STREBL ENERGY™
RENEWABLE ADVANCED TECHNOLOGIES

Waste management solutions

Communal waste processing

MSW Energy Solution

M.S.W.
Concept for municipal waste management

M.S.W.
Modern sorting and recycling technology

M.S.W.
Use of waste heat
O Zone
Filtration technology

M.S.W.
Production of electricity
Heat production
Production of Diesel
Production of synthetic oil

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We supply environmentally friendly technology

STREBL Energy – our Energy Technology concept covers the following fields:

1. Waste Heat - solution for the production of electricity from waste and process heat in any form of technology ORC Green Machine.

2. Biomass Gasification Technology - production of electricity and heat (CHP) or Tri-generation, for processing all types of biomass, including waste.

3. Pyrolysis Technology - unique and proven technology "Low Catalytic depolymerization technology" that uses waste plastics, tyres, and all types of waste polymers in a very clean fuel with low sulphur POLY-FUEL® (Oil) and traditional pure POLY-DIESEL®.

4. Energy Management and Voltage Optimization Management – Quality Power System - technology to enhance power quality for all kinds of equipment, buildings and technological plants.

5. Centrifugal Cleaning Oil System - patented technology for cleaning all kinds of oils.

6. Energy Storage - highly sophisticated technology for energy storage and its subsequent distribution.

The technologies that we supply are designed to increase the energy efficiency of individual applications, with the highest possible efficiency levels, and a quick return on investment.

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A new direction in waste management

Who we are

We are a renowned engineering technology company working on the latest technical foundations. We create our projects in co-operation with leading manufacturers and technology providers for processing various types of waste, with subsequent Waste-to-Energy technology, using advanced emisson-free processes.

Our mission

Our mission is to help municipalities and institutions confronted with waste management and its subsequent effective disposal with the highest efficiency levels.
We can transform waste and recyclable materials into proven clean energy through modern technology.

Our vision

Our vision is a world built on clean, renewable energy with high efficiency levels.
To establish a sustainable state of the environment, without waste and landfill sites.

Our expertise

Our expertise ranges from the processing of waste in timeless sorting and recycling facilities, to energy use waste with first class, unique technology of various types.

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What we offer

We offer a revolutionary solution for recycling and emission-free conversion of waste to energy, which will help solve the problem of landfill sites and the disposal of hazardous materials;

Waste management solutions – M.S.W. Energy Solution

Advanced sorting and recycling technology, which is able to sort 100% of mixed municipal waste effectively, with subsequent high energy efficiency;

Extremely energy-saving drying technology - closed circuit drying process with high efficiency levels;

We produce fuel with high heating values - High Quality Fuel (± 22 MJ/Kg);

Thermo-catalytic Gasification, technology with 90 % efficiency in conversion into energy, practically without waste;

Cleaning is carried out using the "O-Zone" (O^3), currently the most advanced technology available for the ecological filtration of air, water, and gas;

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A new direction in waste management

National and socio-economic benefits of the project:
Prevention of severe air and environmental pollution.

In the process of Thermo-Catalytic Gasification, no environmentally hazardous substances are produced.
The technology works without air or oxygen, combustion does not take place!

Our M.S.W. energy reduces the amount of waste to 5% of the original quantity, without the formation of hazardous substances.

We work with a 2.5 - 3 times higher efficiency than traditional combustion technology.

The return on investment is less than 7 years.

From signing the contract to delivery and installation start, we need only 9-12 months.

