EGI Council Participant: HUN-REN SZTAKI

Participating in EGI Impact Report: Hungary

2024

egi.eu

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Infographic

193 service users

In 2024, 193 researchers from Hungarian institutions used the services provided by the EGI Federation

1,260 publications

The research communities, projects and scientific collaborations from Hungary supported by the EGI led to 1,260 peer-reviewed scientific publications

10 Supported communities

In 2024, the Hungarian infrastructure supported 10 research communities in the following disciplines: Linguistics, Health and Medicine, Physics

Projects

Hungarian partners participate in 3 collaboration projects

Compute Delivery

In 2024, the infrastructure providers from Italy federated in EGI delivered 24,808,872 HTC CPU Hours and 271,462 Cloud CPU Hours.

Country overview

Number of supported publications	1,260
Number of total service users	193
Scientific Communities supported	10
Data Centres contributing to the Federation	2
Collaboration projects	3
Total HTC CPU hours delivered	24,808,872
Total Cloud CPU hours delivered	271,462

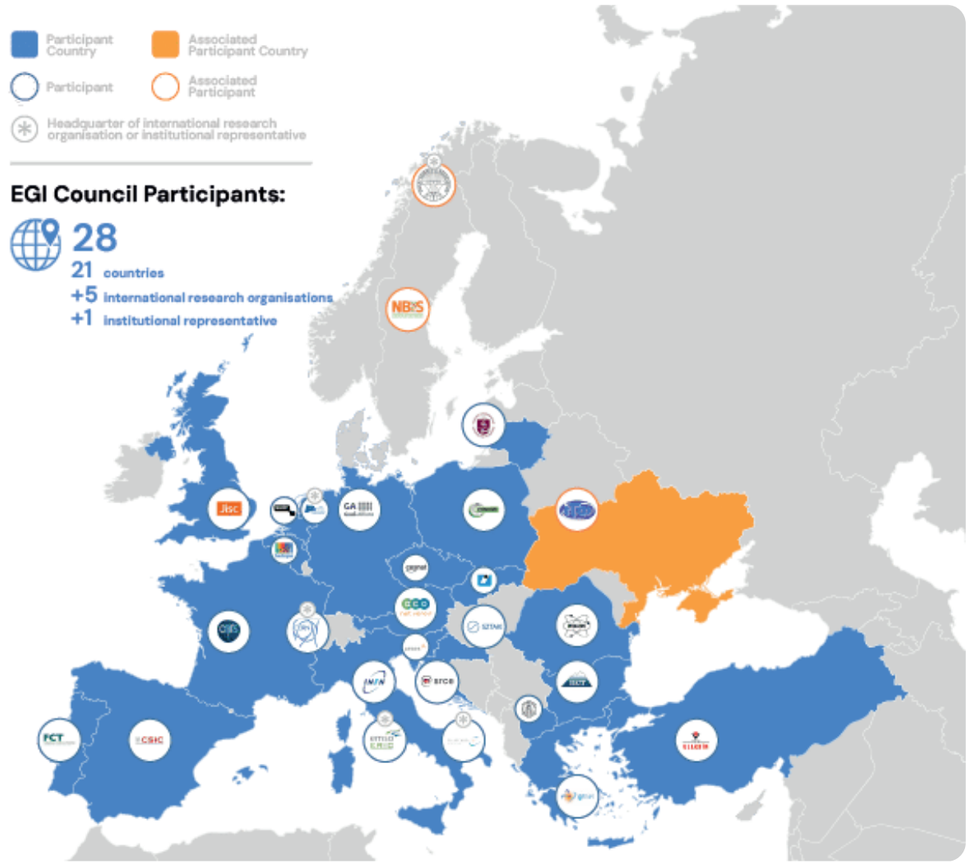
About EGI

EGI is the federation of computing and storage resource providers united by a mission of delivering advanced computing and data analytics services for research and innovation.

