

Centro Nacional
de Computação Avançada

2025
Activities Plan and Budget

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1. INTRODUCTION

In December of 2024 the name and statutes of the INCD[1] Association were changed to assume the mission of National Advanced Computing Centre (CNCA). The widening of the CNCA mission comprises managing and operationalizing advanced computing infrastructures, supporting scientific research activities, technological development, transfer and valorisation of knowledge, qualification of human resources and provision of services, including specialized consultancy, in the scientific-technological areas recognized as core components of advanced computing, as well as the management of research data. This new institutional structure is funded by the Recovery and Resilience Plan (PRR) and is one of the actions included in measure RE-C05-i08 "Ciência Mais Digital", contracted between the FCT and the "Recuperar Portugal" Mission Structure.

Therefore, the CNCA plan of activities for 2025 is largely dictated by the restructuring of the organization at all levels to create the required conditions to realize the CNCA mission. In the context of the CNCA mission, advanced computing is understood comprehensively including all computing models present (e.g. HPC, HTC, GRID, CLOUD) and future (e.g. quantum computing). Therefore, a major goal for CNCA will be to act as a pivotal point for the integration and delivery of different types of computing models and data services for research and innovation. In this regard, three main technical areas have been identified: high performance computing, distributed computing and cloud computing, open science and research data. These technical areas will be responsible for the maintenance, development, operation and provisioning of the CNCA infrastructure facilities and its services.

The initial infrastructure facilities of CNCA include the resources inherited from INCD and from MACC[2]. They comprise high performance computing, high throughput computing, cloud computing and data storage equipment such as the Deucalion supercomputer, the 5% of the participation of Portugal in MareNostrum5, the Stratus cloud computing systems, the Nimbus computing clusters, and several data storage systems that complement these equipments. Under CNCA, better interoperability and tighter integration of the different services will be pursued, while ensuring the availability and continuity of the services already provided.

At the coordination level, a process to enlarge the number of member organisations has started. A call for expressions of interest was opened to all entities that wish to join as associates. In this phase, this process aims to bring together an initial group of members

[1] The former Infraestrutura Nacional de Computação Distribuída
[2] The former Minho Advanced Computing Centre

to facilitate the CNCA's launch and establish a solid foundation for its future development and growth. Once this process is completed a new directorate will be nominated by the new associates.

2. PLAN

In 2025, CNCA will continue participating in the National Advanced Computing Network (RNCA) that joins computing centres to support research and innovation in the country. Through the RNCA protocol, CNCA will be funded by FCT to participate in activities related to advanced computing, open science, and participation in international digital research infrastructures. In particular, the CNCA infrastructure will support high performance computing and cloud computing projects submitted to the FCT calls for advanced computing projects (CPCA). CNCA will support new projects from the 5th CPCA, whose execution will start in 2025, and prepare the future 6th CPCA. Also included in these activities is the participation in international infrastructures and collaborations like EuroHPC, EGI, IBERGRID, CERN and EOSC. This participation will happen at the level of the infrastructure services and support to international research communities, as well as via the participation in research and innovation projects.

In this context the participation in Horizon Europe projects will continue, with CNCA acting as technology and cloud provider. The participation in the iMagine project will continue until the summer of 2025, with CNCA supporting research in marine and freshwater science. The participation in a new project CLIMATE-ADAPT4EOSC will start. The project is focused on Fair Data and Innovative Services for Magnifying the Climate Adaptation potential of European Communities.

The development and improvement of the CNCA infrastructure services will continue. An improved container orchestration platform based on Kubernetes will be made available with dedicated physical resources enlarging the cloud containerisation capabilities.

CNCA will continue collaborating with FCT in the activities of the national catchall repository for research data. The data repository will continue supporting a range of users from several organisations in multiple domains. These research data activities carried in partnership with FCT-FCCN will be enlarged to encompass the upgrade of the storage capacity for research data and the deployment of new open science and research data services. Also in the domain of open data, CNCA in partnership with LIP and ICS, will participate in the Establishment of a Center for Research Data Management. This project will create thematic data repositories in different research

domains contributing to the growth of an interoperable network of research data repositories in the country.

CNCA will participate in the AGRISPACE consortium which will join several entities to establish a data space for the agriculture sector. In this regard a new FCT funded project will start aimed at a pilot installation for the processing and sharing of data relevant to the public sector, featuring machine learning applications and data analytics capabilities. The main use case to be addressed will be the partnership of agriculture of data.

CNCA has established a protocol with the General Directorate of the Territory (DGT) aimed at housing, processing and sharing of geospatial data. In this context, CNCA will facilitate the creation and access to new data products which will be available in the infrastructure.

