

# Schoon Schip

**Menno Merts**  
**HAN Automotive**  
**20-4-2023**

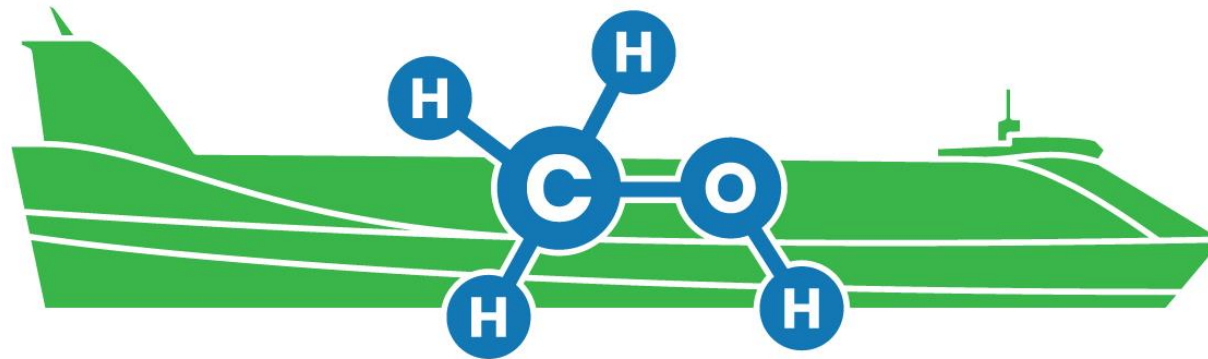
# 1 Schoon Schip Project

**Doel:** Fossiel brandstofgebruik reduceren

**Casus:** Binnenvaart en industrie, bestaande motoren (her)gebruiken

**Waarom:** Niet 30 jaar wachten, nu actie ondernemen

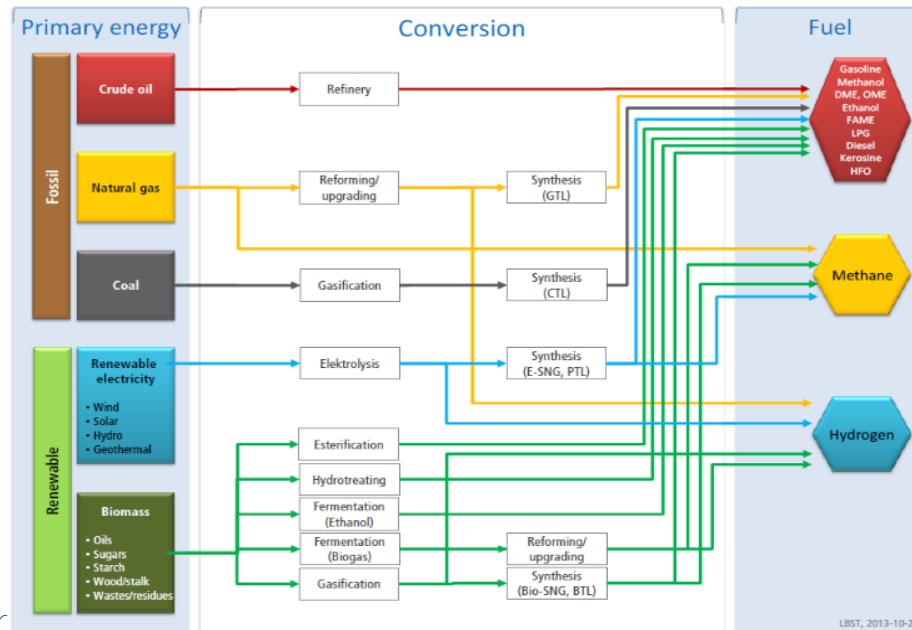
**Hoe:** Retrofit dual fuel methanol



# SCHOOON SCHIP

## 2 Methanol als circulaire brandstof

- Methanol is vloeibaar → energie-dichtheid
- Methanol wordt veel gebruikt in de chemische industrie:
  - >Productie, infrastructuur en bunkers in haven zijn er al
- Hernieuwbaar te produceren, CO<sub>2</sub> neutraal



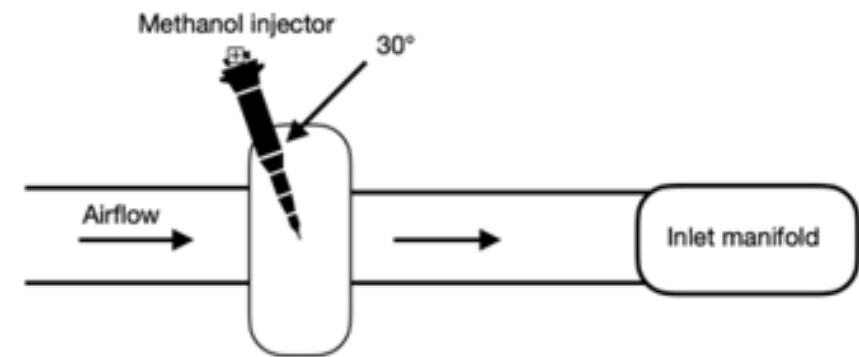
# 3 Dual Fuel

Brandstof met hoog octaangetal inspuiten in de inlaat, mengsel aansteken met diesel

