AALBORG UNIVERSITET

HORIZON EUROPE 2026/2027 CALLS

CLUSTER 5 – CLIMATE, ENERGY AND MOBILITY

AAU Fundraising & Project Management Office

TABLE OF CONTENTS

INTRODUCTION

AAU HORIZON EUROPE COMPENDIUM

Interested in finding academic partners for the upcoming Horizon Europe calls? At AAU, we have collected, mapped, and showcased AAU researchers' interest in collaborating on specific topics within the six clusters of Pillar 2 (including EU Missions & Cross-cutting activities). Each compendium displays our showcased researcher's relevant expertise within each identified topic, which makes it easy to locate AAU researchers who are interested in collaborating and providing their expertise in your next Horizon Europe proposal.

ABOUT AAU

AAU has campuses in Aalborg, Copenhagen, and Esbjerg, as well as an EU office in Brussels. We have 3.700 staff, 18.000 students and an annual turnover of DKK 3 billion.

AAU is a comprehensive university covering four faculties and 18 departments, such as Sustainability and Planning, Energy, Health Science and Technology, Computer Science, Built Environment, Politics and Society, Culture and Learning.

With problem-based learning at the heart of educational programs, AAU researchers and students are well-equipped to take on current and future societal, environmental and economic challenges.

OUR PROFILE AND DNA – WHY SHOULD YOU PARTNER WITH US?

Collaboration is heavily embedded in the DNA of AAU. We have a strong and natural collaboration with industry and the surrounding society – thus our current strategy is labeled "Knowledge for the World 2.0".

We are a mission-oriented university, with three identified AAU Missions:

1. A Sustainable Danish Energy System
2. Improved Wellbeing Among Children and Youth in Denmark
3. Improving Health Through Coherence and Individualisation

As the second best ranked engineering university in Europe, and being no. 16 globally (ranking from the U.S. News & World Report), as well as being in top 5 of universities pursuing the UN sustainable development goals (THE University Impact Rating), we are a very capable partner and collaborator.

AAU has contributed as coordinator or partner in close to 200 projects in the EU Horizon 2020 Framework Programme. For Horizon Europe we have – so far – contributed to more than 150 projects. We are setting even more ambitious targets for Horizon Europe in 2025 and going forward.

DESTINATION 1

CLIMATE SCIENCES AND RESPONSES FOR THE TRANSFORMATION TOWARDS CLIMATE NEUTRALITY

DESTINATION 1: CALLS

CALL – CLIMATE SCIENCES AND RESPONSES FOR THE TRANSFORMATION TOWARDS CLIMATE NEUTRALITY

HORIZON-CL5-2026-07-D1-02: Advancing European climate risk assessments

HORIZON-CL5-2026-07-D1-05: Improving climate and weather models for Africa

HORIZON-CL5-2027-01-D1-07: Advancing understanding, modelling and prediction of extreme events in a changing climate

HORIZON-CL5-2026-07-D1-02: ADVANCING EUROPEAN CLIMATE RISK ASSESSMENTS

Andrés R. Masegosa

Department of Architecture, Design and Media Technology
The Technical Faculty of IT and Design

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HIGHLIGHTED AAU RESEARCH GROUPS

Machine Learning Group, Department of Computer Science, Aalborg University

RELEVANT LINKS OUTSIDE ACADEMIA

Collaborations with industry on probabilistic modeling and AI applications

Member of international research networks in probabilistic machine learning

Organizer of the Nordic Probabilistic AI School (ProbAI)

AREA OF EXPERTISE

Trustworthy and Explainable AI
Deep Learning and Neural Networks
Probabilistic Programming
Modeling Uncertainty
Large-Scale Machine Learning.

Probabilistic Machine Learning for large-scale data modeling
Advance Risk Modelling with Probabilistic ML
Bayesian methods for deep learning models.