A proposal for an EuroHPC AI Factory at the Barcelona Supercomputing Centre (BSC AI Factory) joining Spain, Portugal, Türkiye and Romania has been approved. This proposal expands the AI capacity of MareNostrum5 and is co-funded by FCT aiming at redistribution of a share of the capacity to support Portuguese AI-oriented innovation projects. CNCA is a major partner in this project with responsibilities focused on user support, data spaces, software library, training and networking. This project complements the Portuguese participation in the MareNostrum5 supercomputer at BSC-CNS where FCT has access to 5% of the system capacity.

Following the submission, in 2024, of a proposal to the Call for Expression of Interest launched by CCDR-Norte in 2024, for financing Technological Platforms, CNCA will follow-up in 2025 with the subsequent 2nd stage call for final proposals. This submission, if successful, will enable the buying of new equipment in 2026 to expand and complete that already existing.

In the context of a new national datacentre, to be built by FCT, close to Deucalion, in Azurém Campus, it is foreseen that part of its space will be dedicated to advanced computing equipment. CNCA will seek to define with FCT the terms and conditions for using that space, as soon as it is feasible.

The hiring of new collaborators to strengthen the administrative and technical teams of CNCA started in 2024 and will continue in 2025. This activity has been strongly reinforced with new positions funded by the BSC AI Factory project.

3. ACTIVITIES

The activities for 2025 aim to establish CNCA as an infrastructure of reference for scientific computing and research data in the country and leverage its newly improved capacity and expertise to support relevant research and innovation across all scientific domains. The activities are split according to three levels of priority (Higher, Medium, Lower).

Higher Priority

a) Operation and maintenance of the CNCA infrastructure and related services, enabling a stable environment to support usage by computational and data oriented projects for science and innovation.
   - High Performance Computing (Deucalion, MareNostrum5 and Cirrus)
   - High throughput Computing (Cirrus)
   - Cloud Computing (Stratus)
   - Data Infrastructure

b) Restructuring of the internal organisation at the managerial and technical levels to implement the National Advanced Computing Centre (CNCA) and its mission.
   - Define the CNCA technical areas and organisational structure
   - Enlarge the CNCA membership
   - Appoint the new CNCA management

c) Start a hiring process for managerial and technical positions to reinforce the CNCA human resources.
   - Dedicated accounting and management staff
   - Reinforcement of the distributed computing team
   - Reinforcement of the Deucalion team
   - New positions to support the participation in the BSC AI Factory

d) Rebranding of the organisation from INCD to CNCA.
   - Change of logo and graphics design
   - Update the web and social media presence
   - Increase the awareness about the evolution from INCD to CNCA

e) Implement new open science and research data services in partnership with FCT and LIP in the framework of the National Plan for Open Science and Open Research Data (PNCADAI).
   - Deploy new storage equipment expanding the CNCA managed capacity for cloud storage to support research data and open science applications.
   - Deploy a new nationwide sync-and-share service for the research and academic communities.
   - Host a new service for Data Management Plans.

f) Participation in the Portuguese Advanced Computing Network (RNCA) according to the RNCA protocol addenda for 2025 as agreed with FCT.
   - Participation in the bodies of the Portuguese Advanced Computing Network (RNCA).
   - Coordination of the provisioning of computing capacity to projects and activities supported by FCT according to the RNCA protocol addenda.

- Support the completion of computational projects from the fourth Call for Advanced Computing Projects.
- Support new computational projects from the fifth Call for Advanced Computing Projects.

g) Provide services from the CNCA portfolio acting in the context of its mission to support:
   - Scientific research activities;
   - Technological development
   - Transfer and valorisation of knowledge;
   - Qualification of human resources;
   - Provision of other services, including specialized consultancy.

h) Participate in the IBERGRID and EGI federations and the EOSC initiative supporting research activities of national interest, as well as provisioning and sharing of services and data, for the benefit of researchers and national priorities.
   - Integration of compute and data services in the federations
   - Support the integration of platforms
   - Broker the access to computing and data services
   - Participation in international projects

i) Participate in the EuroHPC AI Fabric at the Barcelona Supercomputing Centre
   - Incubation, co-working and engagement with prospective users like start-ups, SMEs and the public sector.
   - Provisioning of user support, which will constitute the largest component of the effort.
   - Maintenance of the software library.
   - Data space guaranteeing the proper treatment of datasets ready for AI usage and assisting users in bringing their own data.
   - Networking for close collaboration with academia and industry, promoting technology development and innovation.
   - Supporting compliance with Trustworthy AI by adhering to the principles and requirements of the AI Act.

j) Finalise the upgrade of the CNCA cloud computing and data facilities in Vila Real and Lisbon.
   - Enhance the virtual network infrastructure in Vila Real.
   - Transpose new features and improvements from Vila Real to Lisbon.
   - Finalise the migration of tenants to the upgraded facilities.

k) Submit the proposal for the 2nd stage call from CCDR-Norte.

