EUROPEAN HIGH PERFORMANCE COMPUTING JOINT UNDERTAKING
EuroHPC JU)

CONSOLIDATED

ANNUAL ACTIVITY REPORT 2024

ANNEX to GB decision no. 24/2025

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CONSOLIDATED ANNUAL ACTIVITY REPORT 2024

In accordance with Article 19 of Council Regulation (EU) 2021/1173 of 13 July 2021 and with Article 23 of the Financial Rules of the EuroHPC JU.

The consolidated annual activity report will be made publicly available after its approval by the Governing Board.

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Factsheet

Name of the JU	*European High Performance Computing Joint Undertaking (EuroHPC JU)*
Objectives	Council Regulation (EU) No 2021/1173 of 13 July 2021: The Joint Undertaking shall have the following overall objectives: a. to contribute to the implementation of Regulation (EU) 2021/695 and in particular Article 3 thereof, to deliver scientific, economic, environmental, technological and societal impact from the Union's investments in research and innovation, so as to strengthen the scientific and technological bases of the Union, deliver on the Union strategic priorities and contribute to the realisation of Union objectives and policies, and to contribute to tackling global challenges, including the Sustainable Development Goals by following the principles of the United Nations Agenda 2030 and the Paris Agreement adopted under the United Nations Framework Convention on Climate Change b. to develop close cooperation and ensure coordination with other European Partnerships, including through joint calls, as well as to seek synergies with relevant activities and programmes at Union, national, and regional level, in particular with those supporting the deployment of innovative solutions, education and regional development, where relevant; c. to develop, deploy, extend and maintain in the Union an integrated, demand-oriented and user-driven hyper-connected world-class supercomputing and data infrastructure; d. establish in Europe a world-leading, hyperconnected quantum computing service and data infrastructure e. maximise European HPC infrastructure for AI innovation and excellence f. to federate the hyper-connected supercomputing and data infrastructure and interconnect it with the European data spaces and cloud ecosystem for providing computing and data services to a wide range of public and private users in Europe; g. to promote scientific excellence and support the uptake and systematic use of research and innovation results generated in the Union; h. to further develop and support a highly competitive and innovative supercomputing and data ecosystem broadly distributed in Europe contributing to the scientific and digital leadership of the Union, capable of autonomously producing computing technologies and architectures and their integration on leading computing systems, and advanced applications optimised for these systems;

	i. to widen the use of supercomputing services and the development of key skills that European science and industry need
Legal Basis	Article 187 of the Treaty on the Functioning of the European Union and Council Regulation (EU) 2021/1173 of 13 July 2021 on establishing the European High Performance Computing Joint Undertaking and repealing Regulation (EU) 2018/1488] as amended by Council Regulation (EU) 2024/1732 of 17 June 2024 amending Regulation (EU) 2021/1173 as regards a EuroHPC initiative for start-ups in order to boost European leadership in trustworthy artificial intelligence
Executive Director	Anders Dam Jensen
Governing Board	*Chair:* Rafał Duczmal *Vice-Chair: Thomas Skordas* *List of members of the Governing Board can be found in the Annexes*
Other bodies	The Industrial and Scientific Advisory Board consists of the Research and Innovation Advisory Group (RIAG) and the Infrastructure Advisory Group (INFRAG) *List of RIAG members available in Annexes* *List of INFRAG members available in Annexes*
Staff number	By the end of 2024, 40 statutory staff and 4 interim agents were supporting the work of the JU.
Total Budget 2024 [2]	*Commitment appropriations: € 307,160,384* *Payment appropriations: - €347,721,612*
Budget implementation/execution	Commitment appropriations: total consumption: *€ 220,547,509 (72%) (in € and percentage spent on total)* Title 1 – € 5,582,571 (95%) (in € and percentage spent on total) Title 2 – € 2,733,011 (91%) (in € and percentage spent on total) Title 3 – € 212,231,927 (71%) (in € and percentage spent on total) Payment appropriations: total consumption: *€ 206,059,569 (in € and percentage spent on total)* Title 1 – € 5,397,371 (89%) (in € and percentage spent on total) Title 2 – € 1,797,487 (61%) (in € and percentage spent on total) Title 3 – € 198,864,711 (59%) (in € and percentage spent on total)

[2] Total budget includes the administrative budget available for funding Programme Office activities and operational budget available for funding the operational actions (procurements and grants).

Grants/Tenders/Prizes	8 grants signed for a total value (EU contribution) of € 81,092,190.84. 4 contracts signed for the Quantum Computing Infrastructures for a total value of € 50,653,000 from which the EU contribution of € 22,826,500. Discoverer upgrade contracts signed for a total value of € 3,030.000 from which the EU contribution of € 1,060,500. EuroHPC Federation Platform contract signed for a total value (EU contribution) of € 19,999,700.
HPC Infrastructure Procurement	*The following systems are operational in 2024:* • Vega, hosted by IZUM in Maribor, Slovenia • MeluXina, hosted by LuxProvide in Bissen, Luxembourg • Discoverer, hosted by consortium Petascale Supercomputer Bulgaria in Sofia, Bulgaria • Karolina, hosted by IT4Innovations in Ostrava, Czech Republic • LUMI, hosted be CSC in Kajaani, Finland • Leonardo, hosted by CINECA in Bologna, Italy • Deucalion, hosted by FCT in Guimaraes, Portugal • MareNostrum 5, hosted by Barcelona Supercomputing Center in Spain *The following systems under deployment:* **Exascale:** Jupiter, hosted by Jülich Supercomputing Centre, Germany (operational 2025) Alice Recoque, to be hosted by GENCI in Paris, France (operational 2026) **Midrange (all operational in 2026):** Arrhenius, to be hosted by NAISS in Linköping, Sweden Daedalus, to be hosted by GRNET in Athens, Greece **AI:** 7 AI Factories (with 6 AI Optimised systems) to be hosted by Luxembourg, Greece, Germany, Sweden, Spain, Finland and Italy. **Platforms:** EuroHPC Federation Platform EuroHPC Peer-review platform, tenders are under evaluation
Access to Infrastructure	Cut-offs in 2024 = 32 Resources awarded (in node hours) = 41,254,953 Proposals submitted = 892 Proposals awarded = 706 Proposal approval rate = 79%

Quantum Computing Infrastructure	Vendor contracts for the following systems have been signed in 2024: • EuroQCS-Poland, hosted by PSNC in Poznan, Poland • EuroQCS-France, hosted by GENCI in Paris, France • Euro-Q-Exa, hosted by LRZ in Munich, Germany • LUMI-Q, hosted by IT4I in Ostrava, Czechia The vendor contracts for the following two systems have been signed in Q1 2025: • EuroQCS-Spain, hosted by BSC in Barcelona, Spain • EuroQCS-Italy, hosted by CINECA in Bologna, Italy Two additional Hosting Entities have been selected in 2024 with procurement procedures to be started in 2025: • EuroSSQ-HPC, hosted by SURF in Amsterdam, Netherlands • MeluXina-Q, hosted by LuxProvide in Luxembourg, Luxembourg
INFRAG & RIAG MULTIANNUAL STRATEGIC AGENDA	*EuroHPC JU Decision 24/2021- Approving the Multi-Annual Strategic Plan 2021-2027 - Document available at: Documents - EuroHPC JU* *The MASP was developed during 2021 and adopted by the Governing Board in September 2021. An updated MASP was approved in 2023: EuroHPC JU Decision No 8/2023 - Approving the Multi-Annual Strategic Programme 2021-2027 (version 2023) (europa.eu)* *A second amendment to the MASP was proposed by the JU's Advisory Groups (RIAG and INFRAG) at the end of 2023 and approved in 2024: EuroHPC JU Decision No 09/2024 Amending the Joint Undertaking's Multi-Annual Strategic Plan 2021- 2027 (Amendment no. 2)*
Call implementation	Number of calls launched in 2024: 2 for Infrastructure 5 for Research and Innovation Number of proposals submitted: 7 for Infrastructure team (AI Factories) 30 for Research and Innovation team Number of eligible proposals: 7 for Infrastructure team (AI Factories) 20 for Reasearch and Innovation team Number of proposals selected: 7 for Infrastructure team (AI Factories) 13 for Research and Innovation team

Participation, including SMEs	*27 for INFRA team including 2 SMEs* Total number of beneficiaries in funded projects (GA signed in 2024): 108 of which: • 18% of SMEs and 10% of EU funding received by those SMEs • 4% of private for profit/large companies and 19% of EU funding received by those companies • 8% of non-EU-non associated members' entities (openness) • 21% of newcomer entities

Foreword

2024 has been, by all measures, another very busy year for the EuroHPC JU. Not only did we deliver on a range of projects, procurements and partnerships; we also expanded our remit to prioritise Artificial Intelligence (AI) and Quantum computing. Following the adoption of EuroHPC JU's Council Regulation on AI Factories in June, an amendment to our Work Programme was approved in July 2024. It introduced a new set of activities related to the new tasks that the JU was given to complete on AI Factories. In a very short space of time thereafter, the JU selected 7 AI Factories, set to be deployed in the next year in Finland, Germany, Greece, Italy, Luxembourg, Spain and Sweden. A further 6 AI Factories were selected March 2025 to be located in Austria, Bulgaria, France, Germany (JUPITER AI), Poland and Slovenia.

Since our autonomy in 2020, EuroHPC JU has been at the forefront of advancing European ambitions related to supercomputers and digital transformation. We continue at pace to build capacity for HPC research, innovation, infrastructure and education, collaborating closely with the 35 participating states and 3 private members who our support our work.

The evidence of our activities is manifest in the **706** projects we supported in 2024 under the Regular, Benchmark, Development, Extreme Scale, and AI & Data Intensive Applications Access Calls, representing more than 41 million node hours in computational capacity. It is also evidenced in our development of a high-speed, secure network connecting European supercomputers and data centres through a hyperconnected and federated HPC and quantum computing ecosystem. Our achievements in 2024 reflect our deep commitment to supporting the growth of highly competitive and innovative HPC and AI ecosystems in Europe and expanding our collaborations with international partners like India and Japan.

As the remit of our activities expand, I would like to acknowledge the incredible work of the dedicated team at EuroHPC JU and our colleagues in the European Commission, without whom the achievements of 2024 would not have been possible. I also wish to sincerely thank our Governing Board for their ongoing guidance and commitment to the work of EuroHPC JU.

We thank the European Court of Auditors and the Commission's Internal Audit Service for their constructive guidance as we grow as an organisation.

Sincerely Yours,

Anders Dam Jensen
Executive Director
EuroHPC Joint Undertaking

Figure 1: EuroHPC Infrastructure 2024

Executive Summary

In 2024, the **European High Performance Computing Joint Undertaking (EuroHPC JU)** was in its fourth full year of operation since its autonomy in September 2020. 2024 was a year of intense activity for the EuroHPC JU in supporting the development of Artificial Intelligence (AI), quantum computing, hyperconnectivity and supercomputing across Europe.

Following the selection of six quantum computing hosting entities in 2023, the EuroHPC JU announced the signatures of procurement contracts for Piast-Q, the EuroQCS-Poland quantum computer located in Poznan (PL) in July, VLQ, the LUMI-Q consortium's quantum computer located in Ostrava (CZ) in September, Lucy the EuroQCS-France quantum computer in Paris (FR) September, Euro-Q-Exa, the quantum computer located in Munich (DE) in September of 2024. In December 2024, EuroHPC signed hosting agreements to operate two additional state-of-the-art quantum computers in Luxembourg and the Netherlands. The deployment of these quantum computers across Europe offers the widest possible variety of European quantum computing platforms and hybrid classical-quantum architectures, positioning Europe at the forefront of this emerging field and providing European researchers with access to diverse and complementary quantum technologies. The EuroHPC Governing Board has selected the establishment of two Quantum Excellence Centres (QECs) in November of 2024, which will act as one-stop shops for all matters related to quantum computing algorithms and use-cases, as well as, for the hybridisation of workflows to harness the full potential of quantum accelerated HPC. In addition, these quantum developments have opened up a new partnership with Japan. In November 2024, a call was launched to enhance EU-Japan collaboration with a focus on hybrid Quantum-HPC algorithms for material science, biomedical research and climate modelling.

In May 2024, three EuroHPC pre-exa-scale supercomputers were ranked in the top 10 of the TOP500 list, while Deucalion also made its first appearance on the list. The TOP500 appears twice a year and provides an essential benchmark for the supercomputing community. EuroHPC supercomputers were similarly well placed in the November publication of TOP500 and it was especially notable that new entry JUPITER took first place in the Green500 list with its first module named JEDI (Jupiter Exascale Development Instrument). Also, in the first half of the year, the hosting agreement was signed with GENCI in France for EuroHPC second exascale supercomputer, Alice Recoque, and a tender call was launched. A call for tender was also launched for the mid-range supercomputer DAEDALUS which will be located in Greece.

The focus of the second half of the year was on the AI Factories initiative. Following the adoption of the amendment in June of the Council Regulation of EuroHPC JU, the activities of EuroHPC JU grew to

include the deployment and operation of AI Factories. The change of legal base allows for the procurement of AI optimised machines, the upgrade of existing HPC infrastructure with enhanced AI capabilities, and the development of AI ecosystems centred around the EuroHPC supercomputing facilities. In less than six months EuroHPC JU selected seven consortia who will establish the first AI Factories in Finland, Germany, Greece, Italy, Luxembourg, Spain and Sweden. Like the other EuroHPC supercomputers, AI factories are funding by pooling European Union (EU) and national resources. They bring together the collaborative effort of 17 European countries and many consortia involving multiple participating countries. They will create a robust network of AI hubs across Europe that will act as one-stop shops for startups, SMEs and researchers. The fast-paced selection of these initial AI Factories in 2024 is evidence of EuroHPC's ability to respond to the rapidly changing landscape of advanced computing and to support the key objectives of the European Commission.

Alongside the AI Factories initiative, EuroHPC JU signed a contract with a CSC-IT led consortium to implement the EuroHPC Federation Platform in 2024. This new initiative will federate and further interconnect EuroHPC supercomputers, quantum computers, and data resources across Europe, enhancing user access to advanced technologies.

EuroHPC JU also provided technical expertise and software development to advance cutting-edge research. In early 2024 EuroHPC JU launched the EPICURE project which offers a coordinated European HPC application support service to public and private users that encourages the best possible uptake of the HPC systems by European researchers. The EPICURE project is set to run until January 2028

On the International front, the JU also initiated new collaborative partnerships with Japan on quantum and India on HPC applications.

A key objective of the EuroHPC JU is to strengthen Europe's HPC expertise and develop the next generation of highly skilled workers and researchers. A significant milestone was celebrated in October 2024 when the inaugural cohort of students graduated from the EUMaster4HPC programme.

Over the year EuroHPC JU participated in multiple events including ISC24, Europe Day, #SC 24 and the European Agencies Network Day. EuroHPC JU also hosted several large events including our 2024 EuroHPC Summit in Antwerp in March with almost 700 participants, and the EuroHPC User Day which took place in Amsterdam in October.

The EuroHPC JU team continued to grow in 2024 and counted 40 full-time staff members and 4 interims at the end of 2024.

Operational Highlights

Operational EuroHPC Systems in 2024

In 2024, the EuroHPC Joint Undertaking continued to provide compute time for European researchers on the following systems: Leonardo, LUMI, Vega, MeluXina, Karolina, MareNostrum 5, Discoverer and Deucalion. The deployment of Jupiter, Europe's first exascale computer, based at the Jülich Supercomputing Centre in Germany, is progressing at pace, reaching a major milestone in 2024 with the completion of JETI, the second module in this groundbreaking system.

Figure 2: EuroHPC Top500 highlights November 2024

All operational EuroHPC systems were ranked in the June and November editions of the TOP500 list and were among the world's most powerful and energy efficient supercomputers in the world.

In June 2024, 3 Euro HPC systems were listed among the top 10 supercomputers in the world. In November 2024, 3 EuroHPC supercomputers were ranked within the top 15 systems globally as new systems entered the list, and JEDI Module from Jupiter took the #1 spot on the Green500 list (See Figure 2).

Access to EuroHPC Systems in 2024

All operational EuroHPC systems are accessible to users located in the European Union under the conditions set out in the EuroHPC Access Policy.

In 2024, 706 computational projects were awarded a total of 41.2 million node hours access time through the JU Access calls. These were fundamental to provide European scientists and SMEs with

access to the computing resources of the EuroHPC JU for large-scale European projects that have important needs in terms of compute time, data storage, and support resources.

Procurements Highlights 2024

HPC and Artificial Intelligence

Figure 3: Map of European AI Factories procured in 2024

2024 was a very busy year for EuroHPC in terms of procurement and infrastructural development. Across the areas of high-performance computing, Artificial Intelligence (AI) and quantum computing new procurements and partnerships were launched with a view to providing the European Union with an advanced, resilient HPC ecosystem.

The amendment to the Regulation (EU) 2021/1732 adopted Council in June 2024 provided EuroHPC JU with the mandate to boost European leadership in trustworthy Artificial Intelligence (AI).[3]

In September 2024, the EuroHPC Joint Undertaking was then able to launch two calls for expressions of interest to select hosting entities to operate AI-optimised supercomputers, experimental AI platforms, and to deliver AI Factories services across Europe. A total of seven proposals were received, and all were approved by the Governing Board in December 2024.

Europe's first set of AI Factories will be located in Germany, Spain, Luxembourg, Finland, Greece, Italy and Sweden (See Figure 3). Six of these AI Factories will be supported by EuroHPC JU to procure new or upgrade existing machines with enhanced AI capabilities. All AI factories will provide users with services that will support the development of their AI activities across Europe.

Federation and Hyperconnectivity

Two new procurements were launched to federate and provide hyperconnectivity across EuroHPC's pan-European infrastructure. The EuroHPC Federation Platform will provide users with a single access

[3] 2024/1732 COUNCIL REGULATION (EU) 2024/1732 of 17 June 2024 amending Regulation (EU) 2021/1173 as regards a EuroHPC initiative for start-ups in order to boost European leadership in trustworthy artificial intelligence

point to current EuroHPC supercomputing resources and, in the future, to EuroHPC AI Factories and quantum computers. This 'one-stop-shop' approach will ensure greater accessibility and uptake to EuroHPC systems across Europe. The platform will also facilitate federated access to data lakes and data spaces across Europe by seamlessly integrating both private and public solutions. This procurement paves the way for a secure, scalable, and flexible hub, the EuroHPC Federation Platform, which is set to empower Europe's scientific, industrial, and academic communities and foster innovation in Europe.

The hyperconnectivity open tender was launched in December 2024 and aims to establish a future-proof bundle of hyperconnectivity services to support and enhance the capabilities of the European HPC infrastructure. This initiative, combined with the EuroHPC Federation Platform, will create a hyperconnected, federated, and secure ecosystem for High-Performance Computing (HPC) and quantum computing services.

Quantum computer procurements

Following the signature of Hosting Agreements with 6 selected Hosting Entities in June 2023 for EuroHPC's quantum computers, all procurement procedures were finalised in 2024 and four procurement contracts to deliver the systems "EuroQCS-Poland", "EuroQCS-France", "Euro-Q-Exa" and "VLQ" (LUMI-Q consortium) were signed. The last two contracts delivering EuroQCS-Spain and EuroQCS-Italy were signed in early 2025. EuroHPC JU has selected the two additional Hosting Entities "EuroSSQ-HPC" at SURF in the Netherlands and "MeluXina-Q" at LuxProvide in Luxembourg focussing on quantum computing modalities that will complement the existing EuroHPC systems. In addition to acquiring quantum computing infrastructure, the EuroHPC JU has selected two Quantum Excellence Centres (QECs) to address relevant aspects of quantum computing, including hybrid HPC-QC, use-case developments, community and talent building and end-user support.

Grant Agreements in 2024

In 2024 EuroHPC JU signed 7 grant agreements and 1 partnership framework agreement with projects covering skills & usage, HPC applications and technology, AI/ML and international partnerships.

Applications, Competence and Skills

In February 2024, a grant agreement for the EPICURE project was signed. On 1st of February 2024 the grant agreement with the EPICURE project was signed. The project aims at establishing and operating a distributed but coordinated Europe-wide high-performance computing application support service, to encourage the best possible uptake of the systems by European scientists and researchers.

April 2024 was marked by the signing of the Fortissimo FFplus grant, which will support the uptake of HPC-AI among SMEs.

In October 2024, two new grant agreements for Centres of Excellence (CoEs) for HPC Applications were signed (MICROCARD-2 and dealii-X) to support the development and adaptation of HPC applications for exascale and post-exascale computing.

On competences and skills, EuroCC4SEE project grant agreement was also signed in October. EuroCC4SEE aims to establish a network of National Centres of Competence (NCC) in Associated

Countries, addressing HPC deployment maturity differences in Europe and complementing the existing EuroCC network of Competence Centres.

Building on the existing and very successful EUMaster4HPC pilot project, a call was launched in 2024 to design and establish a pan-European MSc programme in High Performance Computing (HPC) to train specialists through advanced education in system architecture, software development, and HPC utilization.

At the end of the year, the MINERVA project which will advance HPC-AI knowledge across European machine learning (ML) and AI communities, acting as a central hub to support large-scale ML and AI research and development.

HPC Technologies

In September, a Framework Partnership Agreement (FPA) was signed with RISC-V for HPC Digital Autonomy in Europe (DARE). This partnership is to be implemented as one or more Specific Grant Agreements (SGA) to invigorate Europe's HPC ecosystem by uniting technology producers and consumers in the development of a RISC-V ecosystem. The first SGA call was launched in the same year, with resulting grant signed in February 2025.

The year closed with signatures on two further grant agreements. NET4EXA will create an advanced high-speed interconnect for HPC and AI systems and the MINERVA project which will advance HPC-AI knowledge across European machine learning (ML) and AI communities, acting as a central hub for large-scale ML and AI research and development.

International Cooperation

At the request of the Commission, following successful the Digital Partnership dialogues, EuropHPC put into place scientific projects with Japan in the field of HPC and Quantum and with India in HPC.

Japan:

In early 2024, the HANAMI projects were signed in March 2024. The HANAMI project aims at supporting and fostering joint scientific teams to improve the performance and transferability of European and Japanese HPC applications by leveraging the skills and expertise of the scientific community within Europe and Japan. A central aspect is the user-driven development of HPC applications in relevant research areas.

To strengthen the digital partnership further between the European Union and its partners, the EuroHPC JU also launched in 2024 a call on international collaboration with Japan on quantum computing, focussing on algorithm and use-case developments in scientific and technological areas relevant for both regions. The evaluation and awarding of this call will take place in 2025.

India:

As part of the India-EU Intent of Cooperation on High Performance Computing and Quantum Technologies Agreement, which was established in November 2022, a joint call was launched in 2024

to foster collaboration with India on high-performance computing (HPC) applications. This initiative culminated in the signing of a grant agreement in April 2025 for the project GANANA.

Implementation of the Annual Work Programme 2024

The Joint Undertaking has continued to implement its objectives as set out by the EuroHPC JU's Regulations, which were amended in June 2024 to include seven pillars of activity. Building a strong high-performance computing sector (HPC) in Europe involves much more than setting up supercomputers; it is a complex endeavour in which each activity enhances and reinforces the others, creating a comprehensive and dynamic ecosystem. The mission and activities of EuroHPC JU are designed to elevate the entire European HPC and AI landscape, strengthening both the public and private sectors, creating innovations and solutions, and creating new fields of research and employment.

EuroHPC JU Pillars 2024

The legal bases for the EuroHPC JU, the Council Regulation EU 2024/1732, establishes the EuroHPC mission, provides details of the seven technology pillars of activity, around which all the EuroHPC activities revolve. These seven pillars are:

- **Infrastructure Pillar** – Building a high-tech computing world, (supercomputers, quantum computers, and data infrastructure) is not just about power and performance, but also about security and hyperconnectivity. EuroHPC's mission under this pillar is to build and promote the usage of our supercomputer infrastructure to protect and benefit the European Union.

- **Federation & Hyperconnectivity Pillar** – Our mission to connect all of the EuroHPC JU's infrastructure through a tailor-made platform ensuring easier access for researchers, businesses and the public sector.
- **Technology Pillar** – Aims to develop cutting-edge novel hardware components and their respective software stack including integration into new computing systems in order to strengthen Europe's strategic independence in this sector.
- **Applications Pillar** – Development and optimisation of applications and codes that can harness the power of supercomputers. EuroHPC JU supports scientists, industry and the public sector to create software that can tackle complex problems, from scientific simulations to big data analytics.
- **Skills and Usage Pillar** - A robust European HPC industry is not just about technology, it is also about the community and competencies built around it. This pillar focuses on the skills and knowledge required to leverage Europe's HPC infrastructure by supporting National Competence Centres (NCCs) and investing in education and training initiatives with the aim of fostering a skilled workforce that can lead Europe's digital transformation.
- **International Cooperation Pillar** – EuroHPC extends its reach beyond Europe by developing resilient international partnerships. Collaborating with international partners allows EuroHPC to contribute to solving global issues while fostering close ties with international partners.
- **AI Factories Pillar** – The purpose of this recent addition to the work of EuroHPC JU is to advance the technological environment required to deliver on AI innovation in Europe. EuroHPC will ensure that existing supercomputers are upgraded for AI capabilities and will build new resources tailored to tackling AI problems, ensuring that Europe is at the forefront of the AI revolution.

EuroHPC JU is tasked with creating synergies in these initiatives by planning across the seven pillars and elevating each initiative to enhance the overall European HPC ecosystem. Each call, contract, or procurement is designed with the broader supercomputing environment in mind, ensuring that each action benefits the entire European HPC landscape.

Key objectives 2024, associated risks and corrective measures

EuroHPC JU's key objectives for the year 2024 were established in the Annual Work Programme 2024 and approved by the Governing Board. The 2024 Work Programme was amended 7 times throughout the year by the Governing Board. This was done to ensure that EuroHPC JU's Work Programme remained fully updated and in line with the evolving landscape of the HPC industry and the European Union's priorities. In 2024, amendments to the budget and work programme of EuroHPC primarily focused on AI initiatives but also related to approval of infrastructural upgrades, hosting entities, and call prioritisation. Almost all actions proposed in the Work Programme 2024 were implemented. Those that were not launched, because of the addition in 2024 of new activities linked to the AI Factories and

the need for more discussions in the Governing Board in 2024, will be postponed and implemented in 2025/ 2026 or cancelled due to budget limitations. [4]

To identify and mitigate risks associated to the JU objectives, a 2024 risk assessment exercise was carried out at entity level at the end of 2023. No critical risks were identified, specific corrective measures were defined and implemented for those risks that disclosed higher likelihood to materialise combined with material impacts.

A key change to EuroHPC objectives in 2024: The AI Factories Pillar

In 2024, a significant amendment to the EuroHPC Work Programme occurred when Regulation (EU) 2021/1173 was amended in order to boost European leadership in trustworthy Artificial Intelligence (AI). This new objective led to the Joint Undertaking adding new activities in AI, namely, to acquire and operate AI-optimised supercomputers, or partitions of supercomputers, and to enable machine learning and training of general-purpose AI models.

This additional responsibility for EuroHPC JU focused on the selection of AI factories to be located across Europe to support start-ups, SMEs and industrial users. To become an AI Factory, a Hosting entity must be in an EU Member State and be able to provide AI optimised compute power and a full range of services necessary to develop and support the growing European AI ecosystem. The Host Member State had to confirm its intention to contribute up to 50% of the costs of the procurement of an AI optimised HPC or the upgrade of an existing EuroHPC system and at least 50% of the costs of AI Factory services. The introduction of AI Factories also led to the introduction of a new access modes to computing resources. These new access modes were designed to address the needs of the SMEs, startups and industry across Europe. The changes in EuroHPC's Regulation also opened the possibility for the AI Factories to interact with one another, with relevant AI initiatives nationally and across Europe.

These changes led to amendments to the EuroHPC Work Programme in 2024, which permitted the JU to launch two calls (described below).

The EuroHPC JU Governing Board also endorsed the latest amendment to the Multi Annual Strategic Plan (MASP) developed by its Advisory Groups (RIAG and INFRAG) and focused on planning for 2025. Input provided by these groups has been integrated into the Annual Work Programme 2025. The Governing Board thus ensured that future Work Programme included the latest technological developments.

[4] Table of Work Programme 2024 is contained in the annexes

In December 2024, the Governing Board selected and approved the budget for seven AI Factory hosting sites (Finland, Germany, Italy, Luxembourg and Sweden) will deploy brand new AI-optimised supercomputers, while the AI Factory located in Spain will result from the upgrade of the EuroHPC system, MareNostrum 5. Greece will establish and operate an AI Factory associated with the DAEDALUS supercomputer, the EuroHPC supercomputer currently under deployment in Greece. The AI Factories in Spain and Finland include experimental platforms, which will provide cutting-edge infrastructure for developing and testing innovative AI models and applications, as well as promoting collaboration across Europe.

Figure 4: AI Factories Launch at EuroHPC Summit 2025 in Kraków

Another six AI Factories located in Germany, Poland, Slovenia, France and Bulgaria were selected on 5 March 2025 following the second cut-off, and further proposals are expected for the planned third cut-off in Summer 2025.

Europe's First AI Factories (selected December 2024)

Finland (LUMI AI Factory)

The LUMI AI Factory will strengthen and support Europe's growing role as an AI innovator by providing a world-class computing environment (LUMI-AI), and access to data sources, together with a service centre and talent pool to support the rapid trials and development of new AI solutions.

The system will be hosted by CSC-IT Center for Science and located in Kajaani, next to the existing EuroHPC LUMI supercomputer. The LUMI AI Factory consortium is led by Finland, together with 5 other countries; Czech Republic, Denmark, Estonia, Norway, and Poland. By leveraging the established LUMI ecosystem and expanding it with new AI-focused features, the LUMI AI Factory will foster a thriving AI community that transcends borders and sectors. The new system will address key challenges such as data reachability and access barriers, aligning with both national and European commitments to advance AI capabilities.

Germany (HammerHAI)

HammerHAI (*Hybrid and Advanced Machine Learning Platform for Manufacturing, Engineering, And Research @ HLRS*) will create a one-stop shop for AI users in academic research and industry, including a focus on lowering the barriers that currently prevent start-ups, SMEs, and larger corporations from using AI. Coordinated by the High-Performance Computing Center Stuttgart (HLRS) in collaboration with a strong consortium from Germany, composed by GWDG, BADW-LRZ, KIT, and SICOS, the new AI Factory will be located in Stuttgart at the HLRS premises.

The project will install new, large-scale, AI-optimised infrastructure at HLRS offering a secure, local, and trustworthy platform for machine learning, artificial intelligence, and hybrid HPC/AI applications.

This architecture will leverage cloud-like technologies, well known in the AI community, lowering the hurdles users face in migrating and scaling existing AI applications from their local networks or other cloud services. In addition, the new AI Factory will provide access to workflow templates, pre-trained models, and shared datasets.

HammerHAI will offer flexible, end-to-end support for the entire AI life cycle, from model development to inference, as well as dedicated user support and continuing professional education to help users develop new skills. The consortium will work within the broader German and European AI ecosystem to accelerate innovation, drive economic growth, and support the development of new AI-based products and services.

Greece (Pharos)

Pharos, the new Greek AI Factory, aims to exploit DAEDALUS, the EuroHPC supercomputer currently under deployment in Greece. It will address national and European AI needs in health, culture, language, and sustainability by offering end-to-end support and engaging the national AI ecosystem.
The system will be managed and operated by the National Infrastructures for Research and Technology GRNET S.A. in Athens, operating under the auspices of the Greek Ministry of Digital Governance. The Greek AI Factory, Pharos, is coordinated by a consortium of partners including the NCSRD and Athena, the National Technical University of Athens, and the National Fund of Greece. Special attention will be given to legal functions to incorporate expertise and activities that will address the ethical use of AI and to monitor compliance to the EU AI Act standards and sector-specific regulations. All services will interact with DAEDALUS infrastructure in order to enable computational-heavy resources, storage resources, job scheduling, high-speed network connectivity, and ready-to-use software stacks.

Italy (IT4LIA)

By building on the experience of Bologna Tecnopolo and the EuroHPC LEONARDO site, IT4LIA will provide world class AI infrastructure and a cohesive ecosystem to bridge the gap between AI providers and users, such as public administration, students, academia, SMEs and industries. The IT4LIA AI Factory consortium is coordinated by Italy, in collaboration with Austria and Slovenia. The new system will be hosted by CINECA Consorzio Interuniversitario and will be located in Bologna, Italy.

IT4LIA AI Factory will represent the evolution of LEONARDO with a new top-class AI-optimised supercomputer, building a user-friendly and highly competitive AI infrastructure. From a technological standpoint, the AI-optimised supercomputer will harness cutting-edge technologies to provide an infrastructure that is 4 times more powerful for standard applications and 40 times more powerful for AI-specific workloads (40+ ExaFlops Linpack mixed precision).
From a systemic perspective, IT4LIA will focus on increasing the adoption of AI solutions in key sectors, namely agrifood, cybersecurity, earth, and manufacturing, by leveraging valuable external and internal data repositories and a vast array of sector-specific and horizontal services, together with a number of

training initiatives aimed at up-skilling the whole ecosystem. This targeted support will be crucial in ensuring that SMEs and emerging players can fully exploit the advanced AI potential.

Luxembourg (L-AI Factory)

Luxembourg's AI Factory is intended to confirm the country's position as a European leader in artificial intelligence. Designed to address critical challenges for AI users in strategic sectors such as finance, space, cybersecurity, and the green economy, the L-AI Factory will offer rapid onboarding and personalised support for enterprises, especially startups and SMEs. At its core is MeluXina-AI, an AI-optimised supercomputer that will deliver unparalleled computing, data, and connectivity capabilities. MeluXina-AI brings together expertise from Luxinnovation, the Luxembourg National Data Service (LNDS), the University of Luxembourg (Uni.lu) and the Luxembourg Institute of Science and Technology (LIST), under the coordination of LuxProvide and supported by key national partners. The AI Factory will amplify Luxembourg's commitment to innovation. MeluXina-AI will be located in Bissen, next to the existing EuroHPC MeluXina supercomputer.

Spain (BSC AI Factory)

The BSC AI Factory is the collaborative initiative of Spain, Portugal, Türkiye, and Romania, in conjunction with Barcelona Supercomputing Center (BSC-CNS), the Fundação para Ciência e Tecnologia (FCT), the Scientific and Technological Research Council of Türkiye (TÜBİTAK), and the National Institute for Research and Development in Informatics (ICI București). The new system will develop and operate an AI Factory and AI-enabled computing infrastructure at the service of the EU AI innovation ecosystem to enable the adoption of AI by industry, start-ups, SMEs and public administrations.

Focused on services for public administration, health, pharma and biotech, finance, legal, agriculture and climate, energy, and communication and media, the BSC AI Factory will be built on three core pillars:

a. the development and operation of a comprehensive set of high-value AI-oriented services with specialised support
b. upgrading the EuroHPC JU MareNostrum 5 supercomputer to include advanced AI computing capabilities with a dedicated and specialised AI software and extensive data repository
c. the establishment of a unique advanced experimental AI-optimised platform for testing new computing technologies as they come to market.

The BSC AI Factory, will upgrade the existing EuroHPC MareNostrum 5 system and will continue being hosted and operated by the Barcelona Supercomputing Center (BSC-CNS), and located in Barcelona, Spain.

Sweden (MIMER)

The Swedish AI Factory, MIMER, will be hosted by the National Academic Infrastructure of Supercomputing in Sweden at Linköping University, in collaboration with the Research Institutes of Sweden (RISE). MIMER will provide a mid-range AI-dedicated supercomputer that prioritises cloud-style access mechanisms and large-scale storage for sensitive data. The Swedish AI Factory will build AI support and training expertise in Life Sciences and Health Care, Material Sciences, Autonomous Systems and Gaming, all of which are areas of strength in Europe in general and Sweden in particular.

As part of the key applications, the project will focus on generative models in structural biology and drug design, large-scale training in personalised medicine, and working with international partners to develop next-generation foundation models that will be fine-tuned for specific industrial and academic applications.

Research & Innovation Activities

EuroHPC JU continued to support cutting-edge research and innovation projects in HPC, Quantum and AI technologies, applications, software, skills and competences, and international collaboration.

Projects completed in 2024

ACROSS - HPC BIG DATA ARTIFICIAL INTELLIGENCE CROSS STACK PLATFORM TOWARDS EXASCALE
This project developed a cross-stack platform leveraging HPC, Big Data, and AI towards exascale computing. Key highlights were a refactored Open Porous Media (OPM) flow for better parallel execution and GPU acceleration, a Workflow-aware Advanced Resource Planner (WARP) with significant potential in HPC resource utilisation, as well as an innovative AI-driven turbine design workflow with potential for the Aerospace industry.

ADMIRE - Adaptive multi-tier intelligent data manager for Exascale
This project provided ad hoc file systems with malleability and input/output scheduling decisions based on monitoring information and performance models provided by historic data info, simulations, and machine learning facilities from historical data. The project also upgraded three European ad-hoc storage systems (GekkoFS, Hercules, and Expand) and a European object store (DataClay). The project has increased the capacity of the partners to provide innovative HOC solutions, the interaction with their customers, and other European projects and worldwide initiatives.

DComEX - Data Driven Computational Mechanics at Exascale
DCoMEX is the implementation of a large-scale European project that provides unprecedented advances to the field of computational mechanics by developing novel numerical methods enhanced by artificial intelligence algorithms. The project's key deliverable is the development of a novel scalable library of AI-enhanced algorithms for the solution of large scale sparse linear systems of equations that lay at the core of computational mechanics.

DEEP-SEA - DEEP SOFTWARE FOR EXASCALE ARCHITECTURES
The DEEP-SEA project yielded notable results in the form of Optimization Cycles, advancements in system software components, and the development of the DEEP-SEA software stack for deployment in heterogeneous computational and memory environments. These results have implications for Modular Supercomputer Architecture (MSA) systems and European Petascale and Exascale systems in general. DEEP-SEA's achievements will likely impact the broader HPC community, benefiting areas such as space weather research, weather forecasting, seismic imaging, molecular dynamics, neutron transport, and computational fluid dynamics among others.

eFlows4HPC - Enabling dynamic and Intelligent workflows in the future EuroHPC ecosystem
The eFlows4HPC project added new functionalities to existing tools, supporting larger and more complex HPC workflows, and cutting-edge technologies such as AI and big data. At the solution's heart lies a series of software components, collectively known as a software stack, which implements HPC-based workflows, from start to finish.

exaFOAM - Exploitation of Exascale Systems for Open-Source Computational Fluid Dynamics by Mainstream Industry
This project boosted the performance of OpenFOAM, a highly popular software for computational fluid dynamics (CFD) workflows, enhancing its ability to leverage the power of HPC throughout the

process chain. By increasing the understanding of areas such as solid mechanics, aerodynamics and heat transfer, OpenFOAM optimises the design of products for ground-vehicle engineering, aerospace, power generation and biomedical applications, amongst others.

IO-SEA - IO Software for Exascale Architecture
The IO-SEA project has contributed several significant scientific and technological achievements to the Exascale storage ecosystem and the project's advancements have the potential to substantially advance data storage and the wider HPC ecosystem. The IO-SEA software stack has successfully been implemented to operate on the DEEP cluster.

