

JOINT FINAL EVENT

12 & 13TH NOVEMBER 2019, SANTA OLIVA, SPAIN
(near Barcelona)

 PaREGEEn

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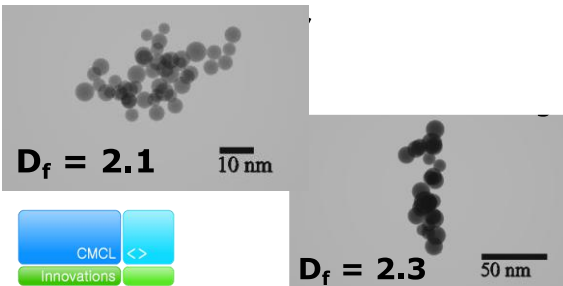
 **PEMs**
4Nano

PEMS4Nano Looking into the future – Viewpoint of projects

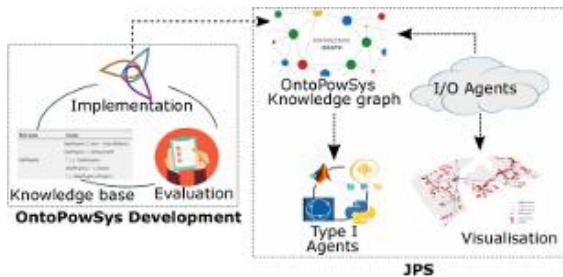
Prof. Dr. Marcus Rieker HORIBA Europe (Coordinator)

Project: PaREGEEn / PEMs4Nano

Future viewpoint: Digitalisation & interoperability



Fractal dimension evaluation
Source: <https://cmclinnovations.com/media/user-stories/>



Ontology engineering and interoperability
Source: <https://como.ceb.cam.ac.uk/preprints/230/>

- PEMs4Nano offers digital workflow that combines physico-chemical with statistical algorithms focused on RDE emissions
- Digitalisation will continue to rely on measurements, in particular, transients
- Interoperability across multiple software and data holds key to avoid information silos
- Cross-domain analysis: automotive → air quality → health

Future viewpoint: Particle characterization

- ☑ Continuing efforts for detailed characterization of the smallest particles
 - ☑ Morphology, structure, chemical composition, ...
 - ☑ Relationship of all these (especially SOF – Surface Organic Fraction) with **optical properties** ... very important for on-line optical analysis (e.g. by Laser Induced Incandescence)
- ☑ Difficult inter-comparison for off-line analyses ... need to define a **“standard” methodology** for particle sampling, transport, storage, analysis.
- ☑ Combining laboratory / test bench / real drive emissions ... **Big data** ... automated sampling / analysis / data processing ... machine learning ?
- ☑ Increasing interest for **non-combustion particles** ... need for chemical markers / source apportionment. Semi-volatiles ?

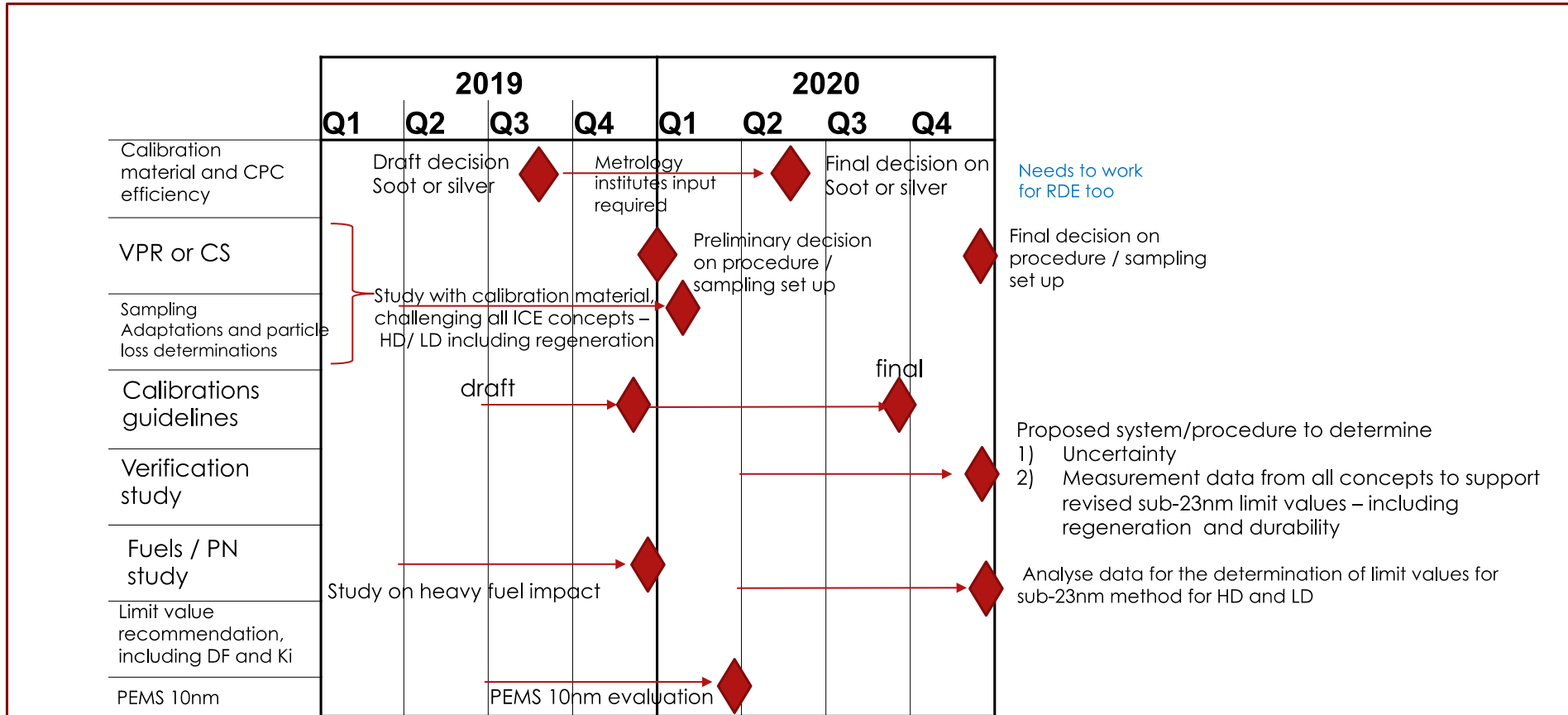
Sub-23 nm exhaust particle measurement

- Strong political pressure to reduce the cut-off size down to at least 10 nm
- Methodology should be ready, from a technical point of view, by the end of 2020
- This means a number of decisions to be taken in the short term to
 - leave enough time to assess different engine technologies and
 - provide inputs for the definition of the limits

presented by Dr. Giorgio Martini (Joined Research Center) in the PMP 49th session on 8th of January 2019

https://wiki.unece.org/download/attachments/75532496/PMP-49-02%20Progress%20Report%20to%20GRPE%20January2019_long_2-1.pptx?api=v2.

Potential Timeline



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Thank you

Any questions?

These projects have received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement no. 723954 (PaREGEEn) and no. 724145 (PEMs4Nano)

