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Development of gasification solutions towards production of materials, based on the experiences from the GoBiGas demonstration

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GoBiGas

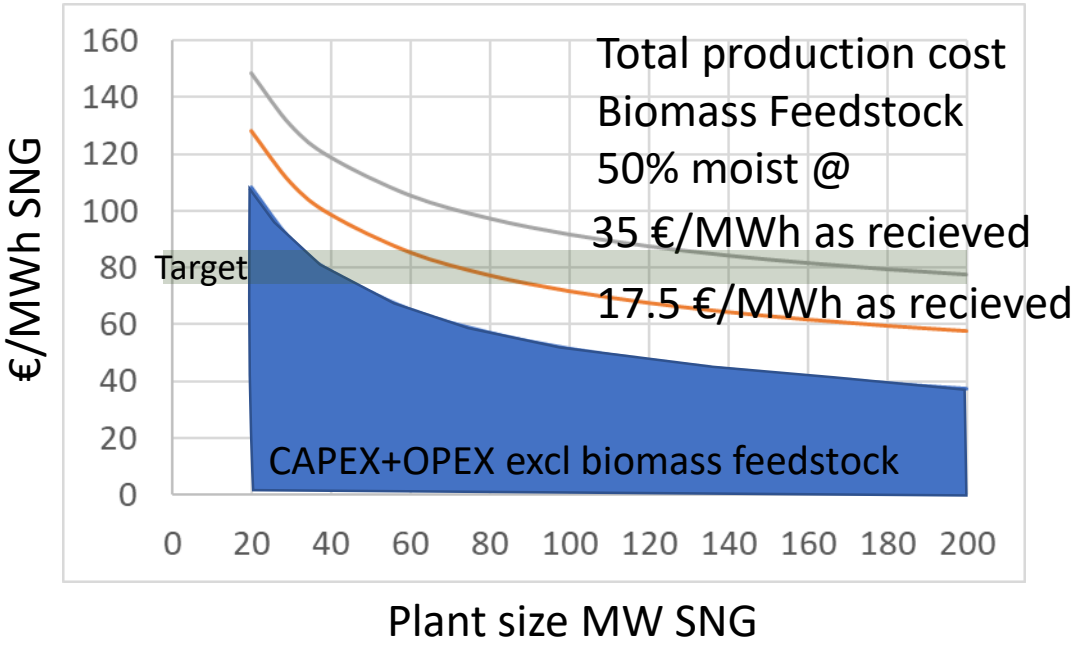
Gothenburg Biomass Gasification Project
0.8 TWh/year SNG production by 2020

Planned to be implemented in two phases:

1. Demonstration/Commercial (together with phase 2)
   20 MW Biomethane (160 M€ investment)
   (32 MW fuel, 6 dry ton biomass/h)
   Performance goal of demonstration
   - Biomass to Biomethane ≥65 %
   - Biomass to Energy ≥90 %
   - 8,000 hours continuous operation per year

   Produced SNG to grid 2014 – 2018

2. ~~Commercial (Plans canceled 2015)~~
   ~~80 – 100 MW Biomethane~~
   ~~(125-150 MW fuel 25-30 dry ton biomass/h)~~



