

PLASTIC TO ENERGY SMART HYBRID PTR SOLUTION



PLASTIC WASTE AND RECYCLED PLASTIC MATERIAL, AS A SOURCE OF RENEWABLE ENERGY AND MATERIAL FOR PETROCHEMISTRY

HEDVIGA GROUP, a.s. in its patented **PTR solution**, presents a method of neo-oxidative slow thermal decomposition, which takes place in closed fuel reactor without air access, in the process temperature range of 300 - 600 °C. In the process of thermal conversion, the input charge as PLASTIC always decomposes into other fractions - solid carbon, liquid fuel - oil and mostly gaseous fuel.

Depending on the origin of this input raw material, here plastic and mix plastic material (PP, PET, LDPE, HDPE), can be these produced fractions especially liquid and gaseous further used as additives to advance fuels, synthetic liquid or gaseous fuels, especially in petrochemicals, e.g. for the production of polypropylene with an emphasis on the energy value/ saving in the output products and CO₂ saving. Process of thermal conversion of plastic is energy self-sufficient and enables continuous supply of electricity to the grid too.

An innovative point of view of PTR technology is especially in an identification of a clear goal of utilization and / or reuse of input raw materials in compliance with the principles of the Circular Economy. The input raw materials for PTR technologies are different sorted recycles from plastic, rubber and waste biomass, sewage sludge or secondary raw materials. The products that can be produced in slow thermal decomposition (PTR) have parameters of saleable product and at the same time a lower emission factor than to usually produced. PTR process is strictly non-oxidative process, what is key to assume the quality and usability of thermal decomposition products and represents the most significant difference between our patented PTR technology and others.

A huge advantage of PTR is the specific batch system for processing the input raw material in the PTR technology, which allows a separate and closable PTR reactors with processed in separate batches. Then can be all PTR operation system modify for any feedstock combination to achieve those requirements parameters e.g., energy efficiency or CO₂ save. This system is called **PTR SMART HYBRID ENERGY**.