Medium Priority

a) Support the FCT catchall research data repository for the Portuguese research community based on the Dataverse software. This activity will be developed in partnership with FCT under the RNCA protocol.
   - Improve the integration with *Ciência ID* and *Ciência Vitae*.

- Integration with the new research data storage system
- Large scale service deployment and delivery

b) Participate in the national activities bridging with the European partnership for agriculture of data.
   - Collaborate with the national organisations in the partnership.
   - Start a new project for processing and sharing of data featuring deep learning and data analytics capabilities, whose main use case to be addressed will be the national participation in the European partnership agriculture of data.

c) Support the activities of the National Competence Centre (NCC) in the framework of EuroHPC.
   - Continue supporting the NCC activities In collaboration with FCT, LIP, INESC-TEC and other partners in the EuroCC 2 project.
   - The activities include housing of web services, and support to the training, dissemination and knowledge transfer.
   - In this context CNCA plans to increase its dissemination and expand the user engagement activities particularly to the public administration.
   - Disseminate the new CNCA structure and its services.

d) In collaboration with LIP and ICS, establish a Centre for Research Data Management focused on thematic areas (social sciences, particle physics, and computing intensive sciences).
   - Defining open science and data policies for the members.
   - Setting up data repositories for thematic areas.
   - Data curation and stewardship.
   - Training and networking.
   - Bridging with FCT and EOSC.

e) Start participation in the European project CLIMATE-ADAPT4EOSC which aims to create a collaborative research environment with FAIR (Findable, Accessible, Interoperable, and Reusable) data and innovative services to support climate resilience.
   - CNCA will be a technological partner enabling integration of data and services (e.g., Big Data Analytics for climate risk assessments).

f) Participate in the European project iMagine (Imaging data and services for aquatic science). iMagine provides a portfolio of image datasets, high-performance image analysis tools empowered with Artificial Intelligence, and Best Practices for scientific image analysis.
   - CNCA is a technological partner providing cloud computing resources and support to the deployment and operation of services.

g) Support new geospatial services and data in the framework of the collaboration agreements with DGT.
   - CNCA will host data and services from DGT enabling high performance access and processing of geospatial data in the infrastructure.

h) Enhance the Kubernetes orchestration services for containers.
   - Improve the capabilities of the Kubernetes orchestration service.
   - Improved Kubernetes platform with dedicated hardware capacity.

i) Participation and organisation of events.
   - In the framework of IBERGRID and EGI, participate in the organisation of the EGI Conference 2025 in Santander.
   - Participation in the 5th edition of "Encontro de Computação Avançada".

Lower Priority

a) Seek engagement with new user communities and use cases beyond science and academy with particular focus in the public administration and innovation sectors.
b) Distribute commercial cloud services from the Google Cloud Platform in the context of the OCRE and EOSC-Future grant. Continue identifying mechanisms to deliver capacity to the user base maximising return while avoiding dependencies and vendor lock-in.
c) Continue improving the CNCA accounting and reporting mechanisms to facilitate collection of detailed usage information per service, for monitoring, resource management and reporting purposes.
d) Prepare for the participation in the EuroCC 3 project.
e) Seek other opportunities to improve the infrastructure and its services.

4. BUDGET

The 2025 budget reflects CNCA's institutional restructuring and the need to secure resources for its strategic priorities. Table 1 shows the expected income by project, with major contributions from national funding (FCT and RNCA protocol), the Recovery and Resilience Plan, and international projects such as EuroHPC AI Factory and Horizon Europe initiatives.

Foreseen income for 2025

Description	Value
RNCA Protocol	67 293,42 €
BSC AI Factory	72 860,44 €
European Projects CA4EOSC + iMagine	24 967,93 €
FCT-CNCA-CompAvanc Protocol	281 310,53 €
Other Projects and Protocols (GDI4CA+Agrispace)	57 687,00 €
CEEC Institucional	62 071,11 €
Total income for 2025	**566 190,43 €**

Table 2 details the foreseen expenses by category. The largest share is allocated to human resources, ensuring the reinforcement of technical and management teams.

Significant funds are also dedicated to infrastructure operation, maintenance, and technological upgrades in HPC, cloud, and data services.

Foreseen expenses for 2025	
Description	**Value**
Human Resources	452 415,73 €
Procurement and external services	95 087,50 €
Missions	18 500,00 €
Bank commissions and other taxes	187,20 €
Total expenses for 2025	**566 190,43 €**

Table 2 Foreseen expenses for 2025 by category

Overall, the budget balances organizational consolidation with investments in innovation, supporting CNCA's mission to establish itself as a national reference in advanced computing and research data management.