



IEA Bioenergy

Technology Collaboration Programme



Belgium Country Update

IEA Bioenergy T33 Meeting

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Technology Collaboration Programme

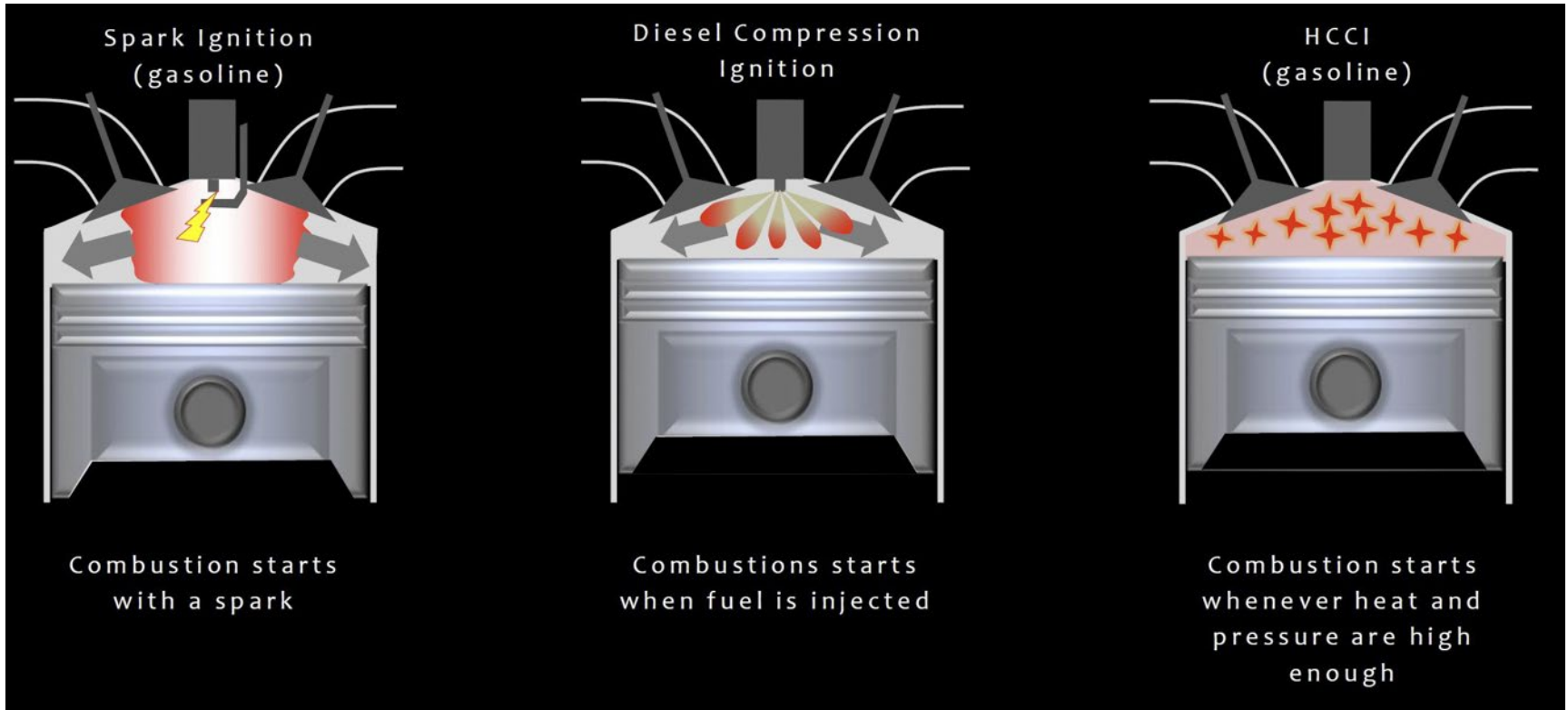
by **iea**



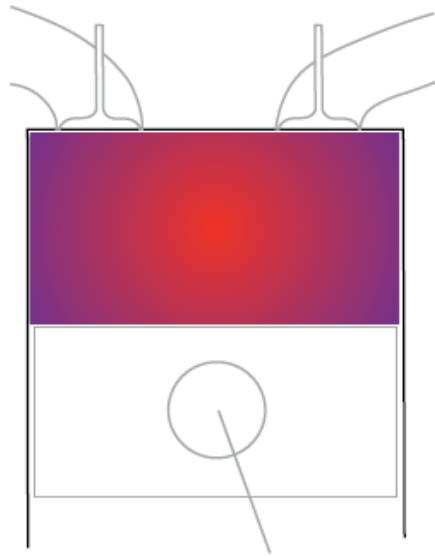
State of gasification in Belgium

- Project at ECAM ended in 2026
- Xylergy filed for bankruptcy at the end of 2025
- Gasifier at UCLouvain will be dismantled in 2026

