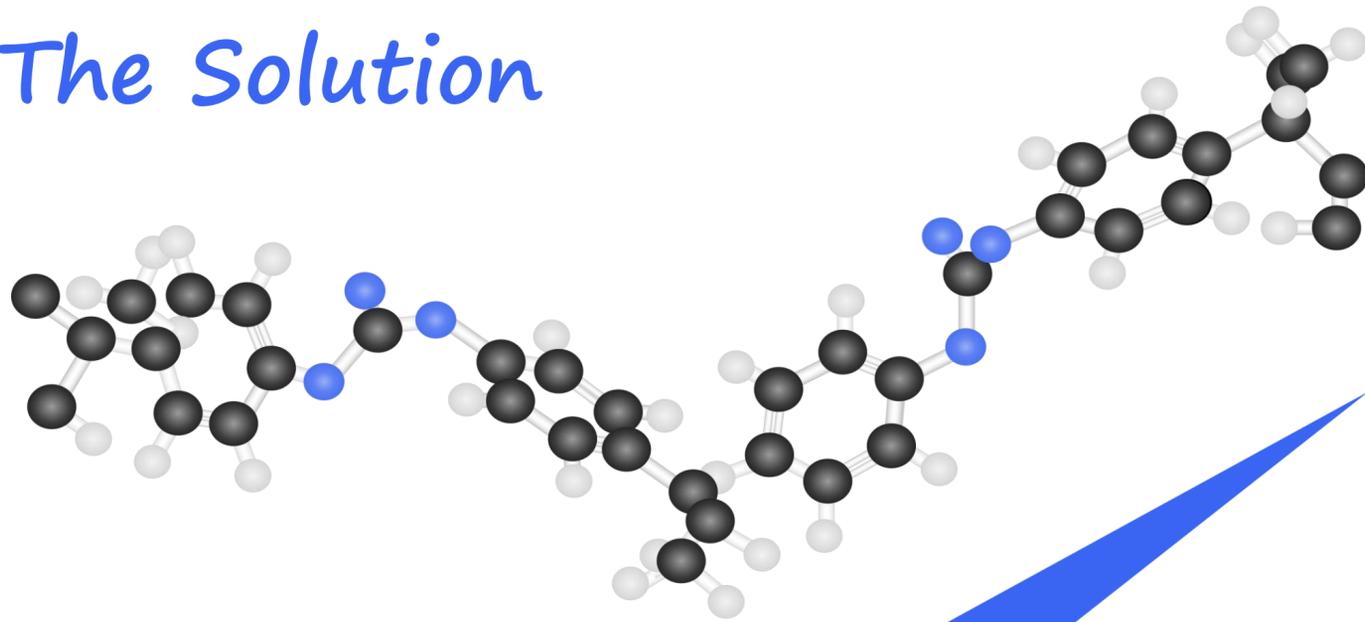


The Solution



PLASTIFISSION



Thermomolecular Decomposition Technology
Technology serving nature





TTL USA INC
TECHNOLOGY TRANSFER LABS

THE NEW SOLUTION

WOW

ENERGY PRODUCTION FROM PLASTIC

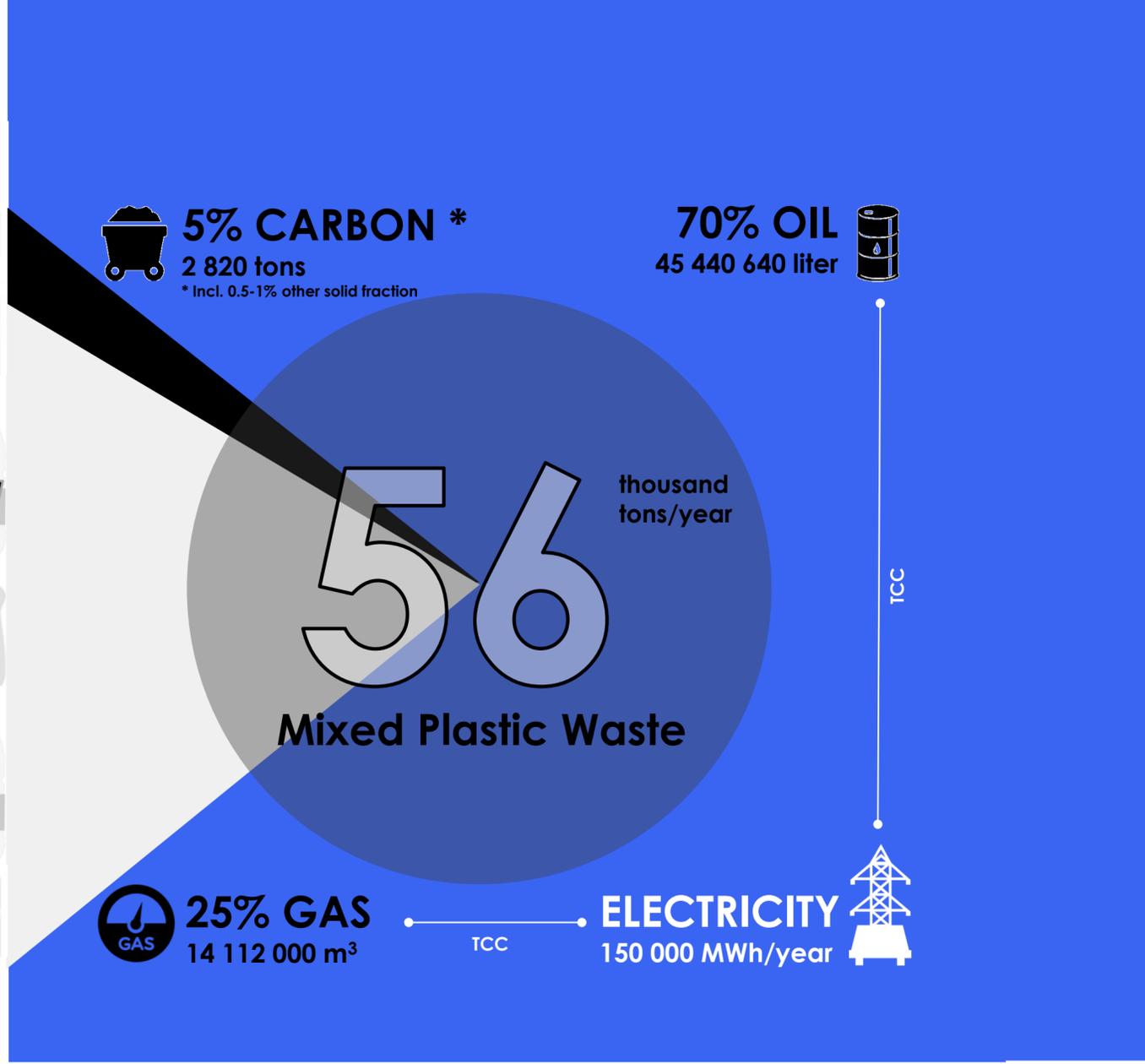
24 Reactors
Electricity
150 000 MWh/y

& Heat Energy
800 000 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
800 000 GJ/year

5% CARBON *
2 820 tons
* Incl. 0.5-1% other solid fraction

70% OIL
45 440 640 liter

56 thousand tons/year

Mixed Plastic Waste

25% GAS
14 112 000 m³

ELECTRICITY
150 000 MWh/year

TCC

OUR TECHNOLOGY

