AnaEE ERIC
ANALYSIS AND EXPERIMENTATION ON ECOSYSTEMS

ANNUAL REPORT 2024

Developments and activities of the year

AnaEE-ERIC is the European landmark for experimental ecology. It features 60+ highly instrumented installations that provide services for the study of ecosystems under several pressures, such as climate change, land management,

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FOREWORD

Biodiversity loss has reached alarming levels in recent years, as documented by UN and IPBES reports, driven by climate change, agricultural practices, and land use changes. In 2024, the signs of the environmental crisis became increasingly evident: it was the warmest year on record according to the World Meteorological Organization, with unprecedented fires, heat waves, and extreme floods. **These multifaceted challenges require urgent solutions for both mitigation and adaptation**.

AnaEE-ERIC's mission is to equip researchers, policy makers, society, and business stakeholders with **tools to enhance ecosystem resilience in the face of climate change and extreme events**. Our scope also includes developing solutions to reduce greenhouse gas emissions from agriculture and even removing them through carbon farming initiatives.

Our core value lies in our experimental approach: we examine the impact of climate change and management practices by manipulating ecosystem environments to simulate future conditions. This allows us to predict functional changes, anticipate shifts in ecosystem services, and test solutions that enhance resilience.

2024 marks our second full year of operation, and **our growth has been remarkable**. Our team expanded from five employees in 2023 to ten by the end of 2024. We are deeply integrated into the European research infrastructure landscape, contributing to seven high-impact projects focused on agriculture, climate risk vulnerability, microbial diversity, and the impact of artificial elements on living systems. This is clear evidence of the impact of AnaEE-ERIC and **the relevance of an infrastructure focused on experimental ecology**.

We achieved **a significant milestone in 2024** with the first services delivered through our network of distributed facilities as part of the AgroServ project on agroecology. This is only the beginning, as the coming year will see a large increase in the delivery of services, both through EU-funded projects and direct requests to the ERIC.

Another key achievement was finalising the agreement between AnaEE-ERIC and CREA to host the **Data and Modelling Centre** in Rome, which will serve as a cornerstone for our service offerings and ensure data delivery according to the highest standards.

The **inaugural AnaEE Science Conference** in Paris was a great success, with participants engaging in collaborative discussions on scientific insights, research opportunities, and strategies for developing AnaEE service offerings.

Science has a critical role in addressing humanity's challenges by **bridging knowledge gaps**, **proposing viable solutions**, and **engaging with citizens**, **society**, and **economic actors** to determine optimal implementation strategies.
This is our vision of the role of AnaEE-ERIC.

Michel Boër, Director General

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ANAEE-ERIC: AN INTRODUCTION

Analysis and Experimentation on Ecosystems - a landmark Research Infrastructure in Europe.

Climate change impacts everyone on the planet. According to the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, it's estimated that species extinction rates are 1,000 times higher than natural background rates due to human activities, with around 1 million species facing extinction.

By 2050 IPCC has projected that climate change could reduce crop yields by up to 30%, exacerbating food insecurity for millions of people worldwide.

Addressing these challenges requires urgent and concerted efforts at local, national, and global levels. Society has to work together to mitigate greenhouse gas emissions, conserve biodiversity, promote sustainable land and resource management, and enhance resilience to climate impacts.

To increase our understanding and be better equipped for changes that are already occurring, we need more scientific research.

AnaEE-ERIC's mission is to operate a research infrastructure focused on studying and experimenting with ecosystems, their functions, and the services they provide. Its aim is to provide the necessary tools, research services, and knowledge to address the complex environmental and climate challenges affecting society. We contribute to sustainable development, the Green Deal, and One Health by promoting sustainable land use, addressing climate action, biodiversity conservation, and ecosystem health.

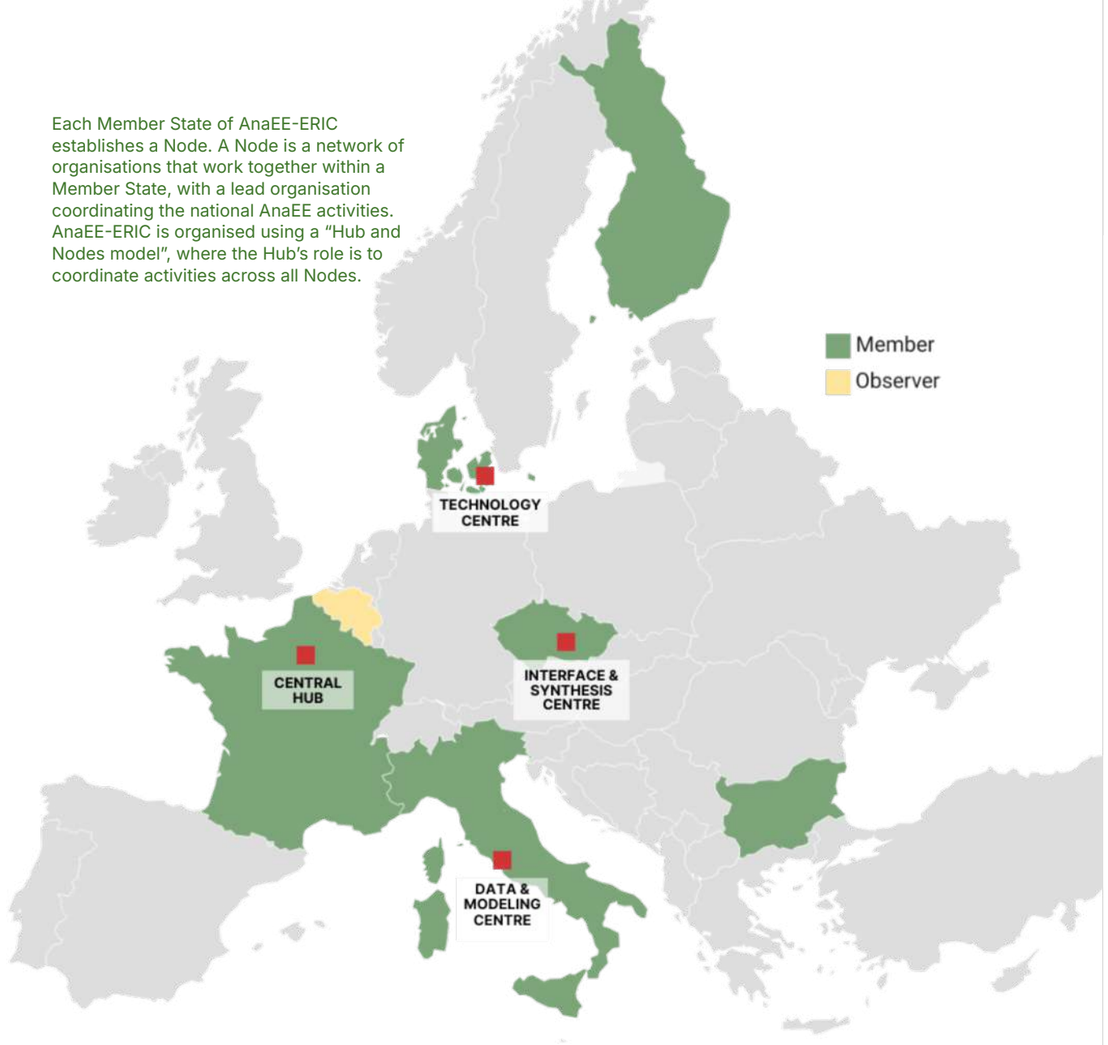
Having recognized the gaps in knowledge highlighted by intergovernmental agencies and academics, we focus on complementing observational approaches with advanced experimental methods. Our approach revolves around manipulation, measurements, modelling, mitigation, and management of continental ecosystems.

That allows researchers to control various parameters and test hypotheses across different ecosystems and climates, serving as a crucial piece in addressing scientific and societal challenges.

AnaEE offers a single point of access in Europe for comprehensive ecosystem research, involving relevant infrastructure and engaging stakeholders. By effectively integrating experimentation and modelling activities, we advance ecosystem science, particularly in expanding Earth system models.

The contributions of AnaEE-ERIC will ultimately help to predict the impact of environmental and climate change drivers, unravel mechanisms and feedback involved in ecosystems' responses, and test mitigation and adaptation measures before it is too late.

Each Member State of AnaEE-ERIC establishes a Node. A Node is a network of organisations that work together within a Member State, with a lead organisation coordinating the national AnaEE activities. AnaEE-ERIC is organised using a "Hub and Nodes model", where the Hub's role is to coordinate activities across all Nodes.



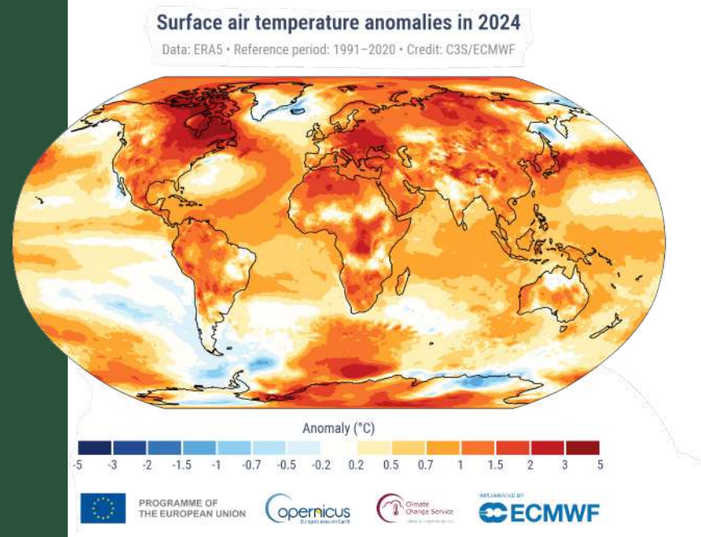
2024 saw unprecedented global temperatures, following on from the remarkable warmth of 2023. It also became the first year with an average temperature clearly exceeding 1.5°C above the pre-industrial level – a threshold set by the Paris Agreement to significantly reduce the risks and impacts of climate change.

Multiple global records were broken, for greenhouse gas levels, and for both air temperature and sea surface temperature, contributing to extreme events, including floods, heatwaves and wildfires.

These data highlight the accelerating impacts of human-caused climate change.

- Copernicus Global Climate Highlights 2024 Report

Chart from the Copernicus Report 2024 showing surface air temperature anomalies in 2024



CHAPTER 2

HIGHLIGHTS 2024

In 2024, AnaEE-ERIC demonstrated significant growth through strategic recruitment of specialized personnel and the initiation of the recruitment process for the Head of the Data and Modelling Centre following the official signing of its Host Agreement with CREA in Italy

Growth and Expansion

Throughout 2024, AnaEE-ERIC experienced substantial growth across its operational centers. The headquarters in Gif-sur-Yvette expanded to eight team members.

The Interface and Synthesis Centre (ISC) became fully operational in Brno, Czech Republic. Meanwhile, the Technology Centre strengthened its capabilities with a new Technology Officer joining as in-kind staff.

A significant milestone was achieved on November 28, 2024, with the official signing of the Host Agreement for the Data and Modelling Centre (DMC) with CREA in Italy. The recruitment process for a Data & Modelling Scientist to serve as Head of the DMC began shortly thereafter, setting the stage for the center's full operationalization in 2025.

Scientific Leadership

October 2024 marked a breakthrough with the inaugural AnaEE Science Conference in Paris, which gathered over 50 participants and featured 15 speakers across three comprehensive sessions showcasing the latest findings from the AnaEE network.

Scientific initiatives expanded with the initiation of an opinion paper examining the impacts of heat and drought on terrestrial ecosystems, engaging experts across member countries. The Technology Centre co-organized a PhD course on greenhouse gas fluxes in collaboration with AnaEE Denmark and the University of Copenhagen, attracting 21 students from eight countries.

Digital Infrastructure Development

AnaEE's digital capabilities saw significant enhancement in 2024, with improved data- and API catalogues now offering additional content and cross-RI access. The Crops and Pests Virtual Research Environment (VRE) successfully transitioned from development to its operational phase, funded by Italy's ITINERIS project.

The establishment of a cloud-based Identity Provider System, compliant with ENVRI recommendations, strengthened digital access across ESFRI research infrastructures.

Network Coordination and Partnerships

Service Level Agreements (SLAs) progressed significantly, reaching an 83.24% completion rate by the end of 2024. New agreements with service providers were successfully signed, laying the groundwork for service delivery in 2025.

Membership expansion efforts continued with Portugal and Spain, both countries now associated with the Extended Management Board to strengthen links between communities and prepare for potential full membership. Belgium's observer status was renewed until 2025, with the national community preparing an application for full membership.

AnaEE established valuable collaborations with EGI and complementary research infrastructures including EPOS, EMSO, and LifeWatch ERIC, positioning itself as a key player in digital research and FAIR data management. The ISC developed AnaEE's stakeholder engagement strategy, which received approval during the 6th Assembly of Members in November 2024.

Project Participation

AnaEE-ERIC actively contributed to multiple EU projects throughout 2024, including IRISCC, M4C, PHENET, AgroServ, AquaServ, and ERIC Forum 2. Personnel across centers collaborated on the successful submission and acceptance of several project deliverables, strengthening AnaEE's presence in the European research landscape.

Significant progress was made in preparing the ISIA-based catalogue of services for both the IRISCC project and AnaEE facilities, with standardization of ecosystem and climate zone definitions advancing through coordination between the Technology Centre, AnaEE France, and the IRISCC project team.

Strategic Direction for 2025

Looking ahead, AnaEE-ERIC has established clear priorities for 2025, including the commencement of service delivery across the network, completion of service catalogue standardization, expansion of Virtual Research Environments for researchers, and strengthened engagement in European digital initiatives such as ESFRI, EOSC, and EU-funded programs.

The organization plans to launch a comprehensive training program on environmental data science and modeling while formalizing a shared vision for research facilities on data management tools.

These strategic initiatives will further consolidate AnaEE's position as a leader in ecosystem research infrastructure across Europe.

A HOUSE ON FIRE

2024 was the warmest year on record. The biggest sources of GHG emissions in EU agriculture are animal rearing and the use of fertilisers, which together are responsible for nearly 380 million tonnes of CO^2e in 2022 or 12% of the EU's total GHG emissions. On top of this, peatlands drained for agricultural purposes emit a staggering 166 million tonnes of CO^2 every year.

If the EU rewetted only 3% of its agricultural land, it would first achieve a 25% reduction in agricultural GHG emissions, and then sequester up to 6 tons of CO2 eq. from rewetted wetlands per hectare per year, nearly indefinitely.

Data: eeb.org

CHAPTER 3

OUR SERVICES FOR CLIMATE CHANGE RESILIENCE

Our extensive network of experimental facilities allows us to simulate environmental changes by making controlled adjustments.

AnaEE-ERIC is a key player when addressing the ecological sustainability challenge for Europe. Our facilities help us understand the impact of each change factor, such as land-use change and climate change, and how they interact.

By combining results with modelling, we can predict how ecosystems will respond in the modern era, including identifying tipping points and understanding how ecosystems can adapt and continue to provide services to society.

The AnaEE-ERIC facilities have been selected on several criteria, such as:

- State of the art instrumentation, following the AnaEE standards.
- Capacity to perform at least two environmental pressures.
- Quality of the data provided.
- Access to the international community using our research services.
- Open access to the data and agreement on the standards for data and metadata provided by AnaEE
- Long term support

DEVELOPMENTS IN 2024

ISIA catalogue of services

ISIA catalogue of services (developed by CNRS) is the digital gateway to all facilities and services offered by AnaEE-ERIC and associated projects. Several significant upgrades were launched on the platform in 2024:

- The software structure has been modified to incorporate an API (Application Programming Interface) that will enable the data collected to be used with any interface technology. This major evolution makes the ISIA tool interoperable with many other tools, such as reference catalogues or project submission tools.
- Thanks to this new API, the application's interface has been completely modernized using REACTjs technology to deliver a much-improved user experience.

