PROMETH$_2$O

20IND06 PROMETH2O

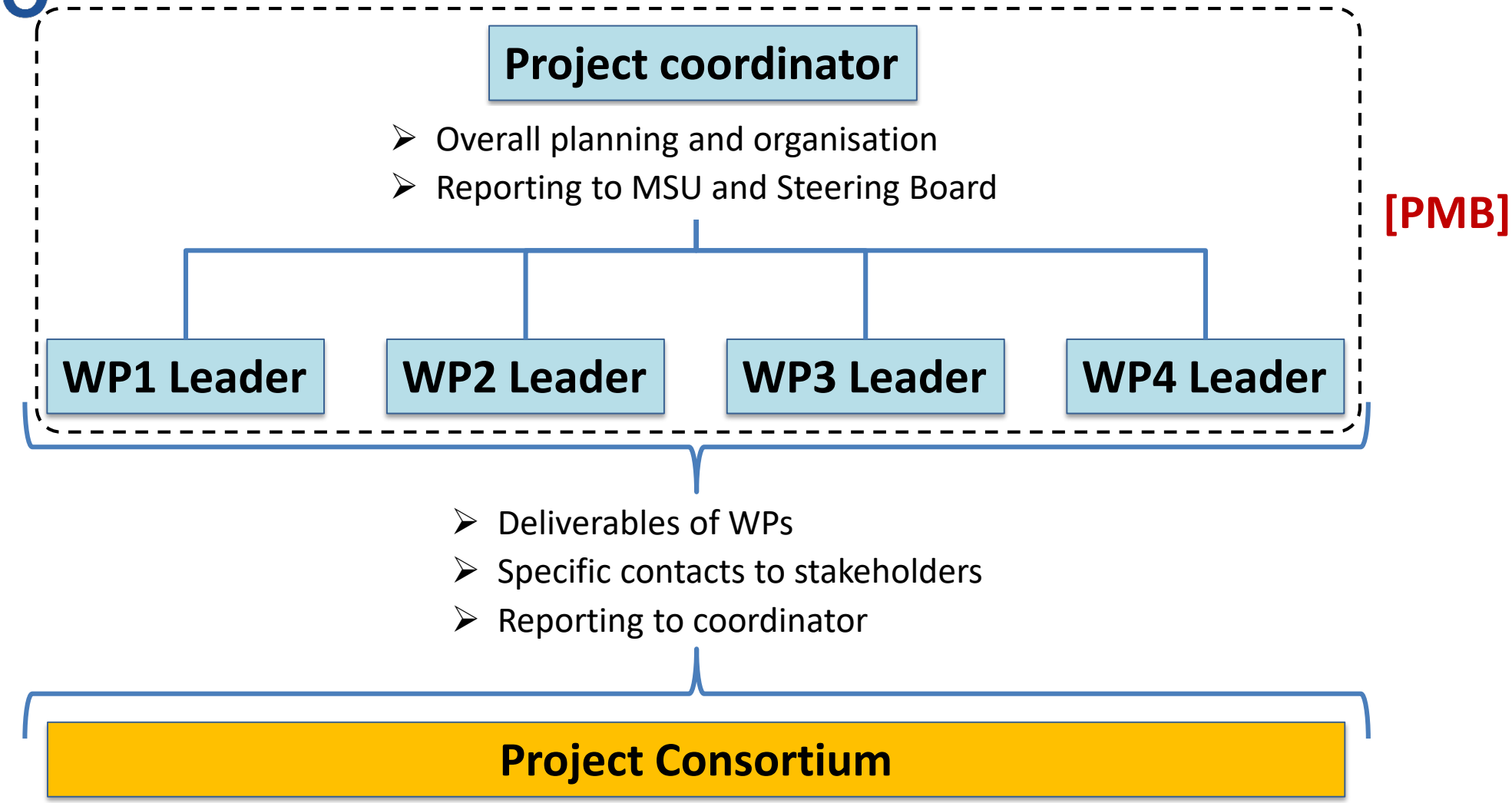
Metrology for trace water in ultra-pure process gases

WP5 Project Management

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

Overall management plan



Agile project management

A5.1.2 The WP leaders will report on the on-going progress in the work packages to the coordinator […] The WP leaders are responsible for the organisation of collaboration with the respective task leaders and partners.

