



Questions and comments

*Joint Workshop on Measurement and Characterisation of
Nanoparticles
Thessaloniki, 9-10 October 2018*



The future of particle emission limits

- Some issues still exist:
 - **PM measurements still needed?**
 - **Sub-23 nm measurements**
 - **Particle composition and toxicity?**
 - **Technology neutral standards**
 - **On-board particle monitors?**

Further questions

- Ultrafine particles might be more dangerous than PM_{2.5}. Are sub-23nm particles more dangerous than >23 nm?
- The 6×10^{11} p/km(kWh) limit was based on best available technologies. What is the health relevance?
- There are health concerns for the (semi)volatile part of particles. Should it be included in the regulations?
- Sampling from the tailpipe opens the door for “total” particles measurements. Does it have an added value for regulations (i.e. does it address vehicle technologies?)

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Primary (solid) particles

- Is it necessary to drive the regulation to sizes below 23 nm, i.e. are we really missing an important part of the PN?
- Do losses and artefacts prevent us going lower than 23 nm?
- Can we robustly measure sub23 nm particles in the real world?
- Do we obtain the “same” results on the CVS and with PEMS?
- Can solid PN regulation provide effective control of vehicle contribution to air quality PM?

Delayed primary (volatile) and secondary particles

- Is it enough to measure solid particles only?
What are we going to do with the total PN (i.e. incl. volatile particles)
- Do we need to understand the chemical composition of particles?
Size resolved? Do we need that?
- Why does regulation ignore the secondary aerosol?
 - We need to further work for the development of representative measurement methodology

Practical observations

- Artefacts can be a big problem, because operators will not be able to distinguish them
- Final system, especially for PEMS measurements must withstand low and high ambient Temperatures, vibrations, etc.
- Final systems must not require any type of interpretations, but give a straight forward result
- These projects should provide an input on whether sub-23 nm are of particular importance for some engine technologies and/or fuels
- Solid PN was the first and "easy" metric but we should start thinking about total PN as it is more relevant to health effects.
- But the particles arriving at our lungs will be different even from the total PN