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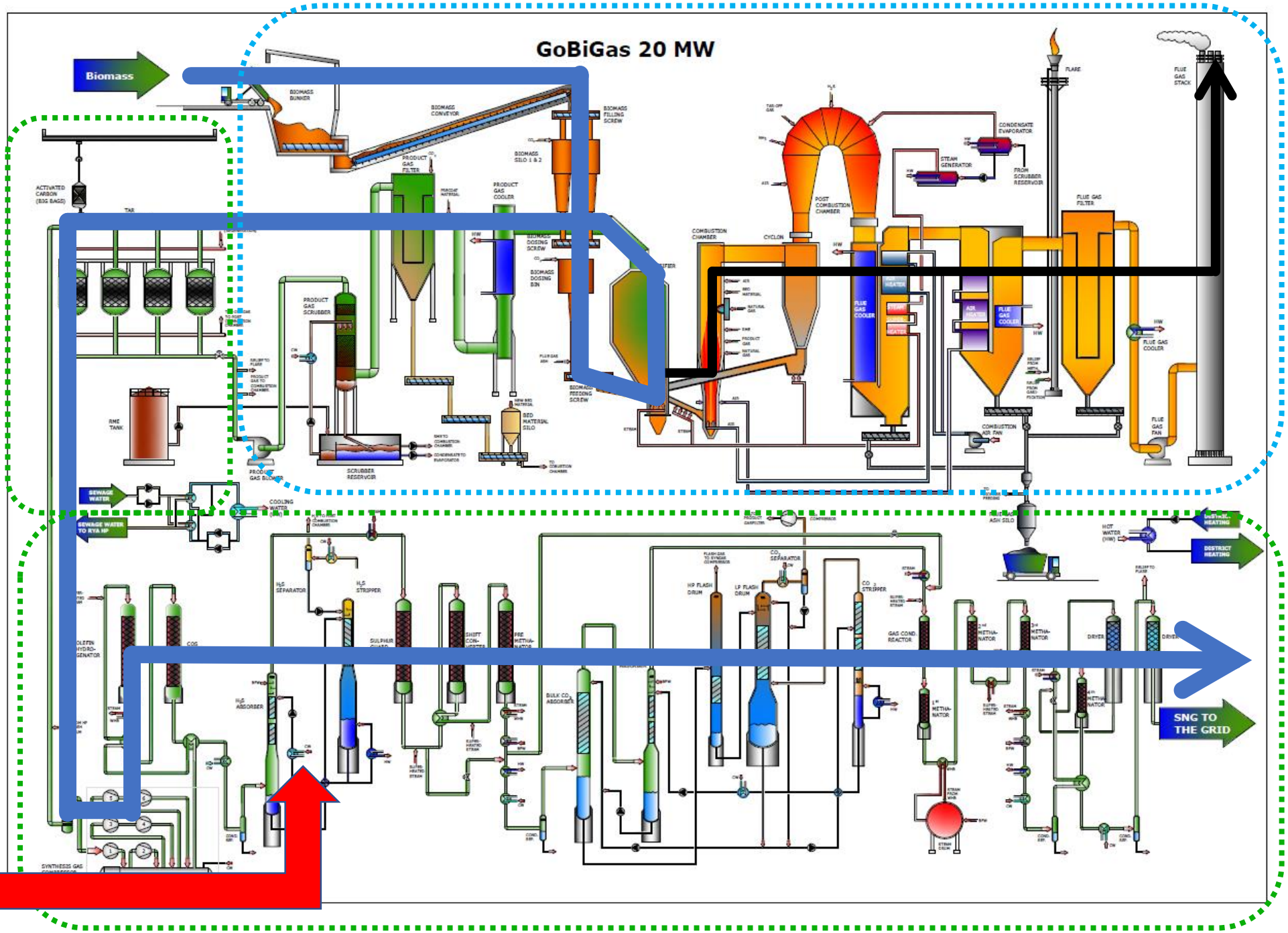