Non-agile project management

- Partners work on their developments individually
- Partners share results at the final stage of their development with the others
- Potential parallel developments and late merge issues

Agile project management

- Partners work on their developments individually
- Partners share results at a very early stage of their development with the others
- All partners can see the project developments and evaluate its usability

Five formal project meetings held prior to reporting (A5.2.2)

- Face-to-face meeting: *when*
  - ❖ Mid-term meeting (M18) **November 2022**
  - ❖ Final meeting (M36) **May 2024**

- Online video conference: *when*
  - ❖ At reporting period (M9) **9 March 2022**
  - ❖ At reporting period (M27) **September 2023**

- If the face to face setting cannot be achieved an online video conference will take place.

Project reporting

A5.3.2 – A5.3.3

- **Progress reports** will be submitted at
  - **M9 (28/02/22 + 45 days)** and M27 (31/08/23 + 45 days)
  - M18 (30/11/22 + 60 days)
  - M36 (31/05/24 + 60 days)
- **Impact/Output Reports** will be submitted at the same time (M9 + 45 days)
- **Publishable summary** will be updated at the same time (M9 + 45 days)

- **Periodic Reports (including DMP, financial reports, exploitation plan and questionnaires)** will be submitted at
  - M18 (30/11/22 + 60 days) and M36 (31/05/24 + 60 days)

❖ All partners will provide input to these reports. WP Leaders will be responsible for their respective reporting parts. INRIM will coordinate the reporting and submit it to EURAMET MSU.

❖ **The project will be subjected to the Midterm Review in Feb-Mar 2023.**

M9 progress report: roadmap and deadlines

→ **3. Deliverables status and progress towards objectives** (next slide)

→ **4. Explanation of the work carried out** (next slide)

		Deadline
➢ All partners provide inputs to the WP Leaders	→	**16 March 2022**
➢ WP Leaders gather information and send to coordinator	→	**23 March 2022**
➢ Coordinator merges all contributions into the progress report	→	**30 March 2022**
➢ All partners review completed part of the document	→	**04 April 2022**
➢ Coordinator makes final amendments and submit to the MSU	→	**08 April 2022**

→ **WP Leaders web meeting in the 1st week of April 2022**

GANTT CHART

3 Deliverables status and progress towards objectives

Relevant objective (Activity delivering the deliverable)	Deliverable Number	Deliverable description	Partners (Lead in bold)	Delivery date in Annex 1	Actual delivery date to EURAMET	Status *inactive, on schedule, delayed to… or completed & submitted to EURAMET*	Summary of the progress towards each deliverable and how the project's objectives are being met in this reporting period (one paragraph, include all partners) (max 250 words per deliverable)
1 (A1.2.7)	D1	Report and recommendations on measurement methods and techniques for trace water measurements in industrial environments in the amount fraction range between 5 parts in 106 (5 ppm) and 5 parts in 109 (5 ppb) (-65 °C and -105 °C frost point) with relative standard uncertainty between 3 % and 8 %, from upper to lower range, respectively	**DTU**, SUN, MBW, INRIM, TUBITAK, Qrometric	Nov 2023			*e.g. The components of the uncertainty budget have been determined by DDD with input from AAA and CCC. BBB did not participate during this reporting period….*
5 (A1.3.3)	D2	Report on the "Recommendation of transfer standards for a future CIPM comparison in the frost-point temperature range -65 °C to -105 °C (5 ppm to 5 ppb)"	**INRIM**, PTB, TUBITAK, DTU	May 2024			

