

PRELIMINARY PROGRAM

*This is a preliminary program and may change following the second review round.
Final decisions will be reflected in the final version.*

Sponsor and EU project dissemination slots are not yet included.

Monday 8 September 2025

17:00–20:00

Registration

Tuesday 9 September 2025

08:30–09:15

Registration

09:15–09:30

Welcome to ORC2025

09:30–09:45

Welcome to LUT University

09:45–10:30

Keynote I: Working fluids

10:30–11:00

Coffee

11:00–12:00

Session 1A – Component design, room TBA

Chair: Teemu Turunen-Saaresti

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|--------|--|
| 25 min | Robin Gautier , Nicolas Tauveron, Pierre Dumoulin
<i>Study of an Axial Micro-Turbine with 1D Model Including Various Fluids or Zeotropic Mixtures and Validated against Experimental Results</i> |
| 25 min | Alessandro Cappiello , Joshua A. Kelly, Piero Colonna, Matteo Pini
<i>On the verification of design guidelines for supersonic ORC vanes by means of adjoint-based shape optimization</i> |
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Session 1B – Cycle optimization, room TBA

Chair: Roberto Cipollone

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|--------|--|
| 25 min | Amalia Stainchaouer , Christopher Schiffler, Hartmut Spliethoff
<i>Off-design and voyage-based optimization of low- and medium- grade ORC systems for enhanced ocean-going vessels performance</i> |
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| 25 min | Lorenzo Galieti , Dario Alfani, Paolo Silva, Paola Bombarda, Piero Colonna, Carlo De Servi
<i>Integrated thermo-economic optimization and working fluid selection for ORC plants operating with zeotropic mixtures</i> |
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Session 1C – Carnot batteries, room TBA

Chair: Konstantinos Braimakis

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|--------|---|
| 25 min | Benoît Payebien , Nicolas Tauveron, Nadia Caney
<i>Theoretical and thermodynamic study of innovative Carnot battery types</i> |
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| 25 min | Dario Alfani , Marco Astolfi
<i>Off-Design Analysis of ORC-based Carnot Batteries: Performance Assessment and Insights into Components Design</i> |
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12:00–13:00

Lunch

13:00–14:40

Session 2A – Component modelling I, room TBA

Chair: Luca Molinaroli

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|--------|--|
| 25 min | Piotr Kolasiński , Sindu Daniarta, Dawid Sowa, Szymon Lech, Przemysław Błasiak
<i>Modelling the influence of the volumetric expander working chamber geometry on the two-phase expansion processes</i> |
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| 25 min | Saverio Ottaviano , Chiara Poletto, Lisa Branchini, Andrea De Pascale
<i>Modelling analysis of partial evaporation Organic Rankine Cycle with volumetric expander</i> |
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| 25 min | Dawid Sowa , Szymon Lech, Piotr Kolasiński, Sindu Daniarta
<i>Modelling of fin-and-tube based Thermal Energy Storage for use with Organic Rankine Cycle</i> |
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Session 2B – Experiments I, room TBA

Chair: Rubén Abbas

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|--------|---|
| 25 min | Xander van Heule , Michel De Paepe, Steven Lecompte
<i>Experimental investigation of the non-equilibrium expansion phenomena within a reciprocating expander</i> |
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| 25 min | Hsien-Ta Tsai , Jui-Ching Hsieh, Yi-Chi Hsieh
<i>Experimental Performance Analysis of a Rotary Vane Expander in Micro-ORC Systems for Low-Grade Heat Utilization</i> |
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| 25 min | Konstantinos Braimakis , Aris-Dimitrios Leontaritis, Tryfon Roumpedakis, Efstratios Varvagiannis, Ioanna Kermida, Antonis Charalampidis, Nikolaos Karkalos, Nikolaos Sarantopoulos, Sotirios Karellas
<i>Experimental demonstration of an Organic Rankine Cycle-ejector cooling cycle prototype for vessel engine waste heat recovery</i> |
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Session 2C – Market deployment I, room TBA

Chair: George Kosmadakis

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|--------|---|
| 25 min | Aitor Cendoya , Frederic Ransy, Bentao Guo, Olivier Dumont, Vincent Lemort
<i>Design, component selection and critical considerations for the development of a 50 kW_e Carnot Battery coupled to waste heat</i> |
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| 25 min | Piotr Klonowicz , Łukasz Jędrzejewski, Łukasz Antczak, Dawid Zaniewski, Piotr Klimaszewski
<i>Performance evaluation of a high-temperature ORC unit with a nominal power of 30 kW_e</i> |
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| 25 min | Christopher Schiffechner , Marco Astolfi, Sotirios Karellas, Tryfonas Roumpedakis, Marcus Budt, Maximilian Weitzer, George Kosmadakis, Vincent Lemort
<i>Bringing reversible ORC-heat pump systems into the market: A perspective on the current obstacles and future application potential</i> |
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14:40–15:30

