

**EPOS
ERIC**

**ACTIVITY
AND
FINANCIAL
REPORT
2021**



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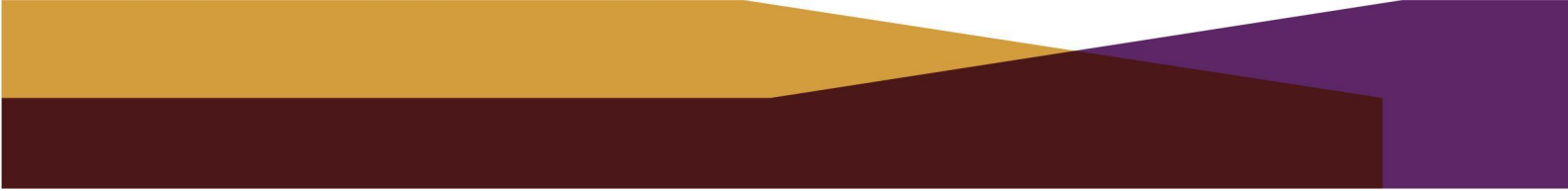
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April, 4th 2022



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Executive Summary

In 2021, EPOS ERIC reached pivotal milestones to ensure the robustness of the Delivery Framework, which is necessary for successfully entering into the Operational Phase in 2023. We achieved these goals despite the difficulties related to the COVID-19 pandemic, which were still heavily impacting our work.

In general, activities performed in 2021 are in accordance with the EPOS ERIC 2021 Activity Plan and Provisional Budget adopted by the EPOS ERIC General Assembly in December 2020 (resolutions No. 11/2020 and No. 12/2020, respectively). The 2021 Activity Plan and Provisional Budget, in turn, have been outlined following the “EPOS ERIC Strategic Plan 2020-2022” designed to manage the transition from the EPOS Implementation Phase to the Operational Phase.

The most noticeable progress made in the framework of the Strategic Plan has been the finalization of the ICS-C Hosting and Operation. All concerned bodies, namely, General Assembly, Executive Coordination Office (ECO), Executive Committee, Integrated Executive Committee, IT Board, Hosting Organisations, Service Coordination Committee, invested significant effort to eventually reach an agreement on the legal, financial, and technical environment to host and operate the ICS-C as a key component of EPOS ERIC. This will allow all concerned organisations to be fully engaged and ensure that the EPOS ICS-C Portal will be fully operational in 2023. While those organisations concerned with the ICS-C were finalizing the governance and financial framework, the EPOS ERIC IT Unit was working to refactoring the Data Portal Graphical User Interface (GUI) in order to deliver an efficient and friendly Data Portal to users. The team analysed the outputs from user engagement activities done during the EPOS Implementation Phase and benefitted from a public research study on the user experience of the spatial and scientific data portal. The GUI has been implemented by adopting a methodology that envisages interviews with users, elaboration of recommendations based on the users' input, and implementation based on recommendations and validation of the prototype through user feedback sessions. The efforts dedicated to the analysis and design guided by experts' opinions, previous work and user interviews will allow EPOS to release a brand-new GUI that largely satisfies the user expectations.

To the task of making the EPOS ICS-C Portal fully operational, noticeable results have been also achieved by the EPOS Policy Working Group. The Working Group, established in 2020, encompasses different areas of expertise including legal, technical, policy, communication, and management and it is in charge of delivering the EPOS Policy for data access. In 2021 the first set of policy documents was delivered: i) Cookie Policy; ii) EPOS ICS-C Terms and Conditions; iii) EPOS ERIC Privacy Policy; iv) text for Initial Page (EPOS ICS-C Data Portal). These documents, available on the EPOS website relevant sections (<https://www.ics-c.epos-eu.org/data/search>), have been approved by the Services Coordination Committee, with the acknowledgement that policies are active living documents that might change in response to the evolution of the EPOS organizational and strategic assets. The Working Group continued working on elaborating further relevant policies on i) Asset Management (Curation, Provenance, Quality Assurance, Licensing, Citation/Acknowledgement) and ii) Security (Physical Security, Authentication, Authorization, Disaster Recovery). The first version of these documents has been presented to the Services Coordination Committee during a dedicated workshop on EPOS Policy held in November 2021. The final version of this second set of documents will be ready in 2022 and will consider the comments received from all TCS. Thanks to this work, EPOS is regarded as a pioneering European Research Infrastructure for its established mechanisms for delivering policy documents. Indeed, in 2021 EPOS has been invited to two training sessions organized by the ENVRI-FAIR project, to present the work done in this area to other environmental Research Infrastructures.

In 2021, the Executive Committee also established three Focus Groups: i) European Open Science Cloud (EOSC); ii) Environmental Research Infrastructures (ENVRI); iii) Group on Earth Observations (GEO). The Executive Committee recognised this action as necessary for representing EPOS interests and strategy in external projects and initiatives especially where EPOS is a member. The EOSC Focus Group was deemed necessary to keep EPOS aligned with the EOSC evolution by i) interacting with and giving support to the EPOS team involved in the EOSC Future project, ii) ensuring the exploitation of ENVRI-FAIR results by the EPOS Research Infrastructures, iii) mapping and harmonising the participation of EPOS teams in national initiatives dealing with EOSC. The ENVRI Focus Group aims to coordinate the EPOS participation in the ENVRI Board of European Environmental Research Infrastructures (BEERi), as well as other initiatives with other ENVRI's Research Infrastructures (e.g., JERICO, ACTRIS, SeaDataNet) and ENVRI-FAIR activities, which are aligned with the EPOS strategy. The GEO Focus Group will rebuild and coordinate EPOS participation in GEO.

Thanks to the joint effort of the Community and the ECO, significant advances were also made in implementing the legal and financial framework necessary to enable the TCS provision of data and services in 2022.

During 2021, a further, appreciable activity that engaged the whole EPOS Community concerned the drafting of manuscripts to describe the EPOS Research Infrastructure in response to an invitation from the Annals of Geophysics to publish a special issue dedicated to the EPOS Research Infrastructure. Annals of Geophysics (<https://www.annalsofgeophysics.eu/index.php/annals>) is an international peer-reviewed open access, free of charge publication, online journal specialised in publishing Earth science articles. The community enthusiastically and actively reacted to this call by submitting fourteen manuscripts, which are currently in the process of being published. This special issue of the Annals of Geophysics will be produced in two volumes during 2022. These volumes and the enclosed papers represent an excellent opportunity to describe EPOS and its multidisciplinary breadth, as well as disseminating the contents of the Delivery Framework.

Finally, a crucial activity performed by the ECO was the negotiation for renewing (in January 2022) the “Multi-Year Agreement 2022-2024 for the hosting and operation of the Executive Coordination Office and the Management of the Italian Contribution”. The purpose of the agreement is to regulate the collaboration between EPOS ERIC and the Istituto Nazionale di Geofisica e Vulcanologia (INGV) that acts as the Representing Entity in the framework of the Italian commitment and contribution to EPOS ERIC for the hosting and operation of the ECO and the management of the Italian contribution.

In 2021, the ECO also supported all EPOS ERIC boards and committees in organizing their meetings, namely, six meetings of the General Assembly, two of the Scientific Advisory Board, one Ethics Advisory Board meeting, six meetings of the Executive Committee, five meetings of the Integrated Executive Committee, and four Service Coordination Committee meetings.

This report is structured in four core sections:

- Activities and Results, reporting on the activities performed to accomplish the objectives foreseen in the 2021 Activity Plan and Provisional Budget
- Financial Statements, composed of Balance Sheet, Profit and Loss Account and Cash Flow Statement
- Notes to the Financial Statements, summarising the incurred costs and revenues taking into account the 2021 Activity Plan and Provisional Budget
- Auditors Report.

This Report has been discussed and approved by the Executive Committee (30th March 2022) and adopted by the General Assembly on 20th April 2022 (Resolution N. 3/2022).

1. Activities and Results

Activities performed in 2021 are in accordance with the EPOS ERIC 2021 Activity Plan and Provisional Budget adopted by EPOS ERIC General Assembly in December 2020 (resolutions No. 11/2020 and No. 12/2020, respectively).

In particular, the following activities have been performed:

- Implementation and operation of the Executive Coordination Office (ECO)
- Finalisation of the ICS-C Hosting and Operation within the EPOS ERIC perimeter
- Support the construction and maintenance of the TCS Governance and Coordination service
- Support to activities for the TCS-ICS interactions for testing interoperability with ICS-C
- Implementation of the legal, governance and financial frameworks to enable the TCS provision of data and services
- Support to EPOS ERIC activities including community building, dissemination and outreach
- Coordination of EPOS SP project.

Implementation and Operation of the Executive Coordination Office (ECO)

The Executive Coordination Office (ECO), representing the EPOS ERIC legal seat, has the central role of coordinating the entire EPOS Research Infrastructure including the operation of the integrated (ICS) and thematic (TCS) services. The ECO is a component of the EPOS ERIC governance structure.