GANTT CHART

4 Explanation of the work carried out

Task number & title *excluding the uptake and exploitation task (JRPs & JNPs only) & management & coordination tasks*	Task end date in Annex 1	Actual task completion date	Status: *inactive, on schedule, delayed to..., or completed*	Explanation of the work carried out in each task in this reporting period	
				Summary of the progress towards the aim of each task in this reporting period (max 700 words per task)	Explain any issues affecting the completion of the tasks (eg describe the cause of delays / deviations etc. and any knock-on effects) (max 300 words per task)
1.1 Development and improvement of optical analysers	May 2023		*On schedule*		
1.2 Validation of the measurement methods and techniques	Nov 2023		*Inactive*		
1.3	May 2024		*Inactive*		

Output and Impact report

No.	Type of open access publication (with unique and persistent identifier)	Lead author	Title of publication (i.e. article / conference paper / book / book chapter etc.)	Title of journal (book etc.)	Publication status	Unique and persistent identifier - in most cases this should be the DOI (provide the DOI as a weblink e.g. "https://doi.org/10.1000/s12345-123-1234-1")	The publication is, or will be, OPEN ACCESS (Green or Gold)
	PEER REVIEWED OPEN ACCESS SCIENTIFIC PUBLICATIONS (with a unique and persistent identifier):				See EMPIR Guide 3 for more information on what should and shouldn't be recorded		

Summary | 1 STAN | 2 PUB | 3 CONF | 4 TR | 5 OTH | 6 FOLL | 7 UP | 8 COLL | 9 IP | 10 RES | 11 FUT | ...

Output and Impact report

A	B	C	D	E	F	G	H
		COLLABORATORS & STAKEHOLDERS:		**See EMPIR Guide 3 for more information on what should and shouldn't be recorded here - http://msu.euramet.o**			
	No.	Collaborator or stakeholder	Type of organisation	Organisation	Location (country)	Country code (auto-filled)	Additional comments (if required)
	1	stakeholder	Other	CIPM CCT WG-Hu	N/A	NA	Member of the steering board
	2	stakeholder	Other	IAPWS	N/A	NA	Member of the steering board
	3	stakeholder	Other	JCS	N/A	NA	Member of the steering board
	4	stakeholder	Public research organisation	KRISS	Korea, Republic of	KR	Member of the steering board
	5	stakeholder	Public research organisation	NMIJ	Japan	JP	Member of the steering board
	6	stakeholder	Standards development organisation	ISO/TC 158 WG3	N/A	NA	Member of the steering board
	7	stakeholder	Other	CIPM CCQM GAWG	N/A	NA	Member of the steering board
	8	stakeholder	Standards development organisation	UNI CIG	Italy	IT	Member of the steering board
	9	stakeholder	Other	ACCREDIA	Italy	IT	Member of the steering board
	10	collaborator	Other	FHa	Spain	ES	Member of the steering board
	11	stakeholder	Industry - SME	Ball Wave	Japan	JP	Member of the steering board
	12	stakeholder	Industry - SME	Li-Cor	United Kingdom	GB	Member of the steering board
	13	stakeholder	Industry - Large enterprise	Baker Hughes	United States	US	Member of the steering board
	14	stakeholder	Industry - Large enterprise	PST/Rotronic	United States	US	Member of the steering board
	15	stakeholder	Industry - SME	EffecTech Ltd.	United Kingdom	GB	Member of the steering board
	16	stakeholder	Industry - Large enterprise	Air Liquide	Spain	ES	Member of the steering board
	17	stakeholder	Industry - Large enterprise	Air Liquide	France	FR	Member of the steering board
	18	stakeholder	Industry - Large enterprise	BOC	United Kingdom	GB	Member of the steering board
	19	stakeholder	Industry - SME	SOL	Italy	IT	Member of the steering board

Summary | 1 STAN | 2 PUB | 3 CONF | 4 TR | 5 OTH | 6 FOLL | 7 UP | **8 COLL** | 9 IP | 10 RES | 11 FUT | ...