RELEVANT PROJECTS

DK-Future: Probabilistic Geospatial Machine Learning for Predicting Future Danish Land Use under Compound Climate Impacts (PI, Villum Foundation, 800K euros)
Explainable Machine Learning: A Probabilistic Approach (Co-PI, Spanish National Grant, 2020-2022)
DarkScience Project: Illuminating microbial dark matter through data science (Villum Foundation)

HORIZON-CL5-2026-07-D1-05: IMPROVING CLIMATE AND WEATHER MODELS FOR AFRICA

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HORIZON-CL5-2027-01-D1-07: ADVANCING UNDERSTANDING, MODELLING AND PREDICTION OF EXTREME EVENTS IN A CHANGING CLIMATE

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DESTINATION 2

CROSS-SECTORAL SOLUTIONS FOR THE CLIMATE TRANSITION

DESTINATION 2: CALLS

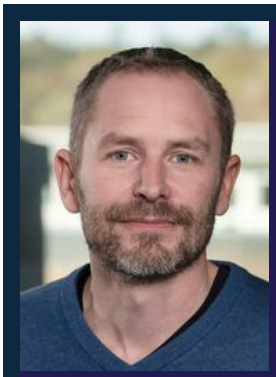
CALL – CROSS-SECTORAL SOLUTIONS FOR THE CLIMATE TRANSITION

HORIZON-CL5-2026-03-D2-02: Development of direct recycling processes (BATT4EU Partnership) (RIA)

HORIZON-CL5-2026-09-D2-04: Coordinated topic with India on recycling of EV batteries (IA)

HORIZON-CL5-2027-02-D2-05: Improvement of Adaptability, Flexibility and Efficiency of Existing Recycling Processes (BATT4EU Partnership) (IA)

HORIZON-CL5-2026-03-D2-02: DEVELOPMENT OF DIRECT RECYCLING PROCESSES (BATT4EU PARTNERSHIP)(RIA)



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HIGHLIGHTED AAU RESEARCH GROUPS

Leader of research group of Advanced Materials and Circular Solutions, AAU

RELEVANT LINKS OUTSIDE ACADEMIA

Many Industrial partners in different sectors both in Denmark and in Europe

AREA OF EXPERTISE

Development, characterization, and testing of materials (polymers, composites, metals, and ceramics).
Chemical recycling of mixed plastic waste, textiles, thermoset plastic and composite materials (e.g. PCB and plastic with flame retardants) by pyrolysis and solvolysis.
Chemical recycling of batteries and E-waste.
Separation and purification technologies
Quantitative chemical analysis
High temperature and high-pressure technologies.
Supercritical CO2 extraction.

HORIZON-CL5-2026-09-D2-04: COORDINATED TOPIC WITH INDIA ON RECYCLING OF EV BATTERIES (IA)

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Chemical recycling of batteries and E-waste.
Separation and purification technologies
Quantitative chemical analysis
High temperature and high-pressure technologies.
Supercritical CO2 extraction.

HORIZON-CL5-2027-02-D2-05: IMPROVEMENT OF ADAPTABILITY, FLEXIBILITY AND EFFICIENCY OF EXISTING RECYCLING PROCESSES (BATT4EU PARTNERSHIP)(IA)

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Separation and purification technologies
Quantitative chemical analysis
High temperature and high-pressure technologies.
Supercritical CO2 extraction.

DESTINATION 3

SUSTAINABLE, SECURE AND COMPETITIVE ENERGY SUPPLY

DESTINATION 3: CALLS

CALL – SUSTAINABLE, SECURE AND COMPETITIVE ENERGY SUPPLY

HORIZON-CL5-2026-03-D3-20: Hybrid AI-Control Framework for a next-generation grid-scale energy storage and system integration (IA)

HORIZON-CL5-2026-03-D3-21: Novel solutions for off-grid storage of renewable energy for critical infrastructures (RIA)

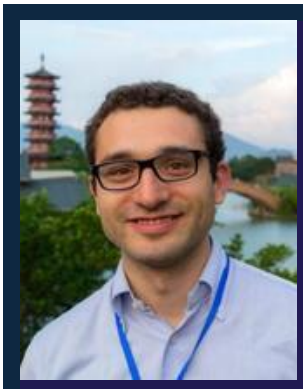
HORIZON-CL5-2026-03-D3-22: AI-driven forecasting algorithms for Grid and Consumer friendly Energy Sharing – Societal Readiness pilot (IA)

HORIZON-CL5-2026-04-Two-Stage-D3-02: Next generation of renewable energy technologies

HORIZON-CL5-2026-11-D3-05: Demonstration of solid biofuel supply and conversion to large scale CHP from fully sustainable regional value chains