ENERGY PRODUCTION FROM PLASTIC

Energy production

24 reactors:
6,720 kg/h (14,815 lbs/h)
capacity unit provides
60,000 homes (in the
EU) with electricity (and
heat) each year.

Job creation

One waste treatment plant
employs **33 people**.
**Additional employment
opportunities** include
collection, selection,
storage, and transportation
of plastics.

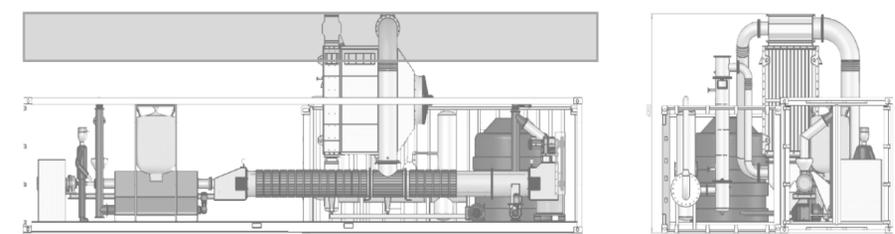
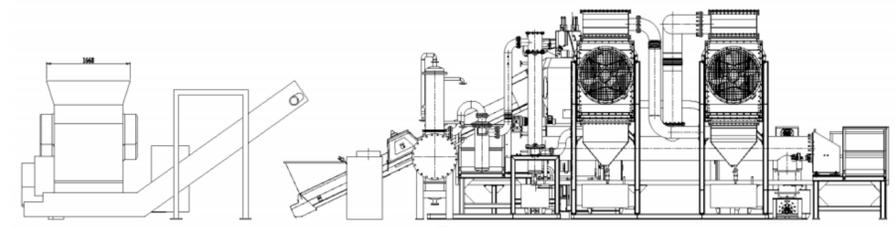
Flexible output materials

Scalable processing capacity
Adjustable power output
Stored energy
Distributed power generation
Modular design in mobile systems on **10,000 m²** (107,640 sq ft)

