

MOLECULAR RECYCLING OF WASTE (MRW)

Energy from organic waste

No chimney No emission of hazardous byproducts

**A new method based on high temperature thermal pyrolysis
and Bosh reaction**



In operation since 2009, tested using EU
funds by
AMP Sp. z o.o, Poland

MRW METHOD

The method takes advantage of two basic facts that all organic matter can be decomposed to simple elements at temperatures ~ 1300 C and that 99% of the weight of organic matter is due to just three elements, C, O, and H. All other elements add up to about 1% and can be also recovered. These three basic elements are re-combined to form Syngas (natural synthetic gas) or Syngas and pure Hydrogen, the fuel of the future. The relative composition of Syngas can be adjusted according to the needs.

Reactor works at 1500 – 1570 C temperature range

Unique advantages

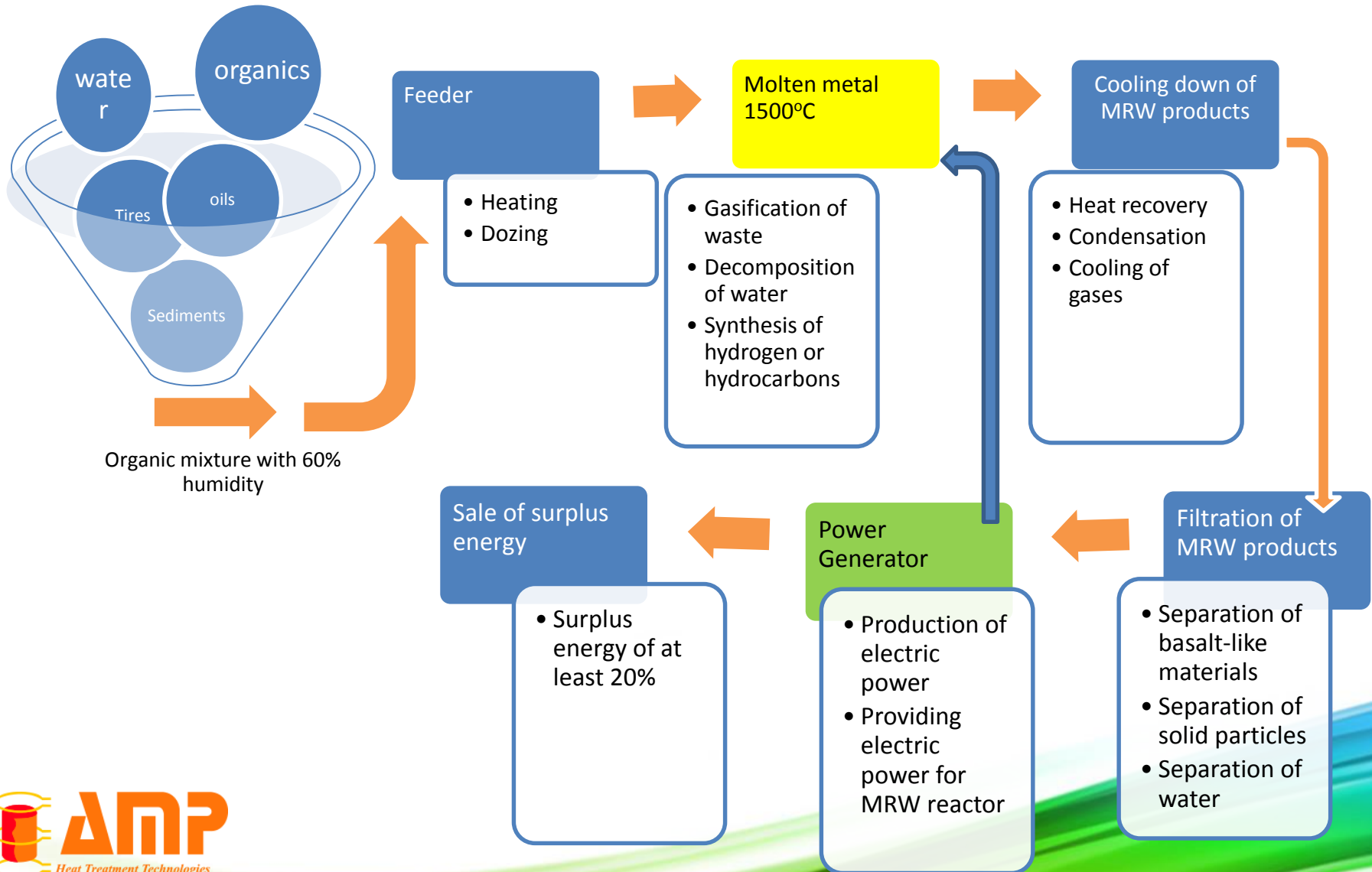
No need to dry the waste – water is used to gasify Carbon

