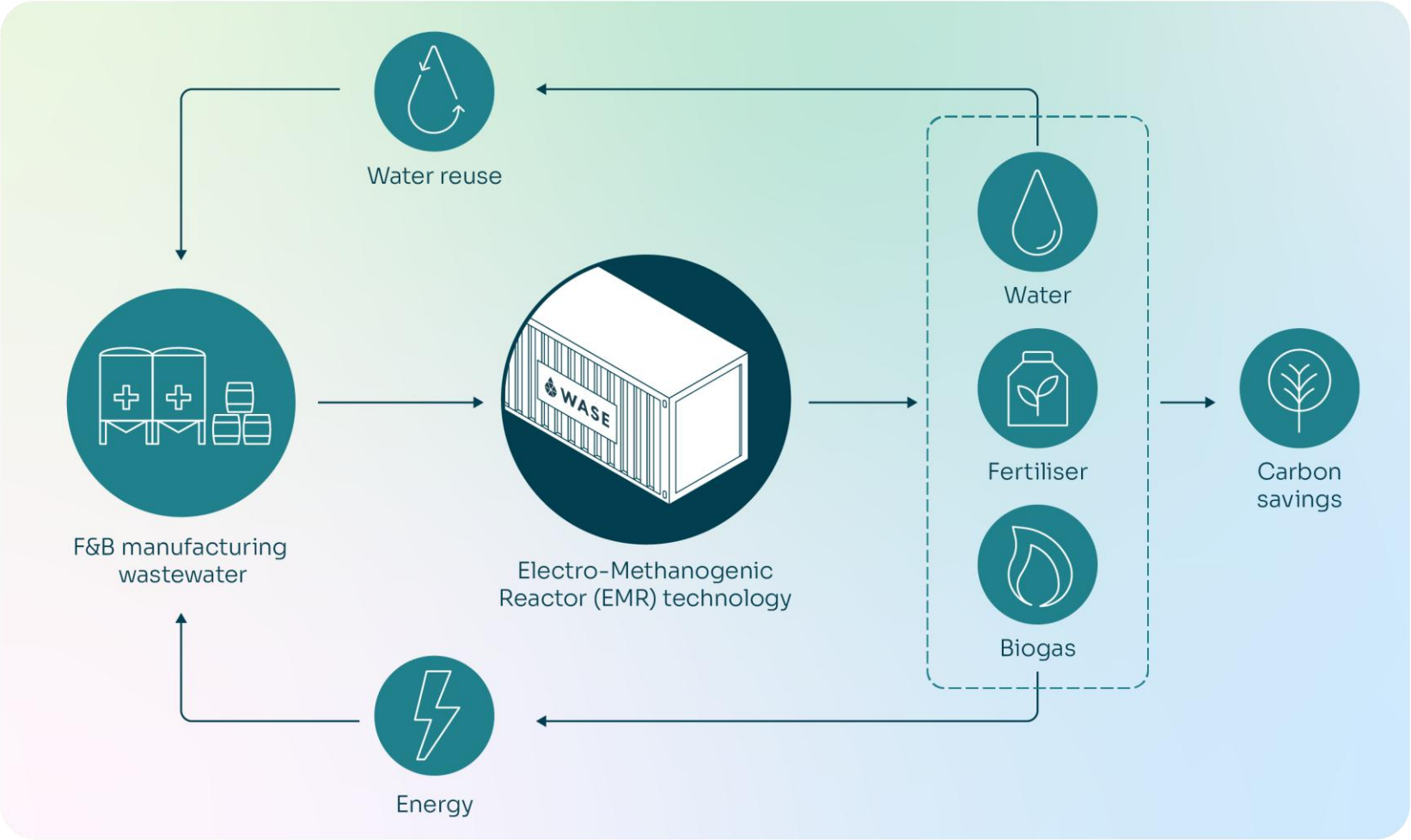
# Our value proposition




1. Treats wastewater on-site
2. Generates sustainable bioenergy
3. Meets regulatory requirements
4. Reduces carbon
5. Smaller footprint
6. Scalable & modular
7. Remote control and optimisation

# What does the industriWASE do?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**A modular WASE waste reactor is a plug and play installation, treating waste directly from source.**

- Generates high-grade biogas
  - Methane content: 70-85%
- Removes <95% of COD
- Easy operation through AI and biosensing