Coffee

15:30–16:30

Poster session

16:30–18:30

Welcome reception

Wednesday 10 September 2025

08:45–09:45

Session 3A – Thermodynamics & Fluids I, room TBA

Chair: Lisa Branchini

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|--------|---|
| 25 min | Réka Kustán , Attila R. Imre
Visualization of the simple thermodynamic processes related to heat-to-power and power-to-heat cycles |
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| 25 min | Marta Zocca , Marta Pederzoli, Teemu Turunen-Saaresti, Alberto Guardone
<i>Investigation of similarity parameters in isentropic supersonic expansions of organic vapors</i> |
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Session 3B – Component optimization I, room TBA

Chair: Henrik Öhman

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|--------|--|
| 25 min | Philipp Streit , Jan Spale, Vaclav Vodicka, Vaclav Novotny, Lukas Völfl, Andreas P. Weiß, Michal Kolovratnik
<i>Design, optimization and experimental investigation of various small-scale ORC expanders in a biomass cogeneration plant</i> |
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| 25 min | Takeshi Yasunaga , Tetsuya Tashiro, Ristiyanto Adiptra, Dwiyooga Nugroho, Kevin Fontaine, Yasuhiro Ohtsu
<i>Theoretical Optimization of Plate-Type Condenser Geometry for Low-Temperature ORC: Case of Ocean Thermal Energy</i> |
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Session 3C – Heat pump technology I, room TBA

Chair: Nicolas Tauveron

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|--------|---|
| 25 min | Albert Vocel , Vaclav Novotny, Jan Spale, Vaclav Vodicka, Karel Sosna, Michal Kolovratnik
<i>Electrothermal Energy Storage Carnot Battery Demonstrator with discharging via ORC</i> |
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| 25 min | Jannik von Zabienski , Florian Kaufmann, Piero Gei, Hartmut Spliethoff, Christopher Schiffechner
<i>Working fluid/oil separation in a reversible ORC test rig with a twin-screw machine: Lessons learned and remaining challenges</i> |
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09:45–10:15

Coffee

10:15–11:00

Keynote II: Technology

11:00–12:00

Session 4A – Cycle concepts I, room TBA

Chair: Sotirios Karellas

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|--------|--|
| 25 min | James Bull , Jed Pound, James M Buick, Jovana Radulovic
<i>Variation of pinch point and approach temperature in geothermal ORC: balancing cycle efficiency and heat exchanger sizing</i> |
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| 25 min | Sindu Daniarta , Piotr Kolasiński, Attila R. Imre
<i>Design and analysis of Organic Rankine Cycle from subcritical to transcritical operations</i> |
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Session 4B – Experiments II, room TBA

Chair: Alberto Guardone

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|--------|---|
| 25 min | Joshua Bäumer , Leander Hake, Hilmar Apmann, Stefan aus der Wiesche
<i>Development of a new test section with an annular ring cascade for testing ORC turbines manufactured using powder bed fusion</i> |
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| 25 min | Matteo Majer , Adam Head, Carlo De Servi, Piero Colonna, Matteo Pini
<i>The ORCHID turbine: a test rig for experimental research on high-temperature supersonic Organic Rankine Cycle turbines</i> |
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Session 4C – Market deployment II, room TBA

Chair: Aki Grönman

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| 25 min | Vaclav Novotny , Jan Spale
<i>Potential of ORC applications for nuclear microreactors</i> |
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| 25 min | Veronica Schwarz, Andreas Schuster, Richard Aumann , Sven Schlotz, Marcel Flipse, Jonah van Sluijs, Andreas Grill, Jens-Patrick Springer
<i>Market Experience: ORC Applications in the Marine Sector</i> |
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12:00–13:00

Lunch

13:00–14:40

Session 5A – Component modelling II, room TBA

Chair: Pablo Alé Martos

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|--------|---|
| 25 min | Nicola Aldi, Michele Pinelli, Mattia Piovan, Alessio Suman, Nicola Zanini, Agostino Gambarotta, Mirko Morini , Costanza Saletti
<i>Simulating ORC expanders: CFD investigation and lumped parameter model identification</i> |
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| 25 min | Pangbo Ren , Graham Cox, Maria Vera-Morales, Stewart Watson, Albert Demargne
<i>Investigation of a novel low-speed radial re-entry turbine for small-scale waste heat recovery</i> |
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| 25 min | Nikolaos Karkalos , Konstantinos Braimakis, Aris-Dimitrios Leontaritis, Tryfon Roupedakis, Efstratios Varvagiannis, Ioanna Keramida, Antonios Charalampidis, Nikolaos Sarantopoulos, Sotirios Karellas
<i>A comparison of 2-D and 3-D Computational Fluid Dynamics approaches for the prediction of ejector devices performance</i> |
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Session 5B – Supercritical CO₂ I, room TBA