Flue gas

Biomethane

H2 from electrolysis Investigated, but never installed

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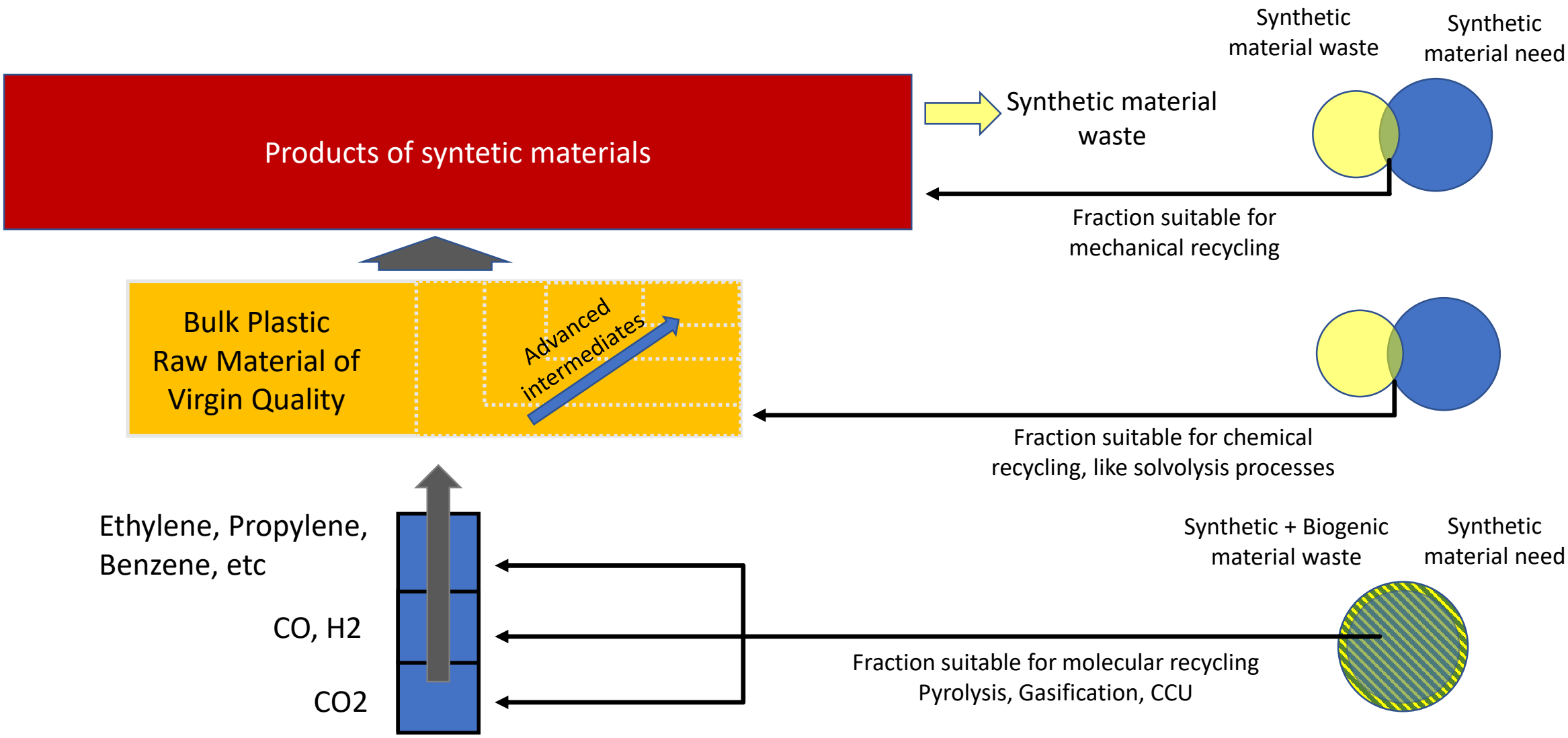
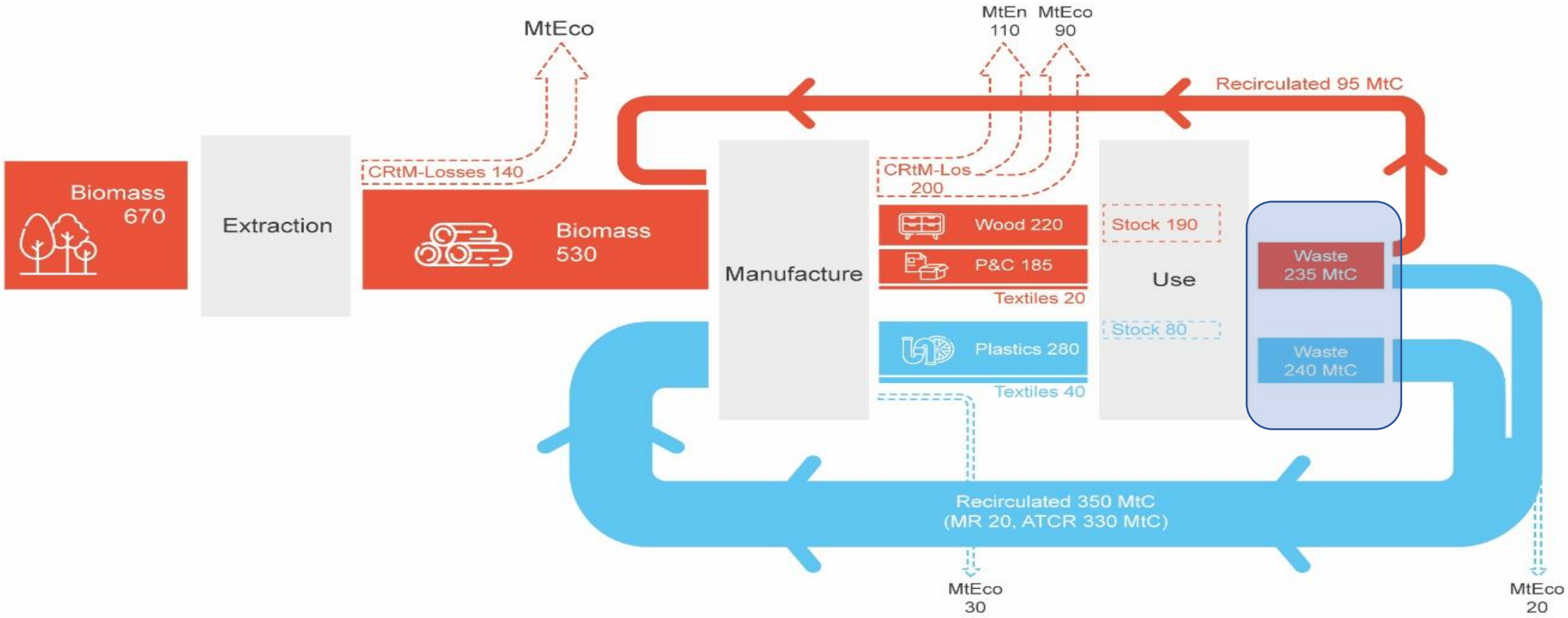
Recycling av carbon atoms to synthetic materials

