

2025
Seville Forum
on Machinery for
Decarbonization

SEVILLE, SPAIN | JANUARY 20, 2025



A Letter from Our Chairs

Dear Seville Forum on Machinery for Decarbonization (SFMD) Attendees,

Welcome to Seville for the first annual SFMD! The world embarked on a quest for decarbonization more than thirty years ago, with the target to accomplish carbon neutrality around 2050. Europe is in the lead, ahead of the intermediate targets set for 2020 and 2035, but we are now entering the decisive phase where new technologies will be needed to tackle the hard-to-decarbonize sectors at sustainable economic and environmental costs. The Seville Forum on Machinery for Decarbonization brings together some of the world leaders in our technology field from industry, academia, and government and will provide an open information and networking event with the primary goal of advancing decarbonization technologies. A special thanks to the University of Seville for hosting this event.

So far, the decarbonization of the electric grid and industry has come about hand-in-hand with the installation of massive amounts of variable renewable energy (VRE) power, mostly wind and solar photovoltaic. However, this is not enough if carbon neutrality is to be achieved without harming the reliability and cost effectiveness of the industry, and electrochemical batteries cannot provide the many services and scales required by the end-users. Together with VREs, other technologies for effective gas compression and transport, grid balancing, carbon capture, and very importantly, energy are also needed. In this latter category, technologies are evolving to be viable alternatives to batteries for a range of energy storage applications such as pumped hydro, compressed air, flywheel, pumped heat, liquid air, thermal hot/cold, hydrogen, oxygen, gravity-based, and other thermo-mechanical-chemical storage methods. These are all advancing at a rapid pace toward commercialization and will compete with batteries to cover a broad range of electric grid and industrial storage needs.

Beyond meeting existing commercial opportunities, the European Union and other international government agencies are seeking to advance these technologies through various funding opportunities with aggressive development targets and pilot/scale-up programs for hydrogen and long-duration energy storage.

This event leverages the experience gained in similar events held worldwide on related topics such as energy storage (Thermal Mechanical and Chemical Energy Storage Workshop – TMCES) and geothermal energy (Geothermal Energy Machinery and Systems – GEMS), recently hosted by the Electric Power Research Institute (EPRI) and Southwest Research Institute (SwRI) in America, respectively, by increasing the involvement of European government and end-user attendees while turning the spotlight on the latest developments in decarbonization technologies. Thanks to our generous sponsors, we will be able to hold this event designed to promote networking opportunities where researchers, industry partners, and end-users will meet to discuss state-of-the-art technology and emerging applications, identify technology gaps and research needs, and develop input to coordinate and direct future pre-competitive R&D activities related to machinery-based decarbonization technologies.

Thank you for attending this workshop and sharing your expertise with your colleagues. We look forward to meeting all of you to hear about your exciting technologies and projects. You, as organization leaders and technology experts, have the vision, knowledge, wherewithal, and experience to help us advance machinery solutions for decarbonization. Throughout this workshop, we ask you to stay engaged, be proactive, and shape the future of a carbon-neutral world. We thank you and respect you all for your involvement.

David Sánchez
University of Seville
SFMD Chair



Klaus Brun
Ebara Elliott Energy
SFMD Chair



Agenda and Organizing Committee

Agenda

9:00 A.M. Welcome

Klaus Brun | Ebara Elliott Energy
David Sánchez | University of Seville
Andrés Sáez | University of Seville

9:20 A.M. Karl Wygant | Ebara Elliott Energy
Challenges of Turbomachinery/Decarbonization

9:40 A.M. Sonia Fereres | Joint Research Center
European Commission – Accelerating Industrial Transformation: The Role of INCITE

10:00 A.M. Tim Allison | SwRI
*Machinery-Based Decarbonization:
An R&D Overview*

10:20 A.M. David Sánchez | University of Seville
*Understanding the Global Decarbonization
Challenge: A SWOT Analysis*

10:40 A.M. Break/Networking

11:10 A.M. John Gülen | Bechtel
Gas Turbines and CAES: Fire or Not to Fire?

11:30 A.M. Jesus Santos | Cox Abengoa
*MALTA, Integration-Ready Steam Energy
Management and Storage Solutions for the
Decarbonization of Industrial and Energy Assets*

11:50 A.M. Piero Colonna | TU Delft
*Thermal Energy Harvesting – The Path to
Tapping into a Large CO₂-Free Power Source*

12:10 P.M. Eduardo de la Rocha | Repsol
*Repsol: Moving Towards Industrial
Decarbonization*

12:30 P.M. Panel Session – Fast Pitch

Lead: Karl Wygant | Ebara Elliott Energy
José Pascual Marti Mata | RANK
Julián Blanco | CIEMAT-PSA
Oliver Velde | CFTurbo
Ana Bernardos | CENER
Norbert Suerken | Siemens Energy
Manuel Martín Sánchez | EDP Renewables

1:10 P.M. Lunch

2:10 P.M. Rainer Kurz | RKSBEnergy
Hydrogen Compression

2:30 P.M. Christer Björkqvist | ETN Global
*The Critical Role of Turbomachinery for
a Successful Energy Transition*

2:50 P.M. Klaus Brun | Ebara Elliott Energy
CO₂ Compression

3:10 P.M. Break/Networking

3:40 P.M. Jason Wilkes | SwRI
*Analysis and Prediction of the Machine
Capacity Required to Meet Net Zero by 2050*

4:00 P.M. Julio Artiñano | COGEN ESPAÑA
Javier Morales | ACOGEN
*Regulatory Framework and Technology for a
Sustainable Future for the Industry*

4:20 P.M. Tomás Álvarez | ENEL/ENDESA
*Decarbonization of Gas Turbine Operation by
Fueling with Renewable Diesel (HVO)*

4:40 P.M. Luis González | Keyter
*The Role of the Heat Pump in Industrial
Decarbonization: Present and Future*

5:00 P.M. Open Forum Discussion
Klaus Brun | Ebara Elliott Energy

Organizing Committee

David Sánchez | University of Seville, Chair
Klaus Brun | Ebara Elliott Energy, Chair
Tim Allison | SwRI
Rainer Kurz | Solar Turbines (Retired)
Karl Wygant | Ebara Elliott Energy
Contact Email | David Sánchez (ds@us.es)

Thank You

Thank you to this year's sponsors for supporting this forum!

