EGI Council Participant: FCT

Participating in EGI Impact Report: Portugal

2023

egi.eu

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Infographic

+510 service users

In 2023, +510 researchers from Portuguese institutions used the services provided by the EGI Federation
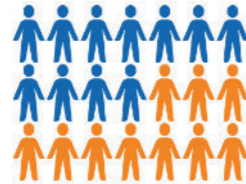
+720 publications

The research communities, projects and scientific collaborations from Portugal supported by the EGI led to more than 720 peer-reviewed scientific publications
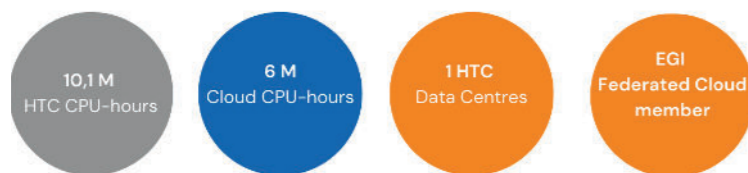
23 Supported communities

In 2023, the Portuguese infrastructure supported 23 research communities in the following disciplines: Agriculture, Climate Research, Health and Medicine, Linguistics, Physics

Projects

Portuguese partners participate in 18 collaboration projects + EGI-ACE, iMagine and interTwin

10,1 M HTC CPU-hours

6 M Cloud CPU-hours

1 HTC Data Centres

EGI Federated Cloud member

Country overview

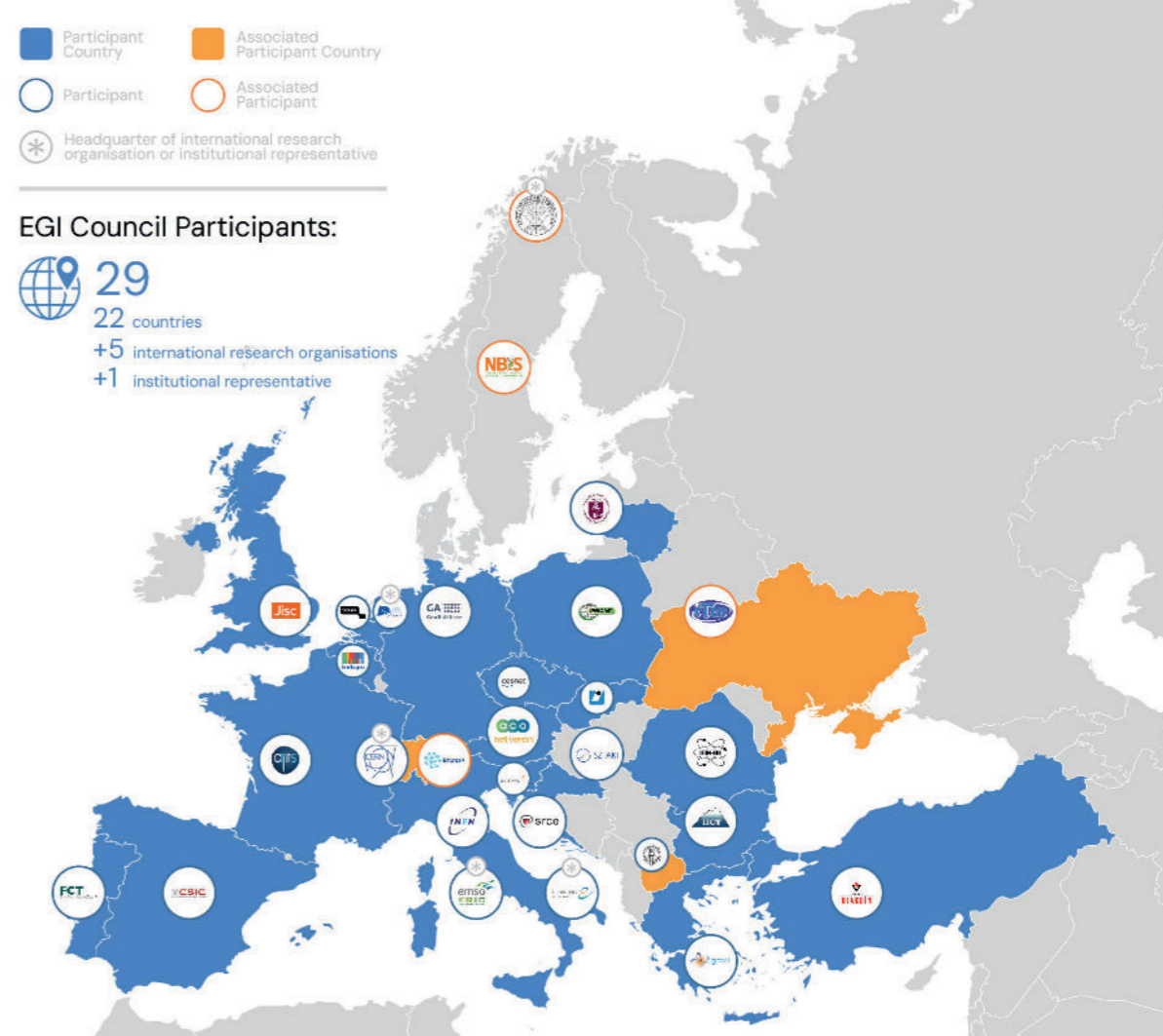|	
Number of supported publications	723
Number of total service users	517
Scientific Communities supported	23
Data Centres contributing to the Federation	1
Collaboration projects	18
Total HTC CPU hours delivered	10,167,296
Total Cloud CPU hours delivered	6,176,195