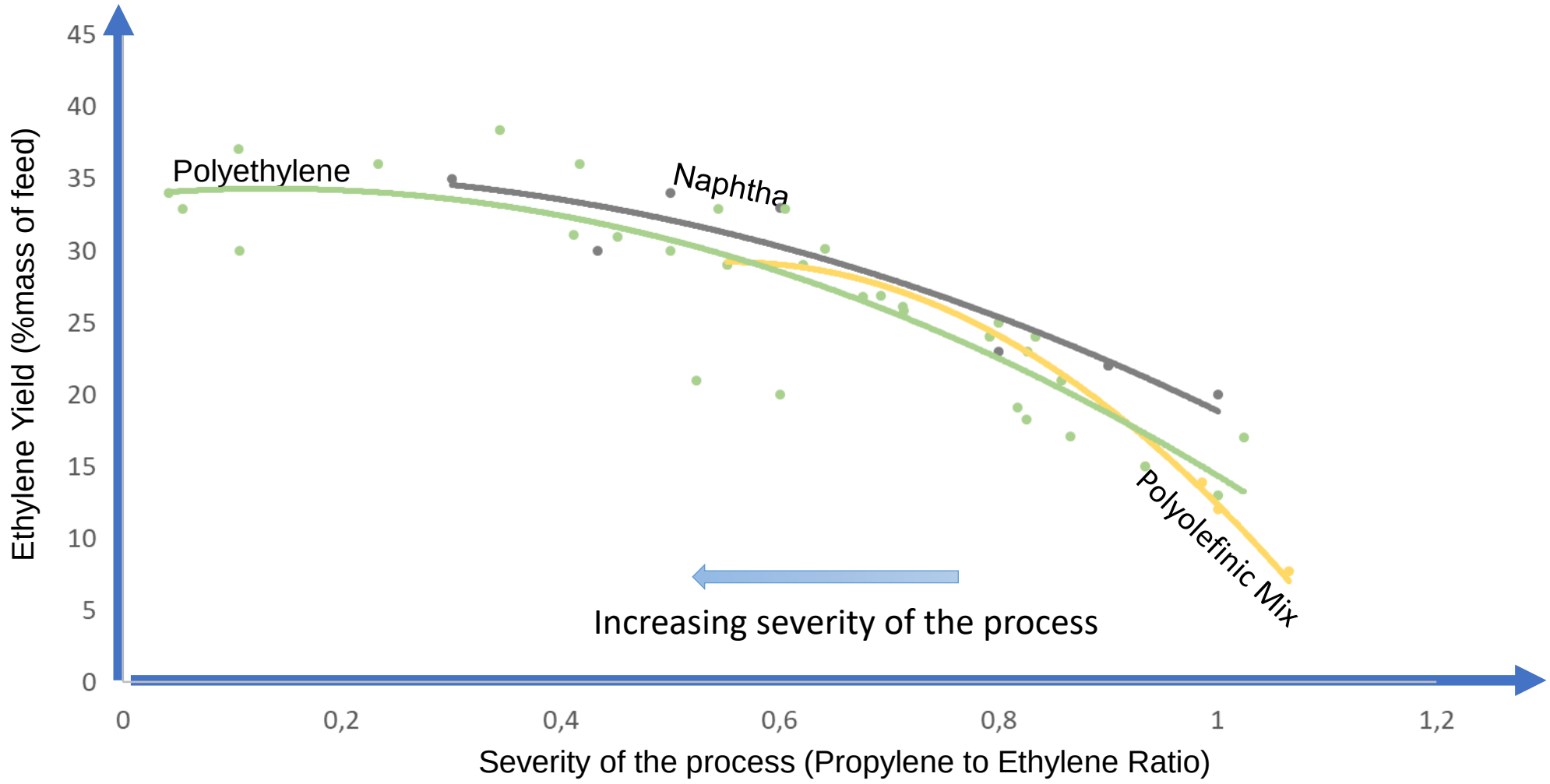


Global carbon balance for a circular system



In million tons carbon per year

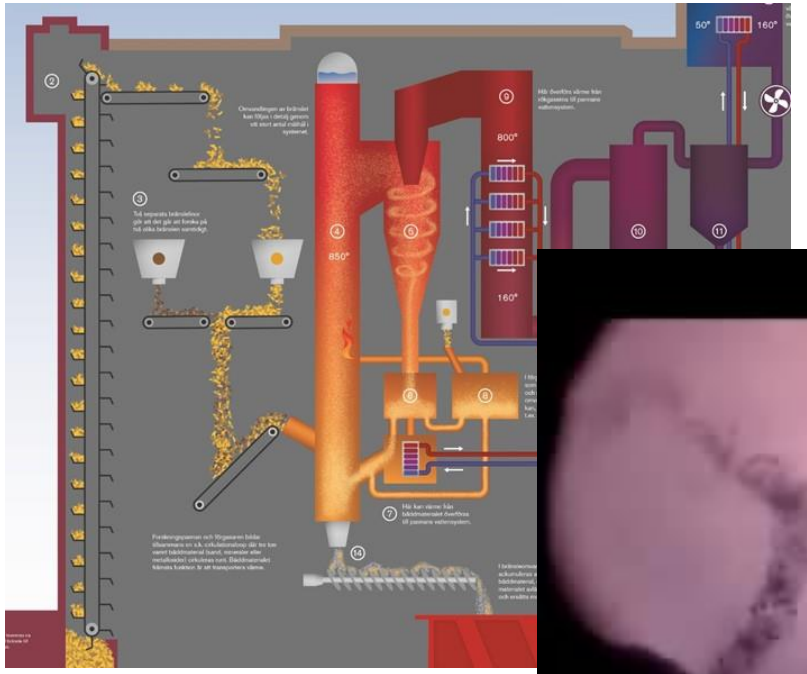
Literature data



Data mainly from: J. Scheirs, W. Kaminsky Feedstock Recycling and Pyrolysis of Waste Plastics: Converting Waste Plastics into Diesel and Other Fuels, 2006 John Wiley & Sons, Ltd, DOI:10.1002/0470021543

Experimental equipment at Chalmers

Experiments has been done in scale of 5 tons plastics /day, which correspond to **250 000** plastic bags/day