ADVANTAGE RECAP



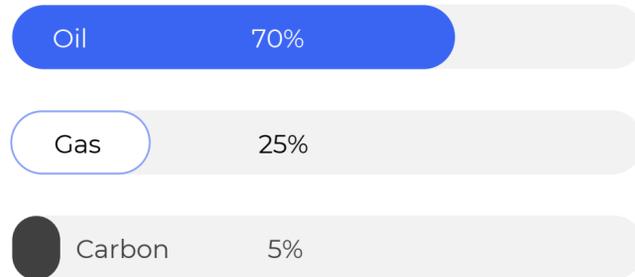
Our technology does not require cleaned plastic and works as a closed system without harmful emissions.



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

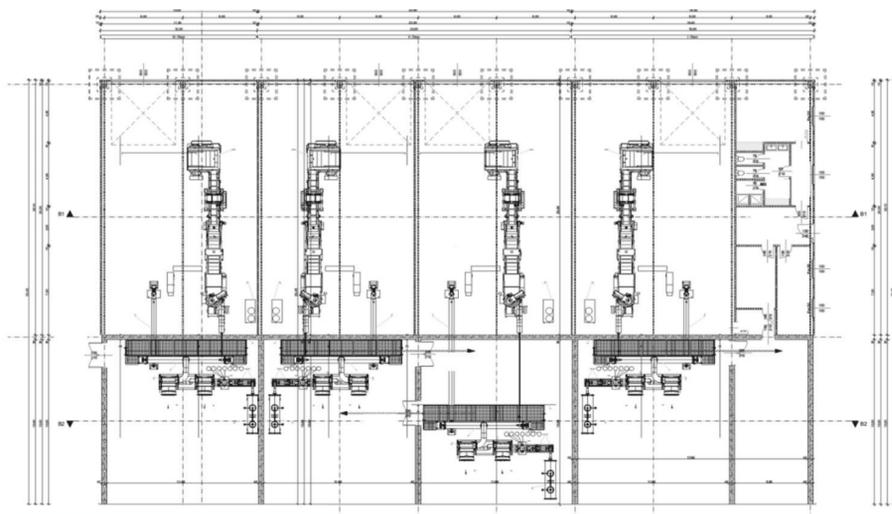
70% Oil
700 kg
(1,543 lbs)

25% Gas
250 m³
(8,828 cu ft)

5% Carbon
50 kg
(110 lbs)

OUR PORTFOLIO

SCHEMATIC DIAGRAM OF PLASTIFISSION



TTL-TMD 300

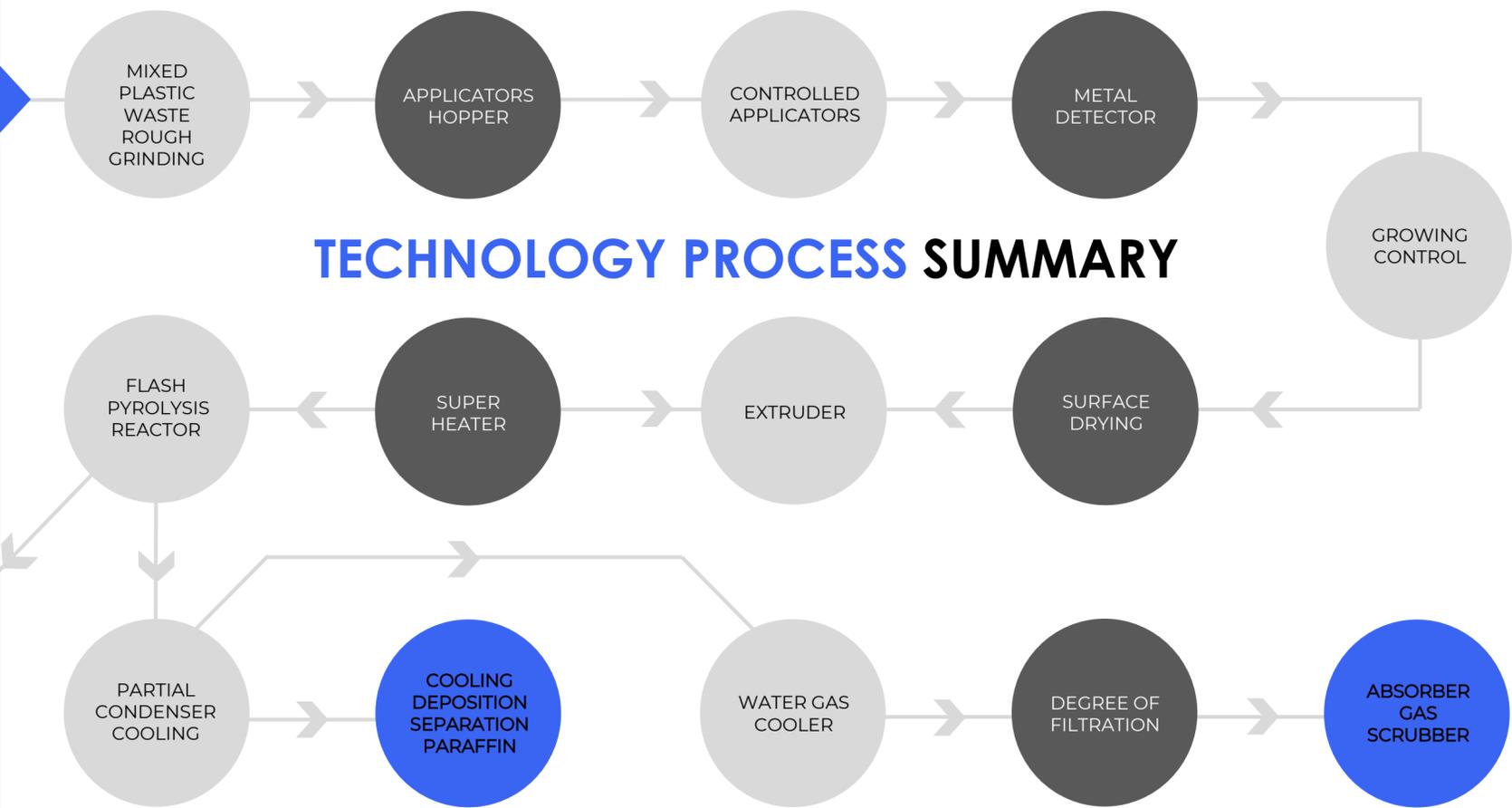
A schematic diagram of 1 block (4 reactors), 6 blocks (24 reactors)