To accomplish its role, the ECO benefits from human resources and skills which ensure the day-to-day operation of the Research Infrastructure performing administration, management, communication, IT, and legal activities. The ECO is entirely supported by the Italian Host Contribution.

The ECO staff, appointed by the Executive Director in accordance with the identified needs, includes (Table 1): i) personnel employed by EPOS ERIC; ii) personnel provided by way of in-kind contributions from the Representing Entity (INGV); iii) consultants. The ECO staff is organized in four different “Units” and it is complemented by the Officers, namely, Scientific Officer, IT Officer, Capacity Building Officer. Therefore, the coordination of the EPOS Research Infrastructure, including the operation of the integrated (ICS) and thematic (TCS) services, is guaranteed by the synergic work of the Executive Director, the Officers and the Staff of the Units. The ECO is also supported by consultants for specific issues such as financial and legal matters, and by external collaborators assisting for i) the EPOS ERIC participation in and interaction with international initiatives fostering international cooperation on e-science and ii) designing effective procedures for the EPOS Service Activation, as part of the EPOS ERIC Service Delivery plan.

In 2021 the EPOS ERIC increased its personnel, hiring three persons to be dedicated to the Communication Unit (Chief, Assistant, and Web Developer) and one person to support the Management and Operation Unit (Governance and Operation Liaison).

Both EPOS ERIC employees and INGV in-kind personnel are involved in the EPOS Delivery Framework activities including the Horizon 2020 and Horizon Europe projects (see “Projects” paragraph).

Table 1. 2021 Human Resources Plan detailing person/months (P/M) for each ECO Unit.

	Unit	P/M
EPOS ERIC Employees	Administration	12
	Management and Operation	3
	Communication	23
	IT	12
	Sub-Total	50
INGV in-kind Employees	Administration	4
	Management and Operation	16
	Communication	24
	IT	25.5
	Legal Services	3
	Sub-Total	72.5
Total		122.5
		5

Hosting the Integrated Core Service Central Hub (ICS-C)

Finalising the legal, financial and technical framework for the hosting and operation of the Integrated Core Services Central Hub (ICS-C) was a mandatory action for EPOS ERIC to ensure its operation during the approaching Operational Phase (2023).

Having negotiated the legal and financial framework, and the technical implementation actions recommended by the IT Board, and following several meetings of the Integrated Executive Committee (from January until June 2021) and of the Executive Committee (from July until December 2021), as well as after having discussed risks, mitigations and contingency actions in continuous consultations among the Executive Director and the Officers and in decisive General Assembly meetings, EPOS ERIC eventually successfully concluded the negotiation with the Hosting Organisations and agreed on the way forward¹.

In May (Resolution No. 6/2021), the General Assembly, having acknowledged the EPOS architecture and the EPOS ERIC governance structure, formally recognised the importance of operating the ICS-C inside the EPOS ERIC perimeter. In July, the General Assembly acknowledged the Integrated Executive Committee evaluation that the existing conditions did not allow consideration of all options for maintaining the “ICS-C as a component within EPOS ERIC perimeter with respect to what was originally defined in the Statutes”. As a result, the Executive Director was asked to deliver a document explaining pros and cons of the ICS-C being inside or outside the ERIC perimeter including the potential implications of the different options. The document was delivered by the Executive Director in September 2021 for discussion during the General Assembly meeting planned in October 2021.

In October 2021, the General Assembly agreed on the conditions necessary for implementing the ICS-C Hosting and Operation (Resolution No. 7/2021). Having confirmed the importance of operating and maintaining the ICS-C inside the ERIC perimeter, the General Assembly agreed to further explore this scenario with UKRI-BGS and BRGM acting as the Hosting Organisations. In this context, the Hosting Organisations were required to provide the General Assembly with the following documents before the meeting planned in December: i) final draft of the UK Mandate Letter; ii) declaration acknowledging conditions for declaring human resources and IT infrastructure as Host Contribution, signed by the Hosting Organisations; iii) confirmation of the Host Contribution, including the EPOS ERIC cash contribution. The General Assembly also requested that the hosting and operation of the ICS-C would be regulated through a Multi-Year Partnership Agreement (MYPA) to be signed between EPOS ERIC and the Hosting Organisations. A

¹ According to the General Assembly decision (Resolution No. 8/2021), the negotiations ended on January 31st, 2022.

comprehensive analysis of the documentation delivered by the Hosting Organizations was then performed by the Executive Director together with the members of the Executive Committee. This analysis highlighted the necessity of implementing the documents in some aspects (e.g., refer to Multi-Year Partnership Agreement instead of Multi-Year Collaboration Agreement, clearly refer to ICS-C Office when declaring personnel). This analysis has been then reported to the General Assembly.

In December, the General Assembly acknowledged that all principal conditions for the hosting and operation of the ICS-C inside the ERIC perimeter have been met and the relevant documents were delivered. Nevertheless, to boost effectiveness in finalising the action, the General Assembly requested the organisations involved (Resolution No. 8/2021) to implement the documentation according to the Executive Director's analysis. Moreover, the General Assembly reiterated its decision to regulate the joint initiative of EPOS ERIC and the Hosting Organisations to host and operate the ICS-C inside the EPOS ERIC perimeter through a three-year Multi-Year Partnership Agreement (MYPA) to be signed in July 2022. In order to ensure the continuation of the ICS-C activities related to the Pilot Operational Testing, the EPOS ERIC General Assembly also recommended the finalisation of an Inter-Institutional Collaboration Agreement (IICA) between EPOS ERIC and UKRI-BGS, BRGM and GEUS covering the period from January to the end of June 2022.

Activation of TCS Governance and Coordination Service

The EPOS ERIC General Assembly approved the activation of the TCS Governance and Coordination service in June 2020². As a consequence, the Executive Director was endorsed to sign collaboration agreements for the year 2020 before approving the financial eligibility, due to this action being necessary to formally establish the TCS Governance and Coordination and start implementing the relevant activities within a legal framework. In December 2020, the General Assembly approved the eligibility of costs and endorsed the Executive Director to negotiate a Multi-Year Collaboration Agreement (MYCA, 2021 – 2023) with each TCS.

Following the General Assembly decision, in 2021 the ECO, supported by financial and legal consultants and collaborators, worked to negotiate and finalise the agreements for TCS Governance and Coordination for the years 2021-2023. The main topics of the negotiation with the TCS concerned the structure of the agreements (bilateral, multilateral, bilateral with support of third parties), cash contribution level, indirect costs percentage and in-kind contribution. The agreements include an annual Work Programme in which activities and allocated resources for running the TCS Governance and Coordination are detailed. Considering the 2021 Activity Plan and Provisional Budget, it was possible to include in the 2021 Work Programme the EPOS ERIC financial support for two other key activities: i) participation to the TCS-ICS Interactions contributing to the Pilot Operational Testing and ii) outreach and dissemination to ensure the engagement of the TCS in sharing and adoption of the EPOS Communication Plan. These two additional activities were conceived as strategic actions for 2021 to accomplish the 2020-2022 Strategic Plan objectives.

As a result, in 2021 a total of eight Multi-Year Collaboration Agreements for TCS Governance and Coordination have been signed by EPOS ERIC with the designated Service Providers for the following TCS: Anthropogenic Hazards; Geomagnetic Observations; GNSS Data and Products; Multi-Scale Laboratories; Near Fault Observatories; Satellite Data; Seismology; Volcano Observations. These agreements set out the collaborative framework and define the terms and conditions under which EPOS ERIC and the organisations concerned shall collaborate and share resources to ensure their contributions to the EPOS Delivery Framework. In particular, the agreement addresses the sharing of resources for implementing the governance and coordination of the TCS and the coordination and contributions to the EPOS Delivery Framework with activities aimed at the engagement of the communities in fostering “open access” in solid Earth science.

² Minutes of the 6th EPOS ERIC General Assembly meeting (16th - 17th June 2020).

These agreements involve twenty-five organisations based in nine ERIC Member Countries³, one Observer Country⁴ and five organisations set in European Countries involved in EPOS but not joining the ERIC yet⁵.

Enabling Data and Service Provision

In December 2021, the EPOS ERIC General Assembly approved the activation of the TCS Data and Service provision⁶ and authorised the Executive Director to sign collaboration agreements in 2022 with Service Providers designated by the TCS. This action is aligned with the “EPOS ERIC Strategic Plan 2020-2022” and will allow testing of TCS Data and Service Provision during the Pilot Operational Phase at the technical, legal, governance and financial levels as designed for the Operational Phase.

The proposal to the General Assembly was supported by the Service Coordination Committee (October 2021) and by the Executive Committee (November 2021). Here, the overall approach was discussed and endorsed, including the steps for realising the implementation of the General Assembly decision if approved in December 2021. These discussions were necessary because a number of questions required further exploration and investigation by the ECO and the TCS in early 2022.