LIGATE - LIgand Generator and portable drug discovery platform AT Exascale
LIGATE's main goal was to affirm the role supercomputing resources can play in drug discovery, which is crucial in times of acute health crises such as pandemics. The project developed an artificial intelligence (AI) assisted virtual drug screening tool that is adaptable to any hardware architecture and forms the functional core of the Exscalate drug discovery platform.

MAELSTROM - MAchinE Learning for Scalable meTeoROlogy and climate
This project's results include: 1) improved understanding of Weather and Climate Machine-Learning (ML) application design, 2) established benchmark datasets and applications to describe ML workloads for the HPC community, 3) the development of new software tools to facilitate the implementation of ML tools on the next generation of supercomputers, and 4) documented the main performance bottlenecks of Weather and Climate ML applications on state-of-the-art computer system designs.

MICROCARD - Numerical ling of cardiac electrophysiology at the cellular scale
In the MICROCARD project, scientists focused on building the next generation of numerical cardiac electrophysiology models which can represent individual cells and their connections.

NextSim - CODA: Next generation of industrial aerodynamic simulation code
The NextSim project set out to increase current capabilities in computational fluid dynamics (CFD), a critical component of aeronautical design. It achieved this through the development and release of the numerical flow solver CODA (a tool for simulating the behaviour of fluids), which is tailored to run efficiently on Europe's next generation of high-performance computing (HPC) machines.

RED-SEA - Network Solution for Exascale Architectures
RED-SEA project aimed to provide innovative, low-latency, scalable, and reliable European Interconnect networks to advance European Exascale systems. This included the next-generation Interconnect, BXI (BXIv3), which represents an upgrade in networking technology with its enhanced performance capabilities. In addition to this, the RED SEA project developed new, efficient network resource management schemes to optimise the utilisation of network resources. The RED-SEA project also enhanced several tools and simulators, to test and fine-tune these network advancements within a controlled environment.

REGALE- An open architecture to equip next generation HPC applications with exascale capabilities
The project identified and implemented software, designed to ensure smooth coordination across processes, nodes and systems. This software included enhancements and coordination of several open-source tools such as OAR, EAR, DCDB, EXAMON, COUNTDOWN, MELISSA, RYAX and others. These are needed for effective resource utilisation and the execution of complex applications.

SPARCITY - SparCity: An Optimization and Co-design Framework for Sparse Computation
This project contributed to progress beyond the state-of-the-art of various applications. The project developed an open-access comprehensive feature extraction tool for common sparse data structures, including matrices, graphs, and tensors, which constitutes the foundation for designing novel Machine Learning systems that predict the efficacy of reordering algorithms. The project also provided a novel open-source framework for creating digital twins of HPC systems (SuperTwin) with functionalities of conducting microbenchmarks, probing, and visualizing monitored applications, aiding in promptly detecting hardware performance anomalies or later software anomalies. The SuperTwin framework is of high interest to the HPC community and will likely significantly impact future HPC task optimisation and performance.

TEXTAROSSA - Towards EXtreme scale Technologies and Accelerators for euROhpc hw/Sw Supercomputing Applications for exascale.
This project's main contributions are "Integrated Development Vehicles" or IDVs and a specific two-phase cooling technology, together with thermal models and their integration in the operating system. Furthermore, a number of IP cores for FPGA-accelerated HPC computing, including POSIT processing units, fast task schedulers, low-latency communication nodes, and several demonstration applications were provided to booster European extreme scale computing.

TIME-X - TIME parallelisation: for eXascale computing and beyond
This project delivered to advance parallel-in-time integration methods from an academic methodology into a widely available technology, delivering Exascale performance for a wide range of scientific and industrial applications. The project also contributed substantially to unifying the European parallel-in-time research community, fostering a coherent and strategic research approach exploiting synergies between the complementary expertise of the partners thereby cementing European leadership in this field.

Calls for proposals, grant information and other funded actions

Calls and proposal evaluations

Under Regulation 2021/1173, Research & Innovation activities in 2024 focused on the calls listed below[5].

DIGITAL-EUROHPC-JU-2023-ACADEMY-02 covered the EuroHPC Academy. The Academy will contribute to the development of coordinated HPC education. The action will ensure the availability of common quality and qualification standards in HPC, the compatibility of training modules and learning objectives as well as the uptake of standardization of training and education in the European HPC ecosystem. The JU has evaluated submissions for the Call and invited the successful proposal, titled Evita, to grant agreement preparation. Funding & tenders (europa.eu)

Funding rate for-profit beneficiaries:	100%	Funding rate non-profit beneficiaries:	100%

[5] Note that the overview includes the funding rates applicable to different types of organisations receiving EuroHPC funding. In particular, for each call the reimbursement rate is specified for: (a) the eligible costs of the beneficiaries that are non-profit making legal entities; (b) the eligible costs of the beneficiaries and the affiliated entities (such as SMEs) that are profit making legal entities.

DIGITAL-EUROHPC-JU-2023-AISC-03 was launched to establish a European support centre to assist European AI users in fully leveraging the innovation potential of supercomputers for advanced AI applications. This initiative aligns closely with the EU's focus on establishing leadership in large-scale AI models. The JU has evaluated submissions for the Call and invited the successful proposal to grant agreement preparation in late 2024 which was finalized successfully. The selected project, titled Minerva, begins January 1, 2025. Funding & tenders (europa.eu)

Funding rate for-profit beneficiaries:	50%	Funding rate non-profit beneficiaries:	50%

DIGITAL-EUROHPC-JU-2023-SME-01 was launched to support the competitiveness and innovation potential of SMEs in the fields of HPC and AI. The consortium selected under this call is expected to define an outreach approach for identifying and attracting SMEs whose innovation potential and competitiveness will be significantly increased by the uptake of advanced HPC services. The JU evaluated submissions for the Call and invited the successful proposal to grant agreement preparation in early 2024 which was finalized successfully. The selected project, titled FFPlus, began on May 1, 2024, and continues the successful series of Fortissimo projects. Funding & tenders (europa.eu)

Funding rate for-profit beneficiaries:	100%	Funding rate non-profit beneficiaries:	100%

DIGITAL-EUROHPC-JU-2024-NCC-02 was launched with the objective of supporting the creation or expansion of up to one new NCC in EuroHPC JU Participating States not currently funded by EuroHPC JU. These NCCs will extend the EuroCC 2 network (, providing HPC services to SMEs, industry, academia, and public administrations. They will focus on fostering HPC adoption in Europe, acting as national HPC hubs, connecting stakeholders with European HPC resources, and prioritizing support for SMEs, with limited engagement with academic institutions. The JU evaluated the submitted proposal, EuroCC4SEE, which was granted funding and commenced on April 11, 2024. Funding & tenders (europa.eu)

Funding rate for-profit beneficiaries:	50%	Funding rate non-profit beneficiaries:	50%

HORIZON-EUROHPC-JU-2023-COE-03 focused on Centres of Excellence (COEs). The Centres of Excellence are responsible for the development of HPC applications for exascale and post-exascale computing in specific scientific domains. EuroHPC JU launched this call to close gaps in the portfolio of scientific domains: Personalized medicine, digital twin of the human body, human brain research and neurological disorders. Funding & tenders (europa.eu)

Funding rate for-profit beneficiaries:	50%	Funding rate non-profit beneficiaries:	50%

HORIZON-EUROHPC-JU-2023-ENERGY-04 was launched to develop hierarchical workload management software solutions tailored to exascale and post exascale supercomputers, to address challenges associated with the energy efficient and energy constraint operation of heterogeneous and modular HPC systems. The JU has evaluated submissions for the Call and invited the successful

proposal, SEANERGYS, to grant agreement preparation. SEANERGYS is expected to commence in the first half of 2025. Funding & tenders (europa.eu)

Funding rate for-profit beneficiaries:	50%	Funding rate non-profit beneficiaries:	50%

HORIZON-EUROHPC-JU-2023-INCO-06 aims to develop a collaboration in HPC with India, advancing the optimisation and co-development of HPC applications in domains of common interest, promoting the exchange of researchers and engineers between India and the EU. The JU has evaluated the submitted proposal for the Call titled GANANA and invited them to grant agreement preparation and is expected to commence in the first half of 2025. Funding & tenders (europa.eu)

Funding rate for-profit beneficiaries:	50%	Funding rate non-profit beneficiaries:	50%

HORIZON-EUROHPC-JU-2023-INTER-02 aims to support the development of innovative and competitive European HPC inter-node interconnect technology. This includes creating a roadmap for scalable interconnects targeting exascale and post-exascale systems, developing interconnect hardware, and fostering synergies with EuroHPC projects. It also focuses on developing software tools and addressing key issues such as bandwidth, latency, power efficiency, scalability, and security. Funding & tenders (europa.eu)

Funding rate for-profit beneficiaries:	35%	Funding rate non-profit beneficiaries:	50%

HORIZON-EUROHPC-JU-2023-QEC-05 aims to create two European Quantum Excellence Centres (QECs) focused on quantum applications for science and industry. These centres will act as a contact point for industry, academia, and the wider quantum technology user community, accelerating the discovery and uptake of new quantum applications. The QECs will be technology-agnostic, user-driven, and committed to co-designing activities to ensure quantum computing architectures meet user needs. Funding & tenders (europa.eu)

Funding rate for-profit beneficiaries:	50%	Funding rate non-profit beneficiaries:	50%

HORIZON-EUROHPC-JU-2024-DARE-SGA-04 was launched to implement the first phase of the partnership on HPC Digital Autonomy with RISC-V in Europe (DARE) as envisioned by the eponymous framework partnership agreement. The call addresses the design and deliver energy efficient high-end tape-outs of a general-purpose processor and of two accelerators, an AI Accelerator and a Vectorial Accelerator, for HPC based on RISC-V silicon and chiplet solutions with advanced memory interfaces. EuroHPC JU (eurohpc-ju.europa.eu)

Funding rate for-profit beneficiaries:	50%	Funding rate non-profit beneficiaries:	50%

HORIZON-EUROHPC-JU-2024-INCO-06 was launched to support the implementation of the Japan-EU Digital Partnership in the area quantum computing R&D. The projects selected with strengthen the European quantum computing (QC) ecosystem by enhancing quantum computing and/or hybrid quantum-high performance computing (HPC) algorithms and codes in advanced academic and industrial applications of interest for Europe and Japan, including applications related to biomedical, material science, seismic/tsunami and/or weather and climate modelling. Funding & tenders (europa.eu)

Funding rate for-profit beneficiaries:	50%	Funding rate non-profit beneficiaries:	50%

DIGITAL-EUROHPC-JU-2024-MASTER-03 was launched to design and establish a pan-European MSc programme in High Performance Computing (HPC), building on the EUMaster4HPC pilot project, to train specialists through advanced education in system architecture, software development, and HPC utilization. The programme aims to meet European industry and labour market demands, ensuring a skilled workforce, increased competitiveness, and knowledge transfer between academia and industry. It promotes collaboration among universities, mobility of HPC professionals, and the development of researchers addressing societal challenges. The initiative will deliver a quality-assured Master programme for 100+ students annually, awarding 120 ECTS over four cohorts.

Funding rate for-profit beneficiaries:	100%	Funding rate non-profit beneficiaries:	100%

Call Evaluation Data

Evaluated calls received applications from a diverse range of European countries, and the successful consortia comprised beneficiaries from 28 countries.

Table 1 offers a breakdown of successful applicants per type (including SME) including the number of successful newcomers per call.

Table 2, Table 3 and Table 4 indicate the financial contribution of the joint undertaking to the individual actions per participant type, proposal, including SMEs, and countries, respectively.

Call	Successful applicants	Successful SMEs	Successful LEs	Successful Other	Newcomers
DIGITAL-EUROHPC-JU-22-HPCQC-04-IBA	*30*	*1*	*1*	*28*	*7*
DIGITAL-EUROHPC-JU-2023-ACADEMY-02	*8*	*1*		*7*	
DIGITAL-EUROHPC-JU-2023-AISC-03	*10*	*1*	*1*	*8*	*3*
DIGITAL-EUROHPC-JU-2023-SME-01	*7*	*2*		*5*	
DIGITAL-EUROHPC-JU-2024-NCC-02	*14*	*3*		*11*	*1*
HORIZON-EUROHPC-JU-2023-COE-03	*26*	*3*		*23*	*5*
HORIZON-EUROHPC-JU-2023-ENERGY-04	*16*	*3*	*2*	*11*	*1*

HORIZON-EUROHPC-JU-2023-INCO-06	*11*		*1*	*10*	*2*
HORIZON-EUROHPC-JU-INTER-02	*5*	*1*	*1*	*3*	*1*
HORIZON-EUROHPC-JU-2023-QEC-05	*29*	*5*		*24*	*10*
HORIZON-EUROHPC-JU-2024-DARE-SGA-04	*45*	*11*	*3*	*31*	*2*
TOTAL	***201***	***31***	***9***	***161***	***30***

Table 1: Overview of successful applicants by type and newcomers per call

Call	Successful proposals	Proposal acronyms	Total budget	Requested grant (EU contribution)
DIGITAL-EUROHPC-JU-HPCQC-04-IBA	*1*	*EUROQHPC-I*	*€15,656,274.24*	*€7,336,882.51*
DIGITAL-EUROHPC-JU-2023-ACADEMY-02	*1*	*EVITA*	*€6,166,056.90*	*€5,999,924.50*
DIGITAL-EUROHPC-JU-2023-AISC-03	*1*	*MINERVA*	*€9,691,771.10*	*€4,845,885.55*
DIGITAL-EUROHPC-JU-SME-01	*1*	*FFplus*	*€29,999,678.81*	*€29,999,678.81*
DIGITAL-EUROHPC-JU-NCC-02	*1*	*EuroCC4SEE*	*€9,928,497.90*	*€4,964,248.95*
HORIZON-EUROHPC-JU-2023-COE-03	*2*	*dealii-X* *MICROCARD-2*	*€8,939,080.00*	*€4,469,540.02*
HORIZON-EUROHPC-JU-2023-ENERGY-04	*1*	*SEANERGYS*	*€33,657,398.75*	*€16,828,699.42*
HORIZON-EUROHPC-JU-2023-INCO-06	*1*	*GANANA*	*€4,999,522.50*	*€4,999,522.50*
HORIZON-EUROHPC-JU-INTER-02	*1*	*NET4EXA*	*€71,147,350.50*	*26,927,020.70*

HORIZON-EUROHPC-JU-2023-QEC-05	*2*	*QEC4QEA* *QUEX*	*€19,870,911.25*	*€9,935,455.65*
HORIZON-EUROHPC-JU-2024-DARE-SGA-04	*1*	*DARE SGA 1*	*€239,995,859.50*	*€119,986,679.27*
TOTAL	***13***		***€450,052,401.45***	***€236,293,537.88***

Table 2: No of retained (successful) proposals submitted under calls evaluated in 2024 and total budgets per proposal.

Call	Successful proposals	Proposal acronyms	Requested grant by SMEs	Requested grant by LEs
DIGITAL-EUROHPC-JU-HPCQC-04-IBA	*1*	*EUROQHPC-I*	€524,999.78	€82,390.00
DIGITAL-EUROHPC-JU-2023-ACADEMY-02	*1*	*EVITA*	€351,840.00	
DIGITAL-EUROHPC-JU-2023-AISC-03	*1*	*MINERVA*	€483,640.00	€641,465.00
DIGITAL-EUROHPC-JU-SME-01	*1*	*FFplus*	€1,605,600.27	
DIGITAL-EUROHPC-JU-NCC-02	*1*	*EuroCC4SEE*	€274,776.00	
HORIZON-EUROHPC-JU-2023-COE-03	*2*	*dealii-X* *MICROCARD-2*	€263,417.50	
HORIZON-EUROHPC-JU-2023-ENERGY-04	*1*	*SEANERGYS*	€3,709,635.63	€2,690,824.38
HORIZON-EUROHPC-JU-2023-INCO-06	*1*	*GANANA*		€382,885.00
HORIZON-EUROHPC-JU-INTER-02	*1*	*NET4EXA*	€5,175,253.13	€15,000,274.19
HORIZON-EUROHPC-JU-2023-QEC-05	*2*	*QEC4QEA* *QUEX*	€1,607,905.01	

HORIZON-EUROHPC-JU-2024-DARE-SGA-04	*1*	*DARE SGA 1*	€95,203,119.64	€475,656.25
TOTAL	***13***		**€109,200,186.96**	**€19,273,494.82**

Table 3: No of retained (successful) proposals submitted under calls evaluated in 2024 and budgets requested by private entities.

Applicant Country Code	Requested budget (EU contribution)
AT	*€ 864,251.38*
BA	*€ 501,268.25*
BE	*€ 8,877,140.63*
CZ	*€ 5,609,157.50*
DE	*€ 77,617,478.18*
DK	*€ 1,876,705.99*
EL	*€ 6,015,009.38*
ES	*€ 43,668,184.78*
FI	*€ 2,379,599.23*
FR	*€ 26,257,696.48*
HR	*€ 791,875.00*
IE	*€ 1,301,324.51*
IT	*€ 24,726,273.67*
LT	*€ 185,031.88*
LU	*€ 2,073,992.50*
LV	*€ 136,425.00*
ME	*€ 533,662.50*
MK	*€ 599,200.00*
NL	*€ 15,359,023.04*
NO	*€ 5,936,730.91*
PL	*€ 3,694,124.19*
PT	*€ 446,758.85*
RO	*€ 347,499.62*
RS	*€ 599,761.75*
SE	*€ 3,502,219.95*
SI	*€ 950,161.26*
TR	*€ 783,481.45*
UK	*€ 659,500.00*

Table 4: Requested budget (EU contribution) in successful (retained) proposals by country

Participation statistics are shown in **Figures 5 - 7**. “Participations” refers to all applicants from eligible proposals (one applicant can be counted multiple times if they are involved in multiple proposals) and “applicants” refers to distinct applicants from eligible proposals. While the participation of SMEs (Small and Medium Enterprises) and LEs (Large Enterprises) is relatively lower than public institutions (Other),

the evaluation process was conducted in an unbiased manner, ensuring a fair representation of different types of participating entities in successful proposals.

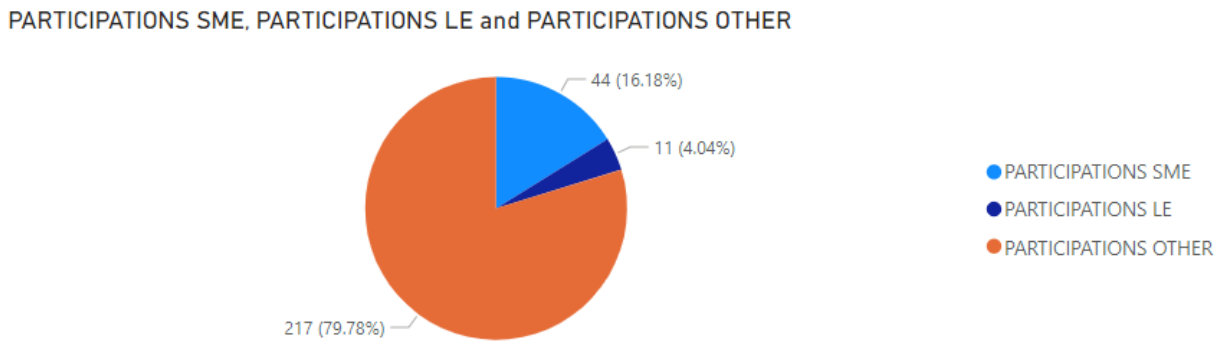


Figure 5: Number of participations (legal entities) by type in calls fully evaluated in 2024.

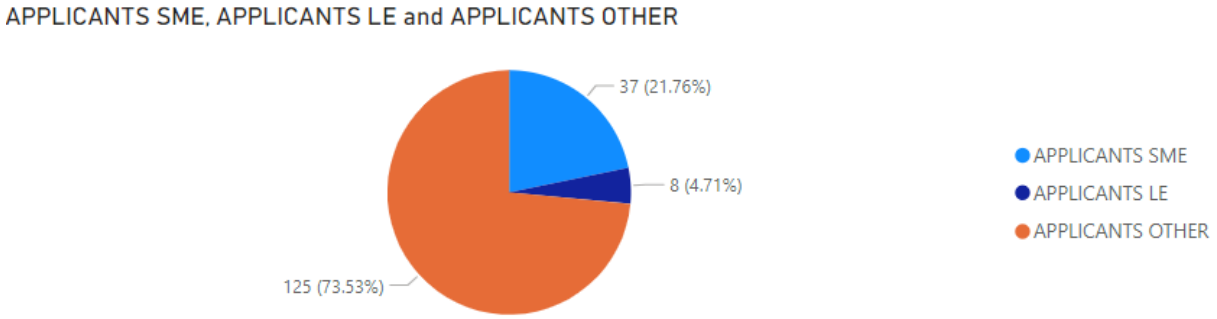


Figure 6: Number of applications (Legal Entities) by type in calls fully evaluated in 2024.

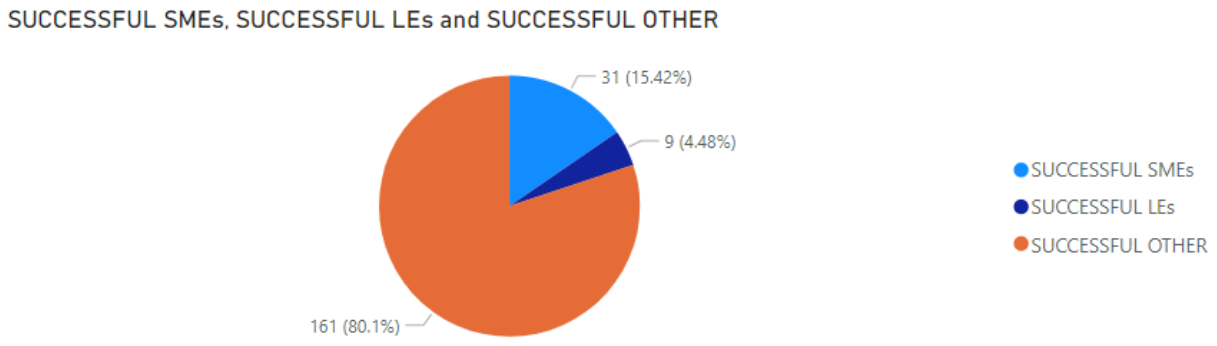


Figure 7: Number of applicants successful entities by type in calls fully evaluated in 2024

In 2024, 170 Legal Entities participated as applicants in evaluated (eligible) proposals. More than the average of the legal entity participations (92%) involved participation in only one proposal, while only two entities participated in more than 5 proposals. The distribution of requested EU grants among the participants also reflects the high participation frequency of a few entities while 156 applicants

requested a total EU grant for all participations up to EUR 1 million. More details are provided in **Figure 8 and Figure 9.**

Participations	No. of legal entities
1	157
2	21
3	3
4	2
5	2
7	2

Figure 8: Participation Histogram

Requested grant participant	No. of legal entities
01: 0-1 M€	156
02: 1-2 M€	15
03: 2-3 M€	5
04: 3-4 M€	2
05: 4-5 M€	1
06: 5-6 M€	2
09: 8-9 M€	1
12: 12-14 M€	2
13: 14-16 M€	1
19: 26-28 M€	2
21: >30 M€	1

Figure 9: Applicant requested budget distribution

Further details on financial aspects of the evaluated (eligible) proposals and successful (retained) proposals are shown in **Figures 10-13**.

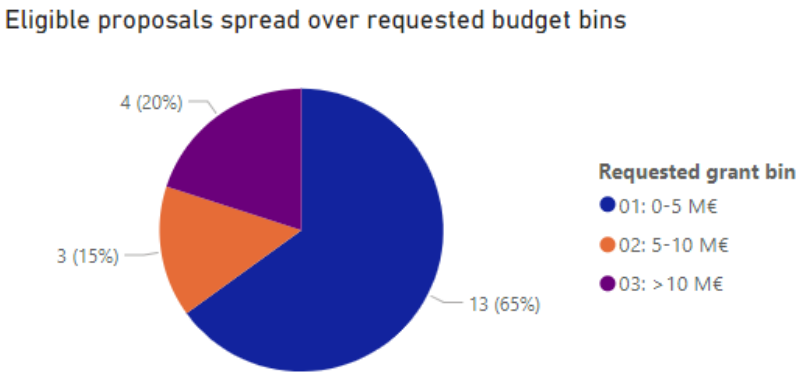


Figure 10: Distribution of eligible proposals over requested budget bins.

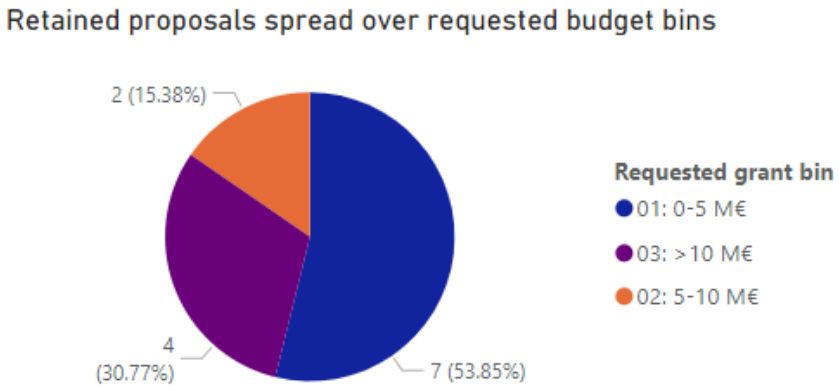


Figure 11: Distribution of retained proposals over requested budge bins.

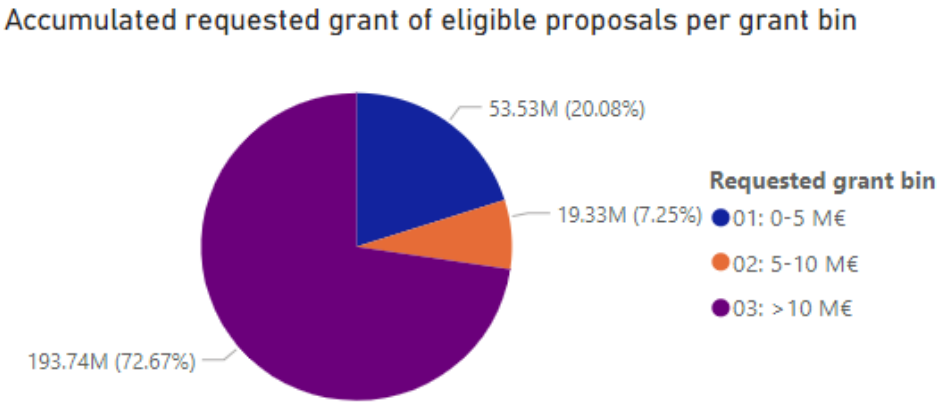


Figure 12: Distribution of accumulated requested budget of eligible proposals over requested budget bins.

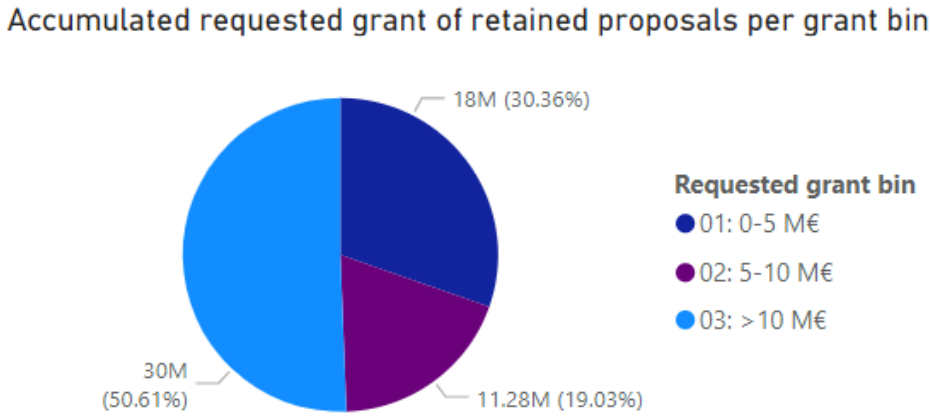


Figure 13: Distribution of accumulated requested budget of retained proposals over budget bins

Ongoing Projects (Grants)

In 2024, the JU managed 46 active projects (grants), as listed in **Table 5**. The table includes information on the project focus areas indicated by keywords. Beneficiary breakdown per type and EU contribution per country are shown in **Table 6 and Table 7**, respectively.

Project Call ID	*Acronym*	*Coordinating Country*	*Project Keywords*
H2020-JTI-EuroHPC-2019-1	ACROSS	IT	Complex workflows, big data, petascale, exascale, neuromorphic processors, multi-level orchestration, cross stack convergence

H2020-JTI-EuroHPC-2019-1	ADMIRE	ES	High-performance input/output, ad-hoc storage systems, malleability, input/output scheduling, intelligent input/output tuning, cross-layer data analytics, heterogeneous dataset, applications co-design, Exascale
H2020-JTI-EuroHPC-2019-1	DComEX	EL	Data Driven Computational mechanics, Exascale Computing, Manifold Learning, Fault Tolerance, Scalability, Heterogeneous CPU+GPU computing, Bayesian analysis, Uncertainty Quantification
H2020-JTI-EuroHPC-2019-1	DEEP-SEA	DE	Programming environment, co-design, exascale, compute and memory heterogeneity, Modular Supercomputing Architecture, software stack, performance analysis, modelling, resource management, scalability
H2020-JTI-EuroHPC-2019-1	eFlows4HPC	ES	Scientific and Industrial Workflows, Convergence High-Performance Data Analytics, Machine Learning and High-Performance Computing, Distributed and heterogeneous computing, Widening HPC usage
H2020-JTI-EuroHPC-2019-1	eProcessor	ES	Open-source hardware, software, energy efficiency, hardware, software co-design, high-performance data analytics, mixed precision, AI, deep learning, machine learning, extreme-scale computing
H2020-JTI-EuroHPC-2019-1	IO-SEA	FR	Data processing, exascale, HPC, Object Store, Hierarchical Storage Management, Data Placement, performance optimization, energy efficiency optimization
H2020-JTI-EuroHPC-2019-1	LIGATE	IT	Drug Discovery, Computer Aided Drug Design, Molecular Dynamics, auto-tuning, portable, artificial intelligence, Machine Learning
H2020-JTI-EuroHPC-2019-1	MAELSTROM	UK	Scalable machine learning, hardware, software co-design, compute system design

H2020-JTI-EuroHPC-2019-1	MICROCARD	FR	Exascale, runtime, solvers, preconditioners, GPU, cardiac electrophysiology, cardiac arrhythmia
H2020-JTI-EuroHPC-2019-1	RED-SEA	FR	Interconnect Network
H2020-JTI-EuroHPC-2019-1	SPARCITY	TR	Sparse Computation, Graph Algorithms, Performance Modelling, Co-design, Performance Tuning, Sparse Linear Algebra, Exascale Computing, Hardware Accelerators, IPUs, GPUs
H2020-JTI-EuroHPC-2019-1	TIME-X	BE	Time-parallel methods, forward-in-time simulation, optimisation, uncertainty quantification
H2020-JTI-EuroHPC-2019-1	exaFOAM	FR	Exascale OpenFOAM HPC Parallel input/output computational fluid dynamics algorithms
H2020-JTI-EuroHPC-2019-1	NextSim	ES	Aerospace engineering, numerical analysis, simulation, optimization, modelling tools, computational engineering and computer aided design, high-performance computing
H2020-JTI-EuroHPC-2019-1	REGALE	EL	Next generation HPC applications, resource management, workflows
H2020-JTI-EuroHPC-2019-1	TEXTAROSSA	IT	Energy efficiency, heterogenous computing, power and thermal management, innovative cooling
H2020-JTI-EuroHPC-2020-1	EUPEX	FR	Pilot for European exascale system
H2020-JTI-EuroHPC-2020-1	The European PILOT	ES	Hardware, energy efficiency, scalability, accelerator, machine learning

H2020-JTI-EuroHPC-2020-2	HPCQS	DE	Quantum simulator, hybrid quantum-HPC computation, modular supercomputer architecture, cloud access, Tier-0, federated quantum-HPC infrastructure, co-design, use case, ATOS QLM, Pasqal Fresnel
DIGITAL-EUROHPC-JU-2022-NCC-01	CASTIEL 2	DE	Competence Centres, Centres of Excellence, Training, Networking, European Collaboration, Twinning, Mentoring, EuroHPC, Artificial Intelligence, High Performance Data Analytics
DIGITAL-EUROHPC-JU-2022-NCC-01	EuroCC 2	DE	National Competence Centres, Competence, Excellence, Artificial Intelligence, High Performance Data Analytics, Exascale, Petascale, Industry, Academia, Public Administration
H2020-JTI-EuroHPC-2020-02	EPI	FR	High-Performance Computing (HPC), Exascale Computing, Low-Power Processors, European Microprocessor Technology, Supercomputers, Artificial Intelligence (AI), Big Data, RISC-V Technology, European Technological Sovereignty EPI
H2020-JTI-EuroHPC-2020-03	EUMaster4HPC	LU	High Performance Data Analytics, Digital Transformation, Education, Research, Innovation
HORIZON-EUROHPC-JU-2021-COE-01	BioExcel-3	SE	Biomolecular Life Science, Drug Discovery, Biotechnology, Exascale, HPC, Automation and Data Integration
HORIZON-EUROHPC-JU-2021-COE-01	CEEC	SE	Computational Fluid Dynamics, Exascale, Algorithms
HORIZON-EUROHPC-JU-2021-COE-01	ChEESE-2P	ES	Solid Earth, code optimization, services, geohazards, urgent computing
HORIZON-EUROHPC-JU-2021-COE-01	ESiWACE3	ES	Weather, climate, exascale, HPC, scalability, portability, simulation, co-design, profiling and optimisation, workflow, computer science, data analysis, large data volume, optimisation services

HORIZON-EUROHPC-JU-2021-COE-01	EXCELLERAT P2	DE	Centre of Excellence, Engineering, EuroHPC, Exascale, High Performance Computing, Artificial Intelligence, Data Analytics
HORIZON-EUROHPC-JU-2021-COE-01	HiDALGO2	PL	Global challenges, global systems science, exascale, air quality, wildfire, meteo-hydrological forecasting, renewable energy, scalability, benchmarking, co-design, HPC, HPDA, AI, novelty architectures
HORIZON-EUROHPC-JU-2021-COE-01	MaX	IT	Lighthouse materials science codes at the exascale, Co-design based on materials science codes, Energy efficiency in materials science codes, Training on HPC for materials research
HORIZON-EUROHPC-JU-2021-COE-01	MultiXscale	SI	Multiscale processes, materials modelling, biophysics, application deployment
HORIZON-EUROHPC-JU-2021-COE-01	Plasma-PEPSC	SE	Flagship Plasma Simulations, Exascale, Extreme Scale, Extreme Data, Heterogeneous Systems, Co-design, European Processor Initiative, PI
HORIZON-EUROHPC-JU-2021-COE-01	SPACE	IT	Astrophysics, Cosmology, Exascale, GPU computing
DIGITAL-EUROHPC-JU-2022-APPSUPPORT-01	EPICURE	FI	Application Support Teams, Porting, Optimisation, Performance Analysis, Benchmarking
DIGITAL-EUROHPC-JU-2022-TRAINING-02	HPC SPECTRA	IE	EuroHPC, Training Platform, International Summer School
HORIZON-EUROHPC-JU-2022-ALG-02	Inno4Scale	ES	Exascale, Algorithms, EuroHPC, Open Call
HORIZON-EUROHPC-JU-2023-COE-01	EoCoE-III	FR	Energy, exascale, fusion, materials for energy, renewables, linear algebra

HORIZON-EUROHPC-JU-2023-COE-01	POP3	ES	Performance Tools and Analysis, Code optimization, Parallel Programming Models, Productivity, Metrics and, Methodology
DIGITAL-EUROHPC-JU-2023-SME-01	FFplus	DE	HPC, HPDA, AI, Fortissimo, Experiments, SMEs, Business, Success stories, Simulation engineering and modelling, Generative AI
DIGITAL-EUROHPC-JU-2024-NCC-02	EuroCC4SEE	DE	HPC, National Competence Centres (NCCs), Supercomputing, AI, Big Data, European Collaboration, Research and Development, Technological Innovation, Industrial uptake
HORIZON-EUROHPC-JU-2022-INCO-04	HANAMI	FR	Material science, climate and weather modelling, biomedical, life science, pre-exascale, exascale
HORIZON-EUROHPC-JU-2022-TECH-03	DARE	ES	Tapeout, chiplet, supercomputing centres, EU sovereignty
HORIZON-EUROHPC-JU-2023-COE-03	dealii-X	DE	Finite element method, computational fluid dynamics, computational structure mechanics, matrix-free methods, multiphysics problems, coupling algorithms
HORIZON-EUROHPC-JU-2023-COE-03	MICROCARD-2	FR	Cardiac electrophysiology, Cardiac arrhythmia, Mesh processing, Exascale, Solvers, Preconditioners, Runtime
HORIZON-EUROHPC-JU-2023-INTER-02	NET4EXA	FR	Inter-node interconnect, switch, NIC (Network Interconnect Card), FPGA

Table 5: Project portfolio 2024

Country	*Beneficiaries*	*SME*	*LE*
AT	*8*	*4*	*1*
BA	*1*		
BE	*9*	*2*	
BG	*3*		*1*
CH	*5*	*1*	
CY	*5*	*1*	
CZ	*4*	*1*	
DE	*46*	*17*	*2*

Country	*Requested EU Contribution*
AT	*€2,160,080.45*
BA	*€450,336.25*
BE	*€3,017,897.46*
BG	*€1,461,022.50*
CH	*€4,229,551.51*
CY	*€1,323,515.00*
CZ	*€3,470,460.25*
DE	*€77,999,405.06*

DK	*1*		
EE	*1*		
EL	*10*	*4*	*1*
ES	*22*	*6*	*1*
FI	*3*		
FR	*31*	*8*	*8*
HR	*4*		
HU	*3*		
IE	*2*		
IS	*2*		
IT	*38*	*9*	*6*
LT	*1*		
LU	*3*		*1*
LV	*1*		
ME	*1*		
MK	*1*		
NL	*7*	*1*	*1*
NO	*9*	*1*	*2*
PL	*3*		
PT	*6*		
RO	*1*		
RS	*1*		
SE	*6*		
SI	*6*	*1*	
SK	*1*		
TR	*4*		
UK	*2*		*1*
Total	***249***	***56***	***25***

Table 6: Distribution of beneficiaries per country and type in projects active in 2024.

DK	*€1,626,597.00*
EE	*€999,999.53*
EL	*€10,931,900.50*
ES	*€31,799,795.34*
FI	*€3,081,114.81*
FR	*€77,289,757.73*
HR	*€2,4447,036.75*
HU	*€1,394,392.53*
IE	*€2,005,137.50*
IS	*€1,164,784.10*
IT	*€29,869,578.91*
LT	*€500,000.00*
LU	*€4,271,828.23*
LV	*€500,000.00*
ME	*€533,662.50*
MK	*€587,055.50*
NL	*€2,721,344.97*
NO	*€8,437,755.21*
PL	*€3,099,178.82*
PT	*€ 1,999,355.48*
RO	*€ 1,048,600.00*
RS	*€ 594,411.75*
SE	*€ 8,925,099.16*
SI	*€ 2,990,978.05*
SK	*€ 1,000,107.60*
TR	*€ 1,235,373.70*
UK	*€ 3,114,006.25*
Total	***€ 298,281,120.40***

Table 7: EU financial contribution per country in projects active in 2024.