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
- PS
- Polypropylene
- PS
- Polystyrene

DOUBLE EXTRUDER SLAG (CARBON) REMOVAL

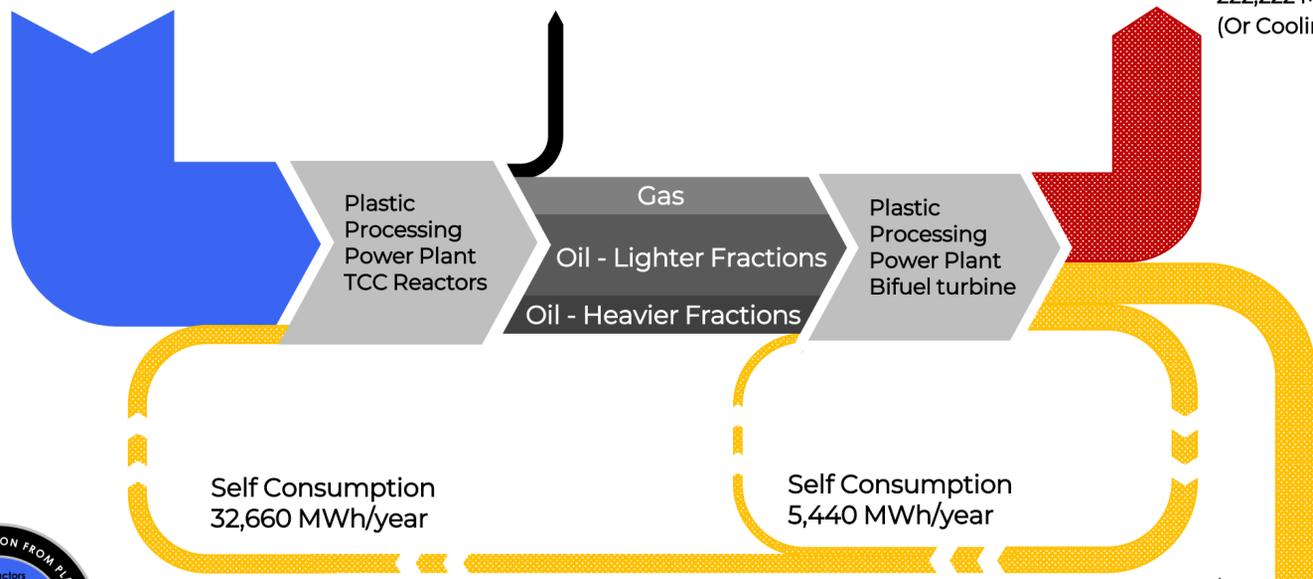


TECHNOLOGY PROCESS SUMMARY

Plastic waste (mixed)
56,000 tons/year

Carbon
2,820 tons/year

Heat Energy
800,000 GJ/year
222,222 MWh/year
(Or Cooling energy)



