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20IND06 PROMETH2O

Metrology for trace water in ultra-pure process gases

Welcome & Overview of the project

9th of March 2022

EMPIR
EURAMET
The EMPIR initiative is co-funded by the European Union's Horizon 2020 research and innovation programme and the EMPIR Participating States

Meeting agenda – Open session

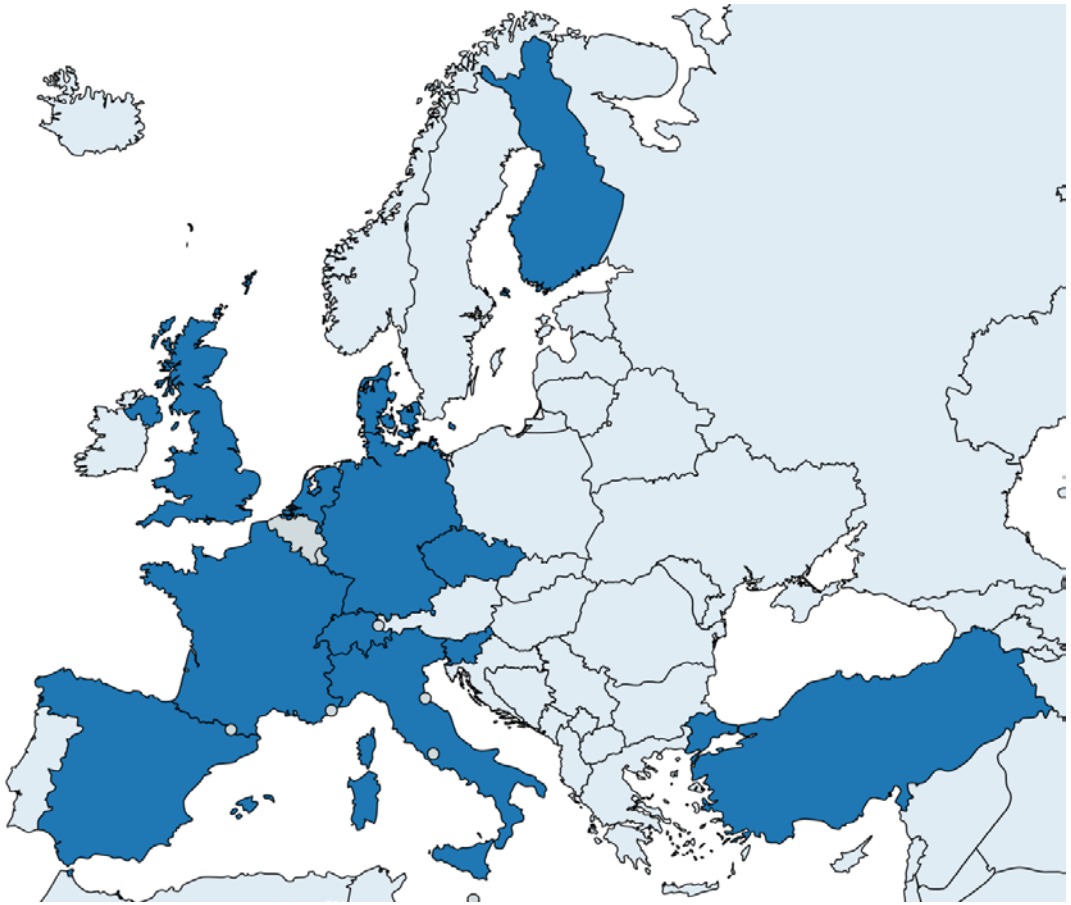
9th of March 2022 – First session (open to stakeholders)	
09:30	**0. Welcome and opening of the meeting**
09:35	**1. Introduction of attendees** (partners & stakeholders)
10:00	**2. Overview of the project (lead VF)**
10:15	**3. WP1: Improved trace water measurement methods and techniques (overview/lead AF)**
10:20 – 11:00	Task 1.1 Development and improvement of optical analysers. *Report from SUN, DTU, Qrometric, and TUBITAK*
11:00 – 11:15	**Coffee break**
11:15	**4. WP2: Provision of robust traceability to trace water measurements in real humid gas mixtures (overview/lead RC)**
11:20 – 12:10	Task 2.1 Development of primary humidity standards for trace water vapour in an increased range of gas matrices. *Report from INRIM, VTT, CMI, INTA, UL, PTB, MBW, VSL, CETIAT*
12:10 – 12:30	Task 2.2 Measurement of the enhancement factor in selected humid gas mixtures. *Report from CNAM, CETIAT, CMI, VSL, UL, INTA, CEM, UVa*
12:30	**5. WP3 Demonstration at industrial test beds and facilitation of end-user uptake (overview/lead SP)**
12:40	**6. Q&A from stakeholders**
12:50 – 13:45	**Lunch break**

