Lower environmental, higher scientific impact

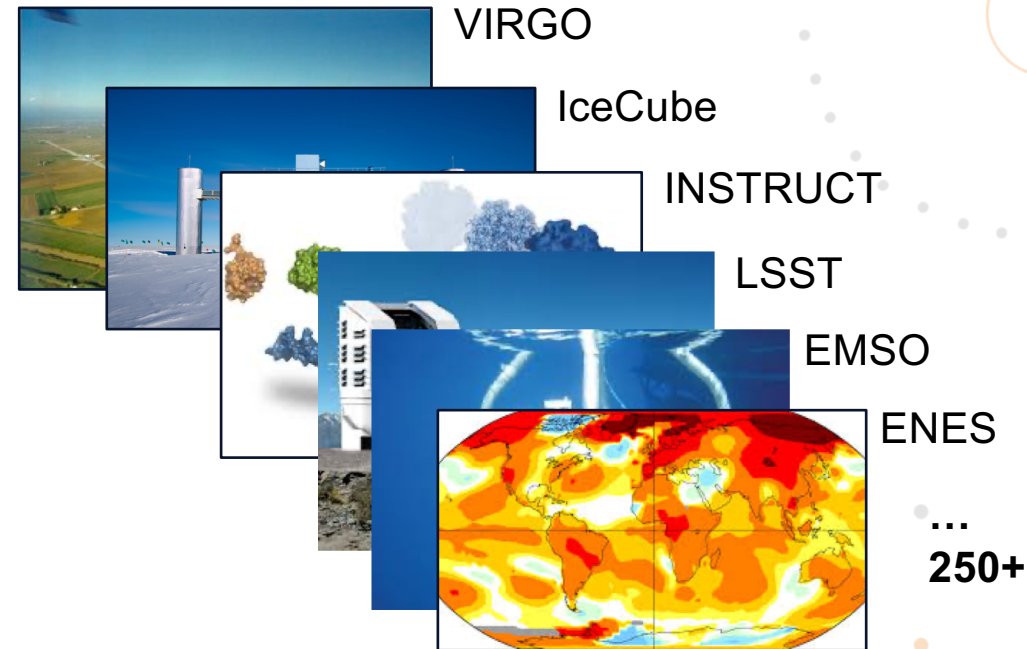## The EGI perspective on green computing

Gergely Sipos

Head of Services, Solutions, Support @ EGI Foundation

An international e-infrastructure for research and innovation

From the high-energy physics compute grid (WLCG @ CERN)

2010

VIRGO
IceCube
INSTRUCT
LSST
EMSO
ENES
…
250+

To a multi-disciplinary, multi-technology infrastructure

Empowering thematic data/compute-intensive infrastructures

Compute
Cloud Compute

Cloud Container Compute

High-throughput Compute

Software Distribution

Security & Identity
Check-in

Compute Orchestration
Workload Manager

Infrastructure Manager

Training
FitSM Training

ISO 27001 Training

Training Infrastructure

Storage & Data
Datahub

Data Transfer

Online Storage

Applications
Notebooks

Replay

High Throughput Compute sites
○ HTC Sites

200 High Throughput Compute clusters

Delivered 7+ Billion CPU-hours in 2022

Cloud Compute sites
○ Cloud compute partner

30 Compute clouds
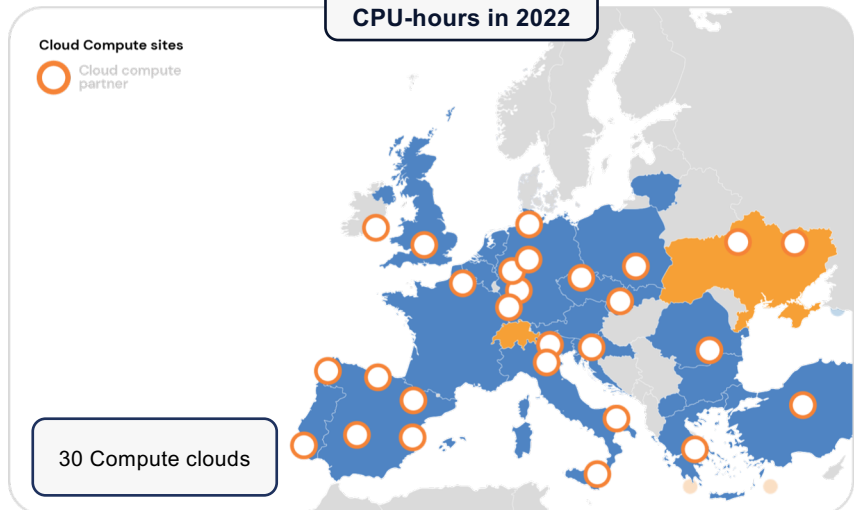
Green Computing – Needs and opportunities

Lowering the environmental impact of EGI and its partner RIs is both a societal and an ethical responsibility – BUT we have to do it without jeopardising scientific excellence

- We cannot lower it if we don't measure it!
    i. Understanding where we are – Done in **EGI-ACE project** between 2022-23
        - Green computing practices at sites (metrics, policies, roles, processes)
        - Software efficiency practices
    ii. Initial action plan, broadened by our colleagues from SLICES, SoBigData, EBRAINS

- OUR ACTION PLAN – to be implemented in the **GreenDIGIT project** between 2024-2026:
    i. Capturing and spreading good practices:
        - Webinars, tutorials, support workshops
        - Not only EGI, but within partner Research Infrastructures too
    ii. Metrics and reporting framework for resource providers
        - Ability to collect, combine and report impact numbers to and when they are needed
    iii. Awareness raising
        - Displaying environmental impact of actions to the users
    iv. Offering the choice
        - Alternative scheduling approaches for workload management (e.g. delaying, re-routing jobs)
            - Research topics: Env. impact aware resource brokering algorithms (choosing compute sites); Smart local job schedulers; , Compute-storage trade-off