The EGI Federation believes that all researchers should have seamless access to services, resources and expertise to collaborate and conduct world-class research and innovation. The EGI Federation is coordinated by EGI Foundation, an organisation with headquarters in Amsterdam. The Foundation offers a service federation and management platform, enabling the data centres to harmonise and integrate their services by connecting to a common hub. Moreover, it engages with international research communities using these services in order to understand and satisfy their demands for advanced computing for research.

The mission of EGI is pursued by coordinating and provisioning an international federated infrastructure that pools together service providers from both the public and private sectors in Europe to develop, integrate and deliver digital services for compute and data-intensive research and innovation. As an open initiative with a global outlook, the EGI Federation also connects service providers beyond Europe, following the collaboration needs of the served communities.

The latest Annual Report provides an extensive overview of the results that have been achieved through our collaborative efforts in 2024.



Approved EGI Council map from 2024

About HUN-REN SZTAKI

HUN-REN SZTAKI is a research institute, governed by the Eötvös Loránd Research Network. Upon the charge by the Secretary-general of the Academy, the supervision of the scientific activity pursued at the Institute is provided by the Board of the Institute.

The fundamental task of the Institute is to perform basic and application-oriented research in an interdisciplinary setting in the fi elds of computer science, engineering, information technology, intelligent systems, process control, wide-area networking and multimedia.

Contract-based target research, development, training and expert support for domestic and foreign industrial, governmental and other partners are important activities at the Institute. The mission of SZTAKI includes the transfer of up-to-date research results and state-of-the-art technology to university students.

Overall EGI impact

The EGI Federation is composed of e-infrastructure providers from national and community initiatives, forming one of the largest distributed computing infrastructures for researchers in the world, integrating about 1,243,400 CPU cores and over 1,4 Exabyte of storage space from hundreds of data centres.

In 2024, the EGI Federation served around 116,000 users (+23%). EGI users consumed 7,4 Billion HTC CPU hours (+5.7%), 62,7 Million Cloud CPU hours (-23,5%), ran over 402 M computational jobs (+8%) and published over 2,560 open access publications.

As of the previous year, the research community with the largest number of users is Medical and Health Sciences, while the community with most extensive HTC CPU/h consumption is CMS.

From the scientific communities engaged in 2024, the one with most extensive Cloud CPU/h consumption is WeNMR.

Moreover, EGI engaged with a total of 249 scientific communities; 11 SMEs and business pilots, and 2 additional Research Infrastructure included in the ESFRI Roadmap, raising the total of number of ESFRI partners/users of EGI to 25.

EGI contribution to Hungarian excellence in science

HUN-REN SZTAKI coordinates the Hungarian participation to the EGI Federation. SZTAKI promotes the building and operation of a multidisciplinary national Distributed Computing Infrastructure open to all sciences and to developing countries in Hungary. This report provides an overview of the activities of HUN-REN SZTAKI in EGI, and the impact that was achieved thanks to this participation. The annual membership fee contributed by HUN-REN SZTAKI to the EGI Foundation in 2024 was 5,000 EUR.

EGI federates hundreds of resource centres that are located at participant countries, organizations and at collaborating e-Infrastructures worldwide. This federated infrastructure supports data- and compute-intensive research across Europe and the world. In 2024, our federation was used by over 260 scientific communities, and has been accessed by around 116.000 users.

Research Infrastructures and multi-national research collaborations are the largest adopters of EGI Services, the main contributors of thematic portals, and operate community-specific compute, storage and data systems based on EGI federation capabilities.

The services of the EGI federation have been used by 193 researchers from Hungary in 2024. The estimated annual scientific output in 2024 produced by research communities, projects and scientific collaborations from Hungary and supported by the EGI Federation is estimated to amount to over 1,260 peer reviewed scientific publications.