Projects with retroactive start

Project number	Project	Start date	Justification
101191687	EuroCC4See	11/04/2024	Starting the project early enabled onboarding of the National Competence Centres of EuroCC4See into the existing NCC network. This is crucial to minimising the risk of widening the HPC knowledge gap in concerned countries.
101175702	NET4EXA	01/09/2024	Starting the project early was crucial to aligning with the BullSequana eXascale Interconnect roadmap. It enables industrial

			partners, including BULL to maintain momentum and make meaningful contributions to BXI development.

Evaluation procedures and outcomes

Evaluation rules and selection of experts

The evaluation of proposals for calls under Horizon Europe (HE) and Digital Europe programme (DEP) follow a set of rules and procedures laid out by those EU funding programmes. Evaluation criteria for HE and DEP were based on three standard criteria: excellence and relevance; impact and implementation; and implementation and impact. The evaluation process involves external experts selected based on their skills, experience, and knowledge in the specific areas of the call. The experts carry out an initial individual evaluation, followed by a consensus group discussion, and concluding with a panel review. Each admissible and eligible proposal was evaluated by at least three external experts to ensure a high level of quality. To guarantee a well-balanced composition, the external experts consider factors such as skills, experience, knowledge, geographical diversity, gender, and affiliation with organizations in the private and public sector.

Table 8 summarises global evaluation outcomes.

Call ID	Received Proposals	Eligible Proposals	Successful Proposals	Net Success Rate	Average TTI	Average TTS	Average TTG
DIGITAL-EUROHPC-JU-2022-HPCQC-04-IBA	1	1	1	100%	438	-	-
DIGITAL-EUROHPC-JU-2023-ACADEMY-02	3	2	1	50%	153	-	-
DIGITAL-EUROHPC-JU-2023-AISC-03	4	3	1	33.33%	127	163	290
DIGITAL-EUROHPC-JU-2023-SME-01	9	1	1	100%	66	109	175
DIGITAL-EUROHPC-JU-2024-NCC-02	1	1	1	100%	70	108	178
HORIZON-EUROHPC-JU-2023-COE-03	4	4	2	50%	125	149	274
HORIZON-EUROHPC-JU-2023-ENERGY-04	1	1	1	100%	97	-	-
HORIZON-EUROHPC-JU-2023-INCO-06	1	1	1	100%	130	-	-

HORIZON-EUROHPC-JU-2023-INTER-02	1	1	1	100%	161	147	308
HORIZON-EUROHPC-JU-2023-QEC-05	4	4	2	50%	195	-	-
HORIZON-EUROHPC-JU-2024-DARE-SGA-04	1	1	1	100%	72	-	-

Table 8: Number of submitted, eligible, successful proposals, success rate and (where applicable) average Time-to-Inform (TTI), Time-to-Sign (TTS), Time-to-Grant (TTG) and Time-to-Pay (TTP) for fully evaluated calls in 2024.

In 2024, a total of 37 experts from 17 different European countries contributed to the evaluation of proposals. 20 proposals were submitted to calls evaluated in 2024. In terms of the gender balance of evaluators there was a slightly greater number of male evaluators than female (60% male to 40% female). Gender-based and country-based overviews are shown in **Figure 14**. On average, each expert evaluator assessed 1.7 proposals.

Two redress requests were submitted: one was deemed inadmissible, and the other was deemed unfounded.

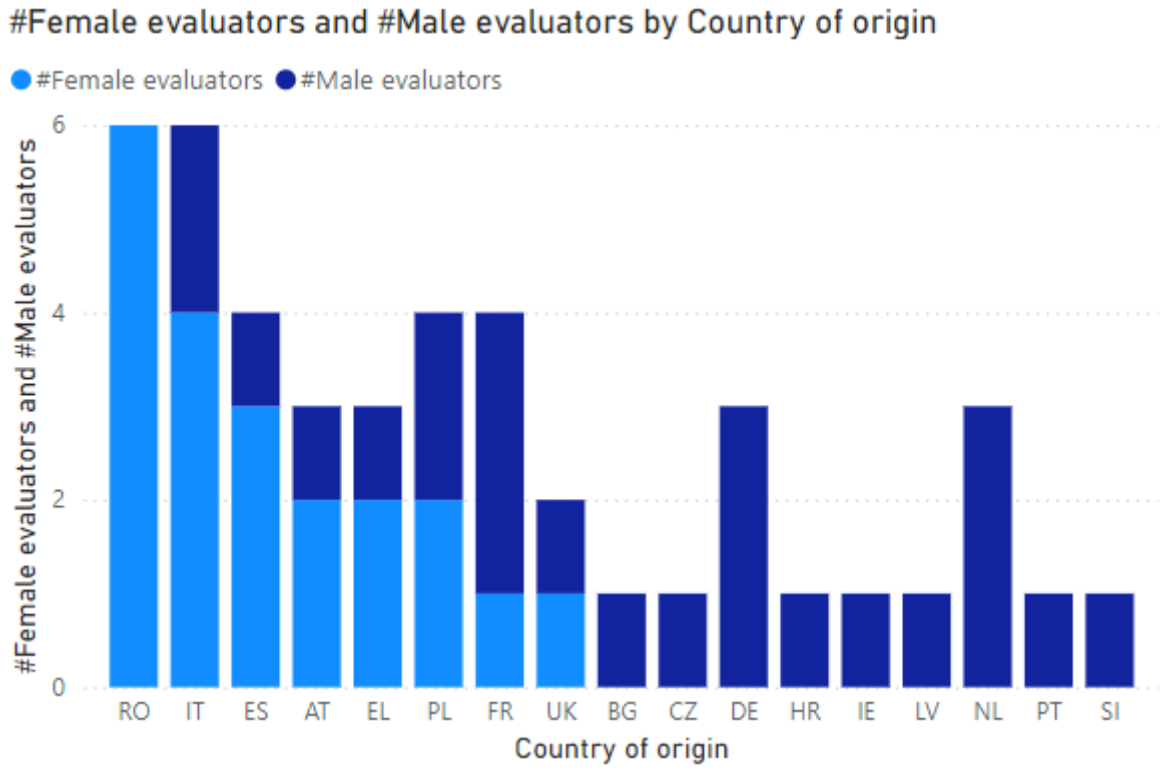


Figure 14: Distribution of experts that participated evaluations performed in 2024 over countries of origin and gender.

Follow-up activities linked to past calls

Organisation of the monitoring and appointment of experts

In total, 39 reviews were organised (each with 3 external experts on average). Three of the reviews were specific issue reviews organised in addition to the periodic reporting periods to address concerns typically identified during a periodic review. The remaining 36 review procedures were part of the formal periodic reporting process. The reviews involved 109 expert participations, with 59% conducted by male reviewers and 41% by female reviewers.

HPC Infrastructure Activities

Calls for tenders and procurements of supercomputers – Horizon Europe Programme

In 2024, the following eight EuroHPC supercomputers were operational: LUMI in Finland; Leonardo in Italy; Vega in Slovenia; MeluXina in Luxembourg; Karolina in Czech Republic; Discoverer in Bulgaria; Deucalion in Portugal; and MareNostrum 5 (MN5) in Spain. All made the TOP500 list[5] of the most powerful supercomputers in the world. All operational EuroHPC systems ranked among the world's most powerful and energy efficient

Calls for tenders and procurements for quantum computers – Digital Europe Programme

Following a call for expression of interest[6] launched in 2022 for the hosting and operation of European quantum computers integrated into HPC supercomputers, the EuroHPC Governing Board selected EuroQCS-Poland, Euro-Q-Exa, EuroQCS-France, LUMI-Q, EuroQCS-Spain and EuroQCS-Italy to receive financial contributions for the acquisition, operation and integration of the systems into their local data centres. The Hosting Agreements will all six Hosting Entities were signed on June 27th 2023. Following the launch of the six tender procedures, the vendor contracts for PEuroQCS-Poland, VLQ, EuroQCS-France and Euro-Q-Exa were signed in 2024. All six systems are expected to be operational by Q4 2025.

To complement the quantum computing fleet with technologies that have not been considered in the first round, a second call for expression of interest was launch in December 2023[7]. The EuroHPC Governing Board selected EuroSSQ-HPC and MeluXina-Q to receive financial contributions for the acquisition, operation and integration of the systems into their local data centres. The Hosting Agreements with the two Hosting Entities were signed in October 2024 and the respective procurements will be launched in 2025 and the systems are expected to be operational in Q2 2026.

[6] EUROHPC-2022-CEI-QC-01

[7] EUROHPC-2023-CEI-QC-01

Calls for tenders and procurements for upgrades of supercomputers – Digital Europe Programme

Following a call for expressions of interest[8] launched in 2022 to upgrade the EuroHPC supercomputers, the EuroHPC Governing Board selected Discoverer and Leonardo to receive financial contributions to make upgrades to their existing systems.[9]

The Discoverer consortium applied to receive the upgrade mainly due to the supercomputer consisting solely of CPU partitions. The upgrade will enhance the system with a GPU partition. The Hosting Agreement and Joint Procurement Agreement were signed with the Hosting Entity, Sofia Tech Park, in the first half of 2023 and consequently the call for tenders consisting of three LOTs for Discoverer+ were launched as an open procedure in September 2023. With the deadline of the call set in December 2023, the evaluations of the submitted tenders were carried out in Q1 of 2024 with the aim to have the new GPU partition in place before the end of 2024. Following this, the contracts were signed on 10 July 2024, with the tenders awarded to A1 for LOT2 and LOT3 (UPS and two new storages). Eviden was awarded LOT1 for GPU partition. The hardware was delivered and installed in November 2024 and is currently at testing stage. The upgraded system is expected to be operational in Q1 2025.

Leonardo is the second machine to receive financial contributions in 2024 to upgrade the existing system. "LISA", the upgrade to Leonardo, will lead to an extension of the supercomputer's lifetime, increase its operational performance and provide new functionalities to address the growing evolution of user needs. The call for tenders was launched on 19 September 2024 with the deadline 15 November 2024. The received tenders are under the evaluation with an aim to sign the award contract in Q1 2025.

Calls for tenders and procurements of mid-range supercomputers – Digital Europe Programme

In 2023, the procurement procedures were ongoing for the new petascale supercomputer to be located at GRNET in Greece. The hosting agreement for GRNET has been signed, and the system procurement launched in 2024. The evaluation of the tenders and installation of the system is expected to be carried out in 2025.

On 19 June 2023, Linköping University (LiU) in Sweden was selected to host and operate a new supercomputer, following a call for expression of interest for a new EuroHPC mid-range system. Named Arrhenius, this machine will be able to tackle Artificial Intelligence/Machine Learning and other applications requiring high memory bandwidth and fast data transfer to disk. The procedures for signing the hosting agreement as well as the joint procurement agreement were finalised in 2024. The procurement process of the system was initiated in July 2024. The evaluation and the tender and the installation of the system is planned to be carried out in 2025 with the aim to have the system fully operational by Q4 2025.

[8] EUROHPC-2022-CEI-UPG-01

[9] DECISION OF THE GOVERNING BOARD OF THE EuroHPC JOINT UNDERTAKING No 28/2022 On the selection of EuroHPC supercomputers to be upgraded

In 2024, three additional hosting entities of future machines were contacted by EuroHPC JU to require them to confirm that they were committed to pursue the procurements. All three confirmed that, subject to reconfirmation of national funding, they were committed to pursue these activities.

Calls for tenders and procurements of exascale supercomputers – Digital Europe Programme

The hosting agreement for JUPITER was signed between the EuroHPC JU and the Jülich Supercomputing Centre (JSC) on 14 December 2022. The procurement was launched in January 2023 and the contract signed on 3 October 2023, with the tender awarded to a consortium comprising of two European companies: Eviden and Par-Tec. JUPITER, which will be the first EuroHPC supercomputer capable of exascale performance, will be located at the Forschungszentrum Jülich campus in Germany and operated by the JSC. JUPITER's general-purpose cluster module include the new Rhea processor, a European-designed CPU, developed in the framework of the European Processor Initiative (EPI). Installation began in 2024, and the GPU partition is expected to be operation in Q4 2025.

On 20 June 2023, EuroHPC JU announced the selection of the Jules Verne consortium to host and operate the second EuroHPC exascale supercomputer, to be hosted in France. In 2024 the procurement of the system was launched, with a view to begin the installation the system in late 2025 and bringing the system into operation in 2026. The second exascale supercomputer, to be named Alice Recoque, will be managed by GENCI (the French national agency for High Performance Computing) and operated at the TGCC computing centre by the CEA (the French Commission for Alternative Energies and Atomic Energy Commission), in Bruyères-le-Châtel.

Calls for expression of interest to host AI-Factories – Horizon Europe Programme and Digital Europe Programme

As already described in Work Programme 2024 Section, infrastructure (AI Factory) activities in 2024 focussed on two Calls (**EUROHPC-2024-CEI-AI-01 and EUROHPC-2024-CEI-AI-02)** which addressed two areas:

- the acquisition of the new AI EuroHPC supercomputers and the upgrade of the existing EuroHPC supercomputers to AI-optimised platforms which was launched under Digital Europe programme and,
- the establishment of AI factories and acquisition of experimental AI-optimised platforms under Horizon Europe programme.

The call was launched on 10th of September 2024 and shall be continuously open until 31st December 2025, with pre-defined cut-off dates. The first cut-off deadline for applications was 4 November 2024, with subsequent submission dates every three months. Seven applications were submitted in the first cut-off were selected.

Global Standing of EuroHPC Systems

As of November 2024, three EuroHPC supercomputers were ranked in the top fifteen of the TOP500 list of the world's most powerful supercomputers.

LUMI is the third fastest supercomputer in Europe and eighth fastest in the world, with a High Performance Linpack (HPL) performance of 379,70 petaflops per second while Leonardo's 238,70 petaflops per second put the system in fourth place in Europe and nineth place globally. MareNostrum 5 entered the TOP500 with 175,30 petaflops per second tool the eleventh place.

All EuroHPC petascale supercomputers, Meluxina, Vega, Discoverer, Karolina and Deucalion are also well placed in the global rankings, all securing positions among the top 300 supercomputers ranked in the TOP500. JETI - JUPITER Exascale Transition Instrument and JEDI- JUPITER's development system were ranked for the first time on the list.

In **Table 9** the ranking and performance in petaflops of all EuroHPC supercomputers is listed, according to the latest editions of the TOP500 and Green500 lists. It is worth noting that Europe's first exascale system JUPITER's development system, JEDI received the prestigious first place on the Green500 list.

System Name	*Linpack Performance (PFlops)*	*Top500 Ranking (November 2023)*	*Green500 Ranking*
LUMI	*379.70*	*8*	*25*
LEONARDO	*238.70*	*9*	*52*
MN5	*175,30*	*11*	*31*
JETI - JUPITER Exascale Transition Instrument	*83.14*	*18*	*6*
MeluXina Accelerator Module	*10.52*	*112*	*60*
Karolina GPU	*6.75*	*165*	*57*
LUMI – C	*6.30*	*177*	*136*
DISCOVERER	*4.52*	*221*	*306*
JUPITER's development system, JEDI	*4,50*	*222*	*1*
Deucalion	*3.96*	*257*	*99*
VEGA CPU	*3.82*	*264*	*331*
VEGA GPU	*3.10*	*342*	*382*
Karolina CPU	*2.84*	*378*	*128*

Table 9: Ranking and performance in Petaflops of all EuroHPC supercomputers according to 2024 editions of the TOP500 and Green500 lists

EuroHPC Supercomputers

Below are the technical specifications of the operational petascale and precursor to exascale supercomputers which make EuroHPC's growing catalogue of supercomputers.

LUMI

LUMI is a Cray EX supercomputer supplied by Hewlett Packard Enterprise (HPE) and located in Finland. The first phase of the system installation has been completed with the delivery of the CPU only partition, LUMI-C. The installation of the GPU partition, called LUMI-G, is currently ongoing and expected to go operational in Q3 2022. Once installed LUMI will be the most powerful system in Europe, and one of the most powerful in the world, able to deliver ~400 PFlops of sustained aggregated performance.

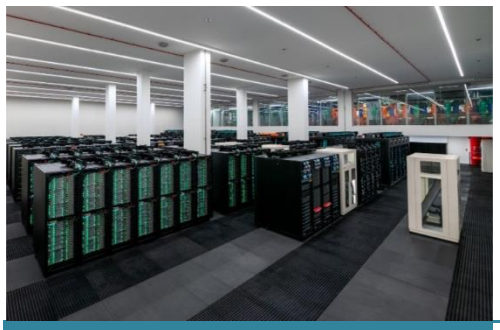
Sustained Performance:	386 petaflops
Peak Performance:	539.13 petaflops
Compute Partitions:	GPU partition (LUMI-G), x86 CPU-partition (LUMI-C), data analytics partition (LUMI-D), container cloud partition (LUMI-K)
Central Processing Unit (CPU):	LUMI-C partition: 3rd generation AMD EPYC™ CPUs 64-core, LUMI-G partition: AMD Trento 64-core
Graphics Processing Unit (GPU):	LUMI-G based on the future generation AMD Instinct™ GPU
Storage Capacity:	LUMI's storage system consists of three components. First, there is a 7-petabyte partition of ultra-fast flash storage, combined with a more traditional 80-petabyte capacity storage, based on the Lustre parallel filesystem, as well as a data management service, based on Ceph and being 30 petabytes in volume. In total, LUMI has a storage of 117 petabytes and a maximum I/O bandwidth of 2 terabytes per second.
Applications:	AI, especially deep learning, and traditional large-scale simulations combined with massive scale data analytics in solving one research problem.

LEONARDO

Leonardo is supplied by ATOS, based on a BullSequana XH2000 supercomputer and located in Italy. Once operational, Leonardo will be one of the fastest Artificial Intelligence (AI) Supercomputers in the world, delivering 10 exaflops of FP16 AI performance.

Sustained Performance:	249.4 petaflops
Peak Performance:	315.74 petaflops
Compute Partitions:	Booster, hybrid CPU-GPU module delivering 240 PFlops, Data-Centric, delivering 9 Pflops and featuring DDR5 Memory and local NVM for data analysis
Central Processing Unit (CPU):	Intel Ice-Lake (Booster partition), Intel Sapphire Rapids (Data-centric partition)
Graphics Processing Unit (GPU):	13824 "Da Vinci" GPUs (based on NVIDIA Ampere architecture) delivering up to 10 exaflops of FP16 Tensor Flow AI performance
Storage Capacity :	Leonardo is equipped with over 100 petabytes of state-of-the-art storage capacity and 5PB of High Performance storage
Applications:	The system targets: modular computing, scalable computing applications, data-analysis computing applications, visualization applications and interactive computing applications, urgent and cloud computing

MARENOSTRUM 5



MareNostrum 5 is a pre-exascale EuroHPC supercomputer located in Barcelona, Spain. The system is supplied by Bull SAS combining Bull Sequana XH3000 and Lenovo ThinkSystem architectures. MareNostrum 5 is hosted by Barcelona Supercomputing Center (BSC).

Sustained Performance:	**215.4 petaflops**
Peak Performance:	295.81 Petaflops
Compute Partitions:	GPP (General purpose partition), ACC (Accelerated partition), NGT GPP (Next Generation Technology General Purpose partition and NGT ACC (Next Generation Technology General Purpose partition). Additional smaller partitions for pre- and post-processing.

Central Processing Unit (CPU):	The GPP, ACC partitions both rely on Intel Sapphire Rapids CPUs. NGT ACC is based on Intel Emerald Rapids and the NGT GPP is based on NVIDIA Grace.
Graphics Processing Unit (GPU):	The ACC partition is based on NVIDIA Hopper whereas the NGT ACC partition is built on Intel Rialto Bridge.
Storage Capacity:	MareNostrum 5's storage provides 248PB net capacity based on SSD/Flash and hard disks, and an aggregated performance of 1.2TB/s on writes and 1.6TB/s on reads. Long-term archive storage solution based on tapes will provide 402PB additional capacity. Spectrum Scale and Archive will be used as parallel filesystem and tiering solution respectively.
Applications:	MareNostrum5 is a highly versatile system thanks to its heterogeneous configuration, with a special focus on medical applications, drug discovery as well as digital twins (earth and human body), energy, etc. Its large general-purpose partition provides an environment well suited for most current applications that solve scientific/industrial problems. In addition, the accelerated partition provides an excellent environment for large scale simulations, AI and deep learning.
Other Details:	MareNostrum 5 is in BSC's new facilities, next to the Chapel which is hosting previous systems. The datacentre has a total power capacity of 20MW, and cooling capacity of 17MW, with a PUE below 1,08.

MELUXINA

MeluXina is an Atos BullSequana XH2000 supercomputer, installed in Luxembourg. The system implements a modular architecture, offering multiple partitions incorporating different technologies to satisfy most of the processing requirements of scientific and industrial HPC applications. MeluXina is the most powerful of the EuroHPC petascale supercomputers with an aggregated performance of 12.81 petaflops. When announced in June 2021, it was listed in #36 of Top500 and #4 in Green500 making it the most energy efficient system in the EU at that time.

Sustained Performance:	**12.81 petaflops**
Peak Performance:	18.29 petaflops

Compute Partitions:	Accelerator - GPU (500 AI PetaFlops), Cluster (3 PetaFlops peak), Accelerator - FPGA and Large Memory Modules
Central Processing Unit (CPU):	AMD EPYC
Graphics Processing Unit (GPU):	NVIDIA Ampere A100
Storage Capacity:	20 petabytes main storage with all-flash scratch tier at 600GB/s, Tape archival capabilities
Applications:	Traditional Computational, AI and Big Data/HPDA workloads, Quantum Simulations
Other Details:	Modular Supercomputer Architecture, Cloud Module for complex use cases and persistent services, Infiniband HDR interconnect, high speed links to the RESTENA NREN and GÉANT network, Luxembourg Internet Exchange and Public Internet

KAROLINA

KAROLINA is a petascale EuroHPC supercomputer located in Ostrava, Czechia. It is supplied by Hewlett Packard Enterprise (HPE), based on an HPE Apollo 2000Gen10 Plus and HPE Apollo 6500 supercomputers. Karolina is hosted by IT4Innovations National Supercomputing Center.

Sustained Performance:	**9.59 petaflops**
Peak Performance:	12.91 petaflops
Compute partitions:	The supercomputer consists of 6 main parts: • a universal part for standard numerical simulations, which will consist of approximately 720 computer servers with a theoretical peak performance of 3.8 PFlop/s, • an accelerated part with 72 servers and each of them being equipped with 8 GPU accelerators providing a performance of 11 PFlop/s for standard HPC simulations and up to 150 PFlop/s for artificial intelligence computations, • a part designated for large dataset processing that will provide a shared memory of as high as 24 TB, and a performance of 74 TFlop/s,

	• 36 servers with a performance of 131 TFlop/s will be dedicated for providing cloud services, • a high-speed network to connect all parts as well as individual servers at a speed of up to 200 Gb/s, • data storages that will provide space for more than 1 PB of user data and will also include high-speed data storage with a speed of 1 TB/s for simulations as well as computations in the fields of advanced data analysis and artificial intelligence.
Central Processing Unit (CPU):	More than 100,000 CPU cores and 250 TB of RAM
Graphics Processing Unit (GPU):	More than 3.8 million CUDA cores / 240,000 tensor cores of NVIDIA A100 Tensor Core GPU accelerators with a total of 22.4 TB of superfast HBM2 memory
Storage capacity:	More than 1 petabyte of user data with high-speed data storage with a speed of 1 TB/s
Applications:	Traditional Computational, AI, Big Data

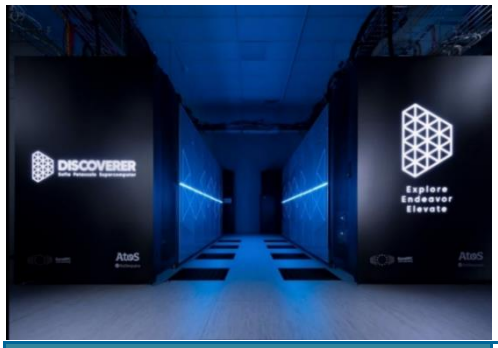
VEGA

VEGA is a petascale EuroHPC supercomputer located in Maribor, Slovenia. It was the first EuroHPC supercomputer to become operational. It is supplied by Atos, based on the BullSequana XH2000 supercomputer and hosted by IZUM.

Sustained Performance:	**6.92 petaflops**
Peak Performance:	10.05 petaflops
Compute Partitions:	CPU partition: 960 nodes with 2CPUs and 256GB memory/node (20% 1TB/node), 1x HDR100 & GPU partition: 60 nodes with 2CPUs and 512GB memory, 2x HDR100, 4x Nvidia A100/node
Central Processing Unit (CPU):	2040x CPUs AMD EPYC 7H12 (64c, 2.6-3.3GHz), 130.560 cores on CPU and GPU partition
Graphics Processing Unit (GPU):	240x Nvidia A100 with 40 GB HBM2 (+4 on GPU login nodes), 6912 FP32 CUDA cores and 432 Tensor cores per GPU

Storage Capacity:	High-performance NVMe Lustre (1PB), large-capacity Ceph (23PB)
Applications:	Traditional Computational, AI, Big Data/HPDA, Large-scale data processing

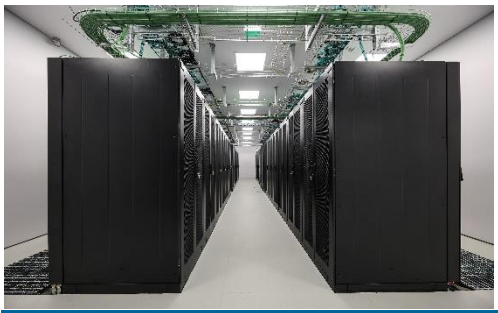
DISCOVERER



Discoverer is a BullSequana XH2000 supercomputer, located in Sofia, Bulgaria. It comprises of a single CPU-based partition offering 4.5 Petaflops of sustained performance. Compared to the rest of the EuroHPC petascale systems, it offers the largest and most powerful CPU-only partition and is an excellent platform for traditional computational applications that do not benefit from GPU accelerators.

Sustained Performance:	**4.52 petaflops**
Peak Performance:	5.94 petaflops
Compute Partitions:	One partition providing 1128 nodes, 4.44 petaflops
Central Processing Unit (CPU):	AMD EPYC “Rome” 7H12 64core, 2.6GHz, 280W (Code name Rome)
Graphics Processing Unit (GPU):	None
Storage Capacity:	2 petabytes
Applications:	Traditional Computational

DEUCALION



Deucalion is a petascale EuroHPC supercomputer located in Guimarães, Portugal. It is supplied by Fujitsu Technology Solutions combining a Fujitsu PRIMEHPC (ARM partition) and Atos Bull Sequana (x86 partitions). Deucalion is hosted by MACC.

Sustained Performance:	**3.96 petaflops**
Peak Performance:	5.01 petaflops

Compute partitions:	ARM Partition: 1632 nodes, 3.8 PFLops; x86 Partition: 500 nodes, 1,62 PFLops ; Accelerated: 33 nodes, 1,72 PFLops
Central Processing Unit (CPU):	A64FX (ARM partition), AMD EPYC (x86 partitions)
Graphics Processing Unit (GPU):	NVidia Ampere
Storage capacity:	430 TB High-speed NVMe partition, 10.6 PB high-speed based Parallel File System partition.
Applications:	Traditional Computational, AI, Big Data

COMING SOON:

JUPITER

JUPITER will be the first EuroHPC exascale supercomputer. The system will be located at the Forschungszentrum Jülich campus in Germany and operated by the Jülich Supercomputing Centre. It will be based on Eviden's BullSequana XH3000 direct liquid cooled architecture.

Sustained Performance	1 Exaflop
Compute Partitions:	Booster Module (highly scalable GPU accelerated) Cluster Module (general-purpose, high memory bandwidth)
Central Processing Unit (CPU):	The Cluster Module will include the SiPearl Rhea1 processor (ARM, HBM), integrated into the BullSequana XH3000 platform.
Graphics Processing Unit (GPU):	The Booster Module will utilise NVIDIA technology, integrated into the BullSequana XH3000 platform.
Storage Capacity:	JUPITER will provide a 20-petabyte partition of ultra-fast flash storage. The spinning disk and backup infrastructure capacity will be procured separately and subject to change.
Applications:	JUPITER will be designed to tackle the most demanding simulations and compute-intensive AI applications in science and industry. Applications will include training large neural networks like language models in AI, simulations for developing functional materials, creating digital twins of the human heart or brain for medical purposes, validating

	quantum computers, and high-resolution simulations of climate that encompass the entire Earth system.

EuroHPC Quantum Computers

Below are the technical specifications of the to be deployed quantum computers which make EuroHPC's growing catalogue of quantum computers and quantum simulators.

Piast-Q

EuroQCS-Poland "Piast-Q" will be a digital, gate-based quantum computer, based on trapped-ions offering 20 data qubits. The new system will provide several unique features such as high-fidelity qubits, long coherence times, universal quantum gates and all-to-all connectivity support. The system will be integrated into a classical supercomputing environment enhancing hybrid quantum-classical computing approaches, novel hybrid quantum-classical use cases and benchmarks, including but not limited to quantum optimization, quantum chemistry, quantum material sciences and quantum machine learning.

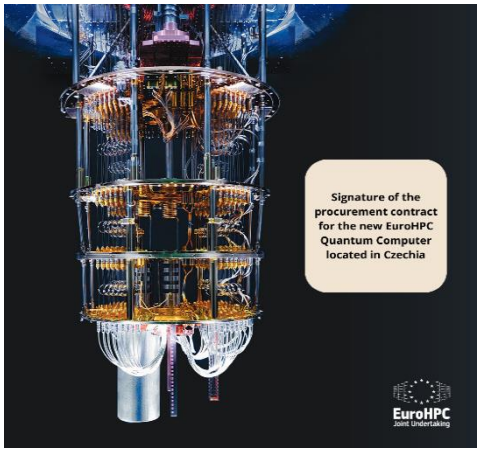
Qubit Modality	Trapped-ions
Topology	Linear chain
Number of data qubits	20
Entanglement capability / Connectivity	20 fully entangled qubits
1-qubit gate fidelity	99.9%
2-qubit gate fidelity	99.1%
Coherence time	10.000 Microseconds
1-qubit gate time	10.000 Nanoseconds
Relaxation time T1	100.000 Microseconds
Dephasing time T2	452.000 Microseconds
Programming environment(s)	Qiskit, Pennylane

Lucy

EuroQCS-France “Lucy” will be a photonic quantum computer offering 12 data qubits. The new system will be available to a wide range of European end-users, from the scientific community to industry and the public sector. The specific architecture of the Lucy universal quantum computer will enable the resolution of existing problems and the discovery of new use cases, it will allow the exploration of numerous hybrid HPC-Quantum Computing workloads for topics such as electromagnetic simulation, structural mechanics, engine combustion, material simulation, meteorology and earth observation.

Qubit Modality	Photonic
Topology	All-to-all connectivity
Number of data qubits	12
Entanglement capability / Connectivity	6 fully entangled qubits
1-qubit gate fidelity	99.6%
2-qubit gate fidelity	99.0%
Coherence time	Infinite
1-qubit gate time	n/a
Relaxation time T1	n/a
Dephasing time T2	n/a
Programming environment(s)	Perceval, Qiskit, myQLM, Qaptiva, Quandela Quantum Toolbox SDK

VLQ



The LUMI-Q consortium's quantum computer "VLQ" will be a digital, gate-based quantum computer, based on superconducting qubits in a star-shaped topology. Such a star-shaped topology minimises the number of swap operations between qubits thus enabling the execution of very complex quantum algorithms. The system will offer 24 physical qubits coupled to a central resonator. The VLQ system will enable European end-users to actively explore applications and algorithms tailored for the novel star topology, such as e.g. hardware-efficient quantum error correction (QEC) schemes.

Qubit Modality	Superconducting
Topology	Star with central resonator
Number of data qubits	24
Entanglement capability / Connectivity	up to 15 fully entangled qubits
1-qubit gate fidelity	99.9%
2-qubit gate fidelity	99.2% (qubit – resonator)
Coherence time	35 Microseconds
1-qubit gate time	40 Nanoseconds
Relaxation time T1	35 Microseconds
Dephasing time T2	25 Microseconds
Programming environment(s)	Qiskit, Cirq, CUDA Quantum, Qaptiva, Pennylane, IQM Pulse

Euro-Q-Exa

The Euro-Q-Exa system will be a digital quantum computer based on superconducting qubits and state-of-the-art entanglement capabilities. The deployment follows two phases: a 54 qubits system in the second half of 2025, and a 150-qubit system by the end of 2026. The Euro-Q-Exa quantum computer will be available to a wide range of European users, from the scientific community to industry and the public sector. The upcoming quantum computing infrastructure will support the development of a wide range of applications with industrial, scientific and societal relevance for Europe.

Qubit Modality	Superconducting
Topology	Crystal
Number of data qubits	54 / 150
Entanglement capability / Connectivity	20 / 25
1-qubit gate fidelity	99.9% / 99.94%
2-qubit gate fidelity	99.2% / 99.4%
Coherence time	60 Nanoseconds / 100 Nanoseconds
1-qubit gate time	20 Nanoseconds
Relaxation time T1	36.6 Microseconds / 76.6 Microseconds
Dephasing time T2	17.5 Microseconds / 37.5 Microseconds
Programming environment(s)	Qiskit, Cirq, CUDA Quantum, Qaptiva, Pennylane, IQM Pulse

EuroQCS-Spain:

MareNostrum Ona will be an "analogue quantum computer" in the form of a quantum annealer. The first-generation system will offer at least 10 physical qubits, with capabilities increasing in both coherence times and number of qubits by the third generation. The name "MareNostrum Ona" refers to the wave function that represents the quantum state. It is also a woman's name that evokes the sea, similar to MareNostrum, the name of the supercomputer it will be integrated into. This EuroQCS-Spain quantum computer will be the first quantum annealer made in Europe. Quantum annealers are well suited to solve optimisation problems.

Qubit Modality	Superconducting - Annealing
Topology	n/a
Number of data qubits	10 / 25
Entanglement capability / Connectivity	3 / 5
1-qubit gate fidelity	n/a
2-qubit gate fidelity	n/a
Coherence time	0.5 Nanoseconds / 1 Nanoseconds
1-qubit gate time	n/a
Relaxation time T1	10.000 Microseconds
Dephasing time T2	1 Microseconds / 5 Microseconds
Programming environment(s)	Pennylane, Qiskit

EuroQCS-Italy:

EuroQCS-Italy will be a quantum simulator based on neutral atoms. The first generation system will provide at least 140 data qubits operating in analogue mode and will be upgrade in 2027 to offer a neutral atom quantum simulator operable in a hybrid analogue/ digital mode offering additional degrees of freedom to enable the design of more sophisticated Hamiltonians, which will allow European end-users to implement a wider range of quantum algorithms and use-cases. Owned by the EuroHPC JU, the system will be hosted and operated by CINECA in Bologna, Italy and integrated into the EuroHPC pre-exascale system Leonardo.

Qubit Modality	Neutral atoms
Topology	2D array
Number of data qubits	140
Entanglement capability / Connectivity	n/a
1-qubit gate fidelity	n/a
2-qubit gate fidelity	n/a
Coherence time	6 Microseconds
1-qubit gate time	n/a
Relaxation time T1	100 Microseconds
Dephasing time T2	45
Programming environment(s)	Qadence, Qaptiva

Support to Users of EuroHPC Systems– Digital Europe Programme

EPICURE

To support the users of the EuroHPC JU systems, a call was launched to establish a dedicated higher TRL user support services across all the EuroHPC hosting entities. As a result of this call a successful application was selected with an aim to establish the High-Level Support Team (HLST) called EPICURE.

On 1st of February 2024 the grant agreement with the EPICURE project was signed. The project is a collaboration of 14 partners across Europe and aims at establishing and operating a distributed but

coordinated Europe-wide high-performance computing application support service, to encourage the best possible uptake of the systems by European scientists and researchers. During the first year of the EPICURE implementation 56 EuroHPC Access projects have been or are receiving support form Research Software experts of EPICURE. As a result of this work 9 codes have been successfully ported and/or optimised on EuroHPC supercomputers and 17 are in progress. 90 EuroHPC JU users have been supported during these activities. In addition, 6 ancillary software developed or improved in the context of the EPICURE support. Within the dissemination activities EPICURE web portal attracted over 2000 visitor and of these 400 followers on within the first year. EPICURE provided multiple training and hackathons as well as produced over 15 blog posts, newsletters and other dissemination material.

Calls for tenders and procurements of federation platform and hyperconnectivity – Connecting Europe Programme

In September 2023, procurement procedures commenced for the EuroHPC Federation Platform (EFP) with the deadline to participate in December 2023. The aim of EFP is to integrate supercomputing, Artificial Intelligence (AI), quantum computing, and data resources across Europe, enhancing user access to advanced technologies. Designed to address diverse user needs, this secure and federated platform will cater for European public and private users, including small and medium-sized enterprises (SMEs). The platform will provide users with a single access point to current EuroHPC supercomputing resources and in the future to EuroHPC AI Factories and quantum computers. This will ensure greater accessibility to and uptake of EuroHPC systems across Europe.

During spring 2024 evaluations of submitted requests were carried out, followed by the dialogue stage. In July 2024 the call for tender was published with a deadline in September 2024. The evaluations of the tender were carried out in Q4 2024. The selected consortium is led by CSC-IT Centre for Science and includes GÉANT, IT4Innovations National Supercomputing Center, University of Tartu, Ghent University, and NORDUnet. The contract was signed in December 2024 with the target to have the first version of Federation Platform operational in Q3 2025.

During 2024 a study was carried out to estimate European hyperconnectivity needs and to explore different scenarios for its procurement and implementation. The study was finalised and presented to the Governing Board in Q4 2024, and procurement was launched for Hyperconnectivity in December 2024.

Access to EuroHPC Supercomputers

Since 2021 EuroHPC JU has been providing access to the operational EuroHPC systems to users from industry, academia and public sector entities across Europe. The Joint Undertaking manages access time for the European Union's allocation on the supercomputers (35% to 50% of the total capacity)

In 2024, EuroHPC JU organised 5 Access Calls and awarded 706 projects awarded a total of **41.2 million** node hours on EuroHPC systems.