Chair: Marco Astolfi

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|--------|---|
| 25 min | Bentao Guo , Aitor Cendoya, Vincent Lemort
<i>A Fixed-Charge Control Strategy of Trans-critical CO₂ Rankine Cycle</i> |
| 25 min | Zhi Ling , Xuan Wang , Rui Wang, Yurong Wang, Hua Tian
<i>A zero-leakage all-in-one supercritical CO₂ expansion generator solution</i> |
| 25 min | Giovanny López-Muñoz , Leonard Muke, Francesco Crespi, David Sánchez
<i>Exploring the Potential of Directly Fired Supercritical Carbon Dioxide Power Cycles: A Comparative Thermodynamic Approach</i> |
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Session 5C – Heat pump technology II, room TBA

Chair: Piotr Kolasiński

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| 25 min | Jaromir Jeßberger , Florian Heberle, Echezona Obika, Dieter Brüggemann
<i>Experimental optimization of the part load behaviour of a high-temperature heat pump</i> |
| 25 min | Echezona Nnaemeka Obika , Florian Heberle, Jaromir Jeßberger, Dieter Brüggemann
<i>Thermodynamic analysis of potential working fluids for high-temperature heat pumps in cascade configuration</i> |
| 25 min | Tryfon Roumpedakis , Matthaios Papatheocharis, Antonios Charalampidis, Konstantinos Braimakis, Sotirios Karellas
<i>Artificial neural network of a reversible small scale hybrid heat pump-adsorption chiller</i> |
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14:40–15:30

Coffee

15:30–16:30

Session 6A – Cycle concepts II, room TBA

Chair: Andrea De Pascale

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| 25 min | Attila R. Imre , Réka Kustán
<i>How can self-consumption for heat engines be reduced to make them a viable alternative to utilize small heat sources for power production?</i> |
| 25 min | José Vasco Mota , Márcio Santos, Jorge André, José Ribeiro
<i>Techno-economic assessment of ORC-based Configurations for Low to Medium Temperature waste heat recovery</i> |
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Session 6B – Experiments III, room TBA

Chair: Stefan aus der Wiesche

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|--------|---|
| 25 min | Omnia Elbaz , Tala El Samad, Martin T. White, Abdalnaser Sayma
<i>Numerical and experimental study of supersonic nozzle for organic Rankine cycle turbine</i> |
| 25 min | Riccardo Gioia , Alessandro Romei, Andrea Spinelli
<i>Facility commissioning for experiments on liquid-to-vapor expansion of organic fluids</i> |
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Session 6C – Heat pump technology III, room TBA

Chair: Christopher Schiffelechner

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| 25 min | Julian Gundelwein , Marco Griesbach, Florian Heberle, Dieter Brüggemann
<i>Dynamic Behavior of an Organic Rankine Cycles for Waste Heat Recovery with focus on Heat Exchanger modeling</i> |
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| 25 min | Matteo Carlo D’Incalci , Dario Alfani, Paola Bombarda
<i>Preliminary Analysis of an Electro-Thermal Energy Storage System for Geothermal Applications</i> |
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16:30–17:30

KCORC meeting

19:00–21:00

Gala dinner

Thursday 11 September 2025

08:45–09:45

Session 7A – Cycle concepts III, room TBA

Chair: Florian Heberle

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| 25 min | Shih-Yen Hu
<i>Thermodynamic, Environmental, and Economic Analysis of a Biomass Polygeneration System with Carbon Capture</i> |
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| 25 min | Néstor Manuel Santana-Hernández , Agustín Manuel Delgado-Torres, Lourdes García-Rodríguez
<i>Advantages of the double-stage ORC configuration for solar driven polygeneration of electricity, cooling and water RO desalination with line-focus collectors</i> |
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Session 7B – Experiments IV, room TBA

Chair: Francesco Crespi

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| 25 min | Stefan aus der Wiesche , Leander Hake
<i>Experimental evidence for supersonic loss reduction through turbine blades with suction side profile bending</i> |
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| 25 min | Rodrigo Branco, João S. Pereira , José Baranda
<i>Development of an experimental setup to study the influence of heating methods on flow boiling heat transfer correlations in ORC applications</i> |
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Session 7C – Supercritical CO2 II, room TBA