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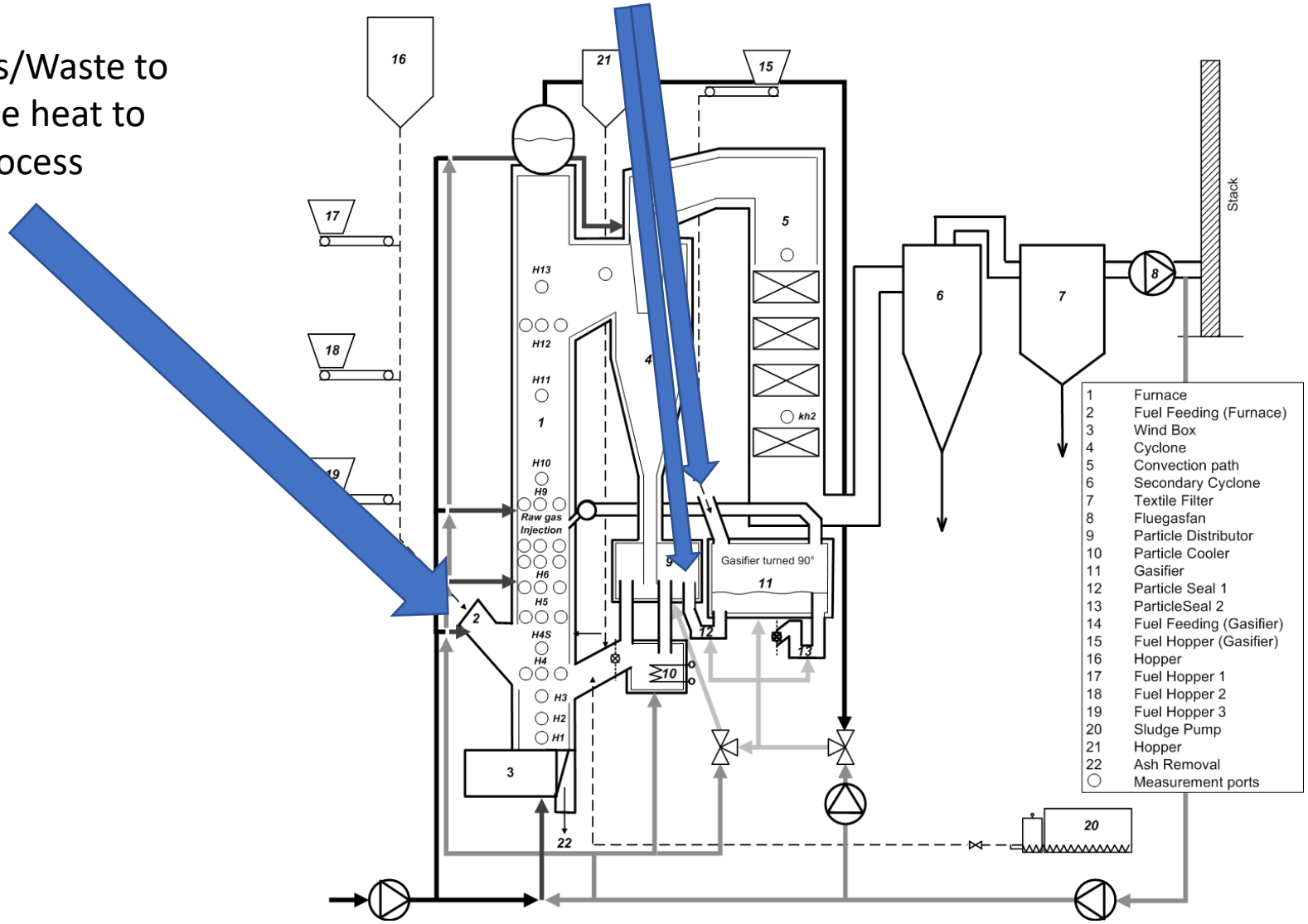
Reactor

Plastics for recycling, fed as pieces or melt

Biomass/Waste to provide heat to process



Global carbon balance for a circular system

Virgin HDPE


PE

Post consumer PE/PP blend


PE PP

Automotive Shredder residue (ASR)

>40% ash (metals, glass)

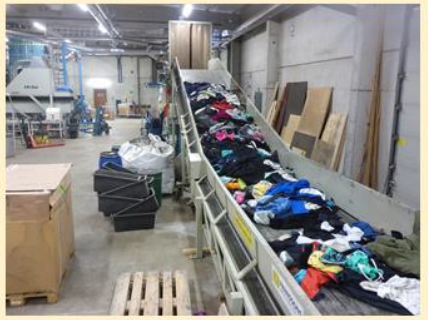

Polyurethane foams

Acrilonitril butadiene styrene (ABS resin)

Fabric (Nylon, Polyester)

