



EGI Council Participant: GRNET

Participating in EGI Impact Report: Greece

2023

egi.eu

Table of Contents

04

Infographic

05

Country
Overview

06

About EGI

10

EGI Contribution to the
country excellence in
science

17

Service
Level
Agreements

08

About
Council
Participant

09

Overall EGI
Impact

18

Participated
Projects

23

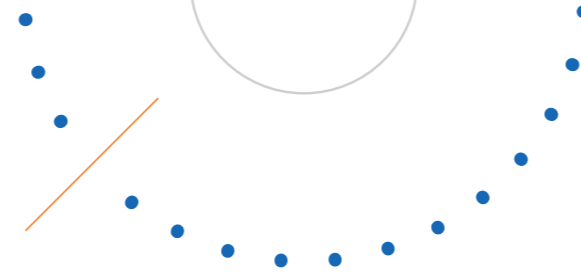
Infrastructure
Contribution

24

Methodology

27 National institutional members of
supported research communities (table 2)

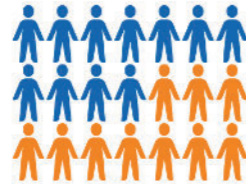
Infographic



Country overview

+930 service users

In 2023, +930 researchers from Greek institutions used the services provided by the EGI Federation



+590 publications

The research communities, projects and scientific collaborations from Greece supported by the EGI led to more than 590 peer-reviewed scientific publications

15 Supported communities

In 2023, the Greek infrastructure supported 15 research communities in the following disciplines: Agriculture, Climate Research, Health and Medicine, Linguistics, Physics



Projects

Greek partners participate in 20 collaboration projects + EGI-ACE, iMagine and interTwin