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.

Participant Country
Associated Participant Country
Participant
Associated Participant
Headquarter of international research organisation or institutional representative

EGI Council Participants:

29
22 countries
+5 international research organisations
+1 institutional representative

Approved EGI Council map from 2023

About FCT

Fundação para a Ciência e a Tecnologia is the Portuguese public funding agency that supports science, technology and innovation, in all scientific domains, under responsibility of the Ministry for Science, Technology and Higher Education.

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 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 in the ESFRI Roadmap, raising the total of number of ESFRI partners/users of EGI to 23.

EGI contribution to Portugal excellence in science

FCT coordinates the Portuguese participation in the EGI Federation; FCT represents Portugal in the EGI Council. The Portuguese National Distributed Computing Infrastructure (INCD) is the e-infrastructure provider in EGI. INCD promotes the building and operation of a multidisciplinary national Distributed Computing Infrastructure open to all sciences in Portugal. This report provides an overview of the activities of Portugal in EGI, and the impact that was achieved thanks to this participation. The annual membership fee contributed by FCT to the EGI Foundation in 2023 was 40,000 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 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.

In 2023, the services of the EGI federation were used by 517 researchers from Portugal. The estimated annual scientific output in 2023 produced by research communities, projects and scientific collaborations from Portugal and supported by the EGI Federation is estimated to amount to over 720 peer reviewed scientific publications. The EGI Federation is currently working with over 40 Research Infrastructures, 23 of which include Portuguese partners. These EGI-enabled research infrastructures, their Portuguese members and their 2023 scientific output (publications) are detailed in the following pages of the report.

Portuguese research collaborations in EGI | EGI supported activities and services | Number of scientific papers published in 2023

AMS-02 (Particle Physics)
- LIP

The AMS-02 experiment on the International Space Station has been using compute resources from EGI for more than a decade. The services from the EGI federation that AMS-02 uses include:

- EGI HTC services from sites in Italy and CERN
- 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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ATLAS (High-Energy Physics)
- Laboratório de Instrumentação e Física Experimental de Partículas - LIP
- Departamento de Física, Faculdade de Ciências, Universidade de Lisboa,
- Departamento de Física, Universidade de Coimbra
- Departamento de Física, Universidade do Minho
- Departamento de Física Teórica y del Cosmos, Universidad de Granada
- Departamento de Física and CEFITEC of Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa
- Instituto Superior Técnico, Universidade de Lisboa

