

# H<sub>2</sub> Capability of SEV Burners DECARBit

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POWER

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# H<sub>2</sub> Capability of SEV Burners Agenda

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Alstom's GT24/GT26

The H<sub>2</sub> challenge

New Concept SEV burner

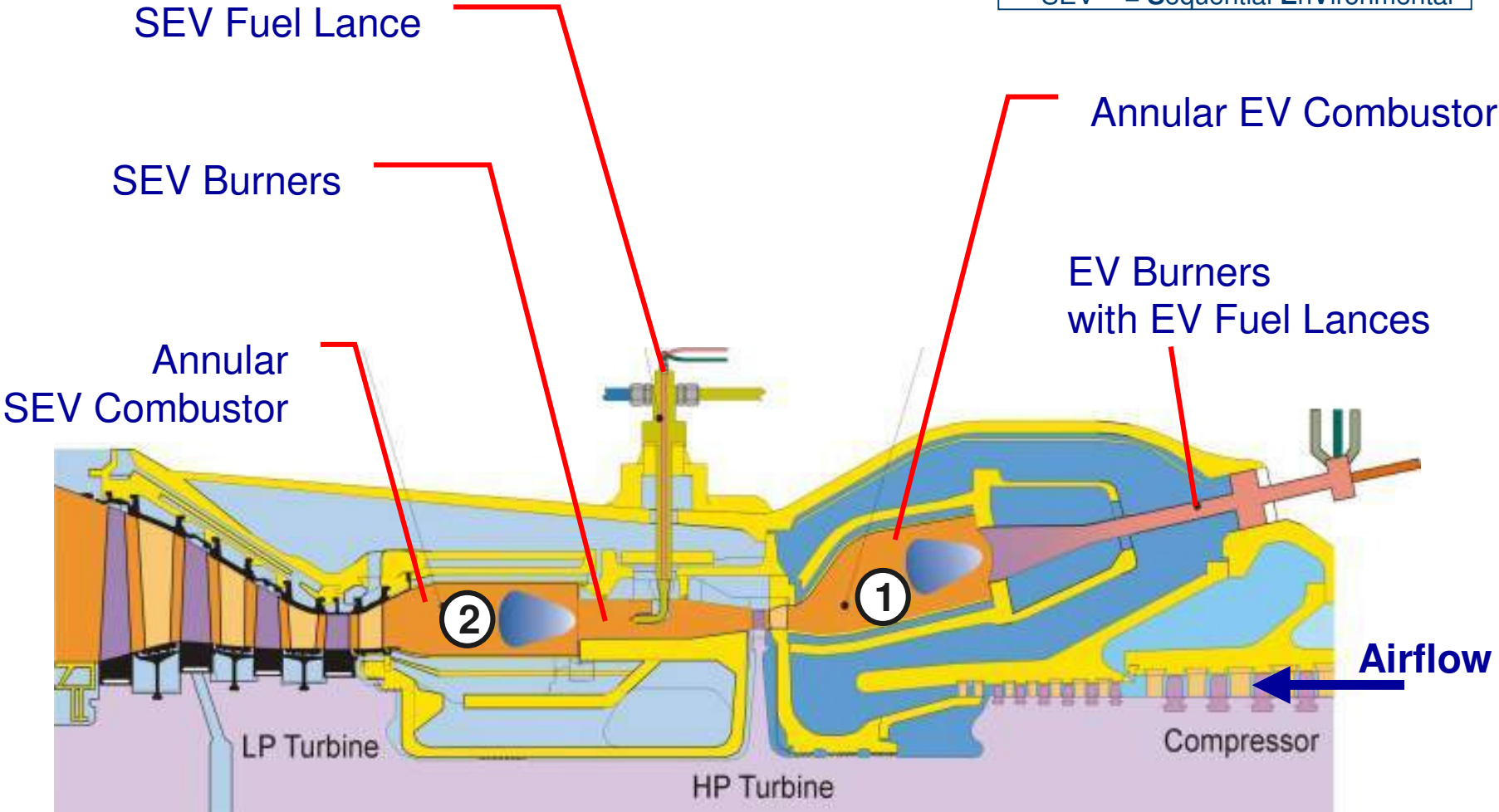
Achievements from DECARBit SP4

Summary

# H<sub>2</sub> Capability of SEV Burners Alstom's GT24/GT26

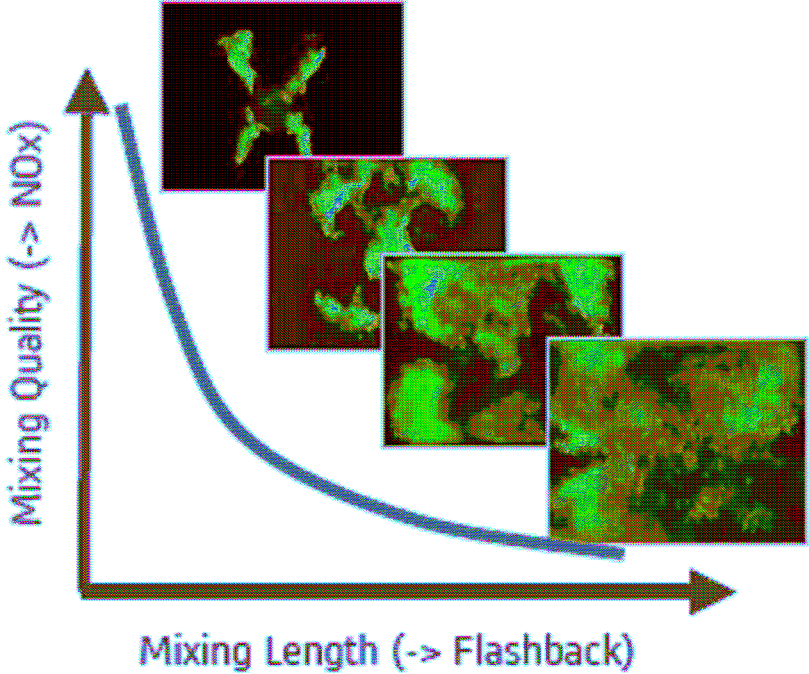
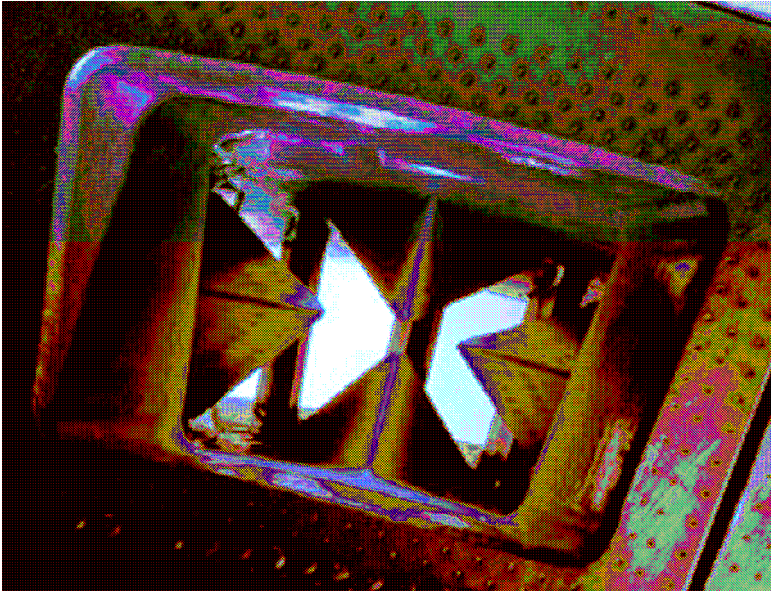
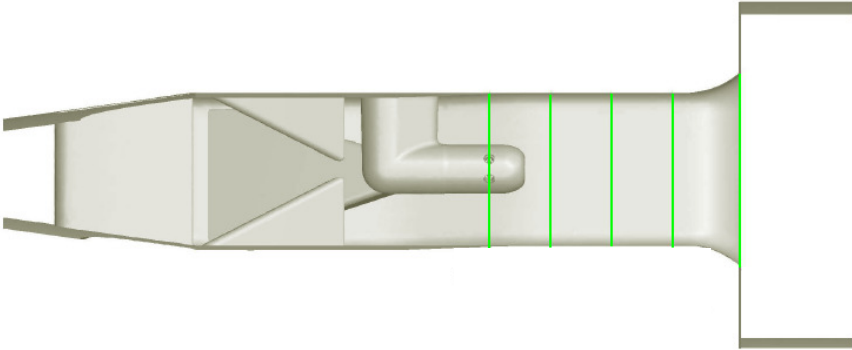


