



**NET-ZERO
INDUSTRIES**
MISSION



Winners and runners-up

Preface

Around the world, governments and industries are accelerating efforts to cut CO₂ emissions from heavy industry. While countries face different starting points and local conditions, they are united by a common need: strengthening cooperation to scale innovative solutions. The Net-Zero Industries Mission (NIM) and its partners firmly believe that progress toward climate neutrality depends on exchanging knowledge, transferring technologies, and learning collectively.

In this spirit, NIM launched the Net-Zero Industries Award in 2023 as the first global competition dedicated to excellence in industrial decarbonisation. Now entering its third edition, the award continues to highlight and celebrate those who are redefining what is possible in transforming energy-intensive sectors. Their ingenuity and commitment are helping to shape the foundations of a net-zero industrial future.

This booklet presents the finalists and winners of the 2025 Net-Zero Industries Award. From a pool of 83 submissions across 22 countries, an independent international jury selected these individuals and projects for their exceptional scientific, technological, and practical innovations in cutting industrial emissions. Their achievements illustrate not only technical excellence but also the global momentum driving innovation, partnership, and impact across industries.



Category YOUNG TALENTS

WINNER



Dr Saravanan Janakiram

Aqualung Carbon Capture, Norway

Saravanan Janakiram is CTO of Aqualung Carbon Capture, where he leads the translation of advanced CO₂-separation membranes into commercial systems across Europe and the US. Trained as a chemical engineer (PhD, NTNU) with dual Erasmus Mundus master's degrees, he has authored work on membranes, cement-flue-gas pilot trials, process optimization, and system integration, earning honors such as the European Membrane Society's Patrick Meares Award and invited talks at major conferences. At Aqualung, he advanced from Product/R&D leadership to CTO, overseeing multi-million-euro public-private projects (e.g., AMbCS, HICCUPS)

and a major joint development with a membrane manufacturer. He also led the technology team supporting large equity raises with industrial investors and partnerships for accelerated deployment.

Statement of the Jury

Dr. Saravanan Janakiram demonstrates the successful transition of carbon-capture technology from academic research to pilot implementation and onward to commercialisation. Combining deep scientific excellence with strong industrial leadership, he has advanced innovative membrane-based CO₂ separation systems relevant across Net-Zero Industries Mission sectors, including cement, steel, and shipping. His work stands out for its clarity, technical rigour, and effective dissemination, offering both a solid scientific foundation and tangible industrial relevance. Dr. Janakiram's achievements illustrate how young scientists can shape the future of clean technology through excellence, persistence, and impactful innovation.



1st RUNNER-UP

National Winner Australia



Dr Ming Jiang Gan

Postdoctoral Fellow, University of New South Wales, Australia

Dr Gan is a Postdoctoral Fellow at the University of New South Wales with years of experience in low-carbon ironmaking research and biomass upgrading. He specialises in process modelling using heat and mass balance (HMB) and computational fluid dynamics (CFD) approaches to develop retrofit-compatible decarbonisation technologies for existing blast furnace operations. Dr Gan's research has been presented at nine scientific conferences (six domestic and three international), and he is the recipient of the ECA Startup Fellowship.

2nd RUNNER-UP

National Winner United Kingdom



Dr. Natanael Otavio Favero Bolson

MTC Manufacturing Futures Fellow, University of Birmingham, UK

Dr Bolson is an MTC Manufacturing Futures Fellow at the University of Birmingham. His research focuses on sustainable manufacturing, industrial decarbonisation, and resource efficiency. He develops process-level frameworks to map industrial energy and material flows, quantify efficiency limits, and assess the integration of electrification and hydrogen. He has published in leading journals (PNAS, Applied Energy, Energy) and contributed to industrial decarbonisation initiatives. His work provides actionable pathways to accelerate net-zero transitions in energy-intensive industries.



National Winners YOUNG TALENTS

National Winner Austria



Rene Baumann

AEE INtec

As a scientific researcher, Rene Baumann conducted energy audits according to DIN EN 16247 in Botswana, Namibia, Austria, Spain, Portugal and South Africa. He served as a trainer for energy audits, renewable energies and monitoring within the SOLTRAIN+ program in Botswana, South Africa, Namibia, Lesotho and Zimbabwe. His work also included the installation and monitoring of solar thermal systems in SOLTRAIN+ projects in Botswana, Namibia and Zimbabwe. In addition, he contributed to developing concepts and transformation pathways for the decarbonization of the manufacturing industry and worked as a trainer for energy engineering in the "GreenHeat" training program.

