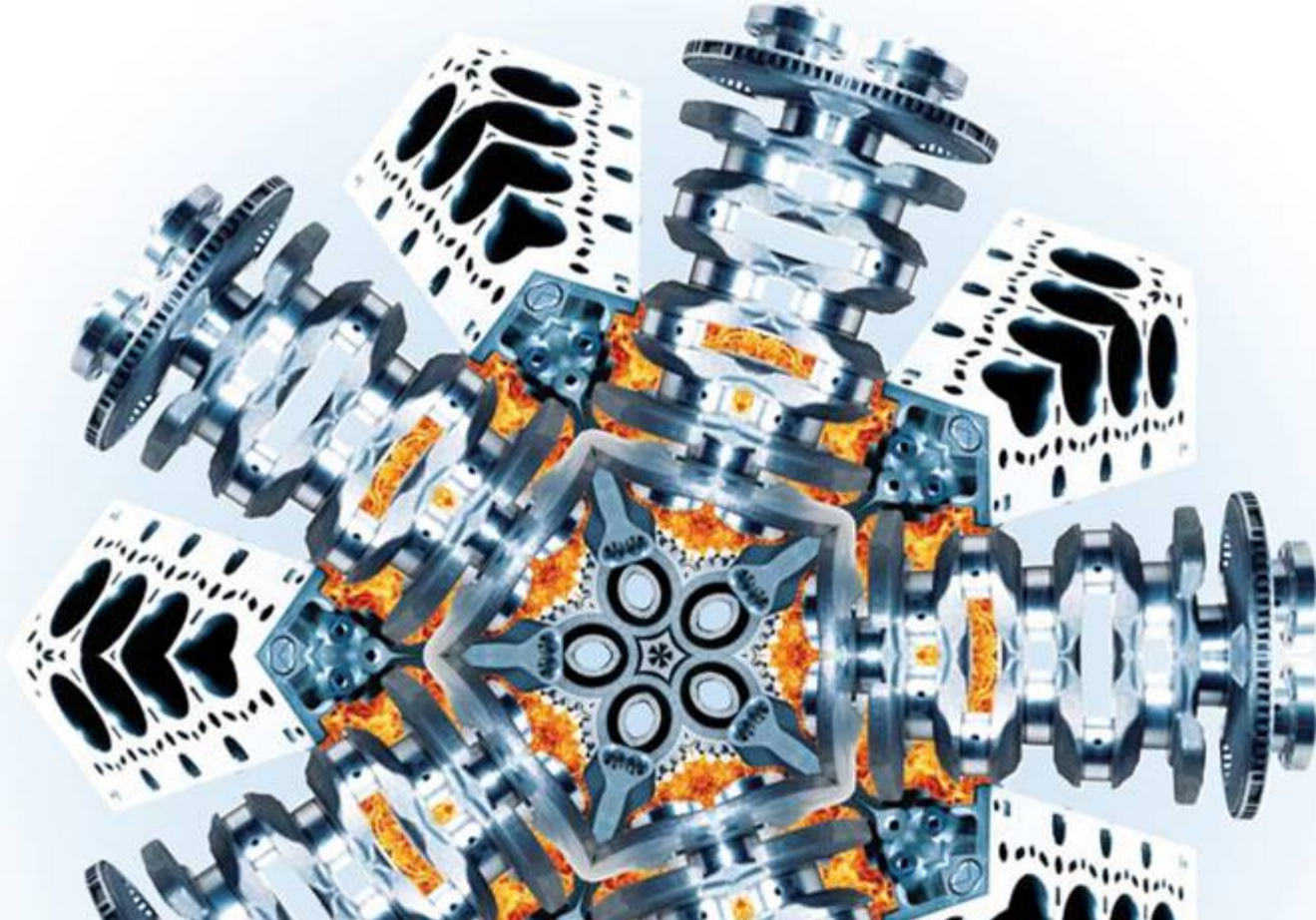


PMP Heavy-Duty Inter-Laboratory Exercise Validation Exercise at AVL MTC

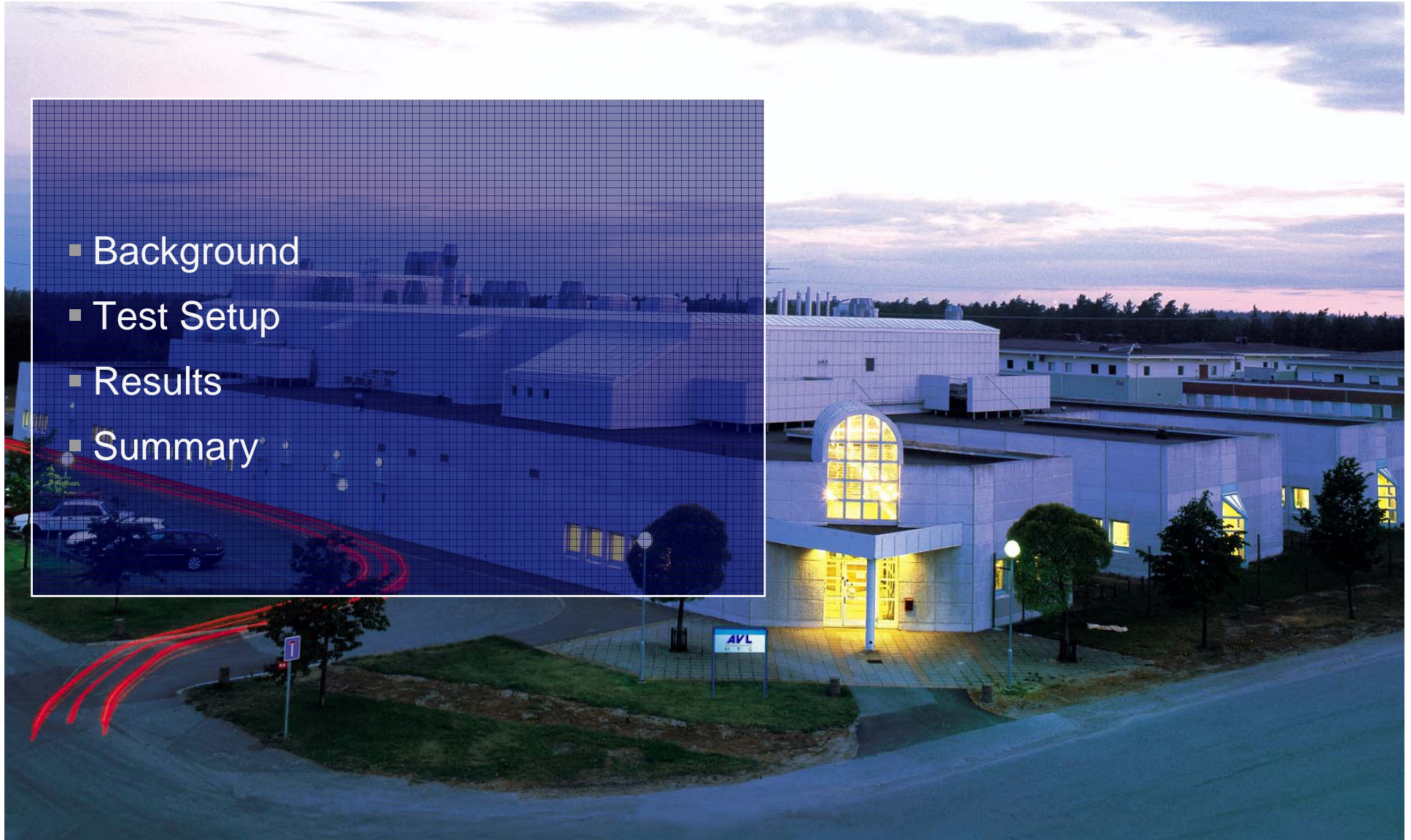


Jan Gåsste, AVL MTC