Calls for Access to EuroHPC Systems

In 2024, EuroHPC JU opened five Access Calls to applicants. These were categorised according to several parameters, such as the volume of resources offered, the complexity of the evaluation process applied, the type and maturity of applications targeted by each mode, and the periodicity of cut-off dates, as summarized in **Fig. 15.**

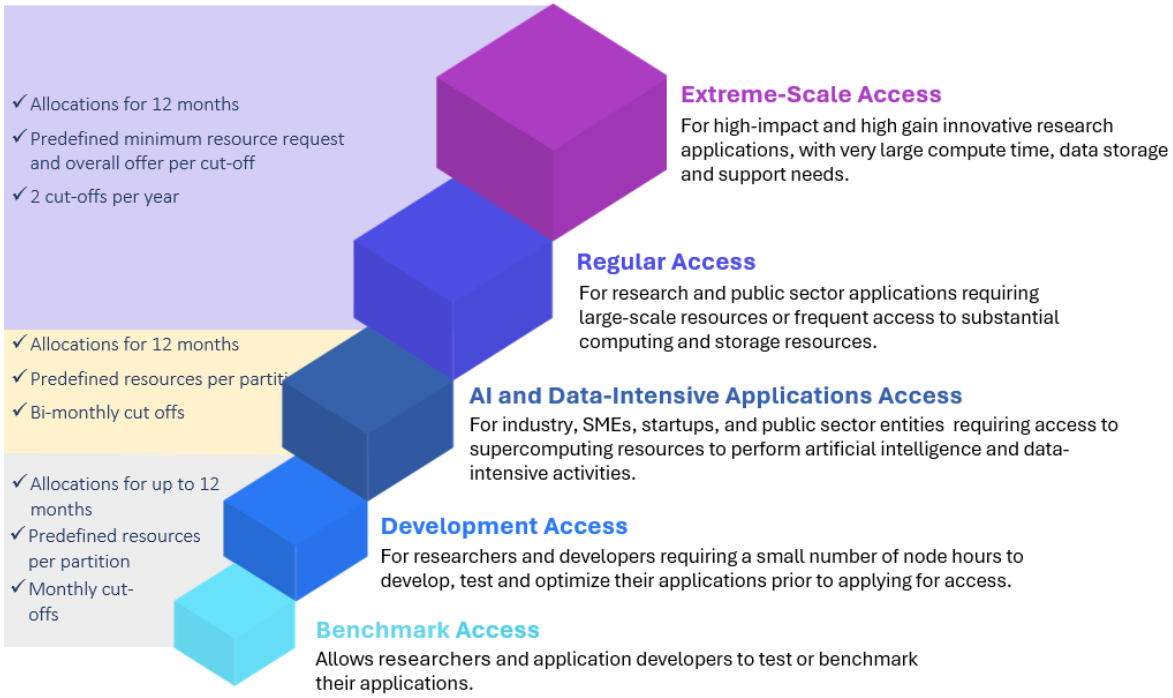


Figure 15: Overview of the Access calls offered in 2024 and their specifications

Benchmark and Development Access Calls

Benchmark and Development Access Calls use a small fraction (~10% in total) of the available resources and follow a simplified approach of proposal assessment to reduce the time to evaluation results and to start the allocation (process timeline is detailed in **Figure 16**).

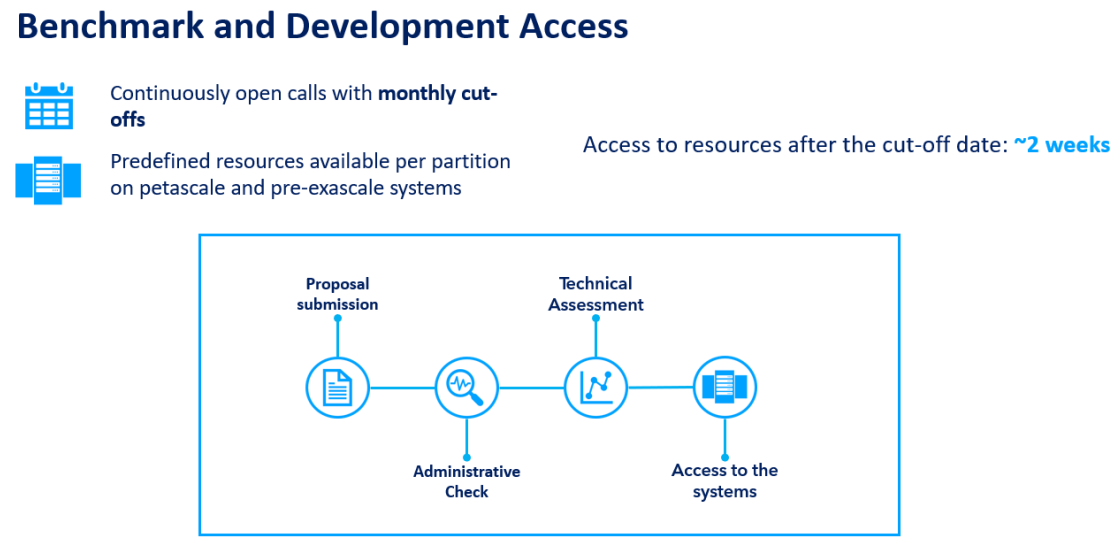


Figure 16: Benchmark and Development access calls in 2024 and proposals evaluation workflow.

Benchmark access mode allows users to collect performance data on the target system in order to document the technical feasibility of their applications before submitting to other access modes.

The Development Access Call is meant for projects focusing on code and algorithm development, development of workflows, HPC training, Natural Language Processing, Foundation Models and other methods for AI applications. This access mode mostly targets medium size executions that do not require large-scale production runs.

AI and Data-intensive Applications, Regular Access and Extreme-scale Access calls

AI and Data-intensive Applications, Regular and Extreme-scale Access Calls provided access, of up to 20%, 30% and 50% respectively of the available resources. These access modes serve users or communities that require medium to very-large-scale access to computing resources. A peer review evaluation is required to rank the applications based on the established evaluation criteria. Many external experts support the Access Resource Committee in the selection of proposals (see **Figures 16, 17 and 18**).

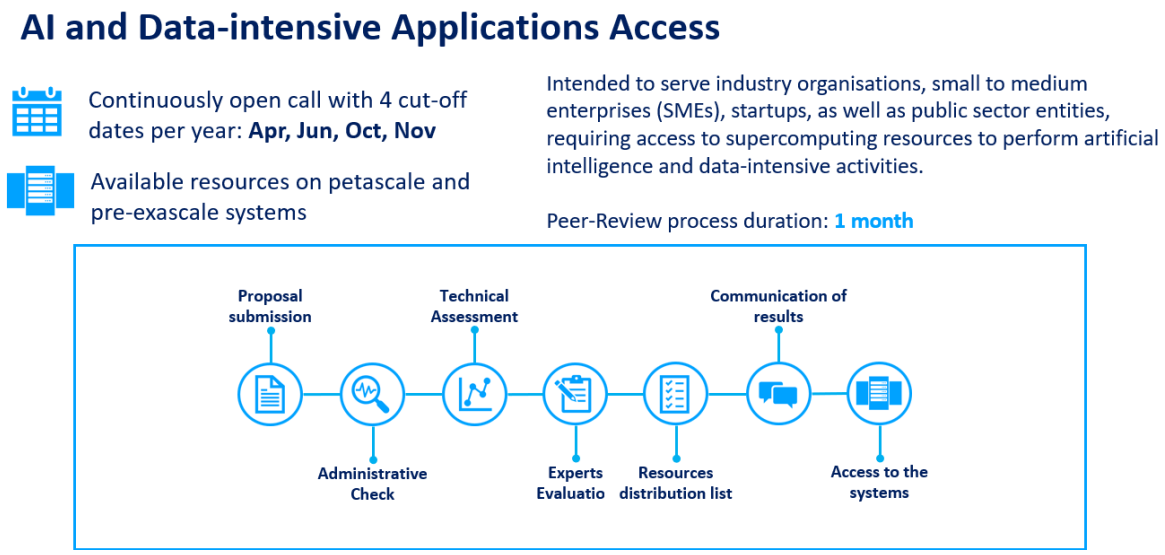


Figure 17: AI and Data-intensive Applications Access call cut-off dates in 2024 and proposal evaluation workflow

The AI and Data-intensive Applications Access Call was launched for the first time in 2024 to fill a gap identified in the existing access modes. This call was specifically designed to serve industry organisations, small to medium enterprises (SMEs), startups, as well as public sector entities, requiring access to supercomputing resources to perform Artificial Intelligence (AI) and data-intensive activities. The maximum time-to-resource-access target was set at 1 month after the cut-off date, 4 times faster than other EuroHPC JU Access Calls encompassing a peer review. Resources were awarded through a continuously open call for applications with four (4) cut-off dates as shown in **Figure 17**.

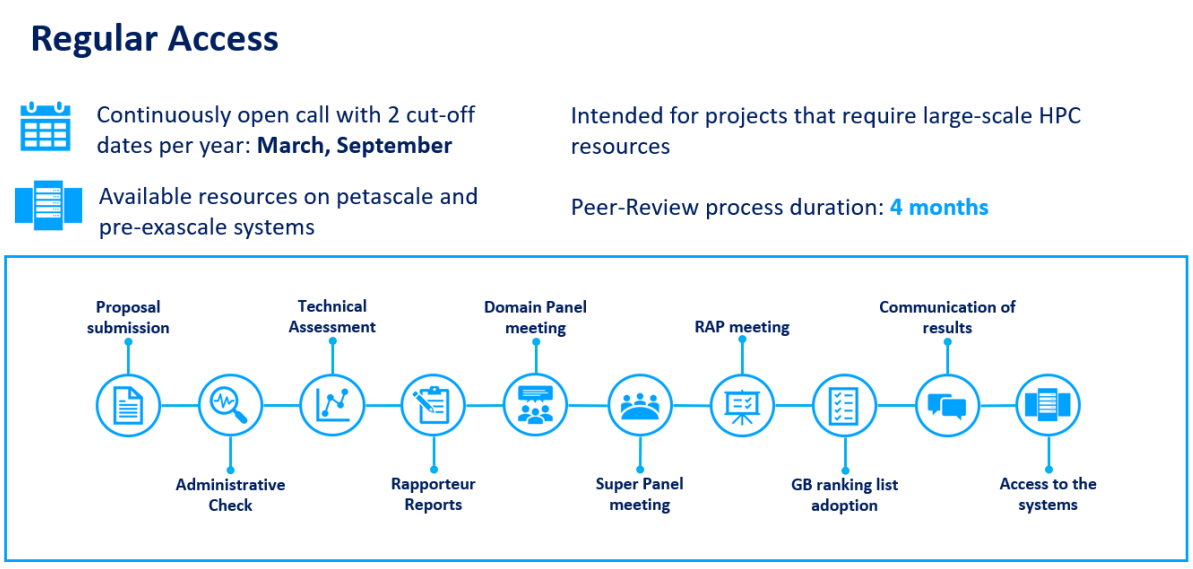


Figure 18: Regular Access call cut-off dates in 2024 and proposals evaluation workflow.

The Regular Access call is open to all fields of science, industry and the public sector, and invites applications enabling scientific innovation in the domains covered. The expected impact in the application's domain should justify the need for large allocations in terms of compute time, data

storage and support resources. Resources were awarded through a continuously open call for applications with two cut-off dates (**Figure 18**).

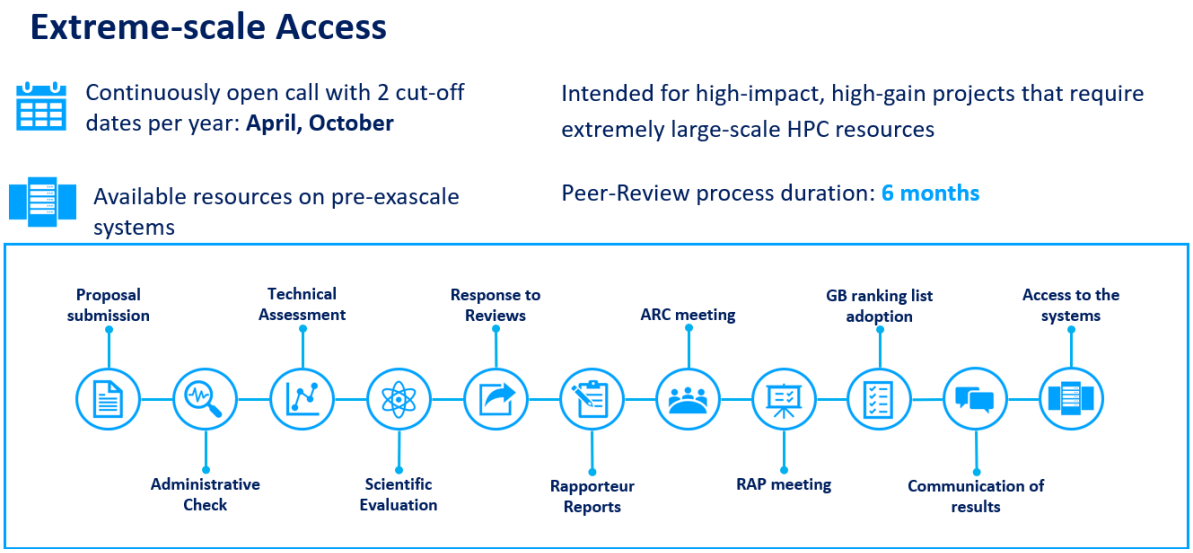
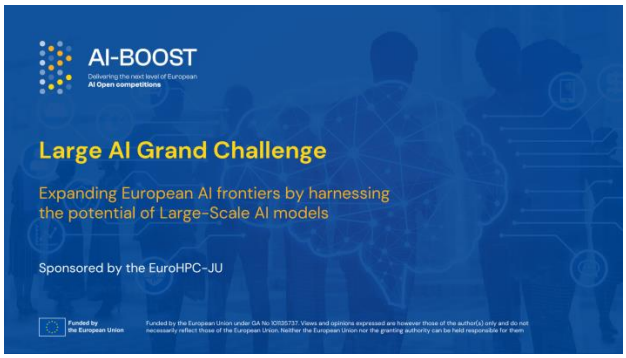


Figure 19: Extreme-scale Access call cut-off dates in 2024 and proposals evaluation workflow.

The Extreme scale Access call is intended for applications with high-impact, high-gain innovative research, open to all fields of science, industry and public sector justifying the need for and the capacity to use extremely large allocations in terms of compute time, data storage and support resources. Resources were awarded through a continuously open call for applications with two cut-off dates (**Figure 19**).

Strategic Access

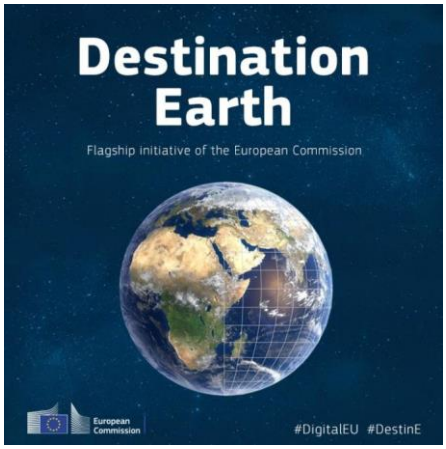
In addition to the above modes, allocations can be granted following exceptional procedures as foreseen by Strategic Access. In 2024, a maximum of 10% of EuroHPC supercomputers' total access time was allocated to two different initiatives, Destination Earth and AI Boost Grand Challenge.



AI-BOOST

The Large AI Grand Challenge was launched to foster European innovation and excellence in large-scale AI models. This initiative was a collaboration led by the EU-funded project AI-BOOST, together

with the European Commission and the EuroHPC Joint Undertaking. 8,800,000 GPU hours in pre-exascale machines (Leonardo Booster, MareNostrum 5 ACC and LUMI-G) were granted to 5 SMEs developing Large Language Models (LLMs). The selected projects were announced in June 2024 by the European Commission and EuroHPC JU.



Destination Earth

The Destination Earth (DestinE) initiative, launched by the European Union, is a strategic project under the European Green Deal. Managed by the European Centre for Medium-Range Weather Forecasts (ECMWF), DestinE seeks to create high-resolution digital twins (DTs) of Earth to simulate and analyse complex environmental phenomena. This capability supports climate adaptation, informs policy, and helps mitigate climate change impacts at multiple scales, from global to local. DestinE's goals align closely with the European strategy for data and emerging service ecosystems, offering enhanced environmental data and insights for government, industry, and research applications. First results of the Destination Earth project were announced by ex-Executive Vice President Vestager in Kajaani in June 2024.

Table 10 below present the total node hours per system that they would be able to provide for special access for 2024.

Supercomputer (partitions)	Percentage of the EuroHPC JU compute time	GPU or CORE hours	NODE hours	Additional budget allocated to DestinE (GPU hours)
LUMI-G	5%	3,514,559(GPU)	439319	390,505
LUMI-C	10%	76,300,000 (CORE hr)	596,094	
Leonardo DCGP	10%	67,376,826 (CORE)	416092	
Leonardo BOOSTER	10% until June 2024 and 5% from July until end of the year	2,729,325	1,023,496	
MN5 GPP (CPU partition)	10%	1480448 (CORE)		
MN5 ACC (GPU partition)	10%		258,755	

MN5 HBM (High Bandwidth Memory nodes)	10%		16,634	
MeluXina CPU (petascale)	10%	23,335,926 (CORE)	182,312	
MeluXina GPU (petascale)	10%	245952(GPU)	61,488	

Table 10: Strategic access per system in 2024

Awarded Access Hours to EuroHPC supercomputers

In 2024, 706 computational projects and 41.2 million node hours access time were awarded through the JU Access calls as summarised in **Table 11 and Figure 20**. These were fundamental to providing European researchers and SMEs with access to the computing resources of the EuroHPC JU for large-scale European projects that have high-level needs in terms of compute time, data storage, and support resources.

Access Mode	No. of cut-offs	CPU time awarded (node hours)	GPU time awarded (node hours)	Total time awarded (node hours)	No. Of proposals submitted	No. Of proposals awarded	Proposal validation rate
Benchmark Access	12	352,500	400,100	752,600	242	203	84%
Development Access	12	1,233,000	1,325,100	2,558,100	419	341	81%
AI and Data-intensive Applications Access	4	-	2,205,600	2,205,600	84	54	64%
Regular Access	2	4,802,132	2,780,841	7,582,973	84	66	79%
Extreme-scale Access	2	8,667,338	11,688,003	20,355,341	63	42	67%
Strategic Access	-	4,240,224	3,560,115	7,800,339	-	-	-
Total	32	19,295,194	21,959,759	41,254,953	892	706	79%

Table 11: Summary of the access calls in 2024: access modes, number of cut-off dates, awarded resources in node hours, number of proposals submitted, awarded and their approval rate.

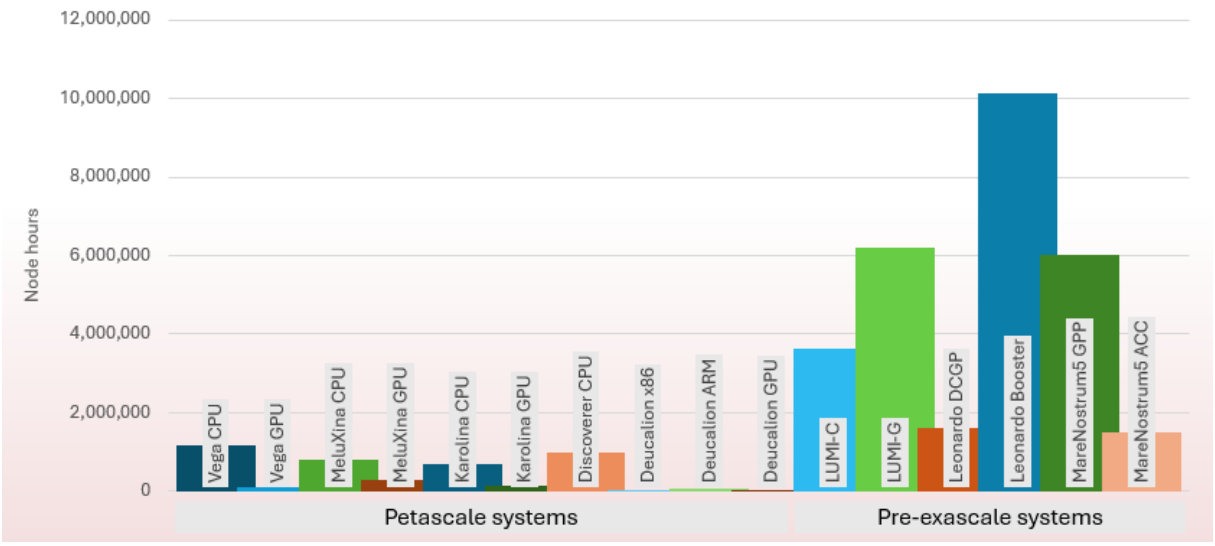


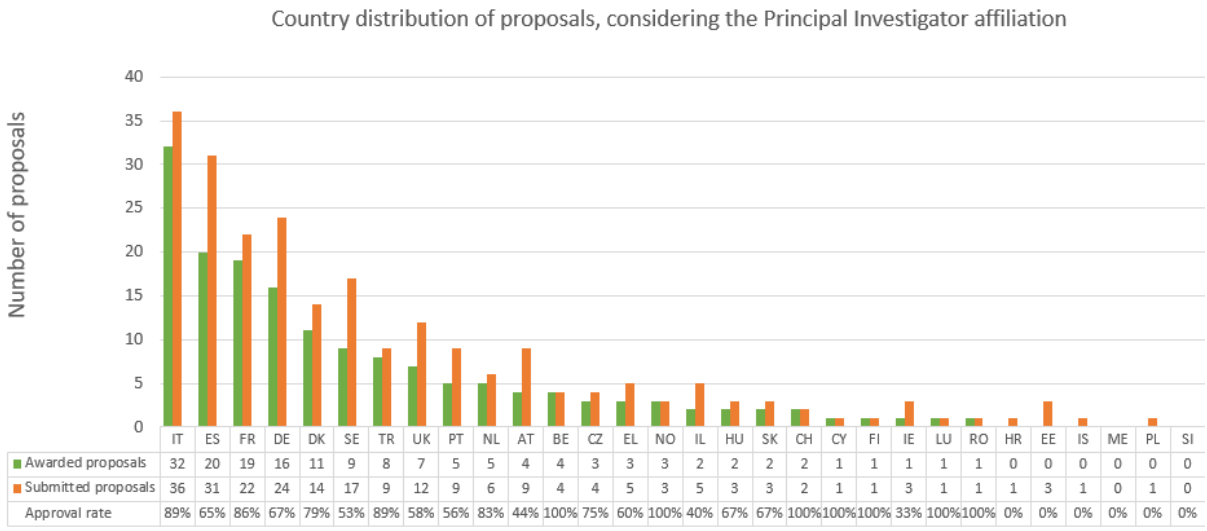
Figure 20: Awarded systems in 2024.

Leonardo Booster, MareNostrum 5 GPP and LUMI-G were the two **most awarded partitions** in terms of total node hours (**Figure. 20**).

The **top 10 awarded countries** were, in descending order: Italy, Spain, France, Germany, Denmark, Sweden, Türkiye, United Kingdom, Portugal and The Netherlands (**Figure 21**). Efforts should be made by the JU to promote the usage of the EuroHPC supercomputers in all EU member states, particularly in those where a low number of proposals have been submitted and/or awarded in recent years, namely, Croatia, Cyprus, Estonia, Iceland, Montenegro, Poland, Slovenia and Switzerland.

All **research domains** were given access time in 2024 (**Figure 22**). Most projects came from Engineering, Mathematics and Computer Sciences (44%), Chemical Sciences and Materials, Solid State Physics (19%), Computational Physics: Universe Sciences, Fundamental Constituents of Matter (19%) and Biochemistry, Bioinformatics, Life Sciences, Physiology and Medicine (11%). Less represented domains were Earth System Sciences & Environmental Studies (6%) and Socio-Economic Sciences and Humanities: Economics, Finance and Management, Linguistics, Cognition and Culture (1%).

Most **Principal Investigators** are male (88%), and only a small fraction are women (11%) (**Figure 23**).



	IT	ES	FR	DE	DK	SE	TR	UK	PT	NL	AT	BE	CZ	EL	NO	IL	HU	SK	CH	CY	FI	IE	LU	RO	HR	EE	IS	ME	PL	SI
Awarded proposals	32	20	19	16	11	9	8	7	5	5	4	4	3	3	3	2	2	2	2	1	1	1	1	1	0	0	0	0	0	0
Submitted proposals	36	31	22	24	14	17	9	12	9	6	9	4	4	5	3	5	3	3	2	1	1	3	1	1	1	3	1	0	1	0
Approval rate	89%	65%	86%	67%	79%	53%	89%	58%	56%	83%	44%	100%	75%	60%	100%	40%	67%	67%	100%	100%	100%	33%	100%	100%	0%	0%	0%	0%	0%	0%

Figure 21: Country distribution of proposals, considering the Principal Investigator's country affiliation under the AI and data-intensive Applications, Regular and Extreme-scale Access calls in 2024.

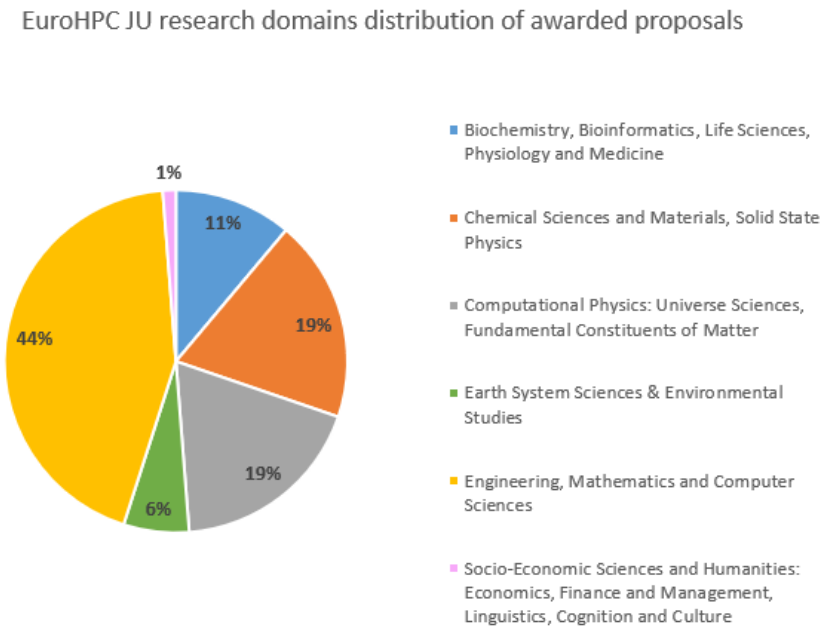


Figure 22: Research domains distribution in awarded projects under the AI and data-intensive Applications, Regular and Extreme-scale Access calls in 2024.

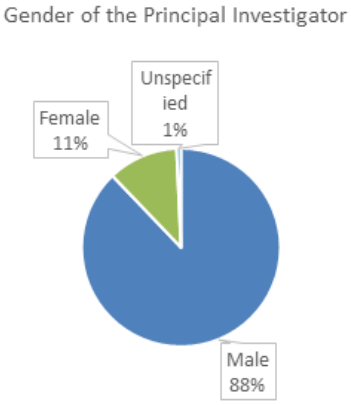


Figure 23: Gender representation of principal investigators.

Access Mode	Partition	Node hours awarded in 2024
Benchmark Access	Vega CPU	27,000
	Vega GPU	4,400
	MeluXina CPU	52,000
	MeluXina GPU	10,200
	MeluXina FPGA	10,000
	Karolina CPU	39,000
	Karolina GPU	14,800
	Discoverer CPU	30,000
	Deucalion x86	10,000
	Deucalion ARM	8,000
	Deucalion GPU	1,200
	LUMI-C	98,000
	LUMI-G	95,500
	Leonardo DCGP	26,000
	Leonardo Booster	196,000
	MareNostrum5 GPP	52,500
	MareNostrum5 ACC	78,000
Development Access	Vega CPU	100,000
	Vega GPU	32,000
	MeluXina CPU	154,000
	MeluXina GPU	80,800
	MeluXina FPGA	0
	Karolina CPU	163,000
	Karolina GPU	74,200
	Discoverer CPU	97,500
	Deucalion x86	33,000

	Deucalion ARM	48,000
	Deucalion GPU	7,600
	LUMI-C	382,000
	LUMI-G	436,500
	Leonardo DCGP	116,000
	Leonardo Booster	505,000
	MareNostrum5 GPP	139,500
	MareNostrum5 ACC	189,000
AI and Data-intensive Applications Access	Vega GPU	7,100
	MeluXina GPU	100,000
	Karolina GPU	7,500
	LUMI-G	175,000
	Leonardo Booster	1,500,000
	MareNostrum5 ACC	416,000
Regular Access	Vega CPU	1,061,181
	Vega GPU	74,000
	MeluXina CPU	598,303
	MeluXina GPU	105,000
	Karolina CPU	486,917
	Karolina GPU	59,000
	Discoverer CPU	864,351
	LUMI-C	955,067
	LUMI-G	563,680
	Leonardo DCGP	488,812
	Leonardo Booster	1,769,473
	MareNostrum5 GPP	347,501
	MareNostrum5 ACC	209,688
Extreme Scale Access	LUMI-C	2,212,308
	LUMI-G	4,936,094
	Leonardo DCGP	994,400
	Leonardo Booster	6,151,909
	MareNostrum5 GPP	5,460,630
	MareNostrum5 ACC	600,000
Total	**All partitions**	**33,454,614**

Table 12: Awarded resources under the 5 Access calls in 2024.

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AI and Data-intensive Applications Access call 2024

For the **AI and Data-intensive Applications Access call** the key highlights are as follows (**Table 13** and **Figures 24-26**):

- 54 out of 84 proposals were awarded access time (64% approval rate) in the EuroHPC JU GPU partitions.

- More than 2 million node hours were awarded to projects that covered a wide range of AI technologies applied to several science domains.
- The preferred AI technologies were Deep Learning, Generative Language Modelling, Vision, Natural Language Processing and Machine Learning.
- Access was given to 22 industry organizations (12 SMEs, 8 startups and 2 large enterprises), 21 universities, 7 research institutions and 4 awarded for public administration or public institutions.
- The top awarded countries were Spain, France, Italy and Türkiye.

Cut-offs	Vega GPU	Meluxina GPU	Karolina GPU	LUMI-G	Leonardo Booster	MN5 ACC	TOTAL
Apr 2024	0	0	7,500	35,000	400,000	128,000	**570,500**
Jun 2024	0	0	0	35,000	300,000	128,000	**463,000**
Oct 2024	7,100	0	0	35,000	200,000	32,000	**274,100**
Nov 2024	0	100,000	0	70,000	600,000	128,000	**898,000**
TOTAL	**7,100**	**100,000**	**7,500**	**175,000**	**1,500,000**	**416,000**	**2,205,600**

Table 13: Awarded resources under the AI and Data-intensive Applications Access call in 2024.

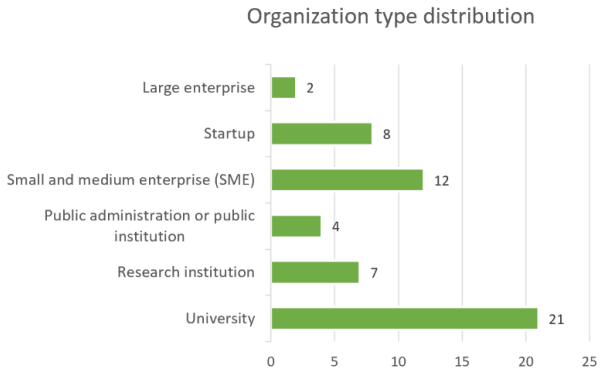


Figure 24: Distribution of access by organisation type - AI and Data-intensive applications

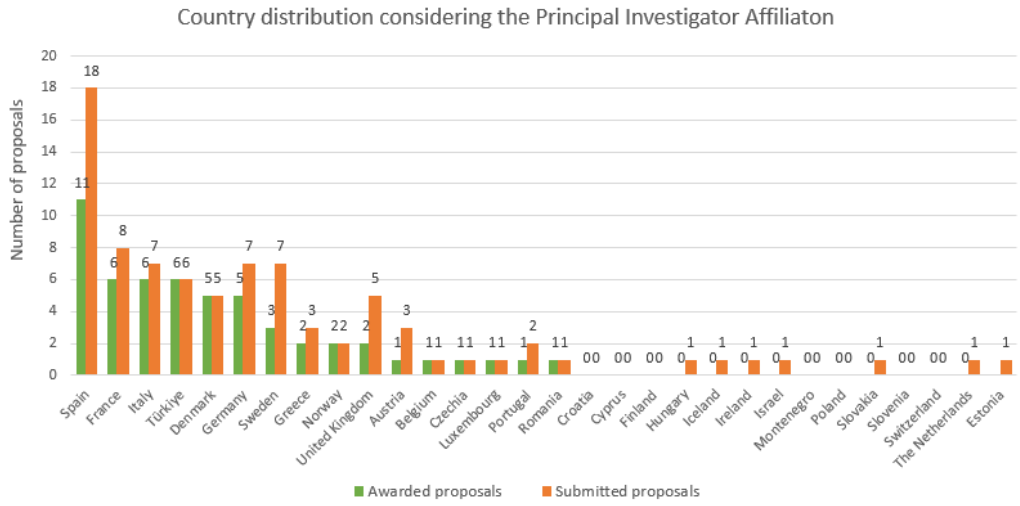


Figure 25: Distribution by national affiliation of principal investigator - AI and Data-intensive Applications

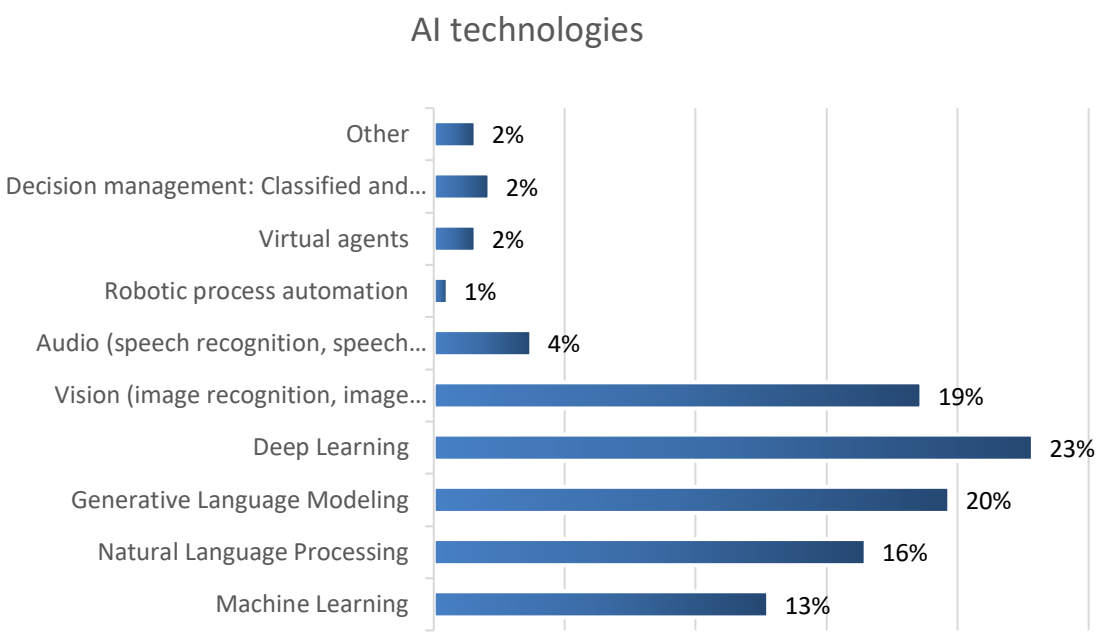


Figure 26: Preferred AI Technologies

Regular Access call 2024

For the **Regular Access call** the key highlights are as follows (**Table 14** and **Figures 27-28**):

- 66 out of 84 proposals were awarded access time (79% approval rate) on the EuroHPC JU systems.
- More than 7.5 million node hours were awarded; 2.7 million node hours to GPU and 4.8 million node hours to CPU partitions.
- More than 80% of the access time was awarded to the following three science domains: Engineering, Mathematics and Computational Sciences (29%), Computational Physics: Universe Sciences, Fundamental Constituents of the Matter (29%) and Chemical Sciences and Materials, Solid State Physics (24%).
- The top awarded countries were Italy, Spain, France and Sweden.

	Vega		Meluxina		Karolina		Discoverer	Leonardo		LUMI		Marenostrum5		TOTAL
Cut-offs	CPU	GPU	CPU	GPU	CPU	GPU	CPU	DCGP	Booster	LUMI-C	LUMI-G	GPP	ACC	
Mar 2024	619,804	0	358,303	105,000	316,075	0	194,531	252,986	386,000	337,800	630,000	228,000	90,000	**3,518,499**

Sep 2024	441,377	74,000	240,000	0	170,842	59,000	669,820	702,081	177,680	151,012	1,139,473	119,501	119,688	**4,064,474**
TOTAL per partition	**1,061,181**	**74,000**	**598,303**	**105,000**	**486,917**	**59,000**	**864,351**	**955,067**	**563,680**	**488,812**	**1,769,473**	**347,501**	**209,688**	**7,582,973**
TOTAL per system	**1,135,181**		**703,303**		**545,917**		**864,351**	**1,518,747**		**2,258,285**		**557,189**		**7,582,973**

Table 14: Awarded resources under the Regular Access call in 2024

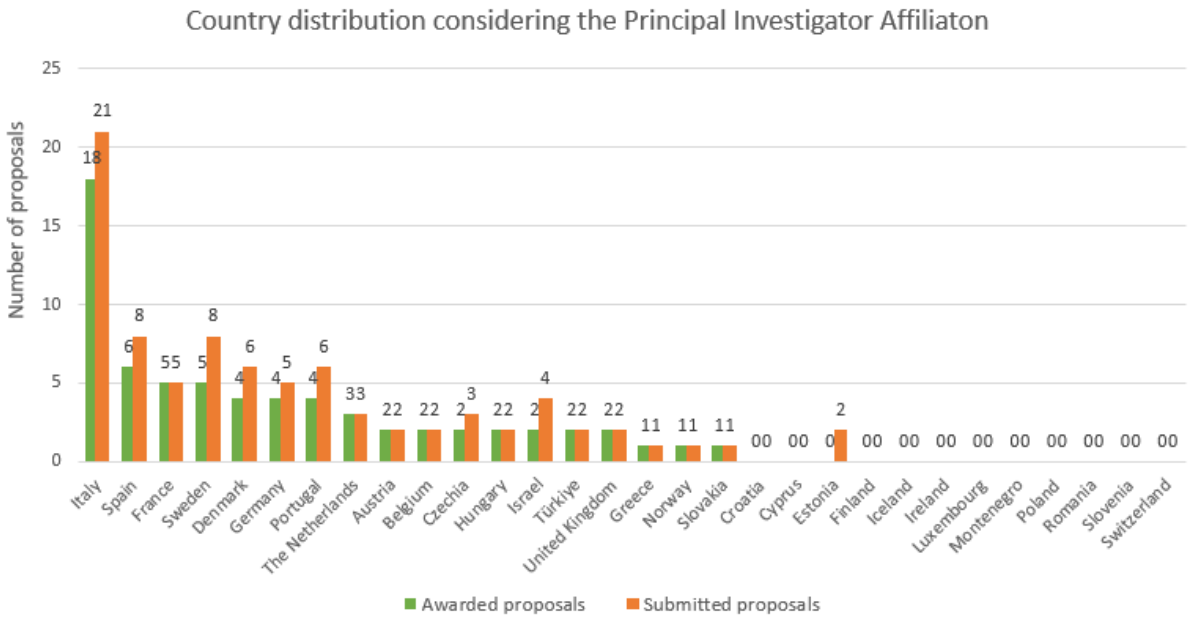


Figure 27: Distribution by national affiliation of principal investigator - Regular Access Call

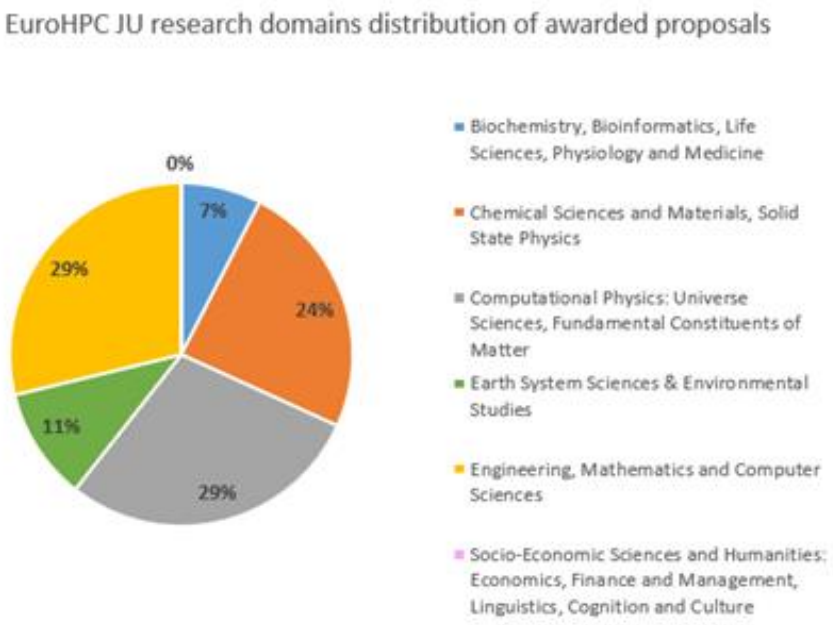


Figure 28: Research Domains - Regular Access 2024

Extreme Access Call 2024

For the **Extreme scale Access Call** the key highlights of the April cut-off are as follows (**Table 15** and **Figures 29-30**):

- 42 out of 63 proposals were awarded access time (67% approval rate) on the EuroHPC JU systems.
- More than 20.3 million node hours were awarded: 11.7 million node hours to GPU and 8.7 million node hours to CPU partitions.
- Almost 90% of the access time was awarded to the following three science domains: Engineering, Mathematics and Computational Sciences (33%), Chemical Sciences and Materials, Solid State Physics (29%), and Computational Physics (26%).
- The top awarded countries were France, Italy and Germany.

