



**PM and PN Emissions from
Two Scania Euro V Engines**

**Hua Lu Karlsson
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SCANIA

Agenda

- ❖ **Background**
- ❖ **Engine Information**
- ❖ **Test Programme**
- ❖ **Results**
- ❖ **Summary**



❖ Background

- **Two golden engines used in Inter-laboratory Exercise are Euro III with DPF**
- **Engine wish list**
- **Two Scania Euro V (EEV), one with SCR and one with EGR and partial flow filter**
- **Supply data for PMP heavy duty programme**





❖ Engine Information

EEV limits

	CO (g/kWh)	HC (g/kWh)	NOx (g/kWh)	PM (g/kWh)
ESC	1,5	0,25	2,0	0,02
ETC	3,0	0,40	2,0	0,02



❖ Engine Information

Model	DC9, EURO 5, EEV 	DC12, EURO 5, EEV 
Engine type	Inline 5-cyl, EGR	Inline 6-cyl
Displacement	9,29 dm³	12,75 dm³
Compression ratio	17:01	18:01
Maximum power	206 kW/1900 rpm	309 kW/1800 rpm
Maximum torque	1400 Nm/1100 rpm	2100 Nm/1100 rpm
After treatment	PMFC (PM filter catalyst)	SCR (Selective Catalytic Reduction)



❖ Test Programme

- Eight days test according to Inter-laboratory Exercise Guideline
- PN measurement using APC 489
- Partial flow system using AVL SPC 472 add on
- Performed at AVL MTC, same test bench as validation programme