In addition to AnaEE-ERIC and the French AnaEE-France infrastructure, the ISIA application is now deployed in several European research infrastructures through the AgroServ, IRISCC and Microbes4Climate thematic networks, for almost a thousand users.

OPEN-AIR FACILITIES

They comprise the predominant land use types of European continental ecosystems including managed and unmanaged ecosystems as well as terrestrial and aquatic ecosystems transecting Europe's climatic zones. Open-air facilities have been designed to host long-term experiments lasting at least over one or two decades to decipher long-term trends and slow processes, especially in soils, but also on other terrestrial and freshwater systems. Long-term, open-air experiments constitute a major scientific approach in ecosystems with potential to unravel future patterns under realistic field conditions.

ENCLOSED FACILITIES

These facilities complement the open-air installations by enabling a higher level of environmental control and process measurement on ecosystems. They can be used when highly controlled conditions are needed and are difficult or expensive to realise in open air, for example, the experimental simulation of elevated atmospheric CO2, climate-warming, heatwaves, or shifting rainfall regimes. The AnaEE enclosed installations are unique in their whole-ecosystem level design and measurement technologies.

Modelling facilities

Modelling facilities give access to existing, state of the art, numerical models and to advanced software facilities for model development that will improve data analysis and synthesis and allow predictions of the responses of ecosystems to global changes. Modelling allows for effective forecasting of environmental trends and the impact of various factors like new management practices and climate change. It helps detect anomalies in field data and provides insights for better experimental design and planning. This information aids stakeholders and policymakers in making informed decisions.

Analytical facilities

They offer advanced biological, physical and chemical analyses of different samples (soil, plant) for a deeper insight into processes. Featuring state-of-the-art large instrumentation, for advanced biological, physical, and chemical analyses. Analytical installations extend the availability of advanced methods, otherwise inaccessible for most experimental installations, to provide comprehensive data that permits the understanding of the mechanisms of response and adaptation to different environmental factors.

The research facility CLIMAITE in Jægerspris is an Open Air facility, located in the Northern Zealand, Denmark. Photo: AnaEE Denmark.

CHAPTER 4

IMPACT

One of the notable achievements of AnaEE-ERIC is its multidisciplinary approach, which integrates forestry, agronomy, freshwater ecosystems, and environmental sciences.

The AnaEE-ERIC network tackles critical questions related to climate change, biodiversity loss, and global change factors, with a particular emphasis on climate extremes such as drought, heat, and heavy precipitation. Moreover, it aims to enhance agricultural productivity by improving crop yield, carbon storage, soil fertility, and greenhouse gas mitigation. It also develops cost-effective, and environmentally sustainable methods for seedling production and forest regeneration to accelerate carbon sequestration in a changing climate.

By combining experimentation, analysis, and modeling services, AnaEE-ERIC enhances our understanding of the impacts of global change on ecosystems. This comprehensive approach facilitates the development of effective adaptation and mitigation strategies to safeguard ecosystem services and their associated economic and societal benefits.

Furthermore, AnaEE ERIC has made significant strides in fostering collaboration among European researchers. By uniting various experimental and analytical platforms, it has created a cohesive network that promotes data sharing, standardization, and the dissemination of best practices. This collaborative framework not only accelerates scientific discovery but also informs policy-making processes aimed at environmental conservation and sustainability.

To ensure visibility and access to cutting-edge experimental and analytical facilities, AnaEE-ERIC has provided enhanced impact to its member institutions through participation in various projects e.g. AgroServ, M4C, IRISCC and as well creating a platform for researchers, experts, and practitioners to exchange knowledge, present new findings, and foster collaborations through events such as the first AnaEE scientific conference and technology foresight workshop.

Ing. Biljana Đorđević, Ph.D. begun her job as the Scientific officer for AnaEE-ERIC in 2024, at the Interface and Synthesis Centre in Brno, Czech Republic.

AnaEE RI Representation

Node	Name of participant	Name of board
Belgium	Nadia Soudziloskaia	Scientific Board of the Belgian Climate Center
Belgium	Jonas Schoelynck	Scientific Advisory Board of the Sigmaplan, the Flemish water management plan of the Scheldt River
Belgium	Jonas Schoelynck	Active contributions to policy forums/round tables: e.g. the ongoing Climate adaptation for Flemish agriculture initiative, by the Flemish Agency for Agriculture and Fisheries (February, March 2024)
Bulgaria	Prof. Irena Atanassova	EU Soil Strategy 2030 “Reaping the benefits of healthy soils for people, food, nature and climate”
Bulgaria	ISSAPPNP committee	Sustainable nutrient management on farms using the “FAST” tool
Bulgaria	Prof. Irena Atanassova,	National Program for the Protection, Sustainable Use and Restoration of Soil Functions
Bulgaria	ISSAPPNP committee	Sofia Municipality program for the protection, sustainable use and restoration of soil functions (2021-2026)
Bulgaria	ISSAPPNP committee	National Environmental Strategy 2021-2030
Bulgaria	Prof. Olya Karajova	National Action Plan for the Management of Persistent Organic Pollutants in Bulgaria 2020-2030
Bulgaria	ISSAPPNP committee	Directive on soil monitoring and sustainability – Soil Law
Bulgaria	ISSAPPNP Committee	Mandatory standards (GAEC) under the strategic plan for the development of agriculture and rural areas
Finland	Lauri Arvola	SYKE proftest group
Finland	Kimmo Kahilainen	Regional climate expert group of Kanta-Häme
Finland	Kimmo Kahilainen	International Cooperative Programme on Integrated Monitoring of Air Pollution Effects on Ecosystems, UNECE/ICP IM
Finland	Kimmo Kahilainen & Janne Sundell	Co-operational board of regional council of Häme, expert & vice member
Finland	Kirsi Järvenranta	Ministry of Agriculture and Forestry in Finland; Manure management policy working group
Finland	Johanna Riikonen	Pohjois-Savon ilmasto-, kiertotalous- ja biotalousryhmä (North Savo Climate, Circular Economy and Bioeconomy Group
Finland	Maarit Liimatainen	Elintarviketalouden työryhmä (Pohjois-Pohjanmaan liitto ja ELY-keskus) 6.2.2024
Finland	Maarit Liimatainen	Pohjois-Pohjanmaan vesienhoidon yhteistyöryhmä (Pohjois-Pohjanmaan ELY-keskus) 2.5.2024
Italy	Yasutomo Hoshika	CP Vegetation annual meeting for the establishment of ozone critical levels for the protection of vegetation

In the spotlight: **AgroServ** opening the gate to research on sustainable agroecology

GLOBAL CHALLENGES

AgroServ stems from the need of a collective action capable of enhancing the sustainability of food systems, safeguarding human, animal, and environmental health.

TRANSdisciplinarity

The project offers complementary services on plant, animal, soil and human health at all scales, from the molecular to the societal level, integrating with 3 Living Labs.

143 services

AgroServ services can be used for experiments with scientific or technological objectives to answer basic and applied questions related to sustainable and resilient agriculture.

The AgroServ project provides researchers with access to specialized facilities and funding, helping teams work across different scientific disciplines.

By connecting research infrastructures and supporting innovative projects, the initiative enables scientists to explore complex challenges from multiple perspectives.

Alberto Akiki,a young researcher from Italy, is among the first users who have obtained free access to services in the project's Transnational/Virtual access programme. Access to research services provided by facilities within AnaEE-ERIC and METROFOOD-RI is allowing Akiki to further develop his project, on the way to achieving promising results.

Ancient Grains, Modern Solutions: Emmer Wheat's Role in Sustainability

In Central Italy, ancient wheats have been considered as alternative crops for their capacity to adapt to adversities induced by climate change. Alberto Akiki's PhD project conducted at IUSS Pavia and the University of Teramo is focusing on valorising emmer wheat supply chain and validating its sustainability. The university team, under the supervision of Prof. Giampiero Sacchetti, is collaborating with local food businesses and AgroServ, aiming to exploring how emmer food can inspire sustainable development from societal, economical, nutritional, and functional aspects.

"AgroServ has become an important stepstone for the project, offering free access to further research units, and enhancing the project's accountability"

Photo: Alberto Akiki

AgroServ has become an important step-stone for the project, offering free access to further research units, and enhancing the project's accountability. The support has significantly streamlined the research process by addressing novel methodologies useful for a transdisciplinary approach and ensuring a solid foundation for implementation. The collaboration could valorise emmer, benefiting both environment and communities.

Following project approval, access managers were contacted, and virtual meetings facilitated the implementation of pre-agreed analyses. Thanks to AgroServ, in-depth nutritional and functional characterization of emmer accessions will be carried out at AnaEE-ERIC (CIHEAM Bari), with the possibility to complete the research through surveys at CETRAD (Socioeconomics), and prototyping at METROFOOD (pilot). By engaging diverse expertise, the aim is to assess emmer foods sustainability and functionality.

The final vision is to promote the cultivation of alternative crops based on rigorous scientific approach; indeed, this platform is potentially contributing to enhancing research in food science and adding value in demonstrating the importance of local ecotypes of emmer wheat.

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CHAPTER 5

GOVERNANCE

AnaEE-ERIC is founded by its 8 members consisting of 6 countries (Bulgaria, Denmark, Czech Republic, Finland, France, Italy), 1 International Organisation (CIHEAM) and 1 observer country (Belgium).

The **Central Hub** is located at the headquarters in Gif-sur-Yvette. It is responsible for access to the infrastructure, the coordination, administration and management of the AnaEE-ERIC web portal and the three Service Centres. The Director General (DG) is the chief executive officer of AnaEE and its legal representative. The DG is appointed by the Assembly of Members (AoM) and has authority on all services of the AnaEE-ERIC.

THE ASSEMBLY OF MEMBERS

The Assembly of Members is the main governing body of the AnaEE-ERIC. It comprises two representatives per member, one with a scientific, and one with an administrative expertise. The AoM appoints the Director General and takes all decisions related to the AnaEE strategy, governance and scientific development.

The Assembly of Members	
Chairperson of the Assembly Sanna Sorvari Sundet	Vice Chairperson of the Assembly Jean-Marie Flaud
Belgium Tom Vandenbogaerde Laurent Ghys	Denmark Mads Rugaard Christensen Jørgen Eivind Olesen
Bulgaria Milena Glavcheva Elena Todorovska	Finland Mikko Peltonen Jaana Bäck
CIHEAM Claudio Bogliotti	France Eric Aubry Jean-Marie Flaud
Czech Republic Jiri Švehla Kristina Trávníčková	Italy Giampiero Golisano Massimo Gardiman

THE MANAGEMENT BOARD

The Management Board (MB) is a committee composed of the DG and the heads of the service centres, and key personnel. The MB advises the DG on all matters related to the day-to-day life of the ERIC, as well as in the preparation of the work programme and budget, strategy, communication and outreach. In its “extended” form (Extended Management Board), the Management Board meets with the representatives of the national nodes and of the four facility types. The Management Board meets approximately once a month, the Extended Management Board once every 2 months.

Michel Boër: Chairman of the Board. Director General AnaEE-ERIC

Marco Bascietto: Data and Modelling Centre (interim)

Klaus Steenberg Larsen: Technology Centre (interim)

Karel Klem, interim (Jan-June 2024) & **Biljana Đorđević** (July 2024-): Interface and Synthesis Centre

Lavanya Premvardhan: Senior Program Manager

Mireille Matene: Chief Administrative and Financial Officer

Amanda Ölander: Communications Officer

Veronique Ozier-Lafontaine: Office manager and Executive assistant

THE INDEPENDENT SCIENTIFIC ADVISORY COMMITTEE (ISAC)

The ISAC is composed of 5 to 10 scientists chosen for their expertise in the fields covered by AnaEE and is appointed by the AoM. It provides advice on the criteria for the acceptation of facilities, on the strategy, on the collaboration with other infrastructures and bodies, it analyses the activity reports and provides recommendations on the work programme and long-term strategy and gives foresight on ecosystem sciences and the links with food security and the bioeconomy.

Ioannis Athanasiadis: Professor of Artificial Intelligence and Data Science at Wageningen University and Research, Netherland

Violeta Bozhanova: Professor, Vice-President of the Agricultural Academy of Bulgaria

Alessandra de Marco: Director of research at ENEA, Italy, and coordinator of the IUFRO (International Union of Forest Research Organizations)

Michael Bahn: Professor at University of Innsbruck, Austria

Stefan Bertilsson: Professor in Functional Ecology of Freshwaters, former Director of the SITES Research Infrastructure, Sweden

Claudio Stöckle: Professor, Washington State University, United States of America

OUR VISION AND MISSION

AnaEE-ERIC operates a pan-European network of facilities in experimental ecology that is open to the scientific community and other stakeholders such as the industry, land managers and the farming community.

Our Vision

To become the international reference organisation for Global Change Ecology, and sustainable services from ecosystems.

AnaEE RI is committed to supporting the European Green Deal, and our goals are in line with the Sustainable Development Goals from the 2030 agenda for sustainable development adopted by all the United Nations Member States in 2015.

Our Mission

Understand how anthropic drivers such as climate change affect ecosystem functions and services. AnaEE RI provides a novel approach by simulating future climate conditions, and other drivers such as management methods to address ecological sustainability challenges for Europe.

CHAPTER 6

ANAEE-ERIC ACTIVITIES

AnaEE RI experienced significant growth in 2024, expanding its team to eight members at headquarters and successfully hosting its first Science Conference in Paris.

THE CENTRAL HUB (FRANCE)

The Central Hub (CH) is the heart of the strategy, coordination, communication and administration of AnaEE. It coordinates the overall infrastructure and manages the AnaEE web portal which gives access to all the resources and services of the infrastructure.

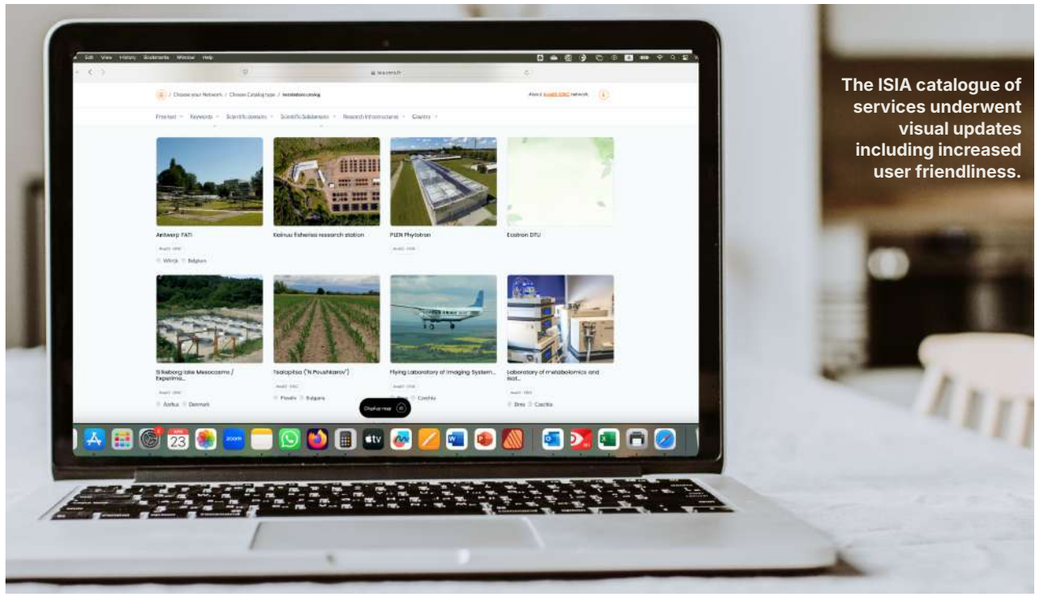
Staffing

AnaEE-ERIC continued to grow during 2024 with our headquarters in Gif-sur-Yvette consisting of eight team members by the end of the year.
The three recruitments in 2024 consist of the following:

- **Science Project Manager: Joseph Timkovsky.** With a PhD in atmospheric chemistry and experience in strategy consulting and startup leadership, combined with expertise as an R&D manager connecting scientific research to practical applications, the focus is on advancing impactful environmental projects. Collaborating with experts on Horizon Europe projects drives innovation and supports critical research and policy development in environmental science.
- **IT-Engineer: Youssef Haidala.** Before joining AnaEE-ERIC, experience included a software engineer internship, followed by transitioning to a full-time IT engineer role. This position involves software development and user needs analysis, contributing to a comprehensive service catalogue that enhances access to providers and services for the EU-projects IRISCC & M4C.
- **Communications Officer, AgroServ: Daniele Baldo.** With a background in Political Science and international studies, Baldo holds a master's degree in urban planning. He has international experience in research, communications, event production, and project development. As the communications officer for the EU project AgroServ project he works with connecting researchers, farmers, policy makers and citizens around tackling agroecological challenges.