HORIZON-CL5-2027-02-D3-30: Advancements in Direct Air Capture

HORIZON-CL5-2026-03-D3-20: HYBRID AI-CONTROL FRAMEWORK FOR A NEXT-GENERATION GRID-SCALE ENERGY STORAGE AND SYSTEM INTEGRATION (IA)



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HIGHLIGHTED AAU RESEARCH GROUPS

Research Group leader for Hydrogen and Electro Fuels

MEMBERSHIP OF EU PARTNERSHIPS

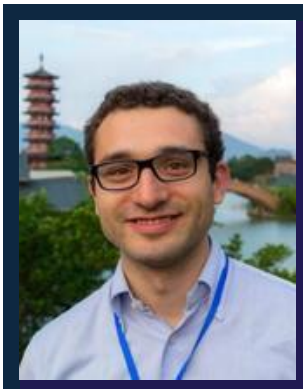
Hydrogen Europe Research
International Ammonia Energy Institute (IAEI)
IEA group on hydrogen

AREA OF EXPERTISE

Hydrogen technologies and electrofuels for reactor/cell to system integration at modelling and experimental level. Fuel cells
Electrolysis
Power to X
efuels synthesis
Thermal integration
Thermal digital twins
Expertise in synthesizing renewable fuels of nonbiological origin, including hydrogen-derived fuels and other synthetic hydrocarbons, through processes like electrolysis and carbon capture and utilization (CCU)

Development of AI-based hybrid control strategies for integrating Power-to-X (PtX) and hydrogen storage systems into the energy grid.
Dynamic modeling of electrolysis, fuel cells, and thermal systems to simulate real-time grid response.
Integration of multi-scale models (from electrochemical to system level) for optimized operation under fluctuating renewable power.
Hardware-in-the-loop testing for validation of control algorithms using laboratory-scale hydrogen systems.

HORIZON-CL5-2026-03-D3-21: NOVEL SOLUTIONS FOR OFF-GRID STORAGE OF RENEWABLE ENERGY FOR CRITICAL INFRASTRUCTURES (RIA)



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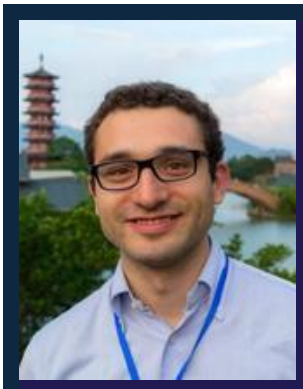
Power to X
efuels synthesis
Thermal integration
Thermal digital twins
Expertise in synthesizing renewable fuels of nonbiological origin, including hydrogen-derived fuels and other synthetic hydrocarbons, through processes like electrolysis and carbon capture and utilization (CCU)

Design of autonomous off-grid PtX systems combining electrolyzers, fuel cells, and thermal energy storage.
Modeling and optimization of hybrid storage concepts (e.g., hydrogen–heat–battery coupling).
Development of compact thermochemical reactors for ammonia or methanol synthesis as chemical storage media.
Experimental validation of small-scale off-grid demonstrators.
Techno-economic and efficiency assessment under intermittent renewable inputs.

HORIZON-CL5-2026-03-D3-22: AI-DRIVEN FORECASTING ALGORITHMS FOR GRID AND CONSUMER FRIENDLY ENERGY SHARING – SOCIETAL READINESS PILOT (IA)



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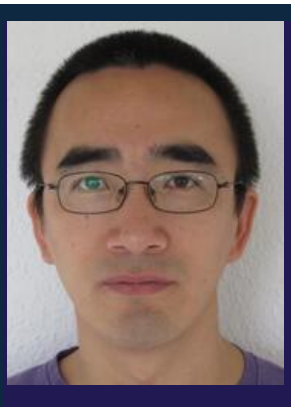
Electrolysis
Power to X
efuels synthesis
Thermal integration
Thermal digital twins
Expertise in synthesizing
renewable fuels of nonbiological origin, including
hydrogen-derived fuels and
other synthetic
hydrocarbons, through
processes like electrolysis
and carbon capture and
utilization (CCU)

Forecasting of PtX plant behavior and flexibility potential under dynamic grid conditions.
Integration of AI-based predictive control for electrolysis and fuel cell systems.
Development of digital twins to simulate and optimize energy sharing and storage strategies.
User-behavior modeling linked to energy consumption in distributed hydrogen systems.