Number of supported publications 598

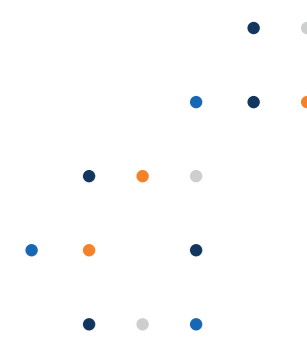
Number of total service users 930

Scientific Communities supported 15

Data Centres contributing to the Federation 4

Collaboration projects 20

Total Cloud CPU hours delivered 456,951



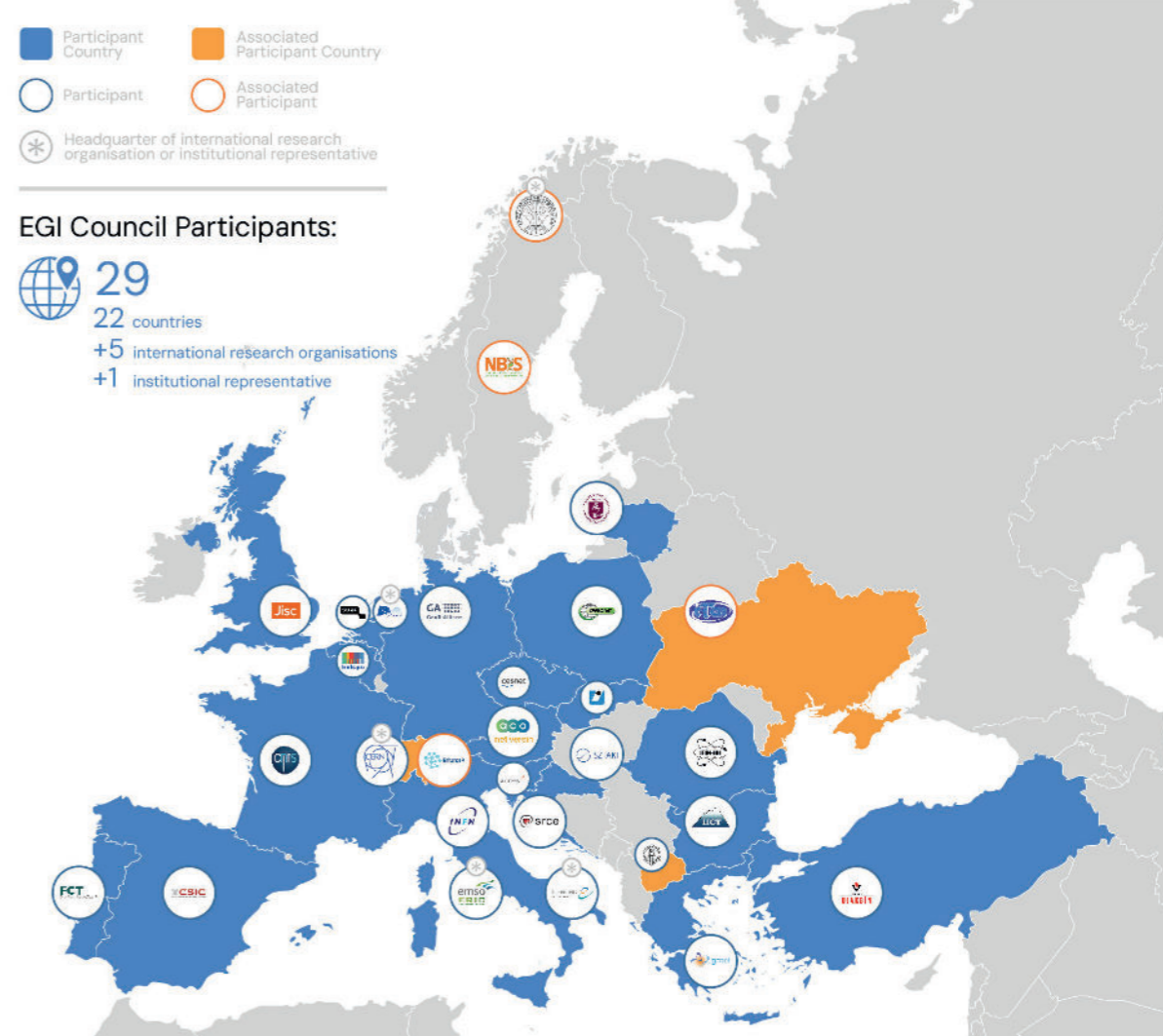
About EGI

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 2023.



Approved EGI Council map from 2023



About GRNET

GRNET – National Infrastructures for Research and Technology, is one of the largest public sector technology companies in Greece. Since August 2019 operates under the auspices of the Ministry of Digital Governance. GRNET provides networking, cloud computing, HPC, data management services and e-Infrastructures and services to academic and research institutions, to educational bodies at all levels, and to all agencies of the public sector.

GRNET holds a key role as the coordinator of all e-infrastructures in Education and Research. It is responsible for promoting and disseminating network and computing technologies and applications, as well as for promoting and implementing Greece's Digital Transformation goals and policy. GRNET leverages the national educational and research activity, striving towards the development of applied and technological research in the fields of telecommunication networks and computing services.

It designs, develops and maintains advanced computer & networking infrastructures and services, data centers, a nation-wide fiber optic network and a high-performance computer system (HPC-ARIS). GRNET also coordinates and participates in Open Science projects, and is involved in the formulation of the National Artificial Intelligence Strategy. Also, it is the Euro QCI (Quantum Communication Infrastructure) national representative.

GRNET develops synergies with other agencies which provide digital services in the Greek public sector, by sharing best practices and know-how on advanced information systems. It provides international interconnection through the pan-European GÉANT network, and is the National Research and Education Network (NREN).

Overall EGI impact

GRNET Consortium coordinates the Greek participation to the EGI Federation, representing the National grid initiative for Greece. GRNET Consortium promotes the building and operation of a multidisciplinary national Distributed Computing Infrastructure open to all sciences and to developing countries in Greece. This report provides an overview of the activities of GRNET Consortium in EGI, and the impact that was achieved thanks to this participation. The annual membership fee contributed by GRNET Consortium to the EGI Foundation in 2023 was 90,000 EUR.

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 2023, the EGI Federation served around 95,000 users (+12%) from over 260 research communities. EGI users consumed 7 Billion HTC CPU hours

(-1.04%), 12 Million Cloud CPU hours +17%), ran over 372 M computational jobs (+13.4%) and published over 2,900 open access publications.

As of the previous year, the research community with the largest number of users is Medical and Health Sciences (+43% annual increase in 2023), while the community with most extensive HTC CPU/h consumption is WLCG.

From the scientific communities engaged in 2023, the one with most extensive Cloud CPU/h consumption is Pangeo (+2959% annual increase in 2023).

