

The Solution



PLASTIFISSION



Thermomolecular Decomposition Technology
Technology serving nature





TTL USA INC
TECHNOLOGY TRANSFER LABS

THE
NEW
SOLUTION

WOW

ENERGY PRODUCTION FROM PLASTIC
6 Reactors
Electricity
37 000 MWh/y
& Heat Energy
200 000 GJ/y
POWER BY PLASTIFISSION TECHNOLOGY

WE GENERATE ELECTRICITY FROM NON-RECYCLABLE, END-OF-LIFE-CYCLE MIXED PLASTIC WASTE USING AN ENVIRONMENTALLY FRIENDLY AND UNIQUE RECYCLING, THERMO – MOLECULAR CONVERSION TECHNOLOGY



HEAT ENERGY
200 000 GJ/year



5% CARBON *
706 tons
* Incl. 0.5-1% other solid fraction

70% OIL
11 360 160 liter



14 thousand tons/year
Mixed Plastic Waste

TCC



25% GAS
3 528 000 m³

TCC

ELECTRICITY
37 000 MWh/year



OUR TECHNOLOGY

ENERGY PRODUCTION FROM PLASTIC

Energy production

6 reactors:
1,680 kg/h (3,704 lbs/h)
capacity unit provides
15,000 homes (in the EU)
with electricity (and
heat) each year.

Job creation

One waste treatment plant
employs 15 people.
Additional employment
opportunities include
collection, selection,
storage, and transportation
of plastics.

Flexible output materials

Scalable processing capacity
Adjustable power output
Stored energy
Distributed power generation
Modular design in mobile systems on 4,500 m² (48,438 sq ft)

ADVANTAGE RECAP

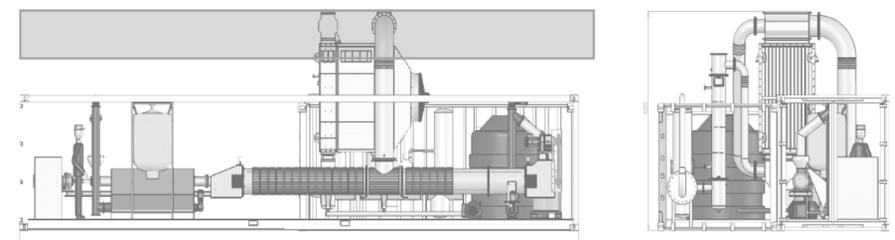
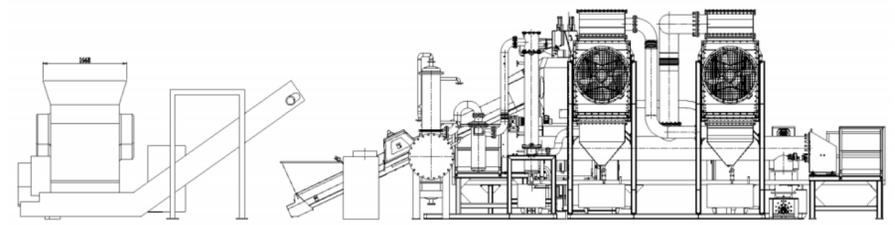
TÜVRheinland®
Precisely Right.



CE certified



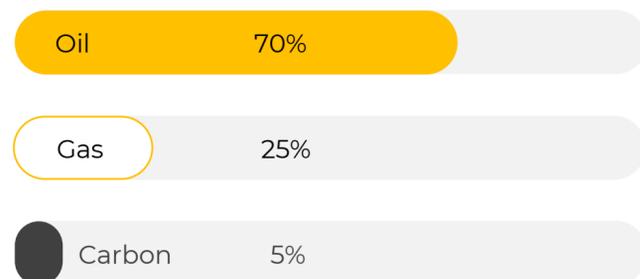
Our technology does not require cleaned plastic and works as a closed system without harmful emissions.



OUR TECHNOLOGY

ENERGY PRODUCTION FROM PLASTIC

In terms of energy, the highest efficiency is achieved with mixed plastic waste input where the yield is:



During heat decomposition, the input waste breaks down to elementary pieces and thereafter the heat builds chemical bonds and transforms the waste to oil, gas and carbon in solid phase respectively.

