ERIC Forum 2

Recommendations for the revision of the European Charter of Access to Research Infrastructures

Work Package 5 Deliverable 5.2

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Description of deliverable	Review of the schemes for deployment of transnational and virtual access (TNA/VA) in terms of funding and access models to identify the ERIC needs for TNA/VA and where relevant to identify access barriers and limitations and potential improvements. Recommendations for the revision of the European Charter for Access to Research Infrastructures.

Executive summary

Task 5.2 of the ERIC Forum 2 project undertook a review of transnational and virtual access (TNA/VA) within European Research Infrastructure Consortia (ERICs), aiming to assess the current state of access modalities, funding mechanisms, and challenges, while identifying opportunities for improvement. ERICs are vital for advancing science, research and development across Europe. Ensuring that researchers from academia and the private sector have seamless access to these infrastructures is crucial for promoting innovation and scientific excellence. This deliverable highlights key findings from a survey, to which 25 ERICs provided responses. Additionally, a representative of the Task 5.2 working group contributed to the revision of the European Charter for Access to Research Infrastructures (RIs), which was published as an updated version in November 2024. This deliverable provides a status update and supports objectives to enhance efficient TNA/VA access to ERIC services in alignment with the European Charter for Access to Research Infrastructures.

ERICs currently offer a range of access modalities, with 68% providing virtual access, followed by physical (60%) and remote access (56%), and hybrid models combining these. Most ERICs offer virtual access free of charge and openly accessible, though special requests may be needed for sensitive data. EU funding, particularly through the EU Framework Programmes, plays a crucial role in supporting transnational and virtual access, complemented by contributions from member countries.

Through the survey, key challenges associated with access modalities and provision were identified. The challenges that exist include funding constraints and inconsistent funding cycles. Complex application and user selection processes within access funding projects create administrative burdens and delays. Additionally, limited awareness of available access options and capacity limitations for both remote and physical modalities hinder broader usage.

To address these issues, securing sustainable funding models for transnational and virtual access is key, enabling long-term programs that avoid resource-intensive funding gaps and overly frequent competitive cycles. Administrative processes should be improved to ensure efficient and effective funding management, while simplifying application and reporting requirements to reduce burdens on stakeholders. Importantly, further investing in capacity to deliver the services is key. Additional investments are suggested on training and capacity-building initiatives for access management and findability of services, enhancing virtual access capabilities such as data interoperability and support systems. Expanding visibility and user engagement will further boost access to the ERICs. In terms of funded access – including through EU Framework Programmes -, focused and flexible funding, with simplifying application and administrative processes will help channel the majority of funding toward access delivery. Integrating access funding to ERIC services across all Pillars of the EU Framework Programmes is critical as well. Finally, continuously bringing access funding to a sustainable level will ensure sustainable access, facilitating resilient and competitive RI services for science and innovation in line with the ambitions set out in the European Charter for Access to Research Infrastructures.

Document log

Issue	Date (yyyy-mm-dd)	Comment	Author/partner
0.1	2024-12-11	Original draft based on survey results	Ilari Pulli, Dorothea Dörr
0.2	2024-12-13	Task 5.1 and Task 5.2 leads survey result alignment meeting	Luc van Dyck, Yasemin Ucal, Bahne Stechmann, Ilari Pulli, Dorothea Dörr
0.3	2025-01-23	Revised draft, shared with the Task 5.2 participants	Ilari Pulli, Dorothea Dörr
0.4	2025-02-07	Review concluded by Task 5.2 participants	WP5 members
0.5	2025-02-10	Review by the project management team	ERIC Forum 2 project management team
1.0	2025-02-27	Final version	Ilari Pulli, Dorothea Dörr

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1. Introduction

Task 5.2 of the ERIC Forum 2 project aims to review the status of transnational and virtual access (TNA/VA) within European Research Infrastructure Consortia (ERICs). ERICs play a crucial role in advancing scientific achievements and discoveries, fostering innovation, enhancing competitiveness, and building resilience within the European Research Area (ERA). Ensuring that researchers and developers from both academia and the private sector have open and effective access to these RIs is essential, as highlighted e.g. in the ERA policy agenda[1] and the ESFRI Report on RI Access[2]. Access to ERIC infrastructures is critical for enabling cutting-edge scientific research.