Cut-offs	Leonardo DCGP	Leonardo Booster	LUMI-C	LUMI-G	MN5 GPP	MN5 ACC	TOTAL
Apr 2024	320,000	3,070,491	702,308	2,196,594	3,860,000	600,000	**10,749,393**
Oct 2024	674,400	3,081,418	1,510,000	2,739,500	1,600,630	0	**9,605,948**
TOTAL per partition	994,400	6,151,909	2,212,308	4,936,094	5,460,630	600,000	**20,355,341**
TOTAL per system	**7,146,309**		**7,148,402**		**6,060,630**		**20,355,341**

Table 15: Awarded resources under the Extreme scale Access call in 2024

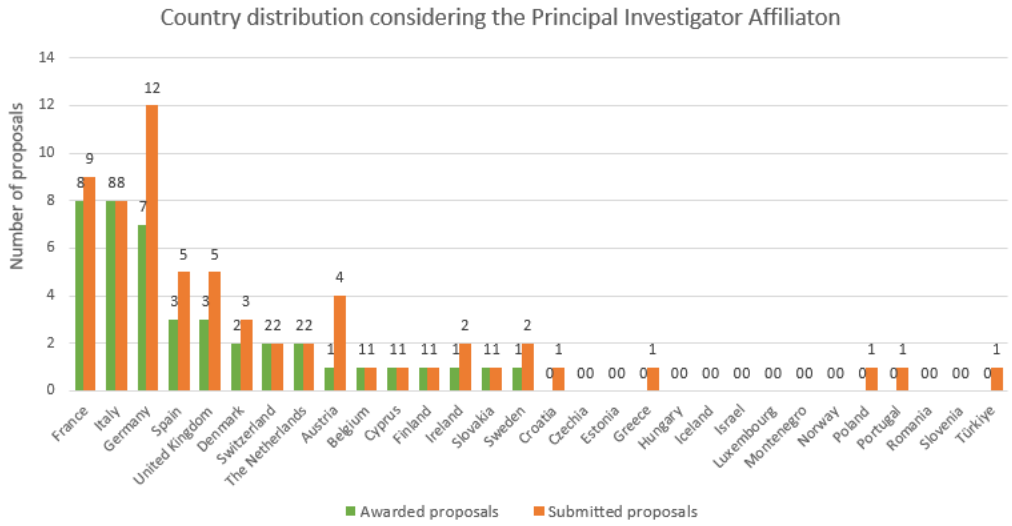


Figure 29: Distribution by national affiliation of principal investigator - Extreme Access Call

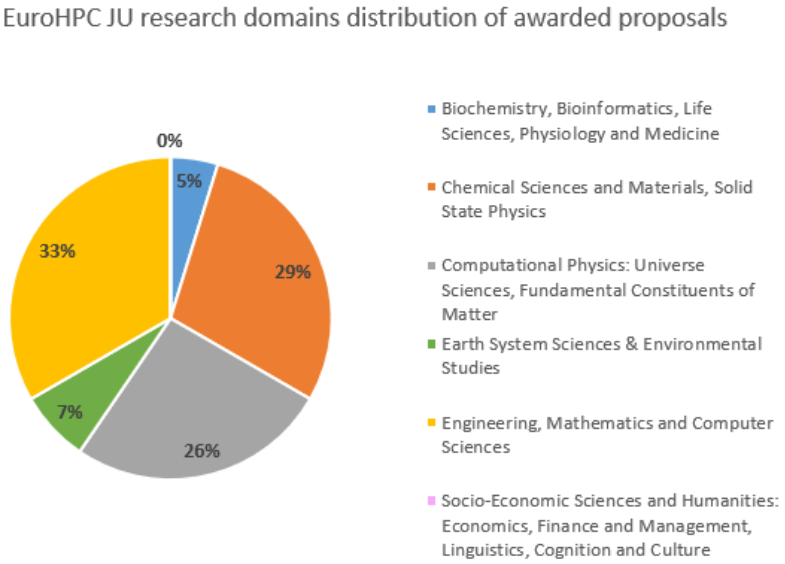


Figure 30: Research Domains - Extreme Access 2024

User Study

In 2022, the JU launched a call for expression of interest to procure a data driven analysis of HPC services uptake by academic, SME, industrial, and commercial end-users in European Participating States who are members of EuroHPC JU. EuroHPC JU commissioned this study to better understand the specific technical, legal, financial and commercial considerations that shape user requirements, and how these requirements influence the business decisions of HPC users.

EuroHPC received a final draft of this study in December 2024 and will publish the results in early 2025.

User Forum Coordination Group

As EuroHPC user communities and ecosystems grow, and remit of the JU expands to include AI research and infrastructure, it is necessary for EuroHPC to develop and maintain channels of communication with user groups in order to optimise our resources. Users, as a primary target group for our operations, can provide essential feedback and experiential perspectives on our computing systems and services. In 2024, EuroHPC supported the development of a User Forum to facilitate independent feedback from users on a regular basis to the JU. With support from EuroHPC JU's Advisory Groups (RIAG and INFRAG) which recommended the need for a User Forum, the Governing Board endorsed the need for a User Group Coordination Group to be set up with a view to formalising the remit of a future User Forum. A committee was selected based on volunteers from the user community which met for the first time at the User Day Event in Amsterdam in October 2024. While EuroHPC JU supports this network it is envisioned that the User Forum should be fully independent to permit open and constructive discussion. The User Forum will take part in EuroHPC events including the EuroHPC annual Summit and annual User Day dissemination event.

Peer review Platform procurement

A Call for tender for the EuroHPC Peer-Review Platform was published in 2024. The objective of this call for tender is to procure, develop and operate a platform in-house for managing the peer-review process of the EuroHPC JU Access calls. This new IT Platform would allow EuroHPC to fully onboard all the Peer Review activities in-house. Up to now, this service was provided by PRACE who very generously ensured that EuroHPC could provide a seamless service to EuroHPC users since 2020. The evaluation was conducted in 2024 and the award decision will be undertaken in 2025.

Horizon KPIs and EuroHPC JU Internal KPIs

In its publication, *European Partnerships in Horizon Europe 2024,* the European Commission reported on EuroHPC JU's progress in meeting key performance indicators (KPIs) in its role to deliver on,

- technological sovereignty
- industry growth and strategic autonomy
- European excellence in HPC and scientific research
- European innovation and strategic autonomy in technologies and competences

through the delivery of world-class supercomputing infrastructure.[10] **Table 16** maps EuroHPC JU's own targets from 2023 to 2027 indicating that they are on track to deliver on all processes and activities.

Given that the nature of the remit of EuroHPC JU is to procure HPC infrastructure and to facilitate access to these resources, our KPIs reflect our ability to meet targets on procurement, partnerships,

[10] Performance of European Partnerships: Biennial monitoring report 2024 on partnerships in Horizon Europe. Available: Performance of European partnerships - Publications Office of the EU

strategic development and research. Impacts are also measured through collaborations with national, international and industrial partners, expanding HPC ecosystems, and the support of those systems to sustain and accelerate HPC and AI research and innovation enabled research communities across Europe. To this end EuroHPC JU lays out below available data from its projects to date as they relate to our mission to develop, deploy, extend and maintain, in the EU, a world-leading federated, secure and hyperconnected supercomputing, quantum computing and AI, service and data infrastructure ecosystem.

AI procurement is not shown in the table below as this was added to the JU in July 2024.

KPI NAME	UNIT OF MEASUREMENT	BASELINE	TARGET 2023	TARGET 2025	TARGET 2027	AMBITION >2027	STATUS
RESOURCES (INPUT), PROCESSES AND ACTIVITIES							
Number of operational supercomputers	#	0	8	14	15	18	On track
Number of operational Quantum computers	#	0	0	8	10	10	On track
Number of projects accessing the EuroHPC JU supercomputers	#	0	150-200	300-400	400-500	>500	On track
Number of newcomers per year/reporting period	#	0	10	12	14	>15	On track
Number of R&I calls launched per year/ reporting period	#	0	6	6	6	6	On track
Number of countries per R&I call	#	0	10	10	10	10	On track
OUTCOMES							
Accessibility of EuroHPC JU supercomputers	%	0	95	95	95	95	TBD
IMPACTS							
Energy efficiency of the supercomputers	%	0	10	10	10	20	On track
Projects from countries without own pre-exascale/exascale supercomputer infrastructure	#	50	100	150	200	250	On track

Table 16: EuroHPC KPI Targets 2023-2027

The following two sections provide key data and statistics on the progress or KPIs of EuroHPC JU relating to Horizon 2020 and Horizon Europe Funding from 2019 to 2024.[11] Please note that overlaps

[11] Figures provided for these sections is supplied by the EU Funding and Tenders Portal. Available at: EU Funding & Tenders Portal

in funding cycles exist for all of these projects and programmes, data provided is at time of publication and subject to change.

Horizon 2020

Key Performance Figures

Participation	Signed Grants	Net EU Contribution	Unique Participation	Total Cost
478	28	149.3M	253	287.3M

[12]

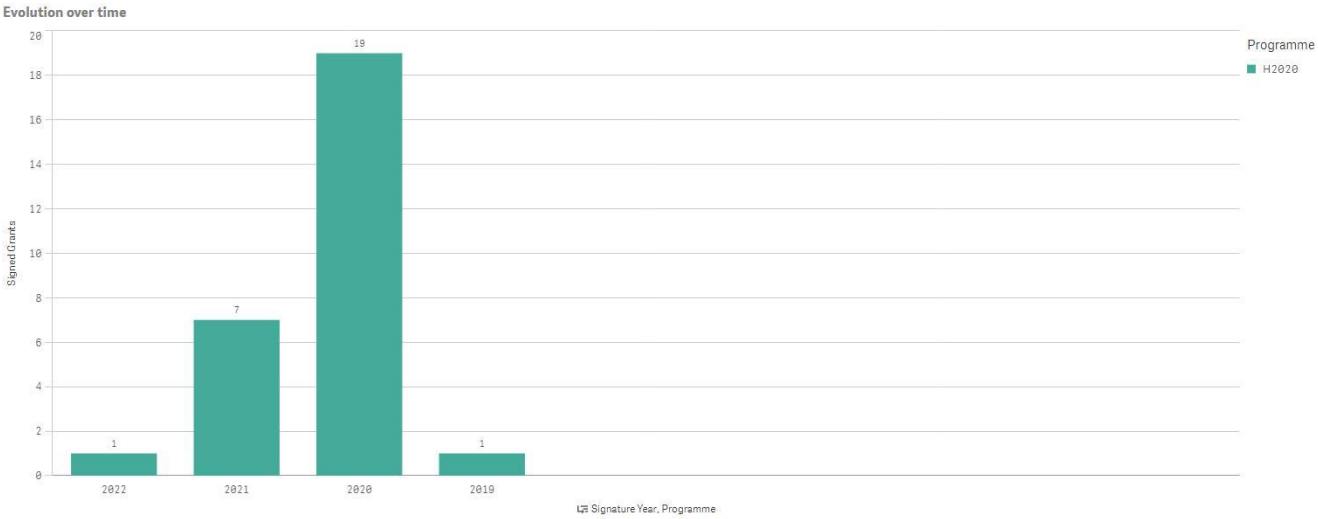


Figure 31: Evolution of H2020 grants from 2019 to 2022

[12] These figures are compiled from the Horizon Dashboard do not include funding from the European Processor Initiative.

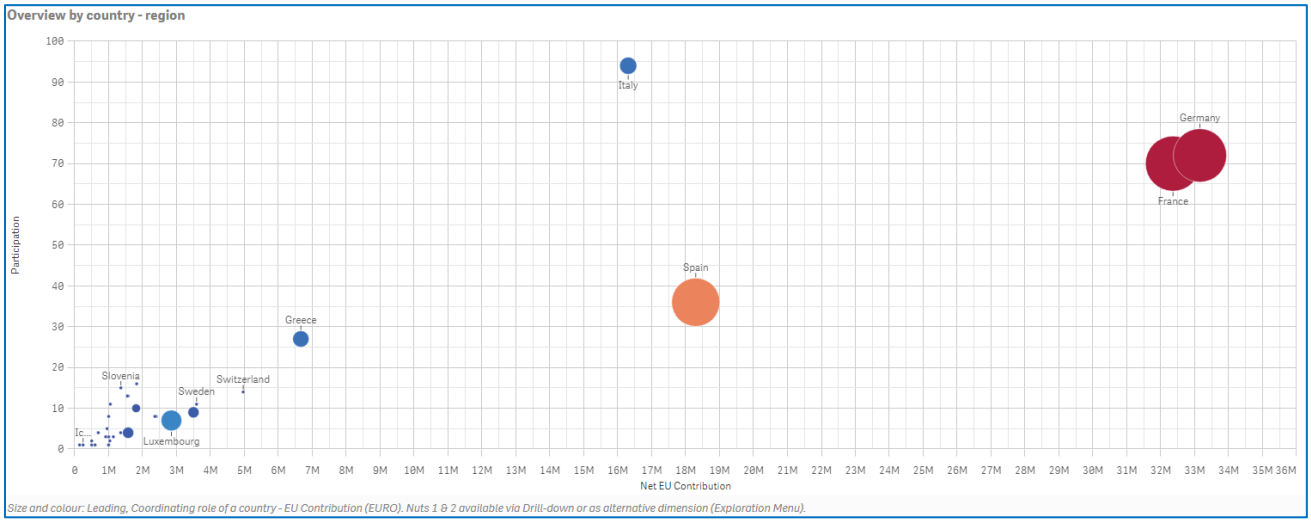


Figure 32: Overview of participation by country

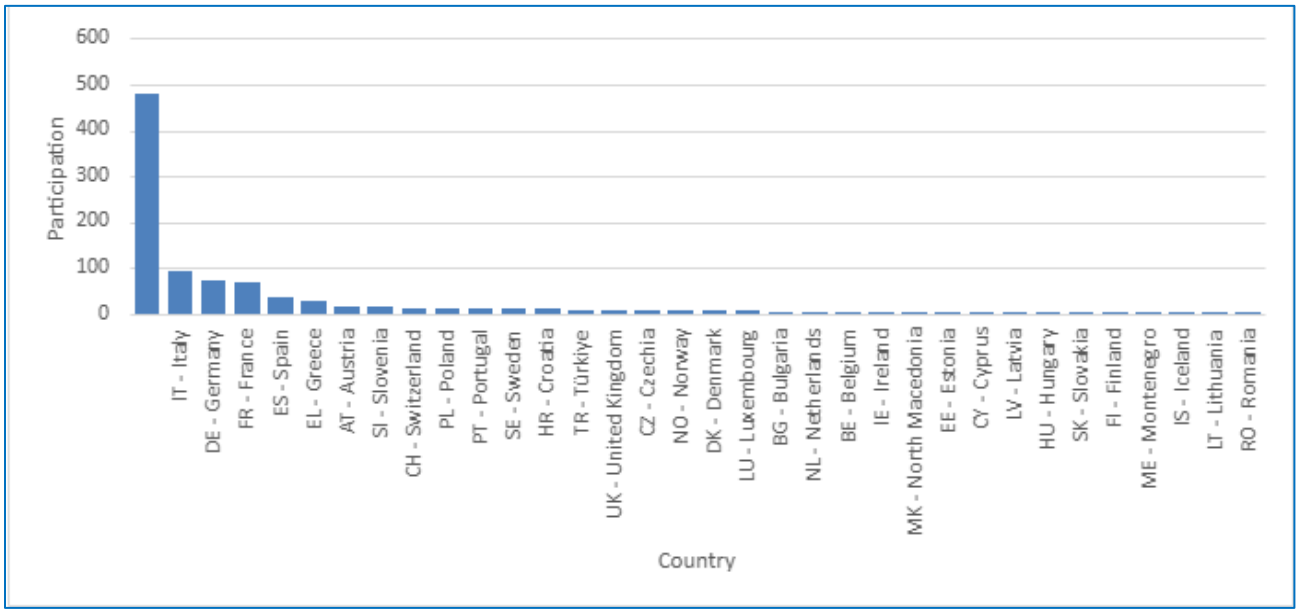


Figure 33: Participation by Country Horizon 2020

Name	Sum of Net EU Contribution
BULL SAS	€ 15,784,730.27
BARCELONA SUPERCOMPUTING CENTER CENTRO NACIONAL DE SUPERCOMPUTACION	€ 13,214,717.14
UNIVERSITY OF STUTTGART	€ 10,445,381.24
FORSCHUNGSZENTRUM JULICH GMBH	€ 7,014,903.58
EIDGENOESSISCHE TECHNISCHE HOCHSCHULE ZUERICH	€ 3,469,096.88
E 4 COMPUTER ENGINEERING SPA	€ 3,308,406.46

IDRYMA TECHNOLOGIAS KAI EREVNAS	€ 3,057,081.88
COMMISSARIAT A L'ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES	€ 2,838,546.26
FRAUNHOFER GESELLSCHAFT ZUR FORDERUNG DER ANGEWANDTEN FORSCHUNG EV	€ 2,683,676.89

Table 17: Top 10 Participating Organisations Horizon 2020 – 2019 to 2022

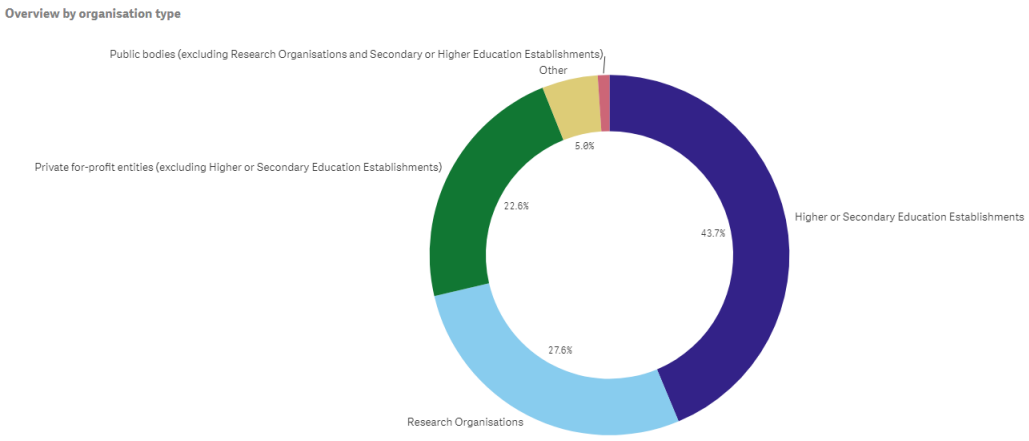


Figure 34: Horizon 2020 engagement with organisations

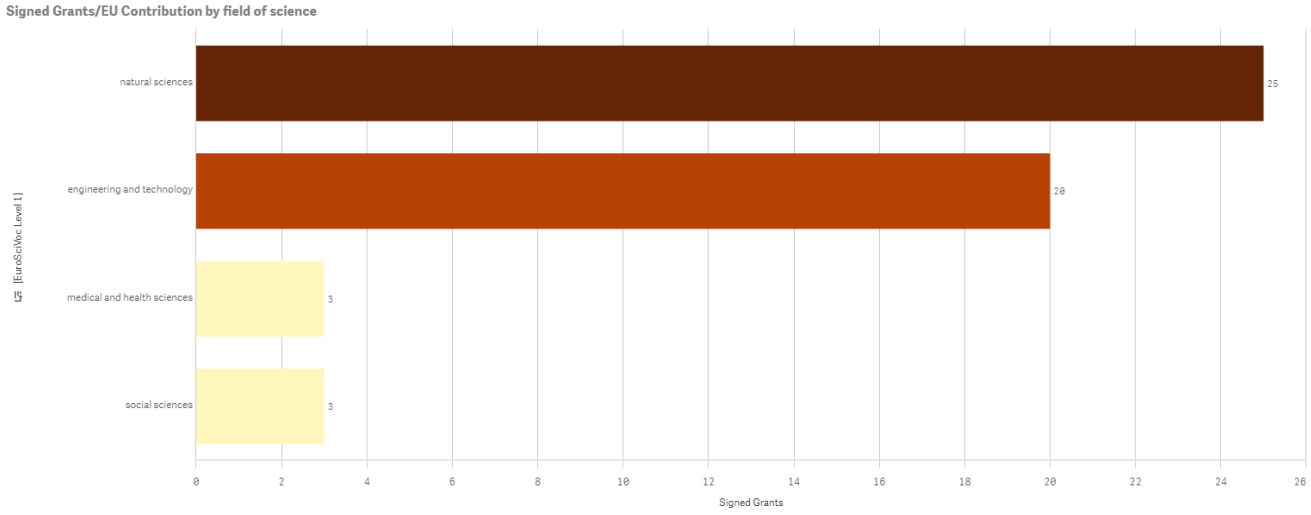


Figure 35: H2020 grants by scientific field

Horizon Europe

Key Performance figures

Participation	Unique Participation	Signed Grants	Net EU Contribution	Total Cost
206	116	17	82.29M	171.9M

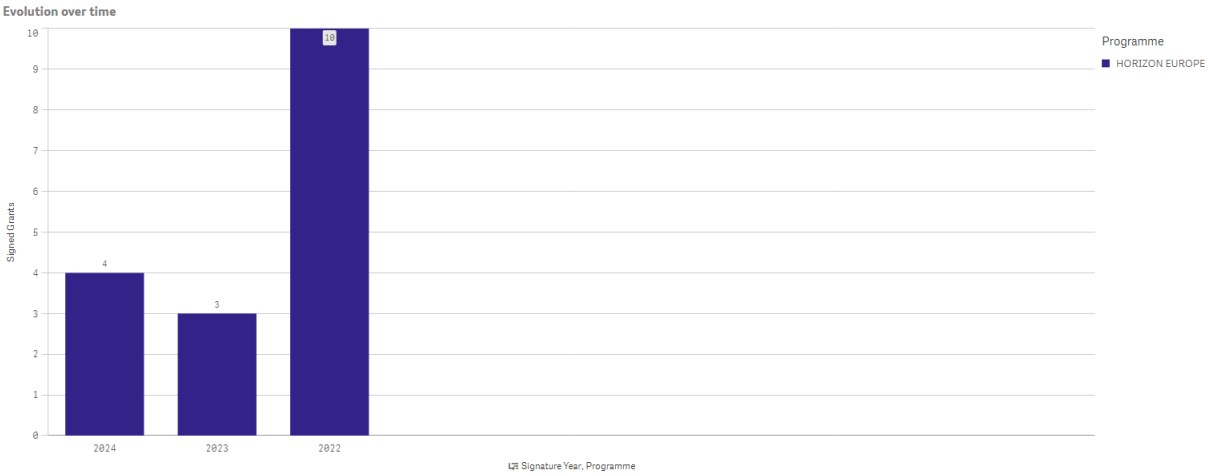


Figure 36: Evolution of Horizon Europe grants 2022 to 2024

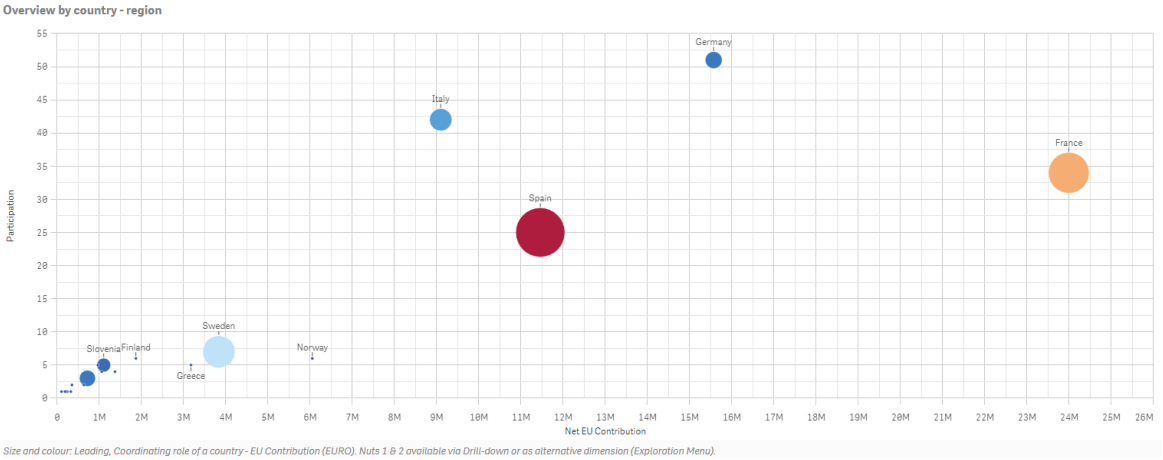


Figure 37: Overview of participation by country

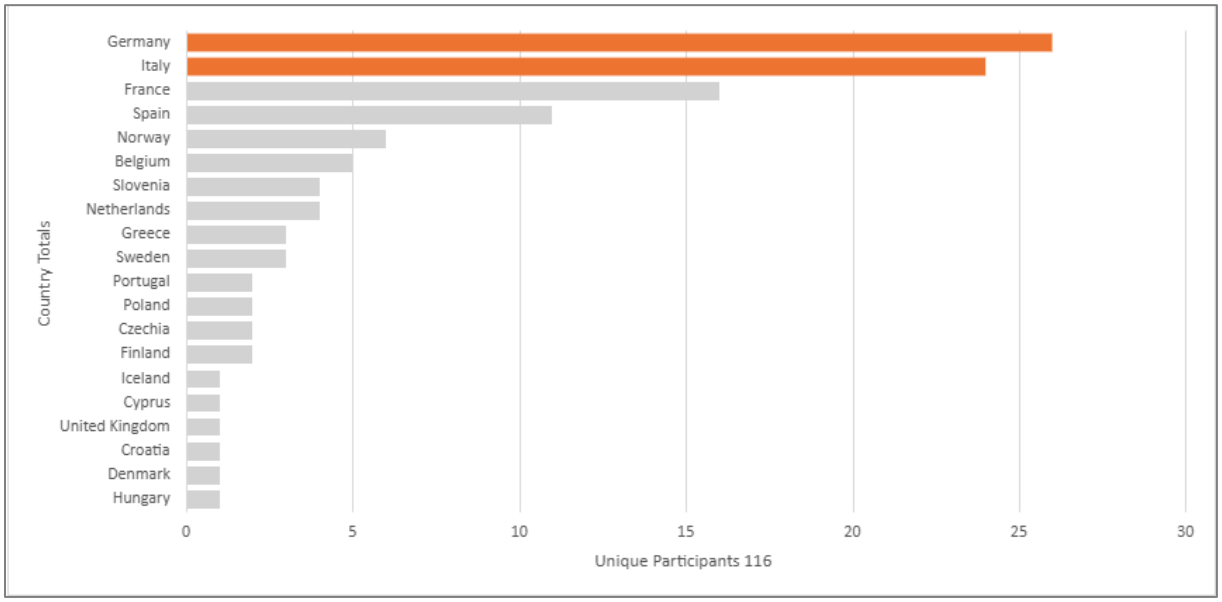


Figure 38: Participation by Country Horizon Europe

Organisation	Sum of Net EU Contribution
BULL SAS	€ 15,833,783.31
BARCELONA SUPERCOMPUTING CENTER CENTRO NACIONAL DE SUPERCOMPUTACION	€ 8,617,328.26
NUMASCALE AS	€ 5,175,253.13
COMMISSARIAT A L'ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES	€ 3,971,451.07
KUNGLIGA TEKNISKA HOEGSKOLAN	€ 3,116,275.38
UNIVERSITY OF STUTTGART	€ 3,067,282.00
IDRYMA TECHNOLOGIAS KAI EREVNAS	€ 2,657,125.00
FORSCHUNGSZENTRUM JULICH GMBH	€ 2,319,231.13
CINECA CONSORZIO INTERUNIVERSITARIO	€ 1,600,072.62

Table 18: Top 10 Participating Organisations Horizon Europe 2022-2024

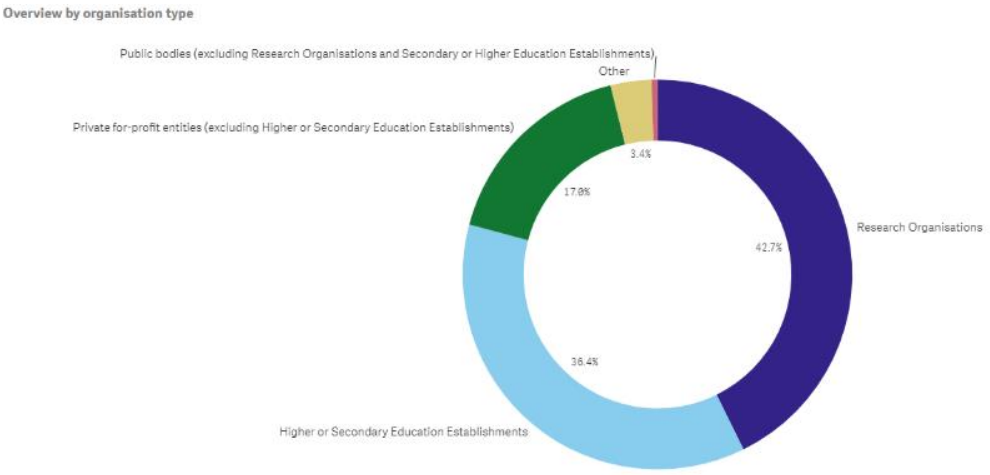


Figure 39: Horizon Europe engagement with organisations

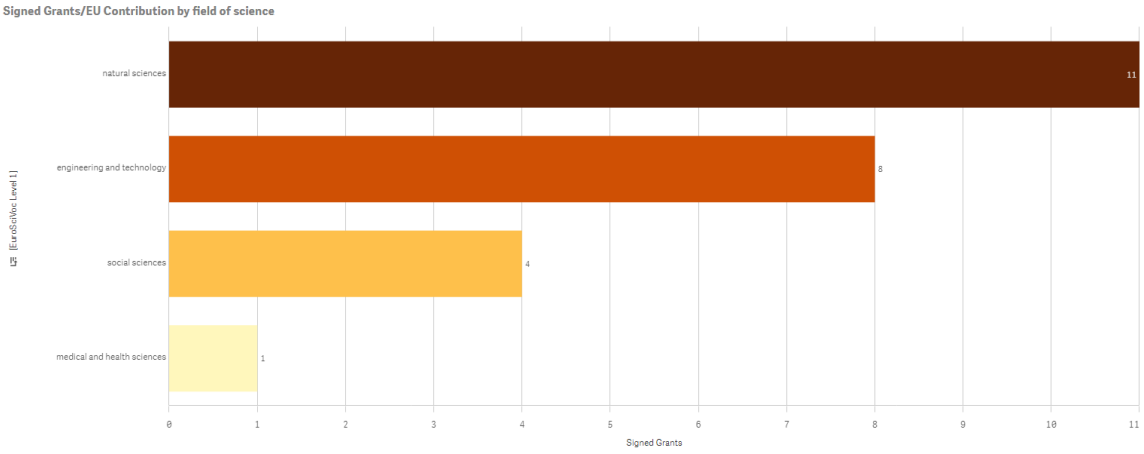


Figure 40: Horizon Europe grants by scientific field

Dissemination and information about project results

EuroHPC JU oversees multiple projects and initiatives as part of its mission. Procuring HPC and quantum infrastructure is one of the main activities of the JU and related projects are reported on the EuroHPC website and shared with the public and strategic communities through media communications such as press releases. Information about all of EuroHPC's supercomputers, quantum computers, hosting entities and other infrastructural projects are detailed on the website.

EuroHPC JU Research and Innovation (R&I) projects are listed on the website including details of budgets, project duration, location(s), aims, and partners (Our projects - EuroHPC JU). Details on new R&I projects are also announced by means of a press release and social media communication. In July 2024, EuroHPC JU published the CORDIS Results Pack on Supercomputing, a thematic collection highlighting 15 successful European projects supported by EuroHPC JU.

As EuroHPC user communities grow, and more of the awarded projects produce outcomes and outputs, the JU is building its dissemination plans to provide a variety of publications on the related research activities. Building strategic relationships with user communities through events and forums has been a growing part of the JU's operations. To this end, in 2024, EuroHPC JU, edited a volume of the journal Procedia: Computer Science[13] with the proceedings from the first EuroHPC User Day projects in 2023. A second edition of the Proceedings will be published in 2025 to present research projects completed in 2024.

EuroHPC Awarded User Projects, are listed on the website along with all of the projects awarded computing time on the JU's supercomputers going back to 2021 (Awarded Projects - EuroHPC JU). Awarded projects generate all kinds of publications including research papers, presentations, patents and articles. The JU highlights some of these awarded projects on the Success Stories webpage, and these publications are further circulated through social media posts. In 2024 the Success Stories webpage promoted EuroHPC supported projects including a story on modelling for ice flow to better anticipate sea-level rise and a project focused on advancing radiotherapy.

Dissemination of information on our projects occurs through a range of channels; through the events we organise, strategic publications, and through EuroHPC JU networks and communities on and offline.

Support to Operations

Communication activities

In 2024 the communications team continued to deliver on its objectives as set out in the EuroHPC JU's Communication Strategy approved by the Governing Board in June 2023. The general objective of the communications policy is to support the mission of the JU in leading the way in European supercomputing by:

- Showcasing and promoting the EuroHPC JU world-leading supercomputing and quantum computing infrastructure
- Raising awareness on EuroHPC JU calls including funding opportunities and access time to the supercomputers
- Promoting calls to access to EuroHPC systems
- Engaging with the HPC and Quantum community, as well as with various stakeholders to widen the use of HPC and Quantum infrastructures while consulting and integrating the inputs of this community where relevant

[13] This publication is open access and available at: Procedia Computer Science | Proceedings of the First EuroHPC user day | ScienceDirect.com by Elsevier

- Disseminating the results of R&I projects funded by the EuroHPC JU which are developing innovative and competitive supercomputing components, technologies, applications and knowledge based on a supply chain that will reduce Europe's dependency on foreign computing technology.

In 2024, the EuroHPC JU Communications Team oversaw the delivery of almost 60 press releases, 6 success stories, 2 blogposts, 1 factsheet, and 1 brochure, as well as generating content and media assets for social media and other channels. The communications department is also responsible for maintaining and upgrading the EuroHPC JU website and conducting media monitoring for EuroHPC JU on its activities and other HPC related topics. Through all of these methods the EuroHPC JU communications team has succeeded in promoting the work of EuroHPC to a variety of audiences and stakeholders in 2024, providing support to the various teams and communities that are part of the JU's activities.

Events

Across the year, EuroHPC JU participates in various workshops, events and presentations. There are two major events in the year, the EuroHPC Summit in March and the EuroHPC User Day in October.

EuroHPC Summit 2024

From 18-21 March 2024, the EuroHPC Summit was held in Antwerp, Belgium. We facilitated 754 registrations (686 in-person and 62 virtual), 130 speakers, and 20 sessions over the four days. Attendees from 47 different countries and across European HPC community, including researchers, industry and policy makers took part in various panels, exhibitions and events.

The 2024 Summit focused on exascale and post-exascale computing, AI for HPC, and quantum computing. The programme featured an extensive array of topics, including international collaboration, the integration of industrial players and SMEs within the EuroHPC ecosystem, energy efficiency in HPC, and a fully packed session on advancements in European chip initiatives for HPC.

The Summit programme featured both plenary sessions for high-level discussions and parallel sessions for more technical topics. Attendees, both onsite and online, actively participated in Q&A sessions, contributing insightful questions and perspectives. Plenaries were live streamed to facilitate online engagement, while offline parallel sessions offered opportunities for informal and spontaneous exchanges. EUMaster4HPC students, from both of the first two cohorts, actively participated in the Summit as HPC Ambassadors, manning the EuroHPC Demo Lab, providing assistance in logistics, but also meeting the community and sharing their insights as the up-and-coming HPC generation. Returning for the second time, the EuroHPC Demo Lab provided an immersive space for live demonstrations conducted by the HPC Ambassadors. Supported by EuroHPC hosting entities, the

demos showcased the capabilities of EuroHPC supercomputers while fostering engagement and knowledge exchange, bridging the gap between novices and experts in the field. Beyond the programme's content, the Summit facilitated community building and networking opportunities. A fast-paced career fair provided students with the chance to connect with industry professionals across various domains, nurturing future talent and fostering industry connections.

The programme was developed by the EuroHPC Summit Programme Committee, composed of EuroHPC JU staff, representatives from the European Commission, members of the JU's two advisory boards (INFRAG and RIAG), the three EuroHPC's private members, BDVA, ETP4HPC and QuIC, and representatives of the host country of Belgium. Feedback on the event was collected through a survey and results shared with EuroHPC management and the Governing Board. In the second half of 2024 work began on the 2025 EuroHPC Summit in Kraków, Poland.