The post-event survey (26 responses) showed on overall appreciation for the event, and participants left many comments on highlights and useful suggestions for the next event.

October 2024 marked a significant milestone with the first AnaEE scientific conference, Ecosystems Under Pressure.



The ISIA catalogue of services underwent visual updates including increased user friendliness.

AnaEE-ERIC Science Conference

In October 2024 the very first AnaEE Science Conference took place in Paris, France. It was a great success, thanks to the valuable contributions and engagement from the network and the 50+ participants. Three sessions were held with 15 speakers on a range of topics and latest findings from the AnaEE network. A technological foresight workshop was also held, as well as discussions about the next AnaEE strategy.

The results from a post-event survey showed that participants appreciated the event, and we gathered useful feedback for how to improve the next event that will be held in October 2026.

ISIA - Catalogue of services

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- The software structure has been modified to incorporate an API (Application Programming Interface) that will enable the data collected to be used with any interface technology. This major evolution makes the ISIA tool interoperable with many other tools, such as reference catalogues or project submission tools.
- Thanks to this new API, the application's interface has been completely modernised using REACTjs technology to deliver a much-improved user experience.

In addition to AnaEE-ERIC and the French AnaEE-France infrastructure, the ISIA application is now deployed in several European research infrastructures through the AgroServ, IRISCC and Microbes4Climate thematic networks, for almost a thousand users. AnaEE-ERIC provides now support for the development of ISIA with an IT Engineer.

Preparation of legal and strategic documents

Host agreement preparation and implementation

In 2024 CH has been busy preparing the host agreements for the Data and Modelling Centre (DMC), to be hosted by CREA in Italy; and the Technology Centre (TC) to be hosted by the University of Copenhagen (UCPH) in Denmark.

The negotiation process was successfully concluded for the DMC, with the Agreement being officially cosigned by both AnaEE-ERIC and CREA on 28 November 2024 in Rome, in the presence of all participants to AoM#6 and the Italian national node. A recruitment process for the Head of the Centre was also launched.

As concerning TC, negotiations with UCPH for Denmark, shall be pursued to reach a final agreement that will satisfy both parties. Such a result will represent an important milestone in the effective implementation of AnaEE as a multisite ERIC, after the 3 hosts agreements successfully concluded with France (CNRS for the Headquarters/CH), Czech Republic (Czech-Globe for the ISC) and Italy (CREA for DMC).

Service level agreement

The service level agreement (SLA) is a legal document that sets out the general terms and conditions, and minimum guaranteed standard levels, by which the National or the Service Provider shall contribute to the AnaEE Work Programme. A significant progress was made since 2022, to have all SLAs signed at the level of each National Node and Service provider, including the corresponding annexes.

Out of the 7 SLAs to be signed at the national node level, 6 SLAs have already been signed and only 1 is still pending. As concerning Services Providers SLAs, 21/26 agreements were signed, and only 5 agreements with the corresponding facilities annexes are still pending. 2

facilities in Denmark and 1 in Finland are under reconstruction. With a completion rate estimated at 83.24% up to the end of 2024 for the signature process, more actions shall be taken to reach a 100% rate, as the delivery of services are expected to begin in 2025.

Partnership and Enlargement

AnaEE-ERIC seeks to extend its membership base with the objective to strengthen its consortium with an expanded reach and better address vulnerabilities, and fill gaps, in the European ecosystem landscape. To this end, discussions with different countries have been opened, and have reached a more advanced stage with Portugal and Spain following the sustained interactions in 2022.

Portugal: continued discussion with partners in Portugal are ongoing. Four institutions in Portugal have passed an agreement for the constitution of a national node. The AoM#2 took place in Porto, December 2022, and was an opportunity for our delegates to meet in person the Portuguese community. The University of Tras os Montes and Alto Duro (UTAD) is a beneficiary of AgroServ, where it provides socio-economic services and contributes to one of the living-labs under the umbrella of AnaEE RI. AnaEE-ERIC and UTAD signed an agreement for the preparation and development of a national node in the perspective of a full membership of Portugal.

Spain: after a successful meeting in November 2022, technical discussions are ongoing. 5 institutes of the CSIC have successfully applied for the constitution of a national node and preparation of an application to the authorities for possible membership of Spain to AnaEE-ERIC. High-level discussions have taken place between CSIC and AnaEE-ERIC.

Both Spain and Portugal are associated to the works of the EMB, in order to consolidate the links between the communities, and to prepare their arrival as full member.

Belgium: Following the success of the AnaEE-Flanders application, Belgium should become soon a full member of AnaEE-ERIC (expected in 2025).

AnaEE-ERIC continues discussions with several partners based on the specificity and added-value of their infrastructure, and interest in AnaEE-ERIC.

Coordination of the network

Regular meetings between the management of AnaEE-ERIC and the national node representatives within the framework of the Extended Management Board (EMB). CH has also been involved in the writing of proposals on behalf of the AnaEE Research Infrastructure, including the scientific, administrative, and financial parts. Most of these proposals were successful (cf. project section).

THE ANAEE-ERIC INTERFACE AND SYNTHESIS CENTRE (CZECH REPUBLIC)

The Interface and Synthesis Centre (ISC) is responsible for the overall integration of the results obtained thanks to AnaEE-ERIC. It prepares synthesis and opinion papers on behalf of AnaEE-ERIC, watch for emerging societal needs, answer to demands from the society, economy, and policy makers. It is also responsible for the training and outreach.

In 2024, the AnaEE-ISC was fully established at CzechGlobe (Global Change Research Institute, Czech Academy of Sciences) in Brno, Czech Republic. As planned, the ISC activities began in the first half of 2024, when two new recruits began their work.

ISC Office Activities and Achievements in 2024

In May 2024, the ISC office, hosted by CzechGlobe in Brno, Czech Republic, became fully operational with the recruitment of two new employees: a Scientific Officer (SO) and a European Project Manager and Liaison Officer (EPMLO). Following the initial setup, ISC personnel were invited to the Central Hub office in Gif-sur-Yvette to meet the AnaEE-ERIC team, facilitating in-person exchanges of ideas and expertise.

Both the SO and EPMLO actively contributed to multiple projects in which AnaEE-ERIC participates. The SO was involved in IRISCC, M4C, and PHENET, while the EPMLO contributed to AgroServ, AquaServ, and ERIC Forum 2. Their participation led to the successful submission and acceptance of several project deliverables.

The EU-funded PHENET project, in collaboration with the International Plant Phenotyping Network (IPPN), hosted a series of joint webinars highlighting leading European research infrastructures. AnaEE was among those featured, with the SO presenting its facilities and services. Additionally, the EPMLO participated in the AgroServ Workshop – Research Infrastructures Towards Agroecological Transition, held in Bari, Italy, on October 2–3. In September, the EPMLO was appointed as AnaEE's Gender Equality Reference Person and participated in the ERIC Forum 2 Gender Equality Workshop held in Amsterdam on September 26-27.

October 2024 marked a significant milestone with the first AnaEE scientific conference, Ecosystems Under Pressure, where the SO played a key role in organising and presenting scientific results. The EPMLO finalised AnaEE's stakeholder engagement strategy which was approved by the 6th Assembly of Members in November 2024. The EPMLO also worked to establish AnaEE's Stakeholders Committee while supporting communication efforts.

Strengthening relationships with Czech-based research infrastructures was another priority. ISC personnel engaged with EIRENE to discuss potential cooperation within the One Health framework and visited the ICOS ecosystem station in Lanžhot. Moreover, both the SO and EPMLO contributed to the development of AnaEE's short- and long-term strategic plans.

ISC personnel were deeply involved in understanding the needs and expertise of AnaEE facilities, actively supporting discussions on AnaEE's participation in Horizon Europe Cluster 6 projects. Additionally, in collaboration with the Technology Centre, work commenced on a report detailing AnaEE's scientific expertise.

Lastly, efforts were initiated to prepare an opinion paper on impacts of heat and drought on terrestrial ecosystems, engaging AnaEE members from various countries to provide their expertise and insights. These initiatives reflect the ISC office's commitment to strengthening AnaEE's role within the European research landscape and fostering collaboration across scientific communities.

Staffing

As part of the establishment and agreement with the CzechGlobe research institute, successfully recruited two new staff members in April 2024:

- **Scientific Officer & head of ISC: Biljana Đorđević**. Đorđević has a background in plant biotechnology, plant physiology, and the effects of biotic and abiotic stress on plant growth, with over 15 years of experience managing and conducting advanced research projects. She was also an assistant professor in Forest Protection and Wildlife Management and as head of a plant biotechnology laboratory at Mendel University in Brno, Czech Republic.

- **Liaison Officer & EU Project Manager: Ogheneyoma Olisah**. With experience in research and industry spanning over a decade, Olisah has worked on international projects in food product development, regulatory compliance, and ecosystem management. She has collaborated with government agencies, NGOs, researchers, and industry partners across Nigeria, the UK, and South Africa.

THE ANAEE-ERIC TECHNOLOGY CENTRE (DENMARK)

The role of the Technology Centre (TC) is to watch and develop new emerging technologies and ensure that instrumentation and methods are coordinated among the installations. The TC is also responsible for the spin-off of new technologies developed within AnaEE-ERIC, as well as for coordinating the training of users and installation operators.

Staffing

The TC staff was affected by long-term sickness of one employee in 2024. From September 2024, **Rachel Elenor Burns** (Technology Officer) joined the TC as in-kind staff contributing to the activities of the TC.

AnaEE Science conference and training activities

As an integrated part of the AnaEE Science Conference, the TC also arranged its annual technology foresight workshop focusing on newest advances in remote sensing and low-cost, cloud-based sensor networks. AnaEE TC was also involved in training activities as a co-organizer of the 5-day, 2.5 ECTS PhD course AMAGS (Advanced measurements and analyses of greenhouse gas fluxes from soils and ecosystems) together with AnaEE Denmark and the University of Copenhagen in August 2024. The course had 21 students from eight countries participating. v

TC other activities

The TC has been highly involved in starting up the IRISCC project and preparing the ISIA catalogue together with the Central Hub and IRISCC partners. The setting up of ISIA for IRISCC is paving the way for also updating and finalising the ISIA-based catalogue of services for AnaEE facilities in 2025. Training material including written guidelines and videos created for IRISCC will be edited and used for the process in AnaEE. As part of the service catalogue development activities the TC has been working on the standardization of ecosystem and climate zone definitions as well as the definitions of scientific domains, which is a work that continues into 2025 in coordination with AnaEE France and the IRISCC project.

The TC has over the year held many online meetings with different AnaEE facilities, keeping updated on services offered and helping them understand their role and involvement in the various INFRASERV projects that AnaEE is involved in, while staying informed on what the needs of facilities are regarding future funding. Most facilities hope to see more support in the future towards multilateral research projects involving several AnaEE facilties.

THE ANAEE-ERIC DATA AND MODELLING CENTRE (ITALY)

The AnaEE-ERIC Data and Modelling Centre (DMC) plays a key role in managing data and metadata, ensuring their accessibility to both individual users and the broader research community. It provides access to models and modelling tools while also organizing workshops and training for AnaEE-ERIC users and staff.

In 2024, the DMC pursued four main objectives: (i) Expanding digital capabilities, leveraging the infrastructure developed in 2022 and 2023 and the preoperational phase. This led to the enhancement of key services such as the data catalogue (data.anaee.eu) and the API catalogue (developer.anaee.eu), now enriched with additional content and cross-RI access. Additionally, the DMC oversaw the development of the Crops and Pests Virtual Research Environment (VRE), funded by Italy's ITINERIS project, which has now entered its operational phase. (ii) Supporting AnaEE-ERIC's growth, notably by finalizing the new Data Management Plan (not yet approved) and providing IT-related strategic guidance. (iii). Fostering cooperation and digital transformation, engaging research facilities and managers to enhance digital integration within AnaEE-ERIC. (iv) Signing the Host and Resource Provision Agreement for the implementation of the AnaEE-ERIC DMC

As part of its broader mission, the DMC has actively contributed to project proposals and supported AnaEE-ERIC's AgroServ initiative, particularly in developing its data management plan. Strengthening ties with the ENVRI and EOSC communities, it has established continuous collaboration with EGI and research infrastructures like EPOS, EMSO, and LifeWatch ERIC, positioning AnaEE as a key player in digital research and FAIR data management.

Researchers now benefit from FAIR-compliant tools that facilitate federated data publication and interoperability, ensuring seamless integration with external repositories and greater visibility for their work. The newly established cloud-based Identity Provider System, compliant with ENVRI recommendations, enhances digital access across ESFRI research infrastructures.

During the Assembly of Member, held in Rome on November 28, 2024, the Host and Resource Provision Agreement between CREA and AnaEE-ERIC has been officially signed. The signing took place in the presence of Dr. Maria Chiara Zaganelli, the newly appointed Director General of CREA, Dr. Michel Boër, Director General of AnaEE-ERIC, and Dr. Jean-Marie Flaud, Vice President of the Assembly.

The DMC will be hosted in Rome by the Centre for Engineering and Agro-Food Processing. During 2025 CREA will recruit a Data & Modelling Scientist, to be seconded to AnaEE-ERIC as Head of the DMC, who will join the appointed cutting-edge environmental research team. The recruitment process for this position begun in November 2024.

The centre leader will be instrumental in designing and implementing advanced ecosystem models, managing FAIR-compliant datasets, and supporting the integration of experimental and observational data across our European research network.

Looking Ahead: 2025 Goals and Strategic Direction

With its new headquarters in Rome gradually taking shape, the DMC aims to formalize a shared vision for research facilities on data management tools. The overarching goal is to define technological guidelines and software requirements to enhance digital capabilities across AnaEE-ERIC.

Planned initiatives for 2025 include: (i) Expanding Virtual Research Environments for AnaEE-ERIC researchers. (ii) Strengthening engagement in European digital initiatives (ESFRI, EOSC, and EU-funded programs). (iii) Launching a training program on environmental data science and modelling.

By combining technological advancements with training efforts, the AnaEE DMC is set to reinforce its role as a hub for FAIR data management and cloud-based environmental modelling, ensuring AnaEE's continued leadership in the evolving digital research landscape.