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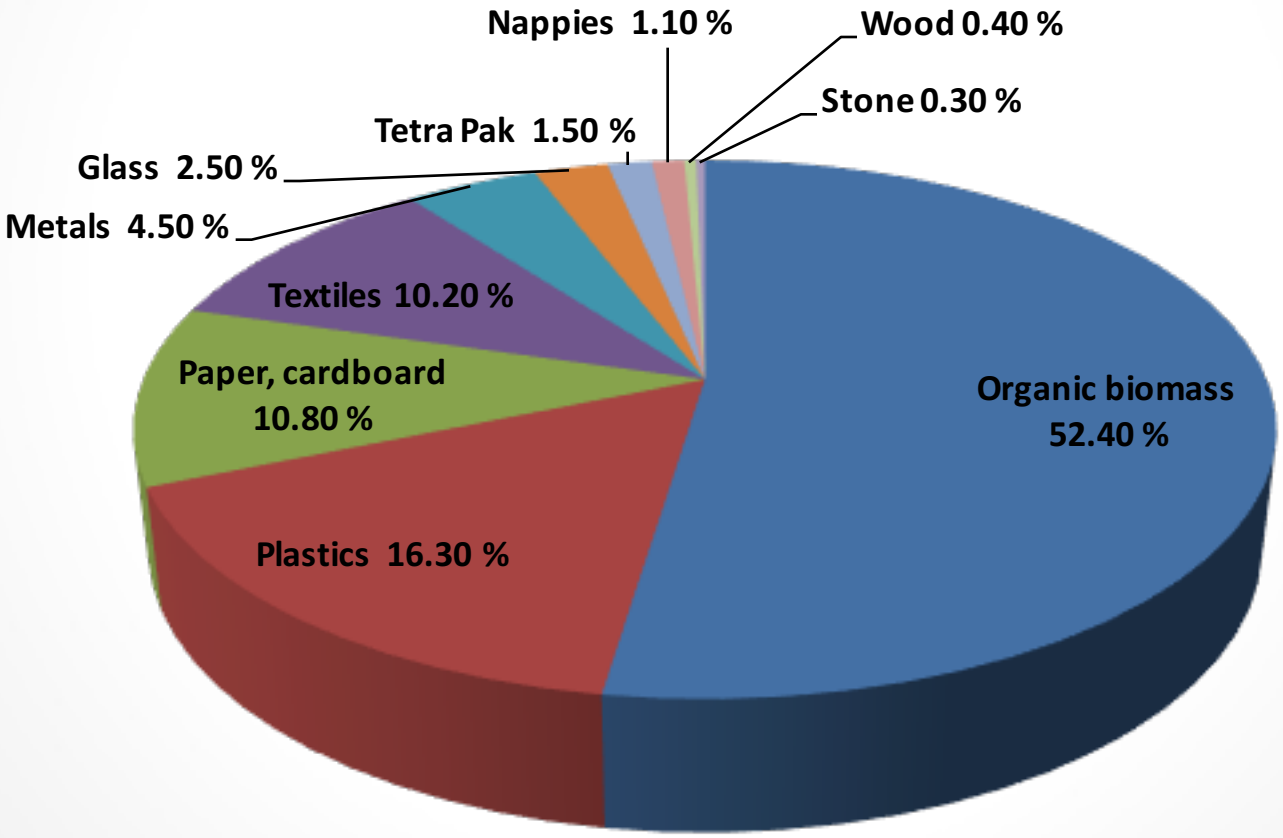
The typical structure of mixed municipal waste (EU)