In particular, at the technical level, the results of Window#1 of the Pilot Operational Testing (POT) indicated that a high number of services are ready to be successfully connected to the ICS-C. Yet, some final verifications are needed to compose the exact list of services that can be proposed for activation for each TCS, and how these services tested in the POT are linked to the level of aggregation of services per Service Provider outlined in the TCS Cost-book - as this is the granularity level used for the description of services in the collaboration agreements. At the legal level, it is necessary to corroborate that the EPOS Policy is guaranteed by all services proposed for activation, and this will be double-checked by the technical teams in early 2022. In addition, there is a need for further consultation with financial and legal experts, as well as with the TCS, in order to define the best approach for establishing the legal agreements. An initial evaluation suggests an approach similar to that adopted for the collaboration agreements for TCS Governance and Coordination, with annual work programs, breakdown of costs covered by EPOS ERIC in cash, and contributions in-kind by EPOS ERIC and the partners. Finally, at the financial level, the basis for the distribution of funds in 2022 amongst TCS was discussed at the Service Coordination Committee (October 2021), but a detailed proposal has been postponed until early 2022.

To achieve this goal, and following the decision of the General Assembly to activate TCS Data and Service provision, a roadmap has been shared with the TCS with the objective of setting up agreements in the first half of 2022 with all TCS having a Multi-Year Collaboration Agreement for TCS Governance and Coordination in place.

Establishing Trans-National Access (TNA) Coordination and Provision

To coordinate and harmonize procedures to be adopted for the activation of the Transnational Access (TNA) Service in EPOS, a dedicated TNA Working Group (TNA WG) was established. The main task of the TNA WG is to set out requirements for the validation of TNA services. The TNA WG is led by the Coordinator of the TCS Multi-Scale Laboratories and includes representatives of all TCS embedding communities that have provided TNA to laboratories in the past or wish to do so in the future (Multi-Scale Laboratories, Volcano Observations, Near Fault Observatories, Seismology and the candidate Tsunami).

³ Belgium, France, Greece, Italy, The Netherlands, Poland, Portugal, Romania, United Kingdom.

⁴ Switzerland.

⁵ Czech Republic, Finland, Germany, Spain, Sweden.

⁶ Minutes of the 14th EPOS ERIC General Assembly meeting (15th - 16th December 2021).

In 2021, a dedicated “Facility Access Validation” document was prepared which contains the rules to which each TCS must conform to validate their TNA laboratories as an EPOS service. The rules described in the document apply to the technical, governance, legal, and financial dimensions of the EPOS Delivery Framework and have been already discussed within the ECO, and a discussion within the Service Coordination Committee is also planned. The results will be then used as further input for the EPOS ERIC Implementing Rules Section 2. The TNA WG also participates in the TCS-ICS System meetings organized in the framework of the Pilot Operational Testing with the goal of creating the EPOS TNA Brokering Service. This service will be fully compliant with the EPOS-DCAT-AP model and fully integrated into the EPOS ICS-C Data Portal. This acts as a “shop window” for researchers interested in the instrumentation, facilities, and TNA services that the EPOS Research Infrastructure offers. In 2021, the TNA WG was involved in all four Pilot Operational Testing cycles and it identified the requirements for the Brokering Service, established user stories and use cases, and started with the technical design for the Graphical User Interface (GUI).

IT Development of the TCS-ICS System and Community Meetings

Activities envisaged in the 2021 Activity Plan and defined in the EPOS ERIC Strategic Plan 2020-2022, focused on ensuring ICS and TCS cooperation to synergically develop a unique, integrated TCS-ICS System to guarantee access to all data and services provided within the EPOS Delivery Framework. To operate and maintain such a complex system, which encompasses several key actors with different backgrounds - technical, engineering, scientific- a clear and structured management activity was carried out by the IT Board. This Board, established in 2020, is in charge of coordinating the ICS implementation as defined in the EPOS Delivery Framework as well as of delivering and implementing the Annual Planning for developments, in turn reviewed and endorsed by the community during the TCS-ICS Interaction workshops. The latter are week-long quarterly meetings dedicated to the interaction of key ICS and TCS personnel, where technical-scientific discussions aiming at developing and operating the TCS-ICS System are carried out. These meetings are also the place where the work is reviewed and planned under the guidance of the TCS-ICS interaction team, led by the University of Bergen which signed a dedicated Multi-Year Collaboration Agreement in 2020 for this purpose. Technical activities discussed during these TCS-ICS Interaction workshops include, for instance, improvement, consolidation and extension of the metadata catalogue and major enhancements of the EPOS ICS-C Data Portal in preparation for the launch of the Data Portal planned in January 2023. These improvements to the Data Portal were based on user feedback and dedicated “User Experience” workshops that suggested usability and access to data and services should be enhanced. Complementary activities like bug fixing, interaction with users, system upgrade and maintenance, ICS-C System robustness enhancement, were also performed to ensure the TCS-ICS System continuity and improved robustness. Finally, preliminary activities to consolidate the Authentication, Authorization, Accounting Infrastructure (AAAI) services were also started.

2021 was a crucial period for EPOS as it was the central year of the Pilot Operational Testing (POT). Consequently, several technical and governance activities were performed, with the aim of testing the robustness of the TCS and ICS services and validating the functionality of the entire TCS-ICS System. The first window of the POT was completed and reported in July 2021. The primary outcome of the POT was identification of weak points and issues to be fixed during the second POT window (to May 2022). Successful finalization of the POT requires a technically stable system driven by services but also demands appropriate governance and engagement at both ICS and TCS levels. As a result, interaction with TCS intensified during the second half of 2021.

Sponsored Research Activities

The EPOS ERIC Strategic Plan 2020-2022 includes support for ERIC sponsored actions dedicated to the consolidation of the TCS role and visibility, and engagement of the community on specific technological and scientific topics. Consequently, the 2021 Activity Plan foresaw supporting Sponsored Research Activities (SRA) but the proper scientific and legal framework has not been defined yet. As a result, 2021 was dedicated to discussing the best strategy to run SRA with both the community and members of the EPOS ERIC Scientific Advisory Board. The latter welcomed the SRA as an opportunity to support the evolution of the EPOS Research Infrastructure but also pointed out that precise mechanisms must be identified to deliver these actions. The Board's advice was to set up a shared system to prioritize topics through a series of calls managed by dedicated Service Coordination Committee working groups in order to keep the community involved and facilitate integration in this process. The ECO then proposed that for 2022 the SRA should focus on a few selected topics aligned with the EPOS strategy and community requirements. This approach will enable testing of the feasibility and organizational aspects (e.g., agreements, project proposals etc.) of SRA in 2022 while allowing the community to study and set up rigorous procedures for supporting SRA in the next few years.

International Cooperation and Global Dimension

EPOS ERIC is leading a globally relevant research infrastructure for the solid Earth domain. This is confirmed by the results achieved during the EPOS Implementation Phase, and its high level of visibility in the wider global landscape of research infrastructures.

In 2021 a strategy for collaborating with pan-European research infrastructures and international initiatives and organisations has been developed. According to this strategy, several key partners have been identified together with mechanisms to establish or strengthen mutually beneficial relationships. A key element of this engagement strategy was the coordination meetings between EPOS and these other initiatives. Unfortunately, due to the impacts of the COVID-19 pandemic, these coordination meetings have been carried out remotely using virtual communication tools rather than the in-person events originally planned.

Specific collaboration activities for data science and e-science innovation have been undertaken within ENVRI (and ENVRI-FAIR) and the Research Data Alliance (RDA). In particular, EPOS participated in ESIP/RDA Earth, Space and Environmental Sciences Interest Group sessions during the virtual 15th, 16th and 17th Research Data Alliance plenary meetings. A series of collaboration activities have also been undertaken for strengthening the existing relationships with the following key initiatives: Gravity community, ECCSEL, EuroGeographics, Copernicus, EUREF, EUMETNET, ENVRI, EuroGeosurveys, ESA, and JERICO. In addition, EPOS has renewed its commitment and participation in the Group on Earth Observations with representation in the newly formed GEO Working Group and the associated In-situ Data subgroup that has a leading role in developing standards and best practices for Earth observation data. To further support and promote selected engagement activities, dedicated Focus Groups for promoting EPOS participation in ENVRI, EOSC and GEO have been established. These groups are now being initiated and setting out terms of reference to maximise the benefit of EPOS involvement in these selected key initiatives.

At the global level, EPOS is fully integrated within the international landscape of Earth science Research Infrastructures. During 2021, EPOS ERIC has strengthened its collaboration and knowledge exchange with other research infrastructures for solid Earth science, such as AuScope⁷ (Australia), IRIS and UNACVO (USA). Networking activities with initiatives in Africa and Latin America have also started during 2021, but the organisation of the international workshops has been postponed due to the COVID-19 pandemic.