EuroHPC User Day 2024

The EuroHPC User Day took place in Amsterdam on the 22 and 23 of October 2024. This event is designed to bring together the EuroHPC user community and to showcase projects awarded access to the EuroHPC infrastructure. A mix of plenary sessions and panel discussions provided opportunities for the hosting entities and users to exchange information and feedback. Informal connections and discussions were facilitated through structured social events and networking sessions. EuroHPC JU introduced a new awards session in 2024 to recognise outstanding contributions to the European supercomputing ecosystem. Awards were presented for Best HPC User, Best Paper and Best AI Project. More than 200 people attended over two days representing all aspects of the EuroHPC ecosystem including industry, academia, government, regulatory bodies and the European Centres of Excellence. The event was promoted across social media and through other channels and further demand for these kinds of events was expressed by attendees. Preparations are underway for the 2025 User Days event which will take place in Copenhagen.

Other Events

The ISC High Performance conference is the largest and most influential event in Europe dedicated to HPC and quantum computing. It serves as a key platform, bringing together leading research institutions, public organisations, vendors and startups, as well as students and young researchers from across Europe. For the EuroHPC JU, this unique European event is a pivotal opportunity to showcase its cutting-edge achievements, world-class supercomputers, and ongoing R&I projects. Participation in ISC is crucial for the EuroHPC JU to solidify its leadership role, expand its influence, and enhance its public profile. It is a decisive moment to engage with a wider audience, strengthen partnerships, and increase the European user base. ISC 2024 took place on 12-16 May 2024 in Hamburg, Germany. In 2024, the EuroHPC JU successfully coordinated a large exhibition space (48sqm) at ISC, bringing together around 40 partners, including Hosting Entities and R&I project awardees. Such

a coordinated presence strengthened the visibility of the EuroHPC JU, driving greater impact and reinforcing its strategic importance in the European HPC landscape.

In addition to these three large events, EuroHPC JU took part in a wide range of other events across 2024. Europe Day takes place in May and is an important event to communicate the work of EuroHPC JU to the general public, creating connections, and sharing, in a more accessible way, the important work that EuroHPC JU is undertaking on behalf of European citizens. The JU organised an AI-Friendly Systems Info Day as a virtual workshop in September and EuroHPC also participated as an exhibitor in the International Conference for HPC, Networking, Storage and Analysis (SC24) in Atlanta, USA in November 2024.

This year, the JU also took part in the inaugural graduation ceremony for the EuroMasters4HPC class of 2024. The master's is a EuroHPC funded project, initiated in January 2022, with the mission of training the next generation of HPC experts. The graduation ceremony was a moment of celebration to mark the success of the programme and the graduating students.

Participating in multiple events across the year allows EuroHPC JU to communicate about its objectives, activities, opportunities and resources to various audiences and stakeholders. The Communications team works closely with the wider European HPC communities to ensure that the JU continue take part in high-impact events.

In addition to the events for external audiences, the EuroHPC JU organised and participated in a three-day inter-institutional event at the European Parliament (1-3 October 2024), coordinated by the EU Agency Network (EUAN). The event, entitled “EU Agencies and Joint Undertakings Contributing to Europe’s Resilience”, was an opportunity to present the activities of the EuroHPC JU to Members of the European Parliament (MEPs) and EP staff, explaining our mission and how the JU’s work in the fields of supercomputing, quantum computing and AI is boosts the EU’s overall competitiveness. The EuroHPC JU communication team and staff also ensured a presence at the ‘Info-stand’ of the event, to meet MEPs, assistants, policy advisors and committee administrators, delivering useful material and information, and creating connections to support legislative work related to EuroHPC activities.

Social Media

EuroHPC is represented on multiple social media platforms (LinkedIn, X, YouTube) with the aim of communicating to ever wider audiences the work of the JU. EuroHPC posts at least five time per week, on LinkedIn (11, 835 followers) and X (4147 followers) about EuroHPC activities, calls and other events including announcements about projects funded by EuroHPC. The Communications team is responsible for producing the written and visual content all social media posts and for the EuroHPC YouTube Channel, which hosts videos from different events and workshops over the year.

Website

Following a comprehensive restructuring of the website in 2023 to enhance accessibility, clarity and transparency, the communications team continues to refine and develop the website to offer users straightforward access to all of EuroHPC’s calls, activities and publications. Information on our

infrastructure, programmes and calls are provided on dedicated pages. Key documents and details on our background, governance, processes and members are provided on a separate page. Awarded projects are summarised and searchable through the Access to Our Supercomputers page and we also publish our promotional materials including blogs, success stories and press releases on our website. The website is constantly updated and is an essential communication tool for EuroHPC JU.

The EuroHPC JU communication team has also embarked on a process to change the visual theme of the internet website with the support of DG DIGIT, with the main goal of achieving autonomy from the European Commission's graphical user interface, which will be completed in 2025.

Internal Communication

As EuroHPC grows as an organisation, internal communication becomes ever more important to facilitate clarity, transparency, efficient planning and to promote cohesiveness. Internal communication is facilitated through weekly meetings with various teams across the organisation and ad hoc meetings as needed in the lead up to large events and announcements. Biweekly meetings are organised for all staff so that senior management and HR can inform staff of all key developments from an operational and organisational perspective. The staff meetings are highly interactive and held in-presence, to facilitate internal communication. In addition, one team-building event was organised for all staff on 20 of September.

In 2024, professional media training was provided to twenty staff members with responsibility for public speaking on behalf of EuroHPC JU. We continue to evolve how we manage communication across the organisation as our team and remit expands.

Publications

Visual assets have become a growing part of the work of the communication team at EuroHPC JU. Posters, flyers, factsheets, stickers and other promotional materials must be created and updated on a regular basis as a means to sharing information on EuroHPC's activities with the public, and HPC communities and stakeholders, in a clear and effective way. As our remit grows to include more complex infrastructure, consortia and partners, visual media artefacts are essential to our communication strategies allowing EuroHPC JU to quickly demonstrate the scale of its network, resources and impact.

In 2024, EuroHPC JU collaborated with 8 other Joint Undertakings as part of the BOA initiative to develop and publish a new tender procedure for communication services covering the years 2026-2030. This collective process will produce a new framework contract to be used across the participating JUs.

Legal and financial framework

The legal framework refers to:

- Council Regulation (EU) 2024/1732 of 17 June 2024 introducing amendments to Regulation (EU) 2021/1173 of 13 July 2021 to boost the EU activities on trustworthy artificial intelligence (AI)
- Regulation (EU) 1291/2013 and its Rules for Participation establishing Horizon 2020;
- Regulation (EU) 2021/695 of The European Parliament and of The Council of 28 April 2021 establishing Horizon Europe;
- The CEF Regulation (EU) 1290/2013;
- Regulation (EU) 2021/1153 of the European Parliament and of the Council of 7 July 2021 establishing the Connecting Europe Facility;
- The Digital Europe Programme 2021-2027, established by Regulation (EU) 2021/694 of the European Parliament and of the Council of 29 April 2021;
- The Financial Rules adopted by the EuroHPC Governing Board on 20 February 2020 and re-adopted by the Governing Board on 30th September 2021

Budgetary and financial management

The budget of EuroHPC JU is divided into 3 titles as follows:

- Title 1: Staff Expenditure
- Title 2: Administrative Expenditure
- Title 3: Operational Expenditure

Budget Revenue

The EuroHPC JU budget revenue according to the final voted budget for 2024 was EUR 348M. The reactivation revenues from the previous years were EUR 106M.

Contributions from EU and Participating States 2024	
EU Administrative Contribution	**7,804,155 €**
EU Digital Europe Programme Administrative	4,821,123 €
EU Horizon Europe Programme Administrative	2,983,032 €
EU Operational Contribution	**182,014,402 €**
EU Digital Europe Programme Operational	89,654,543 €
EU Horizon Europe Programme Operational	60,000,564 €
EU H2020 Operational	32,359,295 €
Total EU Contributions	**189,818,557 €**
Other Incomes - Recoveries from expenses	
Recoveries from expenses - Administrative Budget	235,000 €
Recoveries from expenses - Operational Budget	24,356 €
Total Other Incomes	**259,356 €**
LEONARDO Pre-exascale Project	921,880 €
LUMI Pre-exascale Project	2,183,617 €
MN5 Pre-exascale Project	46,894,349 €
EuroQCS Spain - Quantum Project - RRF programme	1,275,000 €
Total Participating States Contributions	**51,274,846 €**
EU + Participating States Contributions - Total Cashed	**239,818,404 €**
EU + Participating States Contributions - Total Not Cashed	***1,275,000 €***
Other Incomes - Recoveries from expenses	**259,356 €**
Total Revenue Cashed	**240,077,760 €**

Figure 41: Contributions made in 2024 from the EU and the Participating States

Administrative Expenditure (Titles 1 and 2)

In compliance with the financial rules of the JU, and of the n+3 guidelines of the Commission, the JU has not only used C1 (fresh 2024 credits) but also C2 (reactivated credits).

Situation of Commitment and Payment Appropriations - Title 1

Commitment Appropriations (CA)		Payment Appropriations (PA)	
Received	5,889,068 €	Received	6,082,348 €
Consumed	5,582,571 €	Consumed	5,397,371 €
	95%		**89%**

Situation of Commitment and Payment Appropriations - Title 2

Commitment Appropriations (CA)		Payment Appropriations (PA)	
Received	3,000,609 €	Received	2,947,323 €
Consumed	2,733,011 €	Consumed	1,797,487 €
	91%		**61%**

Operational Expenditure (Title 3)

The situation in 2024 was significantly influenced by the adoption of the Council Regulation (EU) 2024/1732 which amended the Regulation (EU) 2021/1173 to boost European leadership in trustworthy Artificial Intelligence (AI) by introducing a new activity pillar for the Joint Undertaking in the area of Artificial Intelligence. As a result, the EuroHPC JU has reprioritised the activities initially approved in the 2024 Working Programme, focusing on this new initiative, which is of high strategic importance for both the European Union and the Participating States.

Throughout 2024, an in-depth analysis was conducted to identify potential funding sources for the implementation of AI activities. Consequently, unused credits from the previous year were reallocated, and certain activities planned for 2024 were either cancelled or postponed.

In Q4 2024, an AI call was launched, to be implemented before the end of the current MFF. The EuroHPC JU had foreseen a total maximum EU budget of EUR 980M for the implementation of AI activities, including EUR 800M from the Digital Europe Programme and EUR 180M from the Horizon Europe Programme. Meanwhile, Participating States are to match the EU contributions by providing at least another EUR 980 M for the execution of this project.

Global Budget Execution (Titles 1, 2 and 3)

All titles considered, the total budget executed by EuroHPC JU in 2024 was EUR 221M in terms of commitments, which represents an execution rate of 72% of the total credits activated and available during the 2024 financial year. Similarly for payments, the global execution rate for all titles was of 59%.

	Commitment Appropriations (CA)		Payment Appropriations (PA)	
JU Budget	**Credits**	**Consumed**	**Credits**	**Consumed**
Title1	5,889,068 €	5,582,571 €	6,082,348 €	5,397,371 €
Title 2	3,000,609 €	2,733,011 €	2,947,323 €	1,797,487 €
Title 3	298,270,706 €	212,231,927 €	338,691,942 €	198,864,711 €
Total	**307,160,384 €**	**220,547,509 €**	**347,721,612 €**	**206,059,569 €**
Budget Implementation rate		**72%**		**59%**

The financial, budgetary and accounting details are provided in the annex to this document, Budgetary and Financial Management 2024, and in the 2024 Financial Statements.

Contributions from Members other than the Union

The following Participating States reported on the value of their financial and in-kind contributions for the operational activities made in this financial year: Denmark, Estonia, Finland, Italy, Malta, Norway, Portugal, Serbia, Slovenia and the Netherlands. The JU has also received reports from DAIRO, ETP4HPC and QuIC. The remaining Participating States did not report their contributions for the operational activities made in 2024.

The United Kingdom joined the JU in 2024; therefore, this Participating State will start reporting next year.

Details on Member's contributions other than the Union are provided in the annex to this document, Budgetary and Financial Management 2024.

Corporate IT and logistics

- In addition to the usual day-to-day tasks of user support and maintenance of the Microsoft Cloud platform, the year 2024 was marked by: Measures to improve the quality of IT processes and the services provided
- Increased requirement of IT support linked to higher recruitment levels in 2024
- Measures to consolidate IT systems and network environment resilience
- Measures to improve collaboration and data sharing in Microsoft 365 environment between EU organizations
- Measures to improve compliance with different regulation in terms of cyber-security and data protection (ICT BOA, external contracts for audits and assessments).

Following the establishment of the ICT BOA (Back Office Arrangements) between JUs (Luxembourg / Brussels) that took place at the end of 2023, EuroHPC JU continued to improve its collaboration and synergy with all participating JUs. In 2024 this included reinforcing its alignment in terms of ICT policies and the improvement of the joint implementation of ICT processes, security, data protection strategies and, in general, compliance with the control authorities.

The ICT BOA has also enabled EuroHPC JU to join the "IT Managed Services Framework Contract", coordinated by CAJU, and establish its own specific contract with the external contractor Real Dolmen, covering the provision of part of the day-to-day user support but also providing support to the local IT Officer in terms of maintenance for Microsoft Azure / 365 environment (security, policies, processes automation, etc.). In 2024 further efforts were made by EuroHPC JU and the other JUs to comply with EDPS recommendations. This covers data protection in the Microsoft 365 environment, as well as measures related to the Regulation (EU, Euratom) 2023/2841 of the European Parliament and of the adoption by the Council of 13 December 2023. These measures provide a framework for a high common level of cybersecurity at the institutions, bodies, offices and agencies of the Union, in close collaboration with EC DIGIT CERT-EU and the other JUs.

In 2024, the EuroHPC JU IT service worked on assuring better collaboration in terms of IT communication and data exchange tools with the other EUIBAs and external stakeholders. To do so, EuroHPC JU joined the EC DIGIT SECABC project that enables all the participating EUIBAs to better share information, such as Outlook contact details, secured mails certificates and different Microsoft Azure tenant information. This allows for better and more secured access to resources across organizations. EuroHPC JU also developed a SharePoint based repository facilitating information exchange with external stakeholders.

Measures have also been taken to strengthen IT business continuity, including the adoption of business continuity plan.

Human Resources

HR Management

Recruitment

During 2024, 11 selection procedures were finalised, of which:

- 10 selection procedures were launched in 2024
- 1 procedure launched during the last quarter of 2023 was finalised in 2024.

As a result, EuroHPC JU team grew to 40 staff members in 2024.
6 selection procedures for the temporary agent posts were external and 2 internal.
2 staff members left the JU in 2024 (<10% of turnover).

Vacancies were actively promoted on the EuroHPC JU website and additional multiplier websites (e.g. EPSO, EU Agencies Network, etc.) as well as on social media (e.g. LinkedIn). Additional channels are used to promote specialised profiles.

This year the HR team, with the support of the Communication team, also participated in the Inter-institutional Job Fair, promoting job opportunities and giving more exposure to the JU's selection procedures. Vacancies were also promoted during EuroHPC JU events.

EuroHPC JU has adapted its HR needs in line with the new responsibilities it acquired in 2024 and in agreement with the Governing Board. EuroHPC JU took on the implementation of the AI Factories mandate without additional budgetary resources in terms of staffing. It also took the decision (due to issues related to difficulties in recruitment at the JU's headquarters) to recruit additional junior officers (CA FGIV) instead of assistants (CAFGIII and II). The Governing Board agreed to adjust the EU EU draft budget 2024 estimate related to Contract Agent grades to reinforce the operational teams and the Peer Review Sector, which are business-critical functions and are needed to ensure the successful implementation of the AI Factories. The differences in grades between the EU draft budget 2024 estimate and the Governing Board Decision 62/2024 amending the Work Programme and Budget and adopted by unanimity is as follows: an increase of 10 posts at CA FG IV and a decrease of 10 posts at CA FG III. The total number of contract agents for the JU (27 over the MFF 2021-2027 period) has not changed and the budget envelope for administrative expenditure remains within the maximum threshold as set out in the EuroHPC JU Regulation.

Implementing Rules

In the course of 2024, the HR team implemented the Code of Conduct, adopted by the EuroHPC JU Executive Director in February 2024.

Commission Decision C (2024) 1038 of 21 February 2024 amending Decision C (2011)1278 final on the general implementing provisions for Articles 11 and 12 of Annex VIII to the Staff Regulations on the transfer of pension rights applied to EuroHPC JU staff by analogy after 9-months period.

SIR implemented in 2024	
Title of the SIR	**Reference and date of the GB decision (if relevant)**
Commission Decision C (2024) 1038 of 21 February 2024 amending Decision C (2011)1278 final on the general implementing provisions for Articles 11 and 12 of Annex VIII to the Staff Regulations on the transfer of pension rights	N/A, as applied by analogy

Code of Good Administrative Behaviour / Code of Conduct

The **Code of Good Administrative Behaviour/ Code of Conduct** for all staff of the EuroHPC Joint Undertaking was established. This Code sets forth the principles and standards for maintaining quality service and upholding ethical values in all our interactions.

HR strategy

In June 2024, the **HR Strategy** was adopted. The aspiration of our HR Strategy is to attract top talent and invest in our staff to cultivate and maintain the skills necessary to achieve the EuroHPC JU's mission, to develop a world-class supercomputing ecosystem in Europe. We aim to create an environment where people can excel by fostering an inter-connected organisation where collaboration is key.

EuroHPC JU values (Respect - Positive Culture, Collaboration – Teamwork, Innovation – Curiosity, Transparency – Trust, Flexibility – Agility, Resilience and Engagement) are fundamental principles that guide our conduct and decision-making and form the foundation of our HR strategy. The HR Strategy is built on the following **7 Key Pillars** which shape our approach to talent management, professional development, and organisational culture:

Talent Attraction - ensuring we attract the best and brightest;
Professional Growth - fostering continuous development;
Collaboration - promoting a collaborative culture and encouraging teamwork;
Efficiency - encouraging smarter, more effective teamwork;
Leadership Development - building strong leaders for the future;
Employee Well-Being - prioritising the health and wellbeing of our staff; and
Safe & Respectful Workplace - where all employees feel secure and valued.

Staff Engagement Survey

The first Staff Engagement Survey was conducted in 2024 as a vital tool for understanding the sentiments and satisfaction levels of our staff members. The survey covered key areas, such as professional development, well-being, and staff engagement. The findings guide our decision-making processes, enabling us to develop targeted action plans and key performance indicators aligned with our organisational goals. Furthermore, this survey will serve as a benchmark for future assessments, allowing us to track progress over time and measure the impact of our initiatives.

We achieved an exceptional response rate of 90% and a staff engagement index of 92%. Notably, the results for EuroHPC JU are significantly above the available EU agencies' average, in all eleven dimensions of analysis.

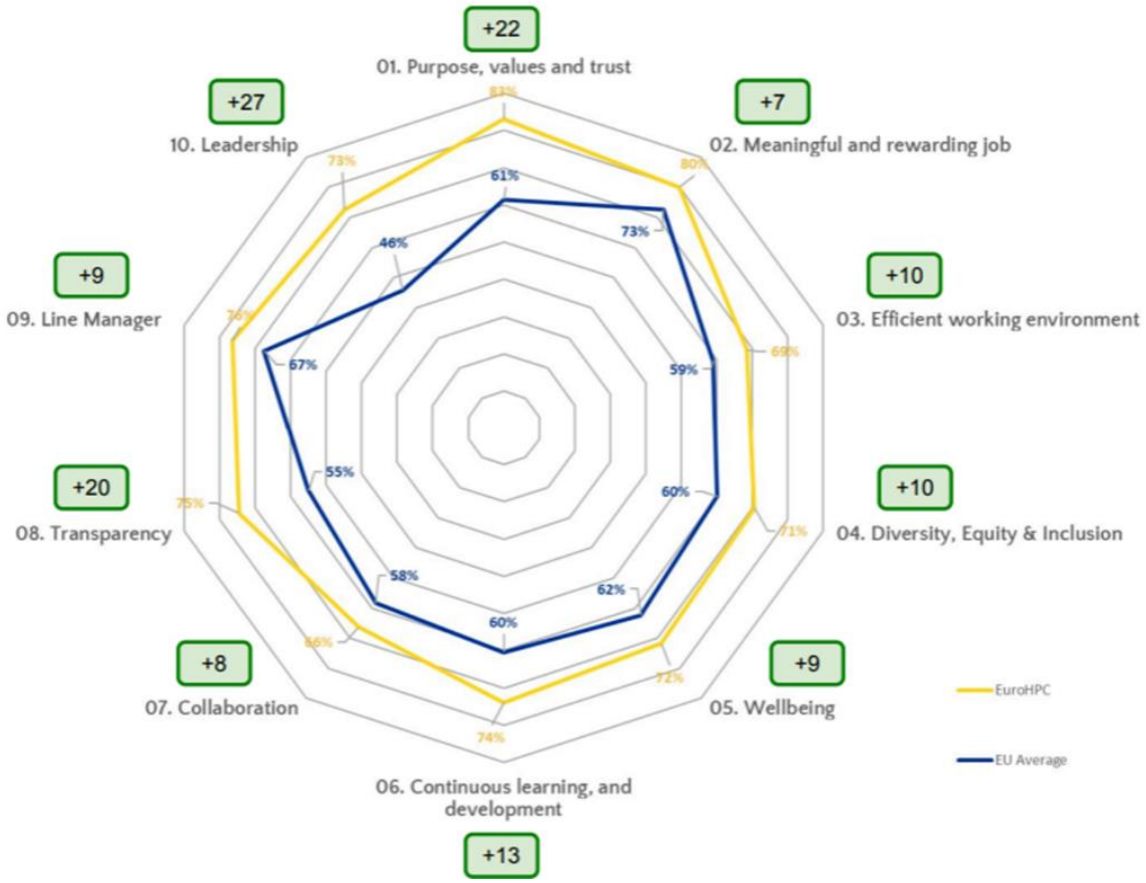


Figure 42: Inter-Agency benchmark

Learning and Development

In addition to regular trainings for all staff, a **Management Development Programme** was organised in collaboration with the Centre de Traduction, also based in Luxembourg. This tailor-made programme aims to equip our managers with the skills necessary to enhance team motivation and productivity, improve team dynamics, and foster a culture of appreciation and overall workplace satisfaction. The

programme is designed with a focus on the unique challenges managers face within the EU's multilingual and multicultural environment, addressing key areas such as leading diverse, multilingual teams, adaptive leadership and change management, effective communication and feedback, team dynamics and conflict resolution, resilience and well-being.

Policy on Sensitive Functions

The EuroHPC JU Policy on Sensitive Functions was adopted to ensure that the management of human and financial resources can be seen to be carried out objectively at all times. Risks associated with the EuroHPC JU's sensitive functions are managed through the implementation of mitigating controls and continuous review and monitoring of positions identified as potentially sensitive. The implementation of this policy reflects our ongoing dedication to transparency and ethical governance.

Staff Committee Elections

Election procedures for the second **Staff Committee** began in November 2024 and concluded with the election of its new members. With an impressive participation rate of **92.5%**, the election demonstrated strong engagement and commitment from our staff.
The newly elected Staff Committee will officially begin its mandate on 1 March 2025.

HR Tools and processes

New Sysper functionalities, which became available in 2024 were implemented at EuroHPC JU. The HR team continued to be involved in the developments of the new corporate tool called HRT.

Together with other JUs, EuroHPC joined a Framework Contract for the use of proctoring services in the context of the selection procedures.

Diversity and inclusion

At the end of 2024, JU staff came from 18 different nationalities. German and Greek nationals are the largest population in EuroHPC JU (6 staff members of each nationality), followed by Italian (5 staff members) and Bulgarian (3 staff members) nationals.

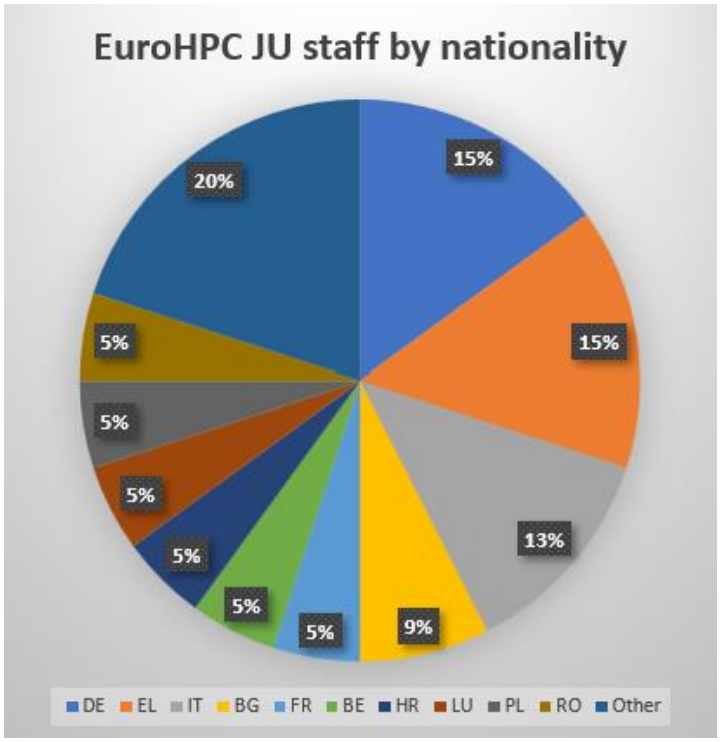


Figure 43: Staff geographical diversity as of 31 December 2024

In terms of the gender balance, 72.5 % of staff are female and 27.5 % male. Regarding the extended management team, the gender balance is 40% male and 60% female.

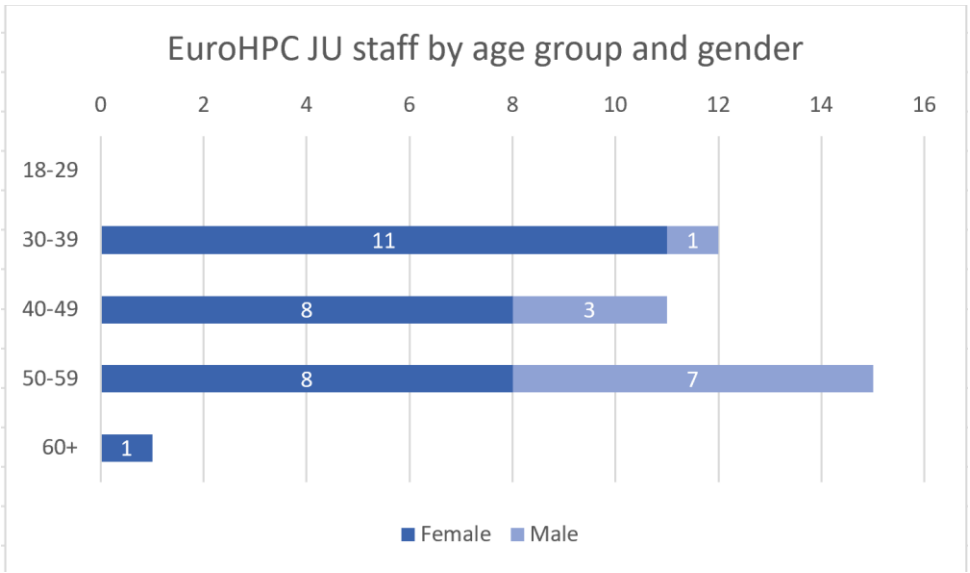


Figure 44: Staff by age and gender as of 31 December 2024

Health and wellbeing

EuroHPC JU organised a team building event for all staff, focusing on the outcomes of the staff engagement survey, as well as aiming to increase team communication and cohesion.

Efficiency gains and synergies and the Back-Office Arrangement (BOA)

In view of the new extended mandate to including Artificial Intelligence (AI), without extension of the JU's establishment plan, the JU had to optimise the use of the existing resources and review the required competencies of the open vacancies.

EuroHPC JU continued the collaboration with other Joint Undertakings (through the inter-JU Back-Office Arrangements), in view of strengthening the collaboration with other Joint Undertakings through mechanisms of pooling expertise in key areas, such as accounting, IT, procurement and HR, as well as identifying the best practices in those areas.

In 2024, under the BOA HR, the Joint Undertakings have continuously maximised their synergies and implemented actions in three HR areas: selection and recruitment; HR legal framework; and HR digitisation. By holding bi-monthly meetings the JUs continued to promote best practice, ensuring consistent HR support services, and achieving efficiencies and economies of scale.

In line with the HR BOA action plan 2024, the JUs have:

- implemented a common online assessment solution for remote proctoring services to support the running of written tests as part of selection procedures. To this end, an SLA was signed by the JUs in September 2024 to proceed with the purchase of the above-mentioned services;
- launched a series of workshops to align and harmonise the selection recruitment procedures practices across the JUs;
- strengthened their cooperation
- organised a HR Officers Away Day to share best practise and shape collaboration
- shared reserve lists to shorten recruitment times
- provided expertise and resources allowing staff members to be panel members in several selection procedures at other JUs;
- supported new joint undertakings during their on-boarding/start-up phase, providing guidance, advice and templates;
- centralised the organisation of training courses of general interest for all JUs (e.g., ethics and integrity, antifraud, respect and dignity at the workplace, and cybersecurity training);
- contributed to the development of a common JU HR legal framework by sharing ED and GB decisions on diverse HR regulatory topics;
- launched a new call for interest for the JUs confidential counsellors service, and supporting the communication campaign on the role of confidential counsellors in the JUs.

The JUs, as inter-institutional partners, have also attended meetings held by the European Commission on the HR transformation programme that intends to set up a new IT platform to replace SYSPER.

EuroHPC JU also shares information and best practices with other JUs through meetings and working groups e.g. the Executive Directors, Heads of Resources, HR officers, Legal officers.

In the case of the Procurement BOA, EuroHPC JU is currently co-leading the working group, providing expertise and sharing best practice.

The JU is now also part of the Back-Office Arrangement in the area of IT. It participates in IT Governance meetings, which provide a platform for exchanging views, sharing best practice and providing an overview of current and future projects of common interest. They also provide the opportunity to review the performance of the external service provider in IT user support, as well as address challenges related to the obligations in cybersecurity.

EuroHPC JU is also participating in various EU Agencies' Network working groups including HR strategy or performance management. These working groups constitute an excellent opportunity for knowledge exchange among EU decentralised agencies and bodies. EuroHPC also continues to benefit from shared services in accounting.

Governance

Governing Board

At the end of 2024, the EuroHPC JU had 35 Participating States, following the Governing Board decision to accept United Kingdom as a new member in May 2024.

The Governing Board met 13 times in 2024, 8 times in a hybrid way (physically and virtually) in Luxembourg or Brussels and 5 times only virtually to make it possible to all GB members to follow the meetings. The Governing Board adopted 72 decisions in total, mostly by written procedures. Major decisions taken by the Governing Board included the amendment of the Multi-annual Strategic Plan (MASP), the selection of hosting entities for new EuroHPC supercomputers, the launch of their procurements and the selection of the related tenders.

In 2024, the EuroHPC JU regulation was amended to include additional calls and activities related to Artificial Intelligence Factories. EuroHPC JU is aware of its responsibilities in relation to Article 10(2) of the HE Regulation and the necessity to develop a phasing-out plan. However, owing to the increased scope of its activities in 2024, the JU has not started to develop such a 'phasing-out strategy' yet and will wait to get a clearer indication on its future activities.

Executive Director

In 2024, the contract of Anders Dam Jensen, Executive Director of the EuroHPC Joint Undertaking, was renewed and he continued to lead the Joint Undertaking.

EuroHPC JU Industrial and Scientific Advisory Board

The EuroHPC JU Industrial and Scientific Advisory Board is composed of two Advisory Groups: The Research and Innovation Advisory Group (RIAG), chaired by Prof. Estela Suarez, and the Infrastructure Advisory Group (INFRAG), chaired by Stephane Requena.[14]

In Q3 2024, the new EuroHPC JU Advisory Boards were selected as the mandate of the previous groups reach the end of the mandate period. The new Advisory groups were informed about their role and

[14] Annexes 5 and 6: RIAG and INFRAG Membership Lists

responsibilities in accordance with EuroHPC JU regulation. Starting from Q4 2024 the new Advisory Groups continued its intensive work on the Multiannual Strategic Plan (MASP) document with the aim to submit the final version to the Governing Board in Q1 2025. The two groups had two formal face-to face meetings: one per group at the EuroHPC JU premises in Luxembourg in May and July 2024 accordingly to elect the Chairs and Vice-chairs of the Advisory groups. Prof. Estela SUAREZ (Chair) and Dr. Daniele CESARINI (Vice-Chair) for RIAG and Stephane REQUENA (Chair) and Walter LIOEN (Vice-Chair) for INFRAG were elected. The second face-to-face meeting happened during the EuroHPC JU User Day event in October 2024 in Amsterdam, where they also met the newly formed EuroHPC JU User Forum Coordination Group.

Additionally, the advisory groups continued the unofficial weekly meetings in online form to discuss and brainstorm about the state of play and the needs of the European HPC ecosystem. The EuroHPC JU supports supporting the Advisory Groups by setting up collaboration environments such as a common document repository, mailing lists and the organisation of in-person meetings. EuroHPC JU supported the Advisory Groups by organising the public consultations with JU Private Members, ETP4HPC and BDVA as well as with different European initiatives, projects and companies such as ADRA, NUMPEX, ALYA, HPC3, EBRAINS, Alice&Bob.

This work was accompanied by several public consultations of the JU Private Members, ETP4HPC, BDVA and QUIC as well as with different European initiatives such as ELIS, CLAIR and other AI European initiatives. These consultations were organised with the help of EuroHPC JU.

Internal Control

This section reports the control results and other relevant information that supports management's assurance on the achievements of the financial management and internal control objectives. It includes the information necessary to establish that the available evidence is reliable, complete and comprehensive. It reports on the performance of the internal control system covering all activities, programmes and management modes relevant to the JU. The internal control system and risk management in place are described, together with the assessment of their effectiveness, efficiency, economy and compliance.

Control results

This section reports on the assessment of elements that were identified by the JU management to support the assurance on the achievement of the internal control objectives: (i) effectiveness, efficiency and economy of operations; (ii) reliability of reporting; (iii) safeguarding of assets and information; (iv) prevention, detection, correction and follow up of frauds and irregularities. The internal control objective 'adequate management of risks relating to the legality and regularity of the underlying transactions ....' is described in section related to the assessment of the internal control system and more precisely in section 4.3.2. This section reports also on the assessment on the cost-effectiveness of controls

Effectiveness of controls (ex-ante and ex-post controls, if relevant)

In 2024, the JU adopted the Control Strategy for EU-funded programmes 2024-2033, providing the overview of the design and functioning of the control activities in place to ensure the sound and fair management of procurement, grants and experts[15].

Legality and regularity of the financial transactions

EuroHPC JU uses internal control processes to ensure sound management of risks relating to the legality and regularity of the underlying transactions it is responsible for, taking into account the multiannual character of programmes and the nature of the payments concerned.

The current Financial Rules of the JU were adopted by the Governing Board in 2020[16] and readopted in 2021[17] in compliance with the Art. 19 of the Council Regulation 1173/2021[18]. The Manual of Financial

[15] Decision of the ED No. 23/2024

[16] Decision of the GB No. 3/2020

[17] Decision of the GB No. 17/2021

[18] Amended by Council Regulation (EU) 2024/1732

Procedures of the JU was adopted by the Executive Director in 2020[19] and states financial responsibilities and circuits for the sound management of underlying transactions.

The treasury function is provided by the European Commission Services, the Accounting Officer was appointed at the end of 2022 within the framework of the common back-office agreement (BOA SLA) established among the joint undertakings, and EU-RAIL was tasked for the leading role of accounting service providers (complemented by CA JU and SESAR JU).

The control objective is to ensure that the JU has reasonable assurance on the legality and regularity of the financial transactions authorised during the reporting year. To conclude that the principle of sound financial management was applied, a review of implemented ex-ante and ex-post controls were carried out.

Ex-ante controls were regularly performed for the whole population of underlying transactions at all stages of the authorisation process (initiation, verification, authorisation and payment). Processes and procedures to adequately perform controls are in place and comply with the JU Manual of Financial Procedures. No material weaknesses were identified for the reporting year.

Ex-post controls were covered by the H2020 Audit Strategy, implemented by the Common Audit Service (CAS) of Commission DG RTD, in line with the operating rules for the Common Implementation Centre (CIC).

The results of ex-post controls were measured to give reasonable assurance on the legality and regularity of financial transactions in the reporting year. The review of ex-post audits results for the 2024 financial year showed that:

- The EuroHPC JU detected error rate is 0.50% (direct coverage only)
- The EuroHPC JU residual error rate is 0.0% (1.64% considering direct and indirect coverage)
- The results of the cumulative ex-post controls covering audits carried out in 2023 and 2024 showed that:
- The EuroHPC JU detected error rate is 0.84% (direct coverage only)
- The EuroHPC JU residual error rate is 0.0%
- There were no extensions of audits launched by CAS in the reporting year, nor in 2023. The overall systemic error was assessed at 450 euro.

Overall, CAS calculated that for the whole H2020 framework programme the cumulative representative error rate is 3.55% and the cumulative residual error rate is 1.79%.[20] The methodology applied is described in Annex 5.14 'Materiality criteria'. The results of the performed controls shows that EuroHPC JU error rates are below the Legislator expectations. A reservation on the financial transaction for the reporting year is not necessary.

[19] Decision of the Interim ED No. 4/2020

[20] CAS standard report H2020 2024 – Q4, issued on the 09/01/2025

Fraud prevention, detection, and correction

The EuroHPC JU Anti-Fraud Strategy 2023-2025 was adopted by the Governing Board with the Decision 38/2023.

The strategy includes an action plan to ensure its implementation and KPIs to annually monitor and reporting on selected actions. The assessment of KPIs showed that in the reporting year, all actions were duly implemented, and no weaknesses were identified.

The fraud risk assessment exercise was regularly carried out during the overall risk assessment exercise.

In the reporting year, no fraud cases involving EuroHPC JU were identified. There were not OLAF investigations reported to the JU management.

Based on the above-mentioned information, the JU has reasonable assurance that the antifraud measures and controls in place are effective and efficient.

Assets and information, reliability of reporting

In 2024, the following controls were performed to monitor the safeguarding of assets and information and the reliability of reporting in the JU:

- The accounting officer carried out the annual evaluation of the local financial management systems in EuroHPC JU. The report was finalised in November, and the evaluation methodology was adapted taking into account the results of previous years' assessments. The evaluation reviewed the available information regarding the follow up of the 2023 evaluation, the analysis of a sample of the operations authorised during the 2023 and the 1st semester of 2024 financial years, and key performance indicators. The evaluation did not identify any internal control weakness which would have a material impact on the accuracy, completeness and timeliness of the information required to draft the annual accounts and produce reliable reporting.
- The latest periodic validation of access rights granted in ABAC had been finalised in June 2024 and resulted in any access right inconsistency identification.

In addition, EuroHPC JU supports its activities with a number of corporate tools ensuring adequate safeguard of information and reliability of reporting. Financial and accounting activities are carried out through ABAC, Projects are managed on Compass, Sygma, AUDEX, PPMT. Treasury of EuroHPC is integrated into the Commission Treasury system. Ares is used for document management. Sysper and RCAM/JSIS are in use for HR matters.

