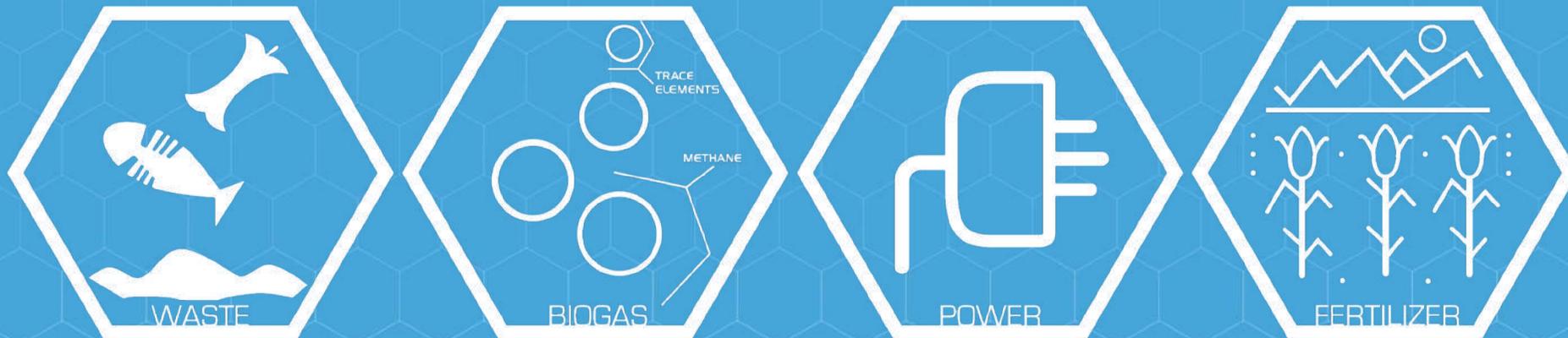


# The Waste Transformers

## ORGANIC WASTE TO VALUE ON-SITE *In-depth information*



### BECOME A BOLD DRIVER OF POSITIVE CHANGE

The Waste Transformers' technology is shaping the future at the nexus of food, water and energy. We have developed a highly innovative, plug-and-play containerized system which restores the valuable nutrient loop in cities, on islands or remote locations, by transforming organic waste into value on-site. No transportation. No CO<sub>2</sub>. The system generates green energy, in the form of electricity and heat, returning this to exactly the same site that produced the waste. In this way handling fees for organic waste streams are reduced to a minimum. Our system then takes what is left over and turns it into a nutrient rich fertilizer that can be used on the same site, to grow fresh food or to give back to the local community. The system, composed of 20-foot shipping containers is modular and scalable. The minimum space needed is about the size of two and a half parking lots. Our technique can also be implemented inside buildings, to reduce the transportation to zero, maximizing the visibility of green tech to visitors.

In this way The Waste Transformers empower local waste producers (hotels, universities, neighbourhoods, food production companies, harbours and wholesalers) to transform their own organic waste streams into value, simply by placing a Waste Transformer on their own site, to power their own good growth.





**MODULAR SYSTEMS, ROOM FOR GROWTH**  
**350-3600 KG ORGANIC WASTE PER DAY**

Waste:	350KG	600KG	1200KG	1800KG	2400KG	3000KG	3600KG	PER DAY
# containers								
Electricity**	22.000 kWh	41.000 kWh	78.000 kWh	123.000 kWh	156.000 kWh	195.000 kWh	247.000 kWh	Per year
Heat**	48.000 tkWh	86.000 tkWh	164.000 tkWh	259.000 tkWh	328.000 tkWh	409.000 tkWh	518.000 tkWh	Per year
Biogas (m <sup>3</sup> )	12.000 m <sup>3</sup>	21.100 m <sup>3</sup>	42.300 m <sup>3</sup>	63.400 m <sup>3</sup>	84.000 m <sup>3</sup>	105.600 m <sup>3</sup>	126.700 m <sup>3</sup>	Per year
Methane (CH <sub>4</sub> )	7.400 m <sup>3</sup>	12.700 m <sup>3</sup>	25.400 m <sup>3</sup>	38.000 m <sup>3</sup>	50.700 m <sup>3</sup>	63.400 m <sup>3</sup>	76.000 m <sup>3</sup>	Per year
Organic fertilizer (Liter)	100.000 L	171.000 L	323.300 L	512.000 L	646.500 L	808.100 L	1.024.000 L	Per year
Gate fee saving (per tonne waste) ***	€	€	€	€	€	€	€	Per year
Reduction of garbage trucks	 10 garbage trucks	 20 garbage trucks	 41 garbage trucks	 62 garbage trucks	 83 garbage trucks	 104 garbage trucks	 124 garbage trucks	Per year

\* All numbers are indicative, based on mixed food-waste.  
 \*\* 20-30% re-used internally by system.  
 \*\*\* Savings for not collecting organic waste.