⁷ A Memorandum of Understanding between EPOS ERIC and AuScope has been signed on January, 24th 2022.

Communication, Dissemination and Outreach

Communication, dissemination and outreach activities have been performed by applying and adapting the practices and strategies described in the EPOS Communication Plan to the specific needs of EPOS during its pre-Operational Phase. Inevitably, this has required the need to mitigate the impact of the COVID-19 pandemic on the visibility and recognition of the EPOS Research Infrastructure.

In particular, these activities have focused in the following areas: i) EPOS visual identity; ii) launch of the new EPOS website; iii) dissemination and outreach events; iv) production of outreach materials.

EPOS visual identity

The new visual identity for EPOS is based on the graphic style developed for the updated website, launched in 2020. The updated styling has been adapted for different applications: letters, documents, presentations, videos, the Intranet and social media (Facebook, Twitter, LinkedIn, Youtube, Flickr); the EPOS logo is now a registered trademark of EPOS ERIC and the visual identity manual has been adopted inside the ECO.

EPOS website

A new website has been developed and launched in 2021. The redesign of the website was not limited to a graphic restyling but has changed both the structure and the language for moving from internal to more public-oriented communications.

Dissemination and outreach events

In addition to the planned workshops and training events, EPOS has participated in the first edition of the Earth Tech Expo (ETE) in Florence (Italy) with a booth that was visited by more than 10.000 visitors. The ETE provided an opportunity to present EPOS in a completely different environment focused on techniques, technologies, control systems, monitoring in real-time and innovative applications.

Outreach materials

During 2021, new EPOS outreach materials have been developed and distributed. This includes a novel video, the first in a series that will target different audiences, to communicate the EPOS mission and delivery of the service portfolio. The video is now published on the website and shown at international events. New brochures, flyers, images and presentations have also been delivered and they are now available for the different needs of the community (<https://www.epos-eu.org/communication/outreach-materials>). Furthermore, EPOS responded to an invitation from the Annals of Geophysics journal to publish a special issue dedicated to the EPOS Research Infrastructure. Annals of Geophysics is an international peer-reviewed open access, free of charge publication, online journal publishing articles on Earth science. The community enthusiastically and actively reacted to the call by submitting fourteen manuscripts currently being prepared for publication. Five manuscripts concern general aspects of the EPOS Research Infrastructure, including a description of the EPOS Delivery Framework, strategies to address its sustainable operation, solutions to tackle FAIR data management and the harmonization of national strategies with the EPOS ERIC pan-European governance. One manuscript is dedicated to presenting strategies and solutions to manage trans-national access. The remaining ones describe single TCS in terms of governance and data and service provision. The submission of three further articles is envisioned in March 2022. The Special Issue of the Annals of Geophysics will be published in two volumes, the first one in April 2022 and the second one in June 2022. These two special issues have provided the EPOS community with the opportunity to give an in-depth description of the EPOS Research Infrastructure and highlight its multidisciplinary, whilst also promoting the Delivery Framework to a wider audience.

Projects

EPOS ERIC is involved in several European projects aiming to ensure sustainability, reinforce the solid Earth science community building and engagement and enhance knowledge-sharing and cooperation between research infrastructures and other international organisations.

EPOS ERIC involved as Coordinator

EPOS Sustainability Phase (EPOS SP) Project started on February 1st, 2020 and it will last until April 31st, 2023. The project involves 24 beneficiaries from 17 European Countries.

The overall objective of the EPOS SP Project is to perform activities aimed at ensuring the long-term sustainability of the EPOS Research Infrastructure through strategic actions dedicated to:

- Secure governance and financial sustainability through the entire Research Infrastructure lifecycle.
- Secure technical sustainability and innovation to exploit data and service provision.
- Establish and maintain excellence by preserving and reinforcing the trust and awareness of users.
- Exploit economic and societal benefits to maintain stakeholder engagement.

During 2021, significant project results were achieved according to the above-mentioned four strategic actions.

Activities performed in the framework of the National Authorities Consultation Board (NACB) have already resulted in Romania joining the EPOS ERIC, and Germany, Finland and Austria have initiated actions at the national government level to join the ERIC. Moreover, new contacts have been established with Bulgaria, Hungary and Turkey. In addition, the finalization of collaboration agreements between EPOS ERIC and the organisations in charge of the governance of the scientific communities (TCS) (see also “Activation of TCS Governance and Coordination Service”) is a further pivotal result for the sustainability of data and services.

Activities focused on enhancing the technical sustainability of the TCS-ICS System have been undertaken for the improvement of the ICS in terms of robustness and metadata ingestion while testing the TCS-ICS System. The work carried out within the project is fully aligned with the testing of the TCS-ICS System planned in the EPOS ERIC Strategic Plan (see “IT Development of the TCS-ICS System”). Furthermore, the project succeeded in engaging new communities with the Tsunami Community having obtained the official status of EPOS “Candidate-TCS” in July 2021. To foster EPOS readiness for EOSC integration and FAIR Data, an on-line survey, based on similar questionnaires conducted by other initiatives (Open AIRE and FOSTER), has been performed to identify the current level of awareness and adoption of good practices to support open science within the EPOS community.

Strategies to strengthen cooperation with the private sector needed to be modified because the COVID-19 pandemic fundamentally changed the original action plan. The revised action plan resulted in the development of strategic documents identifying key partners and alternative engagement strategies that utilised virtual communication tools; these replacement activities have been performed accordingly.

COVID-19 pandemic also severely impacted activities for promoting data science innovation and developing the global dimension of EPOS (see “International Cooperation and Global Dimension”). Nevertheless, the project succeeded in undertaking specific collaboration for these specific purposes within ENVRI and ENVRI-FAIR, and the Research Data Alliance (RDA). In addition, collaboration activities have been initiated to strengthen existing relationships with key European (e.g., EUREF, ESA) and global (e.g., AuScope, IRIS, UNAVCO, GEO) initiatives.

The relevant ethical considerations for existing and future EPOS services were explored by collecting information and perceptions concerning the ethical implications associated with data, data products, and service provision through the EPOS Research Infrastructure; results obtained through the questionnaire will serve as input and a knowledge base to elaborate the Ethics Principles and Guidelines for the EPOS ERIC.

Notwithstanding COVID-19, training and outreach initiatives on the contents and usage of EPOS have been developed and are available on YouTube, which includes an introduction to EPOS and a demonstration on how to search for data using the EPOS ICS-C Data Portal (<https://www.youtube.com/watch?v=8zXPVUwFBcg>).

EPOS ERIC involved as a Beneficiary

EOSC Future Project (April 1st, 2021 - September 30th, 2023) involves 36 beneficiaries coordinated by ATHENA - Greece. The project aims to integrate, consolidate and connect e-infrastructures, research communities and initiatives supporting open science with the aim of advancing the EOSC platform of services (EOSC-Core, EOSC-Exchange, Interoperability Framework). The project also seeks to reveal the potential of European research by connecting the major stakeholders in the EOSC ecosystem, developing scientific use cases in collaboration with the thematic communities, engaging the broader EOSC community, and increasing its visibility.

In 2021, EPOS and its Linked Third Parties INGV, KNMI and CNR-IREA were involved in activities related to: i) definition of the architecture, interoperability guidelines and frameworks needed for the EOSC-Core and EOSC capabilities, which offer an integration point for research infrastructures, providers and researchers; ii) integration of community services and products into EOSC, and, in particular, the Integration of EOSC-Core Services into European Research Practice.

EPOS ERIC involved as an Associate

ERIC FORUM Project (January 1st, 2019 - December 31st, 2022) involves 25 beneficiaries coordinated by Biobanks and Biomolecular Resources Research Infrastructure Consortium (BBMRI ERIC) - Austria.

The project aims to reinforce coordination and networking, support the organisation of specific events and training on shared challenges, facilitate ERICs in preparation and increase ERIC participation as stakeholders in policy actions.

In 2021 EPOS was involved in the activities concerning i) ERIC Forum Governance Model; ii) operations, administration, human resources and finance of ERICs; iii) evaluation and impact assessment; iv) role of ERICs in European science policy and research strategy.

ENVRI FAIR Project (January 1st, 2019 - June 30th, 2023) involves 39 beneficiaries coordinated by Forschungszentrum Jülich GMBH - Germany.

The project aims to advance the findability, accessibility, interoperability, and reusability (FAIRness) of the digital assets provided by research infrastructures and connect them to the emerging European Open Science Cloud. ENVRI-FAIR targets the development and implementation of a technical and policy framework to overcome disciplinary boundaries within the ENVRI community. Cross-discipline harmonisation and standardisation, together with the implementation of joint data management and access structures, will facilitate truly interdisciplinary Earth system science that is fundamental to addressing today's environmental challenges.