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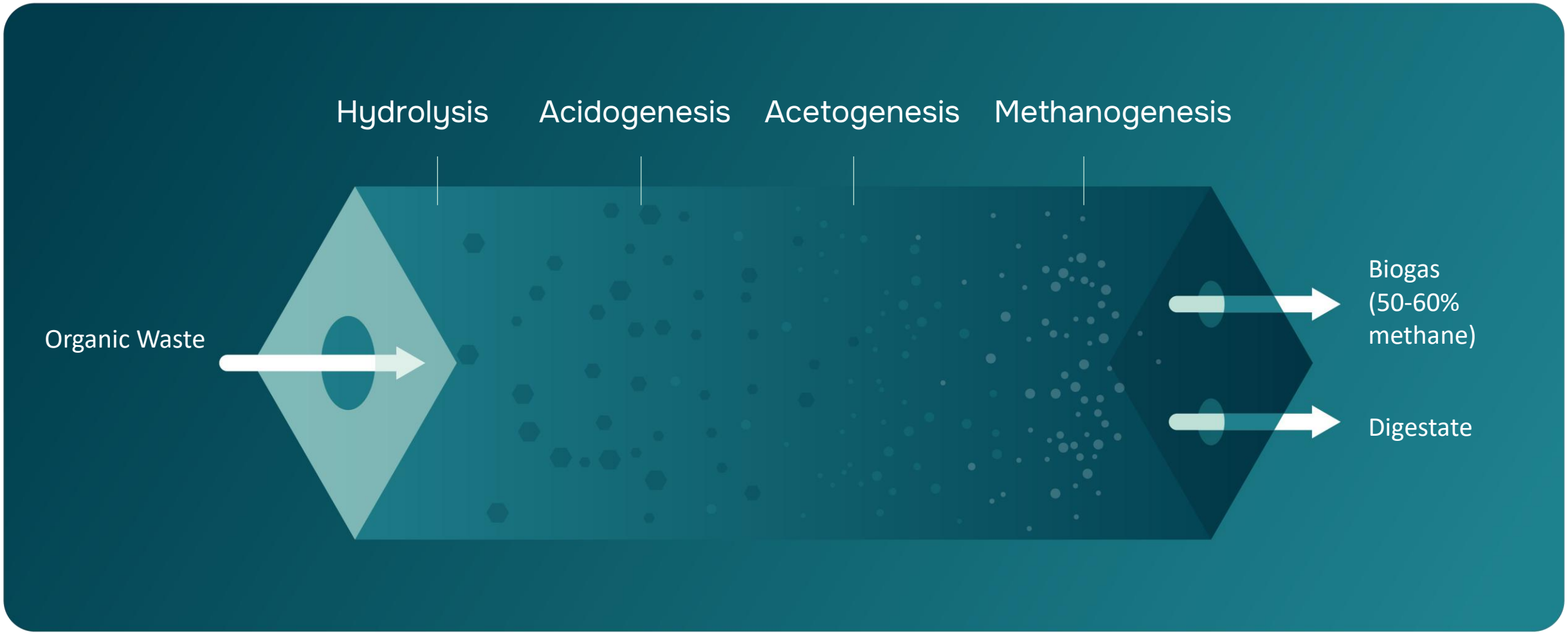
# Anaerobic Digestion