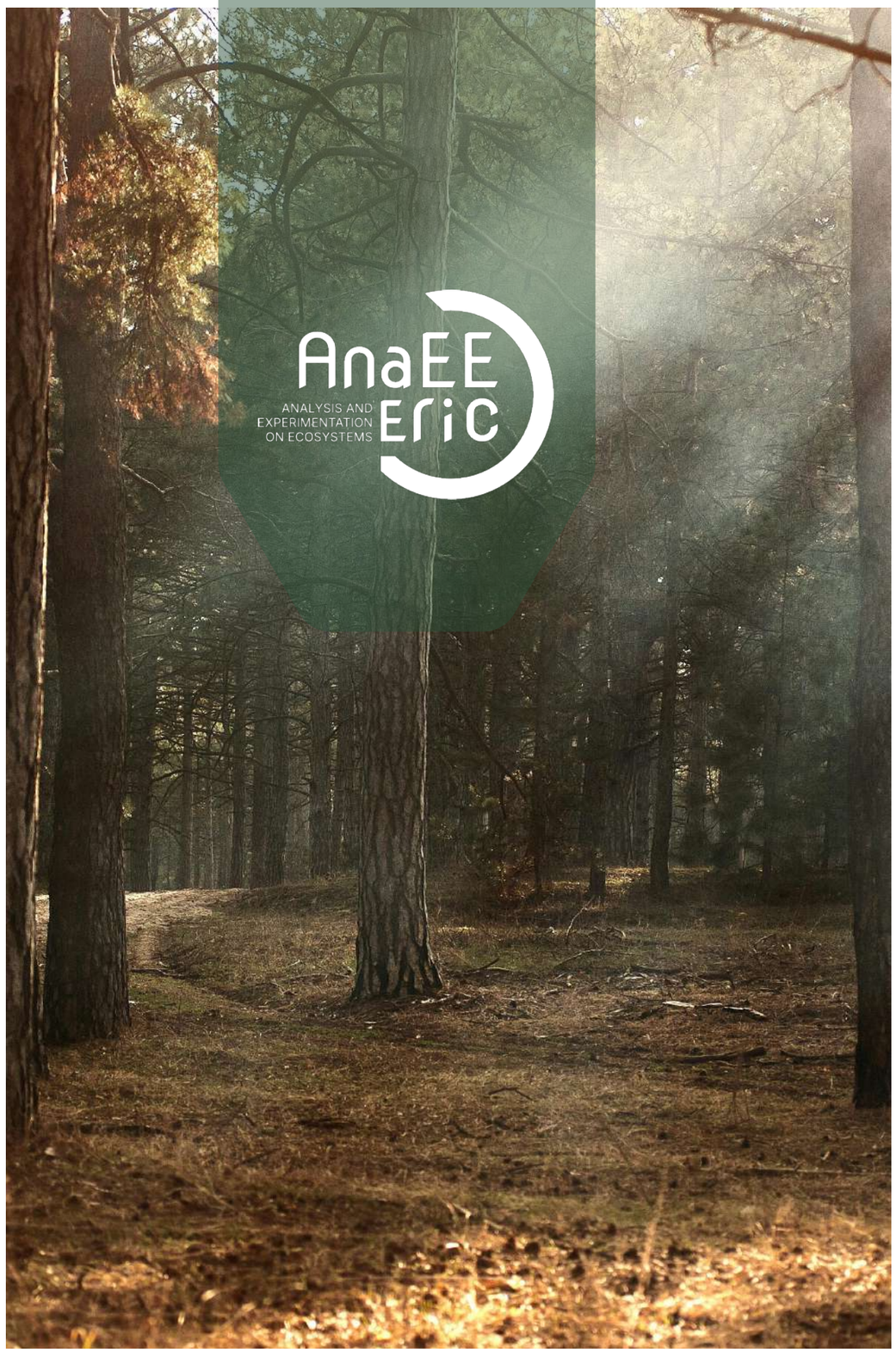
TRAINING

AnaEE TC was also involved in training activities as a co-organizer of the 5-day, 2.5 ECTS PhD course AMAGS (Advanced measurements and analyses of greenhouse gas fluxes from soils and ecosystems) together with AnaEE Denmark and the University of Copenhagen in August 2024. The course had 21 students from eight countries participating.

AnaEE Denmark's successful summer school tackled one of the most pressing questions of our time: reducing greenhouse gas (GHG) emissions while ensuring food security and sustainable biomass use.

AnaEE France organised once again its popular summer school with the theme "Machine learning" in ecology: main principles and applications to the analysis of images or sequences.

AoM#6 participants in Rome, Italy.



The school, organized as part of the national Greenomics thematic network with the national research infrastructure AnaEE France and coordinated by Philippe Vandenkoornhuyse, took place from September 23-27, 2024 at the Jardin du Lautaret. The training was aimed in particular at doctoral students, post-doctoral students and researchers or engineers wishing to train and deepen their knowledge in the use of "machine learning" for image and DNA sequence analysis. It consisted of a series of lectures to cover theory and concepts, tutorials, and a site visit. The courses were delivered in French. The summer school was led by two expert teachers from the University of Rennes, Candide Lissak (Univ Rennes, IRSET) and Yann Le Cunff (Univ Rennes, IRISA).

Other trainings

- Temporary contract within the project ITINERIS, 2 ppl (Elena Marra and Leonardo Lazzara), 1500 hours each participant
- AnaEE Bulgaria: In 2024 ten applications were implemented under the SSA project for staff mobility under the Erasmus+ Program in Croatia, Brazil, Hungary, Sweden, Japan, Albania and North Macedonia (10 persons /84 days)
- AnaEE Bulgaria: Training on the topic: "Field erosion studies and equipment for the construction of field experimental plots on erosion. Spectroscopy of plants and soils", at the University of Zagreb, Department of "General Agriculture", Zagreb, Croatia, under the SSA project for staff mobility for the purpose of training under the Erasmus+ Program, contract No. 2022-1-BG01-KA131-HED-000055751 of 11.12.2023, Assoc. Prof. Dr. Gergana Slavova Kuncheva, 8 days/1 persons
- AnaEE Finland: Contiuous training for new research equipment including water-sampling robot and automatic sampling program for the robot, Sample handling accoring to the standards. 4 participants, 7 days.

AnaEE DK PhD course
Photo: Klaus Steenberg Larsen

Data in the AnaEE RI framework adheres to the principles of being **FAIR**

FINDABLE
ACCESSIBLE
INTEROPERABLE
REUSABLE

AnaEE-ERIC DG - Michel Boër, CREA DG - Maria Chiara Zaganelli & Vice Chair of AnaEE-ERIC Assembly of Members - Jean-Marie Flaud.

Data and modelling in AnaEE

The AnaEE Data and Modelling Centre (DMC) is responsible for the processing of the data and metadata, the provision of data to the users (either the direct users or the community), the access to the models and model factory. It also organizes workshops and training for users and AnaEE staff.

AnaEE offers advanced modeling facilities that provide state-of-the-art tools for simulating and analyzing complex environmental systems.

These facilities support researchers in addressing challenges posed by rapid climate changes and shifting population dynamics in agriculture, forestry, and environmental science.

Why Modeling Matters:

- **Efficient Forecasting:** Simulations predict environmental trends and assess the impact of management practices, new species, and climate change.
- **Data Validation:** Models detect anomalies in field data, enhancing understanding of ecosystem dynamics.

AnaEE's modeling resources provide access to cutting-edge numerical models and tools for developing custom models, improving data analysis, and predicting ecosystem responses to global changes.

CHAPTER 7

COMMUNICATION

In 2024, AnaEE-ERIC established a strong foundation for its communication activities by updating its strategy and building a network of communicators.

In 2024 the foundation for the communication activities was laid. AnaEE-ERIC's new communications officer developed the first visual guidelines, giving the communication materials a more coherent and professional look. The Communication strategy was updated, along with the Communications Work Programme, that serves as the roadmap for building and developing the capabilities to achieve the strategic goals laid out in the overall strategy. With a clear roadmap the organisation ensures that its communication capabilities are continually growing in a way that directly supports AnaEE-ERIC's strategic objectives.

The work programme is designed to build and enhance the organisation's communication results, infrastructure, skills, processes, and tools. It also includes staff training, new technology implementation and content creation capabilities.

In 2024 the following activities were accomplished: First visual guidelines, updated templates and promotional material, a network of communicators from each node has been established, quarterly newsletters, including an e-mail version, an updated AnaEE-ERIC communication strategy, enhanced social media and 5 new YouTube videos, updated website with interactive maps and new pages, new intranet, first AnaEE-science conference, new goodies from sustainable/organic material made in Europe.

All these updates serve to enhance AnaEE-ERIC's visibility and online presence. The intranet has also helped streamlining and increase efficiency and the sense of community among staff and other collaborators within the network.

Upcoming tasks will strengthen the foundational elements of communication that have already been established, ensuring they are fully integrated and optimised. The activities will consolidate AnaEE-ERIC's brand, enhance the intranet for better collaboration, and improve online visibility through social media and a new website design. It will also focus on training staff, developing new communication materials, and implementing a crisis communication strategy.

SOCIAL MEDIA

During 2024, the digital landscape has evolved, and X (formerly Twitter) has been experiencing a significant decline in user engagement and active participation. This trend affects our ability to connect meaningfully with our community and deliver updates effectively.

Bluesky, an emerging and increasingly popular platform in the scientific community, offers a fresh opportunity to revitalise our online presence and engage a growing audience of researchers, policymakers, and enthusiasts interested in environmental research infrastructures. Many RIs, projects, and organisations have already started moving there during 2024.

YouTube

AnaEE-ERIC produced five new videos in 2024 and gathered plenty of material for future communication needs. Single frames can be exported from video material which makes it a great resource for photos as well. By the end of 2024 the videos had accumulated almost 600 views. The videos were made in Belgium and France, in addition the CH received video material from several National Nodes.

LinkedIn

Follower Growth: + 45 % (from 616 to 940 followers compared to December 2023). The number of followers grew at a faster rate the last 6 months (216 from June-December) compared to the first 6 (149 from Jan-May), and we have increased the amount of outreach at the same time.

Engagement Rate: 2.01: AnaEE-ERIC is performing well on engagement rates (ER = Likes + Comments + Shares) / Impressions). Several AnaEE recruitments were made through Linkedln advertisement.

Bluesky

AnaEE-ERIC joined Bluesky in November 2024, a new social media platform, often argued to be a less controversial platform compared to X. Several organisations from the ERIC community are there, and before 2025 we had obtained over 100 followers.

X

Followers: 393 (+3% compared to 2023). On X we publish practically the same content as on Bluesky, but platform popularity and user engagement has decreased overall.

NEWSLETTER

In 2024 we sent four newsletters. We have a Brevo account, allowing us to send news and updates in a handy email-format and have 395 subscribers (39 new subscribers during 2024).

The average opening rate is 29%, which is above average based on Brevo's own statistics.


Participants of the AnaEESC24

Key website metrics compared to 2023 numbers

– 45%

01. Bounce rate

The percentage of visitors who leave a website after viewing only one page without interacting further. The decrease means that fewer visitors leave after viewing only one page.

+ 130%

02. Outlinks

Links on a website that direct users to external sites. An increase in outlinks improves SEO by signaling to search engines that your site provides valuable references, enhances user experience by directing visitors to relevant resources.

+ 242%

03. Average time on page

The average duration visitors spend on a specific page before navigating away. The increase indicates that visitors find the content engaging and stay longer, which can improve SEO rankings and increase conversions.

+ 78%

04. User actions on site

Interactions users take on a website, such as clicks, form submissions, or video plays. The increase indicates that visitors are interacting with the website (e.g., clicking links, filling forms, or watching videos), which boosts engagement and potential conversions.

UNIQUE PAGE VIEWS IN 2024

11 350

ANAEE SCIENCE CONFERENCE 2024

The first ever ANAEESC was organised in 2024 and was a successful event with more than 50 participants, both from within and outside the organisation. More on this under Central Hub activities.

WEBSITE PERFORMANCE REPORT

Over the past year, our website has undergone significant improvements, resulting in substantial growth in user engagement and interaction metrics. Below is a summary of key performance indicators and contributing factors to this success, as well as areas for further development.
Note: It's important to note that direct comparisons to 2023 metrics are limited since all accumulated website data from 2022 and early 2023 was transferred from Google Analytics to Matomo in May 2023. However, certain conclusions can still be drawn from the available data, and by using periodic comparison.

Photo: YouTube thumbnail. AnaEE published 5 new videos in 2024. At the end of 2024 the videos had accumulated a total of 600 views.

Analysis

The data indicates a shift towards deeper engagement and higher-quality interactions with our content. Visitors are staying on pages longer, interacting with more elements, and leaving the site via outlinks at a higher rate, suggesting that the changes made to the website have successfully captured and maintained user interest. The numbers also indicate an increased overall website traffic.

The website's performance metrics reflect a significant improvement in user engagement, driven by improved design and enhanced content strategy.

Key statistics in 2024

- Unique page visits: 3820
- Page views: 17.000
- Unique page views: 11.350
- Average Time on Page: 6min 50s
- User Actions on Site: 5 per visit

AnaEE-ERIC's Communications officer Amanda Ölander is stationated at the Central Hub, Gif-sur-Yvette, France.

CHAPTER 8

EVENTS PARTICIPATION

During 2024 AnaEE-ERIC was represented in the following main events:

January; FHERITALE Kick-off meeting, Florence, Italy. (Michel Boër and Lavanya Premvardhan)

February; Eric Forum 2 Annual meeting, Brussels, Belgium. (Michel Boër and Lavanya Premvardhan)

February; Microbes-4-Climate kick-off meeting, Bragua, Portugal (Michel Boër, Philippe Vandenkoonhuyse, AnaEE France)

February; Agroecology partnership kick-off meeting, Brussels, Belgium (Michel Boër)

March: AnaEE France GA General Assembly, Séte, France. (Lavanya Premvardhan)

April: PHENET General Assembly, Wageningen, Netherland (Michel Boër)

May: DMC Data Management Plan discussion, Milano, Italy. (Lavanya Premvardhan)

June; IRISCC kick-off meeting, Helsinki, Finland. (Michel Boër & Youssef Haidala)

June; Belgian Presidency conference on Research Infrastructure, (Lavanya Premvardhan)

June; Workshop on sustainabiliy of Research Infrastructures / European Commission, Brussels, Belgium (Michel Boër)

June; European Science Foundation event, Strasbourg, France (Michel Boër)

September; ERIC Forum Gender Equality Workshop, Amsterdam, The Netherlands. (Ogheneyoma Olisah)