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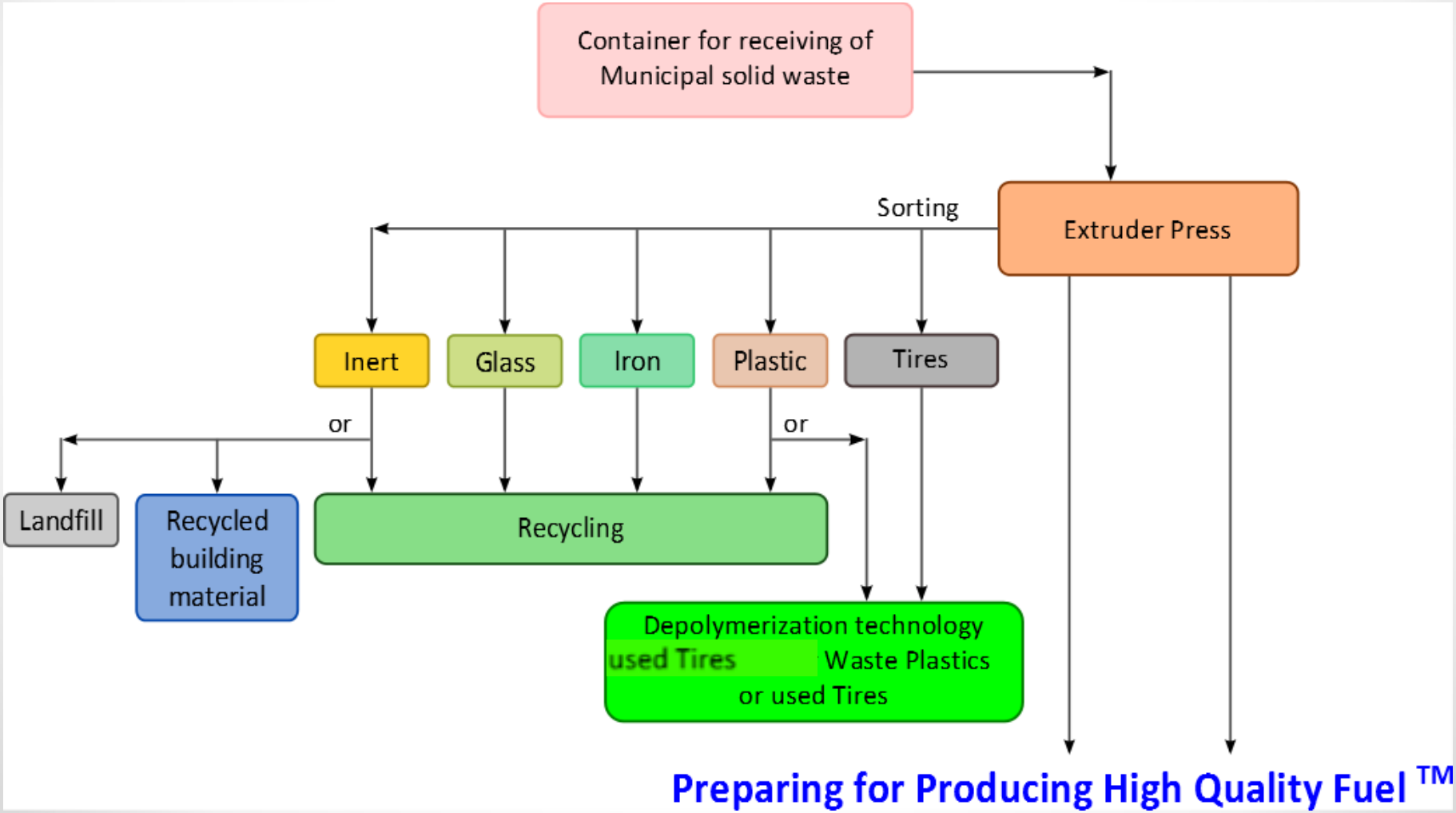
Preparing, sorting, and recycling proccess flowchart



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Proven sorting and recycling technologies

Line for separating and processing M.S.W.

M.S.W.

