INT-Energia kft. Metaplasma S.L Molekula-Szeged Kft.

PGMCC COMPLEX

Green energy, fuels and useful products from renewable energy sources

INNOVATION
TECHNOLOGIES
SOLUTIONS

PGMCC® Technology

GREEN ENERGY

Existing technical solutions for processing municipal solid (MSW) and industrial solid waste (ISW) and their disadvantages

MSW & ISW

Mechanical and biological methods

Sorting

DISADVANTAGES

Sorting helps to get rid of a significant proportion of waste with the production of secondary raw materials, but does not solve the problem of complete vaste disposal

Composting of waste

DISADVANTAGES

Sorting is required and only applies to organic products. Long technological process, with possible problems with the smell. A fixed tonnage of waste is required.

Thermal methods

Incineration

DISADVANTAGES

Toxic emissions into the air and hazardous residue that requires further detoxification or landfilling. Even with the best technologies, incinerators remain major sources of carbon dioxide emissions

Pyrolysis

DISADVANTAGES

High-molecular elements do not fission. Large financial costs for gas cleaning equipment in order to reduce the concentration of harmful substances of emissions into the atmosphere

Gasification

DISADVANTAGES

Large financial costs for gas cleaning equipment in order to reduce the concentration of harmful substances of emissions into the atmosphere

Combined method

PGMCC Technology

Fast Plasma gasification and Gas Conversion Method

INT-Energia kft. Metaplasma S.L.

PGMCC

Our goals and objectives for the processing of solid municipal and industrial waste

Provide to consumers of high-tech PGMCC Complexes for processing solid municipal and industrial waste and biomass, ensuring efficient management of production and consumption waste, including the elimination of landfills.

Metaplasma S.L.

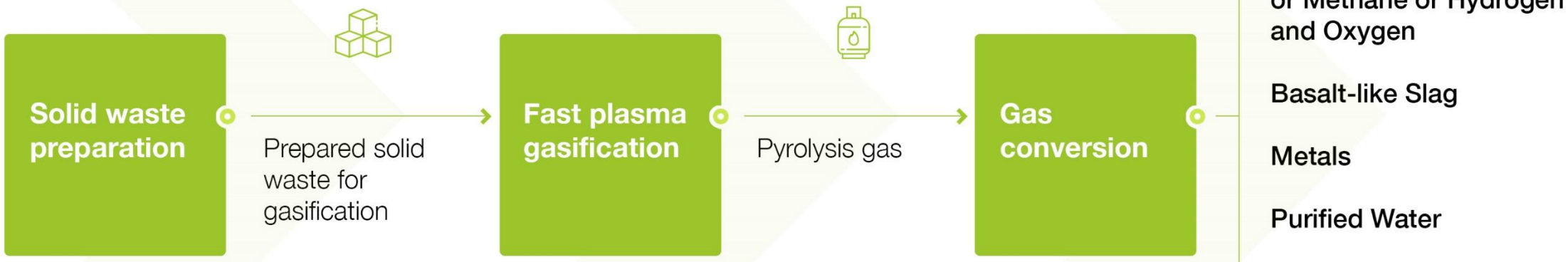
INT-Energia kft.

PGMCC Technology

A method of Fast plasma gasification and gas conversion for processing solid municipal and industrial waste and biomass

Plasma
Gasification
Melting
Closed
Cycle

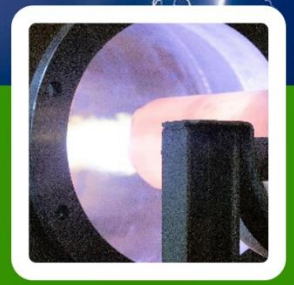
Input:
- Municipal solid waste processing
- Biomass processing
- Medical waste processing
- Agricultural wastes processing
- Hazardous industrial waste processing
- Sewage sludge processing
- Gasification of low-rank coals, culm and oil sludge
- Pharmaceutical waste processing



Closest natural analogues for Fast Plasma Gasification Tech-nology

Lightning is natural analogue of the processes that occur in plasma torch.