24 Reactors
Electricity
150 000 MWh/y
& Heat Energy
800 000 GJ/y
POWER BY PLASTIFISSION TECHNOLOGY

ENERGY BALANCE & YIELD

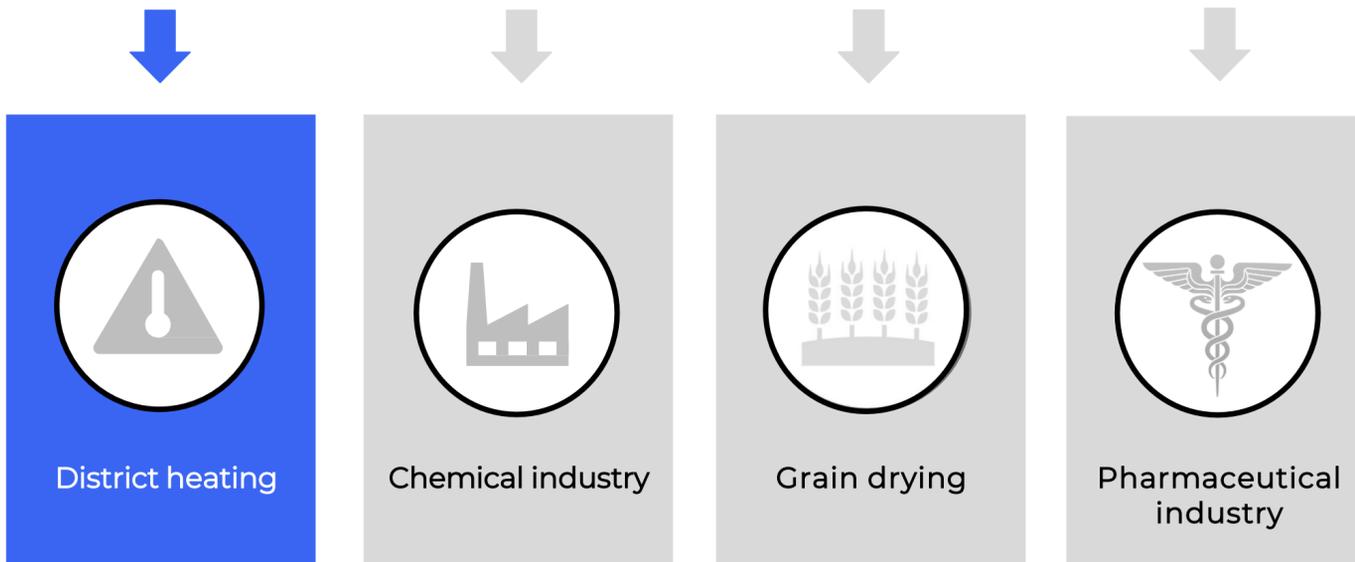
Electricity
111,900 MWh/year

TECHNOLOGY

USE OF HEAT BYPRODUCT



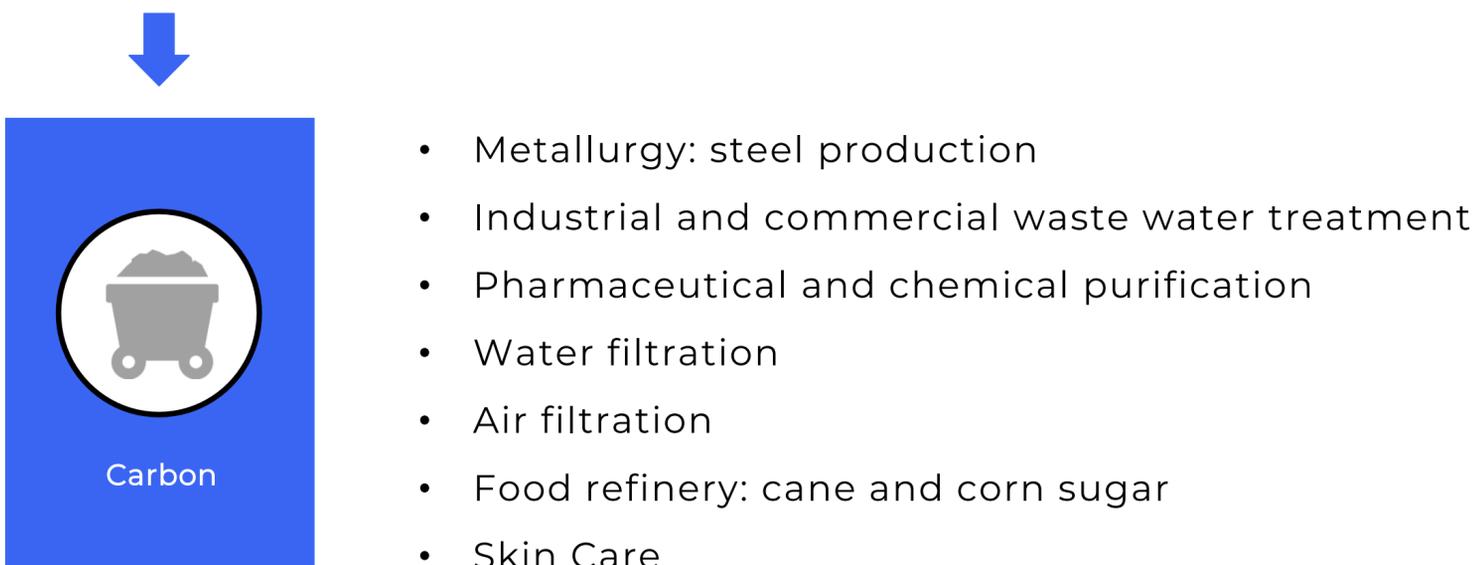
THERMAL ENERGY UTILIZATION: SELECTED POSSIBILITIES



TECHNOLOGY

USE OF CARBON BYPRODUCT

CARBON UTILIZATION: SELECTED POSSIBILITIES

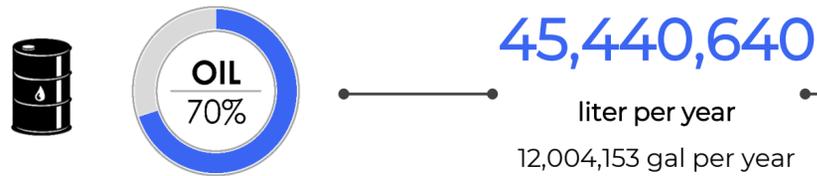


KEY EXPERTISE

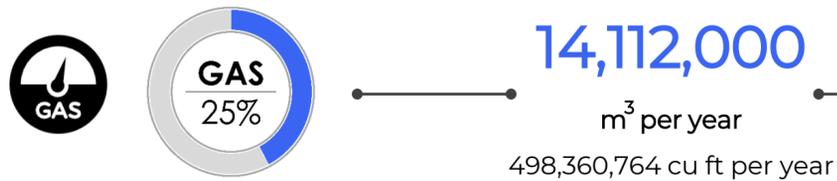
BUSINESS POSSIBILITY – PLASTIFISSION 24 REACTORS

Mixed plastic waste processing capacity: 56,000 tons/year (6,720 kg/hour 14,815 lbs/h) Operating time: 8,400 hours/year.

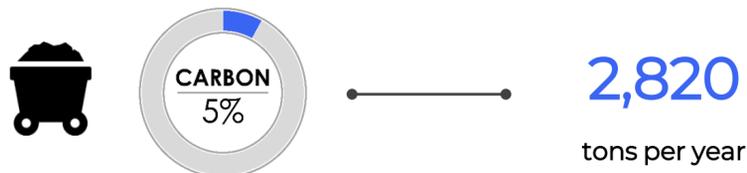
CHEMICAL THERMAL DECOMPOSITION



High quality oil (38 MJ/kg). We can generate 150,000 MWh/year of electricity from chemically processing 56,000 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).

* Unit provides 60,000 homes (in the EU) with electricity (and heat) each year.



Electricity capacity of power plant/year:

150,000 MWh *



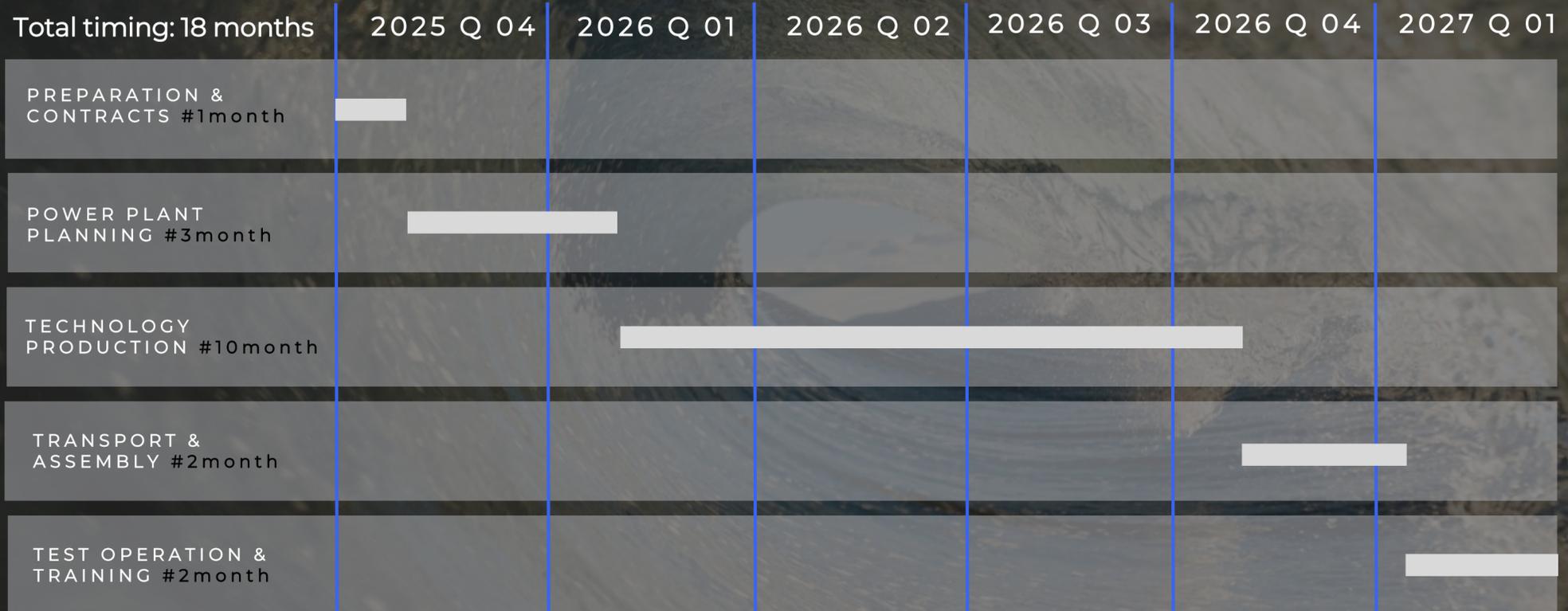
Heat Energy

800,000 GJ/year



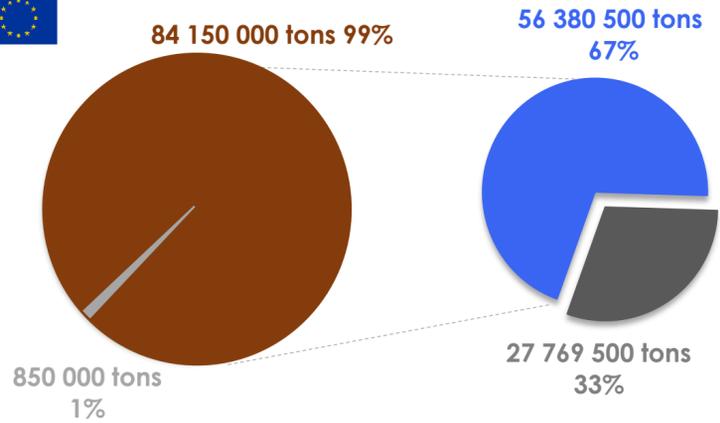
SCHEDULE

PROJECT TIMELINE



STATISTICS

PLASTIC WASTE IN EU PER YEAR

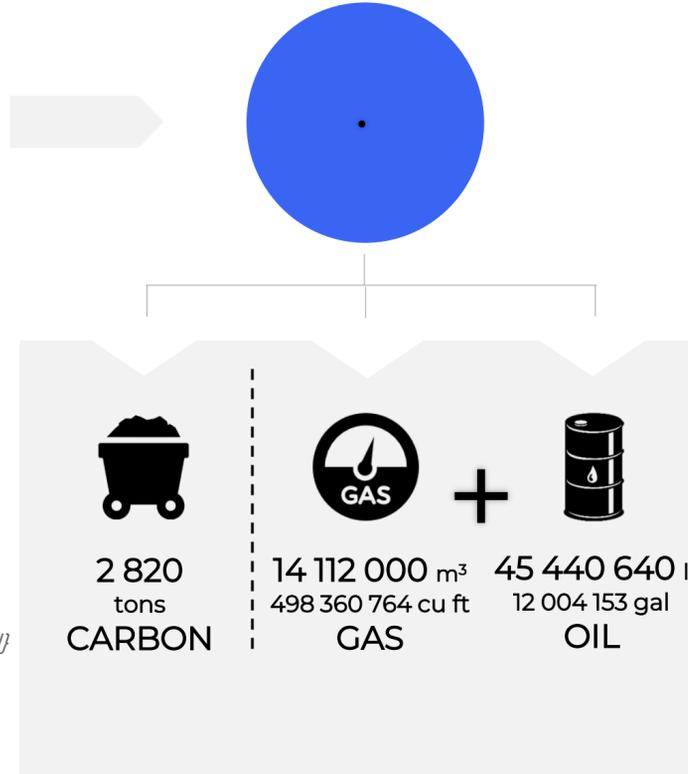


- Metal and textile pollution in EU/year
- Mixed plastic waste deposited in EU/year
- Mixed plastic waste in EU/year
- Mixed plastic waste material recycled