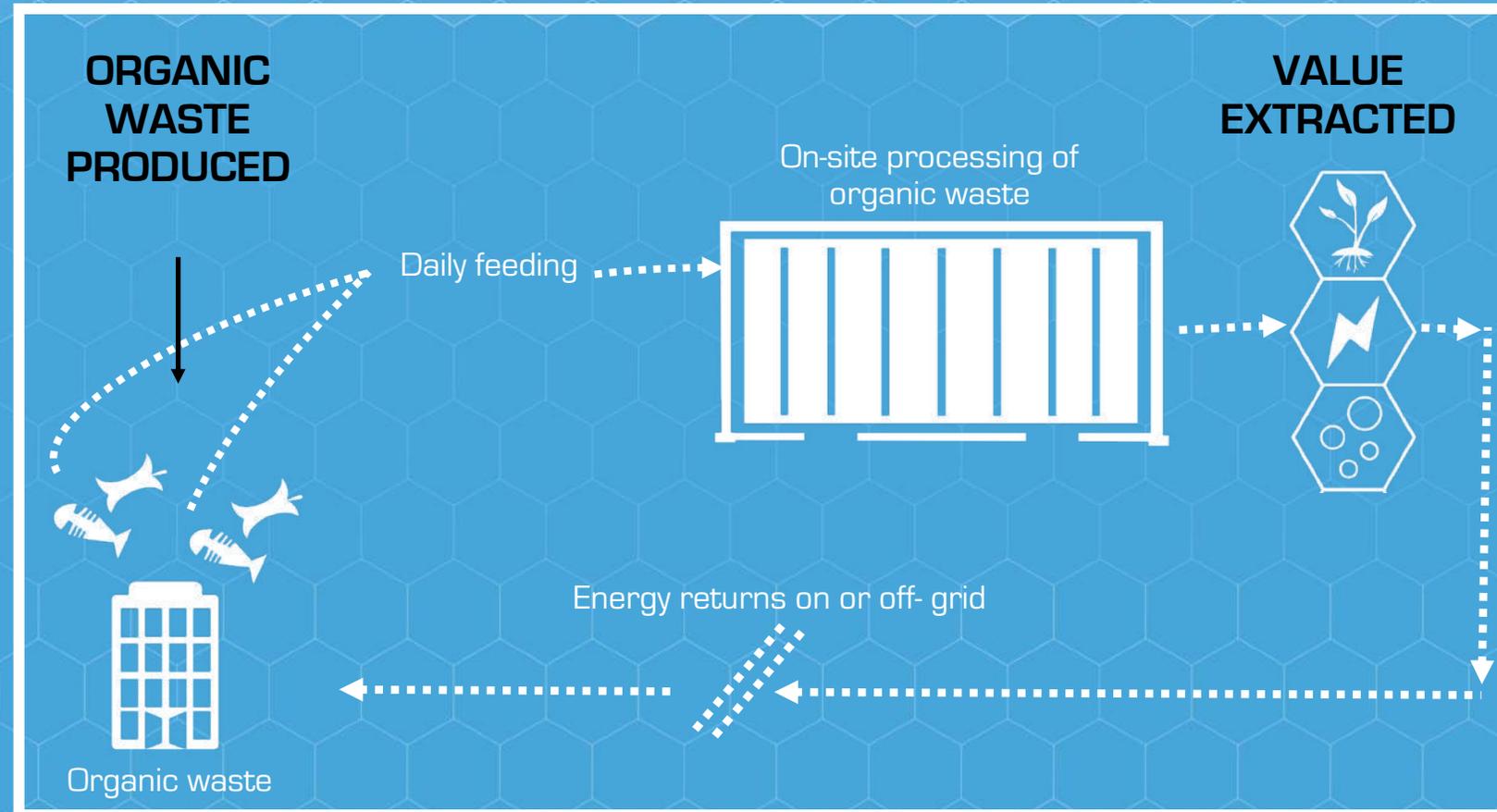
**MODULAR DESIGN**

Each Waste Transformer can be adapted to local needs. Starting with a smaller Waste Transformer and when waste quantities increase, the system can be expanded.

Each Waste Transformer has multiple output streams which can be monetized based on local circumstances.

Based on the type and density of the waste stream available, a particular size of Waste Transformer is needed.

