PRESS RELEASE

ELECTRA

Electrification of high temperature and flexible technologies
for transforming cement, lime and pulp industry

ELECTRA Project Pioneers Sustainable Future with Electrified Cement, Lime, and Pulp Industries

[Jyväskylä, January 2024] - In the quest for a greener tomorrow, the ELECTRA project emerges as a beacon of innovation and sustainability, proudly financed by the European Union's Horizon Europe research and innovation program under grant agreement No. 101138392. By harnessing the power of electricity, ELECTRA pioneers a groundbreaking approach to revolutionize the cement, lime, and pulp industries. This transformative technology promises to reshape the landscape of industrial production, offering emission-free alternatives that propel us towards a more sustainable future.

The journey of ELECTRA began with a momentous kick-off meeting held at VTT's premises in Finland on January 30th and 31st, 2024. Amidst the backdrop of excitement and anticipation, Mr. Toni Pikkarainen, Coordinator of the ELECTRA project, eloquently stated, "Replacing combustion processes with electricity-based solutions and significantly increasing emission-free electricity production is a crucial step in mitigating climate change."

ELECTRA's visionary approach focuses on developing and validating real-life, electrically heated production processes on a multi-megawatt scale, capable of reaching temperatures up to 2000°C. Through the ingenious use of low-emission electricity to replace combustion in decomposing calcium carbonate, and by capturing resulting carbon dioxide emissions, ELECTRA holds the key to virtually eliminating carbon emissions from these crucial sectors, marking a monumental shift in industrial practices.

The impact of ELECTRA is nothing short of remarkable. Successful implementation of the ELECTRA concept will eliminate fuel-related CO_2 emissions, and in addition, unavoidable calcination-related CO_2 is captured efficiently and at low costs, resulting in over 90% total CO_2 reduction and even enabling negative CO_2 emissions across the targeted industries. Not only does ELECTRA pave the way for significant environmental benefits, but its platform-based solutions also offer modularity and scalability. This means that both new electric installations and the revitalization of existing ones can be seamlessly integrated, ushering in a new era of sustainability.

Moreover, the implementation of ELECTRA technologies has the potential to accelerate electrification efforts by up to 5 years, demonstrating the project's commitment to driving progress swiftly and efficiently. As we stand on the cusp of a pivotal transition towards cleaner, more sustainable industrial practices, ELECTRA stands as a testament to the power of innovation in combatting climate change.

In essence, ELECTRA is not just a project—it's a bold declaration of our collective commitment to a better, greener future for generations to come. With the potential to reduce annual European fossil fuel use by millions of tonnes and significantly lower CO_2 emissions from targeted industries, ELECTRA sets the stage for a more sustainable industrial revolution.

ELECTRA partners in the kick-off meeting on 30th January 2024 in Jyväskylä, Finland.

About ELECTRA

The ELECTRA consortium comprises partners with multi-domain knowledge and expertise and consists of 17 partners from 8 countries. They span across the overall cement, lime and pulp process industry value chain: basic and applied research, technology providers, end users/investors, societal sciences and business creation.

VTT TECHNICAL RESEARCH CENTRE OF FINLAND LTD has 80 years of experience in cutting-edge scientific innovation highlighted by its inter-disciplinary and cross-sectional approach. In ELECTRA we focus on coordination and management, concept development and assessment, process unit modelling and scale-up, plant level simulation and optimisation, experimental work on resistively and plasma heated calciners.

HEIDELBERG MATERIALS CEMENT SVERIGE AB is one of the world's largest integrated manufacturers of building materials and solutions with leading market positions in cement, aggregates, and ready-mixed concrete. In ELECTRA we participate in most of the activities, but the focus is on experimental work with plasma heating up to 1 MW effect.

LHOIST is a world leading producer of lime, dolime and mineral solutions that operates 165 sites and terminals in over 25 countries for an ever-growing range of applications. The company has been active in the sector since 1889. In ELECTRA we will contribute to testing and adapting of electrification strategies suitable to produce lime products like quicklime and dolime in the different reactor setups to be built during ELECTRA.