Hua Lu-Karlsson, Scania
London, 2009-03-30



Validation Exercise at AVL MTC

- Background
- Test Setup
- Results
- Summary



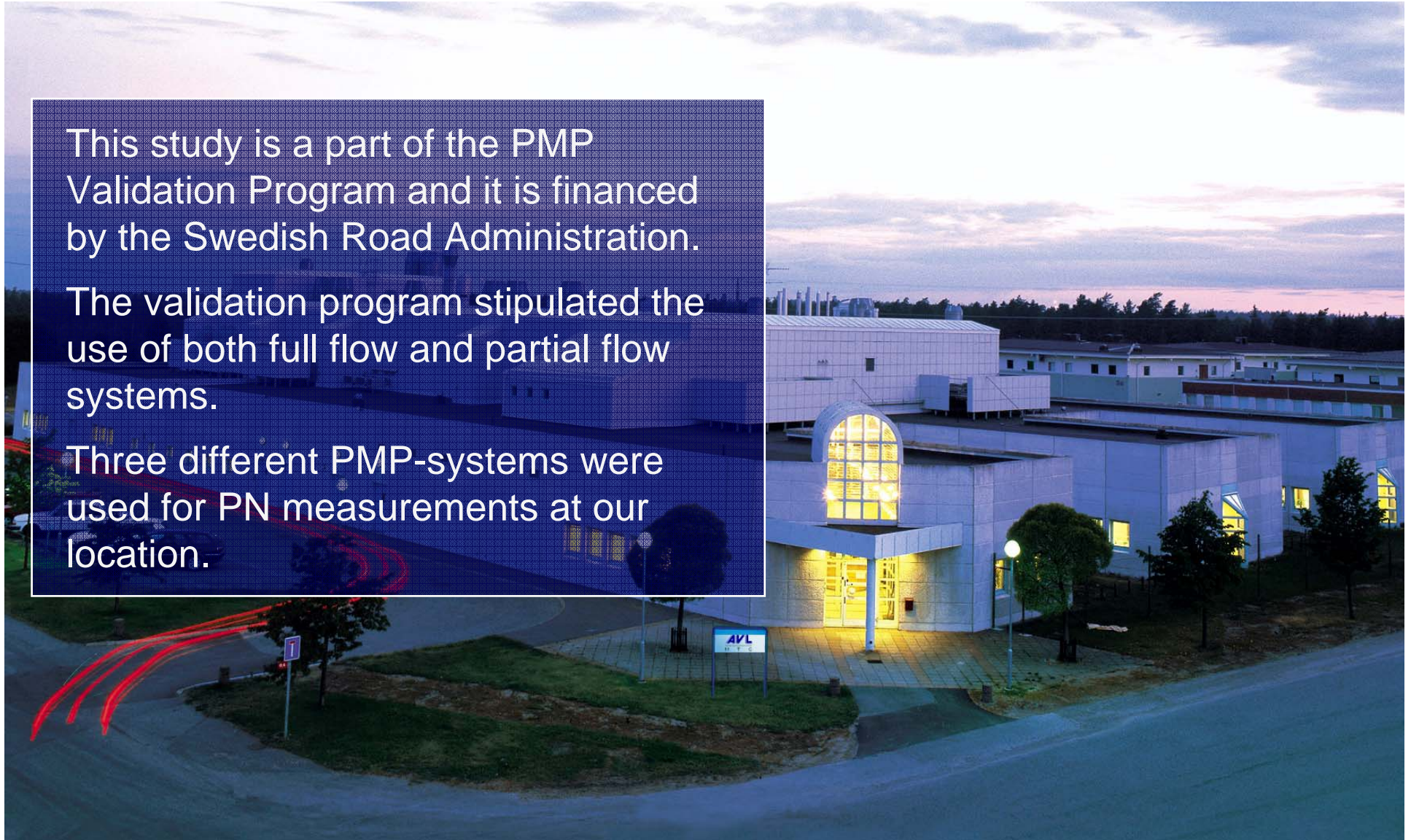


Background