Exploitation plan

A4.3.1 M36	A communication and exploitation plan will be created by CETIAT, and with the support of all partners, **at the beginning of the project (M2) and reviewed, discussed and updated in each project meeting (M9, M18, M27, M36).** The focus points of this exploitation plan will be to detail how the project will ensure dissemination of the project activities and take up of the technology and measurement infrastructure developed in the project.	CETIAT, all partners

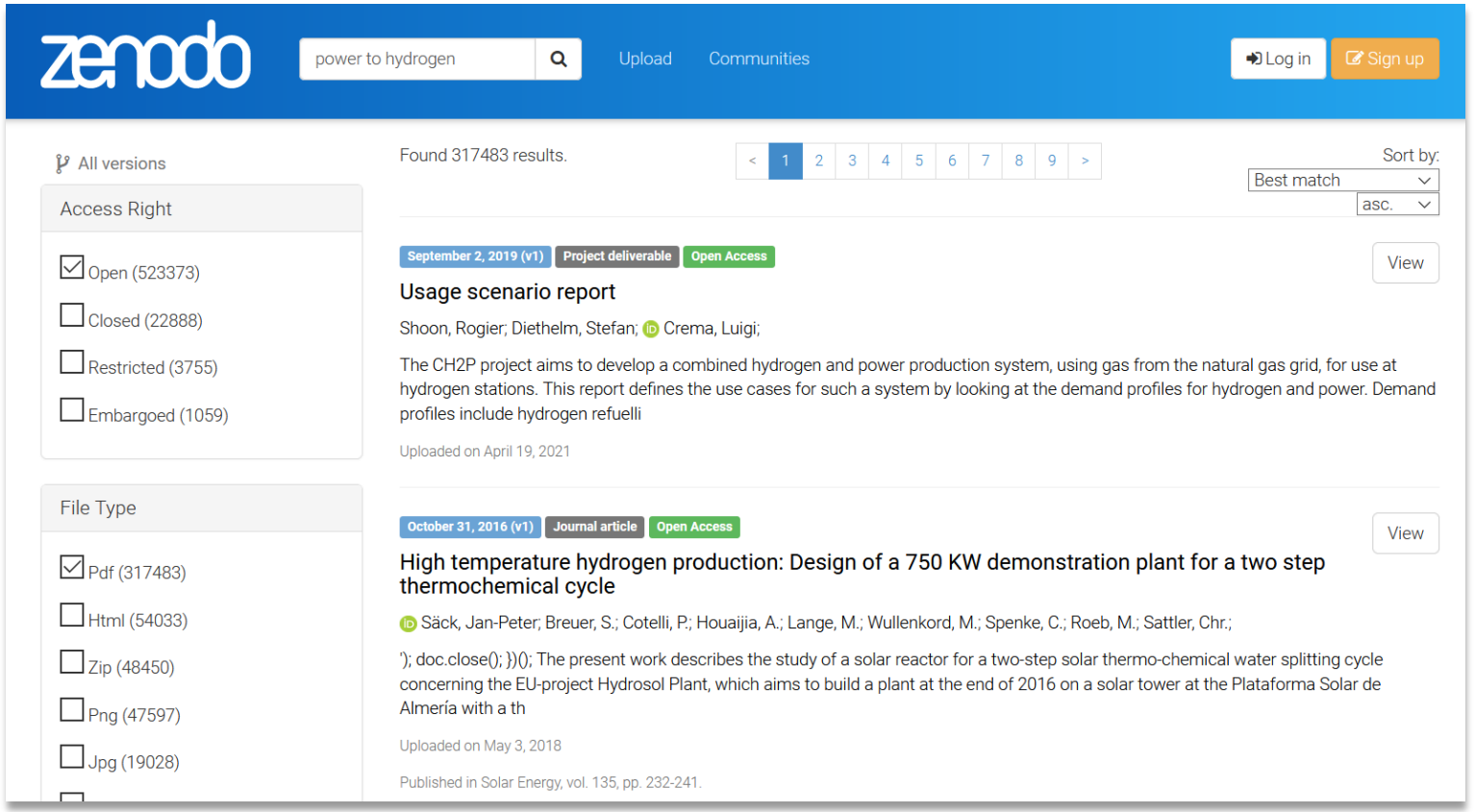
5 Summary of exploitable results and an explanation about how they can/will be exploited (periodic reports only)

Annex 1 **Impact WP4** **Task 4.3: Uptake and exploitation**	**Activity description** (as in Annex 1) e.g. Exploitation plan, new measurement and consultancy services	**Progress achieved**
A4.3.1	A communication and exploitation plan will be created by CETIAT at the beginning of the project (M2) and reviewed, discussed and updated in each project meeting (M9, M18, M27, M36).	
A4.3.2	New primary and reference standards and CMCs will be made available at the end of the project (by CETIAT, VTT, PTB, CEM, CMI, UL) to serve the industry needs and support the accreditation scope of industrial accredited calibration laboratories.	