Research idea : HCCI engine on syngas



Research idea : HCCI engine on syngas



Homogeneous-Charge Compression-Ignition

Intense Compression

Lean mixture



Low power density

Unburned fuel

Difficult control



OK high intake T

Gaseous fuel

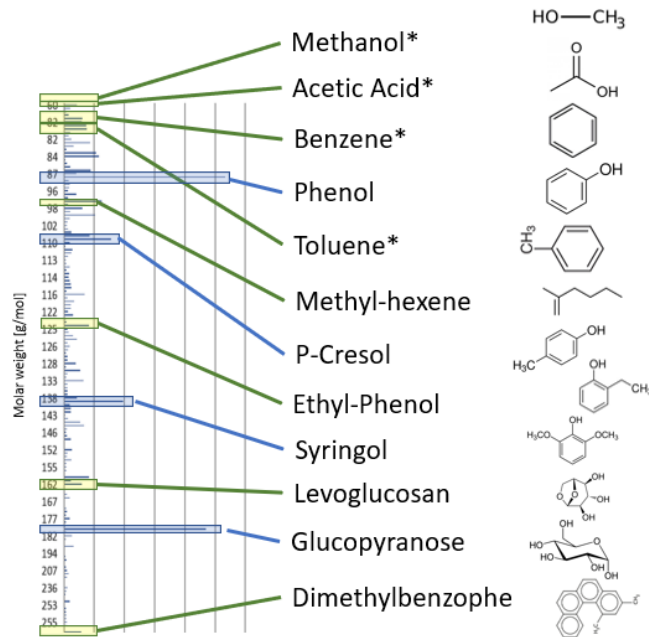
High efficiency

Low NO_x

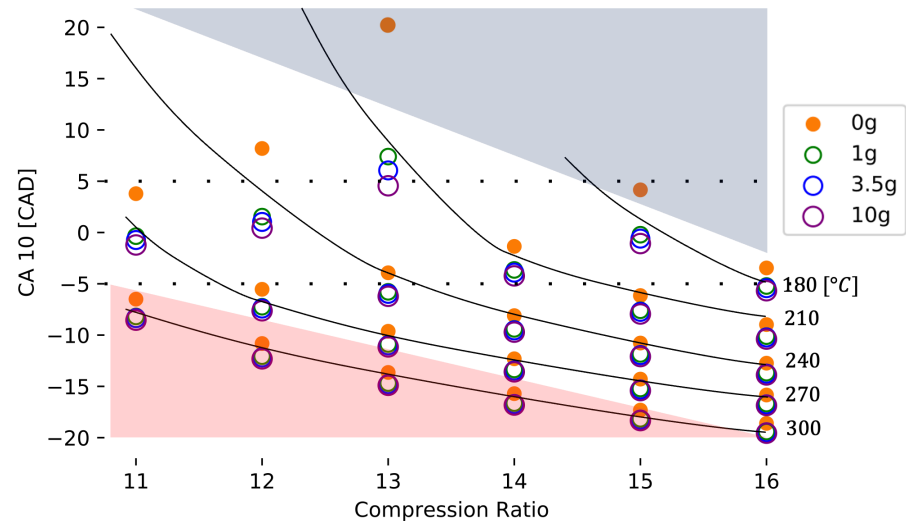
TTcogen numerical investigations (2021)