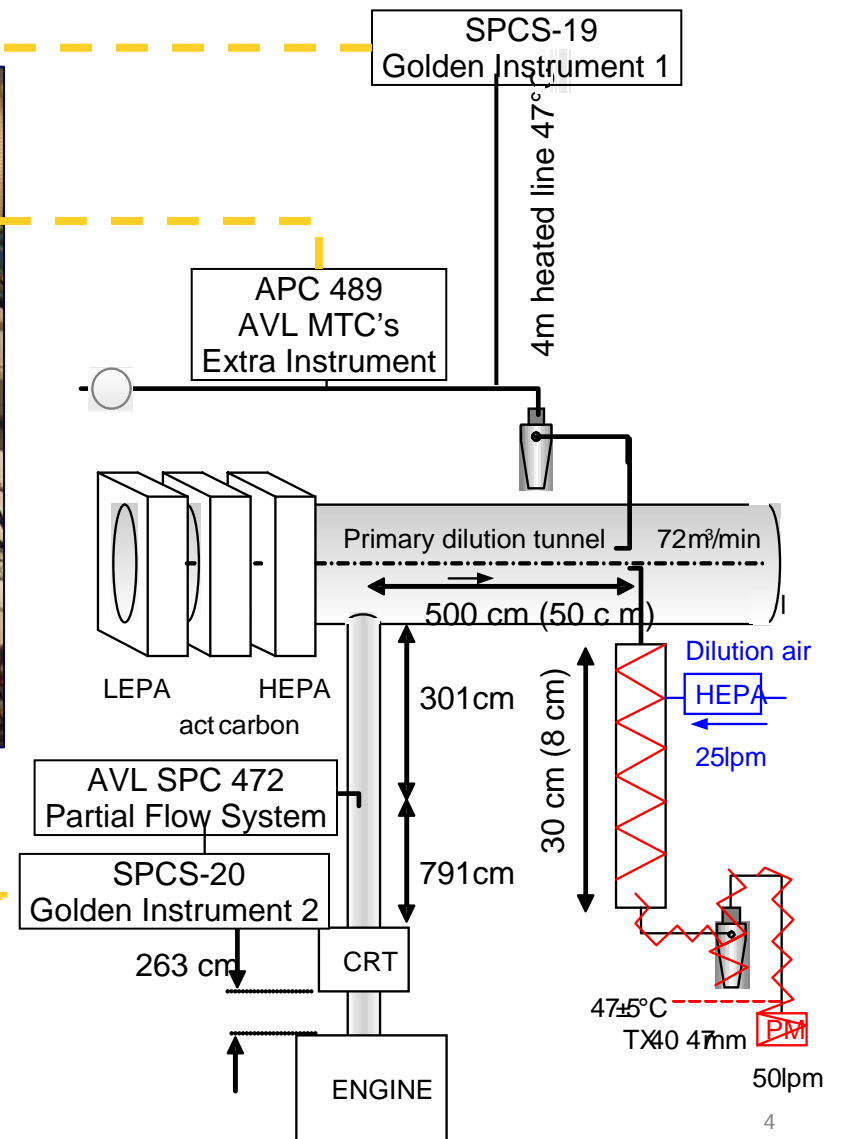
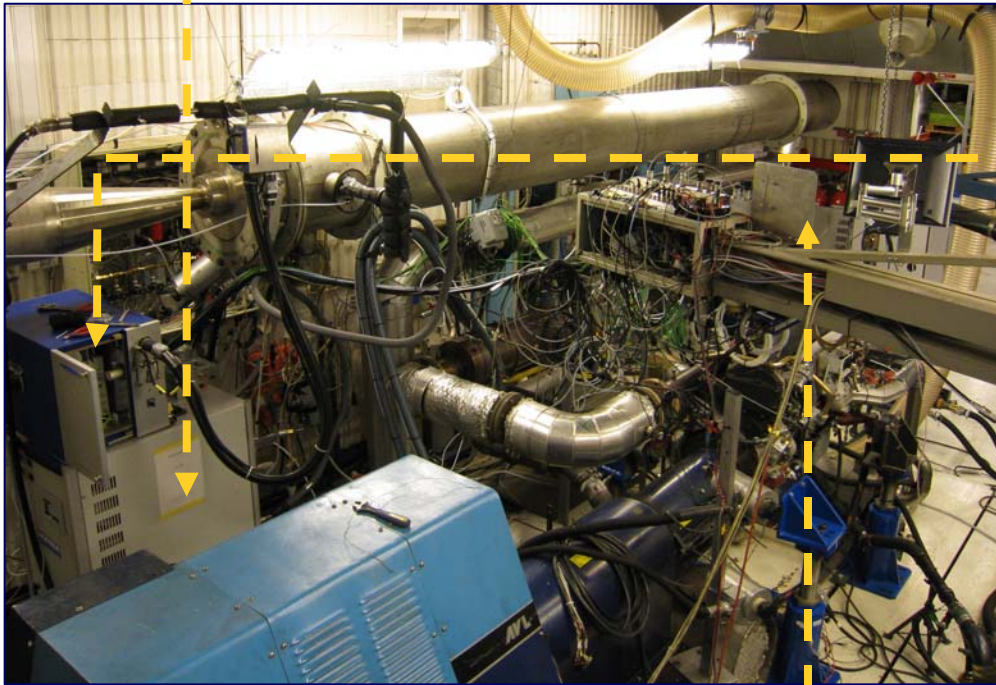
This study is a part of the PMP Validation Program and it is financed by the Swedish Road Administration.