Excellent control and stability of temperature – provided by molten Iron

Excellent homogeneity inside the reactor

Excellent control of the composition of produced gases

Schematic Diagram of MRW Processes

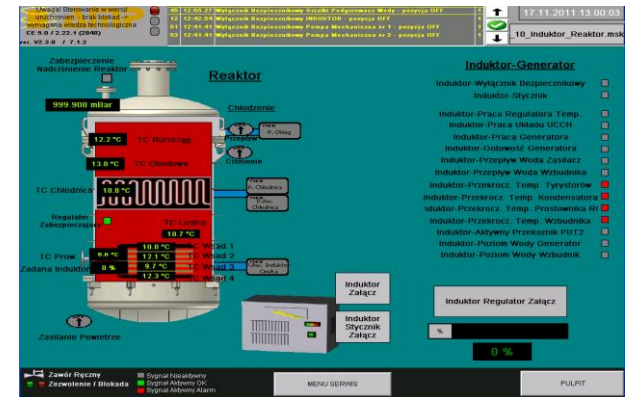


MRW – 17 years of R&D

From prototype
in 1998r



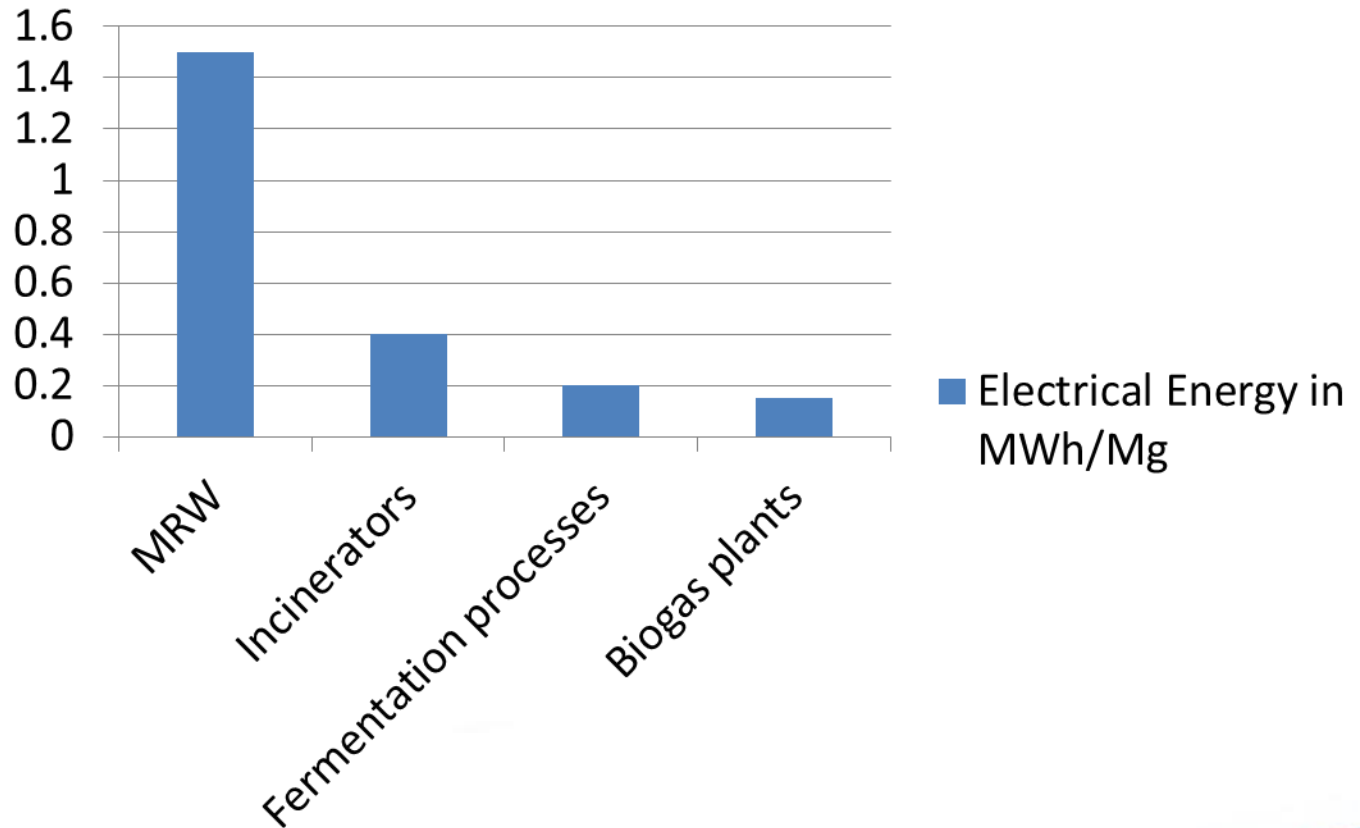
To fully automated MRW system in 2013



Total Energy Produced by Various Processes



Total Electrical Energy

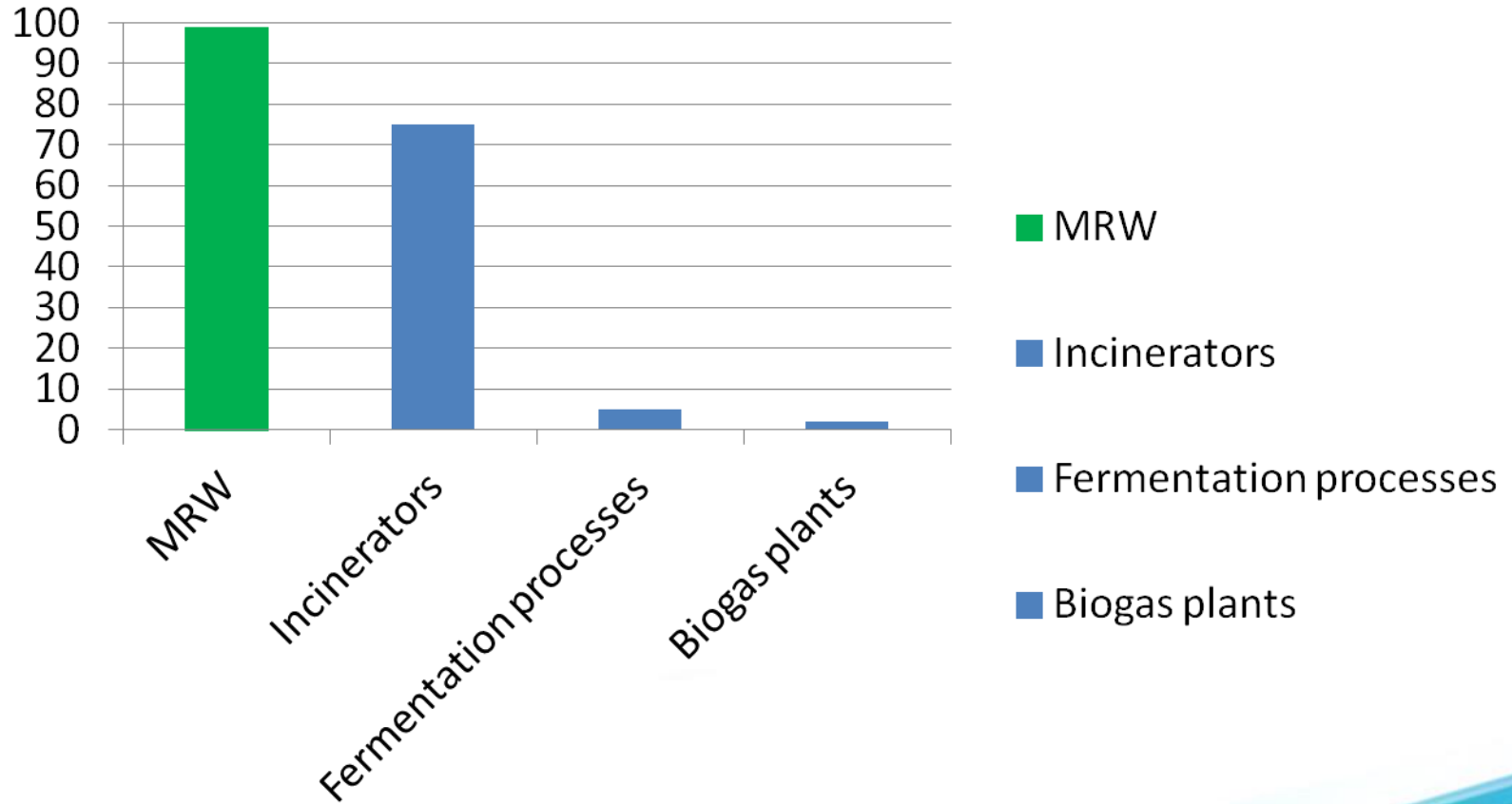


Assumed calorificity of 15GJ/Mg

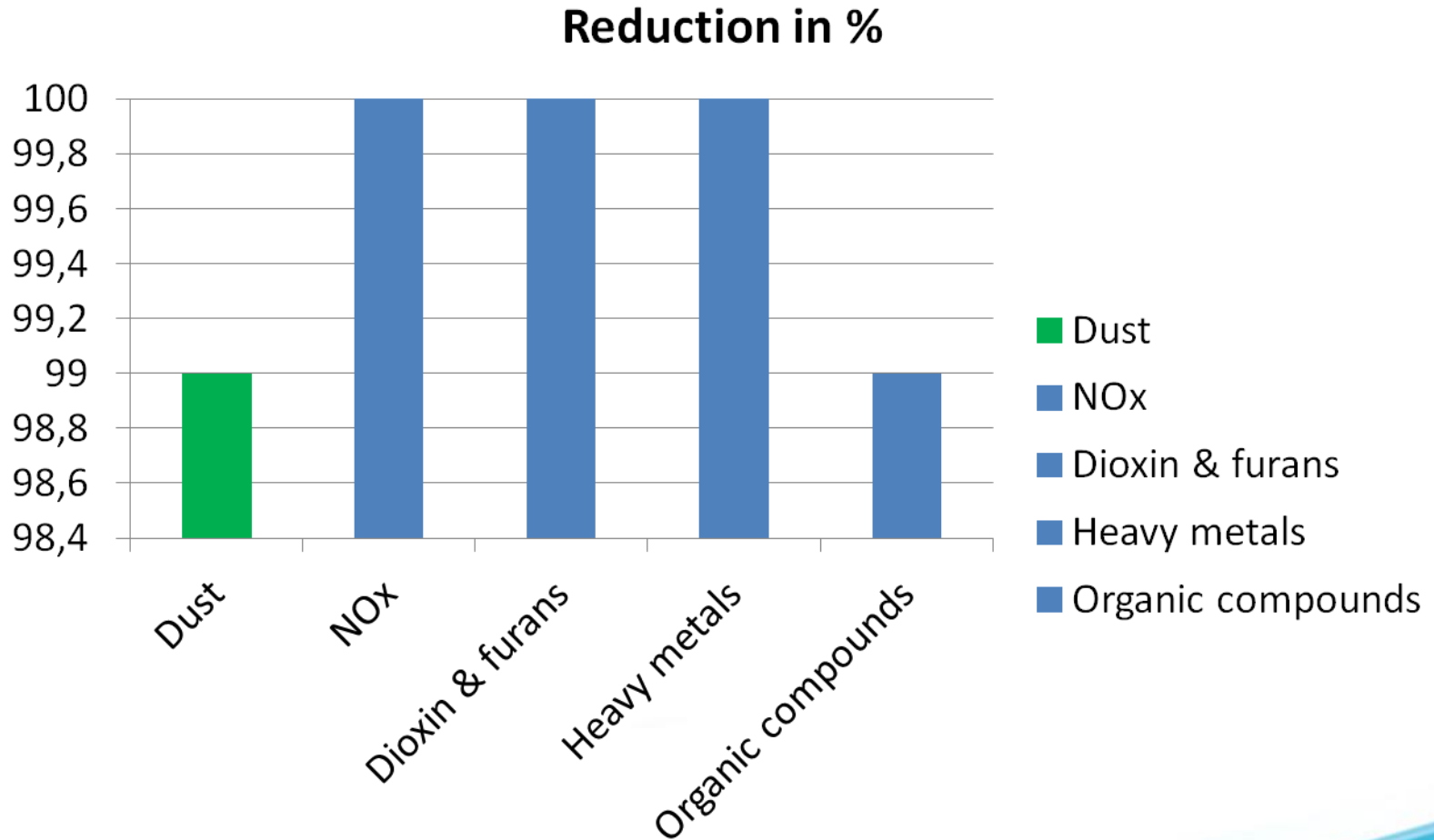


MRW reduces landfills use

Reduction of Landfills in %