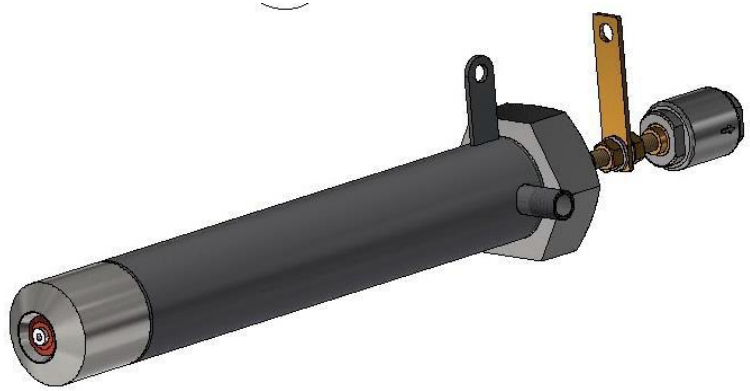
Inside of plasma torch, there are processes associated with the electric discharge with the power of 1.5 eV, which results to the heating of plasma forming gas up to 15,000 °C.



Basalt-Like Slag - Volcanic Glass Analogue.

The melting of inorganic sub-stances in the melting zone has a temperature of not less than 1,500 °C.

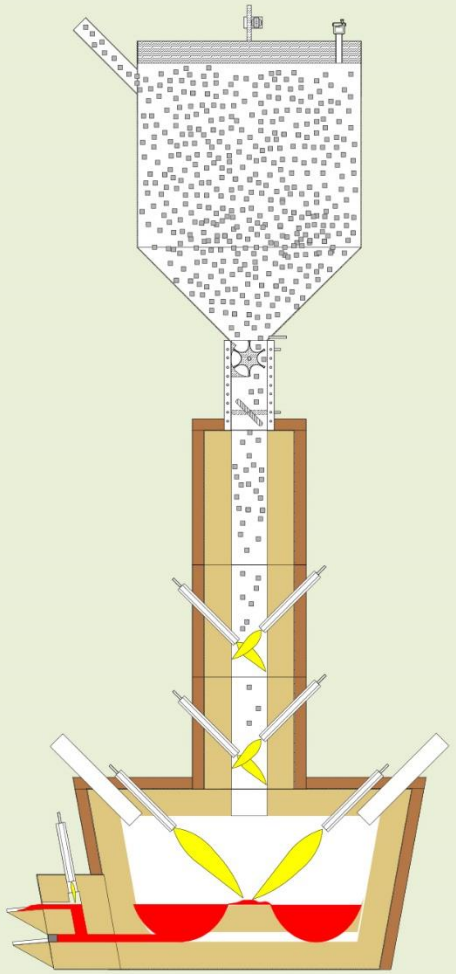
Plasma torches



Basalt-like slag

INNOVATION

Proposed technological solutions for waste processing are protected by a number of patents in the EU and a number of other countries and meet all the requirements of environmental and technical safety of production related to waste processing and electricity and heat generation.

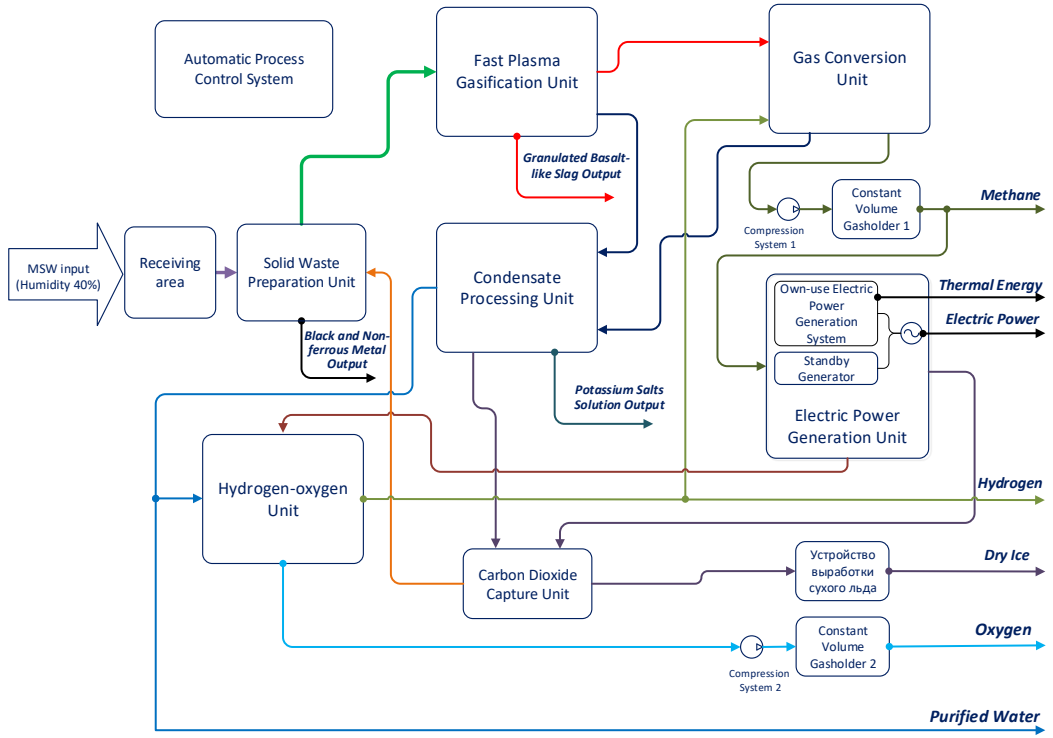


TECHNOLOGIES

The PGMCC Complexes for processing of household and industrial waste are implemented on the basis of the technology of fast plasma gasification and gas conversion.