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)
- LIP
- IST

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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Portuguese research collaborations in EGI	EGI supported activities and services	Number of scientific papers published in 2023
BIOMED (Life Sciences) • Life and Health Sciences Research Institute • Polytechnical Institute of Cávado and Ave • LIP • University of Lisbon • IBEB-FCUL • University of Minho • INESC TEC	The Life Science Grid Community has been supported by EGI for more than one decade and has a 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	**6**
CLARIN (Linguistics) • PORTULAN CLARIN, • Universidade de Lisboa • Universidade de Évora • Universidade de Coimbra • Universidade do Minho • Universidade Católica Portuguesa • Universidade do Porto • Universidade Nova de Lisboa • Universidade dos Açores • Instituto Politécnico de Tomar	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	**38**
CMS (High-Enery Physics) • LIP	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)	**117**

Portuguese research collaborations in EGI	EGI supported activities and services	Number of scientific papers published in 2023
vo.compass.cern.ch (Physical Sciences) • LIP	COMPASS has been supported since 2017 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)	**0**
DUNE (Astroparticle Physics) • LIP	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)	**20**
ELI-BEAM (Physical Sciences) • LIP	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.	**37**

Portuguese research collaborations in EGI	EGI supported activities and services	Number of scientific papers published in 2023
ELI-NP (Nuclear Physics) • Champalimaud Foundation • Instituto Superior Tecnico	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	**48**
EMSO (Oceanography) • EMSO-PT • IPMA	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 harmonise the data sets following Oceansites specifications, FAIR principles, and EOSC guidelines	**0**
EMPHASIS (Agriculture) • BioISI, ULisboa • CIBIO • FCT-NOVA • Green-IT, ITQB-NOVA • INIAV-BPGV (National seed bank) • LEAF, ULisboa	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**

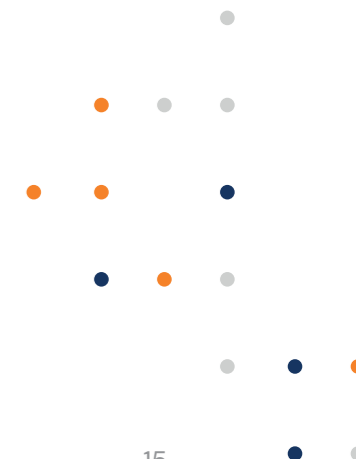| Portuguese research collaborations in EGI	EGI supported activities and services	Number of scientific papers published in 2023
ILC (High-Energy Physics) • LIP	The ILC experiment has been using compute resources from EGI partners since 2004. The services from the EGI federation that ILC experiments uses 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)	**43**
INSTRUCT (Structural Biology) • FC-ULisboa • ITQB • See also WeNMR	The WeNMR structural biology community is supported by EGI since 2011 and have a Service Level Agreement since 2016. WeNMR is part of INSTRUCT and operates online Virtual Research Environments on top of the EGI services. The EGI Services used by the community include: • High-Throughput, Cloud + Online Storage services from 23 EGI federated data centres from the Netherlands, Italy, France, Belgiany, 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.	**87**

Portuguese research collaborations in EGI

EGI supported activities and services

Number of scientific papers published in 2023

LifeWatch (Biodiversity and Ecosystem Research)
- Portuguese GBIF node at Instituto Superior de Agronomia
- Research Centre in Biodiversity and Genetic Resources;
- Associate Laboratory (BIOPOLIS/CIBIO-InBIO);
- cE3c-FCUL, LEAF-ISA and CEF-ISA, University of Lisbon;
- CESAM, University of Aveiro;
- MARE, University of Coimbra;
- Polytechnic Institute of Viana do Castelo;
- MUHNAC (University of Lisbon);
- MC (University of Coimbra);
- MHNC-UP (University of Porto).