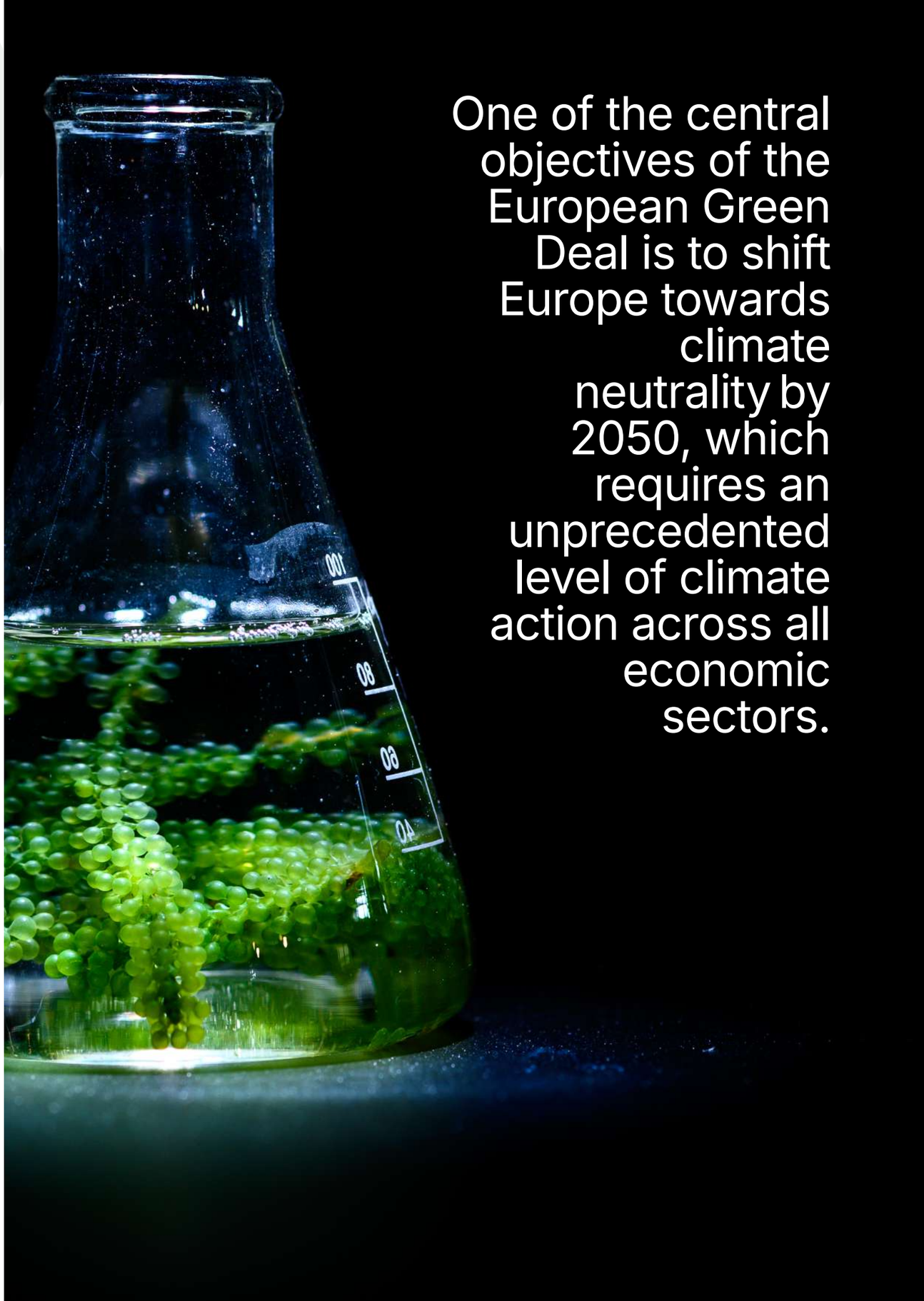
September; European Research Area Stakeholder Conference 2024, Brussels, Belgium. (Lavanya Premvardhan)

October; AgroServ Stakeholder workshop, Bari, Italy (Michel Boër & Ogheneyoma Olisah)

October; PHENET & IPPN webinar, plant phenotyping and envirotyping, informing how European research infrastructures can assist researchers in their work. (Biljana Đorđević)

October; FHERITALE Strategic Meeting (brainstorming retreat), Utrecht, The Netherlands. (Michel Boër and Lavanya Premvardhan).

November; ICRI24, Brisbane Australia, IRISCC was presented and Sanna Sorvari-Sundet, chairperson of the AnaEE AoM moderated a lively panel discussion, emphasising the importance of global collaboration. (Janne Rinne AnaEE-Finland & Sanna Sorvari-Sundet, AoM Chairperson, Jean-Marie Flaud, AoM Vice-Chairperson)



One of the central objectives of the European Green Deal is to shift Europe towards climate neutrality by 2050, which requires an unprecedented level of climate action across all economic sectors.

CHAPTER 9

PROJECTS

The involvement of AnaEE-ERIC in European Projects

At the end of 2024 AnaEE-ERIC was involved in seven European projects, demonstrating the organisation's central place within the landscape of European Research Infrastructures.

- AgroServ, AnaEE-ERIC as coordinator. (1/09/2022 - 31/08/2027)
- PHENET (1/01/2023 - 31/12/2027)
- ERIC Forum 2 (1/09/2023, 31/08/2026)
- FHERITALE (1/01/2024, 31/12/2026)
- Microbes-4-Climate (1/02/2024, 31/01/2029)
- AQUASERV (1/04/2024 - 31/03/2029)
- IRISCC (1/04/2024 - 30/09/2028)

AgroServ

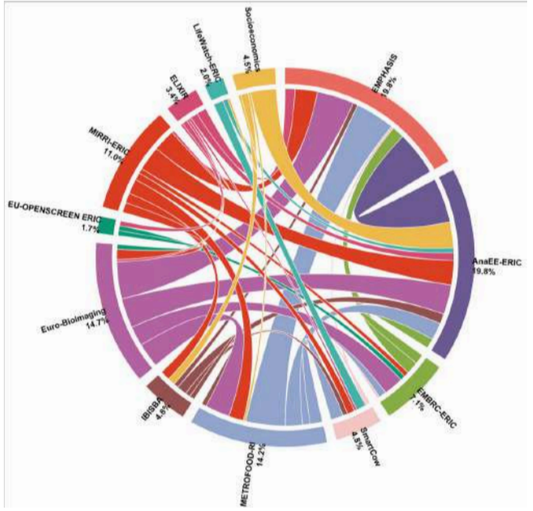
AgroServ, the flagship project coordinated by AnaEE-ERIC is funded by the EU under Horizon Europe, supports agricultural research and innovation to tackle complex challenges like feeding a growing population sustainably, combating climate change, and preserving biodiversity.

With 73 partners offering 143 Research Services, they facilitate collaboration between stakeholders like farmers, industry, and policymakers, providing accessible research from molecular to societal levels. The inclusive approach aims to inform evidence-based decisions for addressing environmental threats, promoting cross-fertilization of knowledge across disciplines.

Developments 2024

In 2024, AgroServ made significant strides in advancing its integrated service offer, further strengthening its role in supporting a sustainable agroecological transition. Following the success of the first call for services, a second call was launched, attracting 38 applications from researchers across diverse disciplines. Meanwhile, the 20 projects funded under the first call progressed steadily, with users now actively accessing AgroServ's research infrastructures (RIs).

To enhance efficiency and accessibility, AgroServ streamlined the Transnational and Virtual Access (TA/VA) process, reducing application times and improving interactions between applicants, service providers, and access managers. The user portal was continuously updated, integrating improved application tools, clear guidelines, and a comprehensive service catalogue aligned with EOSC standards.



Integration of AgroServ Ris by users

A key milestone in 2024 was the operationalization of AgroServ's five Living Labs (LLs), located in the Mediterranean, Central Eastern Europe, and Northern regions. These LLs serve as collaborative spaces where researchers, farmers, and industry stakeholders co-develop solutions to accelerate the agroecological transition. In parallel, AgroServ expanded its training and capacity-building initiatives, launching a series of webinars, workshops, and participatory activities to promote transdisciplinary research and facilitate collaboration across RIs.

Significant progress was also made in data management and interoperability. The AgroServ Knowledge Hub was further refined, providing researchers with best practices for FAIR data management. Key improvements included enhanced usability, integration with data deposition platforms, and alignment with European interoperability standards. A series of training sessions was conducted to equip researchers with the necessary tools to manage and share their data effectively.

Ensuring ethical compliance remained a priority, with AgroServ implementing a robust ethical assessment framework. Over 35 projects were reviewed, addressing concerns related to data privacy, environmental impact,

and research integrity. Additionally, the monitoring framework for TNA/VA projects was launched, enhancing quality management and impact assessment processes.

Engagement with key stakholders and European initiatives was also a major focus in 2024. AgroServ strengthened collaborations with the EU Agroecology Partnership and other Horizon Europe projects, fostering synergies and knowledge exchange. A major workshop on agroecological transitions was held in Bari, bringing together policymakers, researchers, and industry representatives to discuss the role of research infrastructures in driving sustainable agricultural innovation.

Looking ahead, AgroServ plans to launch two additional calls in 2025 (with one already launched), further refine its interdisciplinary service pipelines, and expand its user engagement strategies. By continuously enhancing its digital and physical research services, AgroServ remains committed to empowering researchers, fostering collaboration, and supporting the transition to a more sustainable and resilient agricultural system.

KEY DATA - AgroServ

Project start: 1/09/2022 - **Project duration:** 60 months - **Coordinator:** AnaEE-ERIC (as of 1/09/2023) - www.agroserv.eu

Maximum grant amount for the project: 14,252,873€ (not including UK partners)
Maximum grant amount for AnaEE-ERIC: 720,863€
Maximum grant amount for AnaEE RI partners, transverse work packages (1-9): 2,099,370€
Maximum grant amount for AnaEE RI service delivery: 1,719,089€

PHENET

The PHENET project, responding to call INFRA-2022-TECH-01-01, addresses Europe's need for agroecological transition for food security, climate resilience, biodiversity, and soil carbon restoration. Collaborating with EMPHASIS, AnaEE-ERIC, eLTER, and ELIXIR, PHENET develops tools for future-proofed farming practices across Europe's climate-change scenarios, offering wider access to phenotypic and environmental data, AI-based sensors, Earth Observation data, FAIR data support, and predictive modelling.

PHENET
PHENOTYPING & ENVIROTYPING SOLUTIONS FOR AGROECOLOGY

Eight Use Cases demonstrate solutions' portability, including on-farm data mobilization, while training and outreach activities enhance RI staff skills and broaden user base, benefiting innovative companies and climate-smart agriculture.

KEY DATA - PHENET

Project start: 1/01/2023
Project duration: 60 months
Coordinator: INRAE, France
AnaEE-ERIC role: Beneficiary, WP lead
www.phenet.eu

Maximum grant amount for the project: 9,993,469€
Maximum grant amount for AnaEE-ERIC: 198,750€
Maximum grant amount for AnaEE RI partners: Aix-Marseille Université (Beneficiary, 292,000€), CNRS (affiliated AMU, 67,375€), U. Hasselt (Beneficiary, 344,223€)

Developments 2024

A postdoctoral position for the PHENET project has been launched, and the recruitment process for the most suitable candidate is currently underway.

AnaEE-ERIC's Scientific Officer participated in the PHENET & IPPN Coffee Sessions webinar series, where AnaEE was presented as a research infrastructure along with its services. In the second webinar session, an overview of the eight PHENET use cases was provided, highlighting their scientific objectives, the tools being developed, and facilitating discussions with stakeholders from academia and industry.

The development of new tools and methods across these eight use cases is ongoing. The outcomes of the task led by AnaEE will contribute to the advancement of new research infrastructure services.

ERIC Forum 2

ERIC FORUM

The Second Implementation Project for the ERIC Forum (from now on ERIC Forum 2 or EF2) structures the cooperation between the ERICs and to support the implementation of the ERICs' policy, shaping their community identity and consolidating their integration within the European Research Area (ERA).

The Project's main objectives are to provide updated data and information on the ERICs to demonstrate their outcomes, impacts, and importance in the ERA. It will develop shared practices, regulations, and services to improve ERICs' sustainability and ensure compatibility with European political priorities. Strengthen coordination and networking between the ERICs, supporting ERICs-in-preparation. Ensure that ERICs have an adequate representation on the European stage, a unified voice to speak with, and strong links with society, economy, and competitiveness.

AnaEE-ERIC co-leads the Pillar II on "reinforcing the internal communication" and leads in Work Package WP10: Strategy on building shared services between ERICs.

Developments 2024

In 2024 AnaEE-ERIC contributed to the work package on gender equality and participated to the different meetings involving the work packages of pillar II. AnaEE-ERIC participated to the meeting between the European Commission, the infrastructure National Contact Points (NCP), and the ERICs, on the development and sustainability of ERICs.

KEY DATA - ERIC Forum 2

Project start: 1/09/2023 - **Project duration:** 48 months - **Coordinator:** BBMRI-ERIC - AnaEE-ERIC role: Beneficiary, WP lead-
www.eric-forum.eu

Maximum grant amount for the project: 2,999,463€
Maximum grant amount for AnaEE-ERIC: 64,875€

FHERITALE

Concerns have been growing about the widespread use of artificial materials such as plastics and biotechnological chemicals, as well as their impact on health and the environment. These materials may cause problems either via intended usage (such as food packaging) or throughout their life cycle. Therefore, a systematic approach to investigating consequences is needed.

The EU-funded FHERITALE project aims to transform how European research infrastructures address the difficulties posed by synthetic materials. To that end, we systematically address the development, provision, and integration of services across the European research infrastructures landscape, enabling the scientific community to research the effects of these materials.

Developments 2024

In 2024 we compiled a list of the services available in Europe for scientific research in numerous domains. We also addressed the key priorities in the development of services by making a survey of the research infrastructures.

Under WP4, led by AnaEE-ERIC, a meeting was held in Utrecht with the stakeholder to discuss these priorities, and a document was written as a milestone.

KEY DATA - FHERITALE

Project duration: 1/01/2024 - 31/12/2026
INFRA-DEV
Coordinator: CERM/CIRMMP
https://fheritale.eu

KEY DATA - Microbes-4-Climate

Project duration: : 1/02/2024 - 31/01/2029
INFRA-SERV
Coordinator: MIRRI
https://microbes4climate.eu/

Microbes-4-Climate

Objectives: provide a wider community of users/researchers, irrespective of location, with efficient access to a cluster of complementary world-class Research Infrastructures and their integrated, advanced services, enabling them to conduct curiosity-driven, cross-disciplinary research addressing terrestrial biodiversity and ecosystems, including agricultural and (agro) forestry ecosystems, in light of the multidimensional and still poorly understood microbiomes-plants-soil-environment interactions, and its roles in climate change responses, resilience, and mitigation.

Developments 2024

Several important deliverables have been submitted including a stakeholder and user engagement plan (SUEP) [WP7], and one paper submitted for publication [WP2]. A few other deliverables are being actively worked on. The Catalogue of Services was created, reviewed by the WP1 lead and participants, and submitted in October 2024. In the same month, six training sessions were organized for service managers to train them on how to use the various tools of the M4C catalogue. Additionally, guidelines for training in participating RIs [WP7] and others. A joint SEAB (Scientific and Ethical Advisory Board) and PSC (Project Steering Committee) meeting was held in December where overall positive feedback from the board was received.

AQUASERV

AQUASERV is a pioneering multinational initiative that unites six leading research infrastructures and over 40 scientific institutions across Europe. Our mission is to establish a robust, multidisciplinary network dedicated to advancing sustainable aquaculture, fisheries, ecological restoration and the blue economy through cutting-edge research services.

Developments 2024

Staff Mobility programme Call was launched in November 2024. Deliverable 4.1 has been submitted - a stakeholders database from different sectors to facilitate reaching potential TA users. Deliverable 1.12 has been submitted - report on cumulative expenditure.
The open call was launched in November 2024 with evaluation cycles running every 4 months from submission (March, July, November); a few proposals have already been received.

IRISCC

Integrated Research Infrastructure Services for Climate Change Risks (IRISCC) is a consortium of diverse and complementary leading research infrastructures (RIs) covering disciplines from natural sciences to social sciences, across different domains and sectors.

IRISCC provides scientific and knowledge services to foster cutting-edge research and evidence-based policymaking to improve Europe's resilience to climate change.

Developments 2024

The catalogue of services is being very actively worked on with the aim of providing the first service release in March 2025. “Definition of requirements for the proposed design for the IRISCC Catalogue of Services” (D7.1) was submitted in August 2024. The first transnational access call is being prepared to be launched in April 2025.

KEY DATA - AQUASERV

Project duration: 01/04/2024 - 31/03/2029
INFRA-SERV
Coordinator: EMBRC
https://aquaserv-ri.eu

KEY DATA - IRISCC

Project duration: : 1/04/2024 - 30/09/2028
INFRA-SERV
Coordinator: LUKE
https://iriscc.eu/

Laukaa research infrastructure, Luke, Finland, is one of the partners from AnaEE-RI participating in the AQUASERV project that opened for project applications in November 2024. Photo: Jussi Judin / Luke.