TECHNO

Solid Waste and Biomass Processing Complex using Fast Plasma Gasification and Gas Conversion



Solid wastes are loaded into the receiving zone, from which they go for crushing and then are subjected to vacuum-temperature drying, while ensuring the vacuum removal of volatile compounds and water vapor from solid wastes. These compounds and vapors are compressed and accumulated, then subjected to plasma purification-disinfection, which produces superheated water vapor, which is supplied as plasma-forming steam to indirect arc plasma torches installed in the fast plasma gasification reactor, and the purified and disinfected air is released into the atmosphere. The dried solid waste is shredded, from which ferrous and non-ferrous metals are separated, and then, the dried solid waste is dosed into the fast plasma gasification reactor. In the fast plasma gasification reactor, shredded solid waste is subjected to fast plasma gasification. The resulting gas-steam mixture, in the form of pyrolysis gas, is accumulated and fed to the gas conversion unit, which ensures the conversion of pyrolysis gas into methane.

PGMCC Complex

Input

Energy and Material Flows

- **MSW**
  Average humidity - 25%,
  Average calorie value 14 MJ/kg
- **KOH (alkali)**

Start

Energy and Material Flows

- Electric Power
- Water
- KOH (alkali)

PGMCC COMPLEC

Output

Energy and Material Flows

- Electric Power
- Methane
- Hydrogen
- Oxygen
- Basalt-like slag
- Metals
- Purified water
- Potassium bicarbonate or dry ice

PGMCC Complex

Waste utilization capacity – 1,33 t/h (average moisture 25 %, average calorific value 12 MJ)

Energy and Material Flows of the Methane Production

Start

Electric Power	600 kW h	14 400 kW/day
Water		3 m3/day
KOH (alkali)		25 kg/day
CO2		250 l/day

Input

MSW (W 25%, LCV 14 MJ/kg)	1,33 t/h,	10 667 t/year
Electric power (for own requirements)	611 kW h,	4 888 000 kW h/year
Electric power (hydrogen and oxygen production)		0 kW h/year
KOH (alkali)		8 400 kg/year
KOH (potassium bicarbonate production)		3 817 760 kg/year

Output

Electric Power (own-use)	611 kW h	4 888 000 kW h/year
Methane		2 293 852 m3/year
Hydrogen		0 m3/year
Oxygen		0 m3year
Basalt-like slag		800 t/year
Metals		112 t/year
Purified water		1 572 t/year
Potassium bicarbonate		6 384 214 kg/year
or dry ice		2 551 299 kg/year

PGMCC Complex

Waste utilization capacity – 1,33 t/h (average moisture 25 %, average calorific value 12 MJ)

Energy and Material Flows of the Electric Power Production

Start

Electric Power	600 kW h	14 400 kW/day
Water		3 m3/day
KOH (alkali)		25 kg/day
CO2		250 l/day

Input

MSW (W 25%, LCV 14 MJ/kg)	1,33 t/h,	10 667 t/year
Electric power (for own requirements)	611 kW h,	4 888 000 kW h/year
Electric power (hydrogen and oxygen production)		0 kW h/year
KOH (alkali)		8 400 kg/year
KOH (potassium bicarbonate production)		3 817 760 kg/year

Output

Electric Power (own-use)	1 852 kW h,	14 811 742 kW h/year
Methane		0 m3/year
Hydrogen		0 m3/year
Oxygen		0 m3year
Basalt-like slag		800 t/year
Metals		112 t/year
Purified water		1 572 t/year
Potassium bicarbonate		6 384 214 kg/year
or dry ice		2 551 299 kg/year

PGMCC Complex

Waste utilization capacity – 1,33 t/h (average moisture 25 %, average calorific value 12 MJ)

Energy and Material Flows of the Green Hydrogen Production

Start

Electric Power	600 kW h	14 400 kW/day
Water		3 m3/day
KOH (alkali)		25 kg/day
CO2		250 l/day