The EGI Federation is currently working with over 40 Research Infrastructures, 10 of which include Hungarian partners. These EGI-enabled research infrastructures, their Hungarian members and their 2024 scientific output (publications) are detailed in the following pages of the report

Hungarian research collaborations in EGI	EGI supported activities and services	Number of scientific papers published in 2024
ALICE (High-Energy Physics) • Wigner Research Centre for Physics (Wigner RCP)	ALICE has been supported since 2012 as part of the EGI WLCG collaboration, formally agreed in an MoU. Federated services delivered in the context of the WLCG MoU, including: • Software support (consultancy to users and system administrators, (software maintenance and validation) Infrastructure and operations Services (infrastructure catalogue, accounting repository and portal, helpdesk, monitoring, operations portal, AAI) • Software distribution services (UMC, CMD, operations documentation) • Operations coordination (middleware deployment campaigns, procedures, innovation of tools) • Security services and activities (CSIRT, Software vulnerability group, international security coordination, policies, IGTF distribution)	47
CLARIN (Linguistics) • Hungarian Academy of Sciences	CLARIN thematic services has been supported by EGI since 2018. CLARIN has a Service Level Agreement with EGI, using the following services: EGI services: • EGI Cloud (Compute + Online Storage) for hosting the Virtual Language Observatory (VLO) • Technical support • Service integration	13
CMS (High-Enery Physics) • MTA-ELTE Lendület • Karoly Robert Campus, MATE Institute of Technology • University of Debrecen	CMS has been supported since 2012 as part of the EGI WLCG collaboration, formally agreed in an MoU. Federated services delivered in the context of the WLCG MoU, including: • Software support (consultancy to users and system administrators, (software maintenance and validation) • Infrastructure and operations Services (infrastructure catalogue, accounting repository and portal, helpdesk, monitoring, operations portal, AAI) • Software distribution services (UMC, CMD, operations documentation) • Operations coordination (middleware deployment campaigns, procedures, innovation of tools) • Security services and activities (CSIRT, Software vulnerability group, international security coordination, policies, IGTF distribution)	109

Hungarian research collaborations in EGI	EGI supported activities and services	Number of scientific papers published in 2024
DUNE (Astroparticle Physics) • Eötvös Loránd University	The DUNE experiment has been using compute resources from EGI partners for more than a decade. The services from the EGI federation that DUNE uses include: • EGI HTC services from 6 EGI participant countries (CH, CZ, ES, FR, NL, UK) • Software distribution services (UMC, CMD, operations documentation) • Operations coordination (middleware deployment campaigns, procedures, innovation of tools) • Security services and activities (CSIRT, Software vulnerability group, international security coordination, policies, IGTF distribution)	37
ELI-BEAM (Physical Sciences) • Ministry for Innovation and Technology	ELI works with EGI since 2016 on exploring and validating approaches for off-site computing and data management. ELI-Beams setup a High Throughput Compute Service on EGI resources and works with EGI providers on • Refining the user requirements and translating these to e-infrastructure requirements, and • Identifying and validating services from EGI that can be relevant for ELI (besides HTC and compute). • Mobilising already existing HTC compute, cloud compute and storage resources from EGI for ELI piloting and demonstration activities.	3
ELI-NP (Nuclear Physics) • Institute for Nuclear Research of the Hungarian Academy of Sciences (MTA-Atomki)	ELI has been working with EGI since 2016 on exploring and validating approaches for off-site computing and data management. ELI-NP setup a High Throughput Compute Service on EGI resources and works with EGI providers on: • Refining the user requirements and translating these to e-infrastructure requirements, and • Identifying and validating services from EGI that can be relevant for ELI (besides HTC and compute). • Mobilising already existing HTC compute, cloud compute and storage resources from EGI for ELI piloting and demonstration activities	19