HORIZON-CL5-2026-04-TWO-STAGE-D3-02: NEXT GENERATION OF RENEWABLE ENERGY TECHNOLOGIES



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MEMBERSHIP OF EU PARTNERSHIPS
EERA

AREA OF EXPERTISE
Thermal/fluids energy technologies
Reacting multiphase flows (e.g., bioenergy & biofuels, carbon capture & utilization, green fuels, green cement & ceramics)
Advanced CFD and digital twins
Heat transfer

RELEVANT PROJECTS
BioNETzero: Integrated oxy-combustion solutions for flexible, bio-based combined heat and power: A Negative emissions technology for a net-zero Europe (Horizon Europe project)

BEGINS: Biomass energy deployment with greater flexibility, efficiency and safety

HORIZON-CL5-2026-11-D3-05: DEMONSTRATION OF SOLID BIOFUEL SUPPLY AND CONVERSION TO LARGE SCALE CHP FROM FULLY SUSTAINABLE REGIONAL VALUE CHAINS

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Thermal/fluids energy technologies
Reacting multiphase flows (e.g., bioenergy & biofuels, carbon capture & utilization, green fuels, green cement & ceramics)
Advanced CFD and digital twins
Heat transfer

Grate-firing of biomass – Measurements, validation and demonstration
Straw co-firing in natural gas-fired power plant boilers

RELEVANT PROJECTS

BioNETzero: Integrated oxy-combustion solutions for flexible, bio-based combined heat and power: A Negative emissions technology for a net-zero Europe (Horizon Europe project)

BEGINS: Biomass energy deployment with greater flexibility, efficiency and safety

HORIZON-CL5-2027-02-D3-30: ADVANCEMENTS IN DIRECT AIR CAPTURE

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MEMBERSHIP OF EU PARTNERSHIPS
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AREA OF EXPERTISE
Thermal/fluids energy technologies
Reacting multiphase flows (e.g., bioenergy & biofuels, carbon capture & utilization, green fuels, green cement & ceramics)
Advanced CFD and digital twins
Heat transfer

Manufacturing of highly reactive supplementary cementitious materials for low-CO2 cement in a flash gas-suspension calciner.

DESTINATION 4

EFFICIENT, SUSTAINABLE AND INCLUSIVE ENERGY USE

DESTINATION 4: CALLS

CALL – EFFICIENT, SUSTAINABLE AND INCLUSIVE ENERGY USE

HORIZON-CL5-2026-09-D4-03 – Advanced data platforms to integrate whole life carbon in builiding information tools, assessments, and certification

HORIZON-CL5-2027-05-D4-06: Thermal energy optimisation and waste heat recovery of high energy demand IT rooms in buildings or small edge data centres

HORIZON-CL5-2026-09-D4-02 - Low disturbance prefabrication approaches for deep renovation of multi-storey buildings (Built4People Partnership)

HORIZON-CL5-2026-09-D4-03 – ADVANCED DATA PLATFORMS TO INTEGRATE WHOLE LIFE CARBON IN BUILDING INFORMATION TOOLS, ASSESSMENTS, AND CERTIFICATION (BUILT4PEOPLE PARTNERSHIP)

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HIGHLIGHTED AAU RESEARCH GROUPS

Buildings sustainability; Low energy buildings

RELEVANT LINKS OUTSIDE ACADEMIA

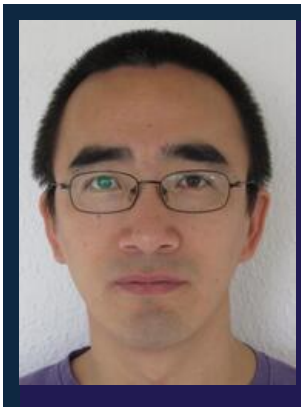
Board member of IBPSA Nordic
www.ibpsa-nordic.org/

AREA OF EXPERTISE

Low Energy Buildings, Energy Savings in Existing Buildings, Energy Optimization of Control Strategies, Energy Improvement of Buildings, Building Integration of Solar Cells, Energy Regulations and Requirements, Demonstration Projects, Measurement and Evaluation of Energy Performance of Buildings, Simulation and Calculation of Energy Consumption and Thermal Indoor Climate in Buildings.

