

Sessione Infrastrutture e Sostenibilità



09:00	Introduzione alla sessione Infrastrutture e Sostenibilita' <i>Sala Maria Luisa, Hotel Hermitage - Isola d'Elba</i>	<i>Daniele Cesini</i> 09:00 - 09:10
	WLCG Environmental Sustainability <i>Sala Maria Luisa, Hotel Hermitage - Isola d'Elba</i>	<i>Domenico Giordano</i> 09:10 - 09:40
	Tecnologie per la sostenibilità al tecnopolo di Bologna <i>Sala Maria Luisa, Hotel Hermitage - Isola d'Elba</i>	<i>Luigi Benedetto Scarponi</i> 09:40 - 10:00
10:00	Il nuovo Data Center HPC di LNF - infrastruttura e scelte progettuali <i>Sala Maria Luisa, Hotel Hermitage - Isola d'Elba</i>	<i>Ruggero Ricci</i>  10:00 - 10:20
	Tavola rotonda: la sostenibilità energetica nell'INFN anche nel contesto nazionale e internazionale <i>Sala Maria Luisa, Hotel Hermitage - Isola d'Elba</i>	<i>Daniele Cesini et al.</i>  10:20 - 11:00
11:00	Coffee Break <i>Area Sponsor (adiacente alla Sala Maria Luisa), Hotel Hermitage</i>	11:00 - 11:30
	Raspberry Pi Pico come sensori IoT: il monitoraggio dei consumi elettrici nel datacenter della Sezione di Padova <i>Daniele Piccoli</i>	
	Enabling performance insights: generating telemetry from software services developed at INFN-CNAF <i>Sala Maria Luisa, Hotel Hermitage - Isola d'Elba</i>	<i>Jacopo Gasparetto</i> 11:45 - 12:00
12:00	Centro HPC ai LNGS: dalla visione alla progettazione e realizzazione <i>Sala Maria Luisa, Hotel Hermitage - Isola d'Elba</i>	<i>Sandra Parlati</i> 12:00 - 12:15
	Advancements in Monitoring Infrastructure at INFN Torino Computing Centre <i>Sala Maria Luisa, Hotel Hermitage - Isola d'Elba</i>	<i>Nicola Mosco</i> 12:15 - 12:30
	Sponsor DELL - Open Rack v3 - A new form-factor for high density computing <i>Sala Maria Luisa, Hotel Hermitage - Isola d'Elba</i>	<i>Paolo Bianco</i> 12:35 - 13:00

- Obiettivi:
 - Diffondere l'ampia gamma di attività in corso nell'Ente e nelle comunità vicine, es. WLCG, CERN, altre federazioni di calcolo ed esperimenti
 - Stabilire la sostenibilità come una preoccupazione centrale nell'evoluzione dell'infrastruttura (di calcolo)
 - Esplorare le azioni concrete e pratiche che possiamo intraprendere per promuovere un'infrastruttura di calcolo sempre più sostenibile.

Ad esempio in WLCG....

Setting the scene

- ‘**Environmental sustainability** is a **strategic area** of priority for many of the WLCG federations and funding agencies’
- ‘Providing information, opportunity, and incentive to help collaborators **reduce the carbon footprint of computing needs** should be a priority for WLCG [...].’
- ‘WLCG should elaborate a plan that covers the areas of **software, computing models, facilities, and hardware lifecycle.**’

December 2024: [WLCG Environmental Sustainability Workshop](#)

May 2025: Plenary Session: Environmental Sustainability
– [2025 WLCG workshop](#)

Background: WLCG Strategy/Actions

<https://zenodo.org/records/12623280>

- **[ENV-1]** WLCG to agree on metrics and provide a framework to collect information related to energy efficiency.
- **[ENV-2]** WLCG to facilitate the use of more energy-efficient hardware where possible, depending on the readiness of the experiment software and the common libraries.
- **[ENV-3]** WLCG to develop and promote a sustainability plan to improve energy efficiency and reduce carbon footprint, covering software, computing models, facilities, and hardware technology and lifecycle.

© Caterina Doglioni – Environmental Sustainability @ WLCG Workshop 5-9 May 2025, Paris

Problema complesso a molte dimensioni

- Infrastructure
 - Facilities, PUE
 - moving from power to carbon accounting
 - Which metrics?
- HW
 - CPU arch, GPU, FPGA
 - Storage
 - Frequency adjustments
 - Procurement strategy
- SW
 - Performance monitor, energy aware benchmarks
 - Larger consumer first
- Computing Models
 - Online, offline
 - Number of replicas
 - Job efficiency, Jobs resubmissions, etc...

