Drivmedel och kemikalier via vätebehandling av pyrolysolja

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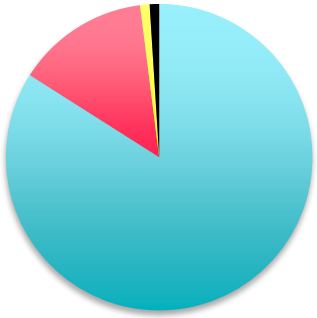
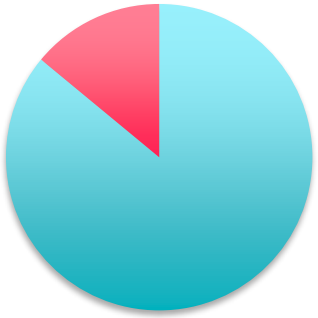
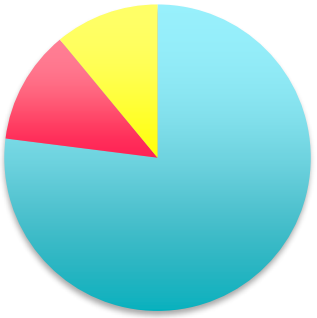
Fossil Råolja



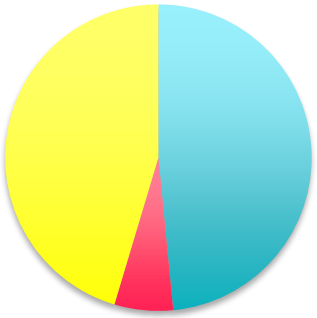
Diesel



Vegetabilisk olja

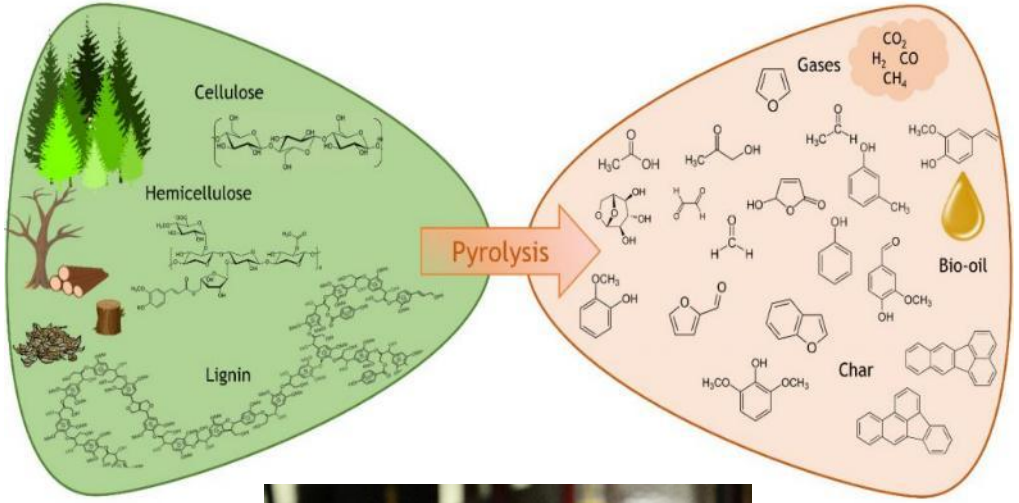


Biomassa



Pyrolys

- ~500 °C, Inget syre
- Hög syrehalt
- Oönskade egenskaper
- Svår att processa