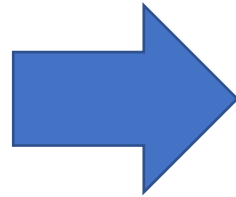
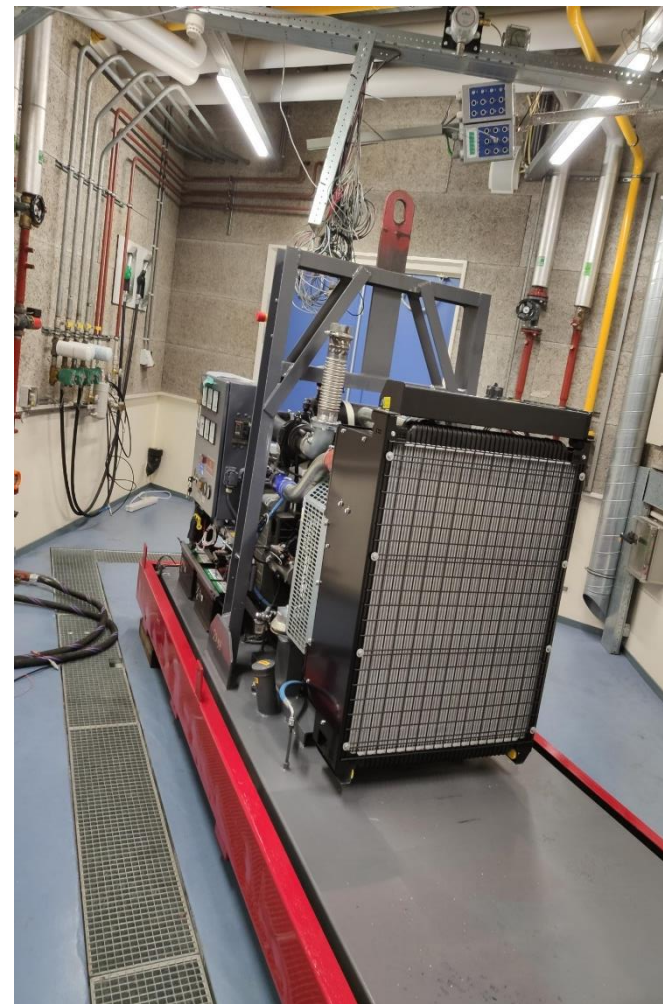
100% Diesel draaien blijft mogelijk

Retrofit dual fuel methanol, minst invasieve methode

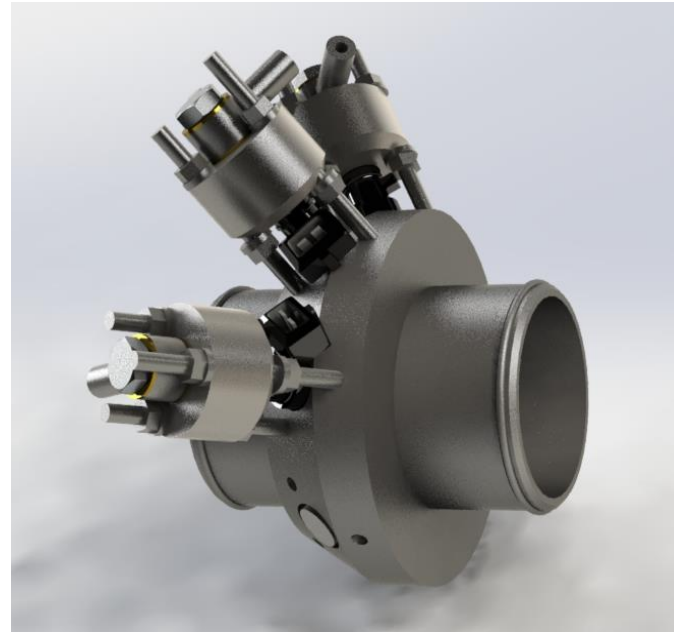
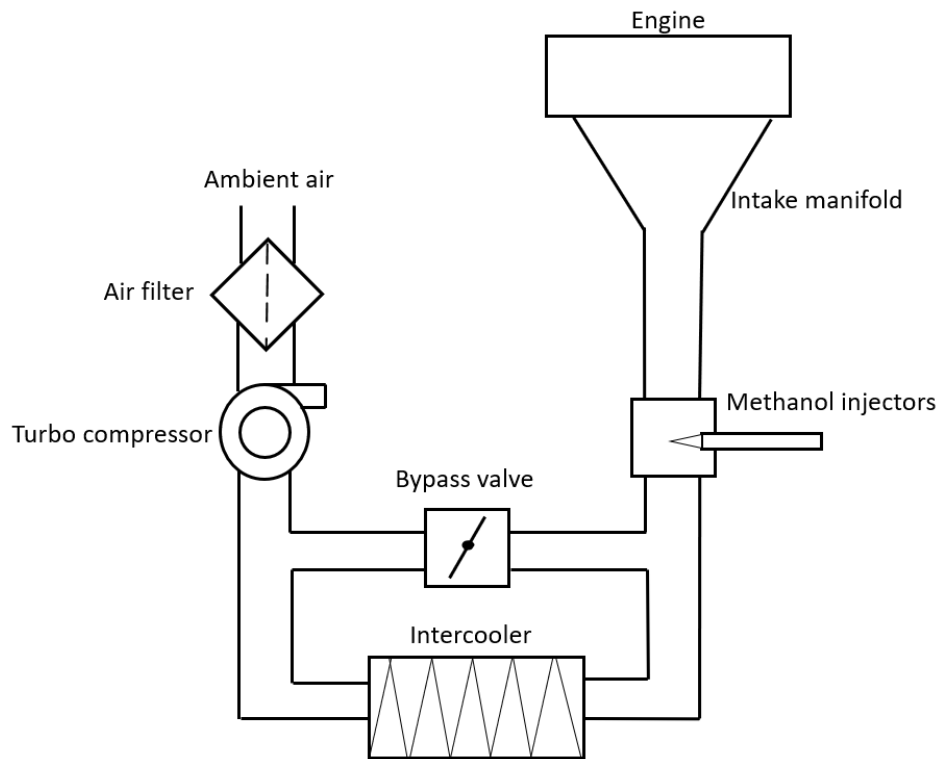
Single point elektronische injectie



