EGI Council Participant: ARNES

Participating in EGI Impact Report: Slovenia

2024

egi.eu

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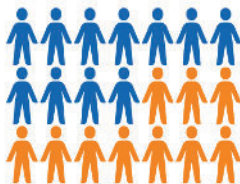
Infographic

132 service users

In 2024, 132 researchers from Slovenian institutions used the services provided by the EGI Federation

1,336 publications

The research communities, projects and scientific collaborations from Slovenia supported by the EGI led to 1,336 peer-reviewed scientific publications

11 Supported communities

In 2024, the Slovenian infrastructure supported 11 research communities in the following disciplines: Climate Research, Health and Medicine, Physics

Projects

Slovenian partners participate in 6 collaboration projects.

Compute Delivery

In 2024, the infrastructure providers from Slovenia federated in EGI delivered 69,735,299 HTC CPU Hours.

Country overview

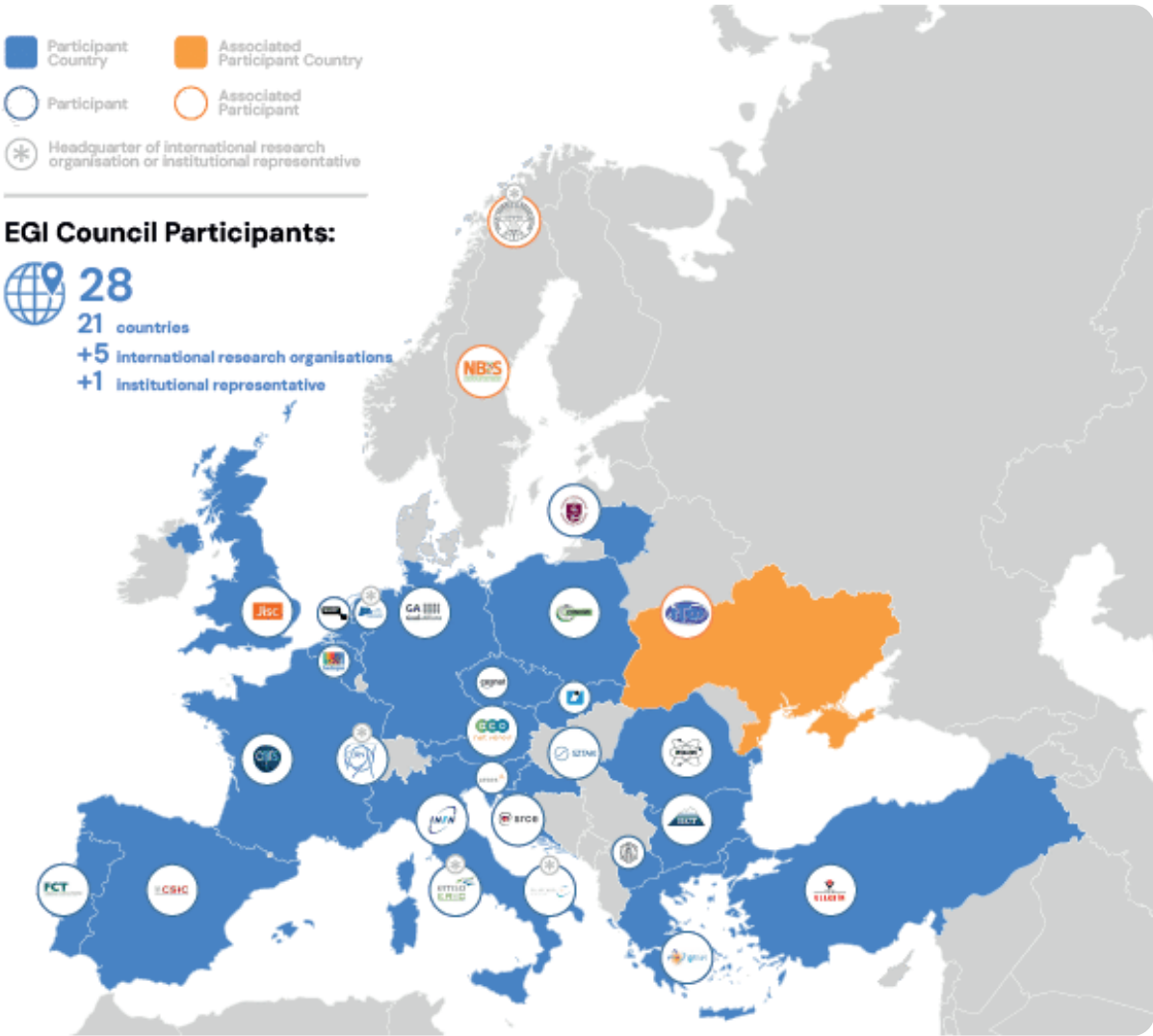|	
Number of supported publications	1,336
Number of total service users	132
Scientific Communities supported	11
Data Centres contributing to the Federation	2
Collaboration projects	6
Total HTC CPU hours delivered	69,735,299