Input

MSW (W 25%, LCV 14 MJ/kg)	1,33 t/h,	10 667 t/year
Electric power (for own requirements)	611 kW h,	4 888 000 kW h/year
Electric power (hydrogen and oxygen production)		9 923 742 kW h/year
KOH (alkali)		8 400 kg/year
KOH (potassium bicarbonate production)		3 817 760 kg/year

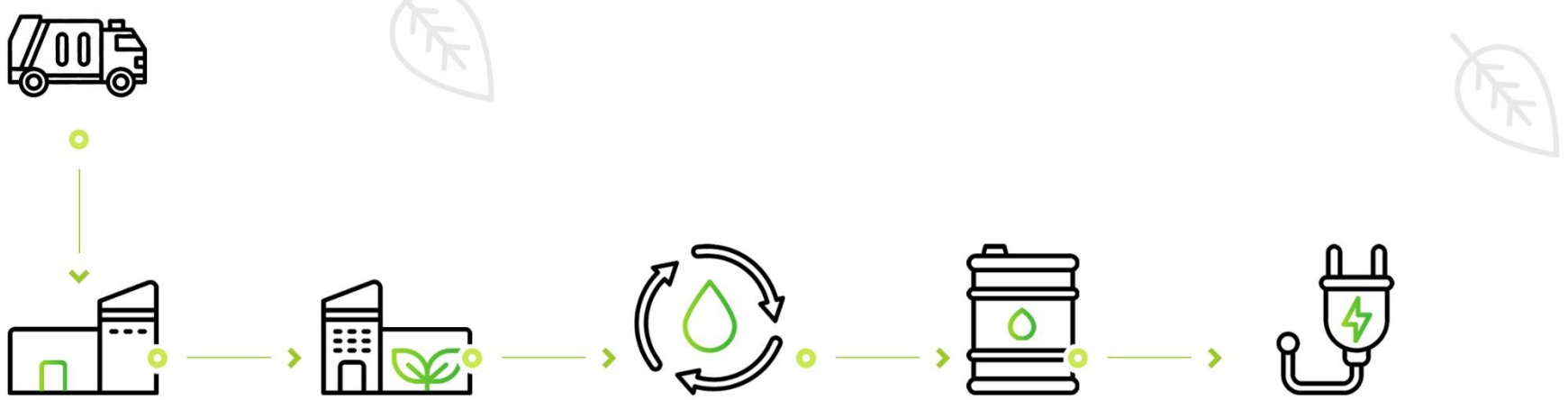
Output

Electric Power (own-use)	0 kW h/year
Methane	0 m3/year
Hydrogen	2 480 935 m3/year
Oxygen	1 236 490 m3year
Basalt-like slag	800 t/year
Metals	112 t/year
Purified water	1 572 t/year
Potassium bicarbonate	6 384 214 kg/year
or dry ice	2 551 299 kg/year

PROCESS

Our offers

We offer turnkey delivery of PGMCC Complexes for processing solid municipal and industrial waste and biomass with a capacity from **0.4 t/h to 6 t/h.**



