

## **Purchase of DSC and TGA Equipment**

- for research of low-carbon building materials

The group of Construction Materials at the Department of Civil and Architectural Engineering, Aarhus University receives donation from COWIfonden for the purchase of (combined) Differential Scanning Calorimetry (DSC) and Thermogravimetric Analysis (TGA) equipment, which will be used for research and education activities on low-carbon building materials, especially cement-based systems.

Cement is a main component to prepare concrete, the mostly used manmade material in the world. The massive production volume of cement makes the sector alone accounting for 5-8% of global CO<sub>2</sub> emissions, which poses a great challenge to the UN Sustainable Development Goals. The international community has been making significant efforts to reduce CO<sub>2</sub> emissions from the cement and concrete industry. Development and application of low-carbon building materials would add significant value to the common endeavours fighting against global warming and climate change.

DSC and TGA are powerful methods to follow the chemical reactions occurred in cement-based systems and provide the key to understand the material properties, which are the critical basis for the development of new material solutions. The equipment will be used, e.g. primarily for two research areas that are the most practical and having the best potential to achieve ground-breaking "Net Zero" CO<sub>2</sub> emissions by 2050 for the cement and concrete industry. The first one is to identify viable options of supplementary cementitious materials that can significantly reduce cement content in concrete, and the second one is to develop feasible carbon capture and utilization techniques aiming for a closed material loop in the construction industry. Important new values are expected to be generated for both public and private stakeholders in the construction industry (e.g. cement suppliers and engineering consultants) and beyond. By performing dedicated research activities using the equipment, the ultimate goal is to help to decarbonize the cement and concrete industry and promote Green Transition of the society.