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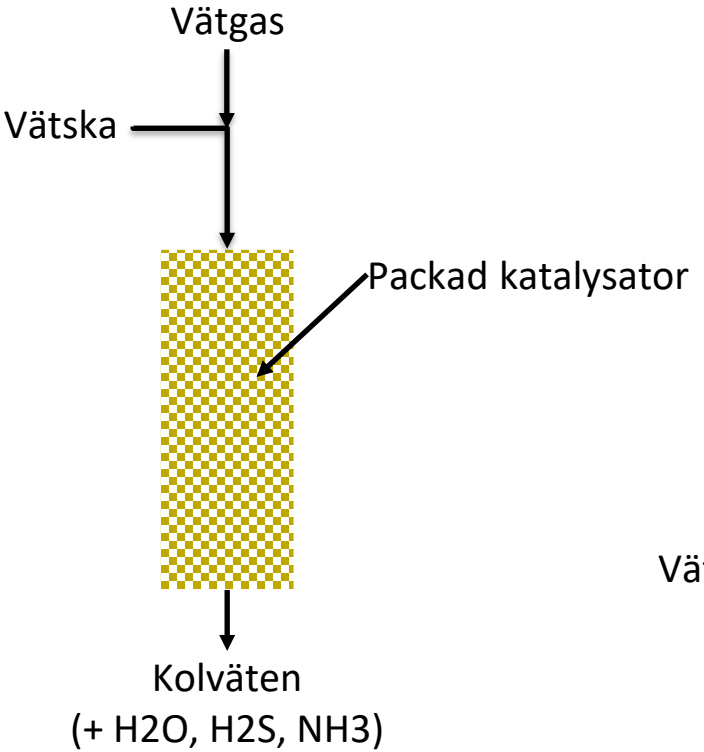
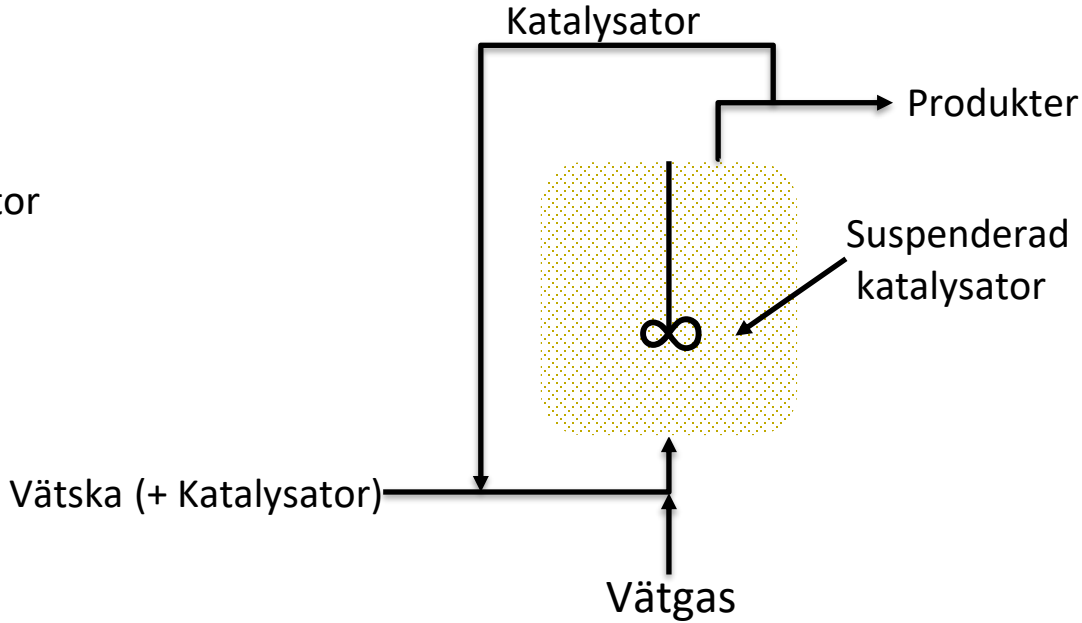
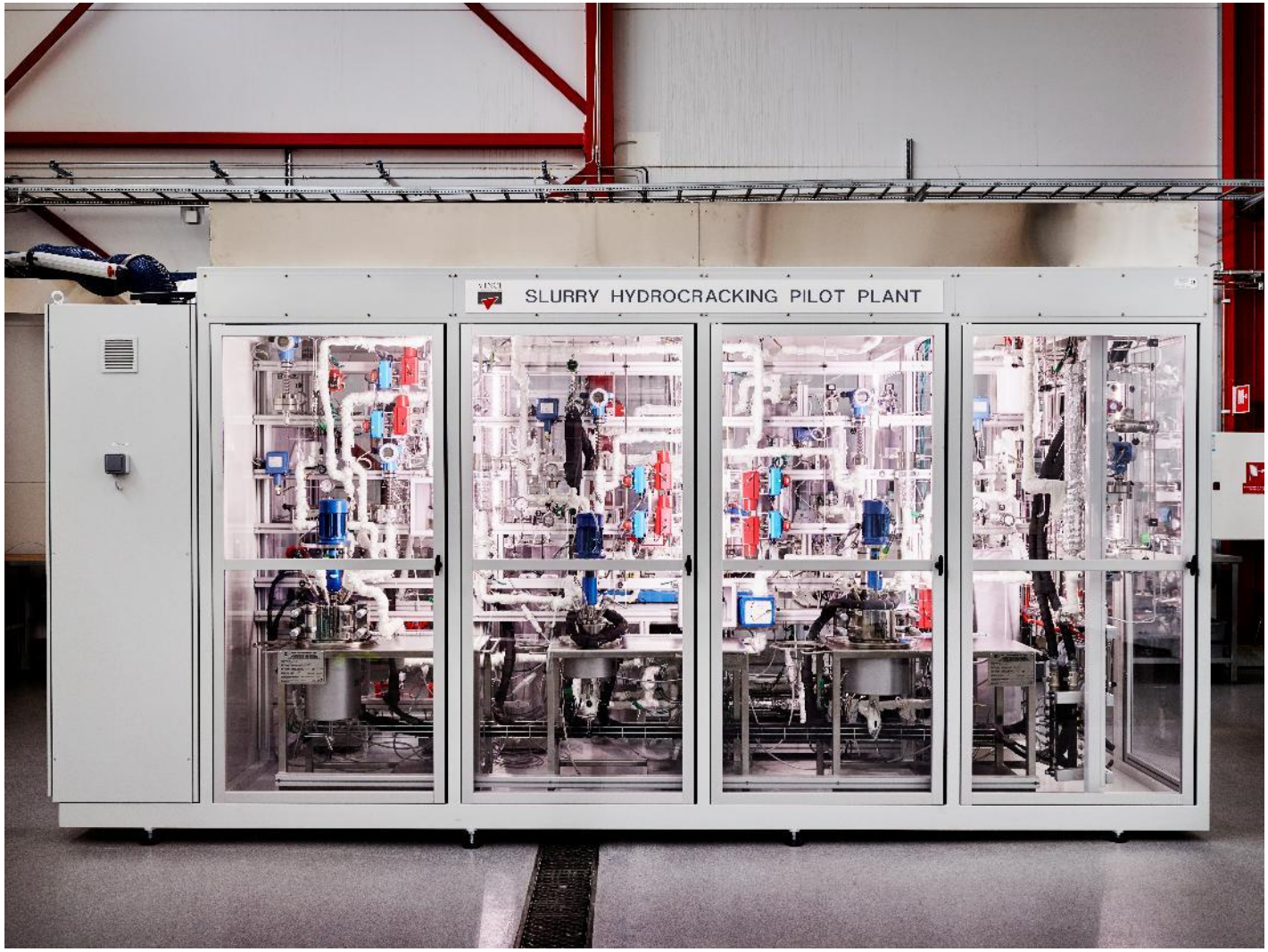
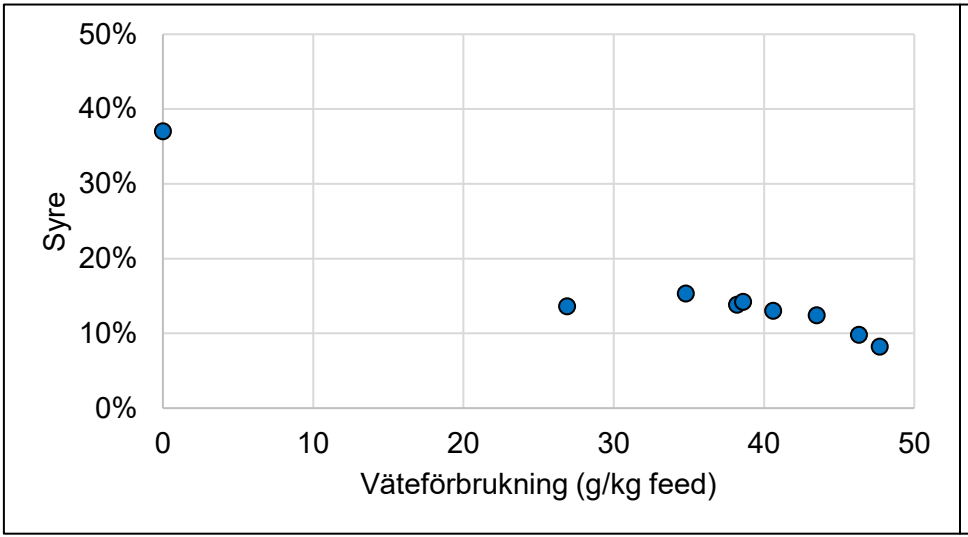
Konventionell vätebehandling