- A Waste Transformer is a complete Anaerobic Digestion system that converts organic waste into value, on-site.
- Processes between 350kg to 3600kg of waste per day and reduces the costs of waste handling.
- Conversion of waste into biogas to electricity, residual heat, recovered water & recovered nutrients, for own usage to reduce energy bills and waste handling fees.
- Modular & scalable to adapt to the available waste stream[s].
- A proven, proprietary technology.
- Housed in standardised shipping containers, which can be branded & designed to match your corporate identity.
- Compliance with strict EU health & safety rules.
- Plug & play.
- Input ALL organic waste.
- 24/7 online monitoring & low maintenance costs.



### WITHIN ORGANIZATION

1. Own waste transformation
2. Daily feeding
3. No waste transportation
4. Circular economy around waste

### OUTCOME

1. No waste collection fees (Savings)
2. Green energy (biogas, or heat and electricity)
3. Nutrient rich natural fertilizer
4. Social entrepreneurship

### HOW TO RUN A WASTE TRANSFORMER?

Your separated organic waste is fed into the Waste Transformer, every day. Once inside the airtight Waste Transformer (there is full odour control), biogas is formed and optionally turned into electricity and heat (the heat is either for hot water, for refrigeration or for air-conditioning purposes). This energy will power your building, community or grid.

The liquid organic fertilizer needs to be offloaded roughly every three weeks (depending on size), and can be sold to local farmers, golf courses or wholesalers.

We assist in training your staff how to feed the Waste Transformer (it is a very simple process). We can consult on waste management plans and support you along the way. We also monitor the installation for you remotely 24/7, sort any technical issues you may have, and pro-actively inform you how to get the most out of your organic waste.



### FROM IDEA TO IMPLEMENTATION

*BELOW PHASES ARE INDICATIVE (NOT ALL ARE ALWAYS NECESSARY TO EXECUTE).*

#### **Phase 1: Quick scan**

*With the quick scan, we can give you an indication based on your input if a Waste Transformer is a suitable solution for you. Based on your first answers, we request for more specific information to continue the conversation.*

#### **Phase 2: Qualification**

*Based on your answers from the first phase, we ask more in-depth information about your organisation. This information is used within our team to compose a first indicative proposal.*

#### **Phase 3: Budget quotation**

*An indicative quote is shared for your specific situation. Once internally agreed within your organisation to continue the process, we can move to the next phase.*

#### **Phase 4: Location audit**

*Members of our team come over to audit the site, the waste situation, potential applications, feed in of energy solutions to design the right model for your situation. A fee is part of this audit, and 50% will be credited on final order.*

#### **Phase 5: Basic engineering (and start permit application if applicable)**

*Based on the audit, our technical team makes a tailored final proposal.*

#### **Phase 6: Contracts and warranties**

*A customer agreement and contract is signed, design and building phase begins (average three months). First invoice is sent.*

#### **Phase 7: Preparation of site and FAT**

*You are responsible for the site preparation to enable the placement of the Waste Transformer. A Factory Acceptance Test is done. On successful completion the second invoice is sent.*

#### **Phase 8: Transport of Waste Transformer to your site**

*The Waste Transformer is ready for transport. The final invoice is sent.*

#### **Phase 9: On-site installation and training**

*Once the Waste Transformer is in place, it will be installed and staff will be trained to operate the digester and the new waste management plan comes in place. Commencement of service contract with 24/7 online monitoring.*

### ASSUMPTIONS UNDERPINNING THE BUSINESS CASE

*N.B. The following Indicative Business case has been calculated assuming the following figures are current for this year.*

Inflation rate:	2,00%
Electricity rate of inflation:	2,00%
Sale price of Electricity/kWh:	€ 0,10
Government incentive of Electricity/kWh	€ -
Sale price of Liquid Fertiliser/T:	€ 75
Sale price of Dry Matter/T:	€ 50
Sale price of Thermal/kWh:	€ 0,10
Government incentive for thermal / kWh	€ -
Labour rate/h:	€ 10
Gate fee	€ 100

## OUR MEDIUM WASTE TRANSFORMER Put an end to waste

Save on your energy bills with this medium sized Waste Transformer. This modular digester is able to transform around 1800KG of organic waste per day. This model diverts 624.000KG organic waste from landfill, reduces your CO2 emissions and saves the valuable nutrients in the organic waste to distribute locally to restore soil health and support farmers in increasing their

agriculture yields. With this daily amount of waste, 123.000 kWh, and almost 260.000 t kWh is produced. A truly circular system to create value from your on-site organic waste streams.