DC 929



- PM and PN sampling from full flow system

DC 1222

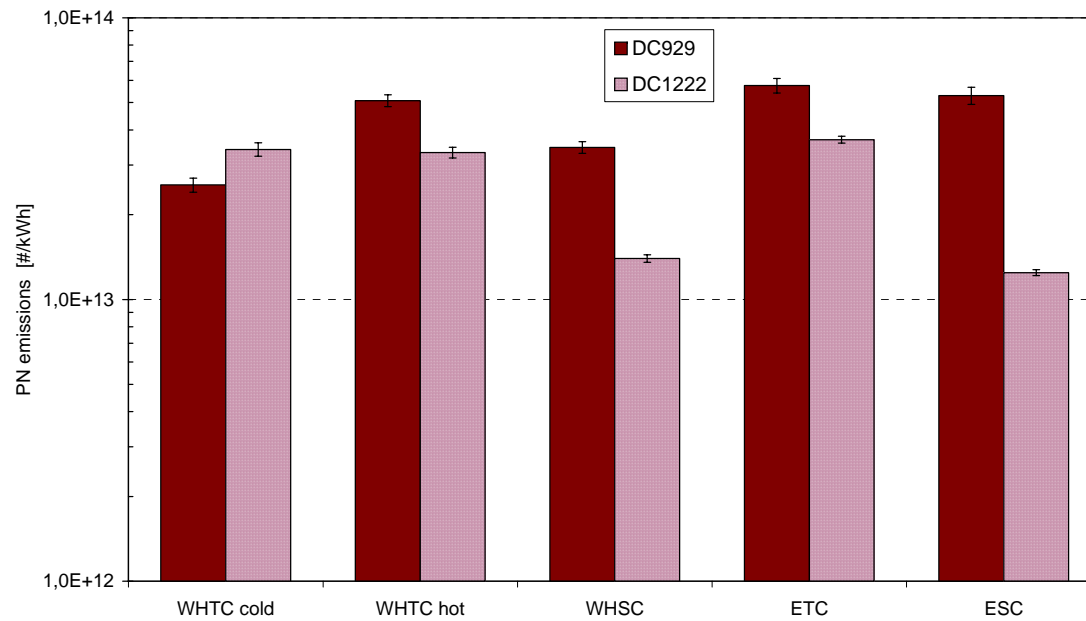


- PM and PN sampling from full flow system and partial flow system



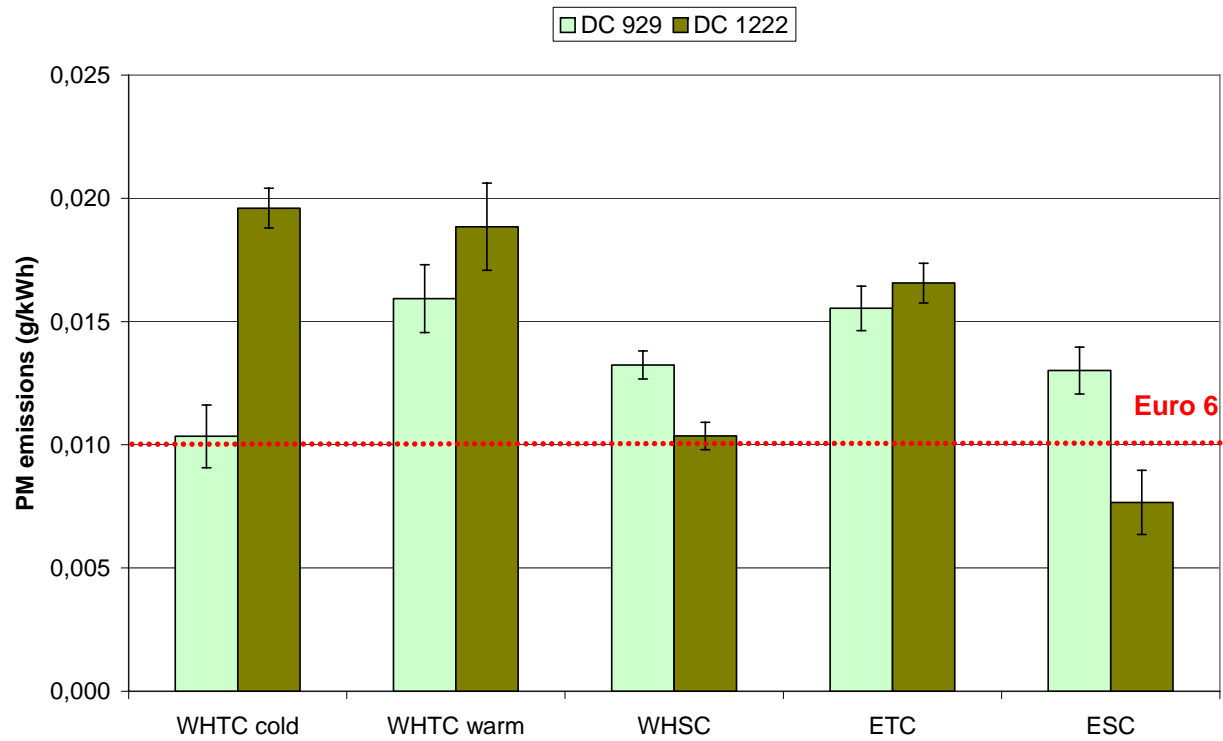
❖ Results

■ PN emissions (CVS)



