

Panel discussion -

"Plastic Recycling & Petrochemistry Challenges"

Moving Towards Non - Fossils

# FRAUNHOFER-GESELLSCHAFT 2021

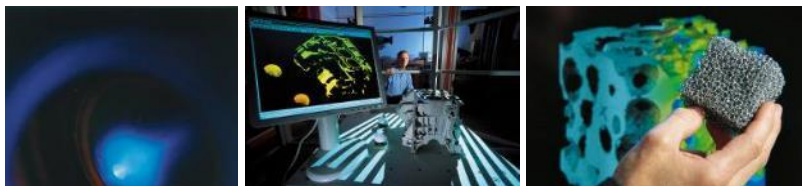
- 75 institutes and research units
- 28.000 employees
- 2,8 billion euro research volume
- Internationally represented in Europe, USA, Asia, Middle East



Head of the institute Sulzbach-Rosenberg  
Prof. Dr.-Ing. Matthias Franke

Fraunhofer UMSICHT  
INSTITUTE Branch  
SULZBACH-ROSENBERG

Employees	102
Household	10,2 Mio EUR
Technical infrastructure	2100 m <sup>2</sup>



# CLOSING THE VALUE CHAIN

## FROM WASTE TO PRODUCT

Waste management

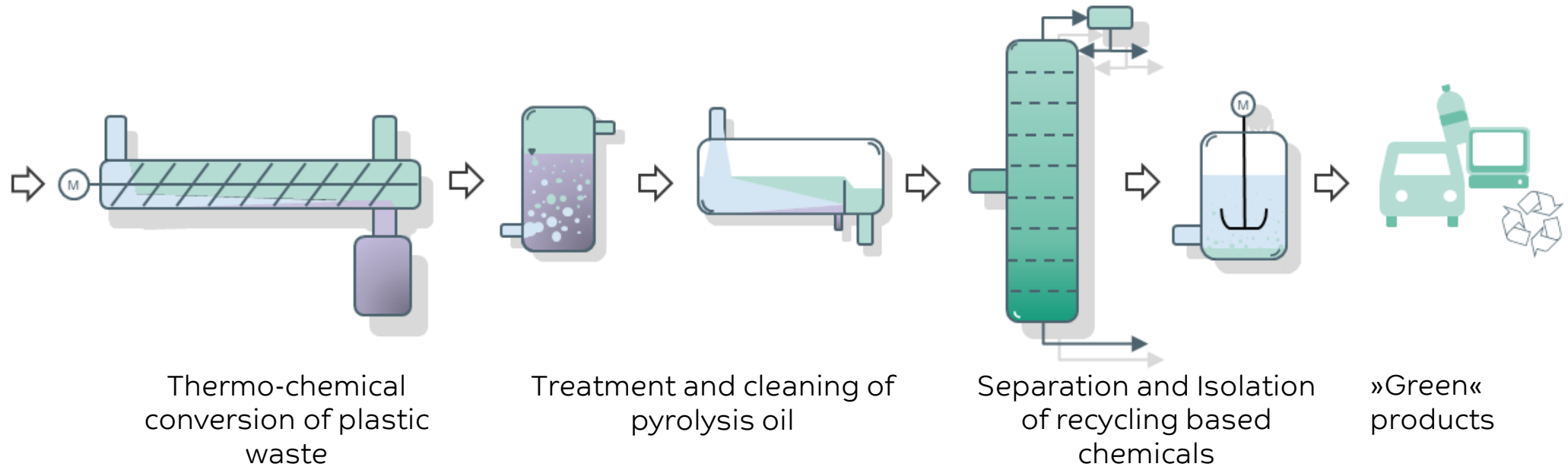
Chemical Recycling

Chemical industry

Manufacturing industry



Plastic waste



# EQUIPMENT

## Pyrolysis plants

- Laboratory: batch 1 – 100 g, Temperature up to 1100 °C
- Technical center: semi continuous 50 – 350 g, up to 750 °C
- Pilot scale: continuous: 10 – 70 kg/h, up to 650 °C

## Distillation

- Laboratory: reflux distillation, rectification, 0.1 - 6 L
- Technical center: Batch rectification, up to 20 L, nitrogen atmosphere and vacuum possible, adjustable reflux ratio

## Hydrogenation

- Laboratory: up to 30 mL, 100 bar, 400 °C
- Technical center: continuously up to 3 kg / h, 200 bar, 400 °C

## Analytics

Broad spectrum of gas, oil and solids analysis e.g. GCxGC-MS, CHNS analysis, XRF, FT-IR, XRD, REM-EDX



Fig. 1: Pyrolysis plant technical center



Fig. 2: Pyrolysis plant pilot scale (iCycle)



Fig. 3: Hydrogenation plant technical center

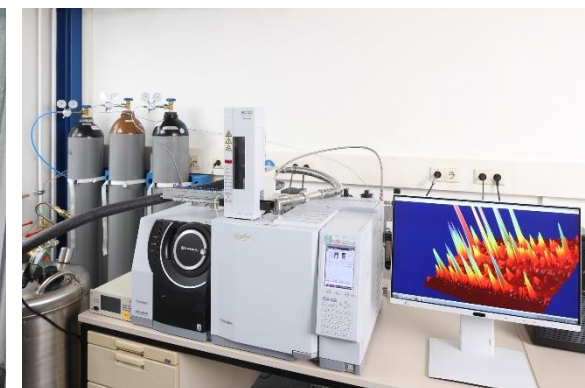
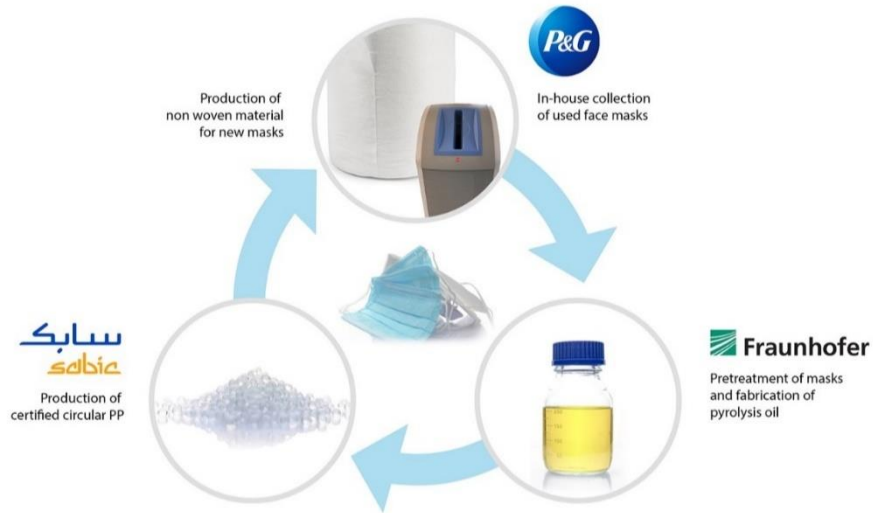


Fig. 4: GCxGC-MS analysis

# RECENT WORKS



closed-loop recycling for single-use facemasks



high quality polystyrene from composite materials

# Thank you for attending the Panel discussion

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