

Data-centres of the future: The RF2.0 Project at DESY

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Abstract

Computing forms a fundamental pillar of modern research. Efforts to minimise correlated CO₂ emissions of research infrastructures therefore need to include plans for sustainable computing models, and research into novel operations of data centres need to be conducted. The team on the Horizon EU RF2.0 project at DESY investigated how their data centre operates and tested a variety of operational policies to manage the environmental impact of a data centre within the larger research ecosystem. A simulation of the data-centre ORACLE-D (Optimised Resource Analysis and Carbon Legacy Estimator for Data centres) designed to test policies faster than real time and some of the discussed saving schemes were trialled during an energy saving program at the data centre during the summer of 2025 where an estimated 3500 kWh of energy was saved. The culmination of DESY's involvement in the RF2.0 project is the building of the POC CET (Proof Of Concept Cluster for Emissions Tracking) mini-cluster; a demonstrator showcasing a future of computing centres where computing policies are autonomously implemented, in possible response to external stimuli like grid cleanliness, or price fluctuations.

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