The validation program stipulated the use of both full flow and partial flow systems.

Three different PMP-systems were used for PN measurements at our location.



Test Setup



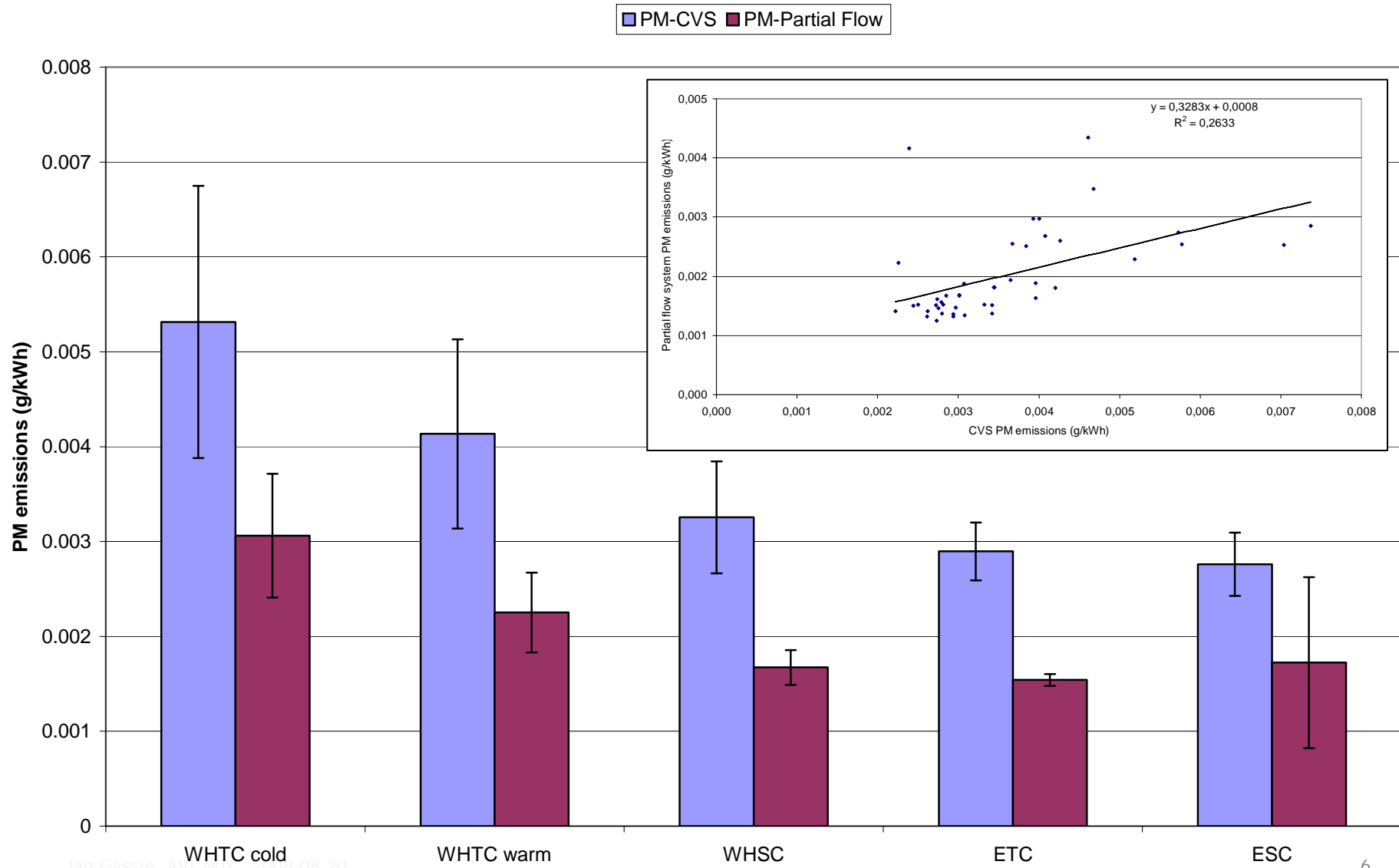
Test Programme

Day 0	Day 1-8	Day 9
Oil change	IFV	IFV
LC	Cold WHTC	Cold WHTC
	10 min soak	10 min soak
	warm WHTC	warm WHTC
	10 min mode #9 (WHSC)	10 min mode #9 (WHSC)
	WHSC	WHSC
	CP	CP
	ETC	ETC
	CP	CP
3 x ETC	ESC	ESC
Prep	PC	PC
	Prep	no Prep