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Mainly
about
«Use»

BS EN ISO 14040:2006 – Environmental management — Life cycle assessment

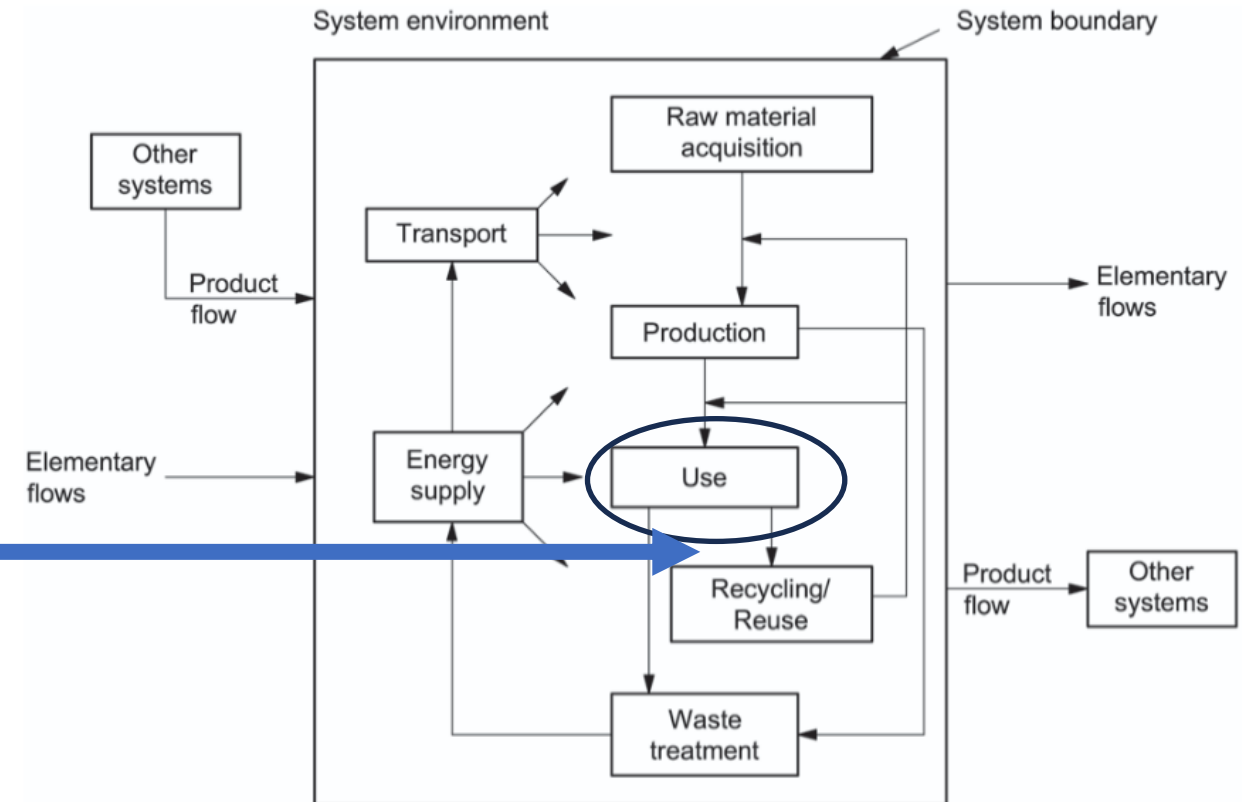


Figure 2 — Example of a product system for LCA

Iniziativa e opportunità in call EC



GreenDIGIT project and its RIs

HORIZON-INFRA-2023-TECH-01-01:

GreenDIGIT New technologies and solutions for reducing the environmental and climate footprint of RIs

- **EBRAINS** - An open research infrastructure that gathers data, tools and computing facilities for brain-related research
- **EGI** - International federation delivering e-Infrastructure and solutions for advanced computing and data analytics in research innovation
- **SLICES** - Scientific Large-scale Infrastructure for Computing and Communication Experimental Studies
- **SoBigData** - Distributed, pan-European, multi-disciplinary research infrastructure aimed at using social mining and Big Data to understand the complexity of our contemporary, globally interconnected society



CESNET, CSIC-IFCA, SZTAKI, CNRS



<https://greendigit-project.eu>

March 2024 - Feb 2027; 5M Eur



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New technologies and solutions for reducing the environmental and climate footprint of research infrastructures

The aim of this topic is to deliver innovative technologies and solutions which generate a step change in reducing the environmental and climate footprint of research infrastructures through the full life cycle of research infrastructures. Proposals should identify common methodologies, among the concerned research infrastructures, to assess environmental impact and strategies to reduce it, as well as efficiency gains in the broader ecosystem.

https://cordis.europa.eu/programme/id/HORIZON_HORIZON-INFRA-2025-01-TECH-01

- cosa manca di significativo nelle attività dell'INFN o della comunità WLCG rispetto alle tematiche di sostenibilità ambientale, quali sono i miglioramenti possibili/auspicabili ?
- come le attività svolte finora nell'INFN (o in WLCG) circa la sostenibilità ambientale si inseriscono nel contesto nazionale e/o internazionale ?
- cosa possiamo imparare dall'esperienza di altri ?
- quali contributi possiamo portare nei vari consessi nazionali e internazionali in cui siamo coinvolti (WLCG, Science Europe, progetti specifici...) ?