CHAPTER 10

REPORTS FROM NATIONAL NODES

BELGIUM

The AnaEE Flanders consortium, a collaboration between UHasselt and UAntwerp, received €3.76 million in funding (2025-2028) from FWO Flanders in December 2024 to support its research on impacts of environmental change on ecosystems in state-of-the-art platforms. In the coming years, UHasselt will install eight new RAU Ecotrons, allowing short-term experiments on ecosystem responses to environmental change.

UAntwerp is upgrading its FATI system, the recently completed Mesocale Ecotron, and the Mesodrome with new instruments and sensors to enhance climate simulation capabilities. With this funding, AnaEE Flanders is now paving the way for full membership in the AnaEE-ERIC consortium (currently only observer).

Experiments in 2024

Antwerp FATI: last part of PRILVO experiment (e.g. Reynaert et al. 2025) Antwerp Mesoscale Ecotron: experiment into irrigation strategies for potato;

UHasselt Macroscale Ecotron: (1) Pear Orchards in Future Climate (QPEAR), (2) Heathland in Future Climate; (3) Impact of future climate on decomposition and C cycling in heathlands; (4) Impact of future climate on phenology decomposition and C cycling in heathlands;

UHasselt Mycotron Soil Lighthouse: Impacts of mycorrhizas on soil functioning and health.
2 selected publications: Reynaert, S.(et al.). (2025). Turning Up the Heat: More Persistent Precipitation Regimes Weaken the Micro-Climate Buffering Capacity of Forage Grasses During a Hot Summer. Global Change Biology, 31(2), e70078;

Rineau, Francois; (et al.). (2024) Limited effects of crop foliar Si fertilization on a marginal soil under a future climate scenario. Heliyon, 10 (1) e23882.

BULGARIA

A three-year project "Innovative Method for Optimal Fertilization of Agricultural Crops" that valuated the conditions of vegetation in an enclosure and open-air platforms at Bojurishte and Tsalapitsa finished in 2024. The project was funded by theBulgarian National Science Fund (BNSF) ofBulgarian Ministry of Education and Science.

The most important result an innovative method for optimal fertilization of agricultural crops. Patent was obtained for an invention from the Patent Office of the Republic of Bulgaria with the name "METHOD FOR OPTIMAL FERTILIZATION OF AGRICULTURAL CROPS".

A successfully completed project was reported

Measurements of emissions of CO2 from soil and plants at Tsalapitsa Open-Air Field were carried out in four phases of the vegetation of barley grown in 2024 with a portable device "ALMEMO".
Photo: AnaEE Bulgaria.

and a closing conference was held under Project "BG06RDNP001-16.001-0023 to the Rural Development Program for the period 2014-2020" under sub-measure 16.1. "Support for the formation and functioning of operational groups within the framework of the EPI", as part of measure 16 "Cooperation" under the Rural Development Program for the period 2014 - 2020, on the topic "Introduction of remote methods for planning activities in agriculture", led by the Agricultural Development and Planning Agency "LAND OF THE FUTURE".

On December 5, in honour of World Soil Day, a scientific conference with international participation was opened on the topic: "Ecology and Agrotechnology - Fundamental Science and Practical Implementation - Business Models for Improving Soil Health".

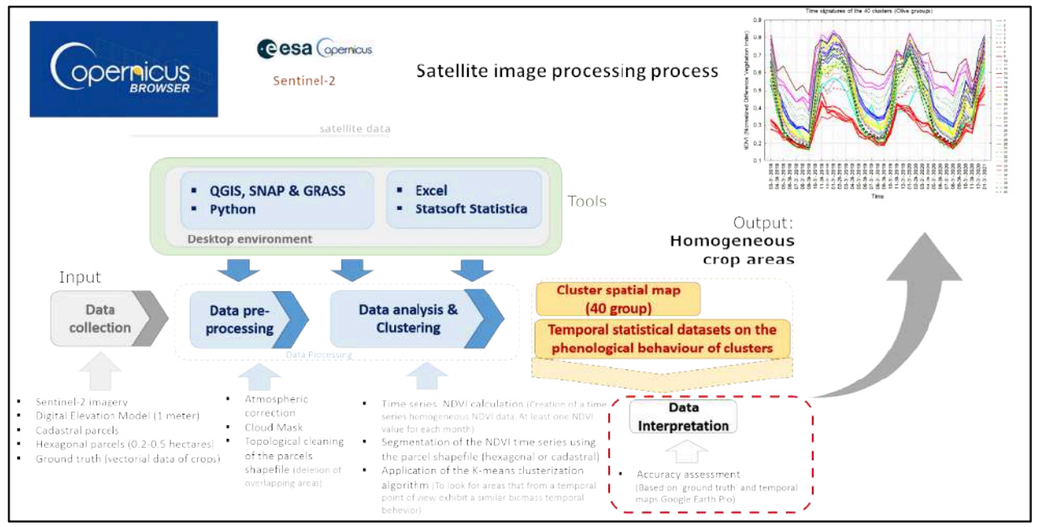
Measurements of emissions of CO_2 from soil and plants is going on at Tsalapitsa and Bozhurishte Open-Air Field in four phases of the vegetation of barley grown in 2024 with a portable device "ALMEMO".

CIHEAM

In 2024, the simulation of Best Management Practices (BMPs) was a core component of CIHEAM Bari's approach to enhancing sustainable land and water use in the WatDEV Project's case study countries: Ethiopia, Egypt, Kenya, and Sudan.

CIHEAM Bari employed an integrated modeling toolbox that coupled DSSAT, SWAT, and MODFLOW, enabling a multi-layered, dynamic analysis of agro-ecological, hydrological, and socio-economic impacts. This innovative DSSAT-SWAT-MODFLOW framework allowed researchers to simulate scenarios that incorporate climate variability, groundwater dynamics, crop responses, and land management strategies to assess the effectiveness of BMPs under real-world constraints. Each component brought specific strengths: DSSAT simulated crop growth under different management and climatic conditions; SWAT handled surface hydrology and watershed processes; and MODFLOW provided detailed insights into groundwater responses to both natural and anthropogenic influences.

To support the complexity and scale of these simulations, CIHEAM Bari invested in high-performance computing infrastructure, acquiring



Satellite image processing and Data interpretation, CIHEAM.

powerful DELL Precision Z2 workstations equipped with 192 GB RAM, 124 CPUs, and top-tier NVIDIA GPUs. These systems allowed researchers to run large-scale, computationally intensive scenarios in parallel, significantly reducing simulation time and increasing the spatial and temporal resolution of our outputs. The toolbox facilitated integration and interoperability between models, while also allowing for the incorporation of field data and stakeholder knowledge gathered from participatory brokerage events in each country. This ensured that simulated BMPs were not only technically robust but also contextually relevant.

The image attached illustrates the overall architecture and data flow of the integrated simulation process, reinforcing the strength of this modeling suite in guiding policy and field-level interventions toward more resilient and productive agricultural systems.

CZECH REPUBLIC

The national research infrastructure support encompassed by AnaEE-ERIC in the Czech Republic is facilitated by the national infrastructure CzeCOS, which, along with the experimental and analytical facilities of AnaEE-ERIC, incorporates the observational infrastructure associated with ICOS-ERIC, in addition to the infrastructure support provided within the projects DANUBIUS-RI, eLTER, and ultimately the EUFAR infrastructure (AISBSL).

The national infrastructure CzeCOS is overseen by CzechGlobe (Global Change Research Institute CAS).

At the end of 2024, the Czech national node started building a network for monitoring CO_2 and N_2O fluxes from agricultural and forest landscapes, called FluxPRISM, within the project AdAgriF. FluxPRISM is a comprehensive, multi-tool system that combines bottom-up and top-down approaches for monitoring greenhouse gas (GHG) fluxes and integrates in-situ measurements, ecosystem, and atmospheric modelling to provide a comprehensive understanding of GHG dynamics, prospectively representing a key tool for assessing the GHG balance from agricultural and forest managed landscapes at higher spatiotemporal resolution. A central component of the top-down system is the atmospheric inversion, which serves to validate and constrain the upscaled bottom-up estimates. This inversion approach uses a newly constructed network of 12 atmospheric monitoring towers located across the country. Measurements from these towers are combined with simulations from Lagrangian particle dispersion models.

The experimental infrastructure, which is part of AnaEE-ERIC within these activities contributes with a range of data from regular measurements of greenhouse gas emissions from experiments with different types of manipulation of climatic factors (drought, atmospheric CO_2 concentration, warming) and in particular experiments with different types of management (soil management, fertilization, mulching, disturbance) that serve not only for the parameterization of models but are an essential part of the validation process of monitoring in the framework of the FluxPRISM network. For these purposes, the infrastructure has been upgraded with new N_2O (LiCOR Li-7820) and CH_4 (LiCOR Li-7810) analyzers, and also uses automated chambers for continuous measurements and mobile platforms for manual chamber measurements equipped with older Picarro G2508 analyzers.

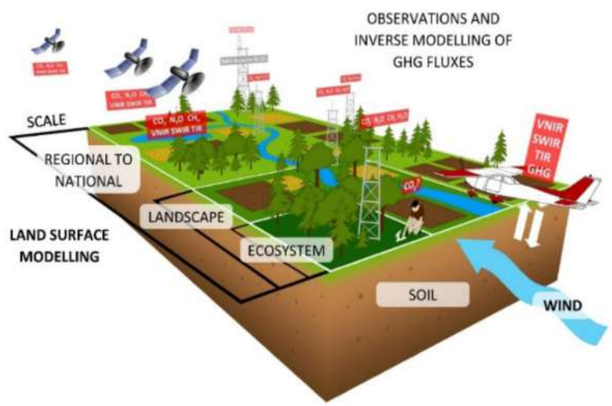


Figure: FluxPRISM - understanding GHG sources and sinks

FLIS – Flying Laboratory of Imaging Systems continued its intensive cooperation with Forschungszentrum Jülich, which installed its HyPlant sensor on an aircraft sensor carrier. HyPlant serves as an airborne demonstrator for the upcoming ESA satellite mission FLEX, designed to measure chlorophyll fluorescence. During the HyPlant campaign, data was collected over various locations in Germany, Italy, and Switzerland. FLIS infrastructure was also used to monitor thermal dynamics of urban areas, led by UT-ITC (University of Twente). As part of this initiative, data was acquired over the city of Enschede.

DENMARK

In 2024, five new research or infrastructure projects were initiated at the Foulum, Højbakkegård and Brandbjerg research facilities. The RECALL project focuses on how to reduce greenhouse gases from agricultural lowland soils, BiokulLTE on the potential of using biochar for long-term carbon storage and soil improvement, N_2O residue on updating emission factors for N_2O in Danish agriculture, FOFE on foliar fertilization methods. Three Danish facilities are also part of the INFRASERV project IRISCC. In total, the portfolio of projects started in 2024 amount to 14.4 million euro.

AnaEE Denmark was originally funded for the period 2018 – 2023 but received an unfunded extension until the end of 2025. Other EU-based research infrastructures are also facing end of funding periods in Denmark.

In 2024, AnaEE Denmark therefore coordinated efforts to create a new umbrella organization in Denmark, supporting integration of new investments and common data tools across the research infrastuctures ICOS, ACTRIS, eLTER and AnaEE, as well as the national experimental research infrastructure ReWET, hich focus on the effects of rewetting formerly drained peatlands in Denmark. ReWet will as part of the proposal be integrated into AnaEE Denmark. The proposal also includes an integration of observational and experimental facilities in both Denmark and Greenland. The proposal for the new umbrella for ICOS, ACTRIS, eLTER and AnaEE in Denmark was submitted in October 2024 and is currently being reviewed. A decision is expected in the fall of 2025.

AnaEE DK PhD course. Photo: Klaus Steenberg Larsen

Cultivated peatlands at AnaEE Finland's NorPeat facility, tackling greenhouse gas emissions and sustainable agriculture in Northern Europe. Photo: Maarit Liimatainen / Natural Resources Institute Finland

FINLAND

In 2024, AnaEE Finland advanced in its third year of operation, fostering a dynamic research environment that tackles critical ecological and societal challenges. The Integrated Atmospheric and Earth System Research Infrastructure (INAR RI) remains central to Finland's role in major European environmental research infrastructures (ICOS, ACTRIS, eLTER, and AnaEE) and strengthens their funding prospects. Its designation as roadmap infrastructure by the Finnish Research Infrastructure Committee (FIRI) ensures its inclusion – alongside AnaEE - in Finland's national research infrastructure roadmap for 2025–2028, solidifying its national importance.

Building on the momentum of its inaugural year, AnaEE Finland has leveraged national and European Union funding to strengthen its research capabilities and expand its impact in ecosystem research. In spring 2024, the HE INFRA SERV projects IRISCC, M4C, and AquaServ were launched, with AnaEE FI contributing three facilities to IRISCC, six to M4C, and one to AquaServ. Additionally, the AgroServ project continued with three facilities, granting the first transnational access project to AnaEE Finland.

Amid evolving environmental challenges, AnaEE Finland advances air quality, climate change, and biodiversity research through collaboration and cutting-edge infrastructure. It also plays a key role in outreach, fostering knowledge exchange and engaging stakeholders. For example, the NorPeat facility, which explores greenhouse gas emissions and sustainable agriculture in Northern Europe, contributed to AnaEE ERIC's Online Scientific Talks and Seminars, where representatives highlighted its role in multidisciplinary research on cultivated peatlands. Over the past year, NorPeat has built a strong foundation for future research while also fostering knowledge exchange through field and research station days. Hyytiälä SMEAR II, a facility for measuring ecosystem-atmosphere relations, released a time-series (1909-2024) of forestry measurements and management practices on the open-access digital repository Zenodo. It also continues to expand outreach through events to students, local stakeholders, and the public. These efforts reinforce AnaEE Finland's commitment to advancing science while engaging society in environmental research.

AnaEE Finland's collective achievements inspire optimism for the future, reinforcing its commitment to scientific excellence, interdisciplinary collaboration, and addressing societal challenges. Its growing contributions drive impactful research and community initiatives, reinforcing its role in addressing environmental challenges in Finland and beyond.

FRANCE

In 2024, AnaEE France achieved significant milestones across its research infrastructure. The organization conducted a comprehensive audit of 32 facilities, which led to the strategic decision to dismantle two analytical facilities after providing detailed feedback to the steering committee.

In collaboration with INIST, the team created an extensive bibliography and developed a prototype for a national data portal, including a comprehensive catalog of monitoring and impact indicators. To foster collaboration and innovation, AnaEE France organized two internal calls for projects aimed at funding collaborative and rejuvenation initiatives. The organization also successfully secured France 2030 funding to support the rejuvenation of most of its installations.

A highlight of the year was the General Assembly held in March 2024 in Sète, which brought together all infrastructure platforms over three intensive days. The program featured engaging roundtable discussions, interactive sessions with PEPR representatives, and workshops dedicated to presenting current projects and strategizing future research directions.

The organization's commitment to cutting-edge research was further demonstrated through various initiatives. The EcoGenO analytical platform in Rennes hosted a Summer School focusing on "Machine Learning for Ecosystem Studies". Technological upgrades were implemented across multiple platforms, including the deployment of ozone regulation equipment at the Montpellier Ecotron's terrestrial mesocosm platform and the upgrade of Aquatic Metatron facilities through the CPER MicroEco program.

Jean-Gabriel Valay presenting the AnaEE-France experimental facilities at the Alpine Lautaret garden to the participants to the Summer School focusing on "Machine Learning for Ecosystem Studies".

Notable research projects included a comprehensive zooplankton eDNA project involving all aquatic facilities, the development of a low-cost and easily deployable weather station with flux analysis capabilities, and participation in an international project investigating the effects of global warming on the soil mycobiome.