- LC Lubricant conditioning
- IFV Instrument functional verification
- WHTC World Harmonised Transient Cycle
- WHSC World Harmonised Steady State Cycle
- ETC European Transient Cycle
- ESC European Steady State Cycle
- CP Continuity Protocol (5 min mode #7 (ESC) and 3 min idle)
- PC Full load curve
- Prep 15 min at mode #10 and 30 min at mode #7 (ESC)

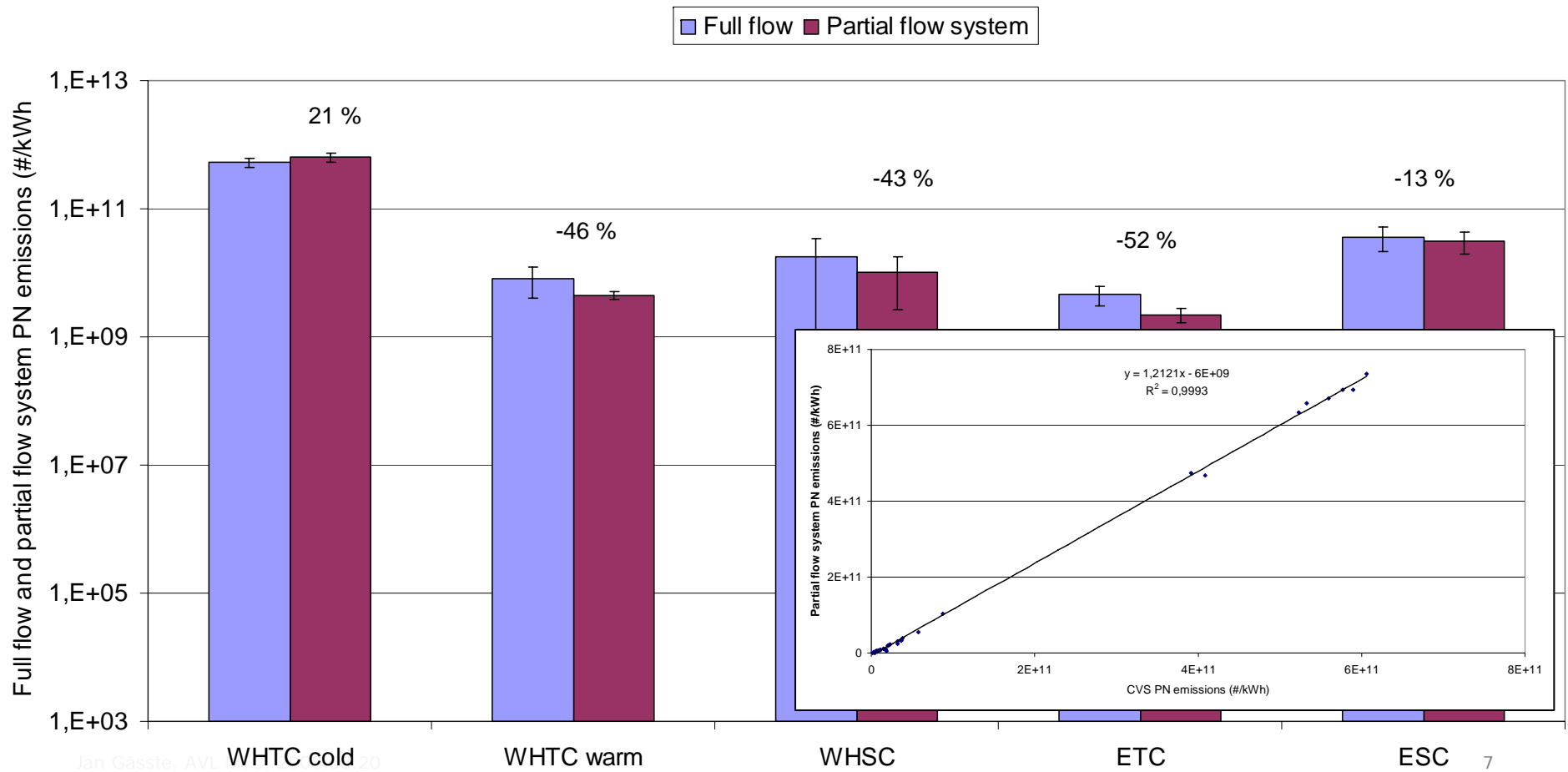
Results

PM Emission Measurement

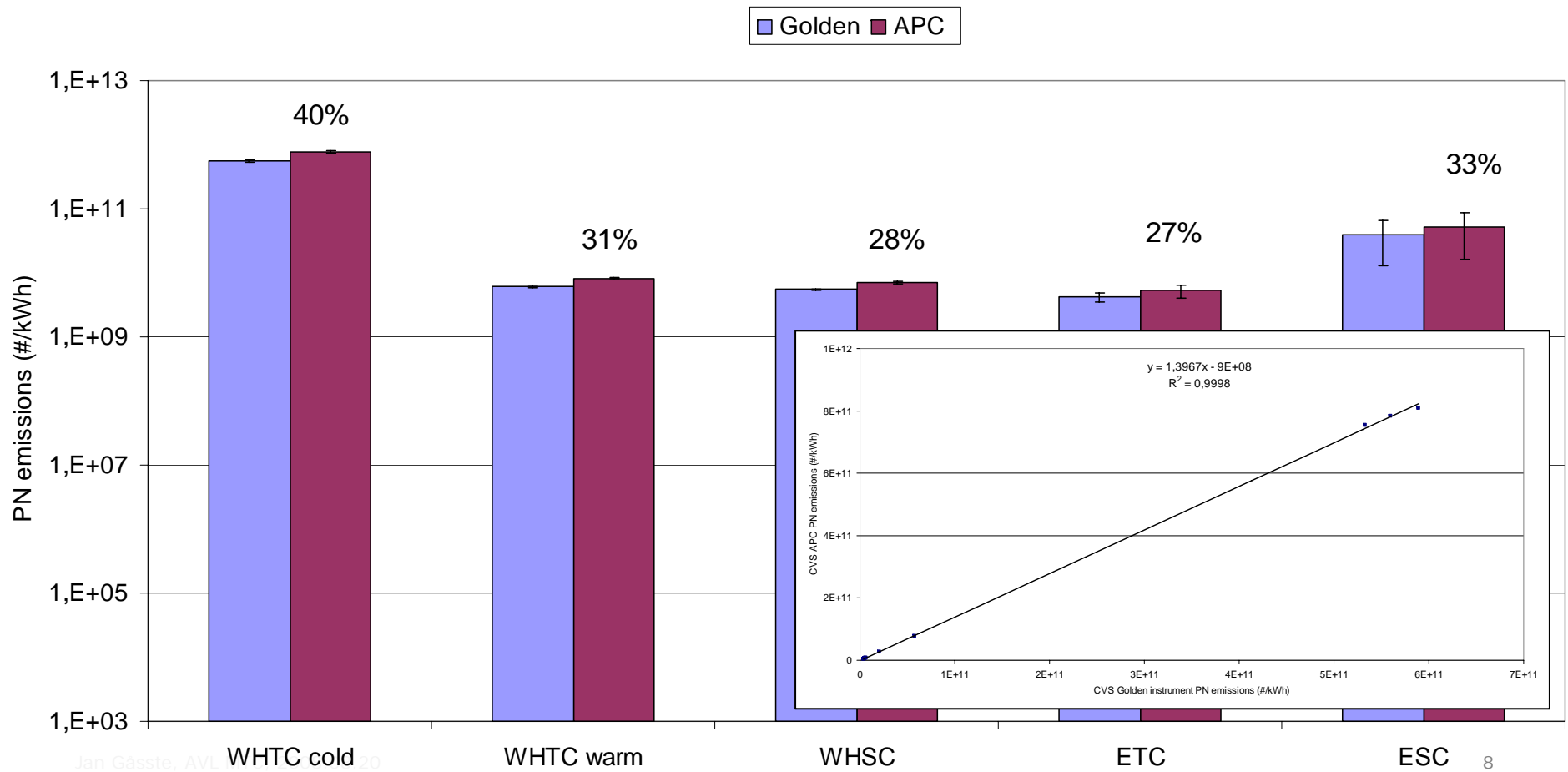


Results

PN Emission Measurement with the Golden Instruments