Estimation of the ideal HCCI compression ratio for 180°C intake

Syng as kinetic mechanism
→ adapted for tars

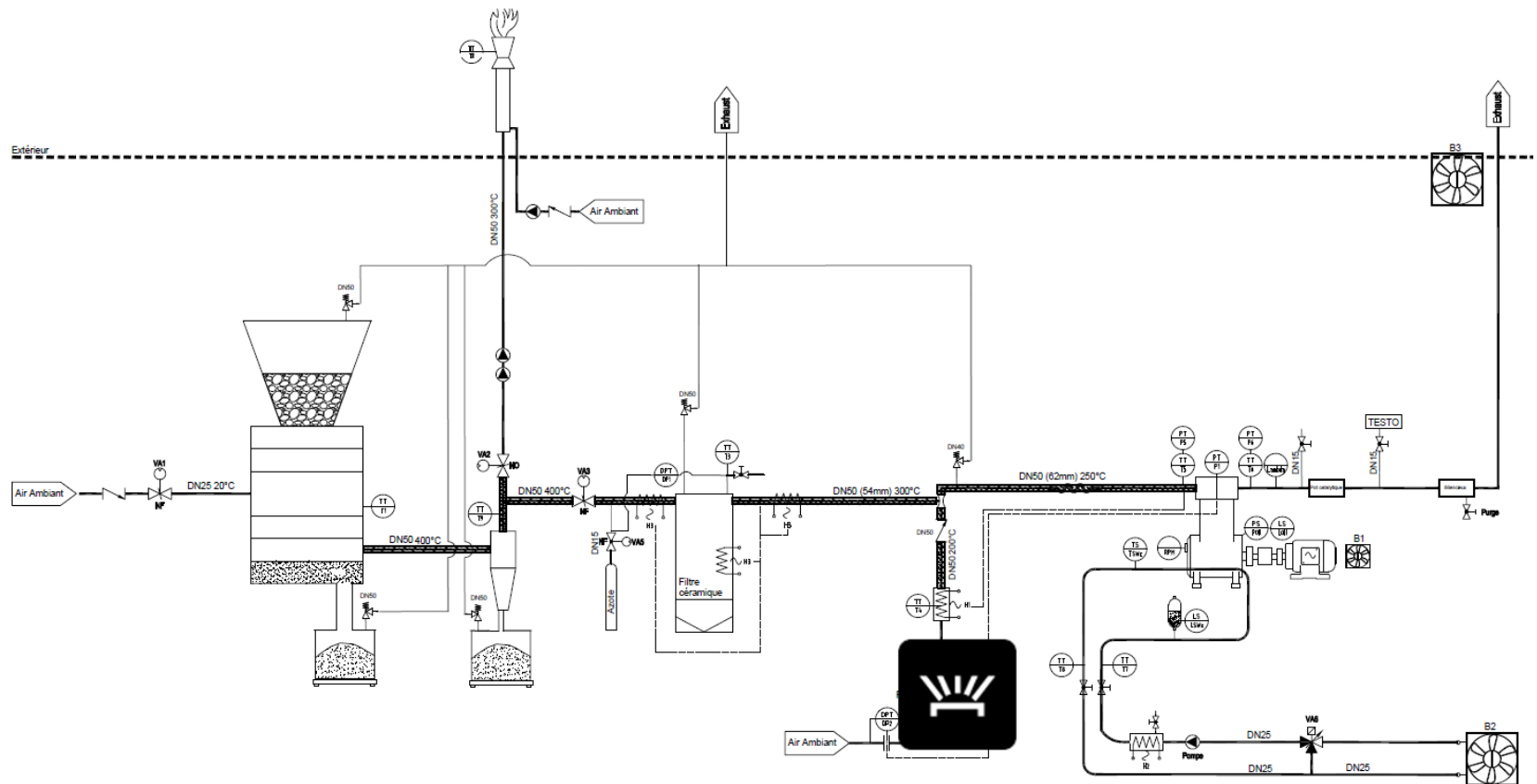


0D HCCI cylinder model
→ Intake T vs. CR vs. tars



From plans to reality (2021 - 2025)

P&ID, ATEX, modified gasifier, adapted engine, automation...