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

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



MIXED PLASTIC WASTE
56 000 tons /year



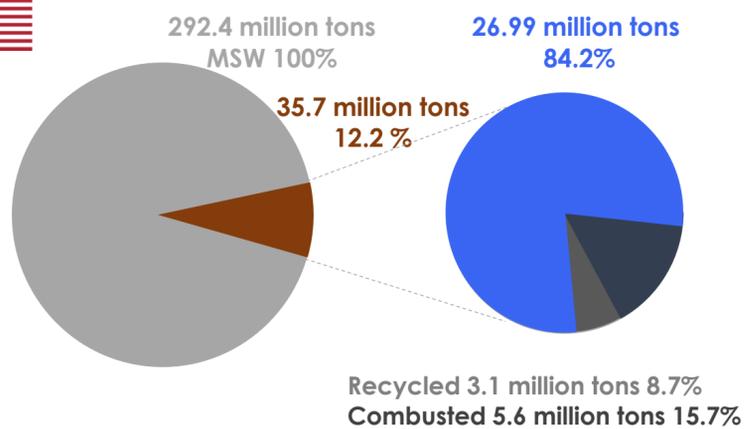
150 000
MWh /year
ELECTRICITY



800 000
GJ /year
HEAT ENERGY

STATISTICS

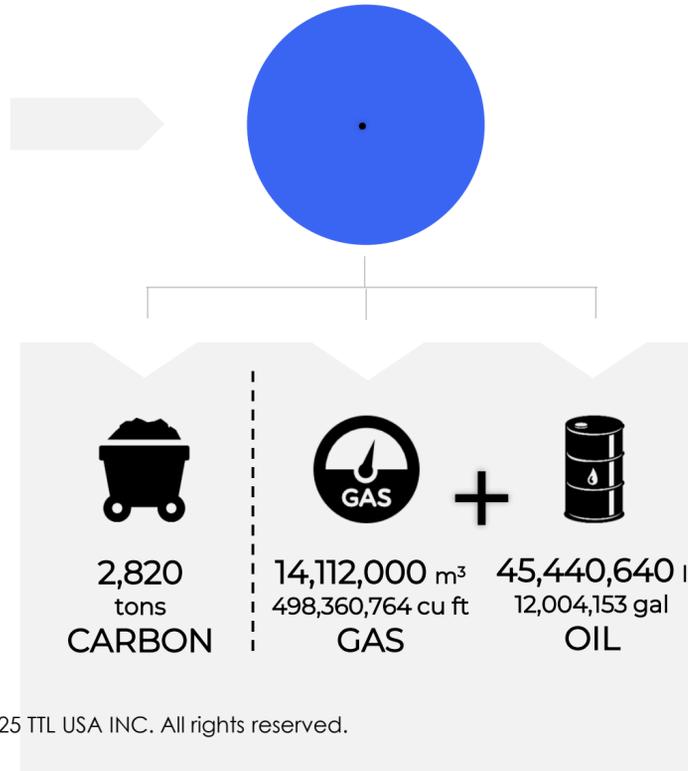
PLASTIC WASTE IN USA PER YEAR



- Municipal solid waste (MSW) in USA/year
- Mixed plastic waste deposited in USA/year
- Mixed plastic waste 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



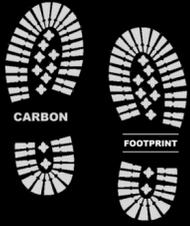
MIXED PLASTIC WASTE
56,000 tons /year



150,000
MWh /year
ELECTRICITY



800,000
GJ /year
HEAT ENERGY



Technology used and details

Raw material processed per year

Volume produced per year

Carbon footprint per year



56 000 tons of mixed plastic waste

150 000 MWh Electricity and **800 000** GJ Heat energy

45 160 tons CO₂

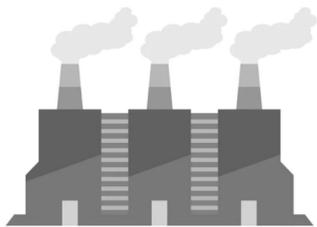


Oil extraction, and Refining

56 000 tons Oil (crude oil)

150 000 MWh Electricity and **800 000** GJ Heat energy

141 120 tons CO₂



Waste Incineration Plant

56 000 tons of mixed plastic waste

70 500 MWh Electricity and **507 600** GJ Heat energy

173 710 tons CO₂



PlastiFission Demonstration Visitor and Research Center



TTL USA INC
TECHNOLOGY TRANSFER LABS



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