One of the primary objectives of Task 5.2 was to review the status and funding schemes for TNA/VA in consultation with all ERICs. This review aimed to identify key infrastructure needs, potential barriers to access, limitations, and opportunities for improvement. As part of this task, a survey was conducted across all ERICs within the ERIC Forum 2 project, gathering insights into the current state of transnational and virtual access to ERICs.

The objectives of the survey were to collect data on existing access models, funding mechanisms, and any challenges faced by ERICs in providing effective TNA/VA. The survey aimed to answer several key questions, including: What are the current access models being used by ERICs? Are there common barriers to access that need to be addressed? How can the deployment of TNA/VA be improved, particularly in terms of funding and infrastructure needs? Furthermore, the survey sought to uncover potential improvements in the access schemes that could enhance the overall effectiveness of ERICs and foster greater collaboration across European research communities. Of note, key infrastructure community discussions regarding virtual and remote access also took place in the frame of the eRImote project[3] and resulted in the green paper 'Facilitating remote and virtual access provision by European research infrastructures – requirements, issues, and recommendations'[4]. Based on the work of the task 5.2 working group, deliverable 5.2 presents an analysis of how access to ERIC infrastructures can be enabled as efficiently as possible, facilitating scientific excellence across Europe in alignment with the European Charter for Access to Research Infrastructures (RI)[5].

In addition, this deliverable reports on the work from the work package (WP) 5 and task 5.2 working group interactions, including the interactions with the European Commission (EC) and other stakeholders involved in the consultation towards the update of the European Charter for Access to RIs. The update process of the European Charter for Access to RIs was launched in Spring 2024 by the EC. As the timeline of the Charter update diverged from the planned timeline of Task 5.2, a representative from Task 5.2 was invited to contribute directly to the update process in dialogue with the EC and other stakeholders. The revision of the Charter was conducted by the EC, inviting input from the ERIC Forum and other stakeholders, and published in November 2024.

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[1] https://commission.europa.eu/system/files/2021-11/ec_rtd_era-policy-agenda-2021.pdf
[2] https://zenodo.org/records/10555986
[3] https://cordis.europa.eu/project/id/101057557
[4] https://open-research-europe.ec.europa.eu/articles/4-152/v1
[5] https://op.europa.eu/en/publication-detail/-/publication/ec4692ae-ac6f-11ef-acb1-01aa75ed71a1/language-en

As defined by the European Commission: *"The European Charter for Access to Research Infrastructures sets out non-regulatory principles and guidelines to be used as a reference when defining Access policies for Research Infrastructures and related services. While not having any legally binding nature, Research Infrastructures are encouraged to use this Charter as a reference when updating existing or defining new Access policies. In addition, the funding organisations of Research Infrastructures are invited to promote this Charter's provisions. The update of the Charter published in 2015 is part of the ERA Policy Agenda 2022- 2024."*

2. Methodology

The deliverable report is based on survey data collected from ERIC participants (25 responses out of 28 ERICs) in autumn 2024. The survey covered the tasks of WP5 of ERIC Forum project 2 and included three individual parts (Part 1: Operational Sustainability; Part 2: Commercial Services; Part 3: Transnational and Virtual Access; see Annex). This deliverable focuses on Part 3 of the survey, 'Transnational and Virtual Access'. For more information about the other parts of the survey and results regarding ERIC operational sustainability and commercial services, readers may refer to ERIC Forum 2 Deliverable 5.1 'Policy recommendations to improve the sustainability of ERIC operations and the development & deployment of commercial services'. The results and recommendations in this deliverable are informed by the feedback from the ERICs and taking into account the interactions towards the revision of the updated European Charter for Access to RIs.