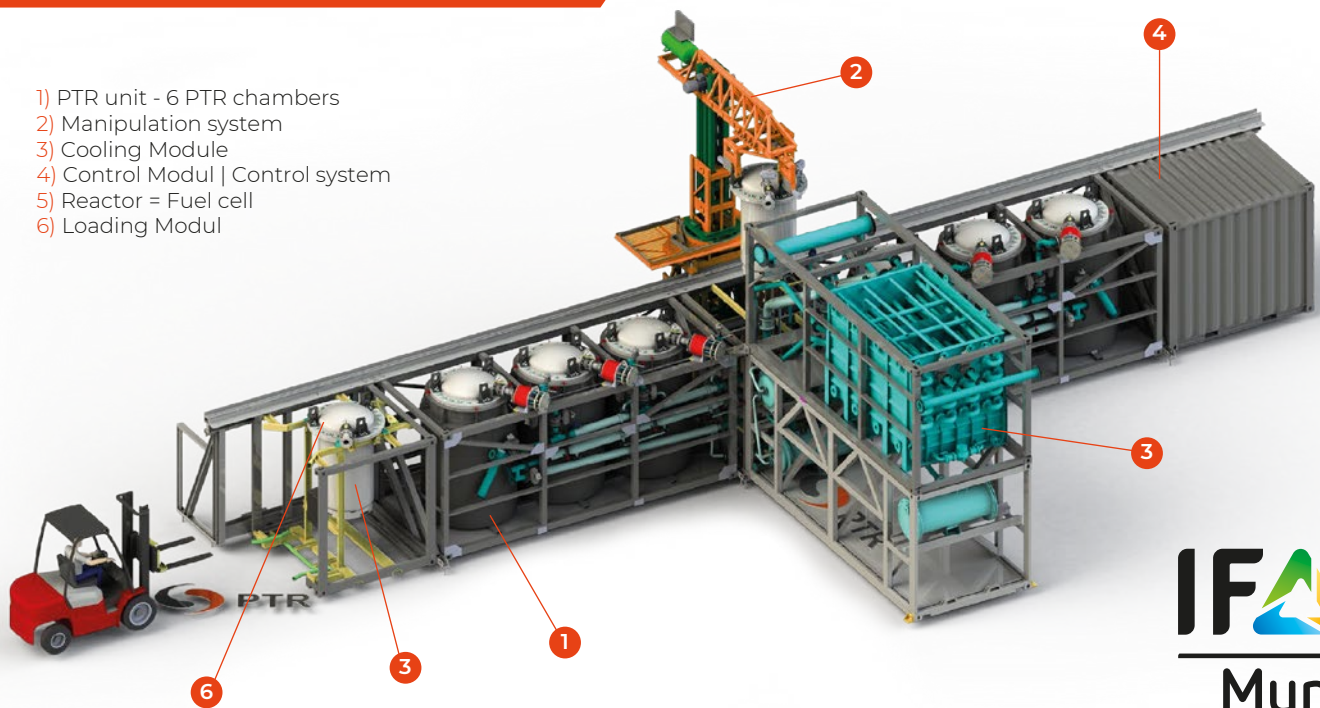
SMART **HYBRID**
ENERGY

 **PTR[®] 1000**
TECHNOLOGY

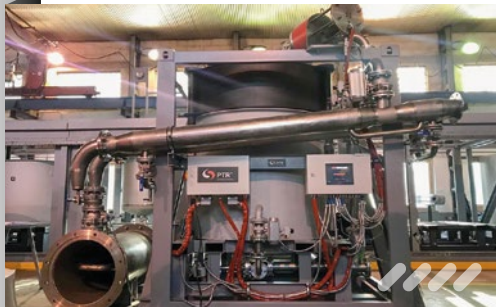
 **MOMENTA[®]**
COGENERATION

VISUALIZATION OF PARTICULAR PTR SOLUTION

- 1) PTR unit - 6 PTR chambers
- 2) Manipulation system
- 3) Cooling Module
- 4) Control Modul | Control system
- 5) Reactor = Fuel cell
- 6) Loading Modul



IFAT
Munich

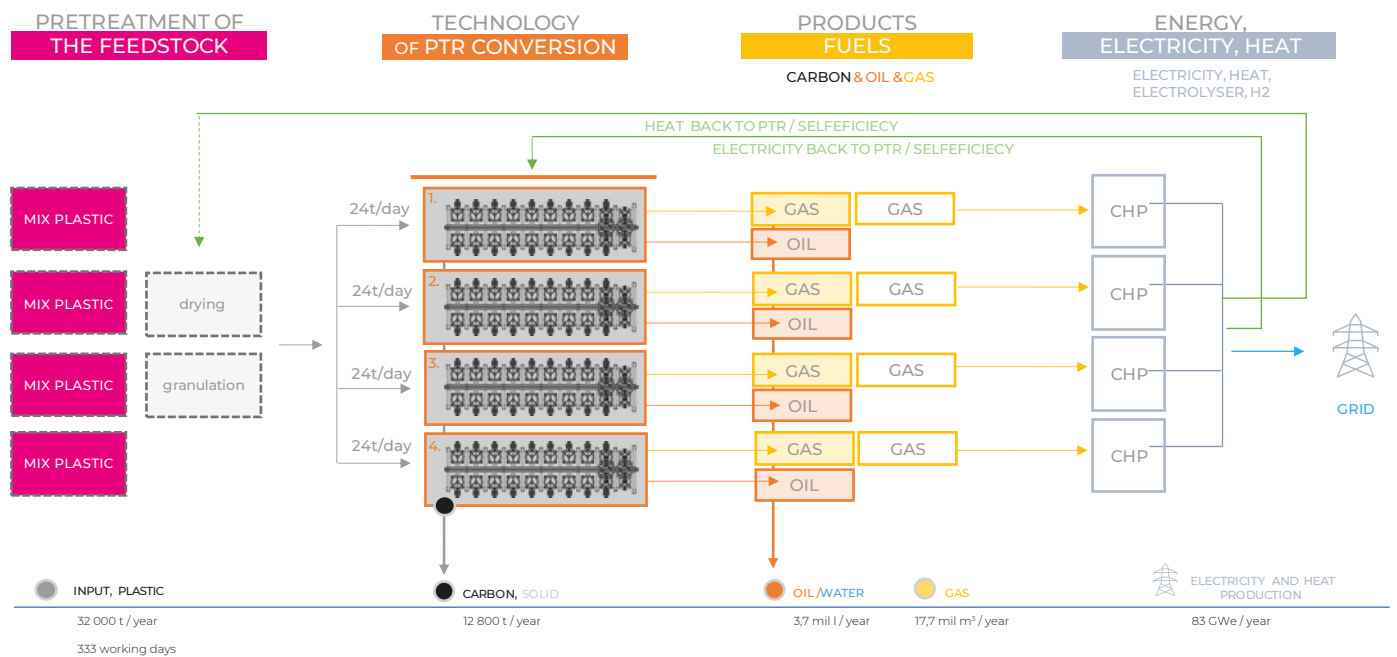


The actual process of slow thermal decomposition (PTR) takes about 2-3 hours and is proceeded in a closed system without air access = Non-oxidative thermal process. The PTR process itself is thermally stable and during the operation it continuously generates from the input charge three output fractions: gaseous, liquid and solid. Depending on the end use of these fractions, the PTR process outputs are certified as products.