# How does Electro-Methanogenisis work?

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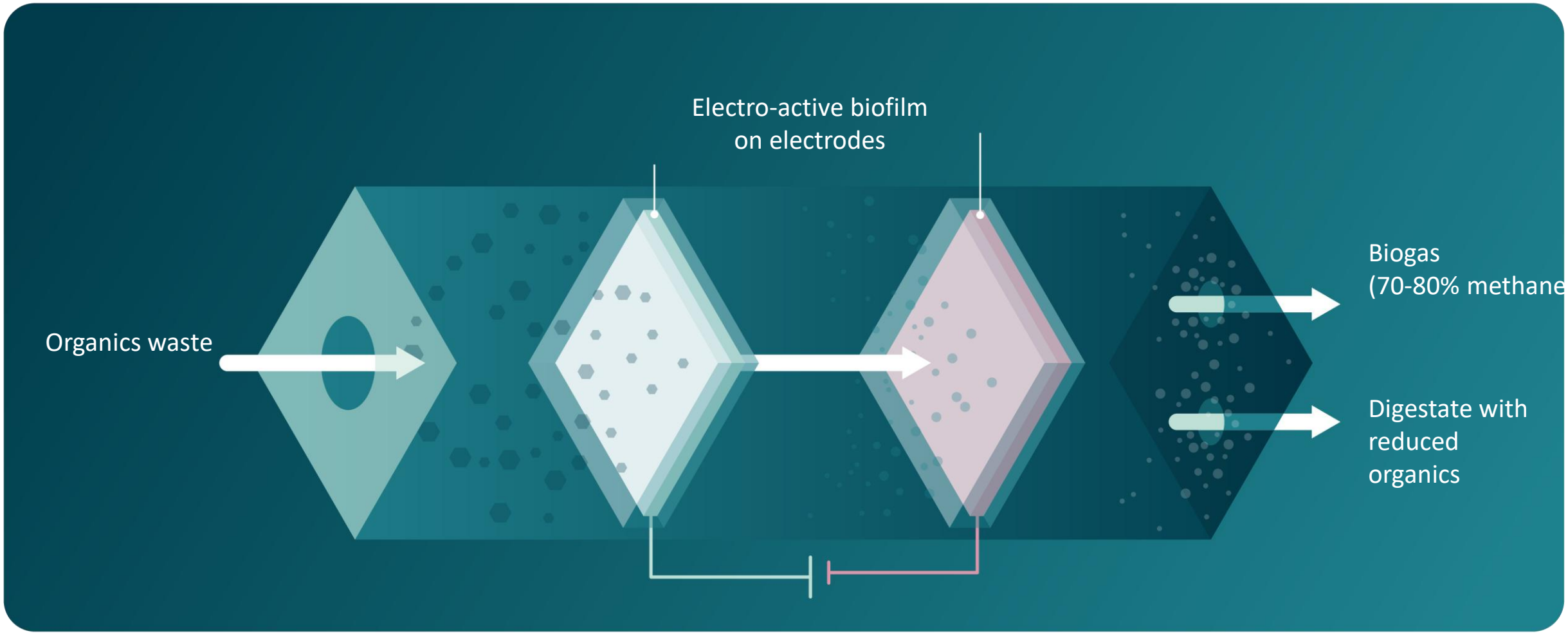

# What is Electro-Methanogenesis?

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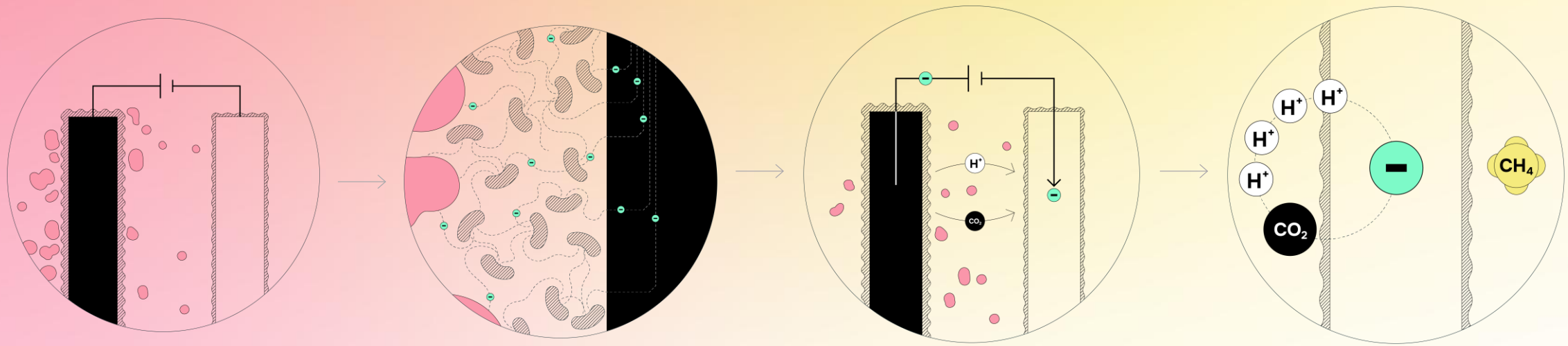


Electro-active biofilms

Biofilm release electrons

Electrons & hydrogen ions flow to the cathode

Bacteria convert $CO_2$ to methane.

