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Environmental Sustainability in Digital Research Infrastructures - the GreenDIGIT project

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GreenDIGIT (<https://greendigit-project.eu/>) is a TECH-01-01 Horizon Europe project that started in March 2024 to pursue environmental sustainability within digital services and service ecosystems that research infrastructures (RIs) rely on. GreenDIGIT brings together institutes from 4 digital RIs: EGI, SLICES, EBRAINS, and SoBigData to address the pressing need for sustainable practices in digital service provisioning.

Central to GreenDIGIT's mission is the identification of good practices in lemphasized textow-impact computing, which involves evaluating the broader computing landscape and identifying opportunities for improvements across various stakeholder groups both within, and beyond the RIs represented in the project consortium. The project will establish reference architectures and design principles that facilitate environmental impact considerations throughout the entire RI lifecycle, ensuring that sustainability is embedded within the entire design-implementation-operation-termination phases of RIs at the level of nodes, services and components.

Moreover, GreenDIGIT will develop and validate innovative technologies and methodologies that empower digital service providers to reduce energy consumption and/or overall operational environmental impact. By supplying technical tools for both providers and researchers, the project promotes the design and execution of environmentally conscious digital applications, aligning with principles of Open Science and FAIR data management.

Through education and support initiatives GreenDIGIT will foster a culture of sustainability among researchers and service providers, equipping them with best practices for lifecycle management and operation. By mapping the landscape of environmentally friendly computing, and by offering policy and technical recommendations, the project not only enhances the sustainability of research infrastructures but also contributes to the broader goal of mitigating climate change.

The first tangible outcome of the project is a landscape analysis that was conducted within the 4 participating RIs, and within other RIs that operate significant digital infrastructures. The presentation will share the first findings from this landscape report, which included responses from 15 EGI sites, many being present in WLCG too.

In the second phase of the project EGI members will extend the EGI-WLCG service configuration database (GOCDDB) with environmental metrics to fuel "green workload optimisation strategies" in HTC and Cloud infrastructures. Based on the metrics the DIRAC workload manager (CNRS), the AI4OS AI/ML framework (CSIC), the Terraform DevOps tool (SZTAKI) and a Data Center Energy scheduler (CESNET) will be extended to optimise job/VM/task execution according to green strategies.

In summary, the GreenDIGIT project is a transformative initiative that champions environmental sustainability in digital research services, offering various outcomes and collaboration opportunities to the WLCG community.

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