National Winner Finland



Sai Kagitham

University of Oulo

Sai Kagitham holds a Master's degree in Environmental Engineering with a focus on Sustainable Energy Systems. His research, part of the HYDRA project at the University of Oulo, compares hydrogen and battery storage pathways through a cradle-to-use life cycle assessment (LCA). The study evaluates three configurations—two hydrogen-based and one battery-based—against key environmental indicators such as global warming potential and resource depletion. Results show battery systems generally perform better due to higher efficiency, providing evidence-based insights for sustainable energy storage design.



Category FEMALE INNOVATORS

WINNER

National Winner Canada



Dr Christine Garbado

Co-Founder & CTO, Cert Systems Inc.



Dr. Garbado is the Co-Founder and Chief Technology Officer of CERT Systems, a company pioneering sustainable chemical production by eliminating reliance on fossil fuels. She leads the development of solutions that transform captured CO₂, water, and renewable electricity into essential chemicals such as ethylene—one of the most widely used building blocks in industry. This approach enables existing infrastructure to remain intact while significantly reducing emissions. Her vision originated from postdoctoral research at the University of Toronto on CO₂ electrolysis and has since propelled CERT to global recognition, including being a top-10 finalist in the NRG COSIA Carbon XPRIZE and receiving the Breakthrough Energy Fellowship.

Statement of the Jury

Dr. Gabardo exemplifies the spirit of the Female Innovator Award—combining scientific excellence, entrepreneurial drive, and a clear vision for accelerating the transition to a carbon-neutral chemical industry. Her work transforms CO₂ from waste into a feedstock for renewable chemicals and fuels, integrating renewable power and circular carbon use within existing industrial systems. Moving far beyond the academic baseline, she has translated cutting-edge science into a viable industrial process with strong decarbonisation potential.



1st RUNNER-UP



Dr Christine Gröll

Dr. Gröll is an innovative leader who successfully translates research findings into practice. As the head of a manufacturing company, she drives the introduction of alternative materials in clinker production with the aim of reducing CO₂ emissions. Through the development of new approaches for automating raw material control and process optimization, she has achieved promising results. Her expertise is based on solid research, practical trials, and strong academic-industrial networks.

2nd RUNNER-UP



Dr Maria Juenger

President, American Concrete Institute & Professor, University of Texas

Dr. Juenger's career has significantly advanced low-carbon cement production, with pioneering research on alternative binders and SCMs shaping international standards and driving decarbonization in a highly carbon-intensive industry. By bridging materials chemistry with practical applications, she has linked research to industrial practices. Dr. Juenger also exemplifies inclusive leadership, mentoring many women and emerging engineers globally.



National Winners FEMALE INNOVATORS

Austria



Sara Vecchiato, PhD

IFA Tulln

Dr. Sara Vecchiato is a pioneering leader in circular bioeconomy innovation. Her groundbreaking work transforms diaper waste, traditionally incinerated, into reusable raw materials through enzyme-based recycling. By combining fruit-waste-derived enzymes with a low-energy, decentralized process, her team has created a replicable model that bridges biotechnology and industrial decarbonisation. Dr. Vecchiato's leadership also fosters women in science, inspiring impactful research that links sustainability with inclusivity. Her work demonstrates significant environmental and cost-saving potential for European healthcare systems.

Australia



Zhila Amir Zadeh

MCI Carbon

Zhila Amir Zadeh presents a scalable, credible approach to industrial carbon utilization, transforming CO₂ into durable materials. It bridges research with commercial deployment, supported by pilot demonstrations and partnerships with major emitters. The work advances circular carbon thinking by integrating capture, conversion, and market uptake, proving that mineral carbonation is a viable industrial route for reducing emissions in cement and heavy industries. She led product development, overcoming challenges to demonstrate that carbon utilization can move beyond the lab to real-world applications.