# EMR is the next Gen AD


**3 – 10X** faster

**30%** more energy

**+30%** increased treatment

AI **biosensing** automation

**70%** smaller


# Rheinalt & Gethin

Business partners at Llefrith Henfaes (Pennant) Dairy Farm

## Pennant farm challenges:

- High energy costs
- Business resilience
- Carbon emissions

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# How small can I go?

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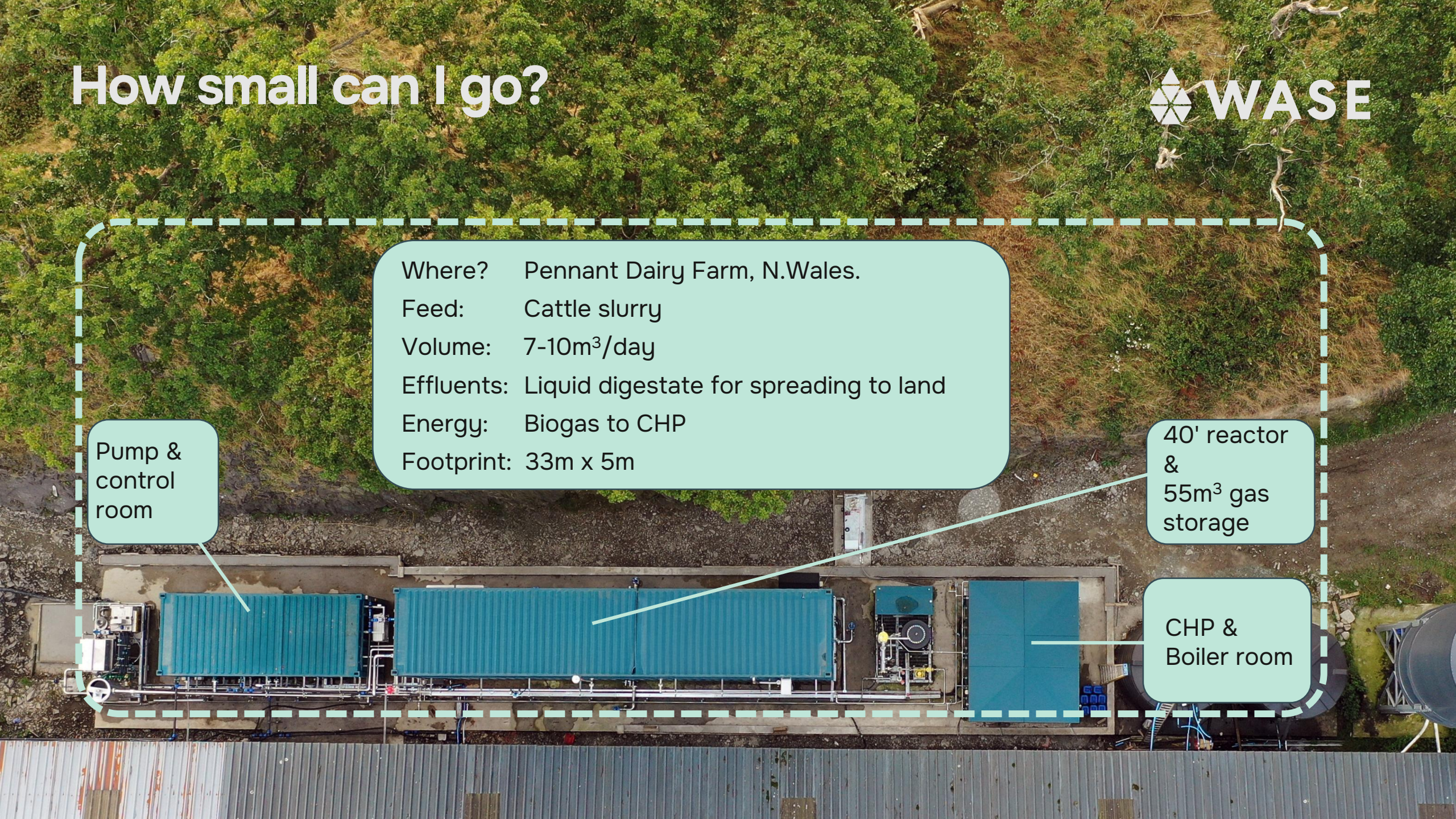
| | |
|---|---|
| Where? | Pennant Dairy Farm, N.Wales. |
| Feed: | Cattle slurry |
| Volume: | 7-10m$^3$/day |
| Effluents: | Liquid digestate for spreading to land |
| Energy: | Biogas to CHP |
| Footprint: | 33m x 5m |