In 2021 EPOS was involved in activities linked to i) strategy for alignment with national and international stakeholders; ii) common standard requirements and testbed for (meta)data services, community standards and cataloguing; iii) training and capacity building; iv) common implementation and support; v) solid Earth subdomain implementation. It should also be noted that EPOS is considered a pioneer Research Infrastructure due to its established mechanisms for delivering policy documents within this framework. Indeed, in 2021 EPOS has been invited to two training sessions organized by the ENVRI-FAIR project to present the work done in this area to the other Environmental Research Infrastructures.

ENRIITC Project (January 1st, 2020 - December 31st, 2022) involves 10 beneficiaries coordinated by European Spallation Source ERIC (Sweden).

The European Network of Research Infrastructures and Industry for Collaboration (ENRIITC) aims to establish a pan-European network of Industrial Liaison and Contact Officers (ILOs/ICOs) to improve the RI-industry cooperation and boost the innovation ecosystem in Europe.

RItrainPlus Project (April 1st, 2021 - March 31st, 2025) involves 15 beneficiaries coordinated by Università degli Studi Milano-Bicocca (Italy).

For the first time, the project brings together research infrastructures, core facilities, business management schools and European universities in a new innovative concept to transform the access and empowerment of human resources for national and international scientific facilities in Europe.

EPOS ERIC involved as a Beneficiary in Horizon Europe projects starting in 2022

In 2021 EPOS ERIC participated as a beneficiary in the following three project proposals that have been submitted for funding to the European Commission and positively assessed to start in 2022:

- Geo-INQUIRE - HORIZON-INFRA-2021-SERV-01-07- Research infrastructures services advancing frontier knowledge.
- DT-GEO - HORIZON-INFRA-2021-TECH-01-01- Interdisciplinary digital twins for modelling and simulating complex phenomena at the service of research infrastructure communities.
- Skills4EOSC - HORIZON-INFRA-2021-EOSC-01-01- Supporting an EOSC-ready digitally skilled workforce.

The Next Steps

This year (2022) will be pivotal for EPOS, marking the end of the Pilot Operational Phase and the beginning of the Operational Phase. Levels of activity are already elevated, which is to be expected as EPOS transitions to the Operational Phase.

The core activity of EPOS in 2022 will be to consolidate the conditions necessary for full activation of virtual access to the scientific data and products from all TCS through the EPOS ICS-C Data Portal.

At the ICS-C level, the General Assembly's decisions already set a clear path for the ICS-C to be fully available in the Operational Phase. In 2022, a Multi-Year Partnership Agreement (MYPA) will be established to regulate the joint initiative of EPOS ERIC and the Hosting Organizations to host and operate the ICS-C. The MYPA will enter into force in July 2022 and will last for three years.

At TCS level, the work conducted in the past (since 2010) supports the activation of TCS Data and Service Provision in EPOS. In 2022, TCS Data and Service Provision will be tested from a nearly-operational point of view as part of the ongoing Pilot Operational Phase and the Pilot Operational Testing. As a result, this data will be accessible through the pre-operational EPOS ICS-C Data Portal, and legal agreements will be established to assess the implementation of the legal, governance and financial mechanisms planned for the Operational Phase. We also foresee significant implementation of the Trans-National Access Service in the Brokering Service.

In 2022 we will initiate crucial activities related to the development and usage of the Integrated Cores Services Distributed (ICS-D). These activities will be supported by both the newly funded Horizon Europe projects and EPOS ERIC funds for Sponsored Research Activities (SRA). Following an in-depth discussion within the Service Coordination Committee on topics to be considered for the SRA, it has been decided to focus on the development of ICS-D, which is unanimously considered to be of highly strategic importance as it includes key players from both the TCS communities and the ICS team. Notably, despite the upcoming EU-funded Horizon Europe projects and other ongoing initiatives on ICS-D development and usage, most of the organizations involved will provide in-kind resources. For this reason, the EPOS ERIC support through SRA funds will be dedicated mainly to those organizations that, while playing a key role for the provision of ICS-D prototypes, are not supported by these new initiatives of the European Commission.

During 2022, our main commitment will be to deliver a long-term plan for the sustainability of the EPOS Research Infrastructure. This task will be mainly addressed within the EPOS SP project, which has been designed to deliver a Long-Term Sustainability Report to the EPOS ERIC General Assembly that proposes strategies and identifies solutions to address the challenge of the sustainable operation of EPOS. Overall, EPOS considers the scientific impact and promoting scientific research as the preconditions to achieving long-term sustainability. Therefore, two key documents will guide the EPOS Research Infrastructure during its Operational Phase, namely, the Science Program and the Business Plan. They are both necessary for the sustainable operation of EPOS for the following years.

2. Financial Statements

as at December 31st, 2021

Balance Sheet

Balance Sheet - Assets and liabilities at 31.12.2021				
		2021		2020
ASSETS		5.147.579		4.220.112
NON CURRENT ASSETS		-		-
Tangible assets (plant, property and equipment)		-		-
Intangible assets		-		-
Long term credits		-		-
CURRENT ASSETS		5.147.579		4.220.112
Stocks		-		-
Short term credits		9.996		42.923
- credits for members' statutory contribution in cash	-		-	
- other current credits and receivables	9.996		42.923	
Cash and cash equivalents		5.136.742		4.170.367
Prepayments and accrued income		841		6.822
EQUITY AND LIABILITIES		5.147.579		4.220.112
EQUITY				
Capital and other permanent contributions from Members		-		-
Reserves				
Accumulated profits		-		-
NON-CURRENT LIABILITIES		18.683		2.663
Long-term financial debts and loans		-		-
Other long-term debts and liabilities		-		-
Employee's severance indemnity		18.683		2.663
Long-term provisions		-		-
CURRENT LIABILITIES		5.128.896		4.217.449
Short-term financial debts		478.726		993.123
Advance payments for externally funded projects		543.980		202.943
Other short-term debts and liabilities		690.986		101.670
Deferred income and accrued expenses		3.415.204		2.919.713
- deferred income for members' statutory contribution in cash (carryover)				
	financial year 2019	1.345.181		1.345.181
	financial year 2020	1.574.532		1.574.532
	financial year 2021	495.491		
- accrued expenses		-		-

Profit and Loss Account

PROFIT AND LOSS ACCOUNT					
			2021		2020
Revenues			2.725.633		1.365.642
	National and international grants and contributions		1.801.416		735.526
	▪ monetary contribution of EPOS ERIC Members	1.484.000		1.328.000	
	▪ host premium cash contribution	648.934		643.806	
	▪ contribution project externally funded	163.973		143.497	
	▪ use of carry over of previous years	-		194.755	
	▪ carry over of the year (-)	(495.491)		(1.574.532)	
	Contributions in-kind		924.215		630.047
	▪ contributions in kind by hosting country	317.922		332.648	
	▪ contributions in kind by members	606.293		297.399	
	Other revenues		2		69
Operating costs			2.710.210		1.359.965
	Costs for raw materials, supplies and goods	46		-	
	Costs for services	478.391		363.854	
	Staff costs	312.219		58.942	
	Costs of rents, concessions and royalties for trademarks	8.557		2.352	
	Contributions TCS	666.975		107.020	
	Contributions ICS-C	319.371		194.755	
	Other operating costs	436		2.995	
	Resources committed in-kind to EPOS from contributors	924.215		630.047	
Ebitda (Earning before Interests, Taxes, Depreciations and Amortizations)			15.423		5.677
Depreciation			470		1.043
Write-downs for impairment of tangible and intangible assets			-		-
Ebit (Earnings before interests and taxes)			14.953		4.634
Financial income and expenses			(2)		1
	Financial income		-		2
	Financial charges (-)		(2)		(1)
Income from investments			-		-
Value adjustments to financial assets			-		-
Result before tax			14.951		4.635
Income tax			14.951		4.635
Result for the year			-		-