United Kingdom



Dr Christine Enowmbi Tambe

Carbon Capture Machine

Dr. Christine Enowmbi Tambe is an innovative scientist who has developed a low-carbon, hydrogen-based process for copper recovery from electronic waste, presenting a sustainable alternative to traditional smelting. Her work aligns with industrial decarbonisation objectives and enhances metal supply chain sustainability. In addition to her technical expertise, Dr. Tambe is committed to mentoring and promoting inclusion in an underrepresented field. Her contributions demonstrate the potential of early-career leadership in addressing both climate and equity challenges, with future plans to scale and commercialize her pioneering technology.



1st RUNNER-UP

Flue2Chem

Unilever, SCI, BASF, Croda, JM, P&G, Reckitt, CCUI, CCSL, Tata Steel, Confederation of Paper Industries, Holmen, UPM, CPI, LanzaTech, University of Surrey, University of Sheffield



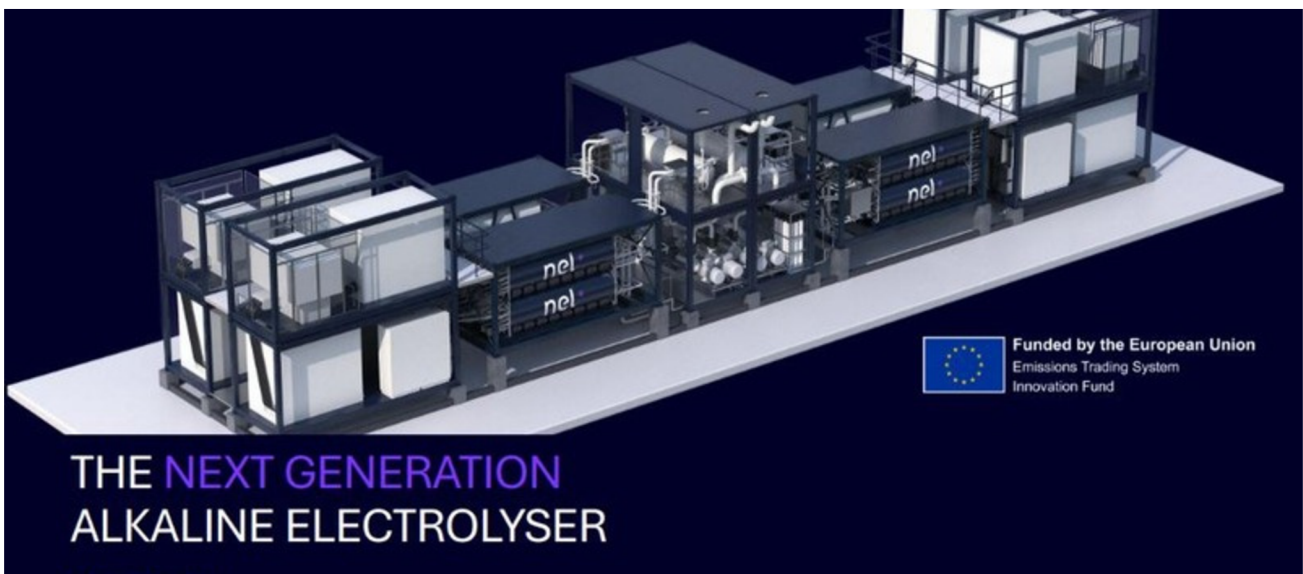
Flue2Chem is a collaborative R&D project, funded by Innovate UK, aimed at converting carbon dioxide (CO₂) emissions from UK industries into valuable chemicals, reducing dependence on fossil carbon. The project involved 12 commercial organizations, universities, and government bodies. It successfully demonstrated the conversion of CO₂ from paper mills into platform chemicals like ethylene oxide, which were then used in products such as detergents and paints. Flue2Chem showcases the potential of carbon capture and utilization (CCU) technologies in driving sustainable innovation and advancing the transition to net-zero.



2nd RUNNER-UP

Automized Manufacturing of Next Generation Pressurized Alkaline Electrolyser

Nel Hydrogen



The pressurized electrolyser (PE) project aims to develop the most energy-efficient and resource-efficient hydrogen production system. Key innovations include a modular, compact design, pressurized operation, and rapid response to renewable energy inputs, making it ideal for integration with renewable sources. The first phase of the 1 GW facility will be completed by 2026, with plans to expand to 4 GW by 2028. This project is a crucial step toward large-scale, sustainable hydrogen production and advancing decarbonization.