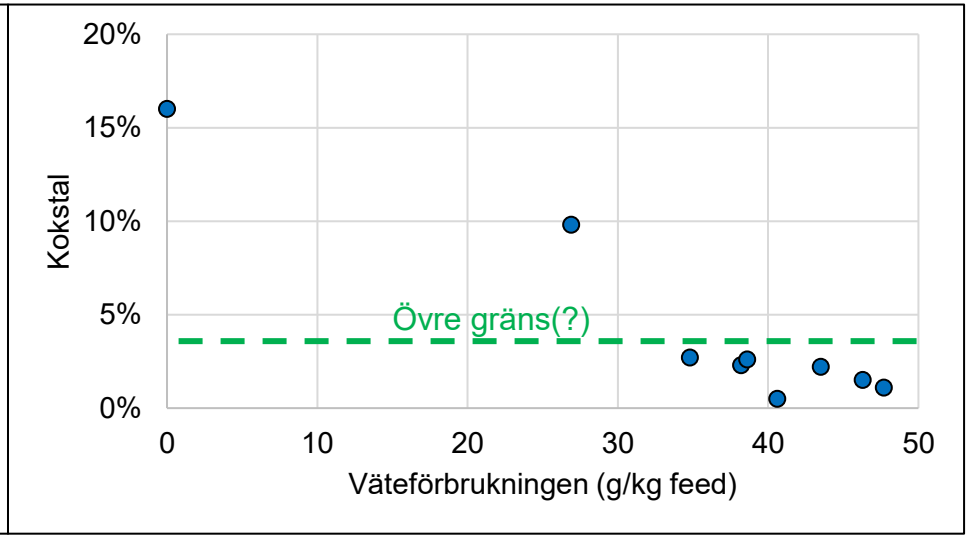


Slurry vätebehandling

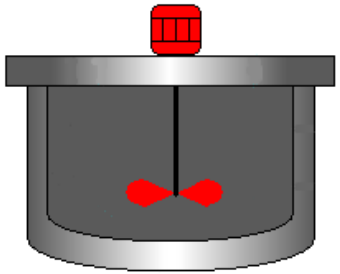



SLURRY HYDROCRACKING PILOT PLANT


50%
40%
30%
20%
10%
0%
Syre
0
10
20
30
40
50
Väteförbrukning (g/kg feed)


20%
15%
10%
5%
0%
Kokstal
Övre gräns(?)
0
10
20
30
40
50
Väteförbrukningen (g/kg feed)