EV	= EnVironmental
SEV	= Sequential EnVironmental



# H<sub>2</sub> Capability of SEV Burners

## Present concept SEV burner

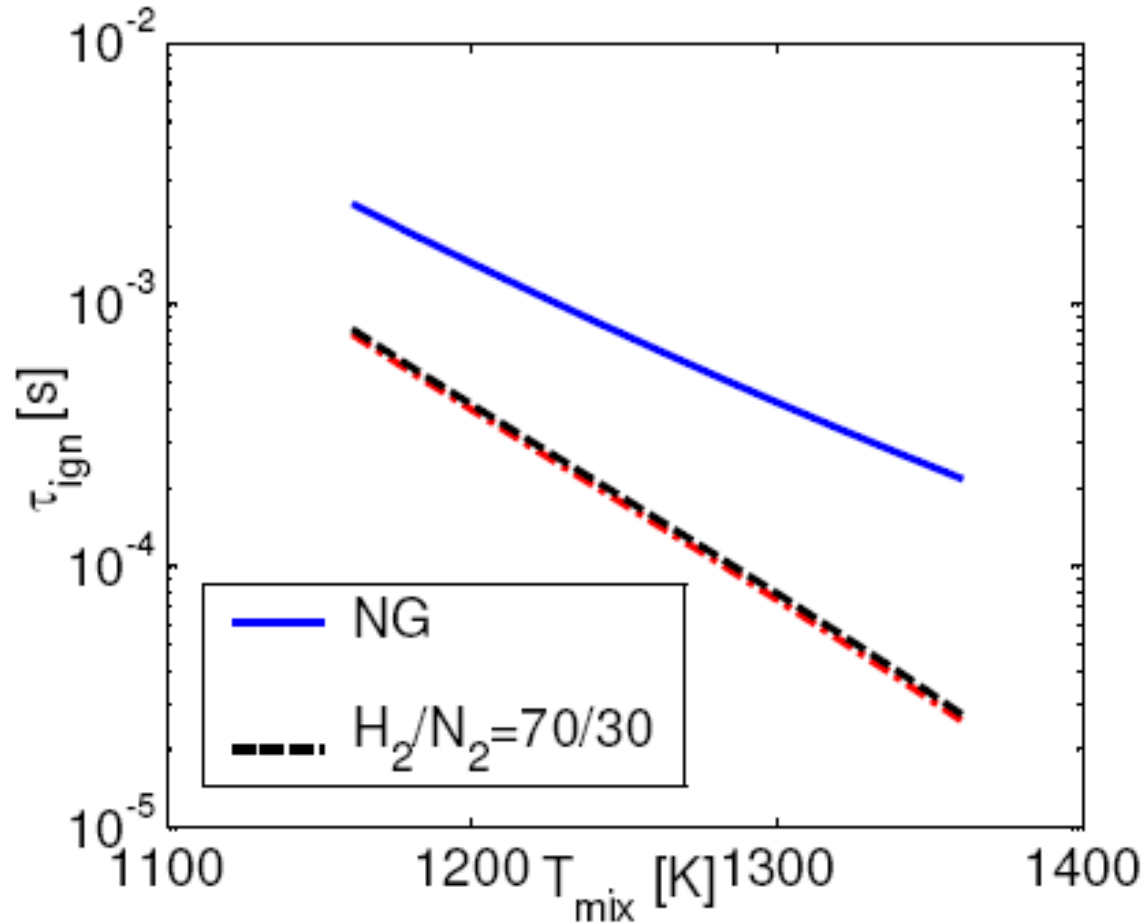


### Cross-flow fuel injection into large vortices

Trondheim CCS, H2 SEV, - KS - 15 June 2011 - P 4

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# H<sub>2</sub> Capability of SEV Burners The H<sub>2</sub> Challenge