Hungarian research collaborations in EGI	EGI supported activities and services	Number of scientific papers published in 2024
ILC (High-Energy Physics) • Hungarian Academy of Sciences	The ILC experiment has been using compute resources from EGI partners since 2004. The services from the EGI federation that ILC experiments uses include: • EGI HTC services from 27 EGI federated sites from IL, DE, FR, ES, NL, PL, UK • Software distribution services (UMC, CMD, operations documentation) • Operations coordination (middleware deployment campaigns, procedures, innovation of tools) • Security services and activities (CSIRT, Software vulnerability group, international security coordination, policies, IGTF distribution)	75
LSST (Astronomy) • ELTE Eötvös Loránd Tudományegyetem, Gothard Astrophysical Observatory • Astronomical Institute (Konkoly Observtarory) of the Research Centre for Astornomy and Earth Sciences	The LSST survey federates High Throughput Compute (HTC) resources from France and the UK and run an analysis campaign in 2020 to prepare for the opening of the Vera C. Rubin Observatory. The campaign consumed over 11 million CPU-hour in 2020 to analyse generated images, imitating the telescope images that are expected to become available from 2023. The LSST compute federation benefited from the following EGI services: • Software support (consultancy to users and system administrators, (software maintenance and validation) • Infrastructure and operations Services (infrastructure catalogue, accounting repository and portal, helpdesk, monitoring, operations portal, AAI) • Software distribution services (UMC, CMD, operations documentation) • Operations coordination (middleware deployment campaigns, procedures, innovation of tools) • Security services and activities (CSIRT, Software vulnerability group, international security coordination, policies, IGTF distribution)	11

Hungarian research collaborations in EGI	EGI supported activities and services	Number of scientific papers published in 2024
VIRGO (Astrophysics) • Institute for Nuclear Research • Wigner RCP, RMKI	The Virgo experiment has been using compute resources from EGI partners for more than a decade. The services from the EGI federation that VIRGO uses include: • EGI HTC services from 8 data centres from France, Italy, The Netherlands, Spain and UK • Software distribution services (UMC, CMD, operations documentation) • Operations coordination (middleware deployment campaigns, procedures, innovation of tools) • Security services and activities (CSIRT, Software vulnerability group, international security coordination, policies, IGTF distribution) • Since 2021 Virgo works with EGI in the EGI-ACE Horizon 2020 project to evaluate and adopt data analysis, federated authentication-authorisation and data management services for thematic applications.	5
WeNMR (Structural Biology) • UNIVERSITY OF PECS • SOTE • BIOLOGICAL RESEARCH CENTRE • ELRN BIOLOGICAL RESEARCH CENTRES • EÖTVÖS LORÁND UNIVESITY • RCNS • UNIVERSITY OF DEBRECEN • SZTE • HUNGARIAN ACADEMY OF SCIENCES	WeNMR is supported by EGI since 2011 and has a Service Level Agreement since 2016. The EGI Services used by the community include: • High-Throughput, Cloud + Online Storage services from 23 EGI federated sites from the Netherlands, Italy, France, Hungary, UK, Poland, the Asia Pacific region, IberGrid (Spain and Portugal), Italy, the Latin America region. • EGI Workload Manager • Trust and identity management with Check-in • Technical support: WeNMR benefited from continual support through dedicated support activities in various EGI flagship projects: EGI-Engage, EOSC-hub and EGI-ACE.	939

Community Engagement

During 2024, 3 participants from Hungary joined the EGI2024 conference and delivered 2 talks in it.

Participated projects

The EGI Foundation leads five Horizon Europe Projects, three of which started in 2024:

- iMagine (September 2022-December 2025)
- interTwin (September 2022-August 2025)
- ENVRI-Hub NEXT (February 2024-January 2027)
- EOSC Beyond (April 2024-March 2027)
- SPECTRUM (January 2024-June 2026)

Furthermore, the EGI Federation was involved in 3 additional projects, increasing the innovation potential of its participants.

The EGI Federation participates in Horizon 2020 and Horizon Europe projects together with Austrian institutions to facilitate the uptake and use of e-infrastructure services for science. A summary of these projects, the involved institutes and the scope of the collaboration is provided in the next table.