National Winners OUTSTANDING PROJECTS

Austria



Green Bricks – The Carbon-Neutral Brick Factory

Wienerberger AG, Wienerberger Österreich GmbH, AIT
Austrian Institute of Technology GmbH



GreenBricks is a pioneering project that sets new global standards in brick manufacturing. At Wienerberger's demonstration plant in Uttendorf, Austria, an 85-meter-long electrified tunnel kiln is powered entirely by green electricity. The project incorporates energy-efficient measures, such as industrial heat pumps for brick drying, and innovative clay mixtures.

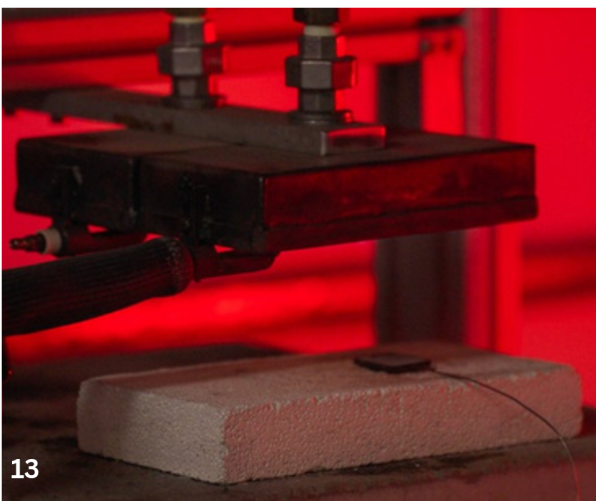
GreenBricks reduces CO₂ emissions by 88%, cutting 7,340 tons of CO₂ annually, and lowers primary energy demand by 30%, demonstrating a major step towards sustainable brick production.

Australia



Innovative Beneficiation Technologies for Green Ironmaking

Alfonso Chinnici, Wei Saw, Nigel Cook, Mario Magaldi, Fulvio Bassetti, Gus Nathan, University of Adelaide, Magaldi Power, HILT CRC



This project aims to develop a low-carbon, cost-effective thermal processing technology for upgrading low-grade Australian iron ores, addressing challenges in both traditional and green steelmaking. Using high-flux radiation from renewable sources, the process efficiently removes impurities and increases iron content to 60-66%, making it suitable for green steel production. Over the next three years, the project will scale up from laboratory to sub-pilot scale, showcasing international collaboration to create sustainable solutions for ironmaking and efficient ore processing.



Canada



First-of-Its-Kind 200,000 Tonne per Year Low-Carbon Cement Substitute Plant in North America

EnviCore Inc.



EnviCore Inc. is pioneering sustainable construction with a commercial-scale plant producing low-carbon cement substitutes. The core innovation is a patented thermo-chemical activation process that transforms industrial by-products and local minerals into high-performance materials, reducing CO₂ emissions by up to 90% compared to traditional cement.

Operating at lower temperatures and avoiding limestone calcination, the process is energy-efficient and environmentally superior. With secured offtake agreements and strong market traction, the project promises significant CO₂ savings and regional economic benefits.

China



Si+ Hydrogen Generator Set

EPRO Advance Technology Ltd

The project introduces a novel solid-state hydrogen generation material, offering potential for safe, distributed energy and heat production. With applications across construction power, hydrogen refueling, and water treatment, it utilizes silicon-based technology for carbon-neutral energy generation. The material, especially when using recycled silicon, promises significant environmental benefits and could become the world's first long-duration energy storage solution. While its real-world impact is still under evaluation, the project outlines a promising path for future development, including cost and emission reductions





Germany



ReConcrete – circular concrete with CO₂ mineralization

Heidelberg Materials AG, Global Research, Development & Innovation



The ReConcrete project addresses decarbonization and resource preservation by fully recycling concrete and cement, including capturing process CO₂ emissions. It introduces three innovative steps: selective separation of waste concrete to recover high-quality materials, enforced carbonation to mineralize CO₂ into stable

calcium carbonate, and using Recycled Concrete Paste (RCP) to replace up to 30% of clinker in cement production. This approach can reduce CO₂ emissions by up to 50%, while saving virgin raw materials and turning waste into valuable inputs. Supported by patents and industrial partners, ReConcrete is a major step toward sustainable concrete production