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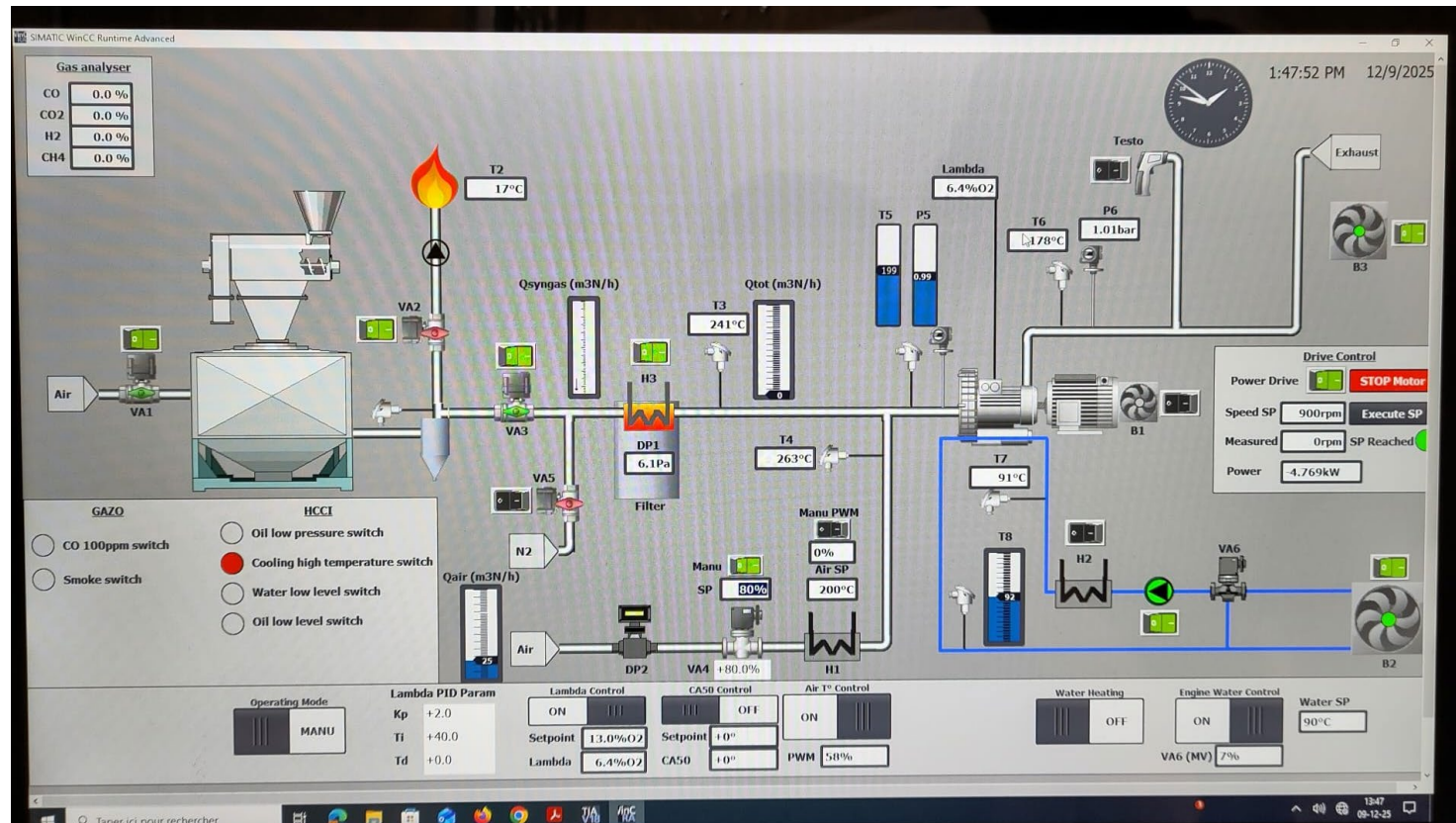
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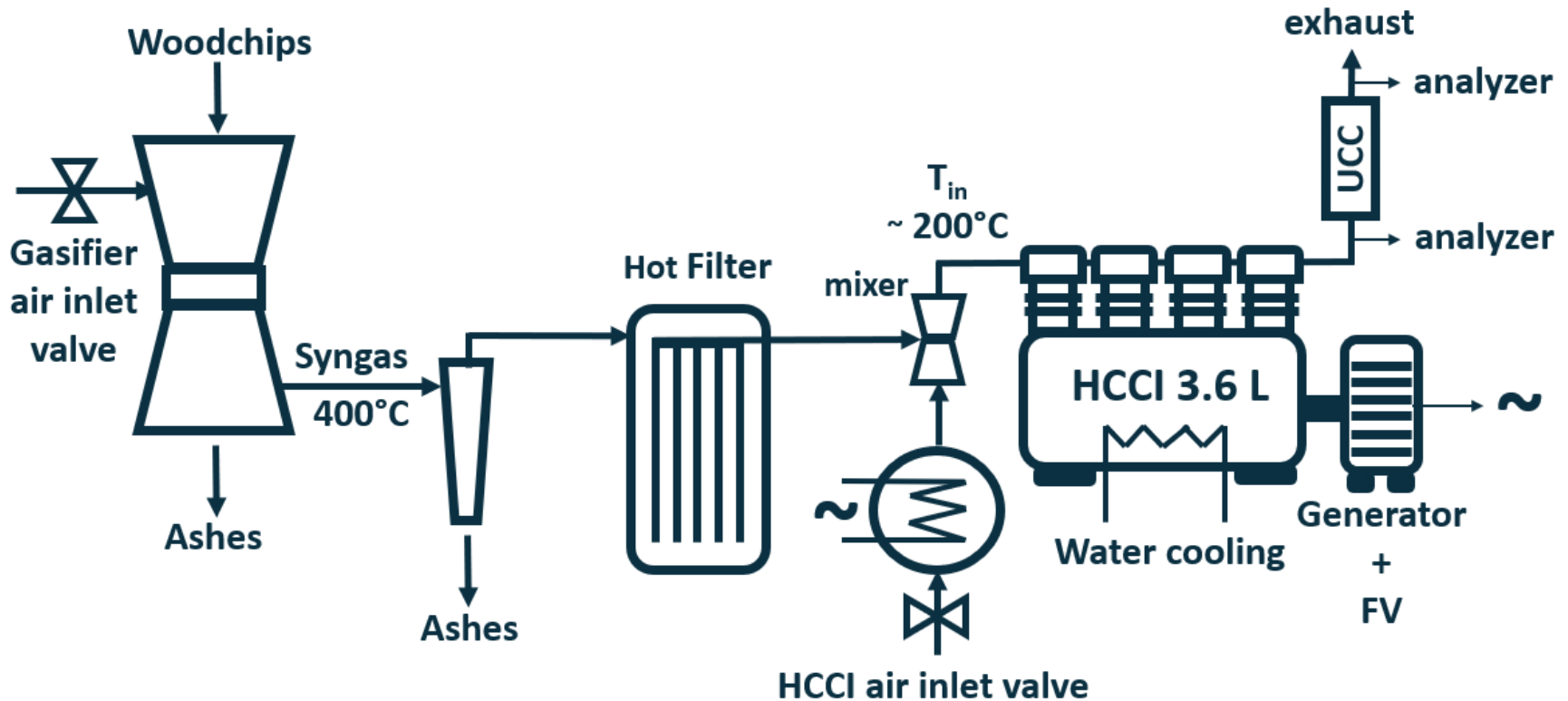
From plans to reality (2021 - 2025)