Meeting agenda – Restricted session

9th of March 2022 – Second session (restricted to partners)	
13:45	**7. WP4: Creating Impact (lead EG)**
13:45 -14:00	Website and social media; Information package; Newsletter
14:00 – 14:15	Communication and exploitation plan
14:15	**8. Project management (lead VF)**
14:15 – 14:45	M9 project reporting and deadlines *Technical report (progress) and Output and Impact report*
14:45 – 15:00	Risk management, delays, amendments to the protocol
15:00 – 15:10	Data management and Publishable summary
15:10 – 15:15	Date and venue of the next project meeting (M18)
15:15 – 15:30	Summary of the meeting and AOB
15:30	**9. Closing of the meeting**

- Introduction of attendees (partners and stakeholders)

The Consortium



19 partners from 12 countries – 242 person-months

Project objectives

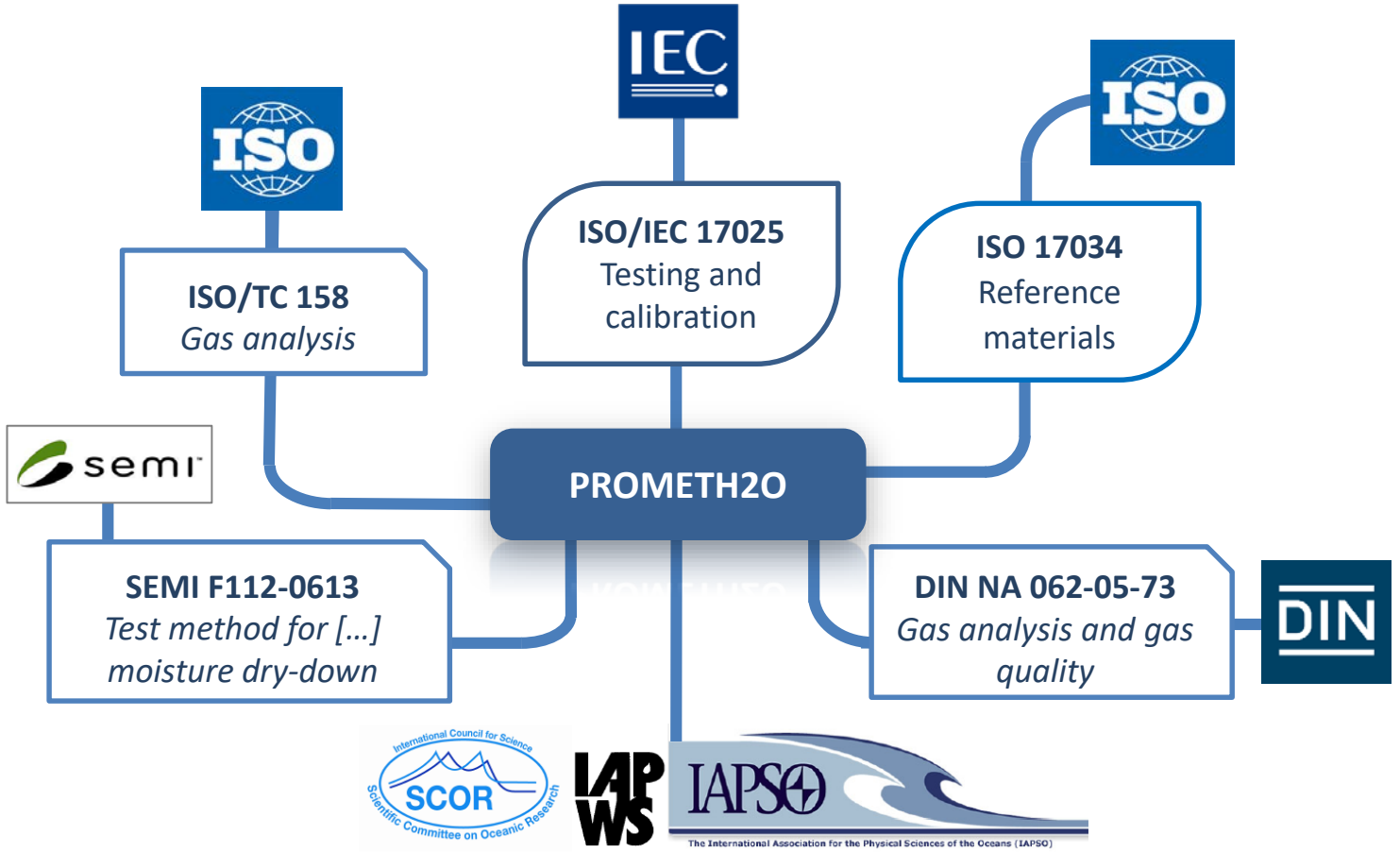
1. Improve trace water **measurement methods and techniques**.
2. Provide **robust traceability** to trace water measurements by suitable standards.
3. Improve the present knowledge of **thermophysical data** of real humid gas mixtures.
4. Demonstrate improved trace water measurement methods in **industrially-relevant facilities.**
5. Facilitate **the take up** of the technology and measurement infrastructure developed in the project.