Statement of Cash Flow

<i>Financial statements as at 31/12/2021</i>		
Financial Statement - Indirect method		
	Amount as at 31/12/2021	Amount as at 31/12/2020
A) Financial flow from operations(indirect method)		
Net profit (loss) for the year	-	-
Incometaxes	14.951	4.635
Interest expenses/(income)	2	(1)
(Dividends)		
(Capital gains)/Capital losses resulting from asset disposal	-	-
<i>1) Profit (loss) for the year before incometaxes</i>	<i>14.953</i>	<i>4.634</i>
Adjustments for non-monetary elements with no offset in working capital		
Accruals to provisions	16.020	2.663
Depreciation of assets	470	1.043
Writedowns due to impairment		
Adjustment of value of financial assets and liabilities of derivative financial instruments not involving cash transactions		
Other increasing/(decreasing) adjustments for non-monetary items	-	-
<i>Total adjustments for non-monetary items with no offset in net working capital</i>	<i>16.490</i>	<i>3.706</i>
<i>2) Financial flow before changes to the net working capital</i>	<i>31.443</i>	<i>8.340</i>
Changes in net working capital		
Decrease/(Increase) of inventories		
Decrease/(Increase) of credits towards contributors - Members	-	80.000
Decrease/(Increase) of credits towards other contributors	-	-
Increase/(Decrease) in payables due to suppliers	90.483	(15.645)
Decrease/(Increase) in accrued income and deferred expenses	5.981	(6.822)
(Increase)/Decrease in accrued liabilities and deferred income	495.491	1.379.775
Other decreases/(Other increases) of net working capital	864.335	42.617
<i>Total changes in net working capital</i>	<i>1.456.290</i>	<i>1.479.925</i>
<i>3) Financial flow after changes to the net working capital</i>	<i>1.487.733</i>	<i>1.488.265</i>
Other adjustments		
Interest collected/(paid)	(2)	1
(Incometaxes paid)	(6.489)	(4.635)
Dividends collected		
(Use of provisions)		
Other collections/(payments)		
<i>Total other adjustments</i>	<i>(6.491)</i>	<i>(4.634)</i>
Financial flow from operations (A)	1.481.242	1.483.631

B) Financial flow from investing activities		
Tangible fixed assets		
(Investments)	(470)	(1.043)
Disinvestments		
Intangible fixed assets		
(Investments)		
Disinvestments		
Financial fixed assets		
(Investments)		
Disinvestments		
Financial assets not classified as noncurrent		
(Investments)		
Disinvestments		
(Acquisition of company branches net of cash and cash equivalents)		
Sale of company branches net of cash and cash equivalents		
Cash flow from investing activities (B)	(470)	(1.043)
C) Financial flow from financing activities		
Loan capital		
Increase/(Decrease) in short-term payables due to banks		
New loans (Contribution quotas due to the Partners)	-	993.123
(Reimbursement of loans)	(514.397)	
Equity		
Increase in paid share capital		
(Capital reimbursement)		
Disposal/(Purchase) of treasury shares		
Cash flow from financing activities (C)	(514.397)	993.123
Increase (decrease) in cash and cash equivalents (A ± B ± C)	966.375	2.475.711
Effect of exchange rates on cash and cash equivalents		
Cash and cash equivalents at the beginning of the year		
bank deposits	4.168.916	1.694.656
cheques		
Cash and equivalents on hand	1.451	-
Total cash and cash equivalents at the beginning of the year	4.170.367	1.694.656
Of which, not freely usable		
Cash and cash equivalents at the year end		
bank deposits	5.131.088	4.168.916
cheques		
Cash and equivalents on hand	5.654	1.451
Total cash and cash equivalents at the end of the year	5.136.742	4.170.367
Of which, not freely usable		
Balance difference	-	-

3. Notes to the Financial Statements

Foreword

On October, 30th 2018 EPOS ERIC was granted by the European Commission.

The Financial Statements (Chapter 2) are composed of the Balance Sheet, Profit and Loss Account and Cash Flow Statement and are complemented by the Notes to the Financial Statements (Chapter 3) and by the Activities and Results (Chapter 1) that details performed activities and achieved results as for the EPOS ERIC 2021 Activity Plan and Provisional Budget adopted by the EPOS ERIC General Assembly in December 2020 (resolutions No. 11/2020 and No. 12/2020, respectively).

Accounting Criteria

These Financial Statements have been compiled in conformity with the IPSAS (International Public Sector Accounting Standards), international accounting standards issued by the International Public Sector Accounting Standard Board (IPSASB), and in process of being adopted by the European Commission within the meaning of Council Directive No 2011/85/EU of 8 November 2011, on requirements for budgetary frameworks of the Member States.

The decision voluntarily to adopt an accounting system that can be connected to international principles is consistent with the process of harmonization started some time ago by the EU Commission, but not yet completed. For this purpose, it is relevant to recall the *“Report from the Commission to the Council and the European Parliament towards implementing harmonised public sector accounting standards in Member States. The suitability of IPSAS for the Member States”*, published in March 2013.

The IPSAS can in general function as a basis for a harmonised accrual-basis accounting standard passing through its transformation into EPSAS (European Public Sector Accounting Standards). The aforementioned EU Directive states that “by 14 December 2018 the Commission shall make public a review of the sustainability of the Directive (see art.16).

EPOS ERIC is set up as an international organization with scopes of general interest typical of an entity referable to the public sector. EPOS ERIC should therefore be able to relate to its Members in different countries in a common language. This should be adopted in all matters and at all levels, and thus also in the model of presentation of economic-financial topics that support annual accounts and budgets.

The use of international accounting standards referable to the public sector, taking into account the specific character and scopes of EPOS ERIC, adequately conformed to the legal characteristics of the Entity and to its functions and scope, allows the development of well-defined best practices, the impact of which on the financial aspects is measurable and effective. The use of international accounting standards, in fact, allows information on the Financial Statements to be presented in a common way for users/stakeholders of different nationalities. By adopting these international standards, it is ensured that the:

- information is relevant, reliable, comparable and understandable;
- used terminology is common, appropriate and explanatory among Members and for similar international organizations outside Europe;
- Financial Statements are auditable by the International Standard of Audit by auditors from different nations;
- host country changing - and thus any site changing - is not relevant for the comparability of information and models, books and records of the accounting system;
- accounting system is able to present the in-kind contribution model and to provide analytical accounting for projects and separate accounting for economic activities.

The aim of the Financial Statements is to provide information on the assets and liabilities, the profit or loss and changes in the financial structure of the Consortium, useful to a wide range of users.

The Financial Statements are prepared within a general-purpose framework.

The Financial Statements are compiled in accordance with the principles of clarity and transparency and provide a correct and exhaustive framework of information on property relations, as well as economic and financial relations implemented by the Consortium in carrying out its activities. They are compiled taking into account international accounting standards for public sector (IPSAS) and integrated in order to be consistent with the legal and effective structure of EPOS ERIC and its scopes.

Of the various options allowed by IPSAS 1, the Consortium has chosen to present the layout of the balance sheet distinguishing between current and non-current items, and the layout of the profit and loss account classifying the expenses by nature, adding some information on destination, when relevant.

In its drawing-up, the following principles have been observed.

The items have been evaluated prudently, taking into account the perspective of the continuity of the activities, as well as the economic function of an asset or liability.

Only incomes and expenditures related to the financial year have been accounted, independently of the day of encashment or payment.

The risks and losses related to the financial year have been accounted for, even if known after the end of the financial year.

These Notes have been compiled with the aim of clarifying, completing and analysing the information contained in the balance sheet and in the profit and loss account, in addition to providing information on the applied evaluation criteria, on movements that have taken place, and changes in various assets and liabilities.

These Notes are an integral part of the financial documents; they serve to present the Financial Statements and provide descriptive and schematic information, with particular reference to property aspects, as well as economic and financial aspects of the overall management.

Evaluation Criteria

The Financial Statements are compiled in accordance with the principles of clarity and transparency and provide a correct and exhaustive framework of information on property relations, as well as economic and financial relations implemented by the Consortium in carrying out its activities. They are compiled taking into account international accounting standards for public sector (IPSAS), applied coherently with the legal nature of an ERIC and with its scopes.

Balance Sheet

Items in the Balance Sheet are classified into/distinguished as current/non-current.

Assets

Assets have been classified as current assets when:

- they have been realized during the normal operating cycle of the institution;
- they are cash or equivalent complement not restricted in their use;
- the collection is due within 12 months from the balance sheet date.

Assets realizable within the operating cycle have been classified as current.

Non-current assets shall include tangible assets and intangible assets (in general all assets not related to the operating cycle and realizable after 12 months from the balance sheet date).

Liabilities

Liabilities have been considered current liabilities when:

- they are extinct in the course of the normal operating cycle of the institution;
- extinction is due within 12 months from the balance sheet date.

Other liabilities, i.e., those not related to the operating cycle and all other institutional liabilities, are classified as current if their extinction is due within 12 months from the balance sheet date.

Otherwise, they are recognized as non-current liabilities.

Deferred Incomes and Accrual Expenses

This item includes the amount of funds received during the year and not yet fully used by 31.12 for the purposes for which they were intended. They will therefore continue to produce utility in coming years, for the same purposes. This item represents the carry-over for balances of the subsequent year to that under review. In this regard, the Consortium is obliged to operate in future years in fulfilment of the mandate assigned by the Member States (when they commit themselves to contribute the Consortium with their Membership fees), and by the Italian Ministry of University and Research, who assigned, through the Italian Representing Entity (INGV), the financial funds (FOE) under which some EPOS ERIC activities were carried out in 2021.

Profit and Loss Account

The drawing-up of the profit and loss account is regulated by the IPSAS, integrated and conformed to be consistent with the characteristics and scopes of EPOS ERIC.

Incomes

Incomes are increases of benefits connected to the administrative year.

