

# VERT Association

## How to go beyond the Commission proposal

**May 27<sup>th</sup> Policy Dinner**  
**Brussels**

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VERT<sup>®</sup>: Created to eliminate particle emissions  
from internal combustion engines (ICE)  
by means of best available technology

## ○ Contents

- **VERT-profile and contribution since 1994**
- **VERT remarks to NRMM regulation proposal**
- **Emission Upgrade Technology Options mandatory  
– a new concept**

## Introduction

### VERT Association

- Dedicated to Best Available Technology for emission control
- Focused on particle number measurement to eliminate Ultra Fine Particles (UFP)
- Certification of emission control technology - VERT<sup>®</sup> filter list
- Partner of Megacities supporting pollution reduction programs

### Volker Hensel

- CEO of the VERT Association in Brugg; Switzerland
- Founder and general manager of aurigna consulting GmbH Heidelberg; Germany

# How to go beyond the Commission proposal

## NRMM Stage V Shortcoming



## ○ NRMM Shortcoming

### PN Count is not in line with state of the art!

- PN criterion by Commission of  $10^{12}$  #/kWh is outdated
- The Case of Switzerland: technically proven DPF emission systems already comply two orders of magnitudes better

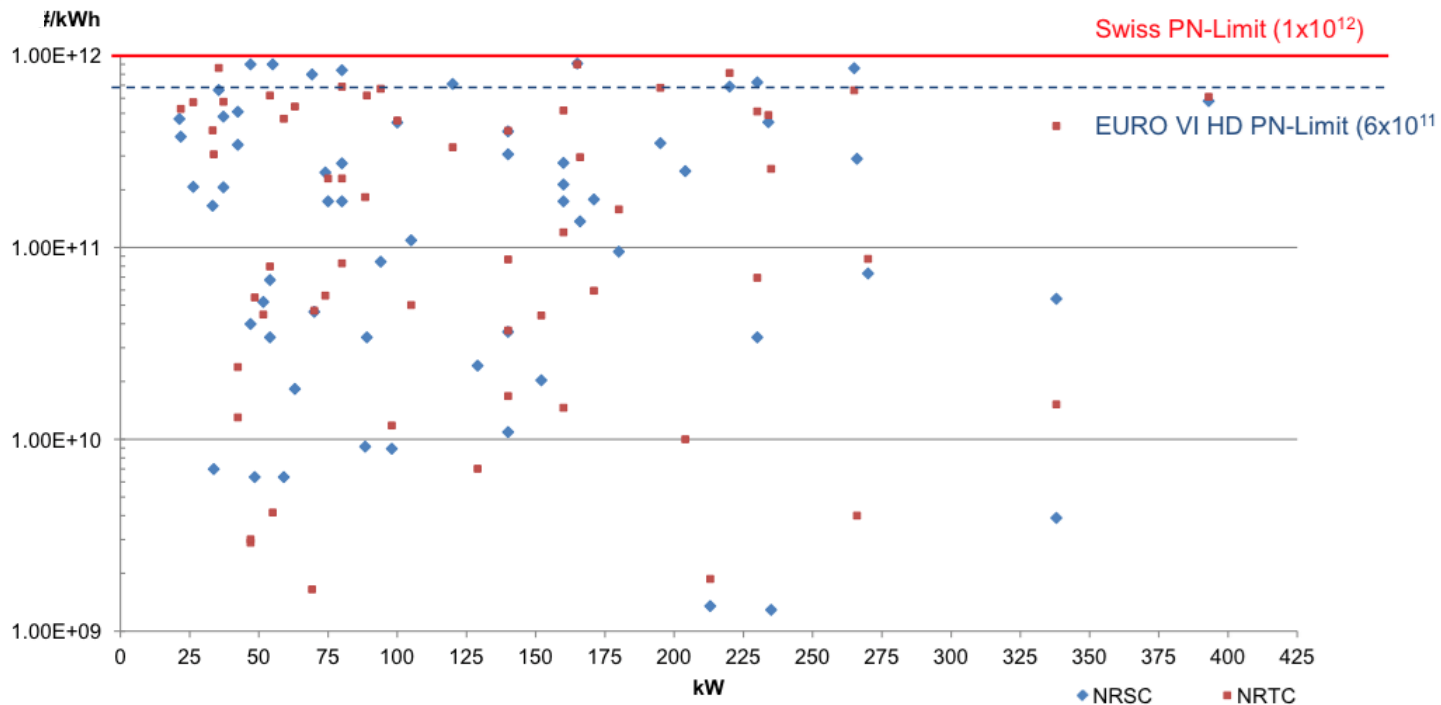
### ***VERT recommends:***

 PN should be below  $6 \times 10^{11}$  #/kWh!