# 4 Testopstelling



# 4 Testopstelling

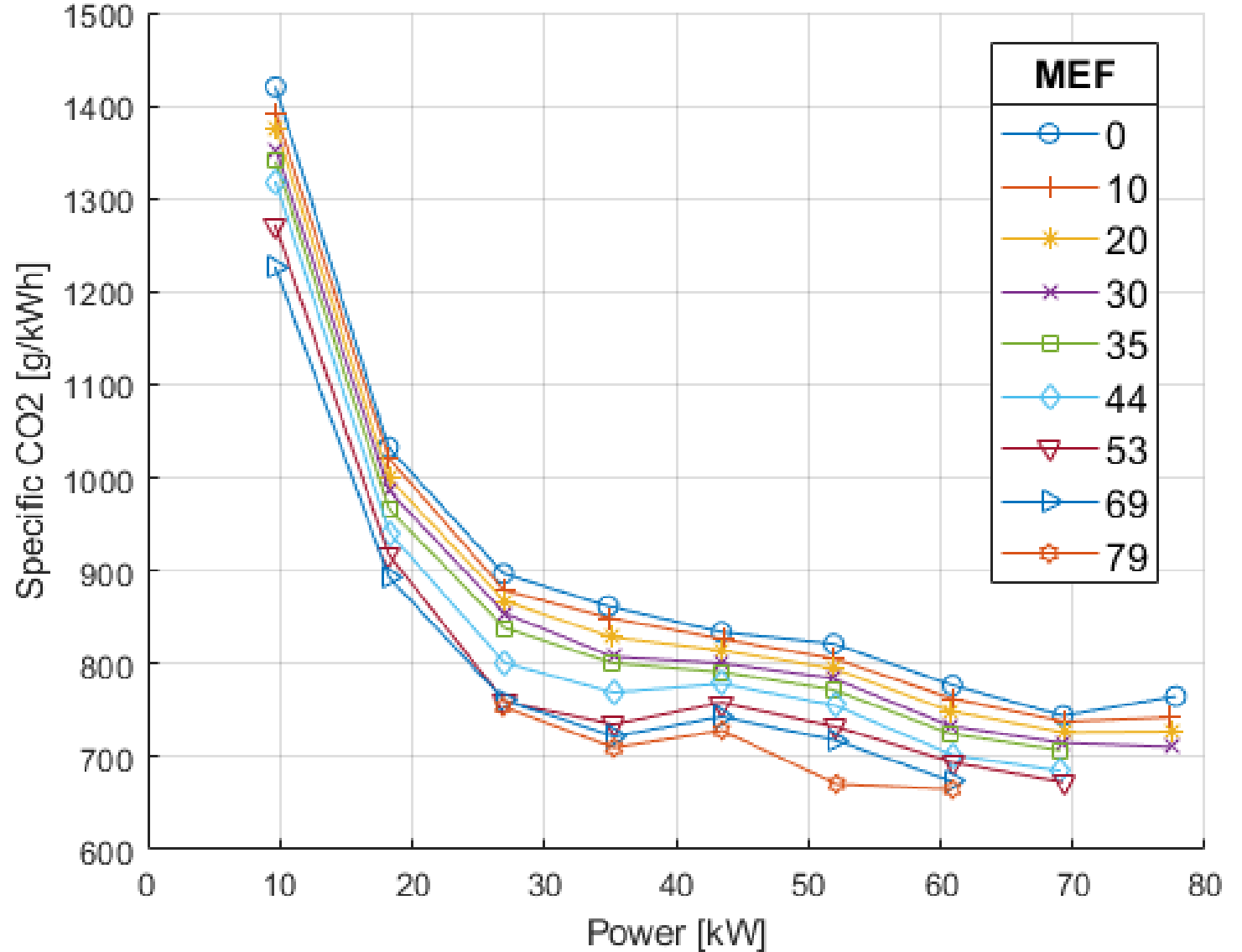


# 5 Resultaat

CO<sub>2</sub> in de uitlaat gemeten