FROM 1,000 KG (2,204 lbs) MIXED PLASTIC WASTE

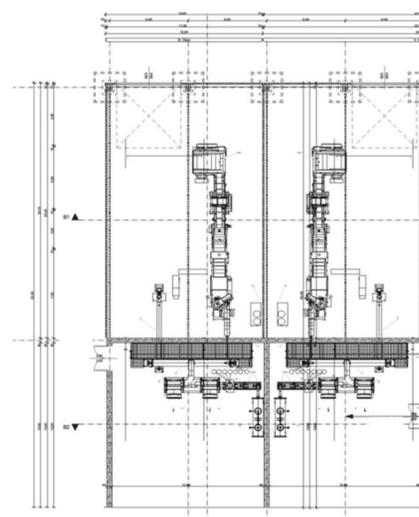
70% Oil
700 kg
(1,543 lbs)

25% Gas
250 m³
(8,828 cu ft)

5% Carbon
50 kg
(110 lbs)

OUR PORTFOLIO

SCHEMATIC DIAGRAM OF PLASTIFISSION



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TTL-TMD 300

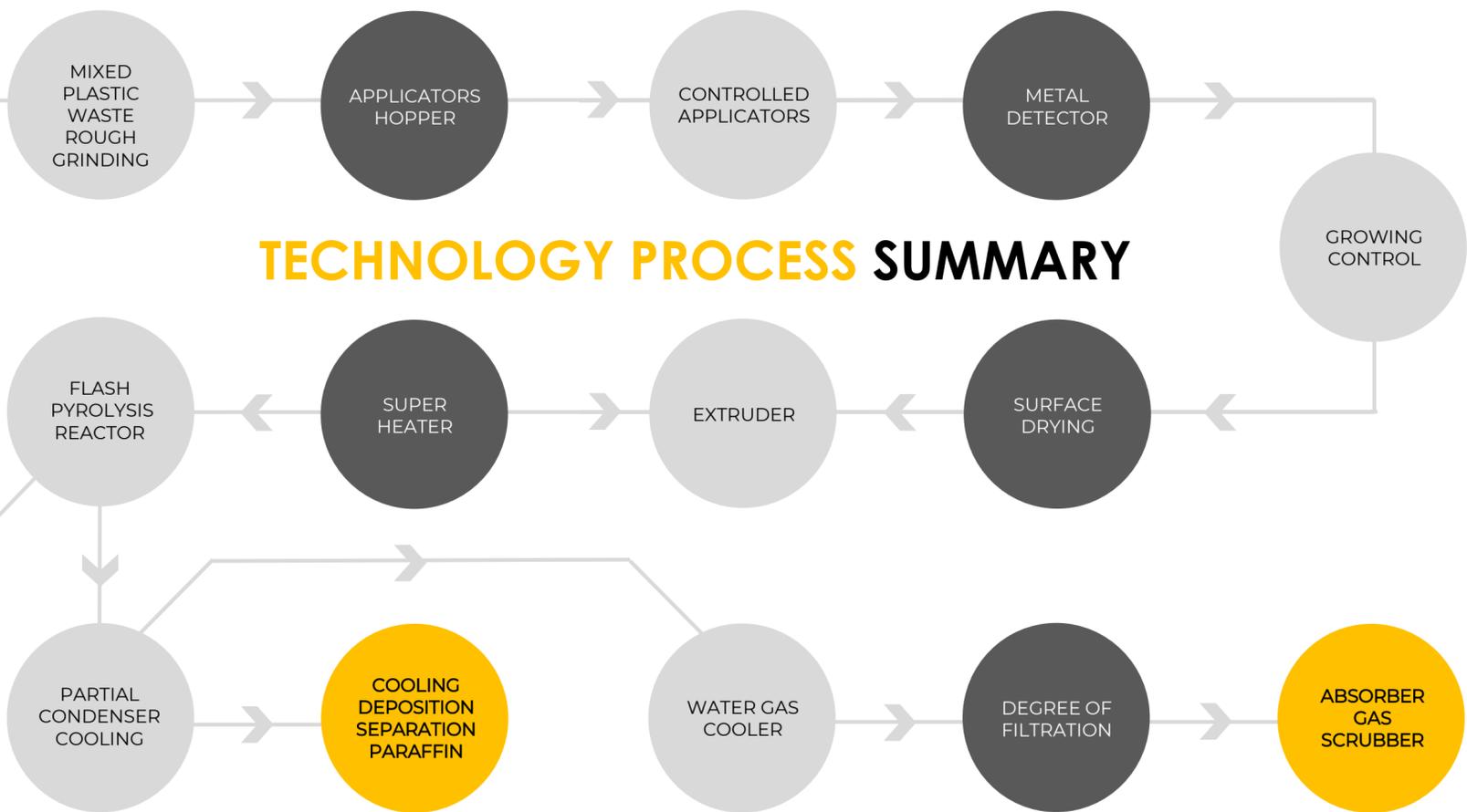
A schematic diagram of 1 block (2 reactors), 3 blocks (6 reactors)