Biogas: 69% methane

Low temperature operation: 22°C

HRT: 9 days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**Fixed Energy prices**
Increasing resilience

**Lower** sludge emissions

**324 MWh/yr**
net energy created

**>67** tonnes/yr $CO_2e$
saved just from the energy

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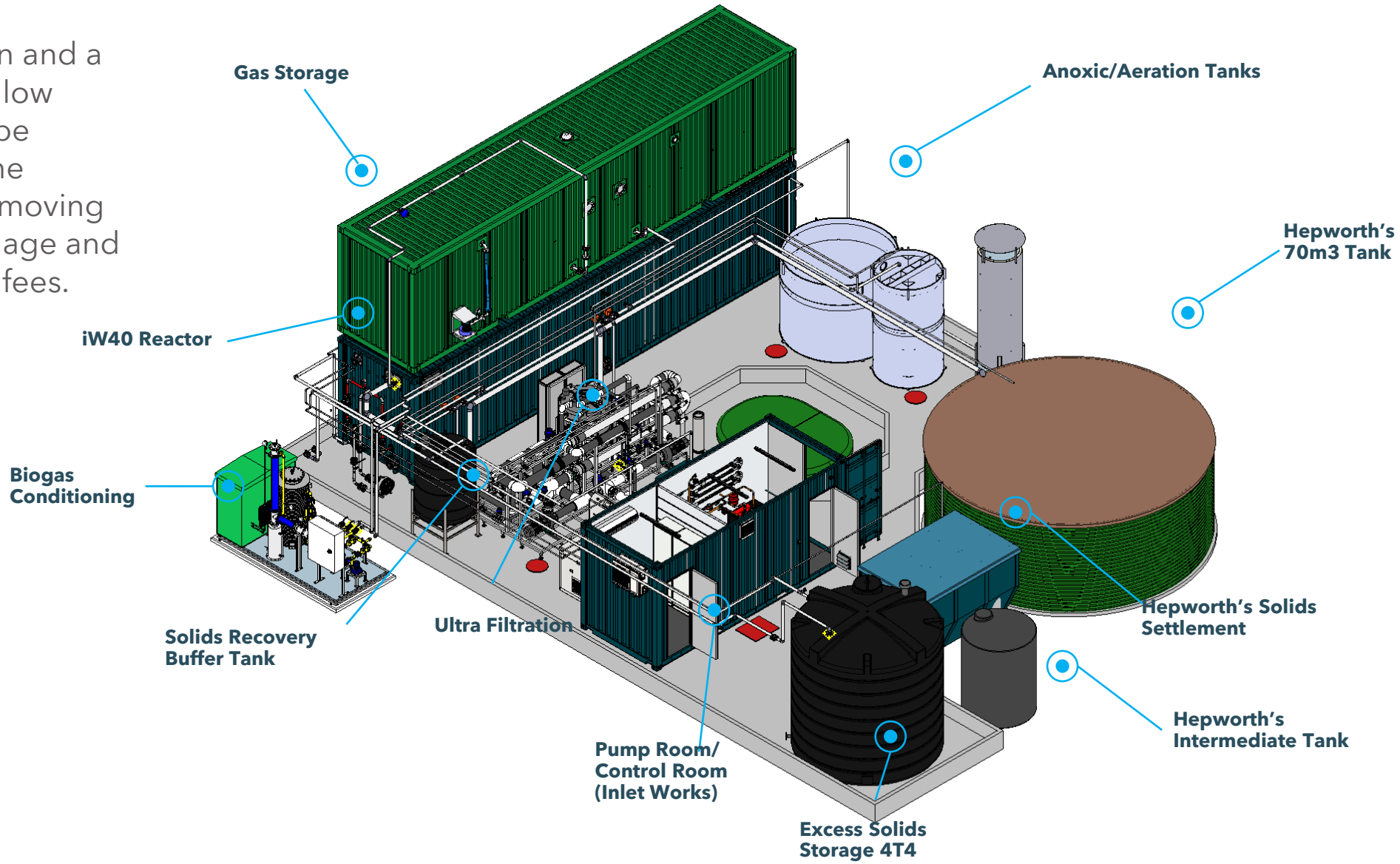
# Can you discharge clean water to environment?

