UC-07: Reducing data centre e-waste via technical LCA-driven refresh and reuse

The objective is to provide the data centre sector with environmentally informed decisions about when and how to refresh and repurpose data centre ICT hardware.

Methodologies (2.1)	Metrics (3.2) Eco-design guidelines (3.3) LCA tools	Second-life electronics developments (4.3) Power supplies (4.4) Liquid cooling

ACTIVITIES

DETERMINE

- impact of the second life of data centre ICT equipment
- added value of the remaining lifetime assessment on easing 6R scenario selection
- effects of liquid cooling on the lifetime of operation
- benefits introduced by power supply modularity and standardisation
- Edge-to-Cloud impacts on 6R.

ACTIONS

- Obtain a range of BOM for various ICT elements and build useful LCA models. (**A1**) [**2.1, 3.2**]
- Test LCA driven hypothesis for the impact of refresh versus repurpose. (**A2**) [**3.2**]
- Use real-world scenarios in an operational data centre including aspects of distributive compute (edge-to-cloud). (**A3**) [**4.3**]
- Improve eco-design, upgradability and repair for a second life. (**A4**) [**3.3, 4.3, 4.4**]
- Quantify the potential e-waste savings. (**A5**) [**2.1, 3.2, 4.3**]

USE CASE PARTNERS

RISE will lead the use case and contribute to the data collection for servers

ATEA will provide data pertinent to the full IT stack that sits in data centres

SVS is supporting the activity from the data storage perspective with the potential of improvements from the eco-design of compact and low-energy data storage systems.

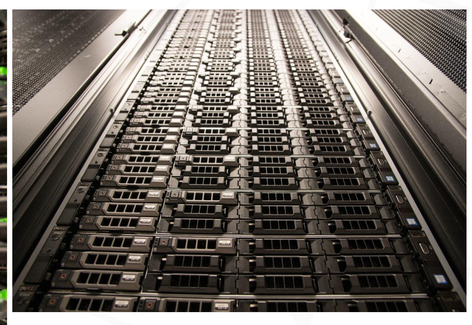
UCLouvain will aid the team on streamlining the LCA methodology

IMEC will aid the LCA activities around the microprocessors

CEA will collaborate by benchmarking the eco-design recommendation of the ICT equipment for data centres

EcoDC will provide the operational data centre perspective and support access to data.

INP-Gre will investigate how modular power supplies with digital twins support data centres for greater robustness.



Racked data centre servers, courtesy of ICE datacenter at RISE.

OUTPUTS

Guidelines for fabrication of racks of servers for improvements

Design and model of an optimal rack of servers with the lowest e-waste

Database of component parts of standard ICT components that make up data centre racks.

Methodology to benchmark e-Waste and environmental impact for current racks of server solutions on the market.

Assess the benefit of modular and standard power supplies if implemented in data centre servers and ICT equipment.

Actions	Timeline											
	M1-3	M4-6	M7-9	M10-12	M13-15	M16-18	M19-21	M22-24	M25-27	M28-30	M31-33	M34-36
A1												
A2												
A3												
A4												
A5												

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