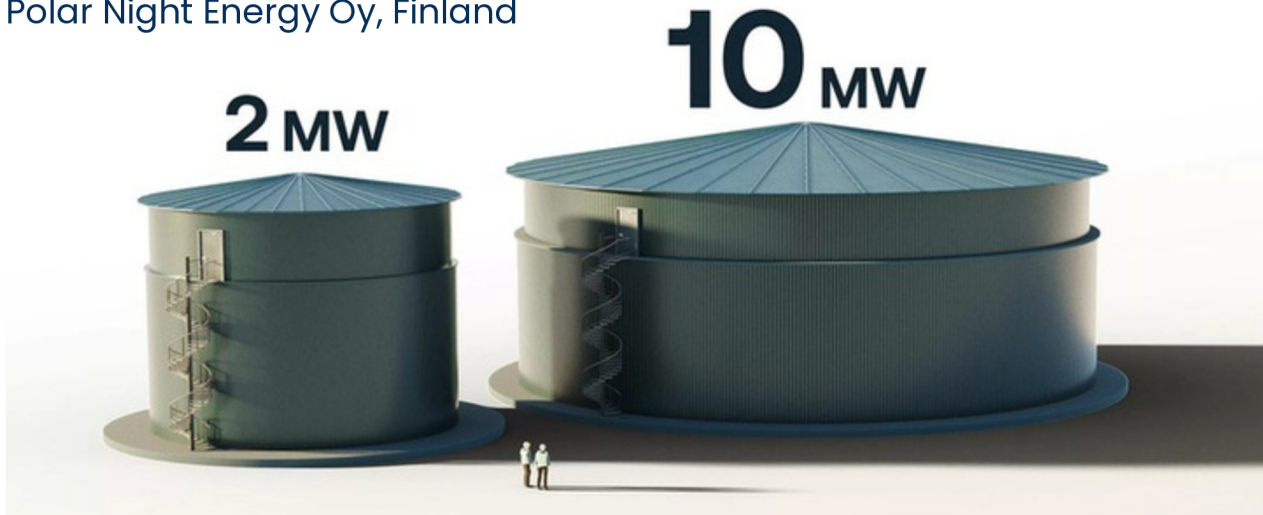
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Category SPECIAL PRIZE

WINNER

Sand Battery – Industrial Scale Thermal Energy Storage for Decarbonizing Heat

Polar Night Energy Oy, Finland



Polar Night Energy's Sand Battery is the world's first commercial sand-based thermal energy storage system, pioneering a breakthrough approach to decarbonising industrial heat and district heating; sectors that together account for around one-fifth of global greenhouse gas emissions. The Sand Battery stores surplus renewable electricity as high-temperature heat in a sand or by-product medium, enabling multi-day to multi-week storage and delivering reliable, emission-free energy when it is most needed.

Statement of the Jury

The Sand Battery is an outstanding, innovative technology for high-temperature thermal energy storage, using crushed soapstone, a by-product from fireplace manufacturing. This circular economy solution eliminates the need for scarce or toxic materials and supports energy independence by reducing reliance on imported fuels. With proven commercial units and scalability across industries, the technology can cover 36% of global industrial process heat demand. A 1 MW plant in Finland already reduces CO₂ emissions by 160 tonnes annually, demonstrating its exceptional potential for decarbonizing energy-intensive industries



Members of the Expert Jury

The Net-Zero Industries Award team would like to express sincere appreciation to the expert jury for their meticulous evaluation of the 83 submissions. Composed of members from around the world, the jury dedicated their time, effort, and expertise, all of which have been instrumental to the success of this initiative.

Outstanding Projects:

Mercedes Maroto-Valer (UK), Eric Aries (European Commission), Cecile Seguinidad (FR), Jordan Parham (AU), Michalakakis Charalampos (UK), Johanna Mossberg (SWE), Michio Kondo (JPN).

Female Innovators:

Nicole Warkotsch (CA), Begonia Figuera (UAE), Frances Buckingham (UK), Felipe Sanchez (ES), Christiane Egger (AUT)

Young Talents:

Thabo Hlalele (SA), Mel Jan Singh (UK), Zafar Samadov (UAE), Kate O'Callaghan (AU), Collete Ng (CA)



Imprint

Publisher

Mission Innovation Net Zero Industries Mission.

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Disclaimer

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Industrie Award 2025

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