Biomass

Mixed synthetic materials / RDF

Aluminium

Plastics

Glass

Metal

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Sorting and recycling

Loading Hopper

Crusher

Belt conveyor

Separator

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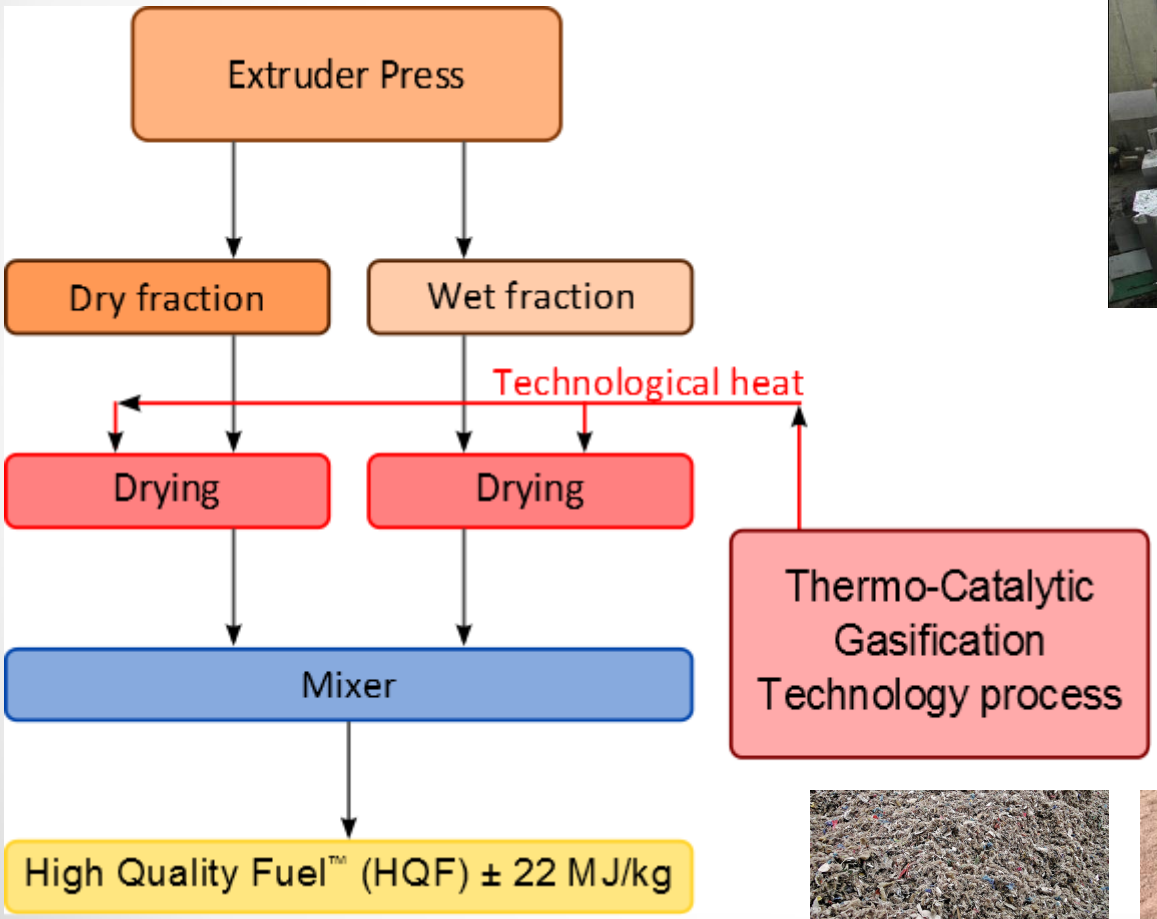
Preparation for the production of high-quality fuels – RDF
High Quality Fuel™




Extruder


Drying

R.D.F.


Crushed dry solid fraction


Organic wet fraction

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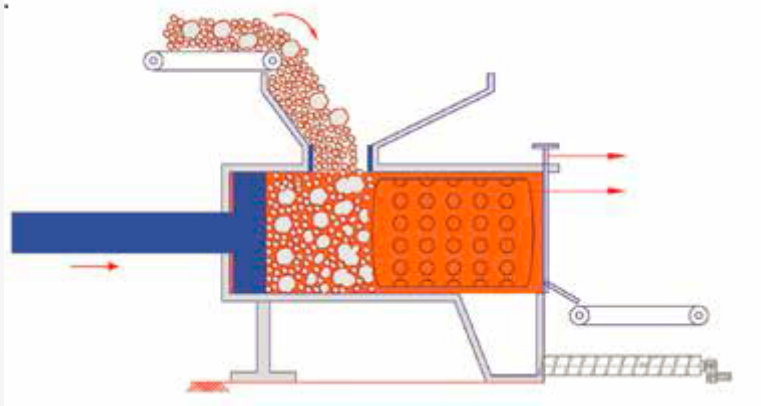
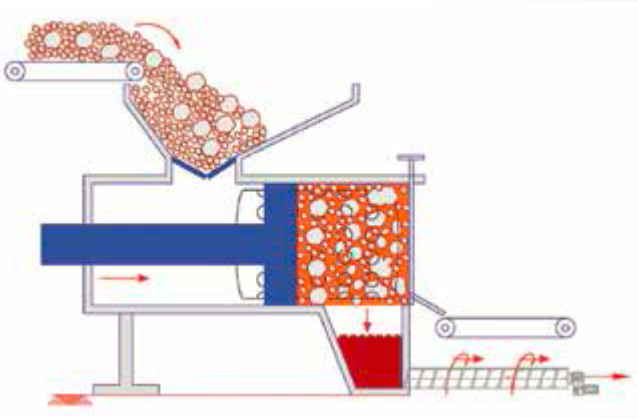
The principle of extruder technology preparation of high-quality fuels – RDF – High Quality Fuel™