01. Raw material conveyor belt
02. Raw material storage silos
03. Thermomolecular reactor
04. Solid fraction quenching
05. Solid fraction quenching pipe
06. Partial condensers
07. Gas chillers
08. Drop separators
09. Common gas cleaner
10. Electric heating element
11. Electricity generating units

MIXED PLASTIC WASTE

- ABS
- Acrylonitrile butadiene styrene
- PA
- Polyamide
- PC
- Polycarbonate
- PE
- Polyethylene
- PP
- Polypropylene
- PS
- Polystyrene

DOUBLE EXTRUDER
SLAG (CARBON) REMOVAL

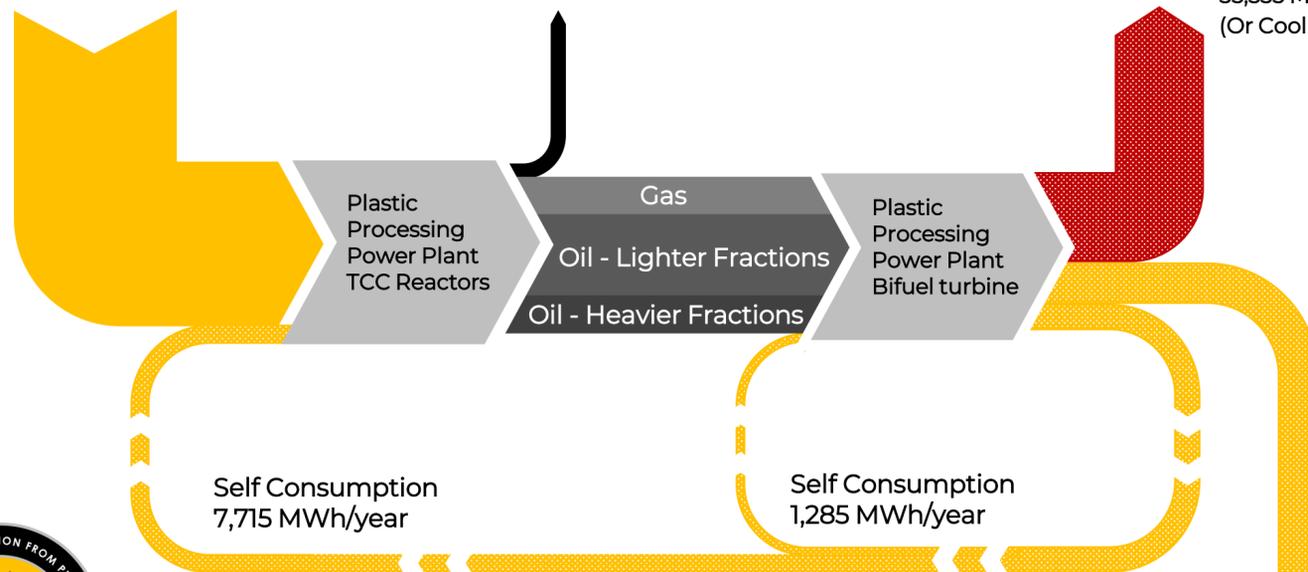


TECHNOLOGY PROCESS SUMMARY

Plastic waste (mixed)
14,000 tons/year

Carbon
706 tons/year

Heat Energy
200,000 GJ/year
55,555 MWh/year
(Or Cooling energy)