## NRMM Shortcoming



### testing since 2008 of new engines acc. NRMM regulation



- The European Union now intends to introduce the same PN limit for all Nonroad engines 19-560 kW

Swiss Air Pollution Control Policy – Visita de la Bogota  
 Dr. Martin Schiess, Swiss Federal Office for the Environment FOEN

## NRMM Shortcoming

### Some NRMM categories lack PN criterion!

- Consider total emissions and long use of NRMM engines (eg Diesel-locomotive)
- The Case of Switzerland and California

### ***VERT recommends:***

 DPF obligation also for NRG  $\geq 560$  kW, NRE  $\leq 19$  kW, RLL, IWP  $\leq 300$  kW and IWA  $\geq 560$  kW!

## ○ NRMM Shortcoming

### 🇨🇭 Example Switzerland Ships and Locomotives

#### Ships operated on Swiss lakes:

- Particle filter mandatory for new ships and new engines

#### Diesel locomotives:

- Particle filter mandatory for new locomotives and new engines

#### Replacement engines:

- During replacing engines each time upgrading with filters has to be considered



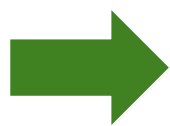


## ○ NRMM Shortcoming

**Handheld machines (NRSh) and NRS put the workers on extreme high exposure risk of carcinogenicity!**

- Emission levels of CO, NOx and Benzene are unacceptable
- Workers not protected by manufacturer
- Workers not protected by his employer

***VERT recommends:***



New Vision for NRSh  
Consider Occupational Health



## ○ NRMM Shortcoming

### No Emission Upgrade for replacement engines is foreseen by the Commission!

- Consider UNECE regulation 132 on the approval of Retrofit Emission Control devices (REC)

#### ***VERT recommends:***



No Exemptions for replacement engines without filters

VERT has experience since 20 years in upgrading engines with filters

## ○ NRMM Shortcoming

### NRMM does not have a NO<sub>2</sub> emission value!

- Avoid EU-regulation mess with modern diesel cars (Euro 5)
- VERT, CARB and EPA have stringent NO<sub>2</sub> targets

### ***VERT recommends:***

 Set emission values for NO<sub>x</sub> and NO<sub>2</sub>!

## ○ NRMM Shortcoming

### EU-Co-Decision for Euro VI /6 (Art.12, Rec.15 - 2008)

- In order to achieve these environmental objectives it is appropriate to indicate that **particle number limits** are likely to reflect the **highest level of performance** with particle filters using **best available technology**
- .. the commission shall introduce **particle number based limit** values at a level appropriate to the **technologies actually being used**.

### ***VERT recommends:***

 onroad Euro VI = nonroad Stage V

# How to go beyond the Commission proposal

Emission **U**pgrade **T**echnology for In-Use machines  
*A realistic vision of Best Available  
Technology for high polluted areas*



## ○ Emission Upgrade Technology for In-Use machines

**The current stage V legislation does not enforce Best Available Technology - BAT should contain:**

- State of the art PN Number limits
- No Secondary emissions e.g. Dioxins, PAH, Nitro-PAH etc.
- NO<sub>2</sub> limit values
- Particle Number values for health critical sizes (20 – 300 nm)

***VERT recommends:***



Amendment for **Emission Upgrade Technologies** similar to EEV for BAT in Emission reduction

## ○ Emission Upgrade Technology for In-Use machines

### Application of EUT (Emission Upgrade Technologies)

- High polluted areas
- Low Emission Zones
- Overcrowded Areas and city centers

### ***VERT recommends:***



Enforce markets, competition and R&D for Best Available Technology to reach best possible results for high polluted areas!

## ○ Emission Upgrade Technology for In-Use machines

### VERT has 20 years of experience with BAT

- State of the art filters to reduce particles
- Particle Number counting in the field (In-use compliance)
- Temperature Management to support regeneration
- Combined Systems reducing PN and NOx and NO2

### ***VERT recommends:***



Manufacturers of engines and machines shall be engaged and forced to develop and deliver EUT kits for in-use machines!



## ○ Emission Upgrade Technology for In-Use machines

### EUT is available but not enforced

- Today only used for retrofit and special applications
- Manufacturers have **Best Available Technology** developed but offer the minimum required to fulfil the limits
- Offering EUT options should be a mandated requirement for each engine in the market
- EUT- Technologies should be officially recognized, awarded, certified, labelled and publically listed
- EUT should become a new competition element for OEM

## ○ Emission Upgrade Technology for In-Use machines

### Proposal for an Emission Upgrade Regulation

- EEV (environmental friendly vehicles) success as a model
- EUT should be officially recognized, awarded, certified, labelled and publically listed
- EUT should become a new competition element for OEM
- WIN – WIN Situation by enforcing European manufactures Innovation strength and stimulate low emission markets

### ***VERT recommends:***



Use Best Available Technology for high polluted areas in Europe

Challenging the industry for innovation in  
emission reduction is an engine for  
European industrial success and  
competitive advantage

**Thank you for your attention**

For more information visit [www.vert-certification.eu](http://www.vert-certification.eu)

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