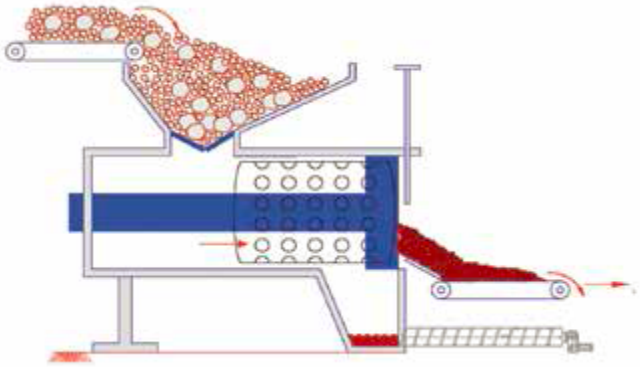
Mixed municipal waste (M.S.W.)





Organic fraction

When municipal solid waste is exposed to extremely high pressure, the organic and wet parts are liquified. The solid and fibrous portion remains in the perforated compression chamber. The organic and wet portions are pressed through the perforations.



R.D.F. fraction

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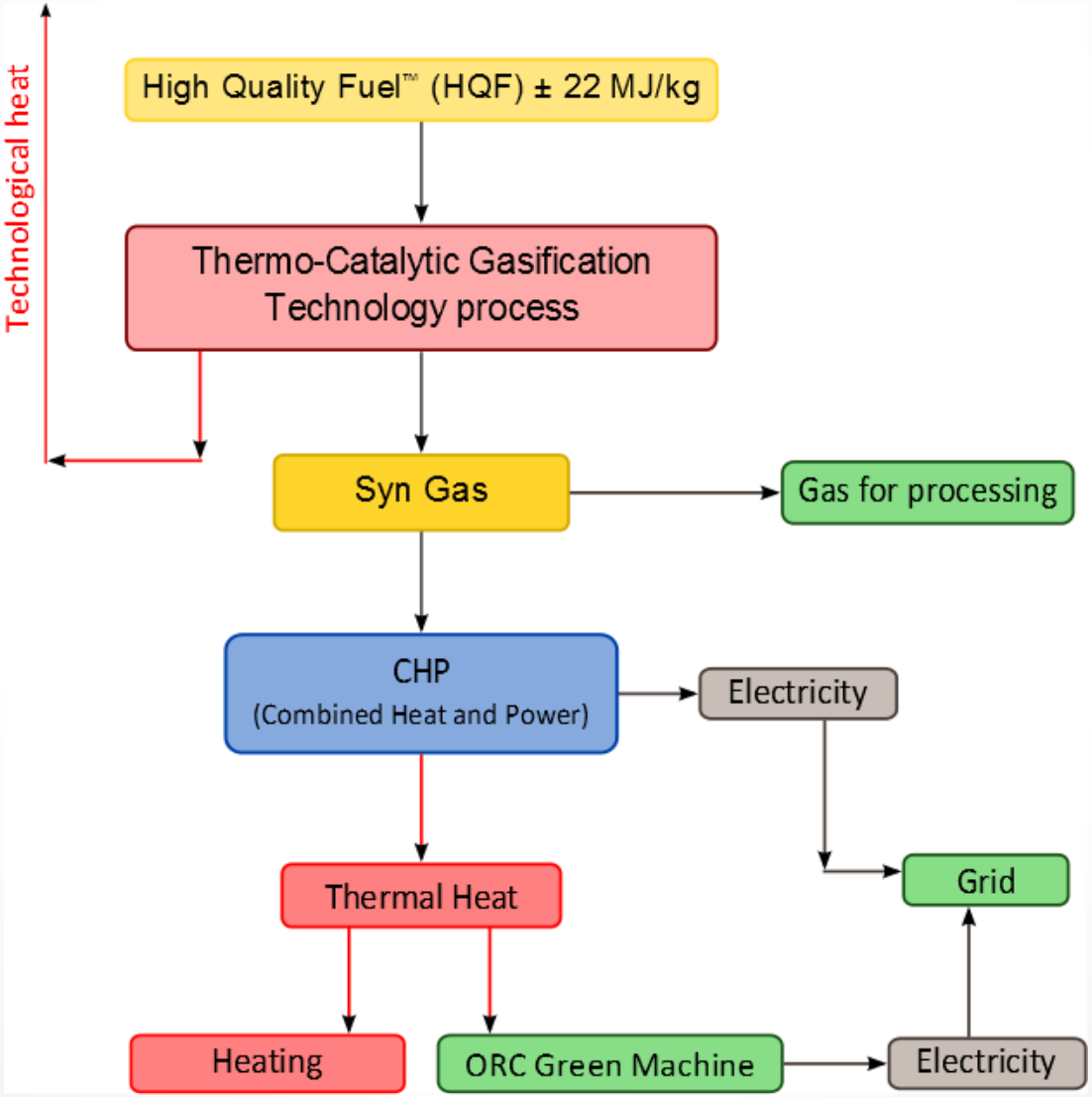
The Thermo-catalytic Gasification process