ENERGY PRODUCTION FROM PLASTIC
4 Reactors
Electricity
37 000 MWh/y
& Heat Energy
200 000 GJ/y
POWER BY PLASTIFISSION TECHNOLOGY

ENERGY BALANCE & YIELD

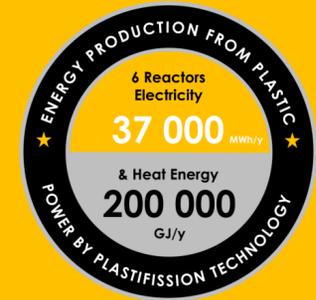
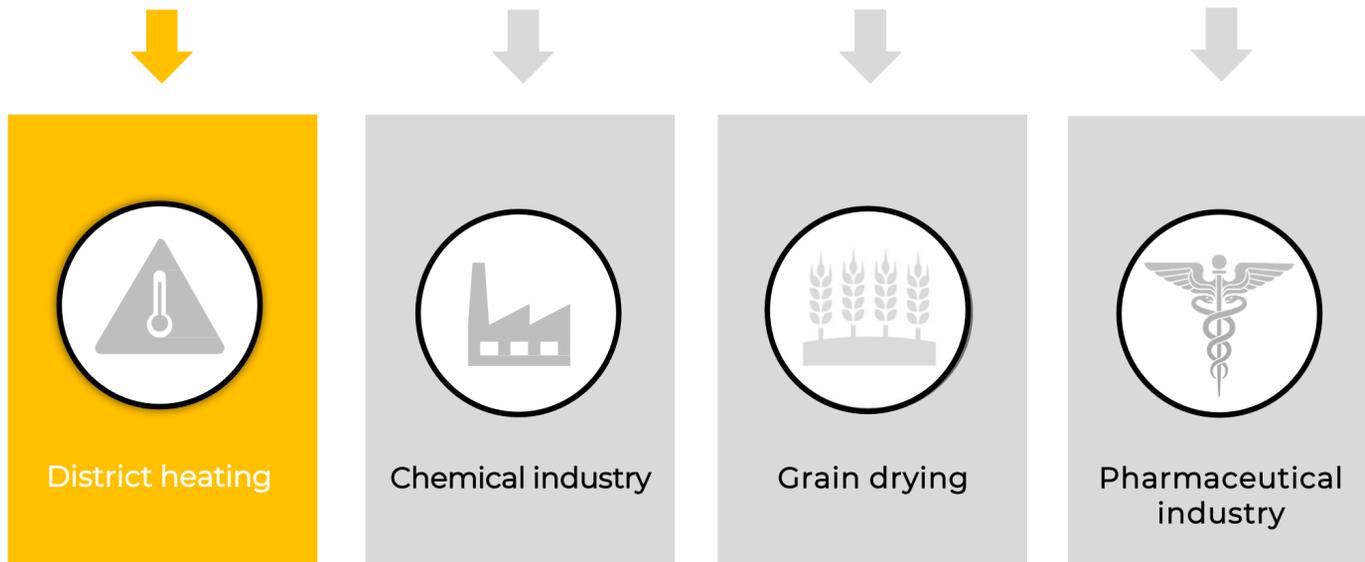
Electricity
28,000 MWh/year