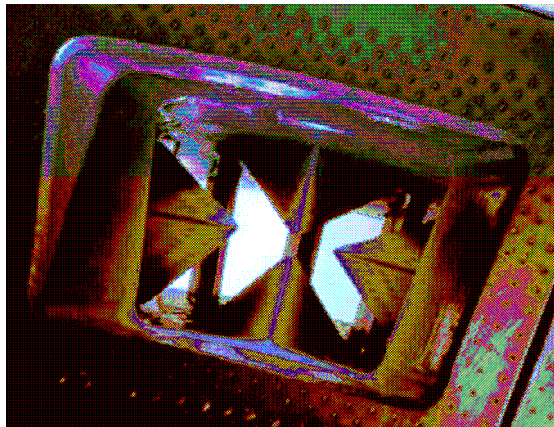
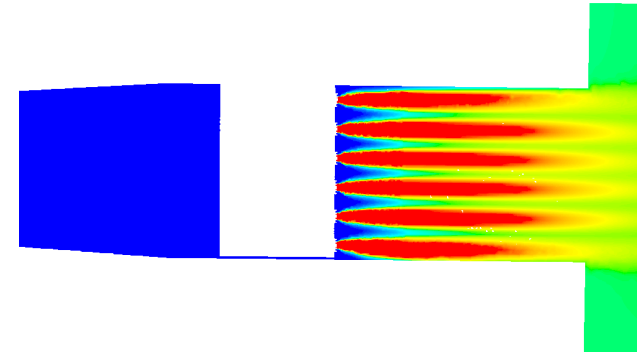
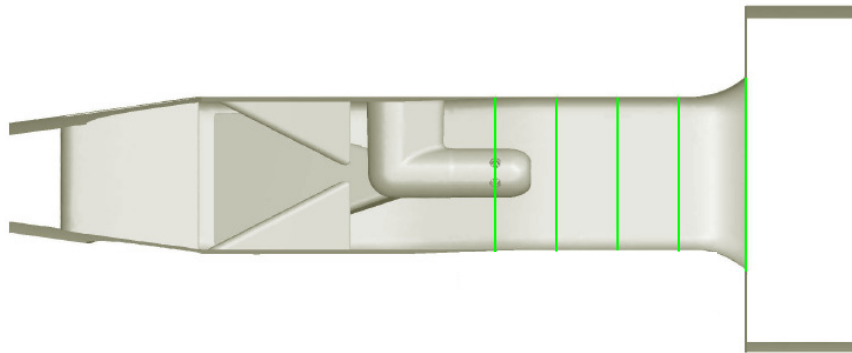
- Target fuel : H<sub>2</sub>/N<sub>2</sub> 70/30