A5.3.1 One month after the start of the project a publishable summary and a **data management plan** (DMP) will be produced and submitted to EURAMET. ✓

- The DMP covers the following aspects (B2.e):
  - the handling of research data during and after the end of the project;
  - specification of the data that will be collected, processed or generated;
  - the methodology and standards (including data security and ethics) that will be applied;
  - plans for data curation and preservation (including after the project).

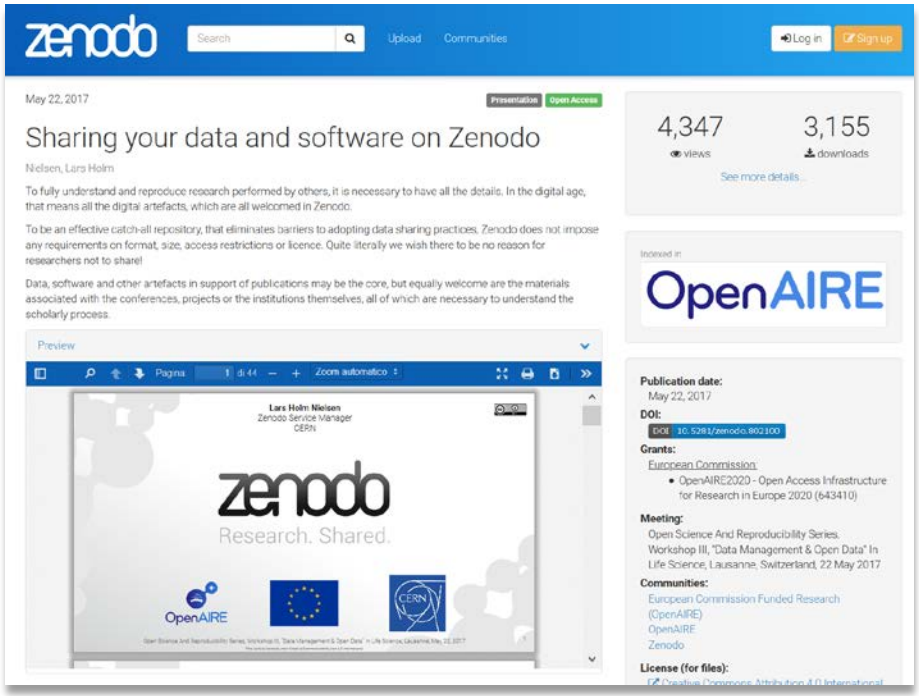
Data management



- **The consortium agrees to deposit its open access data sets in suitable repositories.**
- **It has been suggested to use Zenodo (https://zenodo.org/)**

Zenodo (https://zenodo.org/)

- Developed and operated by CERN
- Creates DOIs for data sets
- Flexible licensing (not everything as creative commons)
- Create a *Community* for improved findability of all project related data with 50 GB limit per file
- Includes versioning of data sets (with referring DOIs)
- Adheres the FAIR principles
- Provides GitHub integration
- Zero costs (funded by OpenAIRE, EU, CERN)



Find out more here: https://zenodo.org/record/802100

A5.1.3 The coordinator, with support from the partners and in particular from the WP leaders, will manage the project's risks to ensure timely and effective delivery of the scientific and technical objectives and deliverables.

Cloud storage:

- A password-protected cloud storage service (**GARRBOX**) for information and document exchange is being set up by INRIM and will be maintained for the lifetime of the project (+1 yr).
- A folder structure for the technical deliverables will be created on the **GARRBOX** server.
- All partners will upload material, information and documentation into the respective folders (…and take care of the version control).