TECHNOLOGY

USE OF HEAT BYPRODUCT



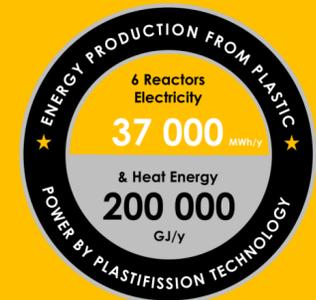
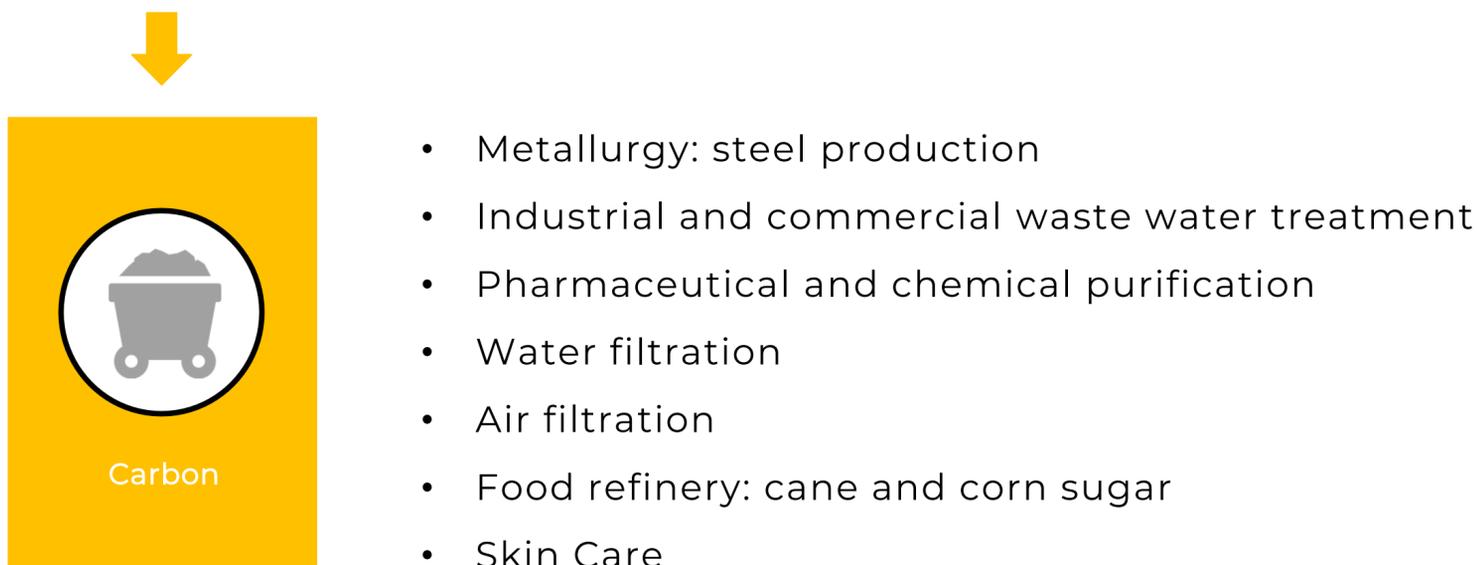
THERMAL ENERGY UTILIZATION: SELECTED POSSIBILITIES



TECHNOLOGY

USE OF CARBON BYPRODUCT

CARBON UTILIZATION: SELECTED POSSIBILITIES

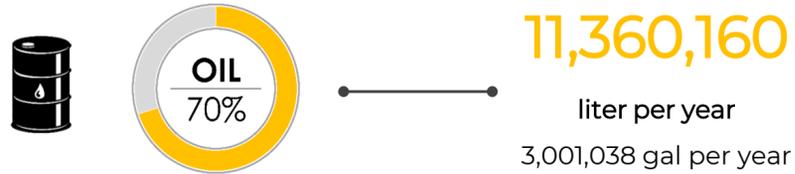


KEY EXPERTISE

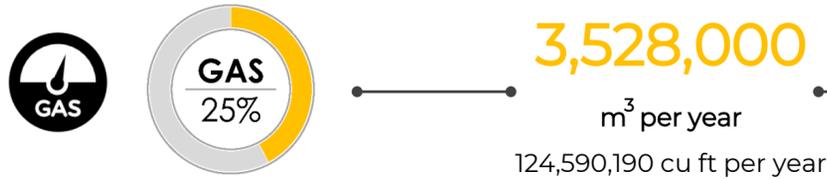
BUSINESS POSSIBILITY - PLASTIFISSION 6 REACTORS

Mixed plastic waste processing capacity: 14,000 tons/year (1,680 kg/h or 3,704 lbs/h) Operating time: 8,400 hours/year.