Moreover, EGI engaged with a total of 265 scientific communities (10 new communities); 19 SMEs and business pilots, and 1 additional Research Infrastructure included

EGI contribution to Greece excellence in science

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 2023, our federation was used by over 260 scientific communities, and has been accessed by around 95,000 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 930 researchers from Greece in 2022. The estimated annual scientific output in 2023 produced by research communities, projects and scientific collaborations from Greece and supported by the EGI Federation is estimated to amount to over 590 peer reviewed scientific publications.

The EGI Federation is currently working with over 40 Research Infrastructures, 33 of which include Greek partners. These EGI-enabled research infrastructures, their Greek members and their 2023 scientific output (publications) are detailed in the following pages of the report

Greek research collaborations in EGI

ALICE (High-Energy Physics)

- Physics Department, University of Athens

ATLAS (High-Energy Physics)

- National Centre for Scientific Research (NCRS) "Demokritos"
- National and Kapodistrian University of Athens
- Aristotle University of Thessaloniki
- National Technical University of Athens

CLARIN (Linguistics)

- clarin:el, ILSP-ATHENA Research Center

EGI supported activities and services

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)

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)

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

Number of scientific papers published in 2022

65

111

38

Greek research collaborations in EGI

CMS (High-Energy Physics)

- University of Ioánnina
- National Centre for Scientific Research (NCRS) "Demokritos"
- National Technical University of Athens
- National and Kapodistrian University of Athens

EGI supported activities and services

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)

Number of scientific papers published in 2022

117

CTA (Astronomy)

- National and Kapodistrian University of Athens
- National Technical University of Athens
- Aristotle University

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

Greek research collaborations in EGI

DUNE (Astroparticle Physics)

- National and Kapodistrian University of Athens

EGI supported activities and services

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)

Number of scientific papers published in 2022

20

ELI-NP (Nuclear Physics)

- Hellenic Mediterranean University

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 ComputeService 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

48

EMPHASIS (Agriculture)

- Mediterranean Agronomic Institute of Chania

EMPHASIS has been supported through the establishment of a Data Space in the EGI-ACE project. Since 2017 EMPHASIS using the following services from EGI:

- EGI Check-in
- EGI Cloud Compute
- EGI Online Storage
- EGI DataHub
- Technical support
- Software integration and piloting

0



Greek research collaborations in EGI

EMSO (Oceanography)

- HCMR

EGI supported activities and services

The collaboration with EGI started back in 2017 when 4 cloud providers of the EGI Federation agreed to support the EMSODEV project during the design and implementation of the EMSODEV Data Portal.

EMSO-ERIC setup the EMSO ERIC Data Management Platform on the EGI providers in order to harmonize the data sets following Oceansites specifications, FAIR principles, and EOSC guidelines.

Number of scientific papers published in 2022

0

KM3NET (Neutrino Observatory)

- Aristotle University Thessaloniki
- Hellenic Open University
- National Centre for Scientific Research (NCRS) "Demokritos"
- National and Kapodistrian University of Athens

The Km3Net experiment has been using compute resources from EGI partners since 2013. The services from the EGI federation that Km3Net uses include:

- EGI HTC services from 2 EGI federated sites from IT and PL
- 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)

58

LifeWatch (Biodiversity and Ecosystem Research)

- Institute of Marine Biology, Biotechnology and Aquaculture (IMBBC)
- 49 partner institutions covering a wide range of scientific disciplines

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)

0

Greek research collaborations in EGI

MINKE (Oceanography)

- Hellenic Centre for Marine Research

EGI supported activities and services

The collaboration with EGI started back in 2021. The services from the EGI federation that the experiment uses include:

- EGI HTC services from 1 EGI federated site from ES
- 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)

Number of scientific papers published in 2022

0

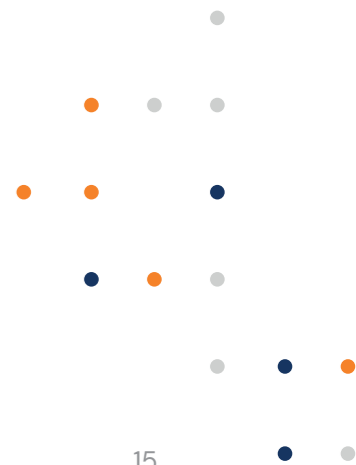
MOEDAL-MAPP (Physical Sciences)

- Technical University of Athens

MOEDAL-MAP has been supported since 2016 as part of the EGI WLCG collaboration, formally agreed in an MoU. Federating 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)

0



Greek research collaborations in EGI

WeNMR (Structural Biology)