The cross-cutting expertise of our research section, Sustainability of Buildings, covers both environmental impact of building materials and optimization of buildings energy performance. Personally, my expertise focuses on building's energy performance. I have participated in numerous European and IEA projects with focus on optimization of building's energy performance, many of these targeting net zero energy buildings.

HORIZON-CL5-2027-05-D4-06: THERMAL ENERGY OPTIMISATION AND WASTE HEAT RECOVERY OF HIGH ENERGY DEMAND IT ROOMS IN BUILDINGS OR SMALL EDGE DATA CENTRES



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MEMBERSHIP OF EU PARTNERSHIPS

EERA

AREA OF EXPERTISE

Thermal/fluids energy technologies
Reacting multiphase flows (e.g., bioenergy & biofuels, carbon capture & utilization, green fuels, green cement & ceramics)
Advanced CFD and digital twins
Heat transfer

RELEVANT PROJECTS

WINDICE: Reliable prediction of icing on wind turbines and icing-induced power loss

HORIZON-CL5-2026-09-D4-02 - LOW DISTURBANCE PREFABRICATION APPROACHES FOR DEEP RENOVATION OF MULTI-STOREY BUILDINGS (BUILT4PEOPLE PARTNERSHIP)

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HIGHLIGHTED AAU RESEARCH GROUPS

Buildings sustainability; Low energy buildings

RELEVANT LINKS OUTSIDE ACADEMIA

Board member of IBPSA Nordic
www.ibpsa-nordic.org/

AREA OF EXPERTISE

Low Energy Buildings, Energy Savings in Existing Buildings, Energy Optimization of Control Strategies, Energy Improvement of Buildings, Building Integration of Solar Cells, Energy Regulations and Requirements, Demonstration Projects, Measurement and Evaluation of Energy Performance of Buildings, Simulation and Calculation of Energy Consumption and Thermal Indoor Climate in Buildings.

RELEVANT PROJECTS

I have participated in several related renovations of existing buildings, among those several EU projects:
EU project RIBuild - Internal Insulation in Historic Buildings (2015-2020). www.ribuild.eu

EU-project EPISCOPE - Energy Performance Indicator Tracking Schemes for the Continuous Optimisation of Refurbishment Processes in European Housing Stocks (2013 –2016). www.building-typology.eu

EU project REQUEST - REnovation through QUality supply chains and EPC Standards, (2010-2012). www.building-request.eu.

DESTINATION 5

CLEAN AND COMPETITIVE SOLUTIONS FOR ALL TRANSPORT MODES

DESTINATION 5: CALLS

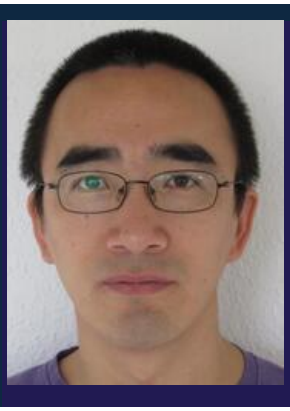
CALL – CLEAN AND COMPETITIVE SOLUTIONS FOR ALL TRANSPORT MODES

HORIZON-CL5-2026-06-Two-Stage-D5-10: Disruptive Technologies and Innovative Concepts for Energy Saving Onboard of long-distance ships (ZEWT Partnership)

HORIZON-CL5-2026-05-D5-11: Scalability of Solid Oxide Fuel Cells for waterborne transport (topic in collaboration between the Zero-Emission Waterborne partnership and the Clean Hydrogen Joint Undertaking) (RIA)

HORIZON-CL5-2027-03-D5-14: Onboard renewable energy solutions and energy saving measures to reduce the fuel consumption of ships by at least 55% (ZEWT Partnership)

HORIZON-CL5-2026-06-TWO-STAGE-D5-10: DISRUPTIVE TECHNOLOGIES AND INNOVATIVE CONCEPTS FOR ENERGY SAVING ONBOARD OF LONG-DISTANCE SHIPS (ZEWT PARTNERSHIP)



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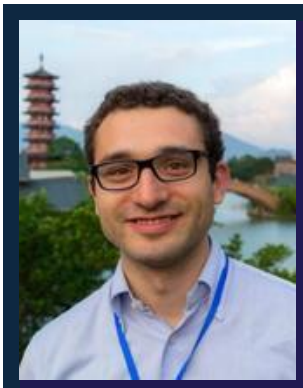
Heat transfer