WASE + filtration and a reed bed, can allow wastewaters to be discharged to the environment, removing need for all haulage and drain discharge fees.



# What makes up a WASE solution?

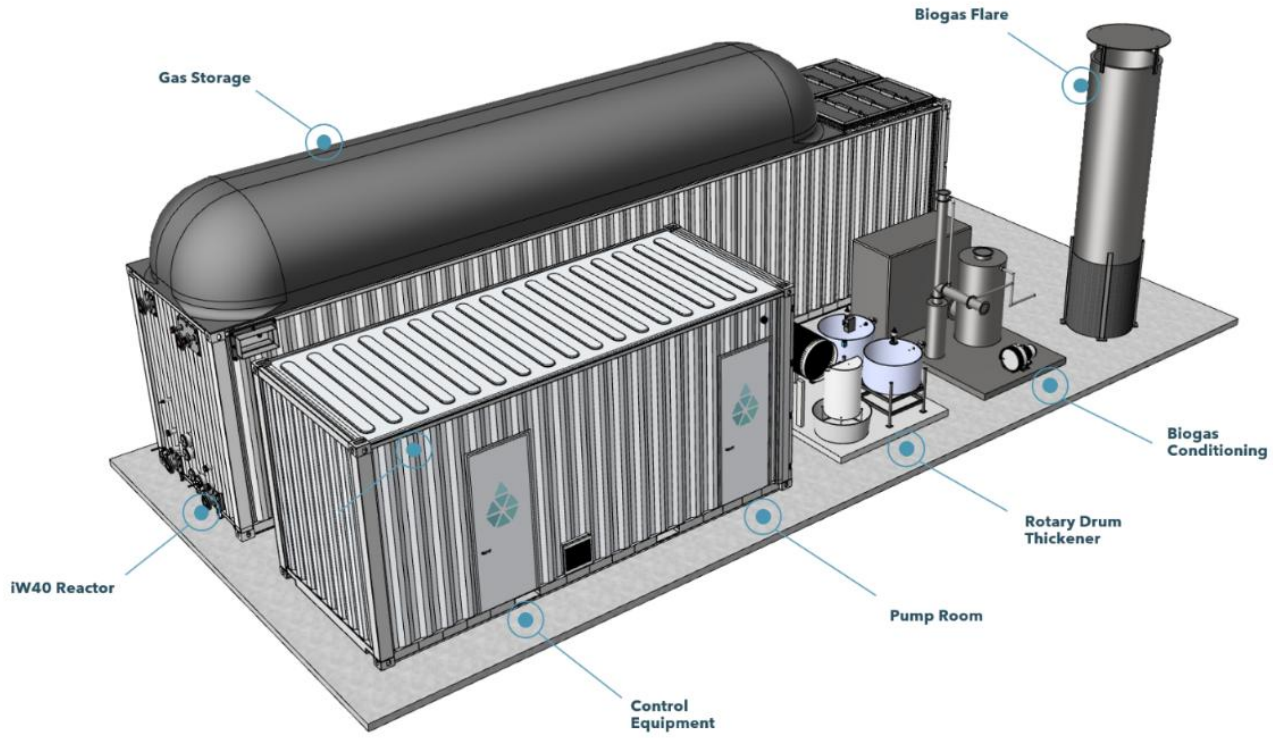
Each WASE solution will require a:

1. Control centre
2. 40’ Reactor modules
3. Gas storage
4. Biogas flare
5. Gas conditioning

Ranges: <9% TS, 10-1000$m^3$/day

Optional:

6. CHP
7. Tertiary treatment



# What do we need to determine suitability?

1. Volume of wastewater/sludge/slurry generated
2. Price per unit of wastewater treated
3. Thermal price £/kWh
4. Electricity price £/kWh
5. Wastewater strength (TS/VS or COD mg/l)
6. Target discharge limit and discharge intent (environment, drain, re-use)
7. *Optional*: How much energy is used on site?


Together we can protect
our most precious resources
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# Join us and accelerate your net zero journey

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