- University of Athens
- National Centre for Scientific Research (NCRS) "Demokritos"
- BSRC Alexandre Fleming
- Aristotle University of Thessaloniki
- University of Patras
- University of West Attica

EGI supported activities and services

WeNMR is supported by EGI since 2011 and has a Service Level Agreement since 2016. The EGI Services used by the community include:

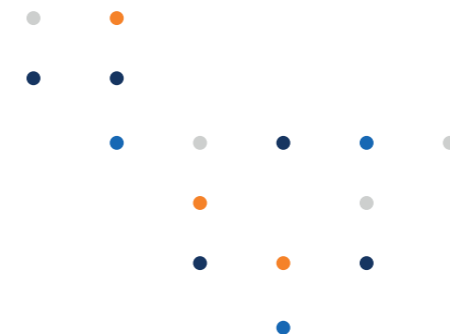
- High-Throughput, Cloud + Online Storage services from 23 EGI federated sites from the Netherlands, Italy, France, 2023y, UK, Poland, the Asia Pacific region, IberGrid (Spain and Portugal), Italy, the Latin America region.
- EGI Workload Manager
- Trust and identity management with Check-in
- Technical support: WeNMR benefited from continual support through dedicated support activities in various EGI flagship projects: EGI-Engage, EOSC-hub and EGI-ACE.

Number of scientific papers published in 2022

136

Service Level Agreements

During 2023, GRNET supported 49 Service Level Agreements for international scientific communities via EGI, delivering the Check-in Identity and Access Management service.



Participated projects

The EGI Foundation coordinated one Horizon 2020 project, EGI ACE (January 2021–June 2023). Moreover, it leads two Horizon Europe Projects, iMagine (September 2022–December 2025) and interTwin (September 2022–August 2025).

Furthermore, the EGI Federation was involved in 8 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.

- TANGO
- TRIPLE

Project title	Scope of collaboration	Participating beneficiaries from the country
---------------	------------------------	--



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.

- National Centre for Scientific Research (NCRS) "Demokritos"



EGI contributes to EOSC-LIFE by supporting the creation and operation of a life science AAI (LS AAI) that is fully interoperable with the EOSC AAI.

- Dimos Athinaion Epicheirisi Michanografisis



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.

- NTUA National Technical University of Athens
- Tilos University of West Attica / Tilos Smart Island
- Holistic Pc



EGI contributes with the services Cloud computing, Notebooks and Applications on demand, FTS, data archiving. It participates to the EOSC Integration processes and the sustainability business plan.

- NATIONAL INFRASTRUCTURES FOR RESEARCH AND TECHNOLOGY
- IDRYMA TECHNOLOGIAS KAI EREVNAS
- HELLENIC CENTRE FOR MARINE RESEARCH



EGI coordinates the task dedicated to the Single Sign-On access with the EGI Check-in service.

- OpenAIRE AMKE



EGI the project coordination and led the activity to setup the C-SCALE Compute Federation, leveraging on its extensive experience on setup and managing large distributed infrastructures. EGI also took care of the interactions with other EOSC initiatives and projects and had a leading role on defining C-SCALE business and sustainability.

- GRNET

Project title	Scope of collaboration	Participating beneficiaries from the country
---------------	------------------------	--



EGI is involved in developing a detailed roadmap, analyzing state-of-the-art technology, and designing a modular architecture framework. Moreover, It works to improve data monetization strategies for EU companies and define KPIs for fair dataset valuation. EGI will help develop business cases for data sharing platforms, explore non-monetary data value dimensions, and prepare pilots for framework deployment. Demonstration and validation tests will be conducted at pilot sites. Additionally, EGI contributes to disseminating results, managing innovation and sustainability, participating in standardization activities, and coordinating with the Data Spaces Support Centre.

- ETHNIKO KENTRO EREVNAS KAI TECHNOLOGIKIS ANAPTYXIS
- EREVNITIKO PANEPISTIMIAKO INSTITOUTO SYSTIMATON EPIKOINONION KAI YPOLOGISTON
- ORGANISMOS TILEPIKOINONION TIS ELLADOS OTE AE
- DIACHEIRISTIS ELLINIKOU DIKTYOU DIANOMIS ELEKTRIKIS ENERGEIAS AE

Project title	Scope of collaboration	Participating beneficiaries from the country
---------------	------------------------	--



EGI Foundation is leading the design of LETHE system architecture and building a data collection and big data framework, including set-up of the LETHE big data infrastructure, set-up the authentication scheme for the LETHE project and registration of the LETHE infrastructure and services in EOSC.