The environmental genomics analytical facilities were actively engaged in multiple significant programs, including the Living Soils and DynaBIOD PEPRs submitted in 2024, the national RMQS program, and the European BiodiverSiRES program. The year concluded with the launch of the OneWater PEPR ALIQUOT project, which involves three AnaEE facilities and focuses on developing nucleic acid methods in aquatic environments.

ITALY

In 2024, the major efforts of AnaEE-Italy are dedicated to the participation into the Italian project titled 'Italian Integrated Environmental Research Infrastructures' (ITINERIS https://itineris.cnr.it/). Here we describe the development of the AnaEE facility called Durum FACE, that has been renovated under the new name of IDroFACE (Italian Drought and Free Air CO_2 Enrichment).

It is installed in the experimental farm of CREA Research Centre for Genomics and Bioinformatics in Fiorenzuola d'Arda (44.928537, 9.894724) in collaboration with the National Council of Research (CNR) institutes IRET and IBE. With the support of the Italian project ITINERIS, the platform is designed to perform a phenotypic evaluation of the plant response to elevated atmospheric [CO_2] and drought, as well as a combination of both in open field.

IDroFACE consists of a network of vertical pipes fixed on modular height-adjustable poles arranged in twelve octagonal rings with a diameter of 4 metres. These pipes, precisely calibrated, release a predefined amount of carbon dioxide, simulating elevated atmospheric CO_2

levels projected for future decades. Furthermore, IDroFACE goes beyond simply manipulating CO_2 levels. To address the increasing variability of precipitation patterns, eight out of twelve rings are equipped with a system of removable rain-out shelters. The rain-out shelters have a tubular steel frame supporting 12 V-shaped clear and UV transparent acrylic glass bands. The amount of intercepted precipitation can easily be adjusted by changing the number of bands. The standard set up with 12 acrylic bands excludes 65% of the total rainfall.

The combination of the FACE system and the adaptable rain-out shelters allows scientists to simulate drought conditions combined with elevated CO_2, providing a powerful research platform to study crop response to climate change.

Weather stations continuously monitor a range of environmental variables, including precipitation, air and soil temperature, humidity, wind speed, air quality, and solar radiation. Embedded sensors track soil moisture within the experimental rings in real time. The environmental data collected from the installation are then transmitted and stored on a local server. This data is used to develop models and predictions that aid in understanding the plant responses to the imposed conditions.

Plant phenotyping in the IDroFACE includes standard phenological and morphological measurements, standard post-harvesting evaluation, UAV-based phenotyping (AnaEE AERO-LAB infrastructure), and stomatal morphology and functioning.

In addition, AnaEE Italy participated as an observer to the Assembly of Members that was held in Rome in November 2024 and to the signature of the Data Modelling Center located at CREA Italy.

Finally, an Italian delegation contributed to the first AnaEE scientific conference in Paris in October.

Ring of the CO_2 FACE experiment at CREA Fiorenzuola d'Arda, Italy. Photo: Davide Guerra

CHAPTER 11

PARTERNSHIP

This figure illustrates the diversity of the interactions between AnaEE and partner RIs. With the exception of FHERITALE and the ERIC Forum, all projects include a substantial part of the AnaEE distributed infrastructure, either as beneficiaries or affiliated entities. The institutions and facilities involved in AnaEE RI can build strong links with other partners through the common involvement in projects.

In 2024 AnaEE-ERIC, as well as the Research Infrastructure at large, have continued and reinforced their partnership activities with other infrastructures, networks and institutions. This is reflected in the project and in the enlargement sections of this document. AnaEE-ERIC is a member of the clusters on environment (BEERI, Board of the European Environmental Research Infrastructures) and life sciences (LS-RI strategic board).

Both bodies are essential in coordinating the RIs, expressing common views towards the Commission as well as member states, suggesting new topics for Horizon Europe and the next framework program, as well as promoting common proposals to HE calls. AnaEE-ERIC is also a strong contributor of the ERIC Forum 2 project, as it leads one of the pillars of this project and coordinates a work package (read more in section Projects).

The strong relationships that AnaEE is building can be shown in the common involvement in many projects with infrastructures, networks, and research institutions in both the health & food and environment domains.

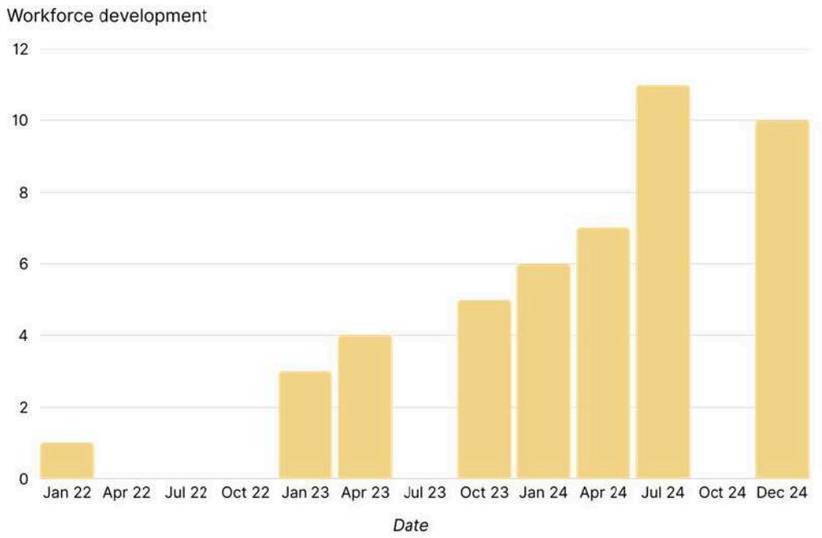
CHAPTER 12

SOCIAL REPORT

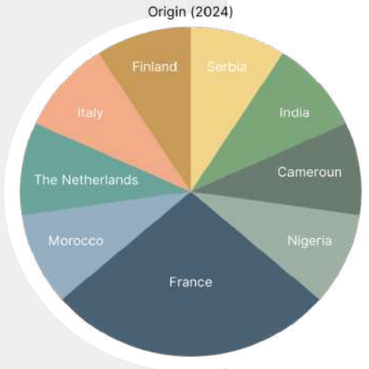
In 2024, AnaEE-ERIC counted 8 direct employees, in addition to 1 employee seconded by the CNRS, as part of the host premium; and 2 employees hired then seconded by CzechGlobe against payment, following the hosting agreement. Nine nationalities are represented, and the gender balance is 7 female, 4 male employees. Approximately half of the personnel has a PhD, one third a master, and two have a bachelor.

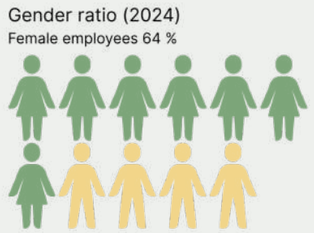
All employees that had more than one year of presence on 31st December 2024 had an annual interview with the DG, that took place in January 2025.

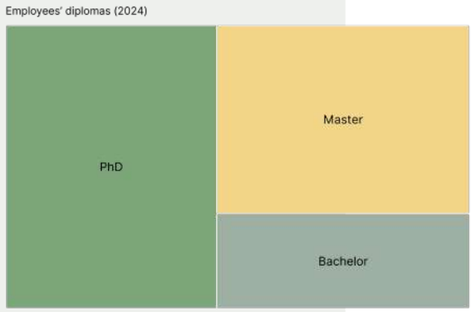
We started to implement an integrated human resource management system (HRMS), OHRIS, that will progressively include all aspects of HR management. By the end of 2024, OHRIS started to be evaluated and used for time, absence, and activity accounting. The annual interview module was implemented for use beginning 2025. Progressively OHRIS, one of the most advanced and widely used HRMS, will manage all HR related tasks, including travel, remote work and expense reports to be implemented in 2025. This represents a simplification both for the administration and employees of AnaEE-ERIC, while providing an accurate global view of the activity.

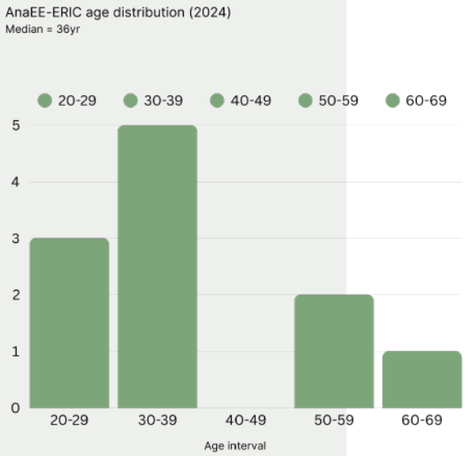


Workforce development in AnaEE-ERIC since January 2022.









The recruitment of ISC personnel followed the rules of operations, with an international publication on Euraxess, social networks X and LinkedIn, web sites of AnaEE-ERIC and CzechGlobe. The evaluation committee included three representatives of CzechGlobe and two representatives of AnaEE-ERIC. After their recruitment, the newly appointed employees of ISC were invited at the headquarters in Gif-sur-Yvette for a team building event. This was an opportunity to liaise, and a visit of the Ecotron and Planaqua installations of Saint-Pierre-lès-Nemours (CNRS/ENS) was organized. The DG visited the ISC in July, an opportunity to have in-depth discussions on the missions and life of the ISC.

Out of the 8 direct employees registered in the Headquarters, three were recruited on projects (AgroServ, M4C, IRISCC and AquaServ). The selection Committee involved personnel from the Headquarters and some invited guests for their expertise with regards to the position foreseen: one from the CNRS for the IT engineer interviews; and another guest from another ERIC in France, for the recruitment of a Science Project Manager.

A security officer was appointed at the headquarters (Véronique Ozier-Lafontaine). She participated to a training session on first aid and security at work in December 2024. A gender officer for the whole ERIC (Ogheneyoma Olisah) was also appointed and she attended the ERIC Forum Gender Equality Workshop organised on 26 and 27 September 2024 in Amsterdam.

A training and skills development plan has been prepared in 2024, and the first training activities took place, mostly using the French official skill operator, financed from a tax on the salaries.

In 2024 AnaEE-ERIC has established most of the framework required from a responsible employer in the EU.

CHAPTER 13

FINANCIAL REPORT

AnaEE-ERIC reported a positive financial balance of 116,184€ in 2024, with total revenues of 1,192,512€ against 1,076,328€ in expenses.

Despite achieving only 95.65% of forecasted core budget revenue due to missing host premium contributions, the organisation has accumulated a total balance of 814,792.75€ over its first three financial years, though additional funding sources will be needed to ensure long-term sustainability as operational costs continue to rise.

AnaEE-ERIC's Chief Administrative and Financial Officer Mireille Matene works at the Central Hub in Gif-sur-Yvette, France.

Introduction

The main sources of revenues in 2024 are the membership fees paid yearly by the members and the host premium contributions received from members hosting one of the four AnaEE-ERIC Centres.

The two additional sources of revenues registered for 2024 are from UTAD and Horizon Europe projects. The 2024 budget forecast was approved by AoM#4, 23-24 November 2023 in Helsinki (Finland). Data reported only concerns the CH, DMC and ISC. In the absence of a host and resources provision agreement concluded with UCPH for Denmark, it wasn't possible to include financial data from TC in the report.

Figure 1: Summary of Revenues for the Core Budget in 2024

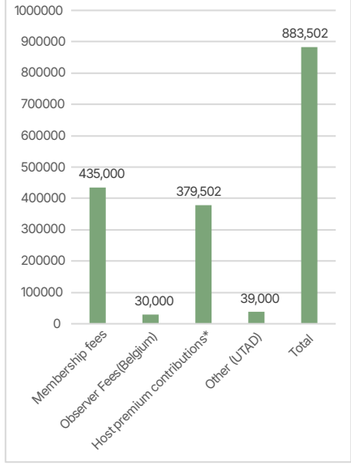
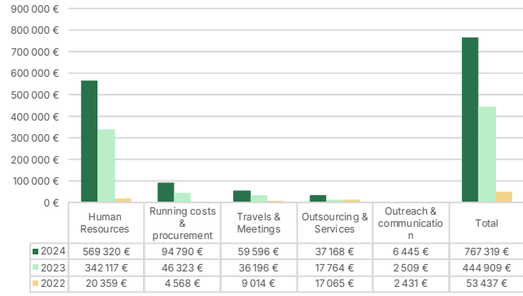


Figure 2 : Expenses made per cost category in 2024 vs 2023 and 2022



	Human Resources	Running costs & procurement	Travels & Meetings	Outsourcing & Services	Outreach & communication	Total
2024	569 320 €	94 790 €	59 596 €	37 168 €	6 445 €	767 319 €
2023	342 117 €	46 323 €	36 196 €	17 764 €	2 509 €	444 909 €
2022	20 359 €	4 568 €	9 014 €	17 065 €	2 431 €	53 437 €

Figure 3: Human resources per centre in 2024

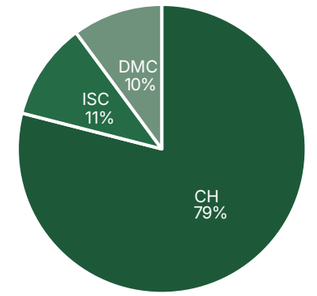


Figure 4: Revenues from Projects in 2024

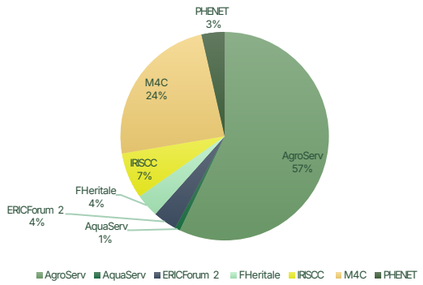
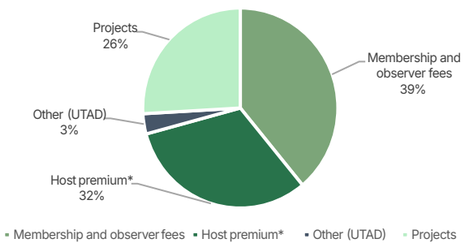


Figure 5: Overhall revenues distribution per category including projects



REVENUES AND EXPENSES FOR THE CORE BUDGET

Total revenues equal 883,503 € versus 767,319 € of expenses made on the Core Budget only.

Revenues accounting for the core budget

Despite the additional revenues received from France as part of their host premium (+70,903 €), and the additional revenue received from UTAD (39,000 €), the revenues percentage of completion amounts to 95.65% (923,725 € forecast vs 883,503 € registered). The host premium contribution from Denmark (UCPH) is still missing.

Expenses made on the core budget

The completion rate for expenses made amounts to 72.17%, with regards to the budget approved by AoM#4.

The increase in expenses from 2022 to 2024, illustrates the progressive steps made to fully implement the four Centres of AnaEE-ERIC. More efforts shall be made to have AnaEE-ERIC fully operational before the end of the first five-years cycle. The main expenses cost category is human resources, with about 79% of the expenses made in 2024.

REVENUES AND EXPENSES MADE ON PROJECTS

Revenues from projects

The balanced revenues and expenses made on projects are presented in Table 1 and 2 on the opposing page.

Expenses made on projects

The balanced budget forecast in 2023 for projects in 2024 amounted to 476,342 € (excluding Overheads). The completion rate is estimated to 64.87%.

CASH AND IN-KIND FLOWS IN 2024

The Overall revenue in 2024, is composed of membership and observer fees (39%), Host Premium Contributions (32%), EU Projects (26%) and services provided to UTAD (3%).

CONCLUSION

The 2024 overall revenues of AnaEE-ERIC, including projects, amounts to 1,192,512 € versus 1,076,328 € of expenses made: hence, a positive remaining balance of + 116,184 € on the core budget.