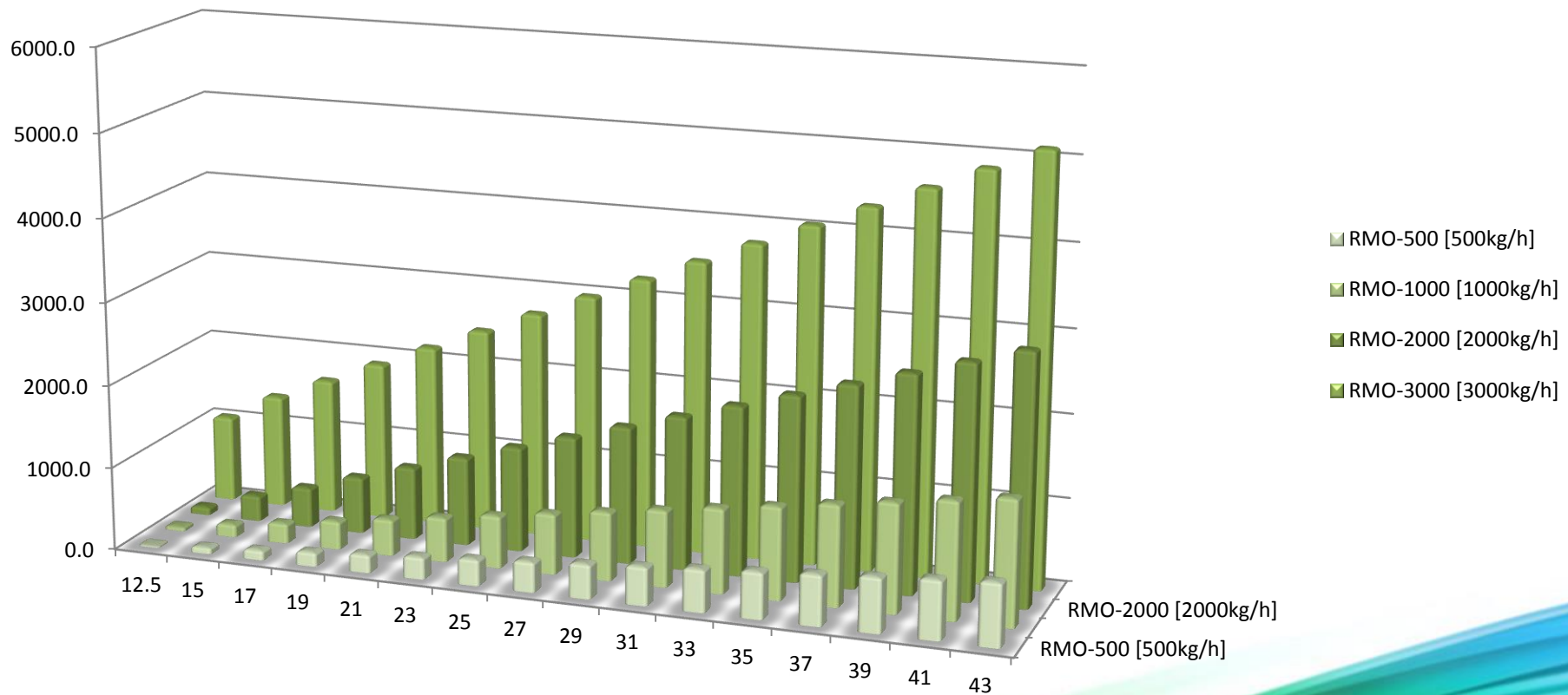


MRW reduces secondary waste



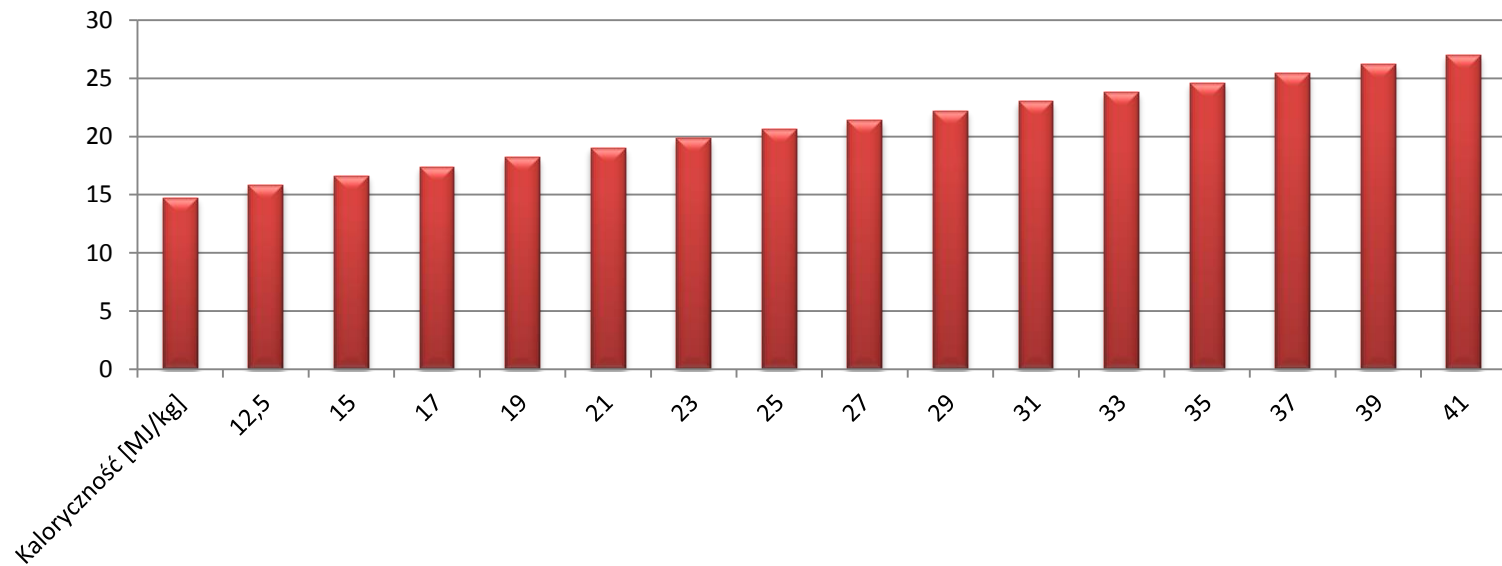
Net Electrical Energy Produced

Electrical Power (in kW) versus calorificity for different size MRW reactors, from 500 to 3000 kg/h



Net Heat Produced

Power in GJ/h vs calorificity for MRW reactor 1000 kg/h



MRW – Other advantages

Safe and fully automated operation

No secondary hazardous byproducts such as furans, dioxins, nitrogen oxides

No smell; no dust; no fumes

High efficiency (at least 20%)

No need for landfills

Scalable according to needs

Less expensive than other methods of waste utilization; Initial investment 5 times smaller than incinerator; operational costs 2-3 times less than incinerator