RELEVANT PROJECTS

Igniting a net-zero future: Developing ammonia marine burners through advanced modelling and virtual testing

HERMES: Heat and emissions reduction in marine engines for sustainability



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Electrolysis
Power to X
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Thermal integration
Thermal digital twins
Expertise in synthesizing
renewable fuels of nonbiological origin, including
hydrogen-derived fuels and
other synthetic
hydrocarbons, through
processes like electrolysis
and carbon capture and
utilization (CCU)

Thermal management and waste heat recovery systems for onboard energy saving.
Design of hybrid fuel cell–battery propulsion concepts with integrated heat recovery.
System modeling and energy optimization under dynamic ship operation profiles.

HORIZON-CL5-2026-05-D5-11: SCALABILITY OF SOLID OXIDE FUEL CELLS FOR WATERBORNE TRANSPORT (TOPIC IN COLLABORATION BETWEEN THE ZERO-EMISSION WATERBORNE PARTNERSHIP AND THE CLEAN HYDROGEN JOINT UNDERTAKING) (RIA)

Vincenzo Liso

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CONTACT INFORMATION

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HIGHLIGHTED AAU RESEARCH GROUPS

Research Group leader for Hydrogen and Electro Fuels

MEMBERSHIP OF EU PARTNERSHIPS

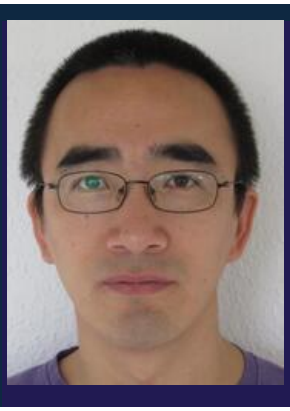
Hydrogen Europe Research
International Ammonia Energy Institute (IAEI)
IEA group on hydrogen

AREA OF EXPERTISE

Hydrogen technologies and electrofuels for reactor/cell to system integration at modelling and experimental level. Fuel cells
Electrolysis
Power to X
efuels synthesis
Thermal integration
Thermal digital twins
Expertise in synthesizing renewable fuels of nonbiological origin, including hydrogen-derived fuels and other synthetic hydrocarbons, through processes like electrolysis and carbon capture and utilization (CCU)

Development of multiscale SOFC models for performance and degradation prediction under marine operation.
Thermal management optimization for SOFC stacks and balance-of-plant integration.
Experimental characterization of SOFC components and subsystems.
Integration of SOFC systems with heat recovery and onboard hydrogen/ammonia fuel processing units.

HORIZON-CL5-2027-03-D5-14: ONBOARD RENEWABLE ENERGY SOLUTIONS AND ENERGY SAVING MEASURES TO REDUCE THE FUEL CONSUMPTION OF SHIPS BY AT LEAST 55% (ZEWT PARTNERSHIP)



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MEMBERSHIP OF EU PARTNERSHIPS

EERA

AREA OF EXPERTISE

Thermal/fluids energy technologies
Reacting multiphase flows (e.g., bioenergy & biofuels, carbon capture & utilization, green fuels, green cement & ceramics)
Advanced CFD and digital twins
Heat transfer
Improving ship propeller efficiency via optimum design of propeller boss cap fins.

RELEVANT PROJECTS

Igniting a net-zero future: Developing ammonia marine burners through advanced modelling and virtual testing

HERMES: Heat and emissions reduction in marine engines for sustainability

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Electrolysis
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efuels synthesis
Thermal integration
Thermal digital twins
Expertise in synthesizing renewable fuels of nonbiological origin, including hydrogen-derived fuels and other synthetic hydrocarbons, through processes like electrolysis and carbon capture and utilization (CCU)

Development of integrated onboard renewable energy systems (solar, wind, hydrogen-based). Design of heat recovery and management systems to minimize waste energy. Modeling and optimization of combined renewable and fuel cell propulsion systems. Integration of Power-to-X derived fuels (ammonia, methanol) with renewable hybrid systems.

DESTINATION 6

SAFE, RESILIENT TRANSPORT AND SMART MOBILITY SERVICES FOR PASSENGERS AND GOODS

DESTINATION 6: CALLS

CALL – SAFE, RESILIENT TRANSPORT AND SMART MOBILITY SERVICES FOR PASSENGERS AND GOODS