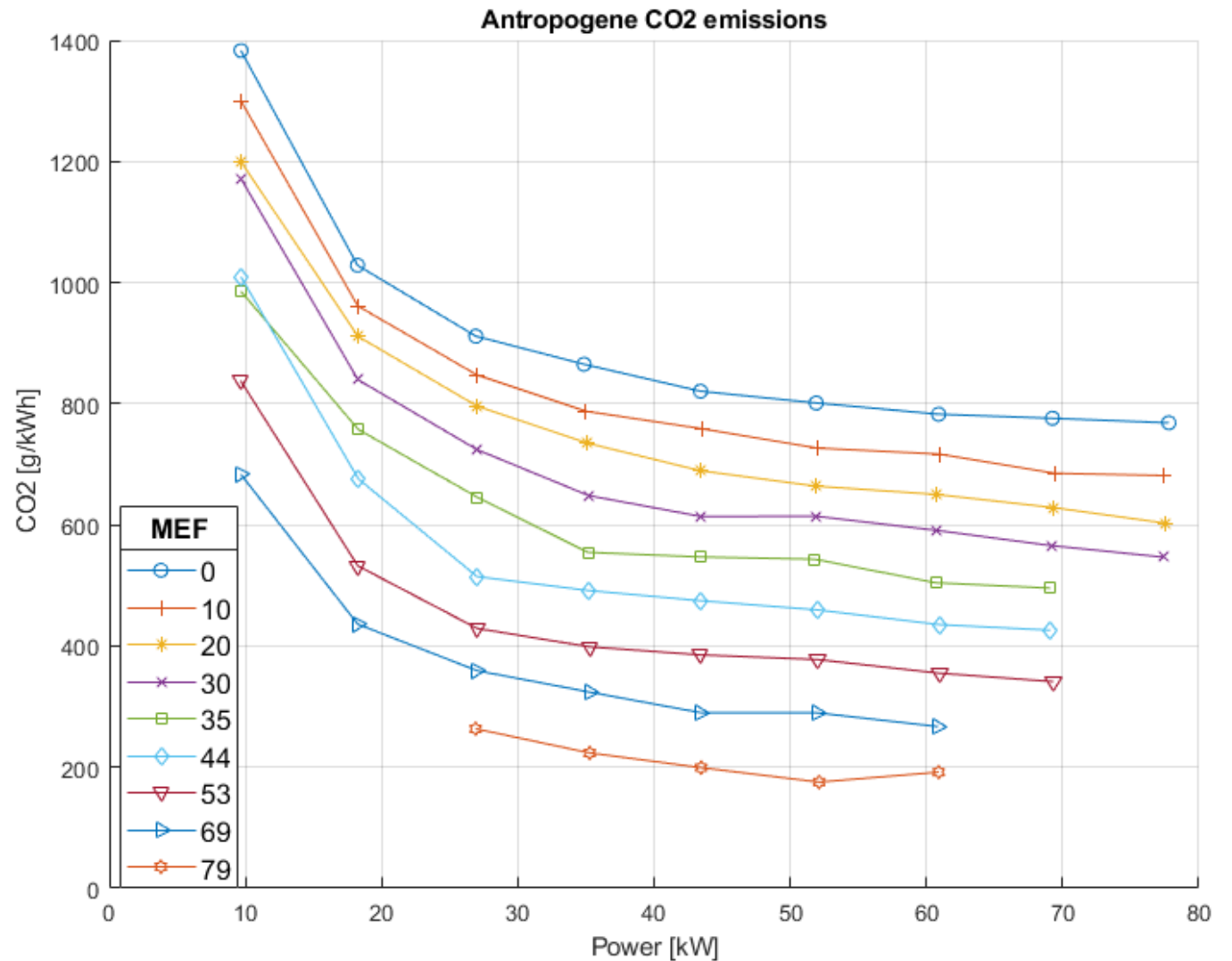


### Total CO2 emissions



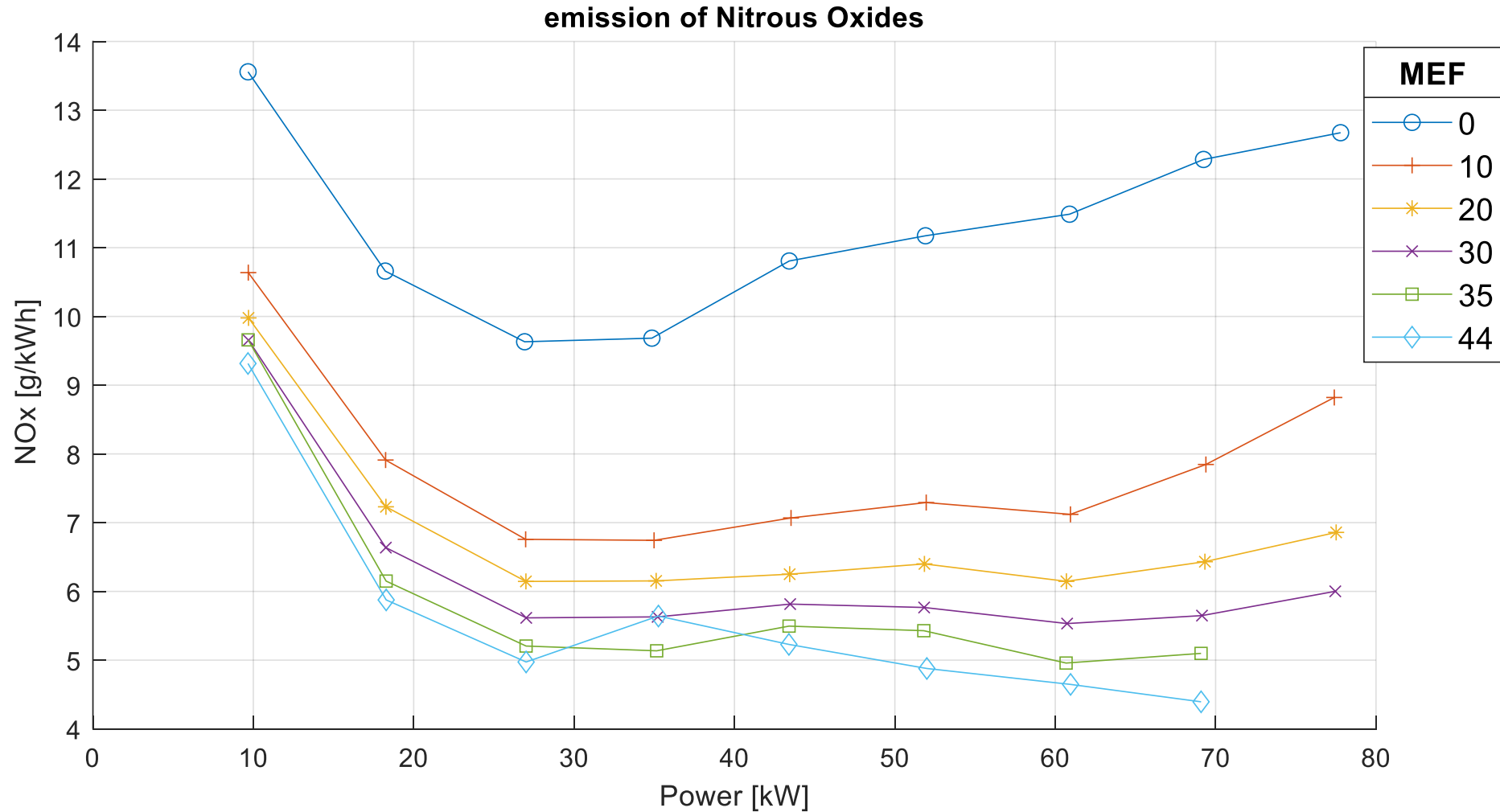
# 5 Resultaat → CO<sub>2</sub>-reductie met hernieuwbare methanol