IT assets and security matters had been managed by the JU IT sector. The register of IT incident is kept by the IT assistant and reported no incidents in 2024. The JU IT inventory of physical assets was completed without reporting any inconsistency. In the event of disaster, the IT BCP is in place and ensure the full recovery of systems.

In the reporting year, no material issues and/or weakness in the internal control system were identified. Overall, The JU has reasonable assurance on the effectiveness of controls to the safeguard of assets and the reliability of reporting. Efficiency of controls ("Time to")

The efficiency of controls in EuroHPC JU is measured through the analysis of indicators stated in the EU financial regulation: time-to-inform, time-to-sign, time-to-grant (Art. 197) and time-to pay (Art. 116).

From the analysis of the grant procedures having closure date of calls in 2024, the following had been measured:

- Time to Inform was 150 days on average
- Time to sign was 137 days on average

Although the time-to-sign indicator exceed the limit stated by the Art. 197 of the financial regulation, the values measured for the management of grants did not disclose any weakness in the control system and provide reasonable assurance on the effectiveness of controls. Delays in signing grants agreements are due to the prolonged negotiation for complex projects.

The JU carried out 1041 payments in 2024, among which 48 were delayed. The late payment rate in 2024 is 4.61%, below the threshold of 5%. Compared to the 2023 rate (slightly above 5%), the JU showed an improvement in this indicator.

Overall, indicators show there was no material impact to the JU and that it is reasonably assured the effectiveness and efficiency of controls in place. Economy of controls

Economy of controls

The estimated cost of controls for EuroHPC JU in 2024 is EUR 2,383,838. The calculation method has been based on the approach used in the Commission and includes the estimated average salary costs (including social charges) of the staff involved in the key control systems such as the operational, the legal and financial verification as well as in other internal, budgetary and accounting controls. The estimation takes into account the costs paid by the JU for evaluation performed by external experts and external auditors.

In 2024 the overall cost of control as a percentage of annual expenditure is 1.15%, as for the table below.

EuroHPC JU Payments of the year	EUR 206,059,569
Estimated costs of controls (staff)	EUR 1,761,666
External cost of controls (experts evaluations and audits)	EUR 622,172
Total cost of controls	EUR 2,383,838

Total cost of controls as a percentage of total expenditure of the year	1.15%

Conclusion on the cost-effectiveness of controls

In 2024, EuroHPC JU has designed and implemented effective and efficient controls to fulfil its control objectives as stated in the current Financial Rules adopted by the Governing Board. Controls in place adequately ensured the legality and regularity of financial transactions, the reliability of information, the identification of weaknesses and effectively supported the achievement of the JU targets.

Overall, in 2024, the controls implemented in the JU were:

- Cost-efficient, as the JU executed a high number of payments with a relatively low cost of controls,
- Cost–effective, as the control system in place ensured that risks related to the achievement of the JU's objectives were mitigated at all levels and led to a residual error rate of 0%.

Audit observations and recommendations

This section reports on the observations and recommendations pointed out by the Internal Auditor (IAS) and the European Court of Auditors (ECA). It summarises about the actions selected and implemented by EuroHPC JU to tackle the weaknesses identified by auditors and assess the overall impact on the achievement of the internal control objectives.

Internal Audit

The Director General of the EC Internal Audit Service (IAS) is appointed as internal auditor in the EuroHPC JU. According to the 2022-2024 Strategic internal audit annual plan (SIAP)[21], the IAS regularly launched three audits in the JU. The first audit topic was on HR management and ethics, it was finalised and the action plan agreed with IAS was adequately finalised in the reporting year, all recommendations were followed up and closed by IAS as adequately implemented[22].

The second audit was carried out in 2024 and concerned performance management and budgeting in the JU[23]. The Final audit report was delivered in August and reported one very important and two important recommendations. The action plan to tackle reported recommendations was agreed in September and is timely ongoing, some actions were due by end of 2024 and already implemented.

Rec	Severity	Title

[21] Ares(2021)4268258 EuroHPC JU 2022-2024 strategic internal audit plan

[22] Ares(2025)378650 Note on the follow-up of an outstanding recommendation for the limited review on HR and ethics in the EuroHPC JU

[23] Ares(2023)6208472 Announcement letter for the audit on planning, budgeting, monitoring and reporting in EuroHPC

1	Very important	MANAGEMENT OF PARTICIPATING STATES' AND PRIVATE MEMBERS' CONTRIBUTIONS
2	Important	MONITORING AND REPORTING ON THE IMPLEMENTATION OF THE ANNUAL WORK PROGRAMME AND BUDGET
3	Important	(MULTI-) ANNUAL WORK PLAN AND BUDGET: PREPARATION AND CONTENT

The third audit planned in the SIAP was launched January 2025 and is in the preliminary phase. The new SIAP exercise starting is foreseen in June 2025.

Audit of the European Court of Auditors

In the reporting year, The European Court of Auditors (ECA) did not carry out specific audits on EuroHPC JU, nor it did in previous years since the JU establishment. In 2024, the ECA carried out the EU Joint Undertakings annual audit for the financial year 2023.

Opinions on the reliability of accounts and legality and regularity of underlying transactions, revenues and payments released in the ECA annual reports on EU Joint Undertakings (financial years 2020, 2021, 2022 and 2023), were unqualified (clean) for EuroHPC JU.

Findings addressed only to EuroHPC JU in the ECA Joint Undertakings annual reports have been followed up. The assessment of these findings' implementation discloses the following status:

Findings pointed out in the 2020 report have been implemented with exclusion of the delays in recruitment of staff (reported also in 2021, 2022 and 2023, major improvements were reached, and full implementation is foreseen at the end of 2025).

Findings disclosed in the 2021 report which implementation are still ongoing are:

- Low results in the achievement of in-kind contribution from private members due to regulation requirements in place (the ECA reported this finding also in 2022 and 2023, and assigned an action requesting the JU to support the Commission re-assessment of current targets)
- Low implementation administrative budget and lack of planning in the management of the and reallocation of unused appropriations (the ECA reported this finding in 2022 and 2023, and assigned an action to the JU on developing corrective mechanism to reduce cash surpluses)

Findings disclosed in the 2022 report which implementation is still ongoing are:

- Low implementation of the operational budget due to the lengthy process for the acquisition of supercomputers (also reported in 2023)

Findings disclosed in the 2023 report are (not already mentioned):

- Incomplete business continuity plan and disaster recovery plan and absence of internal control policy on sensitive functions (both finalised in 2024 and currently in place)

- Implementation of a risk-based approach to grant management covering relevant projects and beneficiaries (already finalised at the end of 2024 and in place)

Overall, most of findings reported in the ECA JUs annual reports had been adequately tackled, only a few of them are ongoing. Controls to ensure monitoring of findings implementation are in place and effective.

Overall Conclusions

In 2024, as well as in previous reporting years, no critical recommendations or findings were reported by IAS or ECA for EuroHPC JU. In the Annual report on EU Joint Undertakings for the financial year 2023, the ECA released unqualified opinions on the reliability of accounts and legality and regularity of underlying transactions of the JU.

EuroHPC JU systematically addressed identified weaknesses and fully implemented actions agreed with the IAS in due time. Some actions listed in the ECA report published in October 2024 are ongoing. Some findings remaining from former ECA reports are disclosed in section 4.2.2, regularly followed up and planned to be finalised by the end of 2025.

The recommendations of auditors and the actions had been assessed to evaluate to effectiveness and efficiency of the JU internal control system. Overall, the assessment gives reasonable assurance on the adequate functioning of the internal control system. The current audit findings that remain open do not impair the declaration of assurance. Conclusion on the assurance is disclosed in section 4.4.

Assessment of the effectiveness of internal control (IC) systems

EuroHPC JU applies, like the European Commission and other EU Institutions, the COSO Internal Control Framework model since 2020[24]. The Executive Director with Decision No. 30/2023 had adopted the JU Internal Control Strategy 2023-2031. The strategy deploys the roles and responsibilities, the roadmap to implement the internal control framework and the guidelines to carry out the periodic internal control self-assessment. The objectives of the JU internal control system are stated in the financial rules.

Continuous monitoring

The continuous monitoring of the JU activities over the reporting year is ensured by several financial and non-financial controls and procedures. Continuous controls are embedded into business processes and implemented by staff. They provide timely information on the presence of weaknesses and allow prompt reaction to tackle them. Some of the most relevant continuous controls in place are ex-ante and ex-post controls, monitoring of EU funded programme KPIs, identification and reporting

[24] Decision of the Governing Board No. 13/2020 adopting the EuroHPC JU Internal Control Framework

of exception and non-compliance events, monitoring and reporting of IT incidents, quarterly review of the risk register, quarterly monitoring of the internal control and risk mitigation action plans.

On annual basis, the internal control system is assessed, and results are published with a Decision of the Executive Director. The annual internal control self-assessment was regularly carried out for the 2024 and former years, weaknesses were identified and tackled according to the action plan.

In addition, the continuous monitoring and reporting of performance are adequately supported by Corporate IT tools such as Compass, SyGMa, Audex, ABAC, ARES, Sysper, Mips and Jsis.

When there are signals of emerging risks or weaknesses, the issue is promptly reported to the JU management that may act and put in place corrective actions with the support of the internal control and audit officer.

The internal control and audit officer monthly reports on the status of the internal control system to the Executive Director.

Overall, continuous monitoring and reporting in EuroHPC JU is present and adequately functioning, some improvements are needed related to the formalisation and integration of controls in place. Regular reporting is provided to the Governing Board at its meetings.

Risk assessment and management

The EuroHPC JU Risk management implementation guide is in place since 2023. The guide is aligned with the Commission instruction for identification, assessment and management of risks and with the Component 2 of the JU Internal control Framework.

The approach applied to carry out the JU risk assessment is bottom-up, all staff and management are involved in the exercises. The launch of exercise begins with an internal workshop aiming at rise awareness and present responsibilities, duties, process and timeline. The risk register and action plan results from the consolidation of risks identified and assessed by staff and is approved by the Executive Director and communicated across the JU. Responsibility to implement actions listed in the action plan are assigned, reviews are performed quarterly with the coordination of the Internal control and audit officer and reported to the Executive Director. The latest available risk register is taken into consideration for the draft of the EuroHPC JU Annual Working Programme (AWP).

In the last quarter of 2023, the JU regularly carried out the risk assessment exercise for the year 2024. The exercise included the antifraud risk assessment and was concluded with the draft of an action plan that was implemented in the reporting year. Review of risk register and follow up of planned actions were performed quarterly. The final assessment was reported in the annual internal control self-assessment for the year 2024.

In the last quarter of 2024, the risk assessment exercise for 2025 was regularly launched and finalised applying the same approach as for former years.

Overall, the management of risks in the JU did not disclose weaknesses that have a material impact on the presence and functioning of the internal control system or that could affect the achievement of the JU objectives.

Prevention of Conflict of Interest

The prevention of conflict of interest in EuroHPC Ju is addressed at different levels.

Rules on Conflict of Interest (CoI) for the members of the Governing Board (GB) and the Advisory Boards (INFRAG and RIAG) are in place and effectively applied since their adoption in 2022. The secretariat of the GB manages the declarations according to established rules. Templates are in place and used for declarations. In 2023, no conflicts of interest were reported for members of the Boards.

Rules on prevention of conflict of interest for EuroHPC staff are stated in the GB Decision No. 16/2022 and regularly applied. In addition, the Ethics module in Sysper had been activated and is in place; it enabled the digital submission of CoI declarations, enhances management of declarations and ensures better monitoring and prevention. In the reporting period, there were no conflict of interest detected among staff.

In the reporting year, EuroHPC JU had reasonable assurance that the overall measures in place to prevent conflicts of interest were effective.

Conclusion on the assurance

Based on the elements reported above, the management of EuroHPC JU has reasonable assurance that, overall, the internal control system is present and adequately functioning. Therefore, in his capacity, the Executive Director has signed the declaration of assurance presented in the section 4.5.2 without reservations.

Statement of Assurance

Assessment of the Annual Activity Report by the Governing Board

BACKGROUND

The Executive Director submits the draft Consolidated Annual Activity Report (CAAR) 2024 to the Governing Board for assessment and approval. The Governing Board approves the CAAR together with the annual accounts. Once approved by the GB, the CAAR is made publicly available. No later than 1 July 2025, the CAAR together with its assessment will be sent by the Executive Director to the European Court of Auditors and to the European Commission.

The members of the Governing Board of the EuroHPC Joint Undertaking took note of the Annual Activity Reports 2020, 2021, 2022 and 2023. The presented document is the fifth Annual Activity Report of the EuroHPC JU since its autonomy in September 2020.

The EuroHPC Joint Undertaking was established on 28 September 2018 by Council Regulation No 2018/1488, published in the Official Journal of the EU on 8 October 2018 and entered into force on 28 October 2018.

Following the adoption of the new Council Regulation 2021/1173 in July 2021, the JU's objectives were updated and now reads as follows:

- to contribute to the implementation of Regulation (EU) 2021/695 and in particular Article 3
- thereof, to deliver scientific, economic, environmental, technological and societal impact from the Union's investments in research and innovation, so as to strengthen the scientific and technological bases of the Union, deliver on the Union strategic priorities and contribute to the realisation of Union objectives and policies, and to contribute to tackling global challenges, including the Sustainable Development Goals by following the principles of the United Nations Agenda 2030 and the Paris Agreement adopted under the United Nations Framework Convention on Climate Change
- to develop close cooperation and ensure coordination with other European Partnerships, including through joint calls, as well as to seek synergies with relevant activities and programmes at Union, national, and regional level, in particular with those supporting the deployment of innovative solutions, education and regional development, where relevant;
- to develop, deploy, extend and maintain in the Union an integrated, demand-oriented and user-driven hyper-connected world-class supercomputing and data infrastructure;
- to federate the hyper-connected supercomputing and data infrastructure and interconnect it with the European data spaces and cloud ecosystem for providing computing and data services to a wide range of public and private users in Europe;
- to promote scientific excellence and support the uptake and systematic use of research and innovation results generated in the Union;
- to further develop and support a highly competitive and innovative supercomputing and data ecosystem broadly distributed in Europe contributing to the scientific and digital leadership of the Union, capable of autonomously producing computing technologies and architectures and their integration on leading computing systems, and advanced applications optimised for these systems;

- to widen the use of supercomputing services and the development of key skills that European science and industry need.

EuroHPC's mandate was further expanded with the adoption of Council Regulation 2024/1732 in June 2024, amending Regulation (EU) 2021/1173, and now allows the JU to *'to perform activities in the domains of acquiring and operating AI-optimised supercomputers or partitions of supercomputers to enable machine learning and training of general purpose AI models and to create a new access mode to its computing resources for the AI startup ecosystem and the research and innovation ecosystem and to develop dedicated AI applications that are optimised to run on its supercomputers. (…)These changes would enable the Joint Undertaking to offer tailored computing power and services to nurture large-scale AI training, development and uptake in the Union, which is not feasible under the current Regulation. and national AI initiatives*[1].

WORK OF THE GOVERNING BOARD AND ADVISORY COMMITTEES

The Governing Board continues its works according to the mission given by the Council Regulation, under the leadership of its Chairman, Mr. Rafał Duczmal who was elected in October 2023.

In 2024, following the end of the two-year mandate of RIAG and INFRAG, the Governing Board elected the RIAG and INFRAG that has a tenure from 2024-2026. In 2024, it also endorsed the latest version of the amended MASP which was presented by the outgoing RIAG and INFRAG (2022-2024).

Seven Governing Board meetings were held throughout 2024. Additionally, several informal Governing Board meetings were held. One new Participating State applied to join EuroHPC JU in 2024.The United Kingdom was accepted during the Governing Board meeting in April 2024. Switzerland, which is in the process of ratifying its accession to the Horizon Europe and Digital Europe Programme, was accepted as observer at the beginning of 2025.

The JU's team expanded to 44 staff members with additional staff planned for 2025. The JU received its European Court of Auditors (ECA) feedback on its budget and accounting over 2023. For the most part this feedback was very positive, EuroHPC JU continued to systematically address identified weaknesses and fully implemented most planned actions.

The Board is of the opinion that the Consolidated Annual Activity Report sets out the relevant highlights of the execution of the 2024 activities defined for the Joint Undertaking from both an operational and administrative point of view. The report will be sent to the European Parliament, Council of Ministers, Commission and Court of Auditors. It will

form the basis of the discussion with the European Parliament in the preparation of the Budgetary Discharge in 2024.

HIGHLIGHTS OF EUROHPC JU MAIN ACHIEVEMENTS IN 2024

The Board is pleased to note that in 2024 EuroHPC JU had procured 6 quantum computers. The quantum computers are Piast Q (EuroQCS-Poland), VLQ (Lumi-Q consortium, Czechia), Lucy (France), Euro-Q-Exa (Germany), and EuroQCS (Spain).

Under procurement are the Alice Recoque, the second Exascale system to be located in France, two mid-range systems (Arrhenius in Sweden and Daedalus in Greece) and the upgrade to the Discoverer supercomputer (Bulgaria).

The exascale supercomputer Jupiter, hosted in Germany, is currently being built and one partition was already ranked first in the Green TOP500 at the end of 2024.

In addition, a call for tender for a new generation of AI optimised supercomputers was launched in September 2024 and the Governing Board selected six 'AI factories' in December 2024. This expanding infrastructure paves the way for a world-class HPC, AI and Quantum ecosystem in Europe that addresses relevant and important societal challenges. EuroHPC supercomputers provide HPC and AI services for users across Europe from the private and public sectors.

In March 2024 EuroHPC JU held its annual Summit in Antwerp, Belgium and its second User Day, in Amsterdam in October 2024, both key events which have the purpose of bringing together the European HPC ecosystem together, with new focus also on the fast-growing group of AI oriented users.

During 2024, EuroHPC JU launched 5 new R&I calls in addition to access and procurement calls.

In regard to international cooperation a call was launched to strengthen cooperation in the field of HPC and facilitate access between the EU and Japan in Quantum and in HPC applications with India.

In 2024, the Governing Board approved a call to support Europe's competitiveness computing hardware technology and applications which implemented the Framework Partnership Agreement (FPA) to develop an innovative HPC ecosystem based on RISC-V.

EuroHPC JU approved projects in technologies and software to improve performance and efficiency of the HPC-systems, in the area of innovation in low latency and high bandwidth interconnects and in the development of energy efficient HPC software tailored to exascale and post-exascale supercomputers.

CONCLUSIONS BY THE GOVERNING BOARD

The Governing Board approved a very ambitious work programme in late 2023 which was not fully completed due to the addition of the new AI Factories activities in July 2024 and consequent additional workload. As a result, the Governing Board had to agree to some calls to be carried over to 2025.

Despite this, the Governing Board is pleased about the excellent implementation of the JU's activities and notes that no critical risks have been identified regarding the JU's main business processes and internal controls. The Governing Board is also very grateful for all the excellent work that was delivered by the JU staff in 2024.

It is also pleased to note the further development and strengthening of the risk management approach, in particular enhancing the systematic monitoring of technical and financial risks in the projects, as well as strengthening internal control capabilities and procedures. The Governing Board takes note that the JU has fulfilled its monitoring tasks through the implementation and usage of dedicated key performance indicators (KPIs) for the achievement of strategic objectives.

In 2024, the JU continued to improve the mandatory reporting process regarding the contributions of Participating States and the IKOP reporting by Private Members on their contribution made to the JU's activities.

Declaration of assurance

I, the undersigned, Anders Dam Jensen, Executive Director of EuroHPC Joint Undertaking,

In my capacity as authorising officer by delegation

Declare that the information contained in this report gives a true and fair view.

State that I have reasonable assurance that the resources assigned to the activities described in this report have been used for their intended purpose and in accordance with the principles of sound financial management, and that the control procedures put in place give the necessary guarantees concerning the legality and regularity of the underlying transactions.

This reasonable assurance is based on my own judgement and on the information at my disposal, such as the results of the self-assessment, ex-post controls, the work of the internal audit capability, the observations of the Internal Audit Service and the lessons

learnt from the reports of the Court of Auditors for years prior to the year of this declaration.

Confirm that I am not aware of anything not reported here which could harm the interests of the Joint Undertaking.

Luxembourg, 26 June 2025

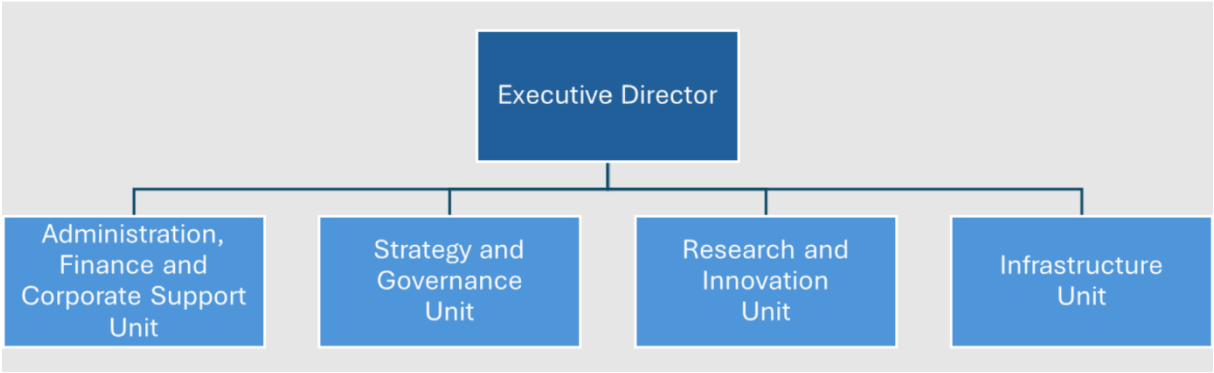
Anders Dam Jensen

Executive Director

Annexes

Organisational chart

The organigramme below presents the organisational structure of the JU, up to the Head of Unit level.



Governing Board Members as of December 2024

COUNTRY	REPRESENTATIVE	SUBSTITUTE
Austria	Stefan Hanslik	Ingo HEGNY
Belgium	Geert Van Grootel	Laurent Ghys Didier Flagothier
Bulgaria	Ivan DIMOV	Yumer Kodzhayumer
Croatia	Zlatan CAR	Mateo Ante Bosnić
Cyprus	Elena POULLI	Loizos Solomou
Czechia	Vít Vondrák	Petra Nichtburgerova
Denmark	René Michelsen	
Estonia	Aile TAMM	
Finland	Erja Heikkinen	Petteri Kauppinen
France	Laurent Crouzet	Pierre Bonnet
Germany	Stefan Mengel	Roland Krüppel Michael Rafii

Greece	Nectarios Koziris	Petros Sampatakos
Hungary	István Erényi	Tamás Máray Zoltan Kiss
Iceland	Morris Riedel	Henning Arnor Ulfarsson
Ireland	Peter Healy	Fiachra MacCanna
Israel	Dan Seker	Hank Nussbacher
Italy	Paola Inverardi	Stefano Fabris
Latvia	Sarmite Mickevica	
Lithuania	Arturas MAL	Povilas Treigys
Luxembourg	Mario Grotz	Gabriel Crean
Malta	Marlene AGIUS	Trevor Sammut
Montenegro	Milena Milonjić	
North Macedonia	Boro Jakimovski	Anastas Mishev
Norway	Liv Furuberg	Waqar Ahmed Nenitha Charlotte Dagslott
Poland	Mariusz Sterzel	Cezary Blaszczyk Rafal Duczmal (Chair) Michał Goszczyński
Portugal	João Nuno Ferreira	Rui Carlos Oliveira
Romania	Monica Alexandru	Dragoş-Cătălin Barbu
Serbia	Bojan Jakovljevič	Bogdan Stešević
Slovak Republic	Pavol Podhora	Michal Ilko
Slovenia	Karolina Schlegel	Peter Sterle
Spain	Inmaculada Figueroa	Javier Ponce
Sweden	Magnus Friberg	Thomas SVEDBERG

The Netherlands	Jelle Stronks	Just van den Hoek Ruben Wassink
Türkiye	Memhmet Mirat Satoglu	Onur Temizsoylu
United Kingdom	Imran Shafi	Sam Cannicott
European Commission	Thomas Skordas	Gustav Kalbe
Private Members		
ETP4HPC	Jean-Pierre Panziera	
DAIRO	Thomas Hahn	
EuroQuiC	Laure Le Bars	

List of RIAG Members

Prof. Estela SUAREZ (Chair)*	University of Bonn & Jülich Supercomputing Centre (JSC)
Daniele CESARINI (Vice-Chair)*	CINECA (Interuniversity Consortium for Automatic Computing in North Eastern Italy)
Rosa BADIA	Barcelona Supercomputing Centre (BSC)
Maike GILLIOT	CEA (French Alternative Energies and Atomic Energy Commission)
Hans-Christian HOPPE	ParTec AG
André MARTINS	University of Lisbon
Jeanette NILSSON	Research Institutes of Sweden AB (RISE)
Jesse ROBBERS	Quantum Delta NL
Bruno TAKETANI	ParTec AG
Sophie Jacqueline Emmanuelle VALCKE	Centre Européen de Recherche et de Formation Avancée en Calcul Scientifique (CERFACS)
Roel WUYTS	IMEC1.3

List of INFRAG Members

Stephane REQUENA (Chair)*	GENCI
Walter LIOEN (Vice-Chair) *	SURF BV
Hans EIDE	Sigma2
Ricardo FONSECA	ISCTE – Instituto Universitario de Lisboa
Hanifeh KHAYYERI	RISE
Dejan LESJAK	Jozef Stefan Institute
Marek MAGRYŚ	ACC Cyfronet AGH
Valentin PLUGARU	LuxProvide

Antti POSO	University of Eastern Finland
Michael RESCH	University of Stuttgart
Gabriella SCIPIONE	CINECA
Göran WENDIN	WACQT

*at the request of the Governing Board, the Chairs and Vice-Chairs of RIAG and INFRAG are invited to attend Governing Board meetings in order to provide, where necessary, their expertise.

Work Programme 2024

The Table of 2024 Actions with budget allocation (estimated amounts in EUR) was adopted by the Governing Board and published in December 2023. It indicates what actions that were launched in 2024. Due to an increase workload due to the new AI Factories workload, the Governing Board chose to cancel or postpone certain actions at the end of 2024.

Pillar	Actions	Funding source	Type of action	Planned EU contribution	Total planned budget	Launched in 2024
Infrastructure	1st CFEI post-exascale supercomputer	DEP	EU 50% (Capex +Opex) PS 50%	400 Million (to be committed in 2025)	800 Million (to be committed in 2025)	Launched
	2nd CEI for an Industrial HPC for AI or other applications of industrial relevance	DEP	EU 35% (Capex only)	45.6 Million	130.4 Million	Launched
	Upgrading EuroHPC systems to AI (commitment planned in 2025)	DEP	EU 35% PS 65%	60 Million	171 Million	Cancelled and budget redeployed into AI Factory activities
	3rd CFEI Quantum Computing	DEP	EU 50% PS 50%	10 Million	20 Million	Cancelled
	Procurement for Peer Review Platform	DEP	EU 100%	1.8 Million	1.8 Million	Launched

Connected and Federated	Connected HPC infrastructure and services	CEF-2	EU 100%	60 Million	60 Million	Launched
Technology	Enhancing competitive European microprocessor technology for HPC	Horizon Europe	EU 50% PS 50%	48.6 Million	97.3 Million	Postponed
	Enabling Universal Access and Integration of Quantum Resources	Horizon Europe	EU 50% PS 50%	10 Million	20 Million	Postponed
	Development of new benchmarks for HPC, Quantum Computing, and AI	Horizon Europe	EU 50% PS 50%	10 Million	20 Million	Postponed
	HPC/QC Middleware technologies	Horizon Europe	EU 50% PS 50%	20 Million	40 Million	Postponed
Applications	Quantum application prizes	Horizon Europe	EU 100%	300,000 EUR	300,000 EUR	Postponed
	HPC for AI Software Ecosystem	Horizon Europe	EU 50% PS 50%	8 Million	16 Million	Postponed
	HPC Applications	Horizon Europe	EU 50% PS 50%	10 Million	20 Million	Postponed
	Centres of Excellence to support the development of exascale applications	Horizon Europe	EU 50% PS 50%	10 Million	20 Million	Postponed
	HPC/Cybersecurity/AI	DEP	EU 50%	5 Million	10 Million	Cancelled

			PS 50%			
	Continuous integration and deployment platform (CI/CD)	DEP	EU 100%	5 Million	5 Million	Postponed
Competences and Skills	EuroHPC Masters Programme (2nd call)	DEP	100%	10 Million	10 Million	Launched
	2nd National Competence Centre Call	DEP	EU 50% PS 50%	5 Million	10 Million	Launched
	EuroHPC Summit 2025	DEP	100%	700,000 EUR	700,000 EUR	Completed
	User Day 2024	DEP	100%	150,000	150,000	Completed
International	Support EU Digital Partnership activities	Horizon Europe	100%	10 Million	10 Million	Launched (Japan and India Calls)

Establishment plan and additional information on HR management

Function group and grade	YEAR 2023				YEAR 2024			
	Authorised		Actually filled as of 31/12		Authorised		Actually filled as of 31/12	
	Perm. posts	Temp. posts	Perm. posts	Temp. posts	Perm. posts	Temp. posts	Perm. posts	Temp. posts
AD 16								
AD 15								
AD 14		1		1		1		1
AD 13								
AD 12		1		1		1		1
AD 11						1		1
AD 10		2		1		1		
AD 9		2		2		2		2
AD 8		10		4		10		6
AD 7		4		10		4		8
AD 6		5		3		5		3
AD 5								
TOTAL AD		25		22		25		22

AST 11								
AST10								
AST 9								
AST 8								
AST 7								
AST 6								
AST 5								
AST 4		2		2		2		2
AST 3								
AST 2								
AST 1								
TOTAL AST				2		2		2
AST/SC 6								
AST/SC 5								
AST/SC 4								
AST/SC 3								
AST/SC 2								
AST/SC 1								
TOTAL AST/SC								
TOTAL AD+AST+ AST/SC		27		24		27		24
GRAND TOTAL	27		24		27		24	

Contract Agents	Authorised 2023	Actually Filled as of 31/12/2023	Authorised 2024	Actually filled as of 31/12/2024
Function Group IV	12	2	22	10
Function Group III	14	9	4	5
Function Group II	1	1	1	1
Function Group I				
Total	27	12	27	16

Materiality criteria

The 'materiality' concept provides the Executive Director with a basis for assessing the importance of the weaknesses/risks identified and thus whether those weaknesses should be subject to a formal reservation to his declaration.

When deciding whether something is material, both qualitative and quantitative terms have to be considered. In qualitative terms, when assessing the significance of any weakness, the following factors have been taken into account:

- The nature and scope of the weakness;
- The duration of the weakness;
- The existence of compensatory measures (mitigating controls which reduce the impact of the weakness);
- The existence of effective corrective actions to correct the weaknesses (action plans and financial corrections) which have had a measurable impact.

In quantitative terms, in order to make a judgement on the significance of a weakness, the potential maximum (financial) impact is quantified.

Whereas EuroHPC JU control strategy is of a multiannual nature (i.e. the effectiveness of the JU's control strategy can only be assessed at the end of the programme, when the strategy has been fully implemented and errors detected have been corrected), the Executive Director is required to sign a declaration of assurance for each financial year. In order to determine whether to qualify his declaration of assurance with a reservation, the effectiveness of the JU's control system must be assessed, not only for the year of reference, but more importantly, with a multiannual perspective.

The control objective for EuroHPC JU is set out in the Commission proposal for the Council Regulation on EuroHPC Joint Undertaking. The objective is to ensure that the 'residual error rate', i.e. the level of errors which remain undetected and uncorrected, on an annual basis, does not exceed 2% by the end of the multiannual programme. Progress towards this objective is to be (re)assessed annually, in view of the results of the implementation of the ex-post audit strategy.

As long as the residual error rate is not (yet) below to 2% at the end of a reporting year within the programme life cycle, the Executive Director may also take into account other management information at his disposal to identify the overall impact of the situation and determine whether or not it leads to a reservation.

If an adequate calculation of the residual error rate is not possible, for reasons not involving control deficiencies, the consequences are to be assessed quantitatively by estimating the likely exposure for the reporting year. The relative impact on the declaration of assurance would then be considered by analysing the available information on qualitative grounds and considering evidence from other sources and areas (e.g. information available on error rates in more experienced organisations with similar risk profiles).

Assessment of the effectiveness of controls

The starting point to determine the effectiveness of the controls in place is the 'representative detected error rate' expressed as the percentage of errors in favour of the JU, detected by ex-post audits, measured with respect to the amounts accepted after ex-ante controls.

However, to take into account the impact of the ex-post controls, this error level is adjusted by subtracting:

- Errors detected and corrected as a result of the implementation of audit conclusions.
- Errors corrected as a result of the extension of audit results to non-audited contracts with the same beneficiary.

This results in a residual error rate, which is calculated as follows:

$$\text{Re } sER\% = \frac{(\text{Re } pER\% * (P - A)) - (\text{Re } pERsys\% * E)}{P}$$

where:

ResER% residual error rate, expressed as a percentage.

RepER% representative error rate, or error rate detected in the common representative sample, expressed as a percentage. The RepER% is composed of complementary portions reflecting the proportion of negative systemic and no systemic errors detected. This rate is the same for all implementing entities, without prejudice to possibly individual detected error rates.

RepERsys% portion of the RepER% representing negative systemic errors, (expressed as a percentage). The RepERsys% is the same for all entities and it is calculated from the same set of results as the RepER%

P total requested EC contribution (€) in the auditable population (i.e. all paid financial statements).

A total requested EC contribution (€) as approved by financial officers of all audited financial statements. This will be collected from audit results.

E total non-audited requested EC contribution (€) of all audited beneficiaries.

This calculation will be performed on a point-in-time basis, i.e. all the figures will be provided as of a certain date.

The Executive Director must also take into account other information when considering if the overall residual error rate is a sufficient basis on which to draw a conclusion on assurance (or make a reservation) for specific segment(s) of the EU Programmes. This information may include the results of other ex-post audits, ex-ante controls, risk assessments, audit reports from external or internal auditors, etc. All this information may be used in assessing the overall impact of a weakness and considering whether to make a reservation or not.

Budgetary and Financial Management 2024

Sources of financing

The EuroHPC JU is funded by its members, the Union represented by the Commission, the Participating States and the Private Members, which are ETP4HPC "the European Technology Platform for High Performance Computing, DAIRO "Data, Artificial Intelligence and Robotics", previously known as BDVA "the Big Data Value Association", and QuIC "European Quantum Industry Consortium".

A. The administrative costs are fully covered by the Union contribution. The appropriations come from the HE and the DEP programmes.

B. The operational costs are covered by means of:

a) the Union's financial contribution;
b) financial contributions by the Participating State where the hosting entity is established or by the Participating States in a hosting consortium to the Joint Undertaking, including the Union contributions that are considered to be contributions of the Participating State pursuant to Article 15(3) of Regulation (EU) 2021/695, for the acquisition of the high-end EuroHPC supercomputers or quantum machines and for their operation until their ownership is transferred to the hosting entity, they are sold or decommissioned in accordance with Articles 11(5) and 12(7) of the EuroHPC Regulation, less the contributions by the Joint Undertaking and any other Union contribution to those costs;
c) in-kind contributions by the Participating State where the hosting entity is established or by the Participating States in a hosting consortium, including the Union contributions that are considered to be contributions of the Participating State pursuant to Article 15(3) of Regulation (EU) 2021/695, consisting of the operating costs of the EuroHPC supercomputers owned by the Joint Undertaking, incurred by the hosting entities, less the contributions by the Joint Undertaking and any other Union contribution to those costs;
d) financial contributions by the Participating State where the hosting entity is established or by the Participating States in a hosting consortium, including the Union contributions that are considered to be contributions of the Participating State pursuant to Article 15(3) of Regulation (EU) 2021/695, consisting of the costs incurred for the acquisition, jointly with the Joint Undertaking, of the mid-range EuroHPC supercomputers, less the contributions by the Joint Undertaking and any other Union contribution to those costs;
e) financial contributions by a consortium of private partners consisting of the costs incurred for the acquisition and operation, jointly with the Joint Undertaking, of the industrial-grade EuroHPC supercomputers, less the contributions by the Joint Undertaking and any other Union contribution to those costs, until their ownership is transferred to the hosting entity, they are sold or decommissioned in accordance with Article 13(6) of this Regulation;
f) financial contributions by Participating States to the eligible costs incurred by beneficiaries established in that Participating State, including the Union contributions that are considered to be contributions of the Participating State pursuant to Article 15(3) of Regulation (EU) 2021/695, in implementing indirect actions corresponding to the research and innovation agenda as a complement to the reimbursement of these costs made by the Joint Undertaking,

less the contributions by the Joint Undertaking and any other Union contribution to those costs. Such contributions shall be without prejudice to state-aid rules; and,

g) in-kind contributions by the Private Members or their constituent entities and affiliated entities as defined in Article 2, points (16) and (17) of the EuroHPC Regulation.

Overview of the 2024 budget

Initial budget, amending budgets 2024 and budget transfers 2024

Initial budget, amending budgets 2024

a) The initial budget and work programme was adopted on 07/12/2023 through GB decision 44/2023 and inscribed in ABAC financial system as the initial budget. This decision also included the approval of the full staff establishment plan for 2024. However, the budget situation in 2024 was significantly impacted by the adoption of the EU regulation Council Regulation (EU) 2024/1732 which amended the Regulation (EU) 2021/1173 by introducing a new activity pillar for the EuroHPC JU in the area of Artificial Intelligence. As a result, the JU reprioritized the activities initially approved in the initial work programme, focusing on this new initiative. The last amendment of the 2024 budget and work programme was adopted in December 2024, leading to the cancellation or postponement of certain calls for proposals. These calls would only be launched in 2025 and did not generate commitments or payments in 2024.

b) Amendment 1: GB Decision 11/2024 - The annual budget and work programme were amended for the first time in 2024 to reflect the following changes:

- A Procurement for Peer Review Platform with a budget allocation from the Digital Europe Programme of EUR 1,8 M;
- A call on Continuous integration and deployment platform (CI/CD) with an updated budget allocation from the Digital Europe Programme of EUR 5 M;
- A 2nd call for National Competence Centres for Exascale Supercomputing with a EU budget allocation from the Digital Europe Programme of EUR 5 M to be matched by Participating States;
- An updated budget, including the reactivation of past years credits.

Budget to be Reactivated in 2023 (Administrative) (of which)	Commitment Appropriations (CA)	Payment Appropriations (PA)	Budget to be Reactivated in 2024 (Operational) (of which)	Commitment Appropriations (CA)	Payment Appropriations (PA)
Reactivation of Available Credits from the year 2023	1,280,000	2,035,108	Reactivation of Available Credits from the year 2023	79,680,688	431,673,408
n-1 - Credits (C1 from FY2023)			n-1 - Credits (C1 from FY2023)		130,337,524
n-2 - Credits (C1 from FY2022)	1,148,681	2,035,108	n-2 - Credits (C1 from FY2022)	26,813,688	301,335,884
n-3 - Credits (C1 from FY2021)	131,319		n-3 - Credits (C1 from FY2021)	52,867,000	-

Reactivation of the unused appropriations

c) Amendment 2: GB Decision 20/2024 - This amendment focused on the additional changes to operational activities of the Joint Undertaking and did not introduce any changes to the budget.

d) Amendment 3: GB Decision 41/2024 - This amendment reflected the operational activities related to the implementation of the 'AI Factories' of the Joint Undertaking. The budget was adapted accordingly.