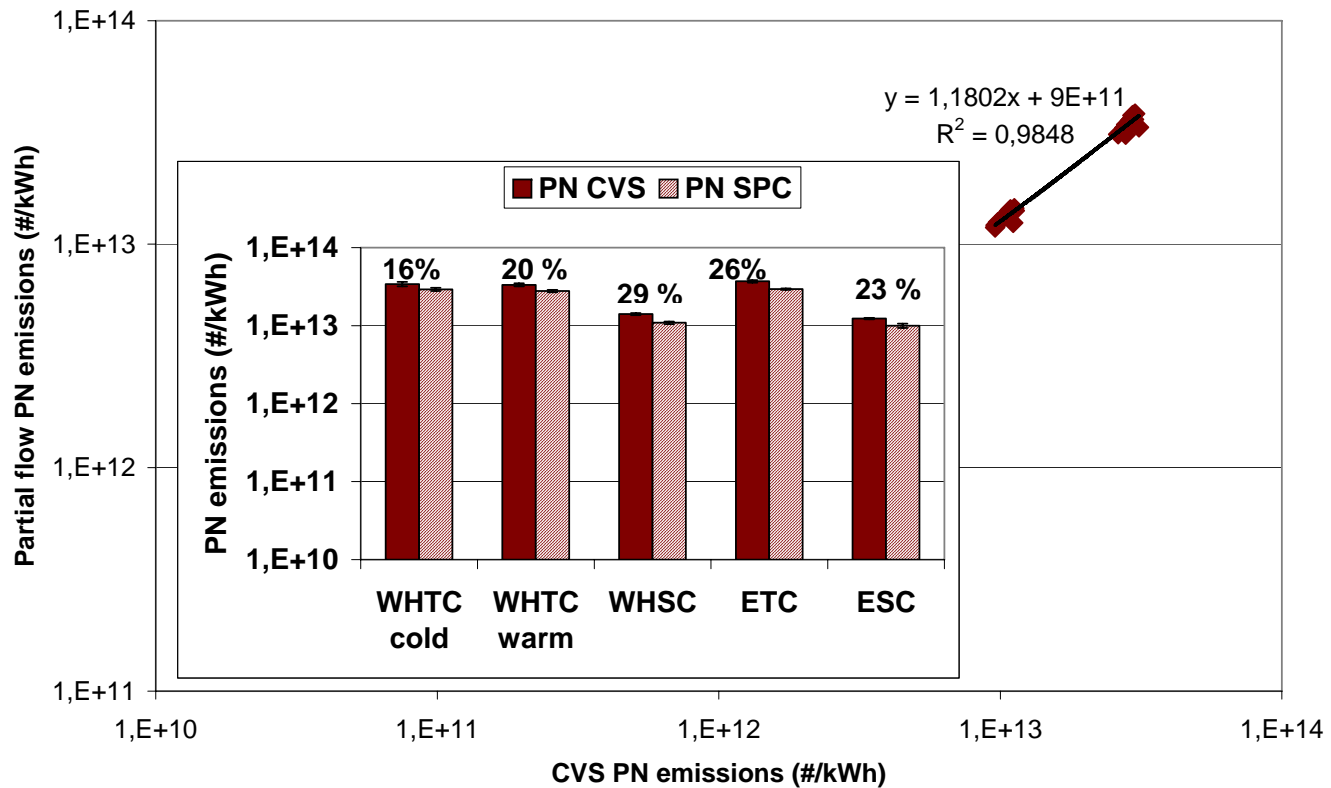
❖ Results

■ PM emissions (CVS)



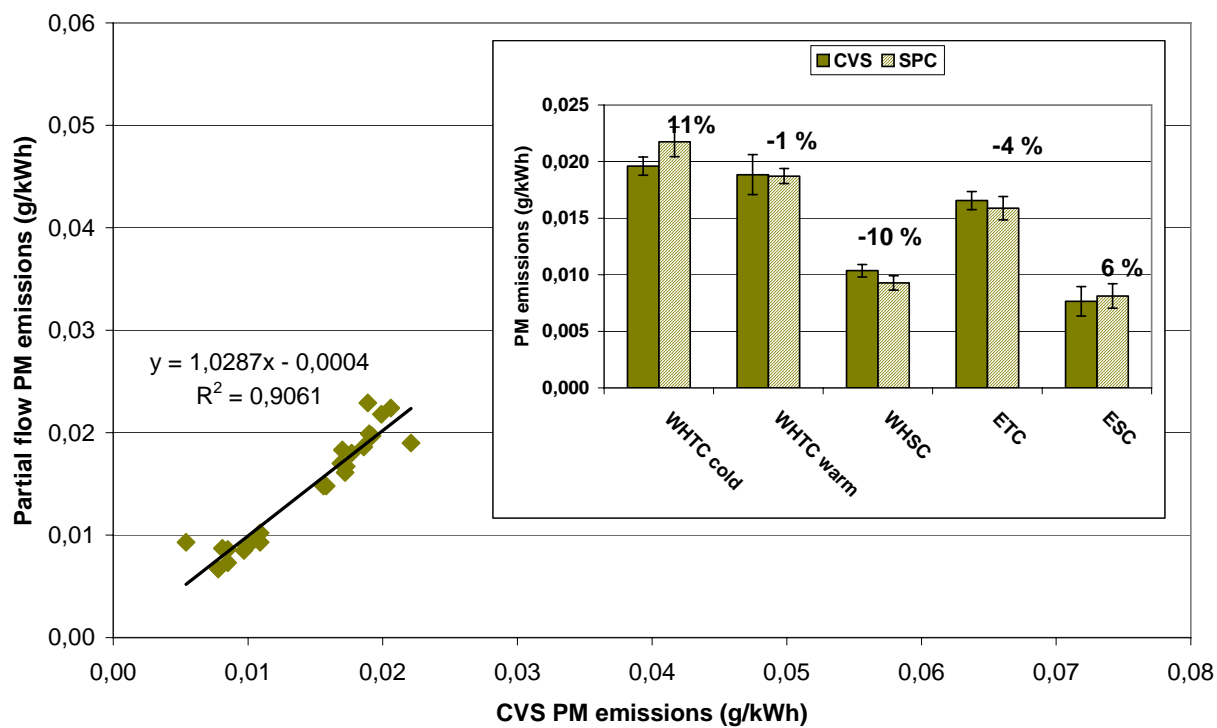
❖ Results

▪ DC1222 PN emissions (full and partial flow)