P&ID, ATEX, modified gasifier, adapted engine, automation...



Experimental campaign (2025)

Variable inputs : RPM, intake T, equivalence ratio



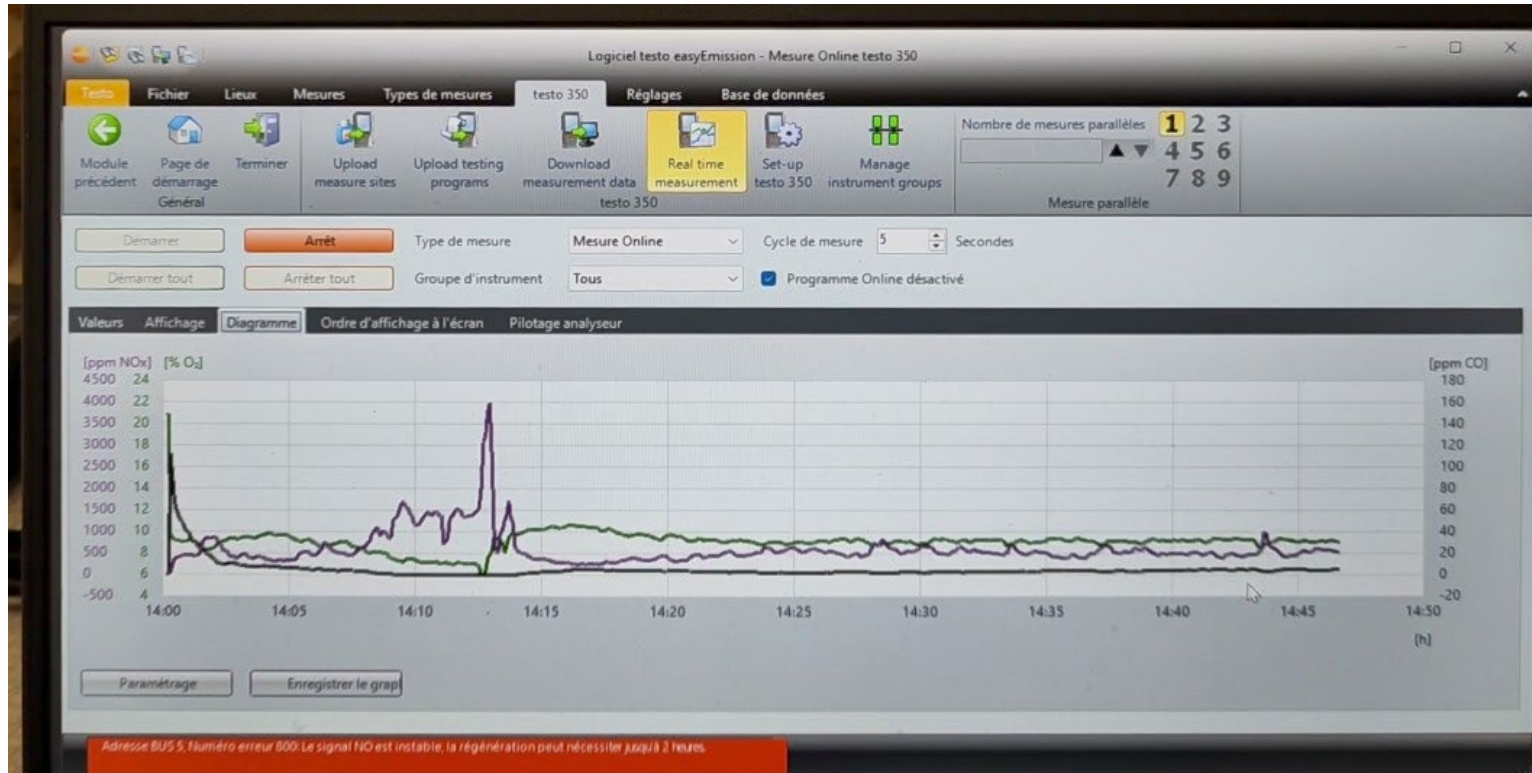
Experimental data (2025)

