Press release #1: March 2025



The Bio-FlexCLC project, short for *Flexible Chemical Looping Combustion for Combined Heat and Power Production from Biogenic Residues with Negative Emission*, was officially launched on June 1st, 2024.

The Bio-FlexCLC project aims to develop a scalable, flexible, and efficient process for converting low-value biogenic residues and organic waste into combined heat and power with net negative or zero emissions. This will be achieved through combining chemical looping combustion (CLC) with circulating fluidized bed (CFB) technology, followed by gas cleaning and CO_2 liquefaction. CLC is an advanced combustion technology that enables efficient energy production with inherent CO_2 capture. Instead of directly mixing fuel with air, CLC uses metal oxide particles as oxygen carriers, transferring oxygen from an air reactor to a fuel reactor. Therefore, the flue gas mainly consists of CO_2 and water vapor, allowing for cost-effective CO_2 capture without the need for energy-intensive gas separation. CLC significantly reduces greenhouse gas emissions and is a promising solution for sustainable and low-carbon energy generation.

Through this innovative approach, Bio-FlexCLC aims to:

- Achieve higher operational efficiency
- Improve the conversion efficiency of feedsctock
- Enhance CO₂ capture efficiency at a lower cost
- > Achieve negative CO₂ emissions in CLC mode and zero emissions in CFB mode
- Minimize SO_x and NO_x emissions
- Ensure operational flexibility to handle load fluctuations
- Enable to switch to conventional CFB combustion if the conditions are not amiable for carbon capture
- > Develop a scalable and replicable process concept for industrial applications

The Bio-FlexCLC consortium consists of 10 international partners from 7 European countries, covering the entire value chain and supported by key industrial players. The diverse expertise and capabilities of the consortium ensure the successful achievement of the project's goals by integrating cutting-edge research, technological innovation, and industrial experience. The partners are:

- RISE Research Institutes of Sweden
- Aichernig Engineering GmbH (REPOTEC)
- Götaverken Miljö AB (GMAB)
- 1CUBE BV
- FORTUM
- Växjö Energi (VEAB)
- Chalmers University of Technology
- Technische Universität Darmstadt (TUDA)
- Spanish National Research Council (CSIC)
- Centre for Research and Technology Hellas (CERTH)





Backed by €3.95 million in funding from the European Union (EU), the Bio-FlexCLC project contributes to the EU's commitment to combating climate change by making the energy sector more sustainable, efficient, competitive, and resilient.

Stay tuned for project updates and detailed information on our website, and follow us on LinkedIn for the latest news and developments!

Website: <u>https://www.bioflexclcproject.eu/</u> LinkedIn: <u>https://www.linkedin.com/company/bio-flexclc/</u>

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