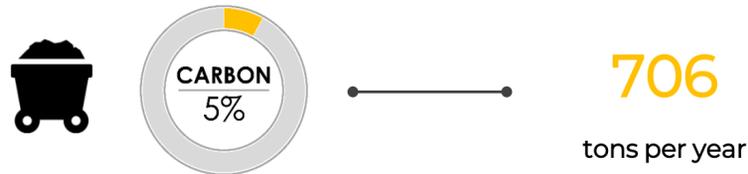
CHEMICAL THERMAL DECOMPOSITION



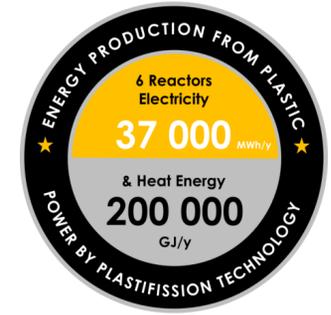
High quality oil (38 MJ/kg). We can generate 37,000 MWh/year of electricity from chemically processing 14,000 tons of mixed plastic waste using an environmentally friendly technology.



High quality gas (52-56 MJ/kg). Provides the electricity required for the operation of the Plastic Processing Power Plant.



High quality carbon powder. Metallurgical raw material, World market price: 750 EUR/tons. We can make activated carbon. (WMP: 2,300 – 2,500 EUR/tons).



Electricity capacity of power plant/year:

37,000 MWh *



Heat Energy

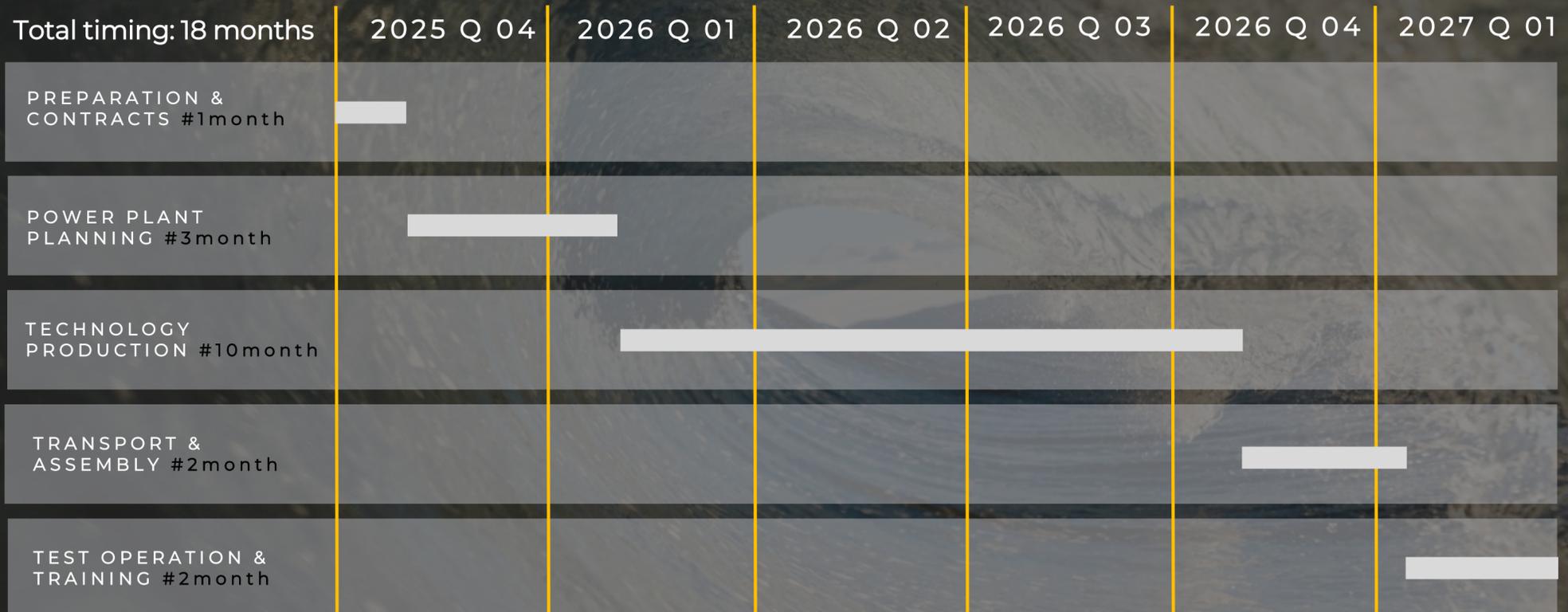
200,000 GJ/year

* Unit provides 15,000 homes (in the EU) with electricity (and heat) each year.



