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Life Cycle Analysis of Compute Nodes

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A model for computing the total life cycle emissions for compute nodes, based on providing a certain level of scientific computing over long time.

This takes real-world data from data centers, electricity generation, and vendor server information and simulates different replacement scenarios (from replacing it as soon as possible to keeping it a long time) to be able to optimize for minimal total emissions.

This work has largely been presented at ISGC and HEPiX, but since then we have a publicly available simulation tool as well as some minor improvements to graphs and conclusions.

The model is available at: https://codeberg.org/wimvanderbauwhede/low-carbon-computing/src/branch/master/LCA-model-equations

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