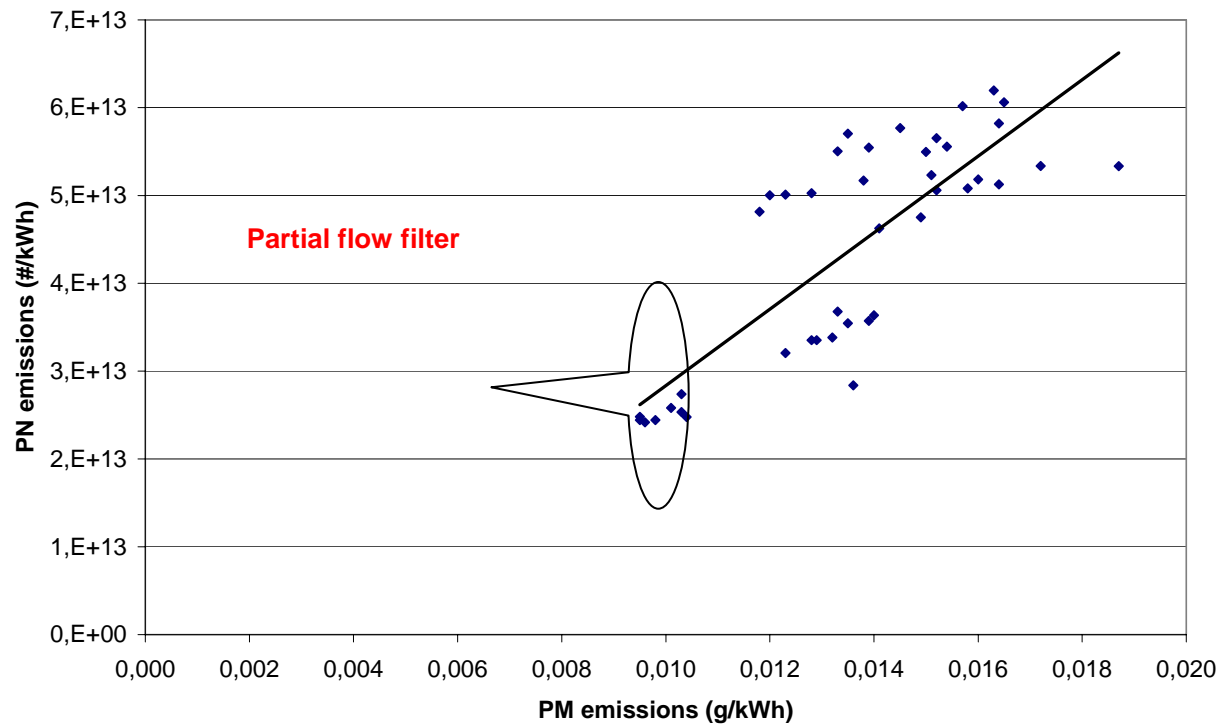
❖ Results

■ DC1222 PM emissions (full and partial flow)