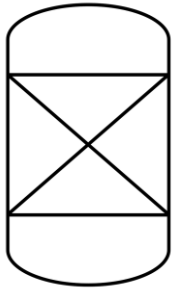
~15 - 30 % Vatten
~35 - 40 % Syre
1.2 kg/L



Slurry
vätebehandling

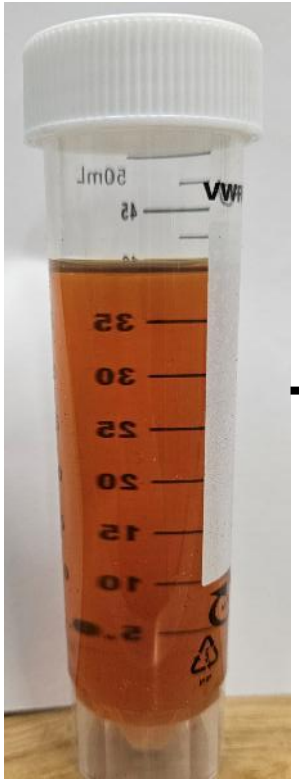
< 1 % Vatten
8 - 15 % Syre
0.9 – 1.0 kg/L

Vätebehandling i
packad bädd

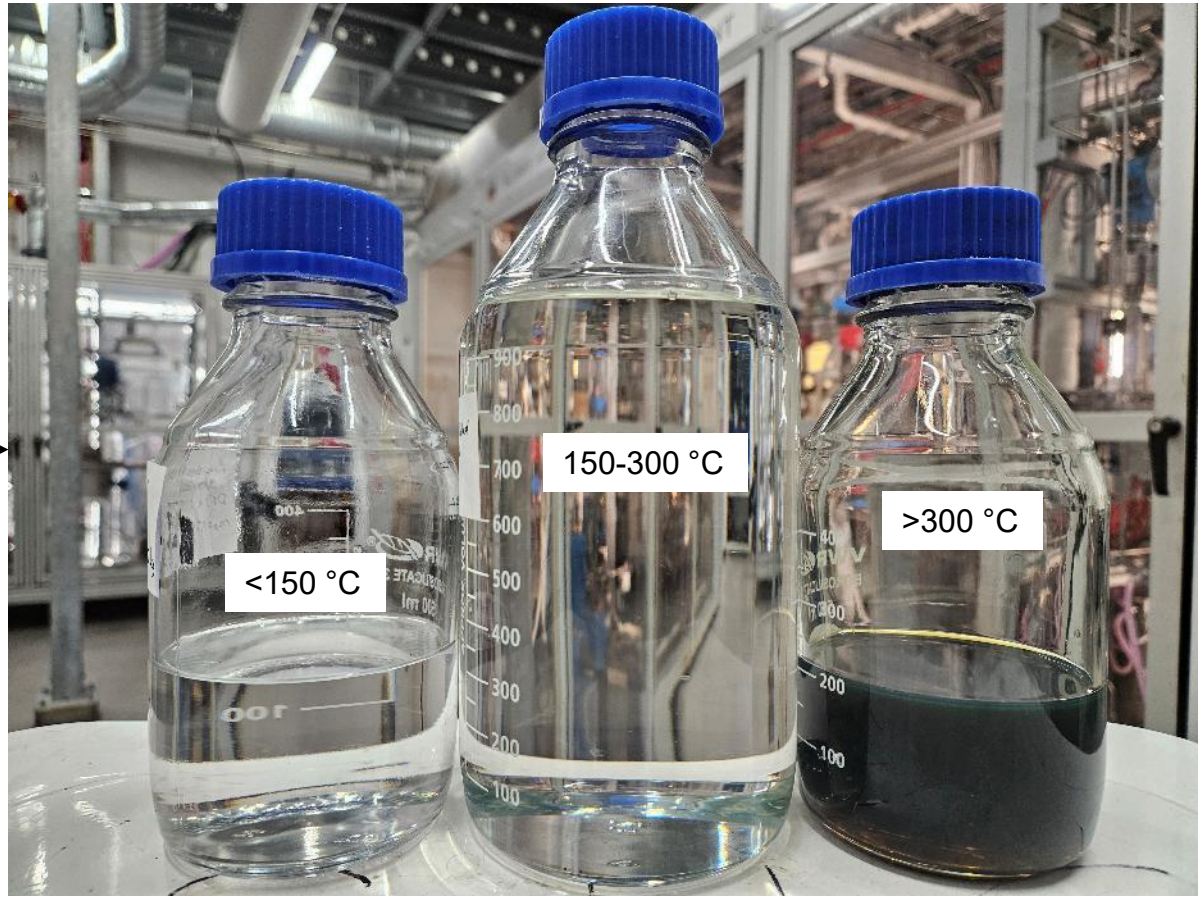


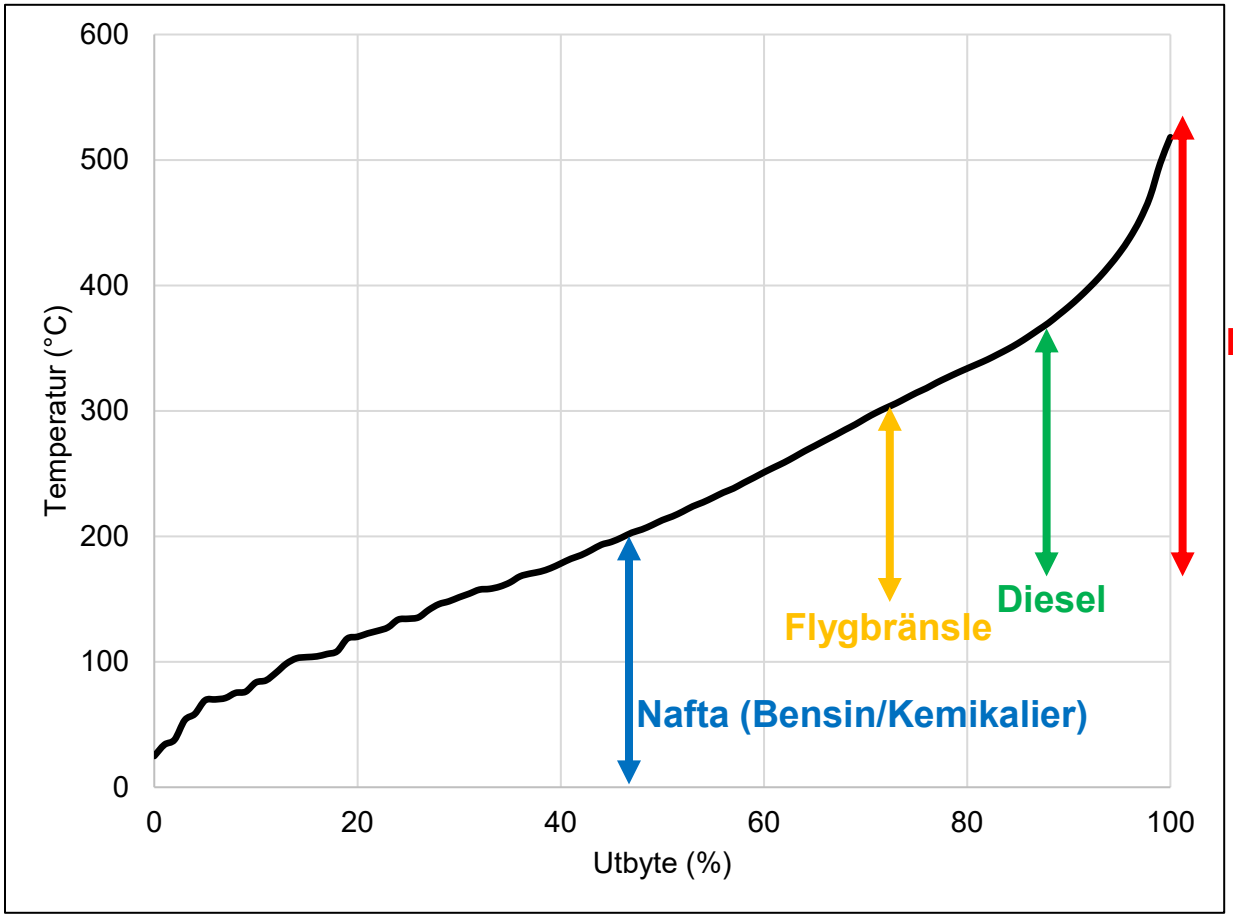
< 0.5 % Syre
~0.83 kg/L
~70 % kolutbyte