Waste Preparation Unit

Fast Plasma Gasification Unit

Gas Conversion Unit

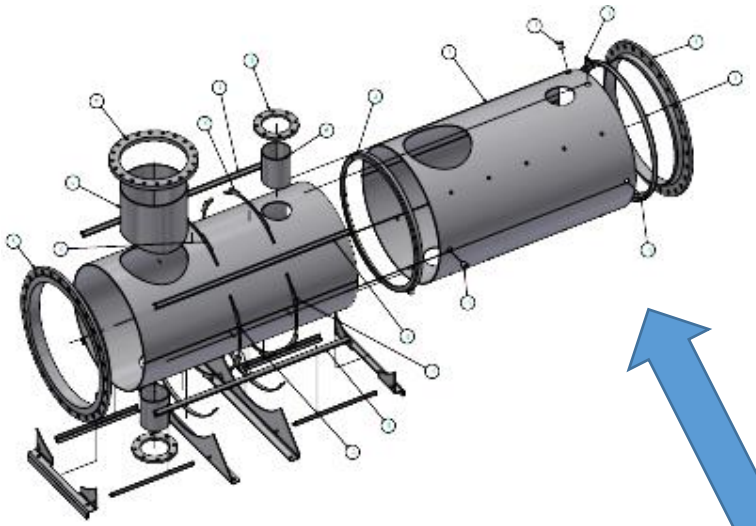
Methane Tank

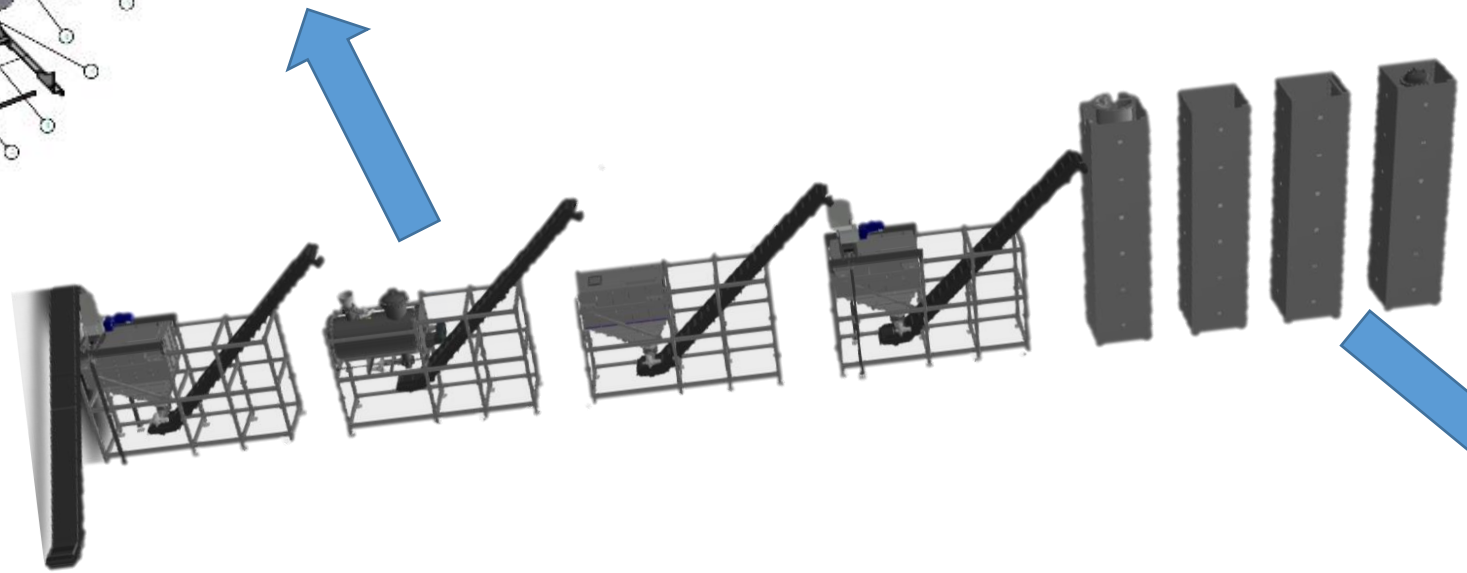
Electric Power and Heat Generation Unit

PGMCC Complex

Waste utilization capacity – 1,33 t/h (average moisture 25 %, average calorific value 12 MJ)

PGMCC Complex equipment 3D models



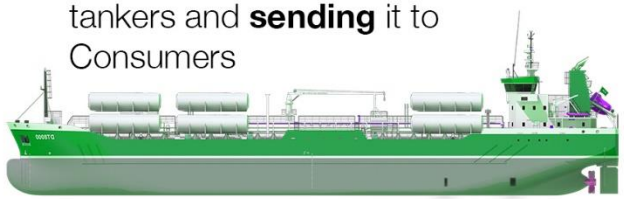


All 3D models of equipment of the PGMCC Complex have technical (working) documentation for industrial production in Hungary.

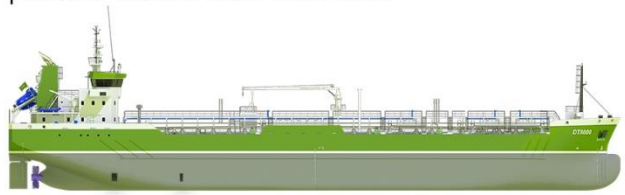
Our strategy for the nearest future

Today, the garbage islands in the Pacific Ocean exceed the territory of three European countries by area. **PGMCC complexes in the mobile version,** installed on ships, are able to effectively destroy them to produce methane.

Loading methane into tankers and **sending** it to Consumers



Recycling
plastic waste into methane



The specialists warn:

“The concentration of plastic is increasing exponentially. I think the situation is getting worse, “said Laurent Lebreton, lead author of the Ocean Cleanup Foundation study in Deltf, the Netherlands.

This highlights the urgency of taking measures to stop the arrival of plastics in the ocean and to clean up the existing disaster.

THANK YOU FOR ATTENTION!

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