2.1 Definitions[6] used in the survey and this deliverable

- **Access:** According to the European Charter for Access to Research Infrastructures, access refers to "the legitimate and authorised physical, remote and virtual admission to, interactions with and use of Research Infrastructures (RIs) and to services offered by RIs to Users. Such Access can be granted, amongst others, to machine time, computing resources, software, data, data-communication services, trust and authentication services, sample preparation, archives, collections, the set-up, execution and dismantling of experiments, education and training, expert support and analytical services."
- **Physical access**: According to ESFRI's 2020 White Paper, physical access is "hands-on" access when Users physically visit an infrastructure, facility or equipment. The available services or resources are not unlimited and a competitive process is required following a defined procedure and criteria for selection of Users.
- **Remote access**: According to ESFRI's 2020 White Paper is access to resources and services offered by the RI without Users physically visiting the infrastructure/facility. Similar to Physical access, the services or resources are not unlimited and a competitive selection is required.
- **Virtual access**: According to ESFRI's 2020 White Paper virtual access refers to free access to Users provided through communication networks; the available services or resources can be simultaneously used by an unlimited number of Users and the Users are not selected. Virtual access typically concerns

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access to data and digital tools. [***NB**. For the purpose of this survey we consider also modalities of **alternative virtual access**, beyond the definition above, as/if applicable, e.g. virtual access for a fee.*]

- **Transnational access**: Transnational access refers to "physical access" and "remote access". Users can either work in a country other than the country(ies) where the installation/facility/service is located or - in the case of access provision through an ERIC - work in the same country as the country(ies) where the ERIC installation/facility/service is located.

3. Results

3.1 Results of the survey

The survey received responses from 25 ERICs including ERICs from all five landscape clusters[7]: Energy (2), Environment (7), Health & Food (10), Physical Sciences & Engineering (4) and Social and Cultural Innovation (4). With the exception of one ERIC that is not fully operational yet and still building up access services, all respondents indicated that they are fully operational, offering services and access.

3.1.1 Current status of ERICs: Access modalities and access funding

Access modalities

ERICs offer a range of access modalities, enabling researchers and other users to interact with their resources in different ways:

- **Physical access** is offered by around **60%** of the ERICs that were surveyed, typically for access to technologies and for performing specific research tasks that require physical presence or activities such as training (Figure 1).
- **Remote access** is available at **56%** of ERICs. This modality allows users to access services without being physically present via e.g. remote connections or sample shipments. As remote access may require increased efforts by ERIC facility staff on-site, e.g. to perform experiments for users, several ERICs indicated that remote access requires more personnel resources and capacity than their physical access services.
- **Virtual access**, provided by **68%** of ERICs, is the most widespread form of access. This allows researchers to use digital tools, access data, or engage with services entirely online. Most ERICs offer virtual access completely openly and freely to all users, while four ERICs ask for some kind of registration, request for access or application for at least some of their virtual access resources (Figure 2).
- Two ERICs indicated that they also offer services in terms of manpower and contract research.
- **Flexibility in access**: There is a trend towards offering **hybrid access models**, combining different types of access to offer more flexibility to users. This is especially true for ERICs looking to cater to a diverse user base with varying needs. For example, some ERICs offer a combination of physical, remote, and virtual access, depending on the user's requirements.

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[7] https://www.eric-forum.eu/the-eric-landscape/

- **Maturity level of access modalities**: While virtual access is increasingly common, some ERICs report that their virtual access offerings are still in development. As a result, these ERICs may be in the process of expanding their digital tools and services to accommodate broader user needs.
- **Data availability and Open Access**: Many ERICs emphasize the importance of open access to data. Many ERICs provide free and open access to their data, while others offer open access with some restrictions for sensitive data. However, for specific services (such as large data sets or on-demand processing), users may need to request access or pay for additional services.
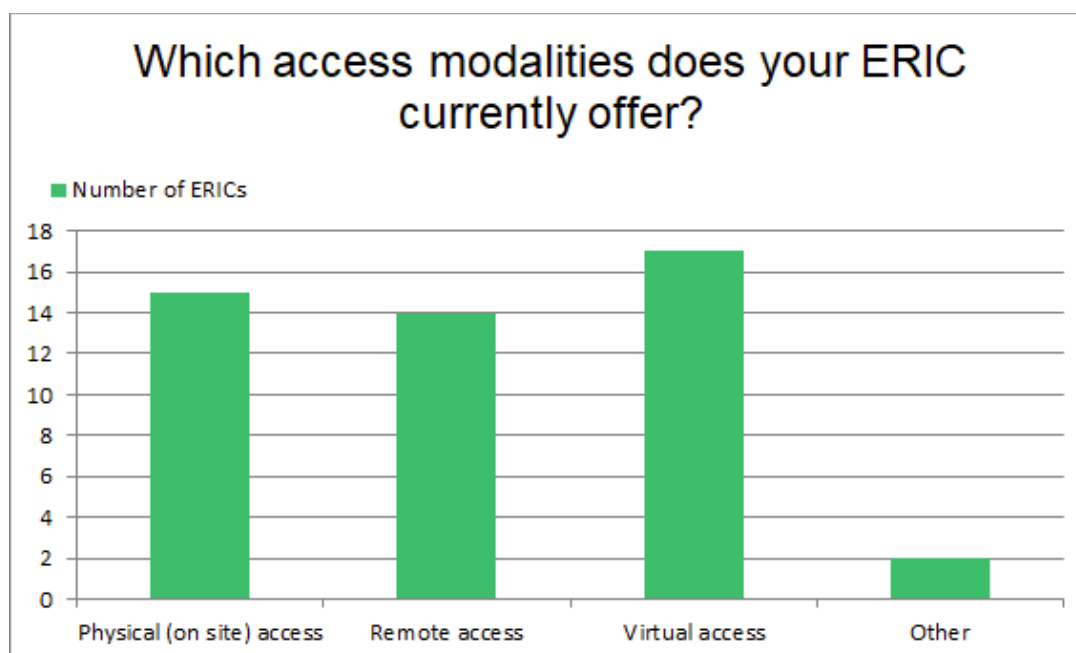