Före destillering



Efter destillering

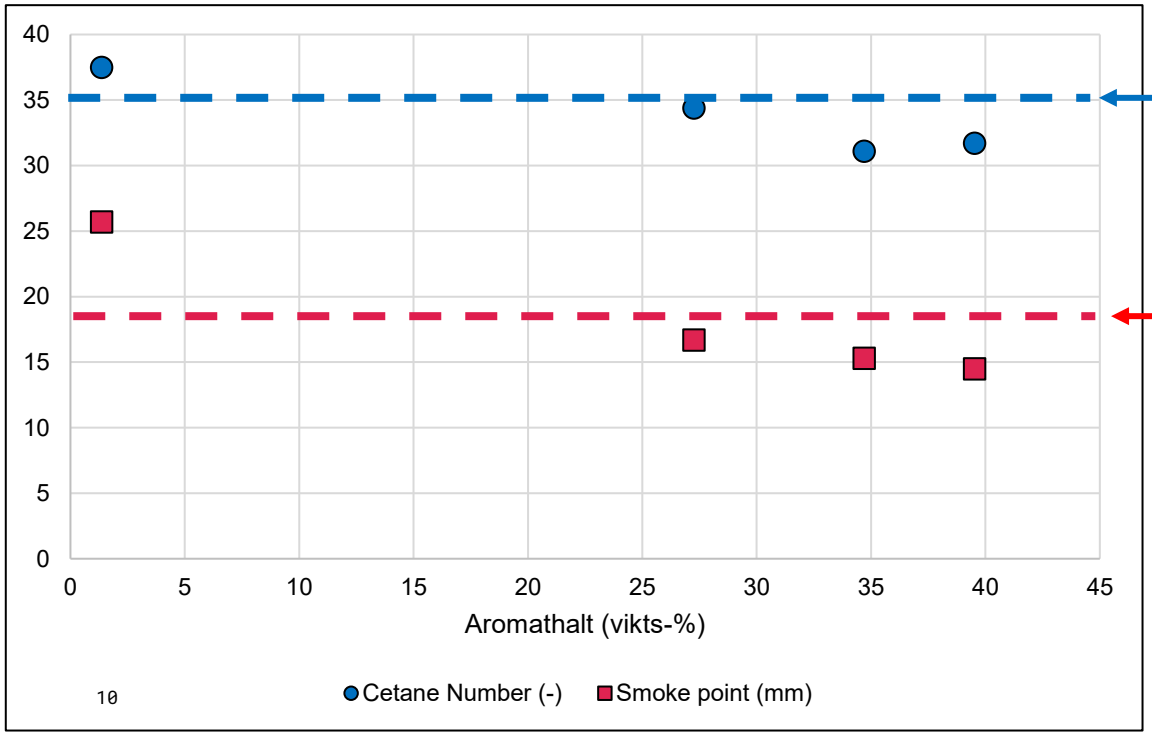




~25 % Nafta
~61 % **Flygbränsle/Diesel**
~14 % Marinbränsle

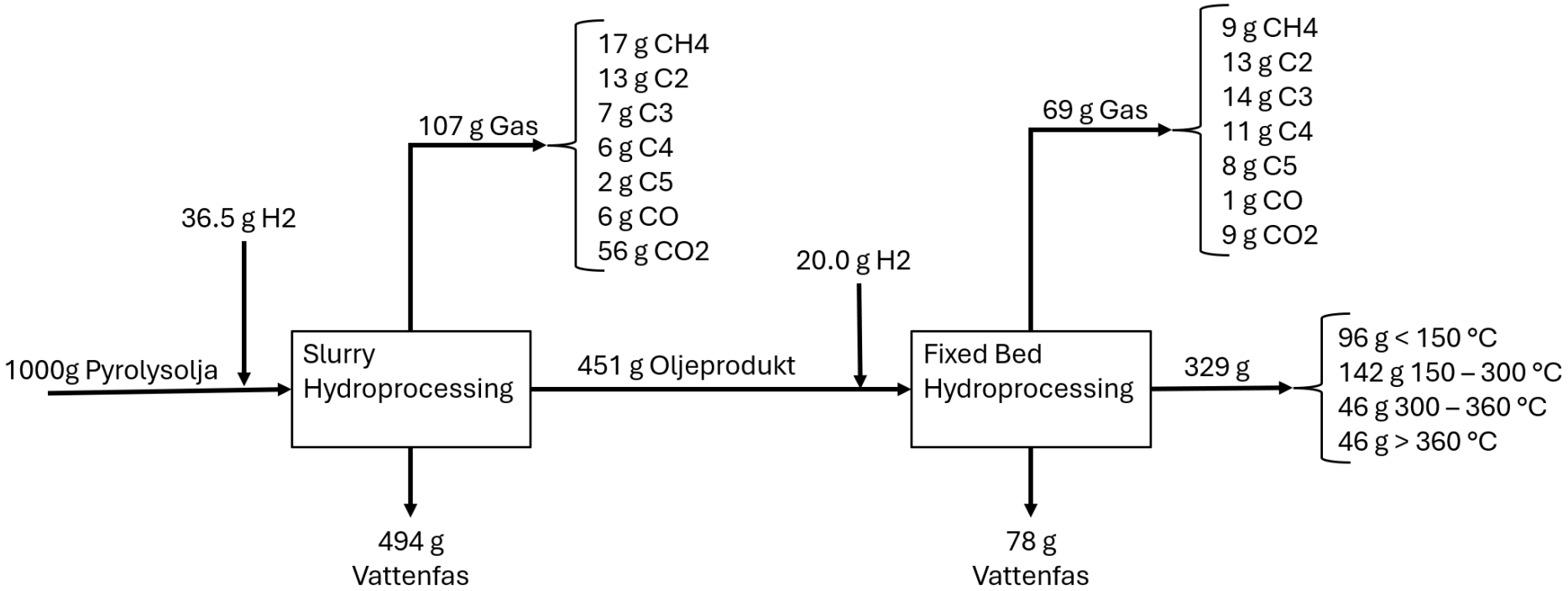
Egenskaper för flygbränsle

Högre halt cykliska kolväten än i konventionella bränslen
- Kan ge sämre förbränningsegenskaper
- Bra komplement till t.ex. HVO (enbart raka kolväten)



Rekommenderad nedre gräns

Gränsvärde


1000g Pyrolysolja
36.5 g H2
Slurry Hydroprocessing
107 g Gas
17 g CH4
13 g C2
7 g C3
6 g C4
2 g C5
6 g CO
56 g CO2
494 g Vattenfas
451 g Oljeprodukt
20.0 g H2
Fixed Bed Hydroprocessing
69 g Gas
9 g CH4
13 g C2
14 g C3
11 g C4
8 g C5
1 g CO
9 g CO2
78 g Vattenfas
329 g
96 g < 150 °C
142 g 150 – 300 °C
46 g 300 – 360 °C
46 g > 360 °C

Ekonomiska aspekter

- Kan vara konkurrenskraftigt med andra biodrivmedel
- Kostnadsdrivande: Investeringskostnad + Biomassa
- Gasprodukter kan tillgodose stor del av vätgasen
- Valorisering av alla fraktioner viktigt

Tack!

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