PROMETH$_2$O

20IND06 PROMETH2O

Metrology for trace water in ultra-pure process gases

Next steps and dates

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

WP1 Technical work

- **A1.1.1** SUN will develop a compact NIR CC-FS-CRDS spectrometer referenced to an optical frequency comb, for traceable measurements of water vapour in H_2 and N_2 from 5 ppm down to 50 ppb.
- **A1.1.2** DTU will develop a compact and transportable far-UV system for trace water vapours measurements in Ar, N_2 and H_2 from 5 ppm to 5 ppb and pressure up to 1 MPa.

- **SUN**
- Result due May 2022

- **DTU**
- Result due May 2022

2nd MILESTONE 11/2022 (M18)

- **A1.1.4** Qrometric will develop a NIR CE-FM spectroscopy hygrometer for measurements of trace water vapours in Ar and N_2 down to ppb level and pressure up to 1 MPa.

- **Qrometric**
- Result due Nov. 2022

WP2 Technical work

- **A2.1.2** CMI, INTA and UL will upgrade their saturation-based generators to produce humid gas mixtures in N_2 and Ar to extend the limit of reference frost-point temperatures to -90 °C and pressures up to 1 MPa.

  - **CMI**, INTA, UL
  - Result due Nov. 2022

- **A2.1.5** CETIAT will upgrade its mixed flow generator in pressure, from 0.1 MPa up to 1 MPa, and in frost point temperature down to -90 °C (possibly -95 °C).

  - **CETIAT**
  - Result due Nov. 2022

2nd MILESTONE 11/2022 (M18)

- **A2.2.3** CEM, will produce cylinders containing pressurised humid gas reference mixtures in matrices of N_2, Ar and H_2 with amount fractions of water vapour to 1 µmol mol^{-1}.

  - **CEM**, Uva
  - Result due Nov. 2022

- **A3.1.1** INRIM, with support from VSL, UL, Qrometric, DTU, Nippon Gases, and Vaisala will collect the stakeholder needs through the Steering Board.
- This collection of data will include specifications on gases, dew-point range, pressure range and other relevant information and will be gathered either through **Steering Board** meetings or mailed **questionnaires**.

- **INRIM**, VSL, UL, Qrometric, DTU, Nippon Gases, Vaisala
- Result due Nov. 2022

2nd MILESTONE 11/2022 (M18)

Steps and deadlines until next meeting

08 April 2022	• M9 progress reporting (Technical, Impact/Output) • Publishable summary	**PMB meeting**
31 May 2022	• WP1 activity results	
31 May 2022	• Steering Board meeting • Stakeholders' needs questionnaire	**PMB meeting**
November 2022	• M18 project meeting	
Nov.-Dic. 2022	• M18 Periodic reporting (Technical, Impact/output, Financial) • Publishable summary • Data management plan • <u>Self-assessment and Mid-term review (02/2023)</u>	**Project meeting**

Summary of earliest deadlines

→ **3. Deliverables status and progress towards objectives**

→ **4. Explanation of the work carried out**

		Deadline
➢ All partners provide inputs to the WP Leaders	→	**16 March 2022**
➢ WP Leaders gather information and send to coordinator	→	**23 March 2022**
➢ Coordinator merges all contributions into the progress report	→	**30 March 2022**
➢ All partners review completed part of the document	→	**04 April 2022**
➢ Coordinator makes final amendments (including the Publishable Summary) and submit to the MSU	→	**08 April 2022**

Researcher Mobility Grants **(RMG)**

- Researcher Mobility Grants enable researchers employed by EURAMET NMIs and DIs to spend between 1 and 18 months working alongside a Joint Research Project (JRP) in a different country to their employer.