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The Thermo-catalytic Gasification process

- Thermo-catalytic Gasification is the conversion of solid or liquid materials with acatalyst in the synthesis gas Syn Gas (the molecular fission of solid or liquid material).

- The process technology of Thermo-catalytic Gasification is an innovative combination of two well-established and proven technologies - gasification and catalytic depolymerization, both of which have decades of proven commercial operation.

- The core of the process of Thermo-catalytic Gasification is the patented design of the reactor and catalyst that convert in advance the carefully modified organic and non-organic waste into synthetic gas Syn Gas. This gas does not contain tar and its markers in our technology working temperatures.

- The Thermo-catalytic Gasification process is carried out at medium-high temperatures, without combustion from a direct flame, between 700 °C – 1200 °C, in a highly controlled environment without oxygen or air. A special reactor for accurate dosing of the catalyst allows the uniform production of the synthetic gas, Syn Gas, and achieves high conversion efficiency (between 85% - 92%) of the waste. The synthetic gas Syn-Gas is then cleaned and exported to the gas tank for further energy recovery.

- The reaction occurs within 10 minutes of the pre-charge of the carefully prepared High Quality Fuel mixture from the mixed municipal waste (MSW) or industrial waste.

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Environmental facts about Thermo-catalytic Gasification

NO exhaust gases that pollute the air are discharged
Full and highly efficient gasification (without oxygen and air) from high standards
Technology meets the applicable standards ISO 14001 and ISO 2001: 2009.

From the process technology, there are no harmful substances and emissions, because there is no combustion.

NO liquid waste is discharged that could pollute water and soil
During cleaning, acid waste water is diluted. This water is cleaned by the O zone (O^3) three-stage filtration process, and used for heating.

NO other solid or liquid waste from process technology is stored in landfill sites
The process leaves no residual substances, as would occur with traditional combustion technology.

NO fermentation of organic waste in the traditional process of biogas or compost production is necessary
During processing, biowaste is treated together with HQF (High Quality Fuel), RDF (refuse derived fuel), or SRF (Solid fuel prepared). We provide a system that destroys viruses, bacteria, and spore-producing pathogens.

The technology for converting materials and thier use is unique in the field of waste management.

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Energy Balance Sheet for the technology of Thermo-catalytic Gasification

Production of processed Municipal Solid Waste (MSW)

Capacity of the technology	t/year	45 000,00	60 000,00	75 000,00
Capacity of the technology	t/day	123	164	205
Number of operational days	days/year	365	365	365
Number of operational hours	hour/year	8 760	8 760	8 760

Energetic balance

Production of electric energy + heat	Capacity (t/year)	45 000,00	60 000,00	75 000,00
Total produced electric energy	MWe/hour	4,270	5,693	7,117
Total produced heat energy	MWt/hour	4,994	6,592	8,240
Total produced electric energy	MWe/year	34 946	46 594	58 243
Total produced heat energy	MWt/year	40 463	53 951	67 439

Energy balance based on the average composition of mixed municipal waste in the Republic of Mali.

Technology for Thermo-catalytic Gasification processes from 15,000 to 300,000 tons of mixed municipal waste (MSW) per year for one installation.

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Advantages of Thermo-catalytic Gasification

- Thermo-catalytic Gasification technology is available and designed for smaller cities and towns, as well as for capital cities. It is flexible and scalable.

- Thermo-catalytic Gasification technology capacity is from 15,000 tons to 300,000 tons treatment of municipal waste per year.