The LifeWatch ERIC including the national nodes of the Global Biodiversity Network (GBIF) from Portugal and Spain have 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

LZ (Physical Sciences)
- LIP

The LZ survey federates High Throughput Compute (HTC) resources from the UK. The LZ 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)

1

OPENCoastS and Worsica (Coastal Engineering)
- LNEC

OPENCoastS and Worsica are services integrated in EOSC that have been using compute resources from EGI partners since 2018. The services from the EGI federation that OPENCoastS uses include:

- EGI Cloud services from 2 EGI federated sites from ES and PT
- EGI AAI Check-in

0

Portuguese research collaborations in EGI

EGI supported activities and services

Number of scientific papers published in 2023

SKA (Radioastronomy)
- Portugal Space

The Square Kilometre Array (SKA) is an intergovernmental radio telescope project being planned to be built in Australia and South Africa. 8 countries that participate in SKA are also represented in the EGI Council (France, Portugal, Italy, Portugal, Spain, Switzerland, The Netherlands and the United Kingdom). Between 2017–2019 SKA worked with the EGI federation in the AENEAS Horizon 2020 project. The collaboration resulted in recommendations on how to:

- organize federated service management within the SKA European Science Data Centre (ESDC) and across multiple SKA Regional Centres to address the management of the SKA community-specific services.
- federate the ESDC services with existing e-Infrastructure federated services (Identity Provisioning, Authentication and Authorization, tools for federated service management)
- collect SKA and e-Infrastructures requirements to federate and eventually enhance existing federation services.

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SeaDataNet (Oceanography)
- IHPT Instituto Hidrografico

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.

1

Portuguese research collaborations in EGI	EGI supported activities and services	Number of scientific papers published in 2023
SNO+ (High-Energy Physics) • LIP	The Snoplus experiment has been using compute resources from EGI partners since 2011. The services from the EGI federation that the Snoplus experiment uses include: • EGI HTC services from 3 EGI federated sites from DE, ES 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)	1
VIRGO (Astrophysics) • Universidade de Lisboa • Universidade do Minho • Universidade de Aveiro • Centre for Research and Development in Mathematics and Applications	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

| Portuguese research collaborations in EGI	EGI supported activities and services	Number of scientific papers published in 2023
WeNMR (Structural Biology) • FCUL • CNC.IBILI • INSTITUTO DE INVESTIGAÇÃO E INOVAÇÃO EM SAÚDE (I3S) • UNIVERSITY OF PORTO • INSTITUTO SUPERIOR TÉCNICO DA UNIVERSIDADE DE LISBOA • UCIBIO - FCT UNIVERSITY NOVA LISBON • UNIVERSIDADE DE COIMBRA • ITQB-NOVA • FACULDADE DE CIÊNCIAS • FACULTY OF SCIENCES, UNIVERSITY OF LISBON	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, Portugal, 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.	136
XENON (Dark Matter Physics) • University of Coimbra • LIP	The XENON experiment has been using compute resources from EGI partners for more than a decade. The services from the EGI federation that XENON uses include: • EGI HTC services from 4 EGI federated data centres from France, Italy, the Netherlands and Israel • 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)	7

Service Level Agreements

During 2023, NCG–INGRID–PT supported 5 Service Level Agreements for international scientific communities via EGI, delivering Cloud Computing, Online Storage and HTC services.

Participated projects

The EGI Foundation coordinated one Horizon 2020 project, EGI ACE (January 2021–June 2023). Moreover, it leads two new 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 Portuguese institutions to facilitate the uptake and use of e–infrastructure services for science.
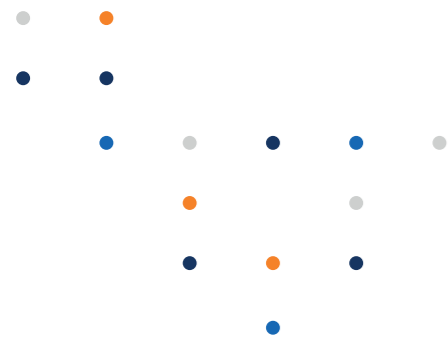
Project title	Scope of collaboration	Participating beneficiaries from the country
AI4EUROPE Supporting AIOD 2022-2025	EGI is contributing to the architectural design and implementation of open distributed software to ensure that AI4Europe evolves as a distributed ecosystem. EGI is also providing its 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.	• GLOBAZ, S.A.
AI4PublicPolicy	EGI is involved in the activities around Cloud-based AI Tools for Citizen Centric & Autonomous Policy, in particular with the Dynamic provisioning of Cloud and HPC. Moreover, it leads the integration of Validated AI-based Applications and Tools, contributes to dissemination and communication, and leads the the business modelling and sustainability planning.	• Unparallel Innovation Lda • Lisboa E-nova
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.	• Ren Redes Energéticas Nacionais • R&D Nester Centro De Investigação Em Energia • Uninova • Enercoutim
eosc Blue-Cloud2026	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.	• Instituto Hidrografico
C-SCALE	EGI the project coordination and led the activity to setup the C-SCALE Compute Federation, leveraging on its exstensive 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.	• INCD
CRAFT-OA eosc	EGI coordinates the task dedicated to the Single Sign-On access with the EGI Check-in service.	• University of Coimbra