- Idryma Technologias Kai Erevnas



PolicyCLOUD aims at delivering an integrated cloud-based environment for data-driven policy management. EGI leads the activities on Cloud Infrastructures Utilization & Data Governance, collaborates to the Use cases Adaptation, Integration & Experimentation and to the project's communication and dissemination activities.

- ICCS – Institute of Communication and Computer Systems
- University of Piraeus Research Centre



EGI contributed to the design, operation and interoperability of EOSC Core services, to running the EOSC Digital Innovation Hub, as well as to resource strategy and the processes for onboarding new groups to EOSC. EGI was responsible for requirements collection and analysis for both the EOSC Back Office and Front Office. It also leads all operational aspects of the EOSC Portal. Finally, EGI played a leading role in developing the EOSC SMS.

- ATHINA-EREVNITIKO KENTRO KAINOTOMIAS STIS TECHNOLOGIES TIS PLIROFORIAS, TON EPIKOINONION KAI TIS GNOSIS
- NATIONAL INFRASTRUCTURES FOR RESEARCH AND TECHNOLOGY
- OpenAIRE AMKE
- JNP STRATIGIKI KAI EPICHIRISIAKI SYMVOULEFTIKI IKE



The EGI Foundation supports the project in defining interoperability standards among the participating facilities, and with the broader landscape, including EOSC, and leads the design of sustainable services and activities that will last beyond the project. EGI members deliver a federated cloud environment with a cloud-based 'EGI Notebooks' service for the PITHIA e-science centre to offer a scalable and customisable web environment for writing workflows, exchanging workflows, accessing, analysis and sharing of data.

- Ethniko Asteroskopeio Athinon



EGI contributes to EOSC-LIFE by supporting the creation and operation of a life science AAI (LS AAI) that is fully interoperable with the EOSC AAI.

- Biomedical Sciences Research Center Alexander Fleming



Within EUCAIM, EGI works on the development of the platform core services in addition to supporting the creation of the platform central storage and infrastructure. Moreover, EGI leads the activities around the design and implementation of a federated learning and data analysis infrastructure, and ensures access to HPC/Cloud resources across Europe.

- Aristotle University of Thessaoloniki
- Foundation for Research and Technology – Hellas
- Hellenic Cancer Society



EGI contributes supporting HPC, Cloud and Edge, and to to the strategic engagement with the European AI Ecosystem and connected communities.

- NCSR-D



EGI contributes to the definition of requirements, metrics, specifications and pilots for the assessment of thematic services and platforms

- ATHENA RC
- OpenAIRE AMKE

Project title	Scope of collaboration	Participating beneficiaries from the country
---------------	------------------------	--



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

- OpenAIRE AMKE



EGI leads the work on Services Provision, which collects information about the services that the RI can provide and creates a plan for a unified single access point RI, including access policies for the distributed resources. EGI also contributes to the development of the financial aspect of the future RI, defines the business cases and the cost book, supports the strategy and enhance the impact of the RI, contributes to the Dissemination and Communication plans (WP5), and to the creation of the Italian central Hub for the preparation phase.

- OpenAIRE AMKE
- ATHINA-EREVNITIKO KENTRO KAINOTOMIAS STIS TECHNOLOGIES TIS PLIROFORIAS, TON EPIKOINONION KAI TIS GNOSIS



EGI is involved in the work ensuring the integration of the TRIPLE solution into the EOSC; also, it collaborates to the sustainability and innovation activities by setting up the processes to prepare maturity assessment and innovative agile management. Last but not least, it guides the implementation of the EGI AAI service in TRIPLE.

- NHRF – Ethniko Kentro Tekmiriosis Kai Ilektronikou Periechomenou



TANGO 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.

- EXUS AI
- University of Thessaly
- UNIVERSITY of PIRAEUS
- METRO

Infrastructure contributions

The EGI Federation offers two complementary compute capabilities: the High-Throughput Compute (HTC) federation and the Cloud federation. 4 Greek data centres contribute to these federations:

HTC Federation:

- GR-07-UOI-HEPLAB (HEP Laboratory, Physics Department, University of Ioannina, Greece),
- HG-02-IASA (IASA),
- HG-06-EKT (EKT – NDC)

Cloud Federation:

- GRNET-OPENSTACK

The data centres provided 11 service endpoints and delivered 456,951 Cloud CPU hours to EGI communities in 2023. The data centres responded to 6 support tickets through the EGI Helpdesk.