Chair: Alessandro Romei

25 min **Seyedehsan Rafiee**, Aki Grönman, Antti Uusitalo, Teemu Turunen-Saaresti
*Off-design analysis on effect of temperature ratio on Supercritical Carbon Dioxide (sCO₂)
Radial Outflow Turbine (ROT) efficiency*

25 min **Arooj Arooj**, Giuseppe Petruccelli, Antti Uusitalo, Teemu Turunen-Saaresti
*Computational Fluid Dynamics Analysis of Two-Phase Flow Heat Transfer in Condenser
with Hydrocarbons*

09:45–10:15

Coffee

10:15–11:00

Keynote III: Technology

11:00–12:00

Session 8A – Thermodynamics & Fluids II, room TBA

Chair: Matteo Pini

25 min Sherryn Sherryn, Rizqi Dian Anggara, Bintang Putra Megantara, **Sindu Daniarta**, Nazrul Effendy, Piotr Kolasiński
*A selection of working fluids for ocean thermal energy conversion using partial evaporator
and two-phase expander*

25 min **Afra Bakhit**, Antti Uusitalo, Teemu Turunen-Saaresti
*Comparative Analysis of Working Fluids and Thermodynamic Parameters on ORC System
and Turbine Design*

Session 8B – Experiments V, room TBA

Chair: Hilmar Apmann

25 min **Vaclav Vodicka**, Jan Spale, Zbynek Zeleny, Vaclav Novotny, Jakub Mascuch
Experimental Experience from Long-term Operation of a Rotary Vane Expander

25 min **Pengcheng Liu**, Xuan Wang, Hua Tian, Qiyao Zuo, Weijia Meng
*Experimental study on on-board performance of ORC waste heat recovery system for
internal combustion engine*

Session 8C – Market deployment III, room TBA

Chair: Emanuele Zanetti

25 min **Giorgia Ruffato**, Diego Milesi, Luca Vanini
*The GEMINI turbine: A breakthrough in radial outflow turbine design for large-scale
geothermal application*

25 min Veronica Schwarz, Andreas Schuster, **Richard Aumann**, Sven Schlotz, Markus Lintl, Yvonne Reissner, Jonas Freischmann
Market Experience: ORC Applications in the Cement Sector

12:00–13:00

Lunch

13:00–14:40

Session 9A – Plant Dynamics & control, room TBA

Chair: Steven Lecompte

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| 25 min | Andres Hernandez , Fredy Ruiz, Vincent Lemort
<i>Data-driven nonlinear modeling for superheating degree in organic Rankine cycle systems</i> |
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| 25 min | Fabio Fatigati , Giammarco Di Giovine, Marco Di Bartolomeo, Davide Di Battista, Roberto Cipollone
<i>Development of a novel control to boost the cogenerating performances of an ORC-based unit fed by a very low-temperature hot source</i> |
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| 25 min | Moritz Westermeier, Aaron Wesemann , Arnaud Bruch, Lea Yvernault, Konstantinos Braimakis, Sotirios Karellas, Michel Beaughon, Aldo Serafino, Hartmut Spliethoff, Christopher Schifflechner
<i>Dynamic Simulation of a 2 MW ORC for Industrial Waste Heat Recovery with a Large-Scale Thermal Energy Storage System</i> |
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Session 9B – Component optimization II, room TBA

Chair: Antti Uusitalo

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| 25 min | Marco Oliveti , Giacomo Persico
<i>Development and validation of a mean-line code for design optimization and off-design analysis of Organic Rankine Cycle axial turbines</i> |
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| 25 min | Joshua Adam Kelly , Alessandro Cappiello, Matteo Pini, Piero Colonna
<i>CAD-Based Optimisation of a Supersonic Stator Vane for an ORC Expander</i> |
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Session 9C – Heat pump technology IV, room TBA

Chair: Vincent Lemort

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| 25 min | Hannah Cortnum , Maximilian Weitzer, Nora Elhaus, Jürgen Karl
<i>CO₂-based zeotropic mixtures for reversible HP-ORC systems – Exploiting temperature glide for enhanced performance</i> |
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| 25 min | Antonios Charalampidis , Nikolaos Sarantopoulos, Aris Leontaritis, Tryfon Roumpedakis, Sotirios Karellas
<i>Experimental Investigation of a Reversible Heat Pump/ORC for Combined Heating, Cooling, and Electricity Production</i> |
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14:40–15:30

Coffee

15:30–18:00

Lab tour and Company visit – SpinDrive (Lappeenranta)

Friday 12 September 2025

08:00–14:00

Technical tour to ORC site in Espoo

A bus will leave from Lappeenranta at about 08:00 and take you to the site. After the visit, the bus will continue to Helsinki Airport, arriving before 14:00. More details will be shared in the final program.