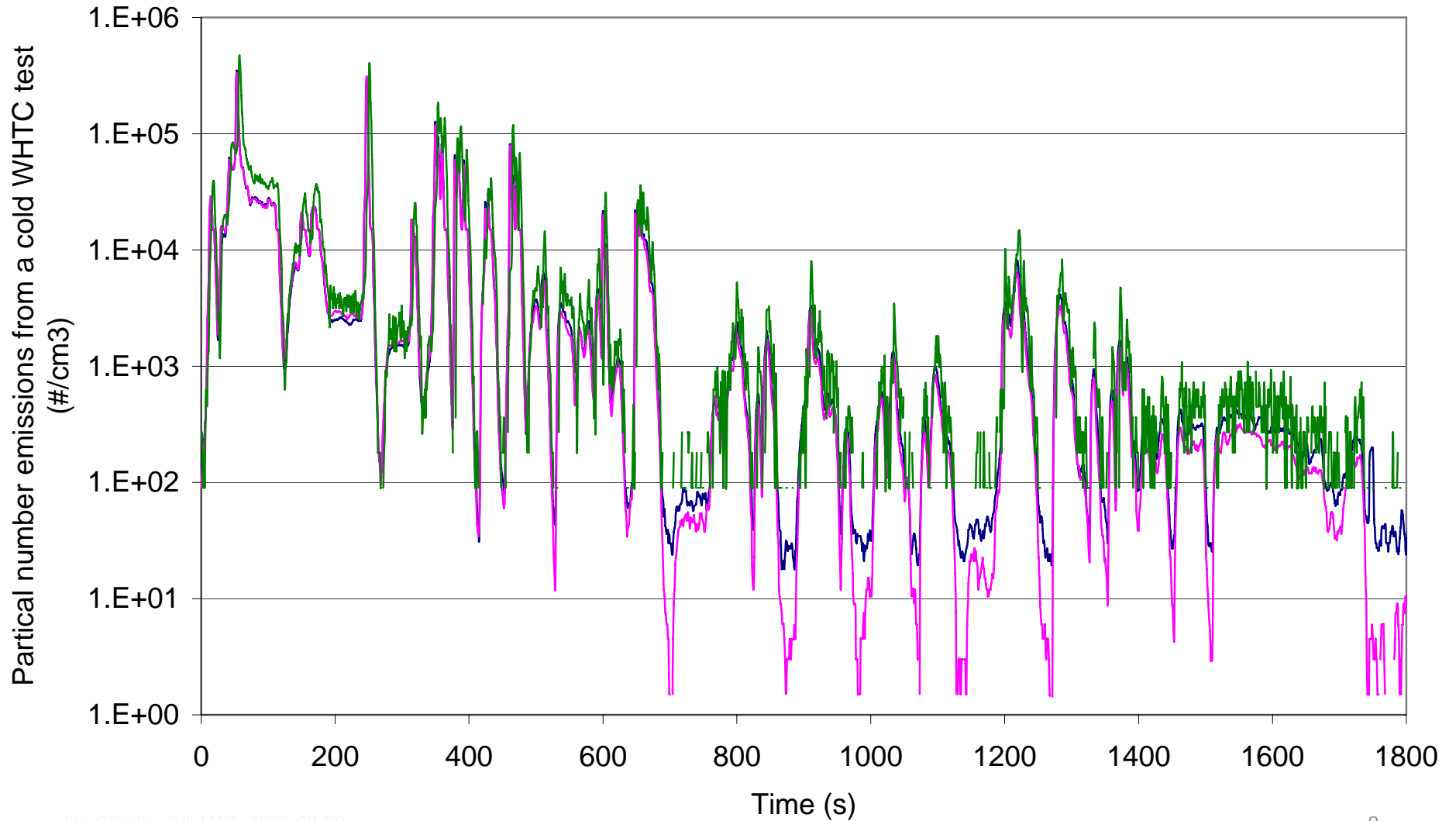
Results: PN Emission Measurement with SPCS 19 & APC489 from CVS



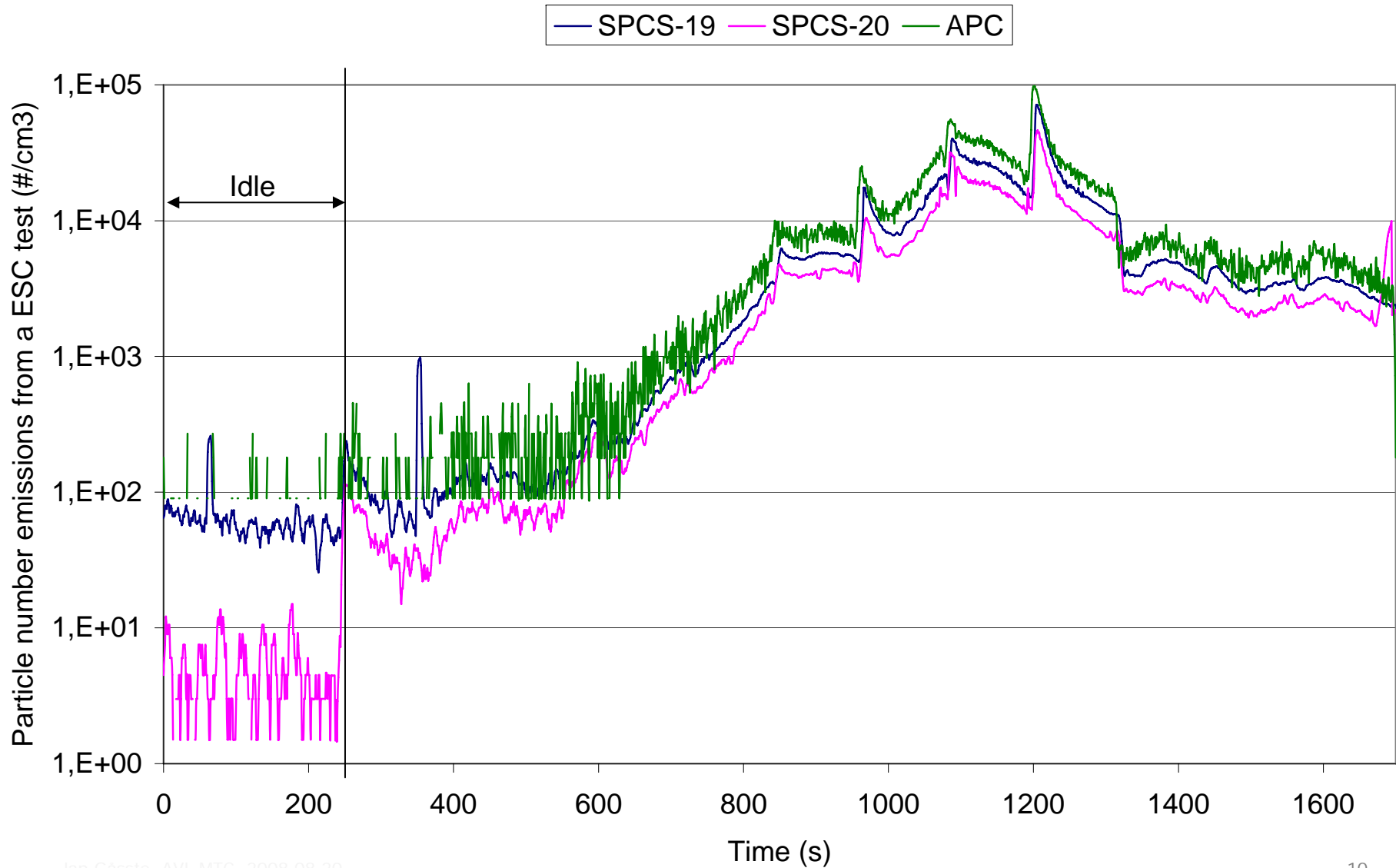
Results: On Line PN Emission Measurements in cold WHTC test with all instruments