CO<sub>2</sub> afkomstig van Diesel →

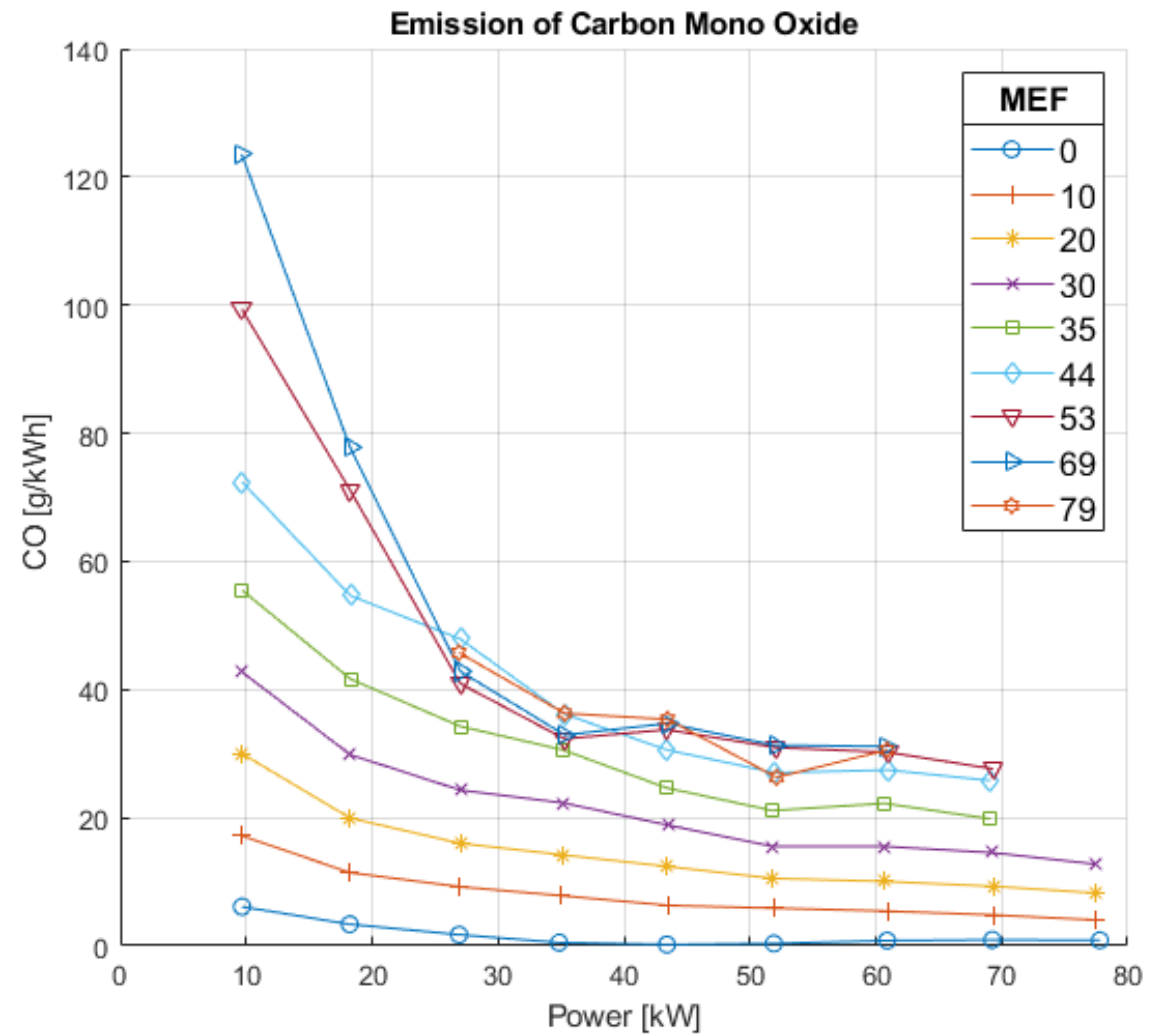
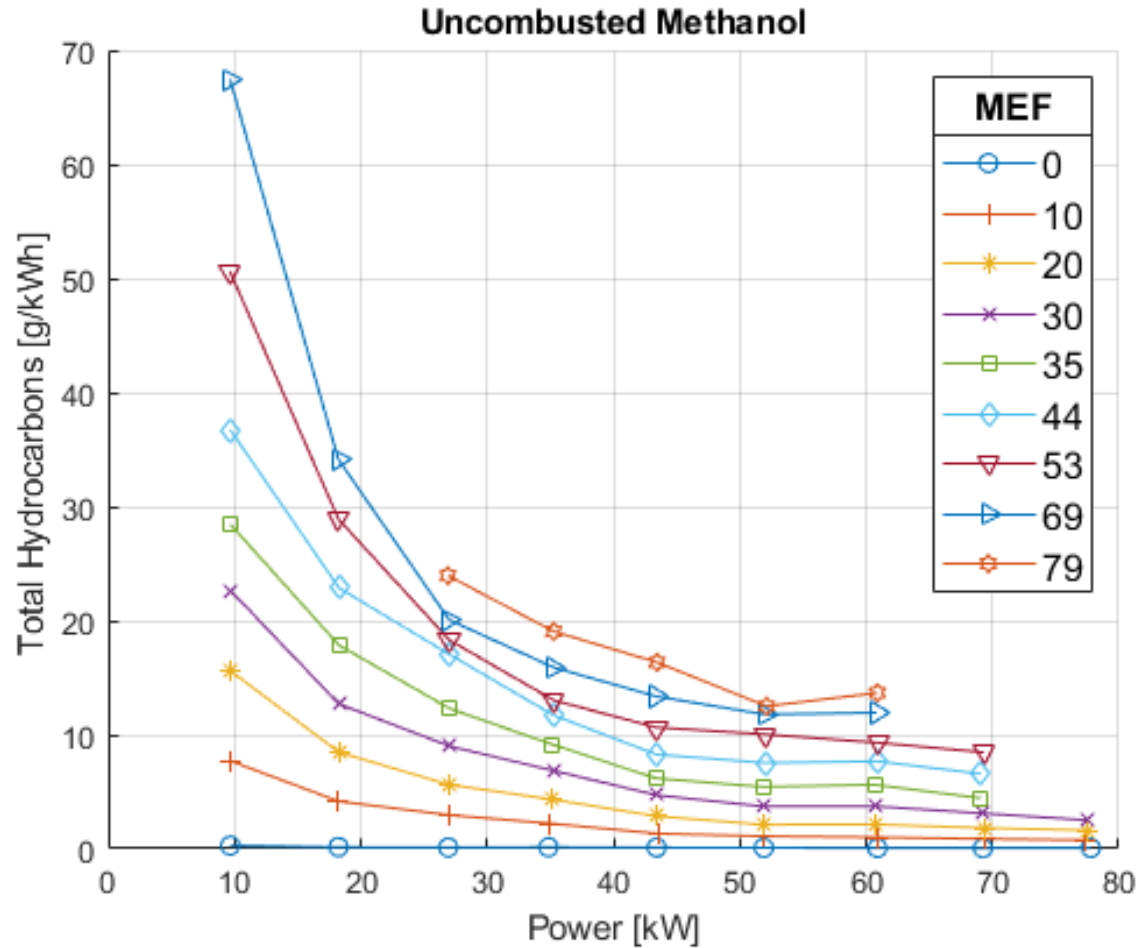