Methodology

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

- Infrastructure contributions, infrastructure usage by research communities: [EGI Accounting System](#)
- List of research publications by supported research communities (table 1)

AMS-02 https://ams02.space/publications	ILC https://inspirehep.net/literature?sort=mostrecent&size=25&page=1&q=international%20Linear%20Collider%20&earliest_date=2021--2021
ALICE https://alice-publications.web.cern.ch/publications	INSTRUCT https://instruct-eric.eu/content/publications-list
ATLAS https://cds.cern.ch/collection/ATLAS%20Papers?ln=en	JUNO https://inspirehep.net/
AUGER https://www.auger.org/science/publications/journal-articles	KM3NET https://www.km3net.org/about-km3net/publications/publication/ ; https://inspirehep.net/literature?q=collaboration:KM3NeT_year:2021
BELLE https://belle.kek.jp/belle/publications.html ; https://inspirehep.net/literature?q=collaboration:belle_year:2021	LifeWatch https://www.lifewatch.eu/catalogue-of-virtual-labs/medobis/publications/

BIOMED https://vip.creatis.insa-lyon.fr/documentation/	LOFAR http://old.astron.nl/radio-observatory/lofar-science/lofar-papers/lofar-papers ; https://lofar-surveys.org/publications.html , or https://ui.adsabs.harvard.edu/search?q=full%3A(%22designed%20and%20constructed%20by%20ASTRON%22)%20OR%20title%3A%22LOFAR%22%20year%3A2021-2021%20property%3Arefereed%20-bibstem%3A(%22AN%22%20OR%20%22MNRAS,tmp%22)&sort=date%20desc%2C%20bibcode%20desc&p_0
CTA https://www.cta-observatory.org/science/library/	LCHb https://cds.cern.ch/collection/LHCb%20Papers?ln=en
CLARIN https://beta.clarin.openaire.eu/search/advanced/research-outcomes?sortBy=resultdateofacceptance,descending&type=publications&year=range2021:2021	LSST https://ui.adsabs.harvard.edu/?with_year:2021+author:(%22LSST%22+OR+%22Vera+C.+Rubin%22)+collection:astronomy+property:refereed
CMS http://cms-results.web.cern.ch/cms-results/public-results/publications/CMS/index.html	NA62 https://cds.cern.ch/collection/NA62%20Papers?ln=en
DUNE https://inspirehep.net/literature?q=collaboration:DUNE_year:2021	OPENCOASTS http://opencoasts.lnec.pt/index_en.php
EISCAT_3D https://eiscat.se/scientist/publications/	PANOSC https://www.panosc.eu/publications/

National institutional members of supported research communities (table 2)

ELI-BEAM

<https://www.eli-beams.eu/publike/>

SeaDataNet

<https://www.seadatanet.org/Publications/Scientific-publications>

ELI-NP

https://www.eli-np.ro/scientific_papers.php

SKA

[https://ui.adsabs.harvard.edu/search/fq=%7B!type%3D%20v%3D%24fq_database%7D&fq_database=database%3A%20astronomy&q=pubdate%3A%5B2021-01%20TO%202021-12%5D%20title%3A\(SKA\)&sort=date%20desc%2C%20bibcode%20desc&p_0](https://ui.adsabs.harvard.edu/search/fq=%7B!type%3D%20v%3D%24fq_database%7D&fq_database=database%3A%20astronomy&q=pubdate%3A%5B2021-01%20TO%202021-12%5D%20title%3A(SKA)&sort=date%20desc%2C%20bibcode%20desc&p_0)