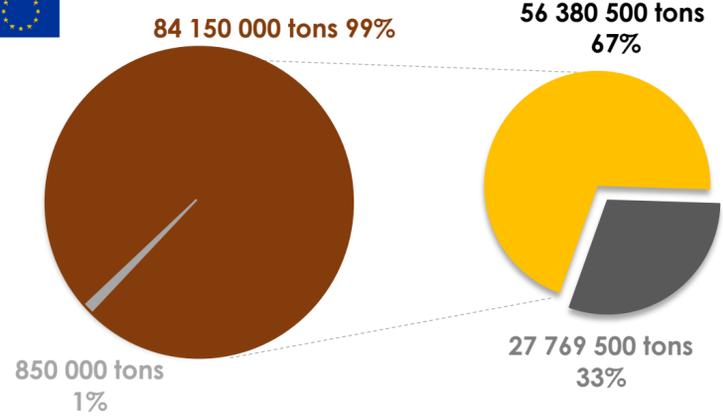
SCHEDULE

PROJECT TIMELINE



STATISTICS

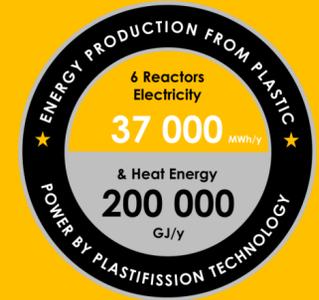
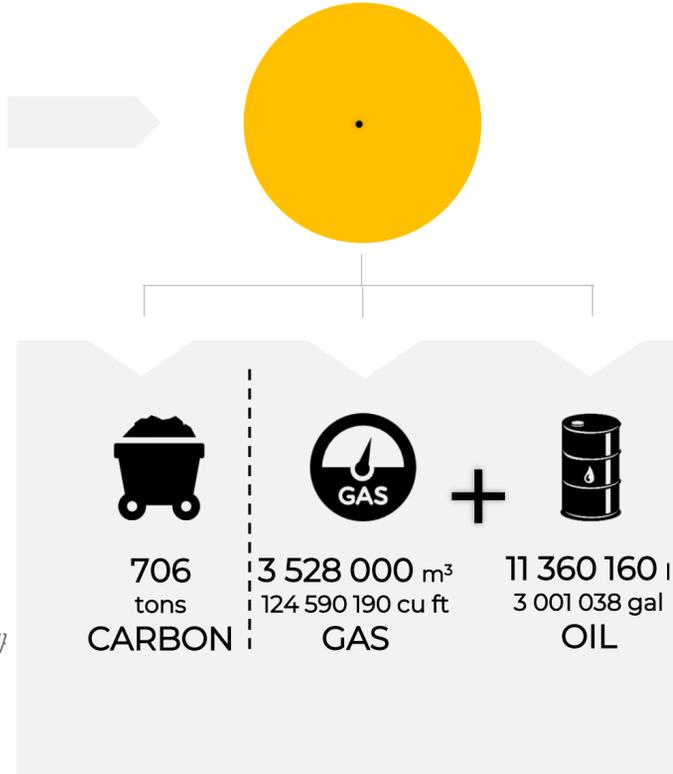
PLASTIC WASTE IN EU PER YEAR



- Metal and textile pollution in EU/year
- Mixed plastic waste in EU/year
- Mixed plastic waste deposited in EU/year
- Mixed plastic waste material recycled