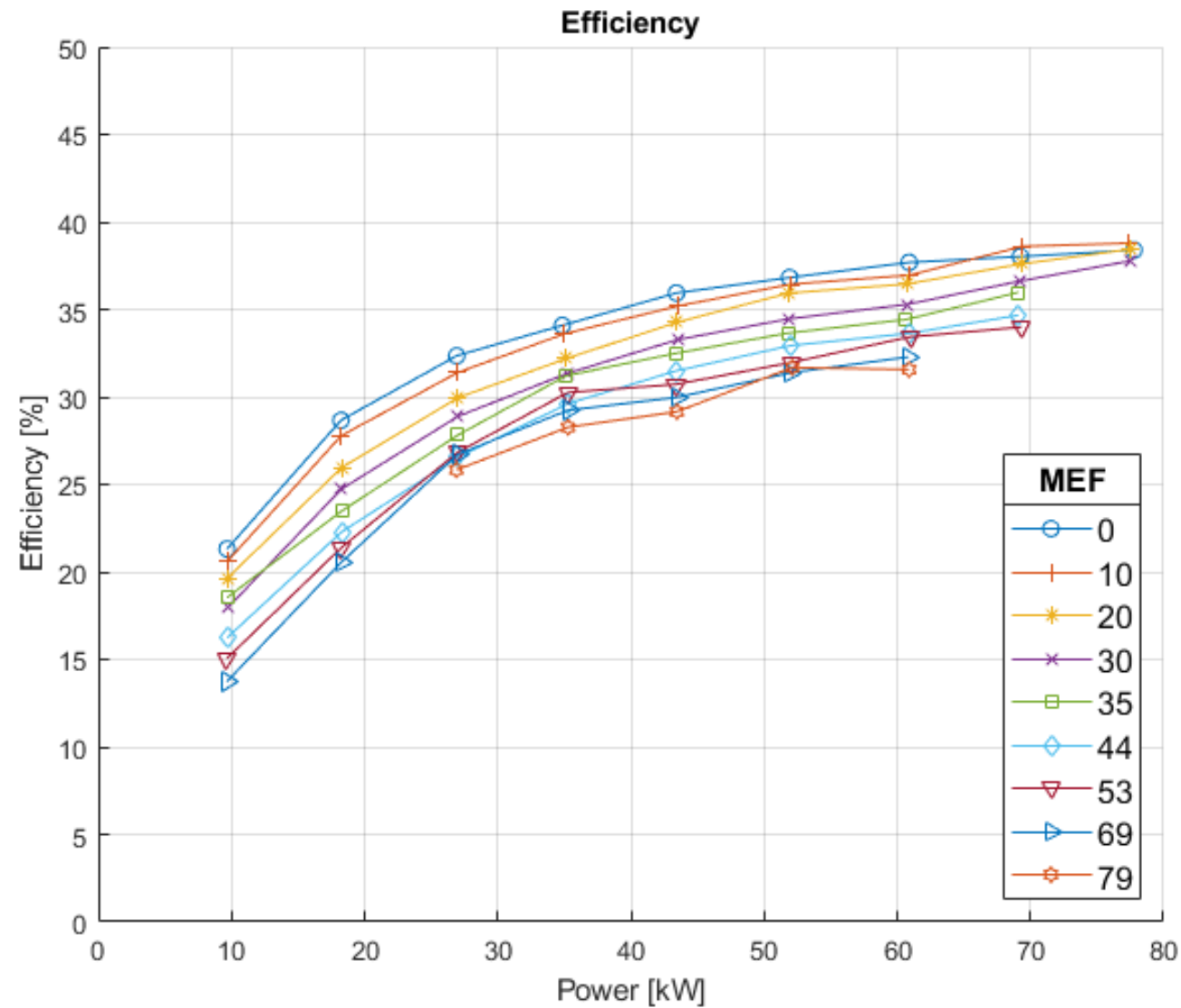
# 5 Resultaat – NO<sub>x</sub> emissie



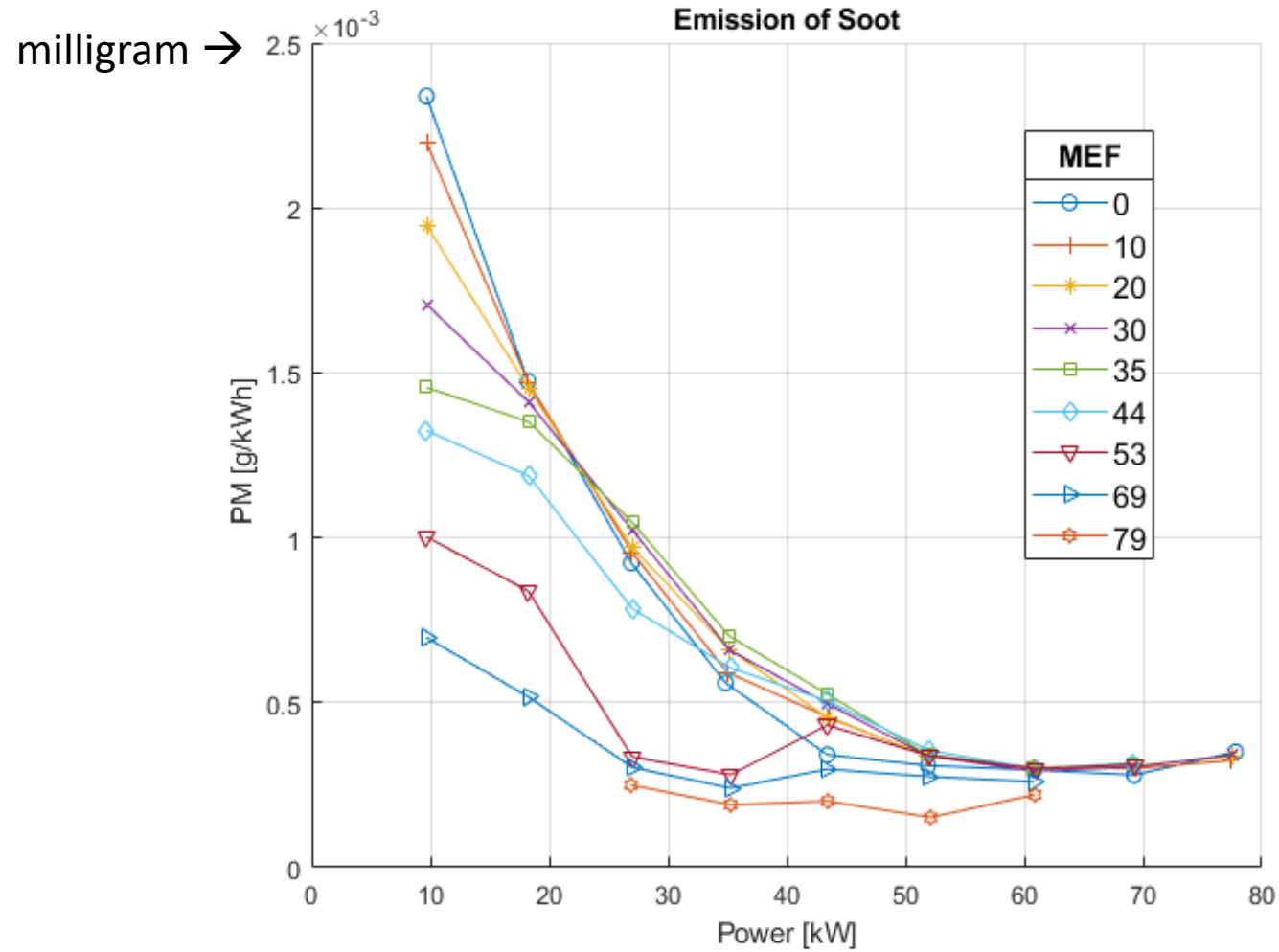
# 5 Resultaat – CO en HC emissie



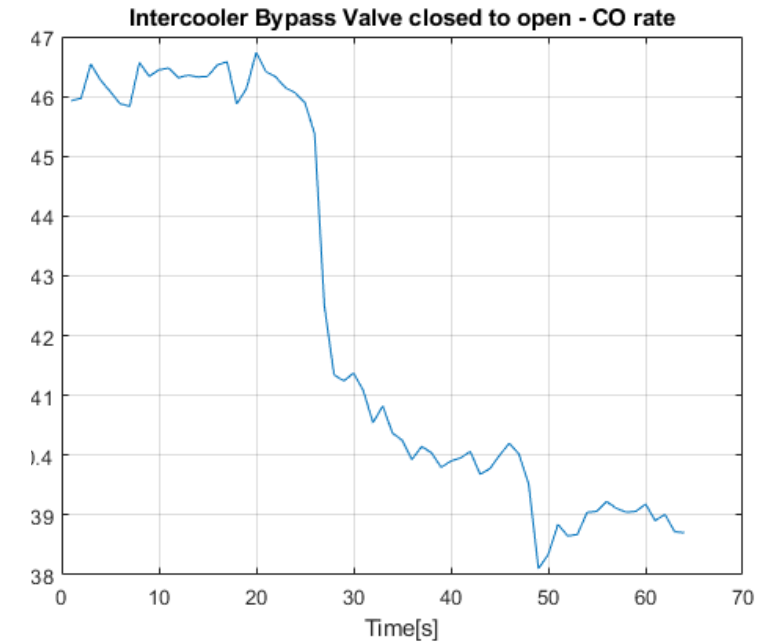