Synthetic and natural rubbers, etc, etc…

Textile residue




Polyester

Nylon 6,6

Nylon

Nylon 6

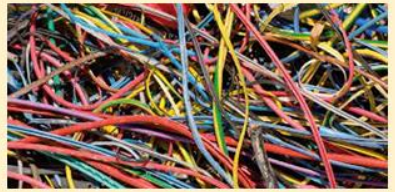
Elastan

Acrylic fibers

Cotton

Wool

Cable plastics



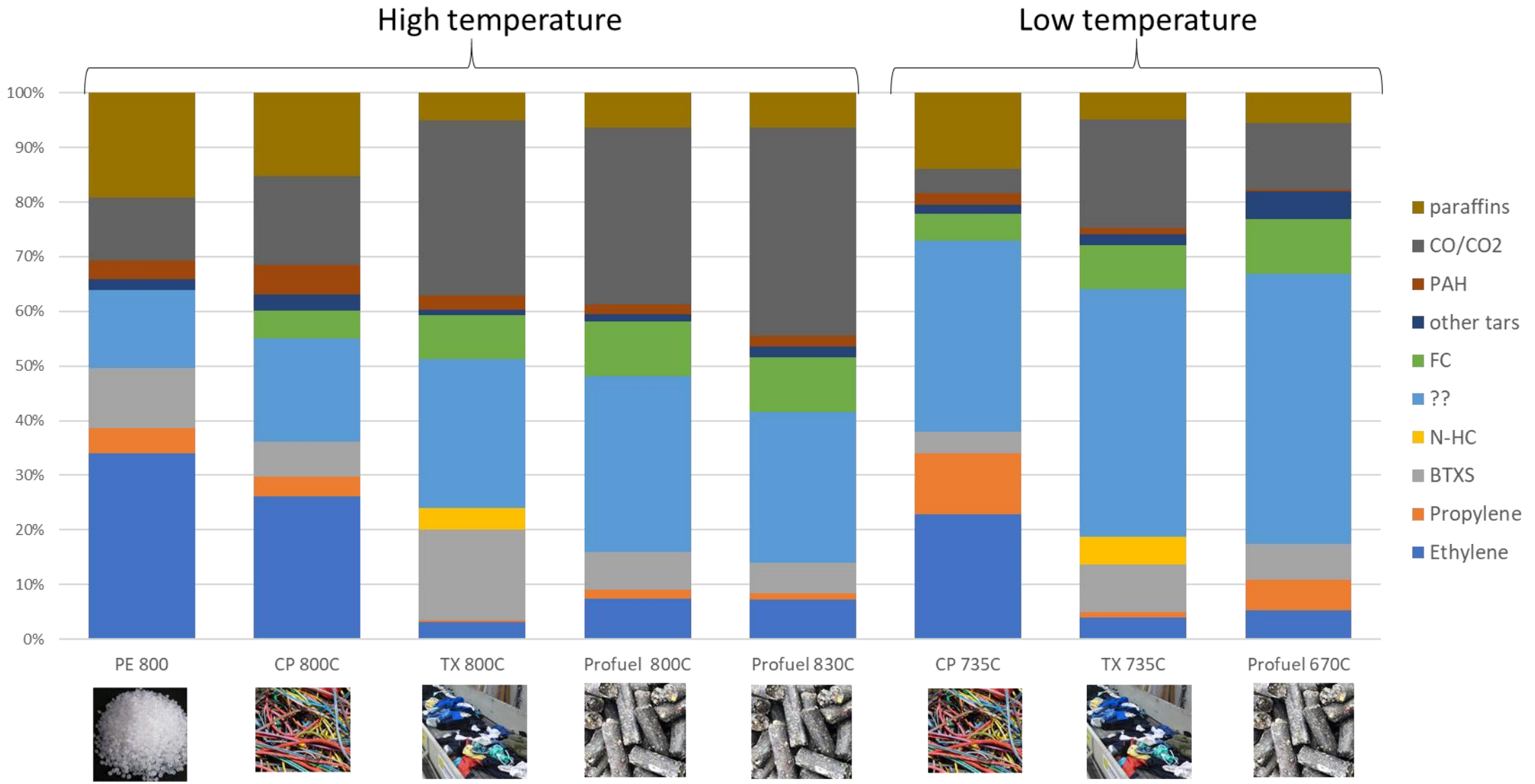
Cross-linked PE

PVC

PE

In million tons carbon per year

Carbon balance example of results



PIONA VUV GC-Analyser

- **PIONA VUV GC-Analyser** offers complete **analysis** of Paraffins, Iso-paraffins, Olefins Naphthenes and Aromatics in gasoline-range materials, also hydrocarbons that contain O,N,S and halogens

- Enhanced reliability of identification ay short detection times in the vacuum ultraviolet spectrum

- VUV detectors provide unmatched selectivity of isomers and co-eluting analytes without the need for chromatographic baseline resolution. VUV detectors are designed for gas chromatography and streaming gas applications