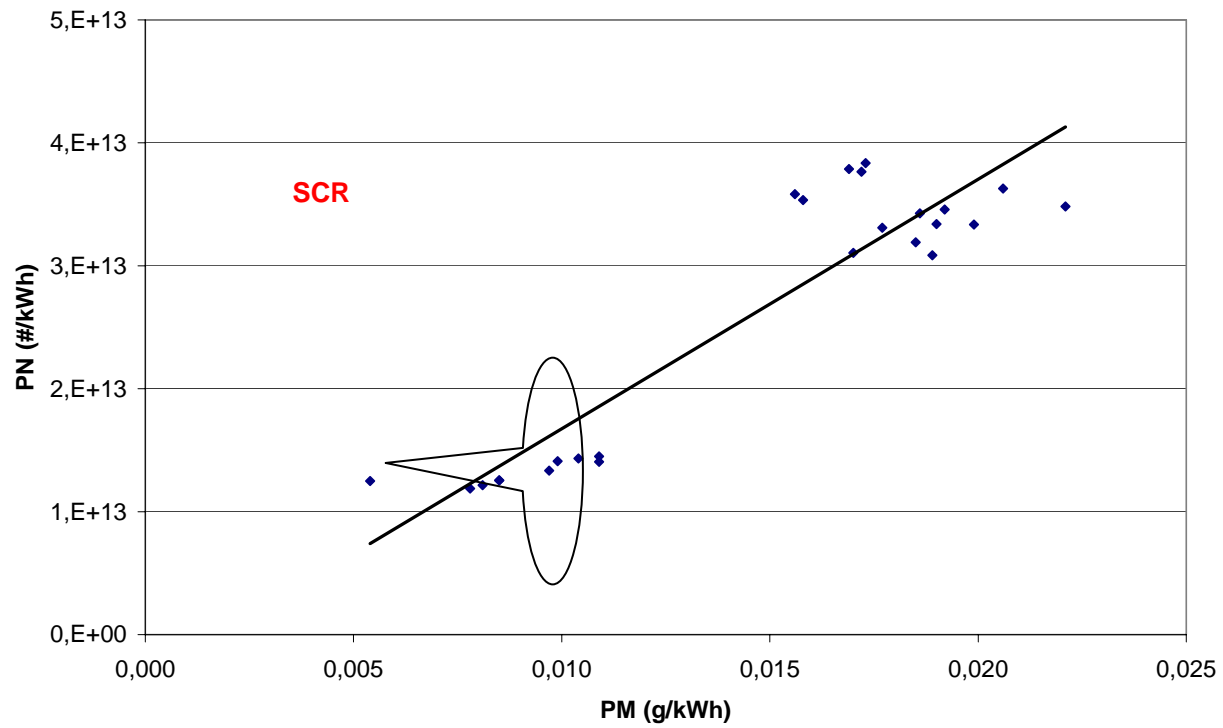
❖ Results

■ PM/PN correlation (DC929)



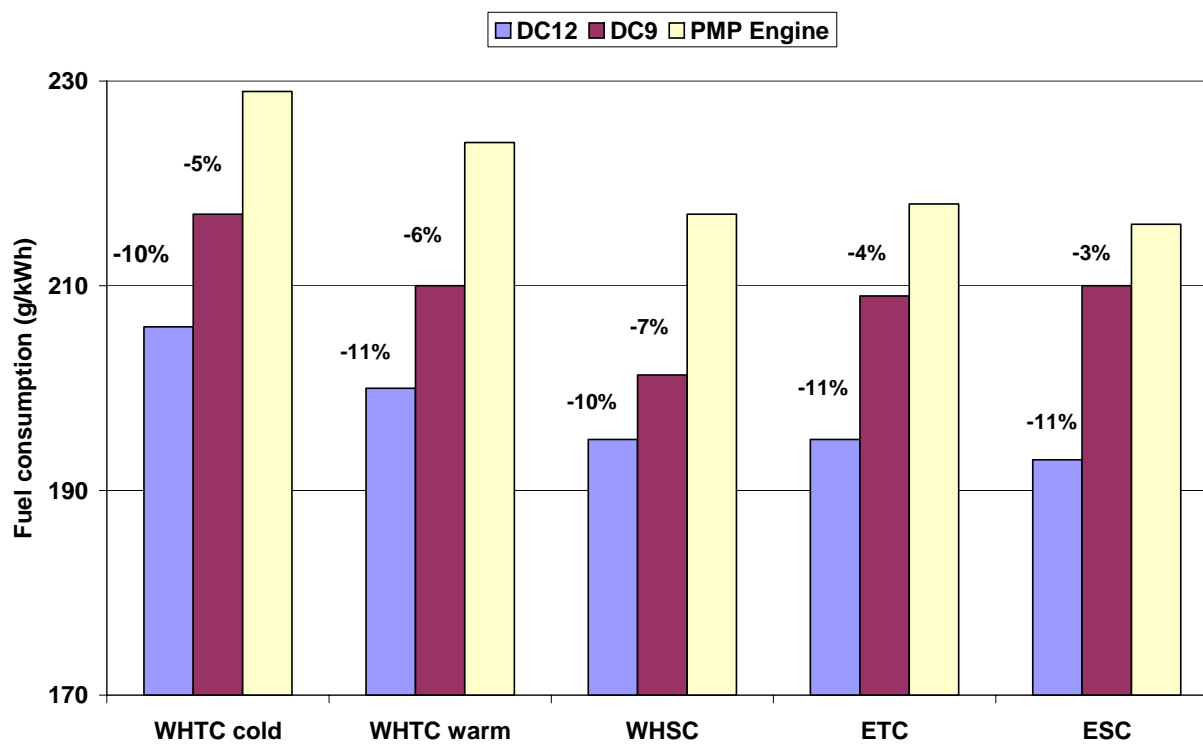
❖ Results

■ PM/PN correlation (DC1222)



❖ Results

■ Fuel consumption



❖ Summary

- **Two Scania Euro 5 engines, one with partial flow and one with SCR, were tested using PMP HD inter-laboratory Exercise programme.**
- **The results show the potential of reaching Euro 6 PM limit with partial flow filter or SCR.**
- **The Euro 6 PM 10 mg/kWh indicates a PN level of 3×10^{13} #/kWh.**
- **Good repeatability of PN and PM measurement were achieved.**
- **There is a good correlation between full flow and partial flow PM and PN measurement.**