Costs/Expenses

Costs/expenses are decreases of economic benefits of the administrative year. The analysis of costs has been explained in the overview of profit and loss account using a classification based on their nature.

In-kind Contributions

Contributions in-kind are included in the Financial Statements on the basis of specific detailed reports produced by the Entity that provided them.

In-kind, non-monetary, contributions will be distinguished (when realized) between:

- those strictly related to the cost of the production factors (exhausting their utilities during the ordinary cycle).
- those strictly related to covering investments (in intangible and tangible assets), if any.

Anyway, for in-kind contribution accounting procedures and valorisation, IPSAS Principle No. 23 was applied.

Assets

Non-current Assets

Balance as at 31/12/2020	Balance as at 31/12/2021	Difference
-	-	-

Tangible Assets

Balance as at 31/12/2020	Balance as at 31/12/2021	Difference
-	-	-

The composition is as follows:

Description	Initial cost	Investment/ Disinvestment	Final cost	Amortization/ Depreciation	Amortization/ Depreciation fund	Residual value
Office furniture	1.043	-	1.043	-	1.043	-
pc and printers	-	80	80	80	80	-
Mobile phones	-	390	390	390	390	-
TOTAL	1.043	470	1.513	470	1.513	-

The value of the tangible assets owned by the Consortium is equal to Euro 1.513; their depreciation process is completed.

Intangible Assets

No values are entered for these items.

Long terms credits

No values are entered for these items.

Current Assets

Balance as at 31/12/2020	Balance as at 31/12/2021	Difference
4.220.111	5.147.579	927.468

Stocks

No values are entered for these items.

Short-term Credits

The balance is divided according to the deadlines of the credits:

Balance at 31/12/2020	Balance at 31/12/2021	Difference
42.923	9.996	(32.927)

The composition of the amount as at 31/12/2021 is as follows:

Description	Within 12 months	Over 12 months	Over 5 years	Total
Advances to suppliers	7.014			7.014
Tax advances	2.979			2.979
Other receivables	3			3
TOTAL	9.996	-	-	9.996

The balance sheet item "Advances to suppliers" represents the part of the expenses prepaid to suppliers.

Cash and Cash Equivalents

The balance represents cash at the bank at the end of the financial year. It represents liquid assets, cash equivalents and prepaid cards at the end of the year.

Description	Balance at 31/12/2020	Balance at 31/12/2021	Difference
Bank deposit (Intesa San Paolo)	4.168.916	5.131.088	962.172
Prepaid credit cards	1.451	5.654	4.203
TOTAL	4.170.367	5.136.742	966.375

Prepayments and Accrued Income

Balance at 31/12/2020	Balance at 31/12/2021	Difference
6.822	841	(5.981)

The item represents prepaid expenses whose utility is postponed to the next year, referred to licences and internet domain.

- Justinmind licence (Euro 111)
- Tophost Internet domain (Euro 37)
- Dropbox licence (Euro 693)

Equity and Liabilities

Equity

Capital and Other Permanent Contributions from Members

No values are entered for these items.

Reserves

No values are entered for these items.

Accumulated Profits

No values are entered for these items.

Non-current Liabilities

Balance at 31/12/2020	Balance at 31/12/2021	Difference
2.663	18.683	16.020

Long-term financial debts and loans

No values are entered for these items.

Other Long-term Debts and Liabilities

No values are entered for these items.

Employee's severance indemnity

Balance at 31/12/2020	Balance at 31/12/2021	Difference
2.663	18.683	16.020

This item represents the actual debt of EPOS ERIC at 31/12/2021, to employees in force at that date (n. 6 employees) and it is made up as follows:

Description	
Initial value	2.663
Severance accrued during the year	16.039
Severance paid during the year	
Tax	(19)
End value	18.683

At 31/12/2021 advances have not been required by employees.

The number of employees has been increased in 2021 as follows:

Description	n.
Employees as at 01/01/2021	2
Recruitment in 2021	4
Employees as at 31/12/2021	6

Long-term provisions

No values are entered for these items.

Current Liabilities

Balance at 31/12/2020	Balance at 31/12/2021	Difference
4.217.449	5.122.896	905.447

Short-term financial debts

Balance at 31/12/2020	Balance at 31/12/2021	Difference
993.123	478.726	(514.397)

This item includes the contribution quotas due to the Partners for their participation to EPOS SP Project and EOSC Future of which EPOS ERIC is Coordinator or linked third parties Representative.

Advance payments for externally funded projects

Balance at 31/12/2020	Balance at 31/12/2021	Difference
202.943	543.980	341.037

This item includes the residual prepayment received from EU for participation to EPOS SP project and EOSC Future project and referred to EPOS ERIC' own quota contribution.

Other short-term debts and liabilities

Balance at 31/12/2020	Balance at 31/12/2021	Difference
101.670	690.986	589.316

Debts are valued at their nominal value. The composition of the aforementioned amounts is as follows:

Description	Balance at 31/12/2020	Balance at 31/12/2021	Difference
Debts to providers and collaborators	57.212	147.695	90.483
Debts to social security institutions	3.390	18.813	15.423
Tax liabilities	8.373	27.145	18.772
Contribution to be paid	24.498	467.265	442.767
Payables to employees	8.197	30.068	21.871
TOTAL	101.670	690.986	589.316

The item "Debts to providers and collaborators" includes debts to third parties, mainly related to services received, accrued but not paid as at the end of the year.

The item "Debts to social security institutions" includes the amount of social security contributions related to employees, accrued but not paid as at the end of the year.

The item "Tax liabilities" includes debts for VAT (INTRA-12), withheld taxes for employees and collaborators and the debt for IRAP (Italian direct tax on personnel).

The item "Contribution to be paid" includes debts to entities involved in the TCS and ICS-C activities regarding cash contribution accrued but not paid as at the end of the year.

The item "Payables to employees" includes the remuneration of the month of December and deferred remuneration for holidays and work permits.

Deferred Income and Accrued Expenses

Balance at 31/12/2020	Balance at 31/12/2021	Difference
2.919.713	3.415.204	495.491

The item breaks down as follows:

Description	
Deferred income as at 01/01/2021	2.919.713
deferred income 2021	495.491
Deferred income as at 31/12/2021	3.415.204

The balance sheet item "Deferred income" measures the portion of the contribution funded by the Members for the activities of the EPOS ERIC, deferred to next years concerning activities included in the 2020-2022 EPOS ERIC Strategic Plan as adopted by the General Assembly on December 10th 2020 (Resolution No.11/2020 and 12/2020). Therefore, this item doesn't represent a liability towards any third parties but

only, and better, the EPOS's own funds available to finalize the above-mentioned Strategic Plan.

Profit and Loss Account

Revenues

Balance at 31/12/2020	Balance at 31/12/2021	Difference
1.365.642	2.725.633	1.359.991

The item breaks down as follows:

Description	Balance at 31/12/2020	Balance at 31/12/2021	Difference
Membership Fee	1.328.000	1.484.000	156.000
Host premium cash contribution	643.806	648.934	5.128
Contribution project externally funded	143.497	163.973	20.476
Use of carry over of previous years	194.755		(194.755)
- Carry over of the year	(1.574.532)	(495.491)	1.079.041
National and international grants and contributions accrued in financial year	735.526	1.801.416	1.065.890
SUB TOTAL			
Contribution in kind	630.047	924.215	294.168
Other revenues	69	2	(67)
TOTAL	1.365.642	2.725.633	1.359.991

"National and international grants and contributions" item identify:

- the cash contribution (statutory membership fees) for the financial year allocated by the Members for the Consortium and attributable to 2021;
- the cash contribution from INGV attributable to the financial year;
- the cash contribution from UE regarding the activities carried on EPOS SP and on EOSC Future projects is attributable to the financial year in proportion to the costs incurred by EPOS ERIC in 2021.

"Contribution in-kind" item identifies:

- the 2021 in-kind contribution for the cost of staff made available by INGV according to the Italian bid to host the legal seat. This contribution has been calculated with reference to the costs of personnel and materials assigned to EPOS ERIC by INGV (Euro 317.922);
- the 2021 in-kind contribution made available by Hosting Organizations engaged in the "ICS-C hosting and operation" and by the Organizations engaged in the "TCS operation" (Euro 606.293).

"Other revenues" item refers to small rounding.

Costs

The Consortium, in the context of purchases realized, and within the limits of the Statute, may use VAT exemptions granted on the basis of Article 143(1)(g) and Article 151(1)(b) of Council Directive 2006/112/EC, and in accordance with Articles 50 and 51 of Implementing Regulation (EU) No. 282/2011 of the Council, and on the basis of Article 12 of Directive 2008/118 /EC.

When it was not possible to call for the exemption, the cost of VAT is included in the cost to which it refers.

Operating Costs

Costs for Raw Materials, Supplies, Consumables and Goods

This category includes costs incurred for the supply of consumables and office stationery.