STORA ENSO AB is a global leading Pulp and Paper company. In ELECTRA, we focus on verifying that the technologies used gives products with the needed properties to be useable in White Liquor Plants in the Kraft pulp sector and to support in the experimental work. We will also support with our extensive industrial knowledge in the field to the up-scaling, business development and to adapt the modelling in the project to the specific needs in the Kraft Pulping industry.

Humboldt Wedag GmbH is a leading developer and supplier of machines and equipment for the manufacture of cement and cement clinker. We will contribute to the evaluation of electrified and hybrid full-scale plant process concepts and configurations, process unit technologies, and auxiliary equipment.

UNIVERSITETET I SOROST-NORGE has cooperated closely with the industry on several national research projects related to process optimisation, emission reduction, CO_2 capture and electrification during the last 20 years. We will contribute to the preparing and testing of the electrified BFB calciner, and will also contribute to defining KPIs, performing mass and energy

balances of different electrification concepts and evaluating the techno-economic potential of these technologies.

SINTEF AS is one of the major independent research organisations in Scandinavia. In ELECTRA we will develop the "high enthalpy torch", build a rotary kiln and test this set-up for different raw materials for the cement, lime and pulp process industries, and lead the WP6 on impact assessment.

CHALMERS TEKNISKA HOGSKOLA AB has a strong background in applied energy engineering linked to industrial high-temperature processes. In ELECTRA we will focus on experimental and modelling work connected mainly to kilns in the 300 kW scale as well as in demonstration scale, 1 MWe. The focus area will be heat transfer and radiative conditions.

UMEÅ UNIVERSITET has a strong tradition in high temperature inorganic chemistry research, collaborating with cement and lime industries since 2007. We contribute to ELECTRA mainly with research on product quality evaluation and high temperature phase chemistry, including laboratory analysis and numerical models.

ANDRITZ OY is a world leading supplier of pulp mill processes and process equipment including rotary lime kilns and fluidised bed equipment. An ambition of Andritz in this project is to test different methods of electrification of rotary and fluidised bed calciners for further development of these sub-processes and their equipment to fit pulp mill environment.

KANTHAL AB is expert in industrial electric heating technology and resistance materials, providing products and solutions to a wide range of industries on a global scale. In ELECTRA, we will develop and deliver protype gas heaters capable to heat the gas up to 1200°C and the embedded resistive heating elements for fluidised bed applications and participate in technology commercialisation and business planning.

ABB (ABB OY and ABB SCHWEIZ AG) is global technology leader in electrification and automation, enabling a more sustainable and resource-efficient future. In ELECTRA, ABB is involved in cement industry related tasks, where ABB covers the entire process from the quarry to dispatch with optimised electrification and automation solutions.