Project title	Scope of collaboration	Participating beneficiaries from the country
GreenDIGIT	Within the project, EGI will conduct an environmental impact landscape assessment within the EGI federation and in partner ESFRIs to identify best practices and opportunities related to environmental sustainability. The project will develop an environmental metrics publication system for digital service providers and energy-aware brokering logics for scientific workflows running on EGI HTC, cloud, container and AI services. EGI will develop an environmental impact self-assessment questionnaire for Research Infrastructures. Finally, EGI will assist with project communications and will provide consultancy and training for service providers within and beyond EGI on methods and approaches to lower their environmental impact.	• HUN-REN SZTAKI HUN-REN Ökológiai Kutatóközpont
IRISCC	EGI plays a key role in IRISCC by leading communication, dissemination, engagement, and exploitation efforts (WP1), including stakeholder mapping and promotion of the service catalogue. In WP3, EGI supports knowledge exchange and user training by developing climate risk training modules and providing access to its training and computing infrastructure.. For WP6, EGI helps assess integrated knowledge services by aligning access policies, analysing AAI services, and contributing to FAIR and interoperability frameworks.	• HUN-REN Ökológiai Kutatóközpont
SoBigData RESEARCH INFRASTRUCTURE	EGI is one of the main contributors to the design and definition of the EOSC architecture and the federated service management framework, and coordinates service pilots participates by the scientific demonstrators. EGI also contributed to the definition of the governance framework and to the works on Rules of Participation. In the project EGI will enhance the SoBigData platform with two services: Jupyter Notebooks and the Workflow manager Galaxy	• Közép-Európai Egyetem

Service Level Agreements

During 2024, HUN-REN SZTAKI and HUN-REN CLOUD supported 2 Service Level Agreement for international scientific communities via EGI, delivering Cloud Computing, Online Storage and Authentication and Authorisation services.

Infrastructure contributions

The EGI Federation offers two complementary compute capabilities: the High-Throughput Compute (HTC) federation and the Cloud federation. 2 Hungarian data centres contribute to these federations:

HTC Federation:
BUDAPEST (Wigner Research Centre for Physics)

Cloud Federation:
HUN-REN

The data centres provided 2 service endpoints and delivered 24,808,872 HTC CPUhours and 271,462 Cloud CPUHours to EGI communities in 2024. The data centres responded to 14 support tickets through the EGI Helpdesk.

The most active international user groups of the Hungarian compute resources were:

- CMS 58.63%
- ALICE 41.37%

With the help of the EGI Security Vulnerability Group, the Hungarian site avoided 50 critical vulnerabilities in foundational software systems during 2024.

Methodology

Data for this impact report has been collected from the following sources.

Users

EGI uses the following methodology to capture the number of EGI users who rely on EGI services

- EGI serves users in the form of 'communities', called 'Virtual Organisations' (VO in short). A VO's members can range from one to tens of thousands. Members of a VO benefit from and use EGI services in different ways (e.g., by using Services for Federation or Services for Research).
- EGI establishes knowledge about its VOs as part of the user community support lifecycle; therefore, baseline information about VOs is collected through the Customer Relationship Management process (CRM).

At the end of 2024, there were 135 VOs in EGI.

EGI Virtual Organisations (VOs) can rely on different technical and non-technical mechanisms to manage their own members. Depending on their choice, the EGI Federation coordinator (EGI Foundation) has to follow different, corresponding approaches to know the number of members in a given VO, and to obtain additional information about these members (e.g. their 'country'). The EGI Foundation uses the following mechanisms to obtain information about the VO users:

- Obtain user number statistics from the EGI Operations Portal for VOs, where the members register personally in a 'VO membership management' system that is either operated by EGI or can be accessed by EGI.
- Obtain user number statistics from Community VRE REST APIs for VOs that operate Virtual Research Environments (VREs) on top of EGI resources. Those VREs implement a specific API to report users (e.g., WeNMR, Virtual Imaging Platform (VIP), NBIS).
- Obtain user number statistics from interviews with VO coordinators for VOs coordinated by one person.

Publications

Publications are collected from each community's public repository, if existing. Additional details are checked with the VO coordinators during the interviews to complement this information. EGI also consults OpenAIRE services to countercheck the data. You can check the list of repositories for each VO here (requires login): https://operations-portal.egi.eu/vo/#collapseVoListOther.

Institutional members supporting research communities

EGI relies on the information on each community's website to list institutions supporting research communities at the national level. Additionally, EGI appreciates the feedback from its national representatives to refine and improve those lists.

EGI Membership Impact Report

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