— SPCS-19 — SPCS-20 — APC



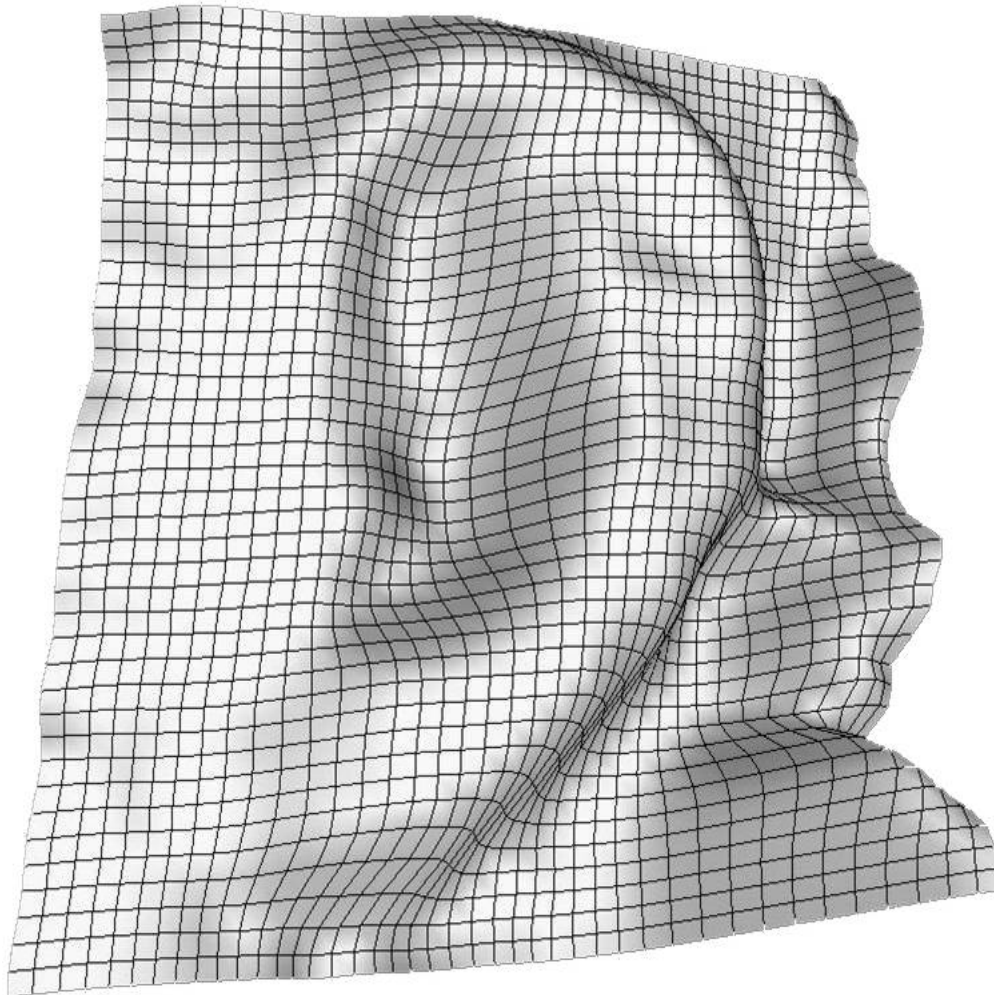
Results: On Line PN Emission Measurements in the ESC test with all instruments



Summary / Conclusions

- PM emissions generally very low with the tested engine.
- WHSC showed lower PN-emissions compared to ESC and the ETC showed lower emissions than both the warm and the cold WHTC
- The Full Flow System showed higher PM-emissions compared to the partial flow system and poor correlation between the two sampling systems at this low PM levels.
- The Full Flow System showed higher PN-emissions compared to the partial flow system for all cycles except the cold WHTC and good correlation between the two sampling systems.
- Good correlation was shown between the Golden Instrument and our extra APC489 system.
- The online data had a similar trace independent of the manufacturer of the PMP-system. This indicates that the PMP method is robust.

Questions?



Don't hesitate to contact...

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