Circular Data Centre Compass - a digital tool to model and assess data centre sustainability

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Connectivity – 55% global population / data traffic = 4.2 trillion gigabytes / yr
Data Centres

7.2m globally / concentration in EU - UK, Germany, France & Netherlands

2010-2020 – $100bn investment in sector
Speed of sectoral development & emphasis on service provision....
Linear model of consumption

- **TAKE**
  - Finite resources
  - Critical

- **MAKE**
  - Planned obsolescence
  - Stockpiling
  - Procurement barriers

- **USE**
  - Short lifetimes
  - Stockpiling
  - Procurement barriers

- **DISPOSE**
  - Growing e-waste
  - Low recycling rates
  - Underdeveloped infrastructure
CEDaCI

• unique, interdisciplinary, multi-output initiative
• uses whole-life thinking
• brings together representatives from all DCI sub-sectors to share knowledge
• accelerating development of sectoral Circular Economy

It will
• reduce waste
• prevent supply chain problems
• secure uninterrupted DC operation and service
KEY OUTPUT – free on line resource
Product Sustainability and Circularity Indicator
Enables business to compare environmental, social and economic impacts and materials’ criticality of different servers

Identify preferred Circular business option based on company and/or performance requirements
Primary source data collection – all partners

inventory building / improving recycling / CRM reclamation / building LCA, LCC and S-LCA models for Pilots (design / manufacture, second-life, end-of-life) and CDCC
Welcome to Compass

Username
Exampleuser

Password
**************

Login
Tool options


Compare
This part of the tool allows you to compare the environmental impact.

Eco-design Evaluator
After a server has reached the end of its first life, different options can be

End of Life
After a server has reached the end of its first life, different options can be
Compare tool uses LCA to assess entire life cycle of the equipment – extraction of raw materials, manufacturing/assembly, transportation, use and end-of-life stages.

Circular Footprint Formula - accounts for benefits and burdens, resulting from the use of secondary and virgin materials, and recycling and energy recovery.
Compare to find out which equipment is most circular - select and configure two servers.
Compare specifications and impacts and download the full PDF report
End-of-Life (EoL) tool encourages more sustainable considerations once a server reaches the end of its usable lifetime for a given user.

Assess and compare impacts and criticality risk of different end-of-life scenarios
• Refurbishment / reuse
• Recycling - current industry methods
• Recycling - CEDaCI recommendations
• Landfill
Compare sustainability categories

Choose Server:

Comparison Results:

Refurbishment  Recycling with CEDaCI  Industry Recycling  Landfilling

- Environmental Impact
- Life cycle costing
- Social Impact
- Criticality risk

Download

Compare impact of E-o-L scenarios

Choose Server:

Comparison Results:

Refurbishment  Recycling with CEDaCI  Industry Recycling  Landfilling

- Environmental Impact
- Life cycle costing
- Social Impact
- Criticality risk

Download
Ecodesign Evaluator consolidates EU Ecodesign Criteria in one place – easy for designers to follow.

Tool includes Ecodesign guidelines from EU Circular Economic Action Plan and CEDaCI.
Benefits / value of CDCC

e-waste

Annual – 2020 ~50 million tonnes – 6kg per person
Business as usual - 2050 – 120 million tonnes

Global - < 20% is formally collected and recycled
Current value - >$62.5 billion

69 elements in EEE
7-10 Critical Raw Materials
Compare carbon assessments / preliminary LCA results – indicate much higher embodied impact

Environmental impact of servers

- typical carbon assessment
- typical carbon assessment
- CEDaCI full LCA
- CEDaCI full LCA

Operational impact
Embodied impact
DC growth – 300% in EU by 2025 / 500% global 2030
CEDaCI – runs until Sept 2023

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