- The use and application of Thermo-Catalytic Gasification technology, apart from classic municipal (MSW) and industrial waste, the technology will also process PCB, chemical, and biological agents, hazardous solid and liquid substances, waste from the computer industry, plastics, waste from extractive industries, municipal sludge from sewage treatment plants, oil sludge, municipal solid waste, medical waste, illegal drugs and valuables taken out of circulation, sludge containing dioxins, furans, polychlorinated biphenyls, rubber, chlorides, hydrocarbons, plastics, wood, and paper products.

- Thermo-catalytic Gasification technology has, compared to Plasma technology and conventional incinerators, very low power consumption (only 130 kWe with a capacity of 100 TPD - 100 tons per day for processing MSW and Industrial Waste) for proper operation with high efficiency conversion into electrical and thermal energy.

- The heat can be transformed either for heating, power generation in ORC, or for cooling.

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Comparison of technology for M.S.W. Energy Solution and ZEVO incinerators

		Municipal Solid Waste Energy Solution	Zevo Incinerator Czech Republic
The amount of waste treated	t/year	95 000	95 000
Production of electricity (net production)	MWe/hour	12,03	4,70
Production of electricity (net production)	MWe/year	98 458	25 810
Heat production (net production)	MWt/hour	9,79	22,00
Heat usage	MWt/year	80 105	108
Fee for combustion	CZK/t	0	2 500
Fee for combustion	CZK/year	0	237 500 000
Landfill technology waste	t/year	4 750	28 500
Fee for storage in a landfill	CZK/year	2 375 000	14 250 000
Expenses for charges for lifetime	CZK/20 years	47 500 000	5 035 000 000
Initial cost	CZK	800 000 000*	2 400 000 000**
Revenues for the recycling of waste	CZK/year	47 500 000	0

*The price includes complete solutions - recycling, fuel fabrication, power terminal, and power output transfer.
**Cost of technology itself.

Prices for fees are approximate, and have not taken into account the increase in inflation of prices for fees, combustion, emission allowances, and landfill charges.

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Summary of the advantages of Thermo-catalytic Gasification

- Prevention of severe air pollution and reduction of emissions
- Maximum diversion from landfill
- Wasteless technology (burning returns more than 25% of inert material to dumps)
- National and socio-economic benefits of the project
- Maximum energy efficiency (2.5 - 3 times greater and more effective than traditional combustion)
- No special fees (e.g. Fee for waste incineration, as with today's traditional incinerators)
- State of the art Ozone filtration (O3) meeting the strictest hygiene requirements and standards
- Low spatial demands across all of the technology
- High bonus for environmental and visual impact
- Local solutions for small towns, up to metropolis
- Low power consumption of electrical energy
- Tailor-made solutions for the given region and type of waste, according to the required capacity
- From signing the contract to the technology start is just a 9-12 months delivery time
- CE and TUV certification
- Fully ecological technology to meet stringent requirements and emission standards. with high technical standards
- Short Return On Investment period

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Plastic, tyre, and waste oil processing

Low-temperature catalytic depolymerization

Catalytic thermodegradation without oxygen

Solutions and processing technology for II. and III. category waste plastics
Solutions and technology for processing waste and used tyres
Solutions and technology for processing waste oil from industrial production

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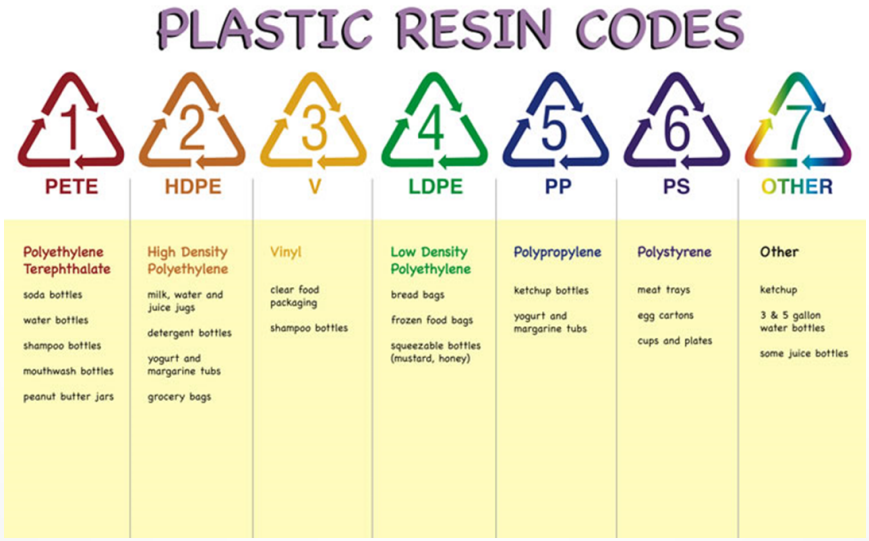
Plastic, tyre, and waste oil processing