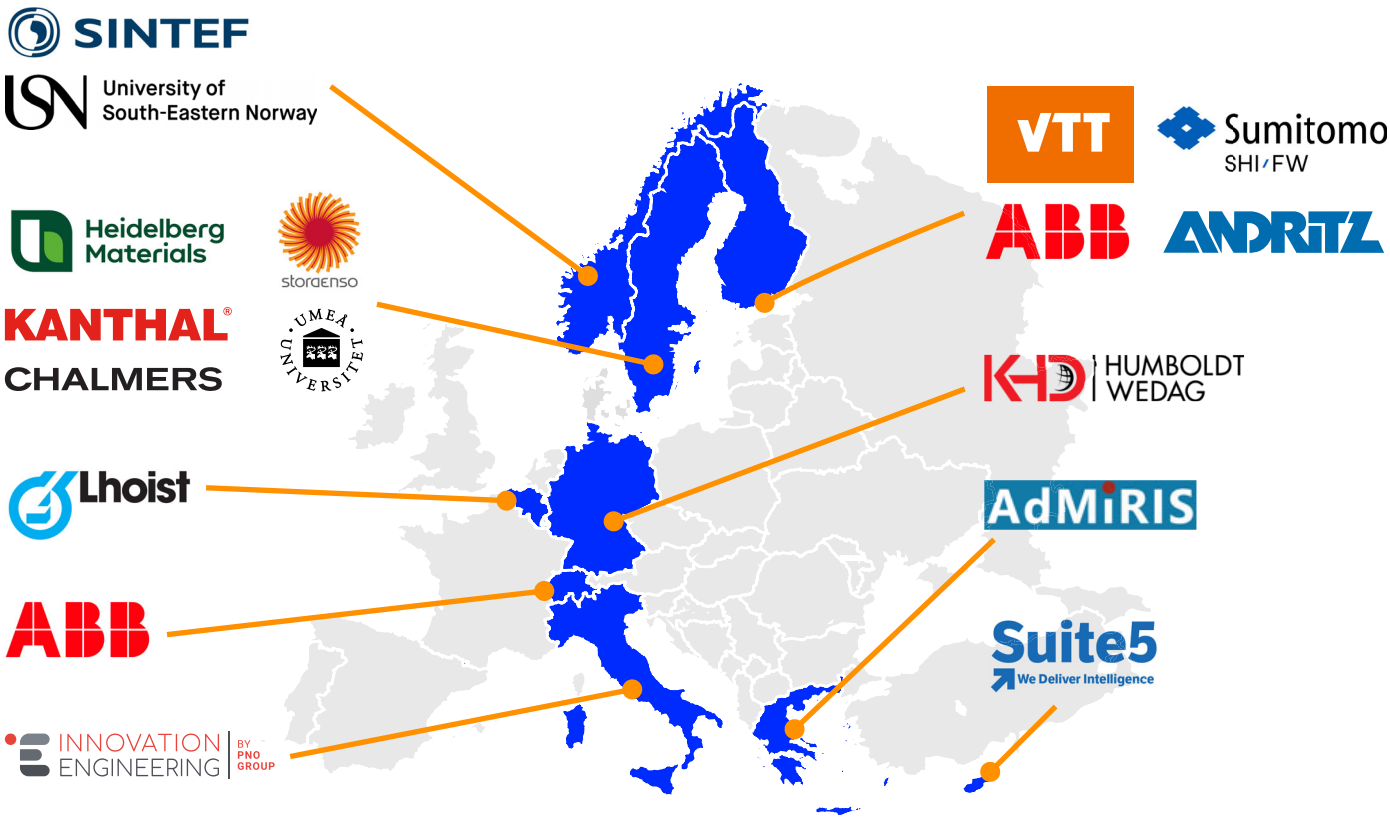
SUMITOMO SHI FW ENERGIA OY is the world leader in fluidised bed boiler technology (CFB/BFB), which has superior multifuel capabilities and low emissions. In ELECTRA we develop solutions for the electrified fluidised bed calciner, technology scale-up for commercial applications and creation of business plans for new products.

ADVANCED MINERALS AND RECYCLING INDUSTRIAL SOLUTIONS IKE is an engineering and consulting firm, specialised in the fields of energy, raw materials sector, industrial and

infrastructure market. In ELECTRA we lead exploitation, business modelling and LCA activities.

INNOVATION ENGINEERING SRL is an IT company, part of PNO Group. It focuses its research and development activities on Information Retrieval and Extraction, Natural Language Processing, big data, and User Experiences. It will support ELECTRA with its expertise in website and platform development to ensure that results are well disseminated. As part of PNO group, INNEN will be supported by its affiliated entity CIAOTECH SRL to carry out the market analysis, the SEA and the development of the business model, thanks to its own business intelligence platform Wheesbee.

SUITE5 DATA INTELLIGENCE SOLUTIONS LIMITED is a high-tech SME specialising in the development of solutions and products related to data management and data analytics applied at various verticals such as the energy and manufacturing industries. We will contribute to the development of the data management plan of the ELECTRA, while supporting the consortium in the assessment of the value that can be extracted by the data generated by the different technologies to be developed in the project.



For more information about the ELECTRA project and its innovative initiatives, visit LinkedIn page.

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