Variable inputs : RPM, intake T, equivalence ratio



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Variable inputs : RPM, intake T, equivalence ratio



Main results (2026)

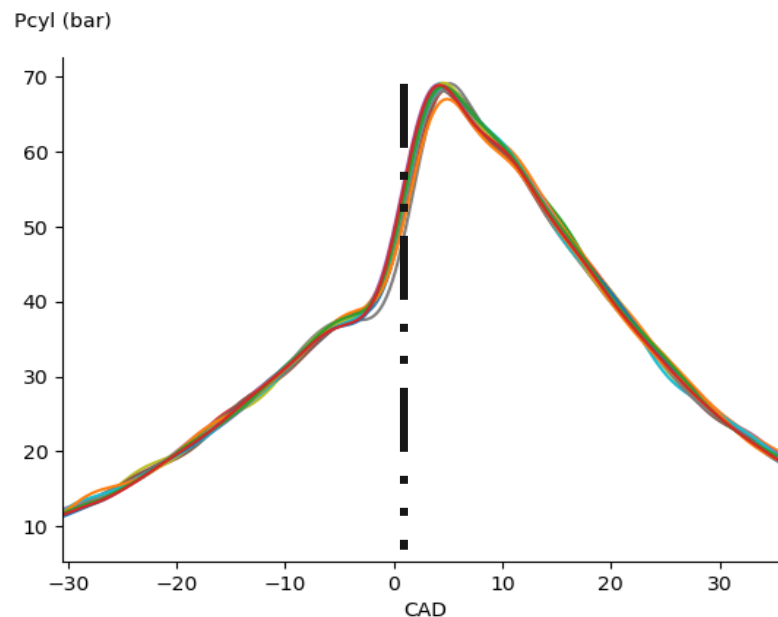
Preliminary results with HCCI and tars

- Stable combustion
- Control easier than expected
- Output max : 10 kWe – 2 bar BMEP
- 15 start/stop – 36H of operation
- Low unburned emissions
- UCC is effective to meet regulations
- Strong auto-ignition promotion from tars

→ 1.3 CAD gain with + 10°C

T_{in}

→ Tars stabilise control !



	upstream DOC (ppm)	downstream DOC (ppm)
CO	900-1200	40-60
H ₂	600-700	< 4
C _x H _y	30-80	< 7
NO _x	200-1000	100-150

Perspectives

To be continued ... looking for partners !

Administrative questions :

- TTcogen project & funding ended
- Installation must be dismantled
- Currently investigating :
 - > hosting partner + operation partners
 - > buyer with or without IP transfer

R&D needs :

- Finding safe Tin threshold for tar dew point → optimal CR
- Added operating hours : Tar condensation, wear, oil pois.
- Piping optimisation : removing air and line heaters
- Filtering optimisation : cyclones in place of ceramic filter
- PM measurements
- Simpler starting procedure : engine, flare blower, ...

Thank you for your attention

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