Budget to be Reactivated in 2024 (Administrative) (of which)	Commitment Appropriations (CA)	Payment Appropriations (PA)
Reactivation of Available Credits from the year 2023	288,723	288,723
n-1 - Credits (C1 from FY2023)		
n-2 - Credits (C1 from FY2022)	288,723	288,723
n-3 - Credits (C1 from FY2021)		

Budget to be Reactivated in 2024 (Operational) (of which)	Commitment Appropriations (CA)	Payment Appropriations (PA)
Reactivation of Available Credits from the year 2023	7,433,000	-
n-1 - Credits (C1 from FY2023)	7,433,000	
n-2 - Credits (C1 from FY2022)		
n-3 - Credits (C1 from FY2021)		

Reactivation of unused appropriations

e) Amendment 4: GB Decision 50/2024 - This amendment focused on the additional changes to operational activities of the Joint Undertaking and did not introduce any changes to the budget.

f) Amendment 5: GB Decision 57/2024 - This amendment focused on the additional changes to operational activities of the Joint Undertaking and did not introduce any changes to the budget.

g) Amendment 6: GB Decision 62/2024 - This amendment focused on the additional changes to operational activities of the Joint Undertaking and did not introduce any changes to the budget.

h) Amendment 7: GB Decision 68/2024 - This amendment reflected the following changes:

- An updated budget which reflects changes in amendment 6 of work programme 2024; and
- Final adjustments of the overall budget to optimize budget resources of the current year.

Budget to be deactivated (Administrative) (of which)	Commitment Appropriations (CA)	Payment Appropriations (PA)
Deactivation of the reactivated unused appropriation from the previous year	- 615,201	- 1,230,316
n-1 - Credits (C1 from FY2023)		
n-2 - Credits (C1 from FY2022)	- 615,201	- 1,230,316
n-3 - Credits (C1 from FY2021)		

Budget to be deactivated (Operational) (of which)	Commitment Appropriations (CA)	Payment Appropriations (PA)
Deactivation of the reactivated unused appropriation from the previous year	-	- 322,798,070
n-1 - Credits (C1 from FY2023)		- 130,337,524
n-2 - Credits (C1 from FY2022)		- 192,460,546
n-3 - Credits (C1 from FY2021)		

Deactivation of unused appropriations

Overview of budgets transfers in 2024

Transfer No	Budget Structure	Type	Amount in EUR	Diff.
1	EHPC-B2024-1500-C1-HPC	PC - Payment and Commitment Appropriations	- 20,000	Y
	EHPC-B2024-3000-C1-HPC	PC - Payment and Commitment Appropriations	20,000	Y
2	EHPC-B2024-2400-C2-HPC	C - Commitment Appropriations	- 6,000	Y
	EHPC-B2024-2700-C2-HPC	C - Commitment Appropriations	6,000	Y
3	EHPC-B2024-2600-C1-HPC	C - Commitment Appropriations	- 93,094	Y
	EHPC-B2024-2400-C1-HPC	C - Commitment Appropriations	91,094	Y
	EHPC-B2024-2700-C1-HPC	C - Commitment Appropriations	2,000	Y
	EHPC-B2024-2600-C1-HPC	P - Payment Appropriations	- 64,700	Y
	EHPC-B2024-2700-C1-HPC	P - Payment Appropriations	64,700	Y
4	EHPC-B2024-1100-C1-HPC	P - Payment Appropriations	- 14,000	Y
	EHPC-B2024-1400-C1-HPC	P - Payment Appropriations	14,000	Y

Final Budget

a) Revenue

The EuroHPC JU budget revenue according to the final voted budget for 2024 was EUR 348 M. The reactivation revenues from the previous years were EUR 106 M. The cashed amount in 2024 is EUR 252 M including two debit notes for an amount of EUR 12 M that were sent to Barcelona Super Computing Center (BSC) late in 2023 and cashed in 2024. Also a debit note for an amount of EUR 1 M was sent to BSC late in 2024 which explains the difference between the total budget revenue for 2024 of EUR 241 M and the cashed amount of EUR 240 M.

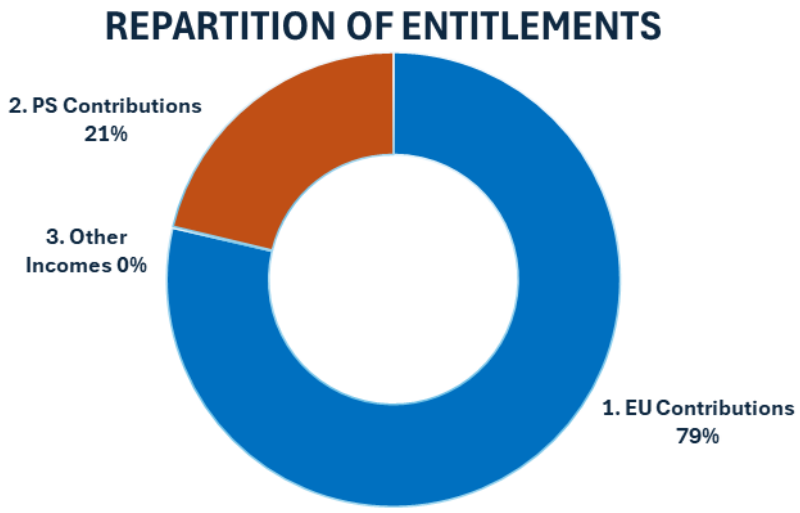
- The financial contributions made by the Participating States to the procurements implemented by the JU amounted to a total of EUR 52 M. They were collected from the Hosting Entities which act on behalf of the consortium of the Participating States. The JU has recovered the amounts indicated in the Administrative Agreements from the following Hosting Entities:

  - CSC – LUMI Consortium and Czech Republic (Pre-Exascale)
  - CINECA – LEONARDO Consortium, Italy (Pre-Exascale)
  - BSC – MareNostrum5 Consortium, Spain (Pre-Exascale)
  - BSC - EuroQCS- Spain (Quantum). For this project the PS funds will be made available from RRF programme in line with our regulation and RRF regulation, actions implemented by Member States.

- The EU contribution for the three funding programmes (DEP, HE and CEF2) and the legacy H2020 (Reg. 2018/1488) amounts to EUR 190 M for 2024.

- Other revenues
    - Costs incurred for the Court Case T-717/20, Lenovo Global Technology Belgium v/EuroHPC JU were recovered following Court judgment of 19 October 2022, to the amount of EUR 235,000.
    - Due to a reconciliation made with three experts an additional amount of EUR 3,153 was cashed.
    - Due to the penalties applied to the vendor for the procurement contract EUROHPC JU 2019 - Joint Procurement for the acquisition, delivery, installation and maintenance of the Euroit4i Supercomputer Karolina, the amount of EUR 10,975 was recovered.
    - Due to a reconciliation made with the coordinator for the project no. 956874 a recovery for the excess amount paid during the final payment phase was made for a total amount of EUR 10,228.

The chart and table below show the contributions made in 2024 from the EU and the Participating States:



Contributions from EU and Participating States 2024	
EU Administrative Contribution	**7,804,155 €**
EU Digital Europe Programme Administrative	4,821,123 €
EU Horizon Europe Programme Administrative	2,983,032 €
EU Operational Contribution	**182,014,402 €**
EU Digital Europe Programme Operational	89,654,543 €
EU Horizon Europe Programme Operational	60,000,564 €
EU H2020 Operational	32,359,295 €
Total EU Contributions	**189,818,557 €**
Other Incomes - Recoveries from expenses	
Recoveries from expenses - Administrative Budget	235,000 €
Recoveries from expenses - Operational Budget	24,356 €
Total Other Incomes	**259,356 €**
LEONARDO Pre-exascale Project	921,880 €
LUMI Pre-exascale Project	2,183,617 €
MN5 Pre-exascale Project	46,894,349 €
EuroQCS Spain - Quantum Project - RRF programme	1,275,000 €
Total Participating States Contributions	**51,274,846 €**
EU + Participating States Contributions - Total Cashed	**239,818,404 €**
EU + Participating States Contributions - Total Not Cashed	***1,275,000 €***
Other Incomes - Recoveries from expenses	**259,356 €**
Total Revenue Cashed	**240,077,760 €**

a) Administrative Expenditure (Titles 1 and 2):

In compliance with the financial rules of the JU, and, in particular, of the n+3 guidelines of the Commission, the JU has not only used C1 (fresh 2024 credits) but also C2 (reactivated credits).

Budget implementation under titles 1 and 2 (C1 and C2 appropriations) is as follows:

Situation of Commitment and Payment Appropriations - Title 1

Commitment Appropriations (CA)		Payment Appropriations (PA)	
Received	5,889,068 €	Received	6,082,348 €
Consumed	5,582,571 €	Consumed	5,397,371 €
	95%		**89%**

Situation of Commitment and Payment Appropriations - Title 2

Commitment Appropriations (CA)		Payment Appropriations (PA)	
Received	3,000,609 €	Received	2,947,323 €
Consumed	2,733,011 €	Consumed	1,797,487 €
	91%		**61%**

In line with the Joint Undertaking N+3 rule, unused appropriations will be carried over to 2024. The tables above show the C1 and C2 appropriations.

The majority of EuroHPC JU's administrative contractual commitments in 2024 were concluded on the basis of existing multiannual framework contracts (FWCs). In terms of volume, the FWCs most used were in the field of IT and audit services. When these contracts were not available to EuroHPC JU or they had expired, it was necessary to launch specific tender procedures, most of them for low-value contracts. All procedures were administered in compliance with EuroHPC JU Financial Rules to ensure fair competition amongst economic operators, and the most sound and efficient use of EuroHPC JU funds.

In addition, throughout 2024, EuroHPC JU used Service Level Agreements (SLAs) in force with the European Commission and other EU bodies. Several other contracts were concluded for less than EUR 15,000 each, while the following Table shows contracts concluded in 2024 for single amounts higher than EUR 15,000.

Contract Official Name	Title/Purpose of contract	Procedure Type/ Legal Basis Desc	Date	Contracted Amount (EUR)
PROMETEUS	BOOKING EUROHPC JU EXHIBITION SPACE AT ISC 2025 - 10-13 JUNE 2024 - HAMBURG/ GERMANY & BIANNUAL PUBLICATION OF TOP500 LIST ON A WEBSITE	(FR2018) Negotiated procedure without prior publication (Annex 1 - 11.1)	10/06/2024	111,320
SELECT CATERING B.V.	EUROHPC USER DAY 2024	(FR2018) Negotiated procedure without prior publication (Annex 1 - 11.1)	22/10/2024	30,160
ARENDT & MEDENACH	PROVISION OF LEGAL ADVICE IN THE CONTEXT OF THE DISPUTE IN RELATION TO THE MARE NOSTRUM 5 PROJECT	(FR2018) Negotiated procedure without prior publication (Annex 1 - 11.1)	15/04/2024	60,000
TSEG OY LTD	EUROHPC JU STAND BUILDING AND DISMANTLING SERVICES AT ISC HIGH PERFORMANCE 2024 EVENT - 12-16/05/2024 - HAMBURG	(FR2018) Negotiated procedure low value contract (Annex 1 - 14.3)	12/05/2024	47,540
PROMETEUS	BOOKING EUROHPC JU EXHIBITION SPACE AT ISC 2024 - 12-16 MAY 2024 - HAMBURG/ GERMANY & BIANNUAL PUBLICATION OF TOP500 LIST ON A WEBSITE	(FR2018) Negotiated procedure low value contract (Annex 1 - 14.3)	12/05/2024	100,460

b) **Operational Expenditure (Title 3):**

The situation in 2024 was significantly influenced by the adoption of the EU regulation Council Regulation (EU) 2024/1732 which amended the Regulation (EU) 2021/1173 to support a EuroHPC initiative for start-ups in order to boost European leadership in trustworthy artificial intelligence by introducing a new activity pillar for the Joint Undertaking in the area of Artificial Intelligence. This new objective will allow the Joint Undertaking to support the further development of a highly competitive and innovative AI startup and research ecosystem in Europe, including the development and uptake of European AI solution, by operating AI Factories.

As a result, the EuroHPC JU has reprioritized the activities initially approved in the 2024 Working Programme, focusing on this new initiative, which is of high strategic importance for both the European Union and the Participating States, the members of the JU.
Throughout 2024, an in-depth analysis was conducted to identify potential funding sources for the implementation of AI activities. Consequently, unused credits from the previous year were reallocated,

and certain activities planned for 2024 were either canceled or postponed being implemented in the period 2025-2027.

In Q4 2024, the AI call was launched and structured into multiple cut-off dates. The EuroHPC JU allocated a total EU budget of EUR 980M for the implementation of AI activities, including EUR 800M from Digital Europe Programme and EUR 180 M from Horizon Europe Programme. Meanwhile, the Participating States committed to matching the EU contribution by providing at least EUR 980 M for the execution of this project.

The first cut-off closed in early November 2024 and was a major success for the EuroHPC JU. In December 2024, the Governing Board selected seven Hosting Entities and awarded funding to their proposals. The maximum EU contribution requested amounted to EUR 653M from Digital Europe Programme and EUR 112 M from Horizon Europe Programme. The implementation of these projects will continue over the coming years through various agreements, such as procurement contracts and grants.

Even though significant changes took place within the EuroHPC JU during 2024, the following activities were successfully carried out by the JU's staff in a timely manner for the projects planned in previous years.

Infrastructure Unit:

Regarding the CEF programme the following projects took place:

The contract signed for the study on Hyperconnectivity for HPC resources was successfully completed and all the payments are performed accordingly.

The contract no. LC-03662828 /EUROHPC/2023/CD/0003 was signed for the acquisition, delivery, installation, and services of the EuroHPC Federation Platform for the European High Performance Computing. The contract will be implemented during the four years and the first payments are foreseen to be performed since 2025.

Also, due to the new priorities that were assigned to EuroHPC JU, the call for tender for the Acquisition of Hyperconnectivity Services for HPC Systems that will build a high-speed, secure network connecting European supercomputers and data centers, creating a hyperconnected and federated HPC and quantum computing ecosystem was published only in late December 2024 and the payments foreseen had been postponed for the coming years.

Regarding the Digital Europe Programme the following procurements took place:

Call for tender for the acquisition, delivery, installation and hardware and software maintenance of mid-range Supercomputer DAEDALUS in Greece, capable of executing more than 60 petaflops or 60 million billion calculations per second. The call was closed in Q4 2024 and the evaluation was not

concluded by the end of 2024. Therefore, the payments are postponed for the coming years once the award decision will take place.

Call for tender for the EuroHPC Peer-Review Platform. The objective of this call for tender is to procure, develop and operate a platform in-house for managing the peer-review process of the EuroHPC JU Access calls. The evaluation was conducted but not concluded by the end of 2024. It is expected that the award decision will take place in Q1 2025 and the signature of the contract in Q2 2025.

Call for tender for the acquisition, delivery, installation and maintenance of hardware and software of Alice Recoque Exascale Supercomputer. The evaluation was not concluded by the end of 2024. Therefore, the payments are postponed for the coming years once the award decision will take place.

Call for tender for the acquisition, delivery, installation and hardware and software maintenance to upgrade LEONARDO supercomputer. The call was closed in 15 November 2024, and the evaluation was not concluded until the end of the year. It is expected that the award decision and the signature of the contract will take place in Q1 2025.

Call for tender for the acquisition, delivery, installation and hardware and software maintenance to upgrade the Discoverer Supercomputer was launched in 2023, and three contracts were successfully signed for the LOT1, LOT2 and LOT3 of the system. Also, the related payments were performed according to the signed contracts. The acceptance of the system is foreseen in Q1 2025. Due to technical issues the OPEX grant could not be finalised in 2024, therefore the payments foreseen were postponed in 2025.

With the GB 43/2024 that was adopted only by end 2024, the first consortium of private partners and the Hosting Entity CINECA for the procurement of Industrial High Performance Computer, Innovative–Italy project was selected. The call for tender was postponed to 2025, therefore the payments foreseen are postponed as well.

In Q4 2024 the 1st amendment of the contract LC-02494571 for the acquisition, delivery, installation, and hardware and software maintenance of Jupiter Exascale Supercomputer. Therefore, the payments schedule was amended and the EuroHPC JU could not pay the instalments previously agreed. At the end of December 2024, the invoice of EUR 44 M was received, and the payment will be performed in accordance with financial rules and binding requirements.

Also, under the federation pillar, during 2024 project no.101139786 – EPICURE was signed, and the pre-financing payment was executed.

Regarding the H2020 programme the following systems were accepted:

The full acceptance of phases 1, 2 and 3 of the pre-exascale supercomputer MareNostrum 5 took place in July 2024. The system was made available for testing to EuroHPC JU's users since the beginning of May 2024. Following the procurement contract as amended, phase 4 is foreseen to be accepted in Q4

2025 and the final payment (EUR 16 M) will be made. Also, the OPEX grant payments will be postponed to 2025 as the hosting entity can request payments only once the supercomputer is operational.

The full acceptance of the Deucalion petascale supercomputer took place in April 2024 and the final payments were made accordingly.

The payments related to the yearly maintenance services of the pre-exascale supercomputers LUMI could not be finalised in 2024 as additional documents required by the JU in accordance with the procurement contract were not submitted. This payment is foreseen to take place in the beginning of January 2025. Also, the OPEX grant was amended and the 3rd interim payment for the OPEX grant was postponed for 2025 as the payment request was received only in late December 2024.

Payments related to the yearly maintenance services of the pre-exascale supercomputer Leonardo were concluded for a lower amount foreseen in the budget 2024 as a result of the acceptance of the supercomputer in two different phases in 2023. Also, the first interim payment request for the OPEX grant was received. However, due to technical reasons further clarification is required by the JU, therefore the payment is postponed for 2025.

R&I Unit

Regarding the Digital Europe Programme (DEP) the following projects took place:

The project no. 101191697 - EuroCC4SEE (DIGITAL-EUROHPC-JU-2024-NCC-02 call) was awarded and signed during 2024. The pre-financing payment was executed accordingly.

The project no. 101136267 - HPC SPECTRA (DIGITAL - EUROHPC-JU-2022-TRAINING-02 call) was awarded, signed and the prefinancing payment already executed.

With the objective to support competitiveness & innovation potential of SMEs, project no. 101163317 – FFPLUS (DIGITAL -EUROHPC-JU-2023-SME-01 call) was awarded and signed. The pre-financing payment was executed accordingly.

The Governing Board awarded three projects for the following calls:

- DIGITAL-EUROHPC-JU-2022-TRAINING-03: the project no. 101136896 – HPCTRAIN;
- DIGITAL - EUROHPC-JU-2023-AISC-03: project no. 101182737 – MINERVA;
- DIGITAL-EUROHPC-JU-2023-ACADEMY-02: project no. 101196394 – EVITA.

The signature of these projects is expected to be finalised in Q1 2025, therefore, pre-financing payments were postponed to 2025.

During 2024 the two first technical and financial reports for project no. 101101903 - EUROCC 2 and project no. 101102047 - CASTIEL 2 were submitted by the consortium and the respective interim payments were executed accordingly.

The R&I unit is entitled to implement the quantum projects as well. During 2024, and with the 1st CEI for the hosting and operation of the European quantum computers integrated in HPC supercomputers where six Hosting Entities were selected by the Governing Board 6 procurements were finalised:

- The contract no. LC-03226116 - EuroQCS Poland signed;
- The contract no. LC-03455291 - LUMI-Q Czech Republic signed;
- The contract no. LC-03485598 - EuroQCS France signed;
- The contract no. LC-03499574 - Euro-Q-EXA Germany signed;
- The supplier for the acquisition of the EuroQCS Spain Quantum was selected – the contract will be signed in early of January 2025;
- The supplier for the acquisition of the EuroQCS – Italy Quantum was selected – the contract will be signed in early of January 2025.

Four pre-financing payments were finalised in 2024 and three pre-financing payments are postponed to 2025. Also, the OPEX grants are postponed and will be finalised in 2025.

Meanwhile, during 2024 the 2nd CEI for the quantum computers took place. The Governing Board has selected two additional Hosting Entities for the installation and operation of MeluXina-Q – Luxembourg and EuroSSQ-HPC – Netherland quantum computers. The respective Hosting Agreements were signed and the calls for tender and the OPEX grants are foreseen to be finalised in 2025.

Regarding the Horizon Europe (HE) Programme the following projects took place:

The project no. 101172493 - DEALII-X and the project no. 101172576 - MICROCARD-2 (HORIZON-EUROHPC-JU-2023-COE-01 call) were awarded and signed during 2024. The pre-financing payments were executed accordingly.

The project no. 101175702 - NET4EXA (HORIZON-EUROHPC-JU-2023-INTER-02 call) was awarded, signed and the prefinancing payment already executed.

The project no. 101136269 – HANAMI (HORIZON - EUROHPC-JU-2022-INCO-05 call) was signed and the prefinancing payment already executed.

The Governing Board awarded five projects for the following calls:

- HORIZON-EUROHPC-JU-2023-QEC-05-01: the project no. 101194322 - QEC4QEA and the project no. 101194491- QUEX;
- HORIZON-EUROHPC-JU-2023-ENERGY-04: project no. 101177590 – SEANERGYS;
- HORIZON-EUROHPC-JU-2023-INCO-06: project no. 101196247 – GANANA;
- HORIZON-EUROHPC-JU-2024-DARE-SGA-04: project no. 101202459 - DARE SGA 1.

The signature of these projects is expected to be finalised in Q1 2025, therefore the pre-financing payments were postponed to 2025.

During 2024 ten first technical and financial reports for the projects awarded under the call HORIZON-EUROHPC-JU-2021-COE-01 were submitted by the consortiums and respective interim payments were executed except for project no. 101093441 – SPACE that was postponed to 2025. First interim payment was executed for project no. 101118139 - INNO4SCALE.

Regarding the H2020 programme the following projects were executed:

Twenty-one final technical and financial reports were submitted. Two were received at the end of 2023 and could be finalised in 2024. From those received in 2024, only six final payments were executed. Thirteen final payments are postponed to 2025. There were two projects where final evaluations took place, and the eligible costs validated were lower than the budget estimated.

Therefore, the evaluation results were communicated to the consortium and EuroHPC is waiting for the final input from the consortium before launching the recovery orders for the excess amount in line with pre-financing payments.

Eight interim technical and financial reports were submitted including some submitted in late December 2023. During 2024 only four reports were finalised. Due to the requirement for further technical or financial clarification the remaining four reports were postponed to 2025.

Situation of Commitment and Payment Appropriations - Title 3

Commitment Appropriations (CA)		**Payment Appropriations (PA)**	
Received	298,270,706 €	Received	338,691,942 €
Consumed	212,231,927 €	Consumed	198,864,711 €
	71%		**59%**

In line with the Joint Undertaking N+3 rule, unused appropriations will be carried over to 2024. The tables above show the C1 and C2 appropriations.

Global Budget Execution (Titles 1, 2 and 3):

All titles considered, the total budget executed by EuroHPC JU in 2024 was EUR 221 M in terms of commitments, which represents an execution rate of 72% of the total credits activated and available during the 2024 financial year. Similarly for payments, the global execution rate for all titles was 59%, equivalent to EUR 206 M. The reasons for the lower budget execution in payments than in commitments are explained in the chapter above (Operational expenditure).

The EuroHPC JU continuously is taking budget control measures to improve its budget execution rates in forthcoming years.

JU Budget	Commitment Appropriations (CA) Credits	Consumed	Payment Appropriations (PA) Credits	Consumed
Title1	5,889,068 €	5,582,571 €	6,082,348 €	5,397,371 €
Title 2	3,000,609 €	2,733,011 €	2,947,323 €	1,797,487 €
Title 3	298,270,706 €	212,231,927 €	338,691,942 €	198,864,711 €
Total	**307,160,384 €**	**220,547,509 €**	**347,721,612 €**	**206,059,569 €**
Budget Implementation rate		**72%**		**59%**

Additional accounting details are provided in the 2024 financial statements.

Breakdown & changes in commitment appropriations

Title 1 (amounts in thousands of EUR)

EUR '000

	Item	Budget appropriations				Additional appropriations			Total appropr. available
		Initial adopted budget	Amending budgets	Transfers	Final adopted budget	Reactivated appropriations	Assigned revenue	Total	
		1	2	3	4=1+2+3	5	6	7=5+6	8=4+7
1100	TA - salaries & all.	3,257	436	-	3,693	-	-	-	3,693
1110	CA - salaries & all.	1,710	(291)	-	1,419	-	-	-	1,419
1120	Interim, Trainees & Seconded National Experts	300	(159)	-	141	-	-	-	141
Total Chapter 11		**5,267**	**(13)**	**-**	**5,254**	**-**	**-**	**-**	**5,254**
1200	Expenditure relating to recruitment	32	(11)	-	21	-	-	-	21
Total Chapter 12		**32**	**(11)**	**-**	**21**	**-**	**-**	**-**	**21**
1300	Mission and travel expenses	120	-	-	120	140	-	140	260
Total Chapter 13		**120**	**-**	**-**	**120**	**140**	**-**	**140**	**260**
1400	CAS & EU School transports	83	-	-	83	-	-	-	83
1410	Trainings (EU & external trainings)	89	(5)	-	84	4	-	4	89
1420	Social measures for Staff	75	(26)	-	48	-	-	-	48
Total Chapter 14		**247**	**(31)**	**-**	**216**	**4**	**-**	**4**	**220**
1500	HR administrative services	520	(365)	(20)	135	-	-	-	135
Total Chapter 15		**520**	**(365)**	**(20)**	**135**	**-**	**-**	**-**	**135**
Total Title 1		**6,186**	**(421)**	**(20)**	**5,745**	**144**	**-**	**144**	**5,889**

Title 2 (amounts in thousands of EUR)

	Item	Budget appropriations				Additional appropriations			Total appropr. available
		Initial adopted budget	Amending budgets	Transfers	Final adopted budget	Reactivated appropriations	Assigned revenue	Total	
		1	2	3	4=1+2+3	5	6	7=5+6	8=4+7
2000	Buildings and associated costs	80	(10)	-	70	-	-	-	70
Total Chapter 20		**80**	**(10)**	-	**70**	-	-	-	**70**
2100	Information Technology	245	46	-	291	243	-	243	534
Total Chapter 21		**245**	**46**	-	**291**	**243**	-	**243**	**534**
2200	Movable property and associated costs	37	(5)	-	32	-	-	-	32
Total Chapter 22		**37**	**(5)**	-	**32**	-	-	-	**32**
2300	Current administrative expenditure	200	(52)	-	148	8	235	243	391
Total Chapter 23		**200**	**(52)**	-	**148**	**8**	**235**	**243**	**391**
2400	External administrative consultancy & auditing	70	119	91	280	100	-	100	380
Total Chapter 24		**70**	**119**	**91**	**280**	**100**	-	**100**	**380**
2500	Internal Meetings	50	-	-	50	20	-	20	70
Total Chapter 25		**50**	-	-	**50**	**20**	-	**20**	**70**
2600	Legal services	150	40	(93)	97	-	-	-	97
Total Chapter 26		**150**	**40**	**(93)**	**97**	-	-	-	**97**
2700	Communication, Information & Events	365	(139)	2	228	6	-	6	234
Total Chapter 27		**365**	**(139)**	**2**	**228**	**6**	-	**6**	**234**
2800	Experts and associated costs	421	422	-	843	350	-	350	1,193
Total Chapter 28		**421**	**422**	-	**843**	**350**	-	**350**	**1,193**
Total Title 2		**1,618**	**421**	-	**2,039**	**726**	**235**	**961**	**3,001**

Title 3 (amounts in thousands of EUR)

	Item	Budget appropriations				Additional appropriations			Total appropr. available
		Initial adopted budget	Amending budgets	Transfers	Final adopted budget	Reactivated appropriations	Assigned revenue	Total	
		1	2	3	4=1+2+3	5	6	7=5+6	8=4+7
3000	Legacy R&I Action	-	14	20	34	97	10	107	141
3010	HE R&I Action	126,678	-	-	126,678	60,300	-	60,300	186,978
3020	DEP R&I Action	18,000	-	-	18,000	5,000	-	5,000	23,000
Total Chapter 30		**144,678**	**14**	**20**	**144,712**	**65,397**	**10**	**65,407**	**210,119**
3120	DEP Infra Action	66,352	-	-	66,352	21,800	-	21,800	88,152
Total Chapter 31		**66,352**	-	-	**66,352**	**21,800**	-	**21,800**	**88,152**
Total Title 3		**211,030**	**14**	**20**	**211,064**	**87,197**	**10**	**87,207**	**298,271**
GRAND TOTAL		**218,834**	**14**	-	**218,848**	**88,067**	**245**	**88,312**	**307,160**

Breakdown & changes in payment appropriations

Title 1 (amounts in thousands of EUR)

EUR '000

	Item	Budget appropriations				Additional appropriations			Total appropr. available
		Initial budget adopted	Amending budgets	Transfers	Final adopted budget	Reactivated appropriations	Assigned revenue	Total	
		1	2	3	4=1+2+3	5	6	7=5+6	8=4+7
1100	Salaries & Allowances Temporary Agents	3,257	436	(14)	3 679	0	0	0	3,679
1110	Salaries & Allowances Contractual Agents	1,710	(291)	0	1 419	2	0	2	1,421
1120	Interim, Trainees & Seconded National Experts	300	(159)	0	141	0	0	0	141
Total Chapter 11		5,267	(13)	(14)	5 240	2	0	2	5,241
1200	Expenditure relating to recruitment	32	(11)	0	21	0	0	0	21
Total Chapter 12-0		32	(11)	0	21	0	0	0	21
1300	Mission and travel expenses	120	0	0	120	154	0	154	274
Total Chapter 13		120	0	0	120	154	0	154	274
1400	CAS & EU School transports	83	5	14	101	0	0	0	101
1410	Trainings (EU & external trainings)	89	(5)	0	84	4	0	4	89
1420	Social measures for Staff	75	(14)	0	61	0	0	0	61
Total Chapter 14		247	(14)	14	247	4	0	4	251
1500	HR administrative services	520	(304)	(20)	196	99	0	99	295
Total Chapter 15		520	(304)	(20)	196	99	0	99	295
Total Title 1		**6,186**	**(343)**	**(20)**	**5,823**	**259**	**0**	**259**	**6,082**

Title 2 (amounts in thousands of EUR)

	Item	Budget appropriations				Additional appropriations			Total appropr. available
		Initial budget adopted	Amending budgets	Transfers	Final adopted budget	Reactivated appropriations	Assigned revenue	Total	
		1	2	3	4=1+2+3	5	6	7=5+6	8=4+7
2000	Buildings and associated costs	100	(30)	-	70	9	-	9	79
Total Chapter 20		**100**	**(30)**	-	**70**	**9**	-	**9**	**79**
2100	Information Technology	245	26	-	271	278	-	278	549
Total Chapter 21		**245**	**26**	-	**271**	**278**	-	**278**	**549**
2200	Movable property and associated costs	17	15	-	32	-	-	-	32
Total Chapter 22		**17**	**15**	-	**32**	-	-	-	**32**
2300	Current administrative expenditure	250	(102)	-	148	48	235	283	431
Total Chapter 23		**250**	**(102)**	-	**148**	**48**	**235**	**283**	**431**
2400	External administrative consultancy & auditing	20	169	-	189	29	-	29	218
Total Chapter 24		**20**	**169**	-	**189**	**29**	-	**29**	**218**
2500	Internal Meetings	40	10	-	50	25	-	25	75
Total Chapter 25		**40**	**10**	-	**50**	**25**	-	**25**	**75**
2600	Legal services	225	(35)	(65)	125	145	-	145	270
Total Chapter 26		**225**	**(35)**	**(65)**	**125**	**145**	-	**145**	**270**
2700	Communication, Information & Events	300	(74)	65	291	-	-	-	291
Total Chapter 27		**300**	**(74)**	**65**	**291**	-	-	-	**291**
2800	Experts and associated costs	421	363	-	785	218	-	218	1,002
Total Chapter 28		**421**	**363**	-	**785**	**218**	-	**218**	**1,002**
Total Title 2		**1,618**	**343**	-	**1,961**	**751**	**235**	**986**	**2,947**

Title 3 (amounts in thousands of EUR)

		Budget appropriations				Additional appropriations			Total appropr. available
	Item	Initial budget adopted	Amending budgets	Transfers	Final adopted budget	Reactivated appropriations	Assigned revenue	Total	
		1	2	3	4=1+2+3	5	6	7=5+6	8=4+7
3000	Legacy R&I Action	24,162	5,411	20	29,593	9,089	10	9,099	38,692
3010	HE R&I Action	60,001	-	-	60,001	6,078	-	6,078	66,079
3020	DEP R&I Action	13,500	-	-	13,500	24,000	-	24,000	37,500
Total Chapter 30		**97,662**	**5,411**	**20**	**103,093**	**39,167**	**10**	**39,177**	**142,270**
3100	Legacy Infra Action	28,189	24,612	-	52,801	56,801	-	56,801	109,601
3120	DEP Infra Action	76,155	1,275	-	77,430	8,616	-	8,616	86,045
3130	CEF2 Infra Action	-	-	-	-	775	-	775	775
Total Chapter 31		**104,343**	**25,887**	**-**	**130,230**	**66,192**	**-**	**66,192**	**196,422**
Total Title 3		**202,006**	**31,298**	**20**	**233,323**	**105,358**	**10**	**105,369**	**338,692**
GRAND TOTAL		**209,810**	**31,298**	**-**	**241,108**	**106,369**	**245**	**106,614**	**347,722**

Contribution per Programme in 2024 (amounts in thousands of EUR)

Programme	EU cash validated	EU cash not validated	Participating States cash validated	Participating States cash not validated	Participating States estimated IKOP	Participating States estimated financial contributions	Private Members estimated IKOP	**Total**
H2020 / CEF 1	477,403	0	179,644	0	51,932	306,780	19,966	**1,035,724**
HE	65,813	234,116	0	0	0	72,292	1,630	**373,851**
DEP	123,732	411,517	36,637	103,180	0	587,440	1,125	**1,263,630**
CEF	775	79,225	0	0	0	0	0	**80,000**

Explanation of the table above is as follows:

Column “EU Cash Validated” and “Participating States Cash Validated”

The EU and Participating States validated cash comprising of the contributions of the Union received by the JU for the programme Horizon 2020 and the contributions implemented by the JU through payments for the programmes Horizon Europe, Digital Europe and Connecting Europe Facility.

Column “EU Cash Not Validated” and “Participating States Cash Not Validated”

The EU and Participating States not validated cash comprising the contributions of the Union received by the JU for the programmes Horizon Europe, Digital Europe and Connecting Europe Facility, which have not been implemented through payments and are thus held as received pre-financing.

Columns “Participating States estimated IKOP” and “Private Members estimated IKOP”

The Participating States and Private Members estimated IKOP category comprising of the Joint Undertakings estimate of the in-kind contributions due in relation to the projects for which the necessary reporting and certification requirements were not yet met in order to validate these contributions.

Column “Participating States estimated financial contributions”

The Participating States estimated financial contributions comprising of the total estimated commitments based on signed agreements for which the contributions have not yet been provided to the Joint Undertaking or are not provided directly to the Joint Undertaking. The amounts include the co-funding contributions of the Participating States to projects funded through grant agreements; the

co-funding contributions for the purchase of supercomputers owned by the JU or co-owned with the JU; and the co-funding of the operational costs of the supercomputers currently in operation.

a) Ongoing activities under Horizon 2020 & CEF 1 programmes

Overall, the achievement rate for funding on the Council Regulation 2018/1488 is at a level expected from a programme approaching its sunset period. The EU funding has reached 89% of its Regulation target while the Participating States contributions (cash provided to the JU and estimated in-kind and financial contributions) has met its regulatory target and even exceeded it by 13%.

b) Horizon Europe, Digital Europe and Connecting Europe Facility programmes

The information presented for the HE, DEP and CEF programmes is in line with the financing expectations from a programme that in reality started for the JU in 2022. The funding from the Union, compared to the total planned MFF funding, has reached 29% while the Participating States contributions (cash provided to the JU and estimated in-kind and financial contributions) is at an estimated 26%. The difference in the pace of contributions between members in the beginning of the programme is expected as the Union's financing in the form of cash is required for the prefinancing of activities and must be provided before any other type of contribution.

Accounting systems

Having concluded a SLA with the Commission's Directorate-General for Budget (DG BUDG), the JU uses the Commission's hosted ABAC and SAP accounting tools. The Joint Undertaking uses ABAC Assets, a specific ABAC module to manage fixed assets. Moreover, the JU is also using all relevant e-Grants and e-Procurement and business trips tools, made available by the Commission.

To cash the contribution paid by the European Commission (DG CNECT) and the Members and to execute payments, the Joint Undertaking has opened a bank account in EUR, benefiting from the same framework contract conditions as the Commission. All transactions via this account are systematically made through the Commission-managed ABAC, SAP and SWIFT systems.

List of acronyms

ABAC *– Accrual Based Accounting*

AI *– Artificial Intelligence*

AIF *– Artificial Intelligence Factory*

AST *– Application Support Team*

AWP *– Annual Work Programme*

BOA *– Back-Office Arrangement*

CAAR *– Consolidated Annual Activity Report*

CEF *– Connecting Europe Facility*

CoE *– Centre of Excellence*

CoI *– Conflict of Interest*

COSO *– Committee of Sponsoring Organisations*

CSA *– Coordination and Support Actions*

DEP *– Digital Europe Programme*

DG CNECT *– Directorate-General Communications Networks, Content and Technology*

DG RTD *– Directorate-General Research and Innovation*

EC *– European Commission*

ECA *– European Court of Auditors*

ED *– Executive Director*

EFTA *– European Free Trade Association*

ERDF *– European Regional and Development Fund*

EU *– European Union*

EuroHPC JU *– European High Performance Computing Joint Undertaking*

FPA *– Framework Partnership Agreement*

FR *– Financial Regulation*

FTE *– Full-time Equivalent*

***GB** – Governing Board*

***H2020** – Horizon 2020 Programme*

***HE** – Horizon Europe Programme*

***HPC** – High Performance Computer*

***HW** - Hardware*

***ICF** – Internal Control Framework*

***ICP** – Internal Control Principles*

***INFRAG** – Infrastructure Advisory Group*

***JTI** – Joint Technology Initiatives*

***JU** – Joint Undertaking*

***KPIs** – Key Performance Indicators*

***LE** – Large Enterprise*

***MASP** - MultiAnnual Strategic Programme*

***MFF** – Multiannual Financial Framework*

***MN5** – MareNostrum 5*

***NCC** – National Competence Centre*

***RIA** – Research and Innovation Actions*

***RIAG** – Research and Innovation Advisory Group*

***RRF** – European Recovery and Resilience Fund*

***SME** – Small and Medium Enterprise*

***SRIA** – Strategic Research and Innovation Agenda*

***SW** – Software*

***TRL** – Technology Readiness Level*

***TST** – Technical Support Team*

***TTG** – Time to grant*

***TTI** – Time to inform*

***TTP** – Time to pay*

***WP** – Work Programme*