

Vahterus Joins New Research Consortium to Explore Hydrogen-Argon Power Cycle for Net-Zero Power Generation

Vahterus is taking part in the Integrated Hydrogen-Argon Power Cycle (iHAPC) project, led by the University of Vaasa. The programme aims to revolutionise the energy sector by showcasing a sustainable hydrogen-argon power cycle (H-APC) at pilot scale. This concept targets unprecedented power-generation efficiency with net-zero emissions.

The hydrogen-argon power cycle could significantly impact the energy sector by enabling the full valorisation of green hydrogen. This process involves burning hydrogen under an argon atmosphere with oxygen obtained from electrolysis, raising the efficiency of hydrogen combustion by 10–20 percentage points and allowing net-zero emissions. Water remains virtually the only combustion product.

The three-year iHAPC project (2025–2027) has a total budget of 8.55 million euros, primarily funded by Business Finland, with the remaining funds provided by participating companies and research organisations. The project will strengthen the global presence of Finnish technologies in sustainable power generation. 'The University's role is crucial in advancing innovative energy solutions with a strong focus on sustainability', says Professor **Maciej Mikulski** from Vaasa. Mikulski is leading the Efficient Powertrain Solutions (EPS) and acts as the responsible leader of the iHAPC project.

In addition to the University of Vaasa, the project involves VTT Technical Research Centre of Finland and University of Oulu. Industrial partners include Wärtsilä Finland Oy, Parker Hannifin Manufacturing Finland Oy, Vahterus Oy, Vaisala Oyj and TotalEnergies SE. 'The collaboration between research partners and industrial companies is important in achieving net-zero power generation', says **Kalle Vähätalo**, R&D Manager at Vahterus. 'Vahterus will conduct heat-exchanger tests and simulations within the project.'

The iHAPC consortium partners will bring their key knowledge areas to the table, with companies developing enabling technologies and research organisations providing prototyping and upscaling tests. The project will culminate with a demonstration of the H-APC technology.

More information:

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