The rate of revenues gathered for the core budget amounts to 95.65% (883,503 € vs 923,725 € forecast). Despite the additional revenues registered in 2024 (+109,903€) from UTAD and France, the 900,000€ revenues foreseen in the Statutes couldn't be achieved, mainly because the Host premium contribution from Denmark is still missing; and Italy couldn't provide for their overall host premium as foreseen in the Statutes (77,600€ vs 104,000€). The completion rate for expenses made amounts to 72.17%, with regards to the budget approved by AoM#4 in Helsinki (767,319 € vs 1,063,166 € forecast). As concerning projects, the balanced revenues and expenses amounts to 309,009 € (excluding overheads).

From a general point of view, the increase in expenses from 2022 to 2024 illustrates the progressive steps made to fully implement the four Centres of AnaEE-ERIC. More efforts still need to be made to have all Centres fully operational before the end of the first five-years cycle. In this field, expenses are increasing throughout years, whereas the annual fees initially planned are not increasing. In addition to the initial budget planned during the preparatory phase which appeared underestimated at the time of the ERIC proposal (2020), the inflation (19% since 2020) has a negative impact on the actual expenses. Besides of enlarging the Organisation to increase the core budget, a discussion on the increase of membership fees might be foreseen at certain point as recommended by the Finance Committee in its May 2024 session.

The positive result balance reported from the 1st of January to the 31st of December 2024 amounts to 116,184€, versus 698,609 € accounting for the 2022 and 2023 results. Hence, the total results up to 31/12/2024, amounts to 814,792.75 €, for the first three financial years of AnaEE-ERIC. However, this balance would slightly decrease in 2025, with the new recruitments to be made for DMC and eventually TC if a host and resources provision agreement is concluded with UCPH. Therefore, there is a need to pursue discussions on additional fundings sources, especially for the enlargement of members/observers, to increase the core revenues and to ensure the financial sustainability of the Organisation.

Figure 6: Revenues & Expenses in brief (Core budget & Projects)

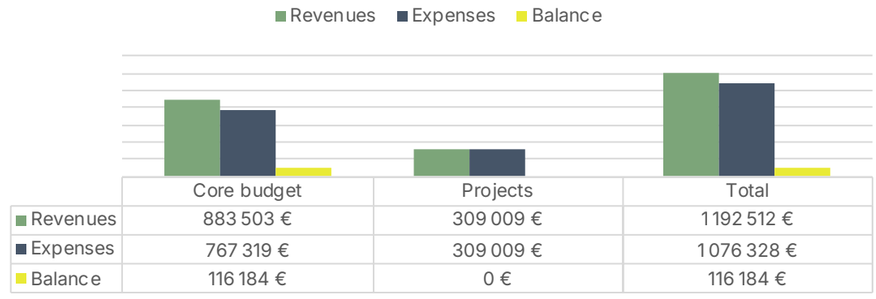


Table 1: Revenues from Projects in 2024 (in euros)

Projects	Amount
AgroServ	176,423
AquaServ	2,486
ERIC Forum 2	11,418
FHeritale	11,245
IRISCC	21,972
M4C	74,410
PHENET	11,055
Total	**309,009**

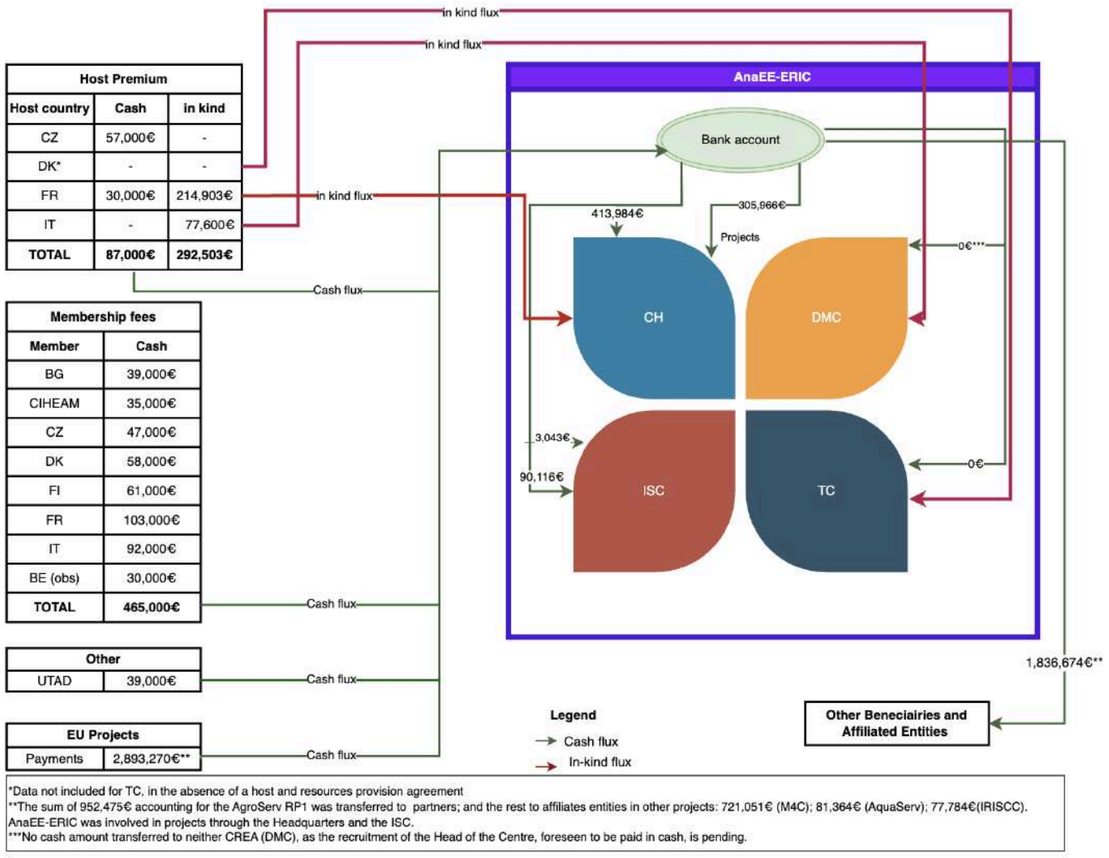
Table 3: Summary of Revenues in 2024 (in euros)

Membership and observer fees	465,000
Host premium	379,503
Other (UTAD)	39,000
Projects	309,009
Total	**1,192,512**

Table 2: Expenses made on projects in 2024 (in euros).

Cost Categories / EU Projects	AgroServ	AquaServ	ERIC Forum 2	FHERITALE	IRISCC	M4C	PHENET	Total
Personnel Cost	155,904	2,486	4,511	6,910	18,672	72,023	5,681	**266,187**
Travel and subsistence	10,401	N/A	3,679	4,335	3,300	2,132	4,457	**28,303**
Other goods, works and services	10,118	N/A	3,228	0	0	255	918	**14,518**
Total	**176,423**	**2,486**	**11,418**	**11,245**	**21,972**	**74,410**	**11,055**	**309,009**

The below figure represents cash and in-kind flow for the 2024 financial year (including projects).



Host Premium		
Host country	Cash	in kind
CZ	57,000€	-
DK*	-	-
FR	30,000€	214,903€
IT	-	77,600€
TOTAL	**87,000€**	**292,503€**

Membership fees	
Member	Cash
BG	39,000€
CIHEAM	35,000€
CZ	47,000€
DK	58,000€
FI	61,000€
FR	103,000€
IT	92,000€
BE (obs)	30,000€
TOTAL	**465,000€**

Other	
UTAD	39,000€

EU Projects	
Payments	2,893,270€**

*Data not included for TC, in the absence of a host and resources provision agreement
**The sum of 952,475€ accounting for the AgroServ RP1 was transferred to partners; and the rest to affiliates entities in other projects: 721,051€ (M4C); 81,364€ (AquaServ); 77,784€(IRISCC). AnaEE-ERIC was involved in projects through the Headquarters and the ISC.
***No cash amount transferred to neither CREA (DMC), as the recruitment of the Head of the Centre, foreseen to be paid in cash, is pending.

ACRONYMS

ACTRIS Aerosol, Clouds and Trace Gases Research Infrastructure

AKIS Agriculture Knowledge Information System

AKPI AnaEE KPI (cf. KPI)

AnaEE Analysis and Experimentation on Ecosystems

AoM Assembly of Members

APF Associated Platform

ARISE Atmospheric Dynamic Research in Europe

BEERI Board of the European Environmental Research Infrastructures

CERN Chinese Ecological Research Network

CH Central Hub

CIHEAM International Centre for Advanced Mediterranean Agronomic Studies (Intergovernmental)

CNR Consiglio Nazionale delle Ricerche (Italy)

CNRS Centre National de la Recherche Scientifique (France)

CORDEX Coordinated Regional Climate Downscaling Experiment

CREA Consiglio per la Ricerca in Agricoltura e l'Analisi dell'Economia Agraria (Italy)

CzechGlobe Global Change Research Institute of the Czech Academy of Sciences

DG Director General

DMC Data and Modelling Centre

DMP Data Management Plan

EC European Commission

EMB Extended Management Board

EMPHASIS European Infrastructure for Plant Phenotyping

ENRIITC European Network of Research Infrastructures and Industry for Collaboration

ENVRI Environmental Research Infrastructures cluster

ERA European Research Area

ERIC European Research Infrastructure Consortium

ESA European Space Agency

ESFRI European Science Forum for Research Infrastructures

EU European Union

EUPHORISC European Plant Health Open Research and Innovation Starting Community

FAIR Findable Accessible Interoperative Re-usable

FAO Food and Agriculture Organization of the United Nations

FP Framework Program (EU)

GHG GreenHouse Gas

GSL Growing Season Length

HE Horizon Europe framework program

ICOS International Carbon Observatory System

IEAC Independent Ethical Advisory Committee

IPBES Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services

IPCC Intergovernmental Panel on Climate Change

ISAC Independent Scientific Advisory Committee

ISC Interface and Synthesis Centre

ISIA Information System for Infrastructure Administration, developed by CNRS and AnaEE-France

LTER Long-term Ecological Research

LS-RI Life Sciences Research Infrastructures cluster

MB Management Board

NEON National Ecological Observatory Network

NSF National Science Foundation (USA)

O3HP Oak Observatory at OHP: cf. OHP

OHP Observatoire de Haute Provence

PRC Proposal Review Committee

RCP Representative Concentration Pathway

RI Research Infrastructure

SDG Sustainable Development Goal

SHC Stakeholder Committee

SLA Service Level Agreement

TC Technology Centre

WG Working Group

WP Work Package

GLOSSARY

Agro-ecosystem: Managed ecosystem with agriculture (cf. ecosystem).

Analytical facility: Facility that offers advanced biological, physical,chemical or socio-economic analyses for a deeper insight into processes.

Analytical installation: Equipment that offers advanced biological, physical and chemical analyses for a deeper insight into processes.

Analytical platform (historical): Facility that offers advanced biological, physical and chemical analyses for a deeper insight into processes. Historical term - Analytical installation or facility to be used.

Aquacosm: Aquatic mesocosm that allows manipulations (cf.mesocosm). In AnaEE, all aquacosms are in fresh waters.

Anthropic Stress: Pressure of human origin that reduces ecosystem state and/or ecosystem functioning below optimal.

Ecosystem: A system that includes all living organisms (biotic component) in an area as well as its physical environment (abiotic component)

Ecotron: A set of enclosed experimental units hosting replicas of a given ecosystem (from few dm^3 to several m^3) where environmental conditions are tightly controlled and multiple ecosystem processes are automatically monitored. Ecotrons allow ecologists to run for several months to years experiments with controlled environmental factors such as temperature, rainfall, greenhouse gases, pollutants, etc. Cf. ecosystem, experiment, enclosed platform.

Enclosed facility: Controlled environment facility where replicas of a given ecosystem (from few dm^3 to several m^3) can be experimentally exposed to tightly controlled environmental conditions in enclosed units.

Enclosed platform (historical): Controlled environment facility where replicas of a given ecosystem (from few dm^3 to several m^3) can be experimentally exposed to tightly controlled environmental conditions in enclosed units. Historical term - enlosed facility to be used.

Experimentation: The act, process, practice, or an instance of making experiments (CollinsEnglishDictionary). In AnaEE manipulation of the conditions or environment of the ecosystem under study (either open-air or enclosed) to explore its behaviour.

Experiment: A test, trial, or tentative procedure; an act or operation for the purpose of discovering something unknown or of testing a principle, supposition, etc. (CollinsEnglishDictionary). Cf. manipulation.

Facility: In AnaEE, a place or set of equipment that delivers one or more research services.

Installation: synonym of facility. This term is often used in the EU project context.

Manipulation: A manipulation of the environment or conditions of an ecosystem in order to simulate environmental pressures such as climate warming, changes in rainfall regime, elevated atmospheric CO2, different management practices, etc. Cf. experiment.

Macrocosm: Large experimental object physically representing an ecosystem in enclosed platforms, consisting offor example several m^3 of soil with vegetation or a water body with aquatic organisms.

Macrocosms are simplified ecosystems used to simulate and predict the behaviour of real ecosystems under controlled conditions.

Mesocosm: Medium-sized experimental object physically representing an ecosystem in enclosed platforms, consisting of for example several dm^3 of soil with vegetation or a water body with aquatic organisms. Mesocosms are simplified ecosystems used to simulate and predict the behaviour of real ecosystems under controlled conditions.

Microcosm: Microscale experimental object physically representing an ecosystem in enclosed platforms, consisting of for example at est tube with microorganisms in soil or water. Microcosms are simplified ecosystems used to simulate and predict the behaviour of real ecosystems under controlled conditions.

Modelling installation: A user interface allowing to run numerical models in ecology to compute the behaviour of a simulated ecosystem under several initial conditions and measured (or simulated) experimental parameters. A modelling platform can host the models on its own computers or elsewhere.

Modelling platform (historical): A user interface allowing to run numerical models in ecology to compute the behaviour of a simulated ecosystem under several initial conditions and measured (or simulated) experimental parameters. Historical term - modelling installation to be used instead.

Observation: It is the action or process of carefully watching someone or something (CollinsEnglishDictionary). In the context of AnaEE and more generally environmental sciences, the process of monitoring or surveying objects or phenomenaon Earth or in the Universe without direct intervention on them (e.g. measuring the greenhouse gases over time).

Open-air facility: An experimental facility in open-air conditions (in natura) allowing the manipulation of several environmental pressures (e.g. rainfall, heating, management practices). The facilities can be installed in several ecosystem types (forest, grassland, peatland, fields, unmanagedland, etc.), as well as several climate types (mediterranean, sub-arctic, alpine, etc.).

Open-air platform (historical): An experimental platform in open-air conditions (in natura) allowing the manipulation of several environmental pressures (e.g.rainfall, heating, management practices, etc.). Historical term - open-air facility to be used instead.

Platform (historical): In the AnaEE context the unit where the activity (experimental, analytic or modelling) is performed; platforms are not belonging to AnaEE, but linked to it thanks to a Service Legal Agreement. Cf. facility, enclosed platform and open-air platform.

Service Centre: one of the AnaEE centres where additional services are provided to the users, stakeholders or to the facilities.

Service Legal Agreement: A legal agreement binding AnaEE and a (group of) facility. Services, such as experiment accommodation, data and metadata production and open access, are provided by the facility to AnaEE and the users. In turn, AnaEE provides services to the facility such as visibility, open and FAIR access to the data, technological expertise, modelling, transnational access, link with other facilities and RIs, etc.

User: The external commissioner of services from AnaEE.

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AnaEE-ERIC is grateful for all contributions to this report, with thanks to the National Nodes, AnaEE-ERIC service centres and the personnel at the centres.

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