➢ **REMINDER**

Next project meeting

- Face-to-face meeting:

	when	*where*
❖ **Mid-term meeting (M18)**	**Early November 2022**	**?**
❖ Final meeting and workshop (M36)	**May 2024**	**CETIAT, Lyon**

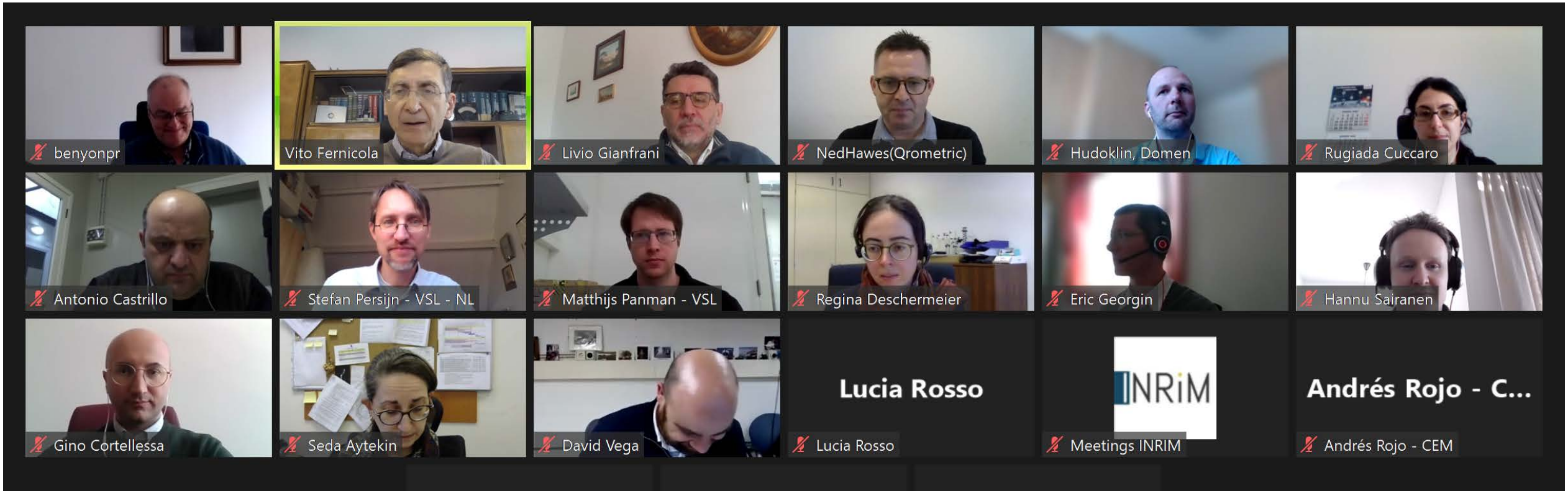
- Online video conference:

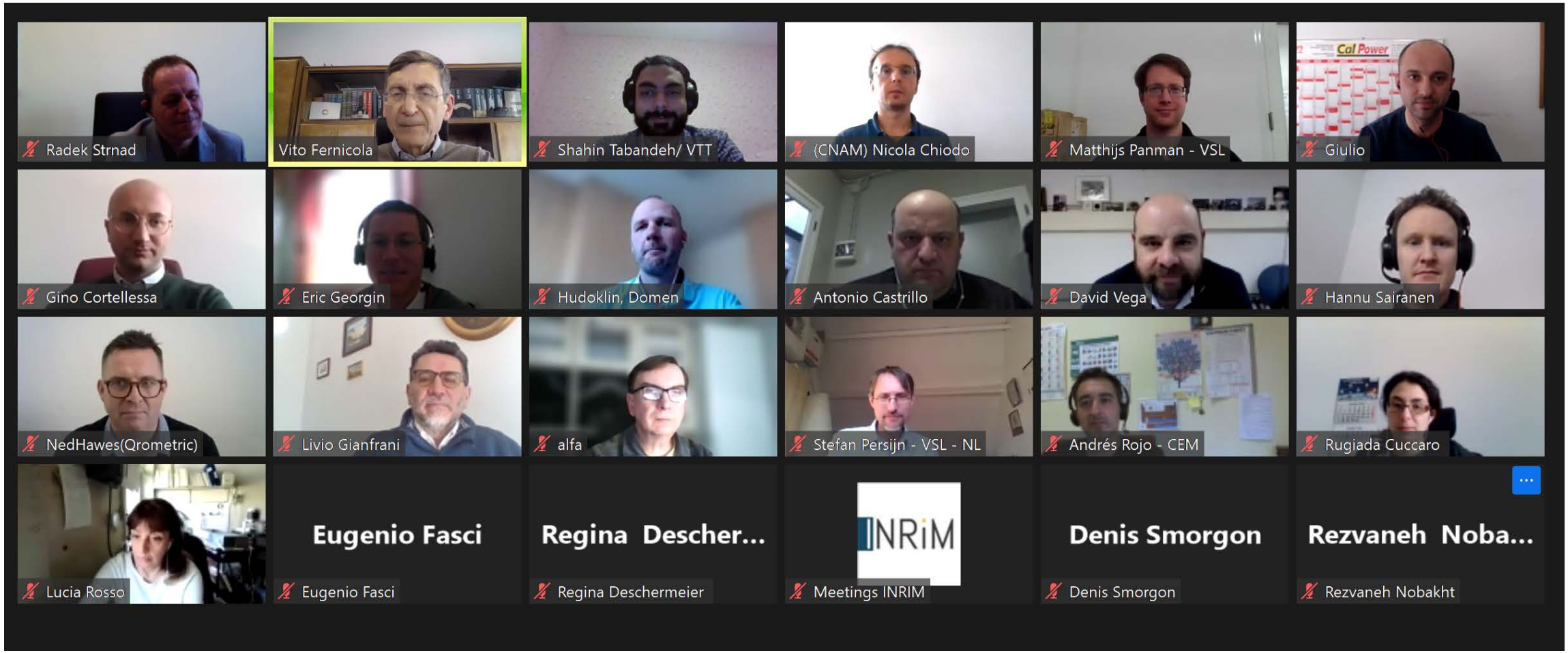
	when
❖ At reporting period (M9)	**9 March 2022**
❖ At reporting period (M27)	**September 2023**

Here we are…


benyonpr
Vito Fernicola
Livio Gianfrani
NedHawes(Qrometric)
Hudoklin, Domen
Rugiada Cuccaro
Antonio Castrillo
Stefan Persijn - VSL - NL
Matthijs Panman - VSL
Regina Deschermeier
Eric Georgin
Hannu Sairanen
Gino Cortellessa
Seda Aytekin
David Vega
Lucia Rosso
Lucia Rosso
INRiM
Meetings INRIM
Andrés Rojo - C...
Andrés Rojo - CEM
alfa
alfa
Denis Smorgon
Denis Smorgon

...and here, too!


benyonpr
Vito Fernicola
Livio Gianfrani
NedHawes(Qrometric)
Hudoklin, Domen
Rugiada Cuccaro
Antonio Castrillo
Stefan Persijn - VSL - NL
Matthijs Panman - VSL
Regina Deschermeier
Eric Georgin
Hannu Sairanen
Gino Cortellessa
Seda Aytekin
David Vega
Lucia Rosso
Lucia Rosso
INRiM
Meetings INRIM
Andrés Rojo - C...
Andrés Rojo - CEM


Radek Strnad
Vito Fernicola
Shahin Tabandeh/ VTT
(CNAM) Nicola Chiodo
Matthijs Panman - VSL
Giulio
Gino Cortellessa
Eric Georgin
Hudoklin, Domen
Antonio Castrillo
David Vega
Hannu Sairanen
NedHawes(Qrometric)
Livio Gianfrani
alfa
Stefan Persijn - VSL - NL
Andrés Rojo - CEM
Rugiada Cuccaro
Lucia Rosso
Eugenio Fasci
Eugenio Fasci
Regina Descher...
Regina Deschermeier
INRiM
Meetings INRIM
Denis Smorgon
Denis Smorgon
Rezvaneh Noba...
Rezvaneh Nobakht

PROMETH$_2$O

Thank you for your attendance to PROMETH2O M9 progress meeting!

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