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 ARNES

The Academic and Research Network of Slovenia (ARNES) is a public institute that provides network services to research, educational and cultural organizations, and enables them to establish connections and cooperation with each other and with related organizations abroad.

ARNES builds, maintains and manages infrastructure linking universities, institutes, research laboratories, museums, schools, databases and digital libraries. It offers users the same services as national academic networks in other countries; it cooperates with these networks in European Commission projects to test, develop and introduce new Internet protocols and services. It also provides services that are not offered by commercial organizations but which are essential to the operation of the Internet in Slovenia.

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 Slovenia excellence in science

ARNES coordinates the Slovenian participation to the EGI Federation, representing the SLING (National Supercomputing Network Consortium). SLING promotes the building and operation of a multidisciplinary national Distributed Computing Infrastructure open to all sciences and to developing countries in Slovenia. This report provides an overview of the activities of ARNES in EGI, and the impact that was achieved thanks to this participation. The annual membership fee contributed by ARNES to the EGI Foundation in 2024 was 25,000 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 132 researchers from Slovenia in 2024. The estimated annual scientific output in 2024 produced by research communities, projects and scientific collaborations from Slovenia and supported by the EGI Federation is estimated to amount to 1,336 peer reviewed scientific publications. The EGI Federation is currently working with over 40 Research Infrastructures, 11 of which include Slovenian partners. These EGI-enabled research infrastructures, their Slovenian members and their 2024 scientific output (publications) are detailed in the following pages of the report.

Slovenian research collaborations in EGI

EGI supported activities and services

Number of scientific papers published in 2024

ATLAS (High-Energy Physics)
- Jožef Stefan Institute
- University of Ljubljana

ATLAS 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)

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AUGER (Astronomy)
- University of Nova Gorica
- J. Stefan Institute

The Pierre Auger Observatory has been using compute resources from EGI partners for more than a decade. The services of the EGI federation that the Auger observatory benefits from include:

- EGI HTC services from 9 EGI participant countries (CZ, DE, IT, FR, ES, NL, RO, PT, SI)
- 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)

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Slovenian research collaborations in EGI	EGI supported activities and services	Number of scientific papers published in 2024
BELLE (High-Energy Physics) • Univ. of Ljubljana • Univ. of Nova Gorica	The BELLE experiment has been using compute resources from EGI partners since 2016. The services from the EGI federation that BELLE benefits from include: • EGI HTC services from 9 EGI participant countries (CZ, DE, IT, FR, ES, NL, RO, PT, SI) • 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)	9
BIOMED (Life Sciences) • University of Pola • ZRC SAZU	The Life Science Grid Community is supported by EGI for more than one decade and have an Service Level Agreement since 2016. The EGI Services used by the community include: • High-Throughput + Online Storage services • EGI Cloud services • EGI Workload Manager From 2021 the community is one of the Data Space providers supported in the EGI-ACE Horizon 2020 project.	2
CLARIN (Linguistics) • CLARIN.SI, Jožef Stefan Institute	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