EUROPEAN COMMISSION Source: EUROPEAN COMMISSION {SWD(2018) 16 final}

Raw material - Mixed Plastic Waste
53,56 million tons/year



MIXED PLASTIC WASTE
14 000 tons/year



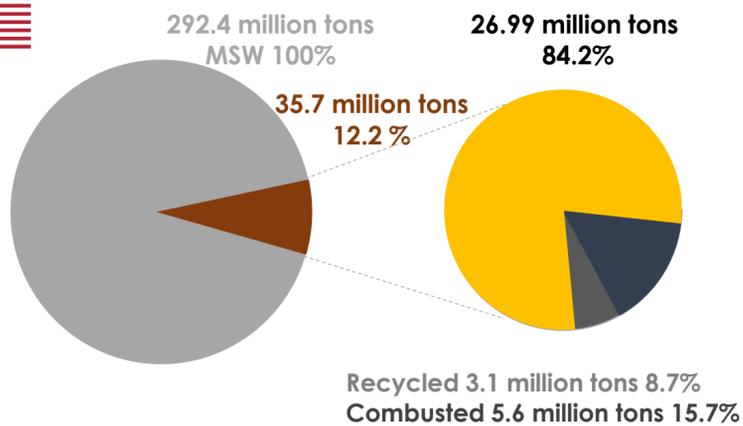
37 000
MWh /year
ELECTRICITY



200 000
GJ /year
HEAT ENERGY

STATISTICS

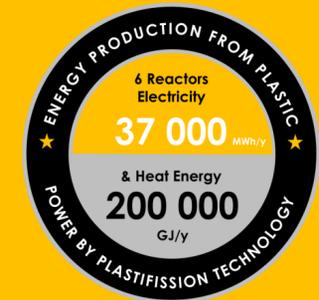
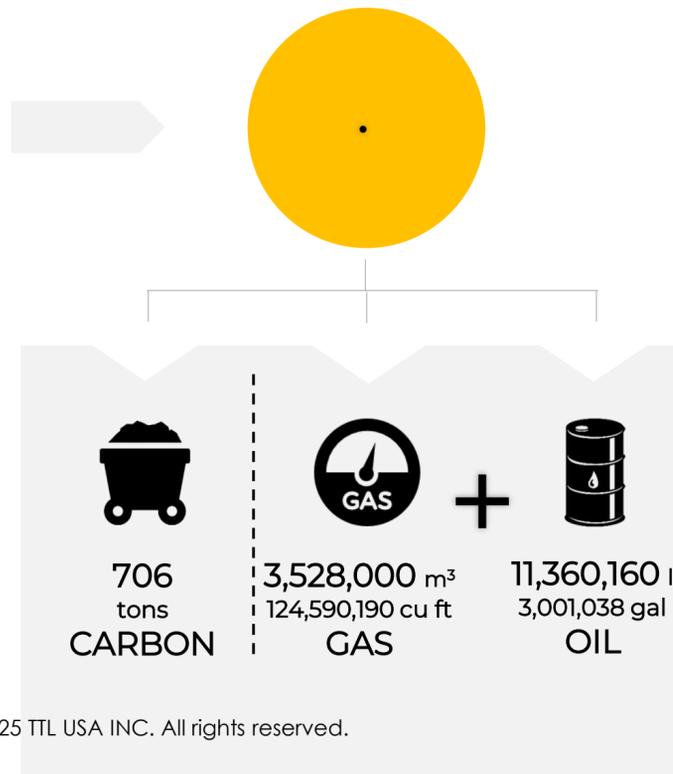
PLASTIC WASTE IN USA PER YEAR



- Municipal solid waste (MSW) in USA/year
- Mixed plastic waste in USA/year
- Mixed plastic waste deposited in USA/year
- Plastic waste material recycled & combusted in USA/year

Source (2018): United States Environmental Protection Agency, American Chemistry Council

Raw material - Mixed Plastic Waste
25.54 million tons/year



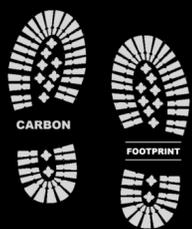
MIXED PLASTIC WASTE
14,000 tons/year



37,000
MWh /year
ELECTRICITY



200,000
GJ /year
HEAT ENERGY



Technology used and details

Raw material processed per year

Volume produced per year

Carbon footprint per year



14 000 tons of mixed plastic waste

37 000 MWh Electricity and 200 000 GJ Heat energy

11 290 tons CO₂



Oil extraction, and Refining

14 000 tons Oil (crude oil)

37 000 MWh Electricity and 200 000 GJ Heat energy

35 910 tons CO₂



Waste Incineration Plant

14 000 tons of mixed plastic waste

17 625 MWh Electricity and 126 900 GJ Heat energy

44 200 tons CO₂



PlastiFission Demonstration Visitor and Research Center



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TECHNOLOGY TRANSFER LABS



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