Project outputs

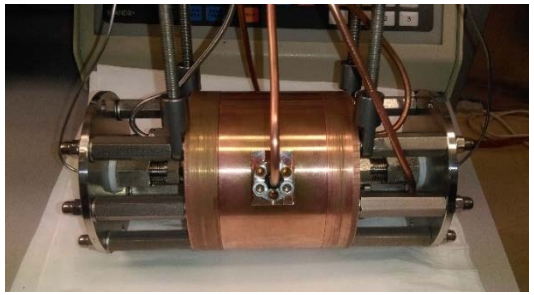
- ✓ **New measurement methods** in the amount fraction range between 5 ppm and 5 ppb with relative standard uncertainty between 3 % and 8 %.
- ✓ **New primary standards** for trace water vapour in N_2, Ar and H_2 down to 5 ppb (or -105 °C frost point temperature) at pressures up to 1 MPa.
- ✓ **New data** and correlation equations of water vapour enhancement in N_2, Ar and H_2 in the temperature range from -30 °C to -90 °C and pressures up to 1 MPa.
- ➢ **Demonstration** in two selected industrial environments with real-time measurements and on-site calibrations.
- ✓ A **toolkit of metrological solutions** for robust measurement traceability in the production of ultra-pure process gases.

Impact on metrology and standards

- **Extended-range primary standards** and measurement traceability for trace water in UHP gases.
- **Integration of metrology infrastructure** in Europe and leadership of European NMIs in this developing field.
- **Underpinning of metrology** of trace water for reference gases (e.g. N_2, H_2, Ar).
- **Better knowledge** of measurement techniques and of real humid gas mixtures.
- A **CIPM comparison** enabled in the trace water range.



Project implementation



Project Steering Board

Robust traceability by suitable primary standards (WP2)

Improved trace water measurement methods (WP1)

Improved knowledge of real humid gas mixtures (WP2)

Creating Impact (WP4)

Demonstration at industrial test beds: facilitation of end-user uptake (WP3)

Project Steering Board (SB)

A **Steering Board** made of, at least, 6 key stakeholders (i.e. gas and equipment manufacturers, industry, standards developing organisations, international scientific associations) will be established.

21 organisations have joined the SB so far!

Project Steering Board (SB) members

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International Organisations	
CIPM CCT WG-Hu	Stephanie Bell *
IAPWS	Karsten Meier
JCS	Olaf Hellmuth
KRISS	Byung Il Choi
NMIJ	Hisashi Abe
ISO/TC 158 WG3	Adriaan van der Veen
CIPM CCQM GAWG	Paul Brewer
UNI CIG	Paola Comotti
ACCREDIA	Rosalba Mugno

Instrument Manufacturers	
Ball Wave	Yusuke Tsukahara
Meeco	Rutger Oudwater
Li-Cor	Graham Leggett
Baker Hughes	Gerard McKeogh
PST/Rotronic	Richard Gee
EffecTech Ltd	Paul Holland

Gas Producers	
Air Liquide	Jean-Luc Blanc
Air Liquide	Antonio Carreira
BOC	Kevin D. Cleaver
SOL	Riccardo Nava
SIAD	Pierluigi Bissolotti
SAPIO	Pierluigi Radaelli
FHa	Laura Abadía Albás

*** The SB is chaired by Stephanie Bell**