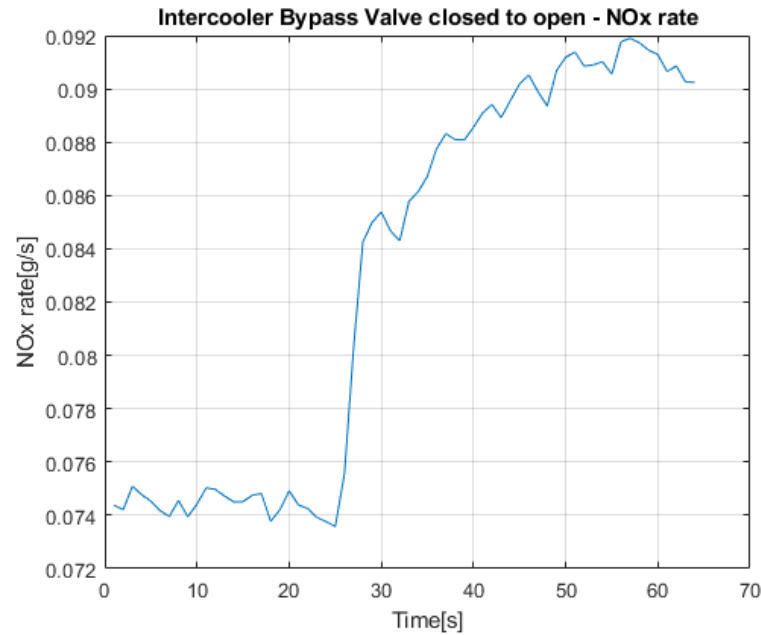
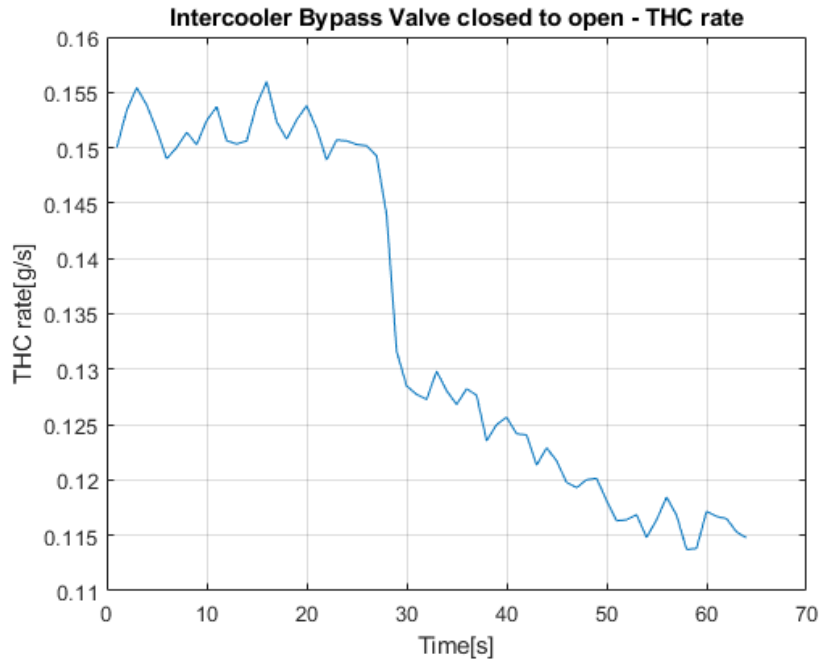
# 5 Resultaat – Rendement



# 5 Resultaat – Roetuitstoot



# 5 Resultaat – Optimalisatie



Invloed van inlaattertemperatuur: 63kW, 60% MEF=> intercooler bypass volledig open

THC -25%

NOx +25%

CO -18%

# Vragen?



# 6 Planning

Tier3A motor ombouwen, John Deere

Werkt de universele aanpak?

Is dezelfde NOx reductie te behalen? 4 g/kWh  ?????

# 4 Testopstelling