Project title	Scope of collaboration	Participating beneficiaries from the country
dj	EGI is involved in developing a detailed roadmap, analyzing state-of-the-art technology, and designing a modular architecture framework. Morever, 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.	• GLOBAZ S.A. • E-REDES - Distribuicao de Electricidade SA
DIGITBRAIN	EGI leads the processes related to setup and operate of testbed infrastructure, the Edge/cloud/HPC orchestration, to secure resource access and user management. It also works on the commercial exploitation and sustainability plan and on dissemination activities..	• Porini International Lda
EOSC-Life	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.	• Centro De Ciências Do Mar Do Algarve
EOSC SYNERGY	EGI contributes to the project activities related to innovation management, policy development, and project activities and results communications and dissemination.	• LIP • LNEC • FCT • INCD
EUCAIM CANCER IMAGE EUROPE	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.	• Centro Hospitalar Universitário de Santo António • Champalimaud Foundation • Servicos Partilhados do Ministerio da Saude • University of Coimbra

Project title	Scope of collaboration	Participating beneficiaries from the country
HEALTHYCLOUD	EGI Foundation leads the task on the analysis of the existing computation infrastructures with a special view on health research and will propose a reference architecture for computational services to serve the Health Research and Innovation Cloud ecosystem.	• SPMS – Servicos Partilhados Do Ministerio Da Saude Epe
LABPLAS	EGI works on the deployment and operation of a FAIR federated data repository, promoting enhanced exploitation of project outputs (data and results). It also provides expertise in order to formulate a strategy regarding data preservation. In particular, EGI will implement a DataHub and a Data preservation service for the project.	• INL • AIR Centre
PHENET PROMOTING ENVIRONMENTAL SOLUTIONS FOR AGROECOLOGY	In the project, EGI co-designs and deploys AI models on edge resources, enhancing capacity through its federation's computational and storage resources. EGI expands resource allocations, provides a two-tier e-infrastructure for validation and large-scale data processing, and ensures sustainable setups by coordinating national funding. EGI addresses data management challenges, integrates distributed storage solutions, and connects PHENET with the European Open Science Cloud.	• Universidade Nova de Lisboa • Universidade do Porto
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.	• SQUAD IT LDA • RIA STONE
Triple	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.	• University of Coimbra

Infrastructure contributions

The EGI Federation offers two complementary compute capabilities: the High-Throughput Compute (HTC) federation and the Cloud federation. One Portuguese research infrastructure participates in both of these federations:

• INCD – Infraestrutura Nacional de Computação Distribuída.

In 2023, INCD provided 11 service endpoints and delivered 10,167,296 HTC CPU hours and 6,176,195 Cloud CPU hours in total to EGI communities.

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/pubblication/; 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:("LSST*" OR "Vera C. Rubin*") 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/

ELI-BEAM
https://www.eli-beams.eu/publikace/

SeaDataNet
https://www.seadatanet.org/Publications/Scientific-publications

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

SKA
https://ui.adsabs.harvard.edu/search/fq=%7B!type%3Daqp%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

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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=2005&cites=6482114501244947208&scipsc='; Citations of the SpotON web portal: https://scholar.google.com/scholar?as_ylo=2021&hl=en&as_

Ice-Cube
https://icecube.wisc.edu/science/publications/

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

National institutional members of supported research communities (table 2)

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

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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.lnec.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

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