PTR TECHNOLOGY

PATENTED COMPLEX SOLUTION



PTR TECHNOLOGY

COMPREHENSIVE TURN-KEY SOLUTION



The intention of the PTR comprehensive energy solution is always to design for the future operator a turn-key utilization (disposal) of a particular input material (waste), as well as to simultaneously design an effective energetic arrangement within the current use of PTR products (fuels) to drive a power unit. The PTR comprehensive solution, extended by energy module - cogeneration, will enable to create a completely self-sustaining system, independent of external energy supplies.

ADVANTAGES OF PTR COMPREHENSIVE SOLUTION

- ✓ **Container arrangement** > which is capacitively modular.
- ✓ **Semi-mobile** > enables a continuous and temporary operation at various locations according to needs (e.g. near landfill sites), or to purposefully use it as a local source for production of electricity and heat for companies, municipalities and micro-regions.
- ✓ **Energy self-sustaining** > can be installed even where there is no assured supply of electric current.
- ✓ **Combinability of input raw materials** > operational and technological system PTR SMART HYBRID ENERGY | SOLUTION for ensuring the required product quality and sufficient energy.

PTR solution + Cogeneration unit =
TECHNOLOGY FOR WASTE TREATMENT AND FUEL AND ENERGY PRODUCTION



HEDVIGA GROUP, a.s.
 Husova 464
 738 01 Frýdek-Místek, CZE

contact@hedviga.cz
www.hedviga.eu



WASTE TREATMENT AND FUEL AND ENERGY PRODUCTION



PLASTIC TO ENERGY - SMART HYBRID PTR SOLUTION

PLASTIC WASTE AND RECYCLED PLASTIC MATERIAL, AS A SOURCE OF RENEWABLE ENERGY AND MATERIAL FOR PETROCHEMISTRY

PTR PLASTIC is an innovative technology solution, processing mix-plastic material, plastic separated material (PP, HDPE, PET, LDPE, automotive plastic, foils.. etc.) based on slow thermal decomposition (PTR process) of organic feedstock.

The PTR Plastic system represents a self-sufficient system not only for disposal of plastic waste, but also for the direct energy usage of the product of thermal conversion.

PTR conversion of plastic generates high caloric value gas comparable in quality to natural gas and oil, which can be directly used for energy production in CHP or turbine, or produce grid quality gas in regime "Gas to grid injection", as useful product that has monetary value.

Thermal conversion of plastic is not the way to produce carbon black, but the way how decrease amount of waste using PTR technology in energy self-sufficient operation, and the way how to bring the positive carbon footprint within produced fuel, or electricity for green hydrogen production.

Chemical additives in plastics, especially chlorine, pigments, binders and flame retardants, are problematic. The batch processing system in PTR technology, including the filtration system, makes it possible to achieve safe and environmentally friendly values even with the problematic substances of plastic waste.

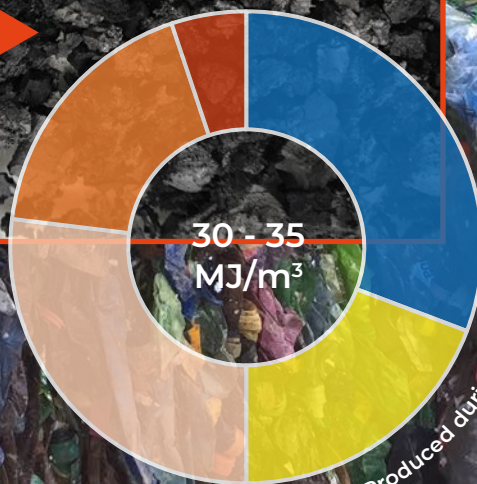
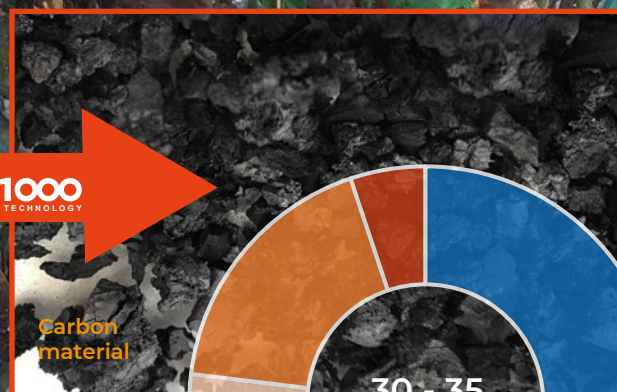
= Mix Plastic -> PTR gas, PTR oil -> **ENERGY and CIRCULAR SYSTEM OF ENERGY**

= Mix Plastic -> PTR gas -> produced **GRID QUALITY GAS**

= Mix Plastic -> PTR gas, PTR oil -> Electricity -> **HYDROGEN**

= Mix Plastic -> **ELIMINATION** of the waste from the **Landfill** and from **the Sea**

= Plastic waste from recycles -> Elimination of Waste and Energy production



IFAT
Munich