Slovenian research collaborations in EGI	EGI supported activities and services	Number of scientific papers published in 2024
CTA (Astronomy) • University of Nova Gorica	The CTA experiment has been using compute resources from EGI partners for more than a decade. The services from the EGI federation that CTA uses include: • EGI HTC services from 9 EGI participant countries (CZ, DE, IT, FR, ES, NL, RO, PT, SI) • 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)	0
ILC (High-Energy Physics) • Jozef Stefan Institute	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
LifeWatch (Biodiversity and Ecosystem Research) • Karst Research Institute at Research Centre of the Slovenian Academy of Sciences and Arts – ZRC SAZU	The LifeWatch experiment has been using compute resources from EGI partners since 2018. The services from the EGI federation that LifeWatch uses include: • EGI Cloud services from 2 EGI federated sites from ES and PT • 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)	149

Slovenian research collaborations in EGI

EGI supported activities and services

Number of scientific papers published in 2024

LSST (Astronomy)
- University of Nova Gorica (UNG)

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)

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SeaDataNet (Oceanography)
- National Institute of Biology (NIB) – Marine Biology Station

SeaDataNet has been supported by EGI partners in the EOSC-hub project in the setup and validation of a data access service on federated cloud resources. Since 2021 the SeaDataNet community is represented in the EGI Council by MARIS, and works with several EGI members in the EGI-ACE Horizon 2020 project. In EGI-ACE, SeaDataNet and EGI partners from Spain are setting up and operating a WebOcean Data Analysis service in the EGI cloud federation, and deliver the service in EOSC.

0

Slovenian research collaborations in EGI

EGI supported activities and services

Number of scientific papers published in 2024

WeNMR (Structural Biology)
- UL FKKT
- NATIONAL INSTITUTE OF CHEMISTRY
- UNIVERSITY OF LJUBLJANA
- INSTITUTE OF BIOCHEMISTRY AND MOLECULAR GENETICS
- JOZEF STEFAN INSTITUTE

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, Slovania, 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.

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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
AI4EUROPE Supporting AI RD	EGI is contributing to the architectural design and implementation of open distributed software to ensure that AI4Europe evolves as a distributed ecosystem. EGI is also providing its expertise on physical resources, usability, development of systems, distributed systems and new technologies to develop mechanisms for the AI tools to deploy/make use of private/public Cloud and HPC resources.	• ZRC SAZU
BD4NRG Big Data for Next Generation Energy	The EGI Foundation delivers a reference architecture for Smart Energy and extend COSMAG specification to enable B2B multi-party data exchange, while providing full interoperability of leading-edge big data technologies with smart grid standards and operational frameworks; evolve and upscale a number of TRL 5–6 technology enablers; delivers a TRL8 open modular big data analytic toolbox as front-end for one-stop-shop analytics services development by orchestrating legacy and/or third party assets (data, computing resources, models, algorithms); validates such framework through the delivery of predictive and prescriptive edge AI-based big data analytics on 13 large scale pilots, deployed by different energy stakeholders.	• Univerza V Ljubljani • Comsensus • Elektroljubljana • Borzen • Eles
CRAFT-OA eosc	EGI coordinates the task dedicated to the Single Sign-On access with the EGI Check-in service.	• ZRC SAZU
EUH4D	EGI contributes to the Federation sustainability model and the expansion of the DIH ecosystem. Moreover, it collaborates to the development and maintenance of the service catalogue, to the training programme, and to the dissemination and outreach of the project activities and results.	• Univerza V Ljubljani
FANCO	EGI contributes to the GAP analysis, User needs and requirements, Definition of System Requirements and Technical Specifications, and Security, in addition to the Self-sovereign Identity Management and Dissemination and Communication. EGI coordinates the task dedicated to Policy recommendations on Distributed Infrastructures, Secure Data Exchange & Data Spaces.	• XLAB

iMagine

interTwin

ENVRI-Hub NEXT

eosc BEYOND

SPECTRUM

Infrastructure contributions

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

HTC Federation:
- ARNES (Arnes, Ljubljana)
- SiGNET (Jozef Stefan Institute)

The data centres provided 2 service endpoints and delivered 69,735,299 CPUhours in total to EGI communities in 2024. The data centres responded to 25 support tickets through the EGI Helpdesk.

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

- ATLAS 78.36%
- BELLE 21.64%

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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