H<sub>2</sub> rich fuel has shorter auto-ignition delay time



# H<sub>2</sub> Capability of SEV Burners

## New concept SEV

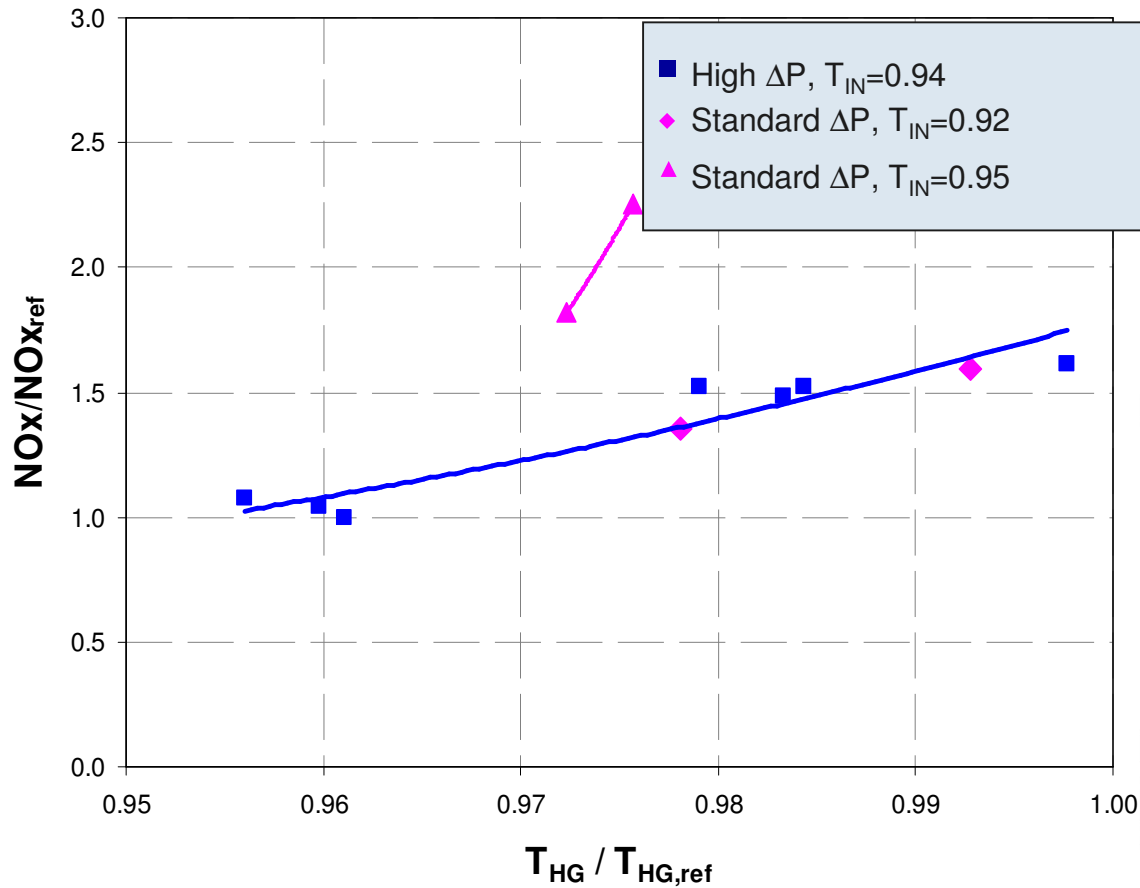


- Original concept**
- Cross flow injection
  - Large scale mixing devices

- New Concept**
- In line injection
  - Small scale mixing devices

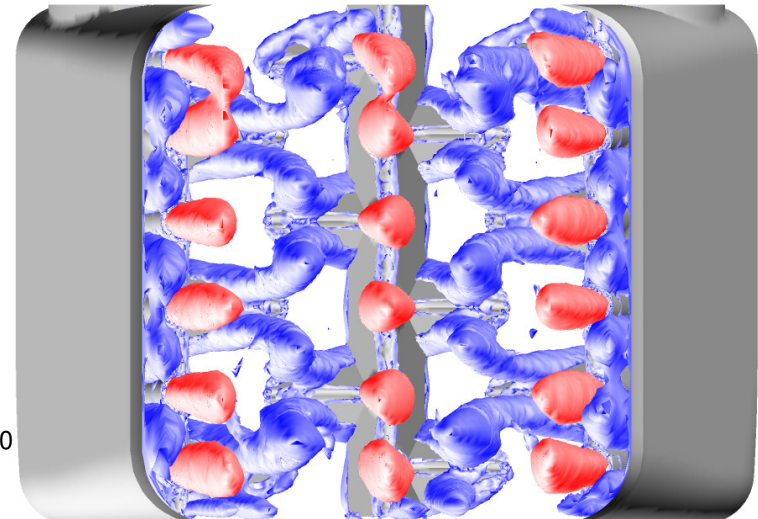
# H<sub>2</sub> Capability of SEV Burners

## Full scale high pressure test results



Fuel: 70/30 H<sub>2</sub>/N<sub>2</sub>

$$T_{IN} = T_{SEV,in} / T_{SEV,in,ref}$$



**Achieved 70%H<sub>2</sub>, low NO<sub>x</sub>, ΔP close to Nat.Gas burner**

# H<sub>2</sub> Capability of SEV Burners

## Summary

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- Objective
  - Develop SEV technology for H<sub>2</sub> rich fuel
    - Target fuel H<sub>2</sub>/N<sub>2</sub> 70/30 (90% CO<sub>2</sub> capture)
  - Lean premixed operation for low NO<sub>x</sub>
  
- Achievements
  - New concept developed
    - Rapid mixing
    - Low pressure drop
    - High flashback resistance
  - Full scale burner tests show new concept achieves target



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