EMSO-ERIC

from the community representative; SLA <https://documents.egi.eu/document/3539>

SNO+

<https://snoplus.phy.queensu.ca/results/collaboration-papers.html>

FUSION

<https://documents.egi.eu/public/ShowDocument?docid=3484>

VIRGO

<https://pnp.ligo.org/ppcomm/Papers.html>

HESS

<https://www.mpi-hd.mpg.de/hfm/HESS/pages/publications/>

WeNMR

<https://explore.openaire.eu/> advanced search project outcomes. field to search "project" enter project name; Citation of HADDOCK web server: https://scholar.google.nl/scholar?hl=en&as_sdt=2005&cites=10355645612647046441&scipsc=&as_ylo=2021&as_yhi=2021; Citations of the AMBER web portal publication: https://scholar.google.com/scholar?as_ylo=2021&hl=en&as_sdt=0.5&sciodt=0.5&cites=6696812766870837905&scipsc=; Citations of the FANTEN web portal publication: https://scholar.google.com/scholar?as_ylo=2021&hl=en&as_sdt=0.5&sciodt=0.5&cites=10578718345045994565&scipsc=; Citations of the DISVIS/POWERFIT web portals publication: https://scholar.google.com/scholar?as_ylo=2021&hl=en&as_sdt=2005&cites=6482114501244947208&scipsc=; Citations of the SpotON web portal: https://scholar.google.com/scholar?as_ylo=2021&hl=en&as_sdt=2005&cites=6482114501244947208&scipsc=

Ice-Cube

<https://icecube.wisc.edu/science/publications/>

XENON

<https://inspirehep.net/literature?q=collaboration:XENON&year:2021>

AMS-02

<https://ams02.space/collaboration/institute>

ILC

<https://linearcollider.org/team/>

ALICE

https://alice-collaboration.web.cern.ch/General/Members/List_Institutes.html

INSTRUCT

<https://instruct-eric.eu/countries>

ATLAS

<https://atlas.cern/discover/collaboration>

JUNO

<https://juno.ihep.ac.cn/collaboration.php>

AUGER

<https://www.auger.org/collaboration/institutions>, <https://www.auger.org/collaboration/funding-agencies>

KM3NET

<https://www.km3net.org/about-km3net/collaboration/members/>

BELLE

<https://belle.kek.jp/bdocs/collaboration.html>

LifeWatch

<https://www.lifewatch.eu/organisation-governance/>

BIOMED

<https://vip.creatis.insa-lyon.fr/>

LOFAR

<https://www.astron.nl/telescopes/>

CTA

<https://www.cta-observatory.org/about/cta-consortium/>

LCHb

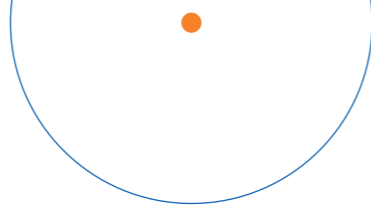
<https://lhcb-public.web.cern.ch/en/collaboration/Collaboration-en.html>

CLARIN

<https://www.clarin.eu/content/participating-consortia>

LSST

<https://www.lsstcorporation.org/international-contributors>

**CMS**

<https://cms.cern/collaboration/cms-institutes>

NA62

<https://greybook.cern.ch/experiment/detail?id=NA62>

DUNE

<https://lbnf-dune.fnal.gov/about/countries-and-institutions-participating-in-dune/>

OPENCOASTS

http://opencoasts.inec.pt/index_en.php

EISCAT_3D

<https://eiscat.se/wp-content/uploads/2016/12/EISCAT-Organogram-202x.jpg>; <https://eiscat.se/scientist/document/information/>

PANOSC

<https://www.panosc.eu/partners/>

ELI-BEAM

<https://www.eli-beams.eu/about/cooperation/science/>

SeaDataNet

<https://www.seadatanet.org/About-us/SeaDataNet-AISBL/Members>

ELI-NP

https://www.eli-np.ro/scientific_collaborations.php

SKA

<https://www.skatelescope.org/participating-countries/>

EMSO-ERIC

<http://emso.eu/organization/>

SNO+

<https://snoplus.phy.queensu.ca/collaboration.html>

FUSION

<https://documents.egi.eu/public/ShowDocument?docid=3484>

VIRGO

<https://apps.virgo-gw.eu/vmd/public/institutions>

HESS

<https://www.mpi-hd.mpg.de/hfm/HESS/pages/collaboration/>

WeNMR

<https://documents.egi.eu/document/2751>

Ice-Cube

<https://icecube.wisc.edu/collaboration/institutions/>

XENON

https://science.purdue.edu/xenon1t/?page_id=27



EGI Membership Impact Report

Contact us

Science Park 140
1098 XG Amsterdam
Netherlands

Phone:
+31 (0)20 89 32 007

Email:
contact@egi.eu

 [egi_einfra](https://egi.eu)

 [EGI Foundation](https://egi.eu)

 [EGI](https://egi.eu)

www.egi.eu