Raw materials suitable for depolymerization:

- waste plastics II. and III. category
- electronic waste, automobile plastic,
- mixed plastic (HDPE, LDPE, PE, PP, Nylon, Teflon, PS, ABS, FRP etc.).
- layered plastic, Tetrapack, Celulose
- used tyres
- rubber
- plastic or rubber parts of vehicles
- waste motor oils, industrial oils, and other food oils, etc.



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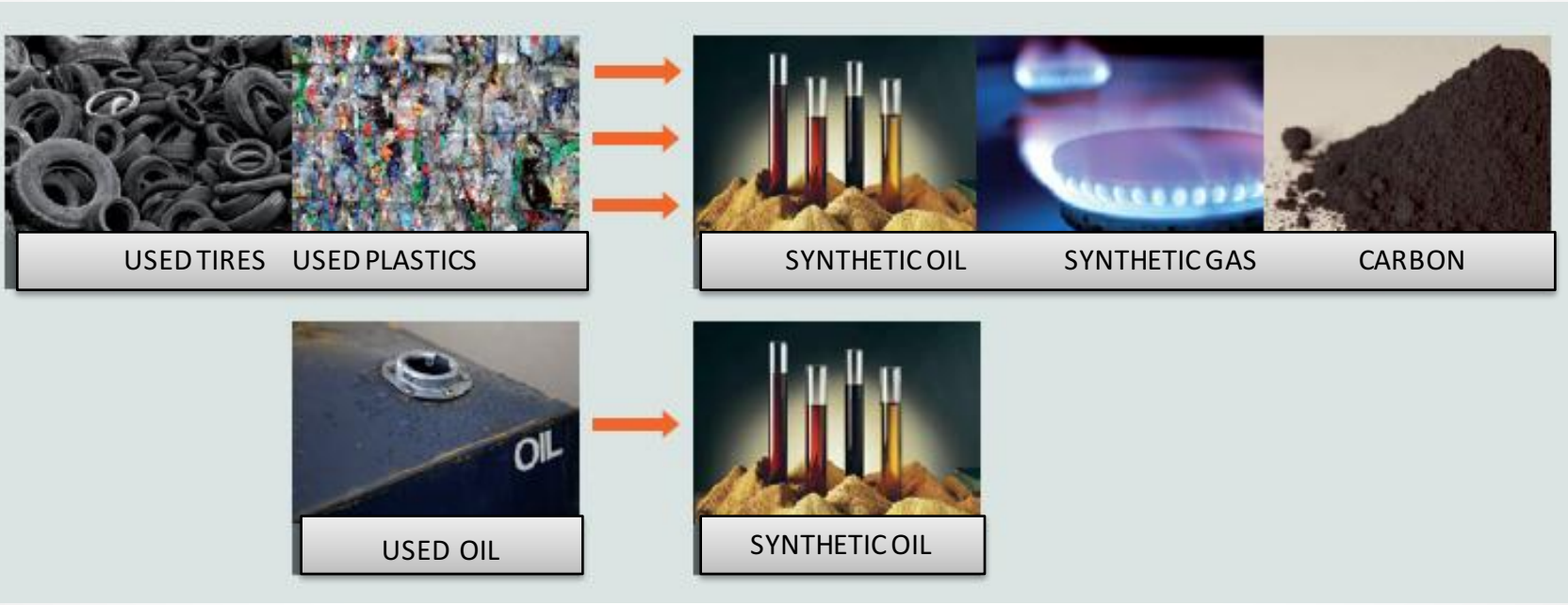
Outputs from Depolymerization technology



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Thank you for your attention