Balance at 31/12/2020	Balance at 31/12/2021	Difference
-	46	46

Costs for Services

It has been decided to detail the item service costs, to facilitate the clarity of these Financial Statements, into the following categories of expenses:

Description	Balance at 31/12/2020	Balance at 31/12/2021	Difference
Executive Director assigned by INGV	143.131	35.770	(107.361)
Executive Director (remuneration and social security contribution directly by EPOS)	26.922	118.781	91.859
Expenses for meetings	27.709		(27.709)
Intranet network	17.000	10.000	(7.000)
Website		35.975	35.975
Other software assistance		1.480	1.480
Translations		1.420	1.420
Travel costs for employees, collaborators, and bodies	5.551	5.267	(284)
Legal, fiscal, labour consultancy and accountant services	89.831	69.758	(20.073)
Advertising and communication	15.971	47.490	31.519
Support to international activities	17.016	29.235	12.219
Support to activation procedures		74.500	74.500
Other administrative collaborations	3.931	7.500	3.569
Auditor fees	10.550	15.800	5.250
Telephone and communication utilities	2.178	2.937	759
Workshops, seminars and publications	82		(82)
Training		11.002	11.002
Prepaid meals	1.803	9.045	7.242
Bank charges	1.893	2.054	161
Postal charges	286	343	57
Other services		34	34
TOTAL	363.854	478.391	114.503

Staff Costs

This item includes the cost of staff directly employed in EPOS ERIC.

At 31/12/2021 EPOS ERIC has n. 6 people hired with the status of employee.

Staff costs includes:

Description	31.12.2020	31.12.2021
Salaries	43.497	228.781
Social security charges	12.782	67.399
Severance indemnities	2.663	16.039
Other personnel costs		
TOTAL	58.942	312.219

Costs of rents, concessions and royalties for trademarks

This item represents the cost for software licences.

Description	31.12.2020	31.12.2021
Licences	2.352	8.557
TOTAL	2.352	8.557

Contributions

The item "Contributions" concerns:

Description	Balance at 31/12/2021
TCS-ICS Interactions	56.534
TCS AH Governance and Coordination MYCA	139.520
TCS Satellite Data Governance and Coordination MYCA	80.000
TCS GNSS Governance and Coordination MYCA	110.841
TCS MSL Governance and Coordination MYCA	20.521
TCS Seismology Governance and Coordination MYCA	259.559
SUB TOTAL TCS	666.975
ICS-C Hosting and Operation	319.371
SUB TOTAL ICS-C	319.371
TOTAL	986.346

Resources committed in-kind to EPOS ERIC by contributors

Description	Balance at 31/12/2021
INGV - Istituto Nazionale di Geofisica e Vulcanologia - Staff cost	305.035
INGV - Istituto Nazionale di Geofisica e Vulcanologia - Other costs	12.887
SUB TOTAL	317.922
ICS-C IICA 2020/2021	395.135
TCS-ICS Interactions MYCA	52.757
TCS AH Governance and Coordination MYCA	29.344
TCS Satellite Data Governance and Coordination MYCA	20.017
TCS GNSS Governance and Coordination MYCA	27.483
TCS MLS Governance and Coordination MYCA	16.667
TCS Seismology Governance and Coordination MYCA	64.890
SUB TOTAL	606.293
TOTAL	924.215

Contributions have been accounted on the basis of International Public Sector Accounting Standard No. 23.

This accounting standard is focused on contributions from non-exchange transactions, which have the following characteristics:

- are non-reciprocal transfers;
- are transfers of non-monetary nature to or from entities acting on the basis of a specific agreement;
- are made or received on a voluntary basis and valorised following a cost basis criterion;
- in particular, for services contributed in-kind, these are accounted even in the costs and in the revenues of the receiving Entity, depending on the fact that it is possible and objective to give a proper valorisation to them.

Other Operating Costs

This item concerns stationery and other small administrative expenses.

Balance at 31/12/2020	Balance at 31/12/2021	Difference
2.995	436	(2.559)

Depreciation (of Tangible and Intangible Assets)

Depreciation is calculated on the basis of the useful life of the asset and its use in production.

The assets purchased in 2021 were fully depreciated.

Description (Tangible Assets)		Depreciation
PC and printers	100,00%	80
Mobile phones	100,00%	390
TOTAL		470

Financial Income and Expenses

Description	Balance at 31/12/2020	Balance at 31/12/2021	Difference
Financial income	2	-	2
Financial charges	(1)	(1)	
TOTAL	1	(1)	(2)

The item "Financial charges" includes exchange rate costs.

Income from Investments

(No values are entered for these items).

Events after the Reporting date

Following IPSAS 14, this paragraph reports about events that have been occurred between the reporting date (December 31st 2021) and the date when these Financial Statements have been approved by the Executive Director and thus are authorized for delivery.

Still remain the consequences to be referred to the prosecution of worldwide emergency caused by the COVID-19 pandemics. It is relevant to state that this event, as the previous year, can be classified among the "non-adjusting events after the reporting date" and that it does not influence the assessment of the appropriate assumption of the ongoing concern of EPOS ERIC.

Further information on performed activities and achieved results, complementing the Notes to the 2021 Financial Statements, is reported in Chapter 1.

Taxation

In 2021 EPOS ERIC carried on only non-commercial activities, but, since is subject to Italian fiscal legislation, it has to calculate IRAP. About this tax, EPOS ERIC adopts the "remuneration system" (art.10 of Legislative Decree 446/1997); this system provides that the tax base is determined from the sums paid for salaries of the employees, for incomes assimilated and for remuneration paid for coordinated and continuous collaborations or for activities of self-employment not practised professionally.

IRAP calculated for the current year amounts to Euro 14.951.

Rome, 30 March 2022

Carmela Freda

A handwritten signature in black ink, appearing to read 'Carmela Freda', written in a cursive style.

Executive Director

4. Auditors Report

European Plate Observing System
European Research Infrastructure Consortium
(EPOS - ERIC)

INDIPENDENT AUDITOR'S REPORT

Financial Statements as of
December 31st, 2021

Protocollo RC104012021BD1198

This report has been translated into English from the original, which was prepared in Italian and represents the only authentic copy, solely for the convenience of international readers.



Report on the audit of the financial statements

To the Consortium Members of
European Plate Observing System European Research Infrastructure Consortium (EPOS - ERIC)

Report on the financial statements

Opinion

We have audited the financial statements of EPOS - ERIC (the Consortium), which comprise the statement of financial position as at December 31st, 2021, the statement of income, the statement of cash flows for the year then ended and explanatory notes to the financial statements, including a summary of significant accounting policies.

In our opinion the financial statements give a true and fair view of the financial position of the Consortium as of December 31st, 2021 and of its financial performance and its cash flows for the year then ended in accordance with the international accounting standards IPSAS (International Public Sector Accounting Standards) issued by the International Public Sector Accounting Standard Board.

Basis of opinion

We conducted our audit in accordance with International Standards on Auditing (ISA Italia). Our responsibilities under those standards are further described in the *Auditor's Responsibilities for the Audit of the Financial Statements* section of this report. We are independent of the Consortium in accordance with ethical requirements and standards applicable in Italy that are relevant to the audit of financial statements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Other matters

The financial statements for the year ended December 31st, 2021 were audited on a voluntary basis, since an audit the financial statements of EPOS - ERIC is not required by Italian law.

Directors' responsibility for the financial statements

The Executive Director is responsible for the preparation of financial statements that give a true and fair view in accordance with the international accounting standards IPSAS (International Public Sector Accounting Standards) issued by the International Public Sector Accounting Standard Board, and, within the limits of the law, for such internal control as the Executive Director determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, Executive Director is responsible for assessing the Consortium's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Consortium or to cease operations, or has no realistic alternative but to do so.

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Iscritta al Registro dei Revisori Legali al n. 167911 con D.M. del 15/03/2013 G.U. n. 26 del 02/04/2013

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Auditor's Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with International Standards on Auditing (ISA Italia) will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

As part of the audit in accordance with International Standards on Auditing (ISA Italia), we exercise professional judgment and maintain professional scepticism throughout the audit. We also:

- Identify and assess the risk of material misstatement of the financial statements, whether due to fraud or error; design and perform audit procedures in response to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of non detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations or the override of internal control;
- Obtain and understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Consortium's internal control;
- Evaluate the appropriateness of accounting principles used and the reasonableness of accounting estimates and related disclosures made management;
- Conclude on the appropriateness of management's use of the going concern and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Consortium's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Consortium to cease to continue as a going concern;
- Evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions in a manner that achieves fair presentation.

We communicate with Executive Director, identified at the appropriate level as required by the ISA Italia, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

Rome, April 4th, 2022

BDO Italia S.p.A.

Signed by
Fabio Carlini
Partner

This report has been translated into English from the original, which was prepared in Italian and represents the only authentic copy, solely for the convenience of international readers.