*Below numbers are indicative only. Gate fee's, electricity and fertilizer prices vary greatly in different parts of the world.*

1. Container information		3. Income and profits	
Digester Quantity:	3	Electricity annual sale value +/-	€ 9.841,75
Control Containers:	2	Electricity annual FIT/SDE+ value +/-	€ -
Gas buffer:	1	Thermal annual sale value +/-	€ 16.033,95
Total # containers:	6	Thermal annual RH value +/-	€ -
<b>2. Costs</b>		Sale of liquid fertiliser +/-	€ 38.385,23
CAPEX (Investment)	€ 276.508,29	Sale of dry matter +/-	€ 561,74
<i>CAPEX includes a fully operational anaerobic digester</i>		Gate fee +/-	€ 62.415,00
OPEX* +/-	€ 27.097,75	Annual income +/-	€ 127.237,66
*OPEX includes labour costs ;	€ 10.402,50	Annual profit +/-	€ 100.139,91
Yearly Service & Support Package	€ 8.400,00	ROI +/-	41%
Additional costs reservation	€ -	Payback in year +/-	3

What your organic waste potentially could produce on your own site:

Per day	1.800	KG of organic waste
Per year	624	tons of waste
Creates	123.748	kWh per year
In	6	containers on-site
Equals electricity usage of	35	households each year
CO2 reduction	362	tons of CO2

Energy and fertilizer outputs

Per day kWh	357
Per year kWh	123.748
Per day thermal Heat	462
Per year thermal heat	259.471
Liquid fertilizer per day (L)	1476
Liquid fertilizer per year (Tons)	512



### ONLINE MONITORING

All our Waste Transformers are monitored online by The Waste Transformers team. This monitoring consists of waste input volumes, data logging of system parameters, the monitoring of energy consumption and generation. For process optimization all system parameters are adjustable and there are standard fault codes used for proactive system diagnosis.

### SERVICE AND MAINTENANCE AGREEMENTS

- Remote support from TWT experts.
  - Process optimization
  - Fault diagnoses
  - Early notification/preventative monitoring
- Support from local mechanical and electrical engineers, across the globe.
- Global CHP service and maintenance support from leading manufacturers.
- Preventative maintenance and servicing schedules.
- Flexible servicing and maintenance contracts depending on your in-house ability/expertise.
- Out of house support.
- Training for operational and maintenance staff.

### CERTIFICATIONS AND STANDARDS

The Waste Transformer is designed, built, documented and supplied CE marked to the following standards:

- DIRECTIVE 89/391/EEC Safety of Workers
- DIRECTIVE 2014/34/EU ATEX 114 Manufacturer
- DIRECTIVE 1999/92/EC ATEX 153 Employer
- DIRECTIVE 2000/14/EC Outdoor Noise Directive
- DIRECTIVE 2014/30/EU EMC Directive
- DIRECTIVE 2006/42/EC Machinery Directive
- DIRECTIVE 2014/35/EU Low Voltage Directive
- DIRECTIVE 2014/68/EU Pressure Equipment Directive

#### Mechanical Manufacturing Standards:

- ISO 9001 Fabrication quality standard
- ISO 3834/EN1090 Welding standards
- ISO 668/ISO 1496 Containers design

#### Electrical Manufacturing Standards:

- IEC 60364-1 (NEN 1010) Electrical installation
- IEC 60529 Ingress protection code
- 



## OUR GLOBAL RECOGNITION

- VOTED A TOP 3 GLOBAL IMPACT INVESTMENT PROPOSITION, BY **MORGAN STANLEY**, IN THEIR IMPACT INVESTMENT CHALLENGE, 2016
- WINNER OF THE 2017 **SHARE AWARD** FOR THE **MOST CIRCULAR COMPANY**
- FINALIST IN THE **POSTCODE LOTTERY GREEN CHALLENGE** FOR MOST GLOBAL IMPACT, 2017
- WINNER OF THE 2018 **BEST BUSINESS PLAN AWARD** FOR RENEWABLE ENERGY IN WEST AFRICA, AFDB & UNIDO
- WINNER 2019, **GLOBAL INNOVATION AWARD**, ABU DHABI SUSTAINABILITY WEEK UAE
- WINNER 2019 WHAT DESIGN CAN DO, (**IKEA FOUNDATION & UNCC**)
- 2020: AWARDED THE **SOLAR IMPULSE EFFICIENT SOLUTION LABEL**





- Click on the [video](#) to learn more about the positive impact our Waste Transformer produces in a shopping mall in Cape Town South Africa.



- Click on the [video](#) to learn more about what our Waste Transformer does in Sierre Leone, where we formed a Joint Venture with a local waste management company, called Masada.

- Stay informed of our developments, via our social media channels and [website](#).

# The Waste Transformers

WILL YOU BECOME A WASTE TRANSFORMER?

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