MRW – Other Advantages cont.

Can be configured to produce Hydrogen only (after filtering out CO_2 ; filtering can produce K_2CO_3 , used in soap, glass and china making)

Energy produced from anything

Metals recovered

Ceramic inclusions vitrified; can be used in construction

Modular design

TÜV Rheinland certified; CE certified

Example Industries & Applications



- Communal waste
- Leftovers from biomass plant
- Alternative to biomass plant
- Plastics, tires, oils
- Biohazardous waste in hospitals
- Waste from chemical plants
- Crematory
- H₂ production for fuel cells. The reactor can be configured to produce H₂ and CO₂ only. Oxygenation of C to CO₂ is highly exothermic (efficient method). CO₂ can be filtered out by $\text{CO}_2 + 2\text{KOH} = \text{K}_2\text{CO}_3 + \text{H}_2\text{O}$

AMP Certifications and Tests



ISO 9001/2008 Certification done by TUV Rheinland

CE safety certification for EU – emissions, safety, machinery, electrical, environmental

Upcoming installation in Augustow, Poland (3000 kg/h; 3MW)

Output products tested by Central Mining Institute of Poland since 2009

AMP established in 2004; products for Aerospace (70%), Automotive (10%), Tools/Machines (10%), Industrial Heating (10%)

Clients across Europe and USA, including Sikorski, UTC, Goodrich



Installation Options



A- Reactor Only

Reactor installation plus quarterly maintenance service
Setup of input and output processing done by other firm

B- Turnkey Installation

Reactor installation plus quarterly maintenance service
Complete setup of input and output processing plant (e.g., feeders, shredders, power generators, warehouses)

Price depends on volume and type of material processed :



Contact

Energyglobe LLC

105 NW 33 Court, Suite B
Gainesville, Florida 32607

www.energyglobex.com

contact@enfoglobex.com

Tel: 1 352 213-3900

Fax: 1 352 575-2384