

# Supercritical CO<sub>2</sub> WG Meeting

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10 October 2024



# Agenda of the Meeting



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1. Results of 2024 & Learnings from Day 1
2. Activities for 2025
3. Thematic Presentation
4. Q&A



# Results of 2024 & Learnings from Day 1



# Results of 2024

## Summary

2024 Activity	Status and current results achieved
Webinar Series	Ongoing, held two sessions (6 <sup>th</sup> and 7 <sup>th</sup> ): “Balance of Plant” and “sCO <sub>2</sub> cycles for nuclear power production”. Both had very good attendance (132 and 109 persons respectively)
Follow-up paper on offshore waste heat recovery	Discussion ongoing with technology providers to gather data for a more detailed techno-economic analysis. Task force being enlarged with an EPC
Study on flexibility requirements for different electricity market services	Discussed with YEC and aligned with their scope to create KPIs to understand flexibility of different sCO <sub>2</sub> cycle configurations vs steam to penetrate ancillary and capacity market



# Webinars

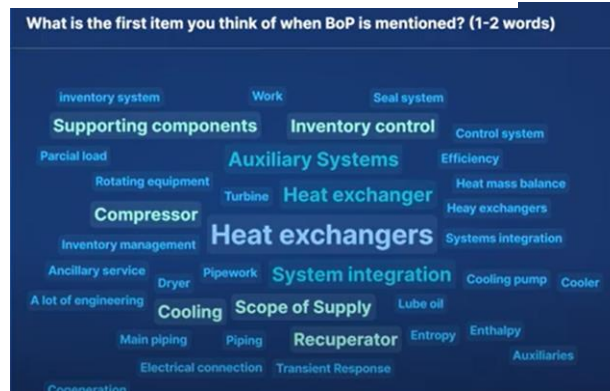
## Webinar content & speakers

- **View of impacts on CAPEX and plant feasibility**  
(Matteo Baggiani – SIME)
- **Large scale CO<sub>2</sub> heat-pumps for decarbonizing heat and cold and for electricity storage (LDES)**  
(Raymond C. Decorvet – MAN Energy Solutions)
- **Transforming Natural Gas into Clean Power**  
(Xijia Lu – NET Power)
- **STEP Pilot Plant Inventory Management System**  
(Joshua Warren – Southwest Research Institute)



## Webinar content & speakers

- **Nuclear landscape, a brief introduction**  
(Moderator Albannie Cagnac – EDF)
- **Use of carbon dioxide in nuclear energy**  
(Otakar Frýbort – Research Centre Řež)
- **sCO<sub>2</sub> for molten salt reactors**  
(Paul Levisse – NAAREA)
- **Fusion Energy and the role of sCO<sub>2</sub>**  
(Jack Acres – UK Atomic Energy Authority)





# Learnings from Day 1

## Key take-aways

- Power production **flexibility** requirements
- **H<sub>2</sub>-readiness** → **redefinition** of the definition?
- **Resilience to climate impact** on the existing and new assets operability
- **New** technical/business/regulations **models'** outlook



# Activities for 2025



# Activities for 2025

Problem statement	Proposed activities
Construct a <b>large demonstrator</b> in Europe (MW-scale)	<ul style="list-style-type: none"><li>• Set up a case to be presented to funding institutions</li><li>• Align member states to work together on this platform</li><li>• Gather industry-support/commitment to work together to advance the technology (master lines for IP sharing)</li></ul>
<b>Market uptake</b> in various applications	<ul style="list-style-type: none"><li>• Assess viability of sCO<sub>2</sub> power plant for grid services (YEC project)</li><li>• CAPEX estimation for an sCO<sub>2</sub> offshore application</li><li>• Set up a consistent/reliable cost database using anonymised cost figures, including maintenance impact, to perform TCO evaluations</li></ul>
<b>System integration</b>	<ul style="list-style-type: none"><li>• Integration and operation of sCO<sub>2</sub> systems, including BoP</li><li>• Front-End Engineering of a reference power plant (need to choose between Waste Heat Recovery, CSP and Nuclear)</li></ul>