Figure 1: Access modalities currently offered by the ERICs that were surveyed. Other: Operational services in terms of manpower; Contract research.
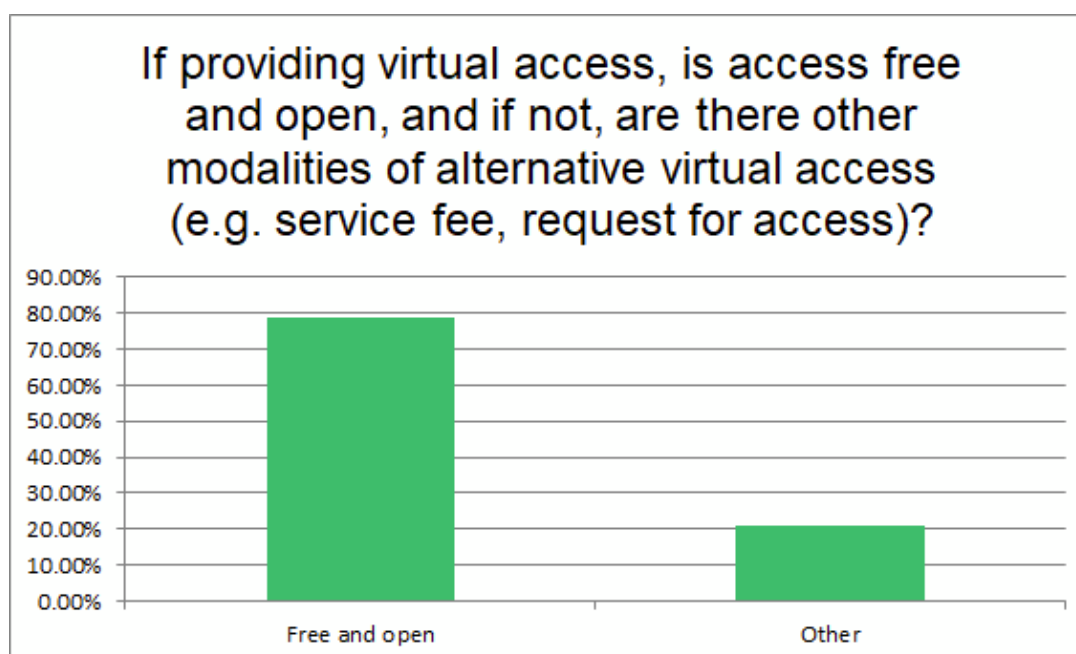
Figure 2: Current operation modes of ERICs offering virtual access. Other: Some virtual access resources (e.g. sensitive data) require a request for access, registration or application.

Funding sources for access

The funding for access services within ERICs comes from different sources, with some funding channels being more significant than others. It is also important to distinguish between different aspects of access provision in this context such as routine operations and maintenance of access, development of new access services or financial support for users:

- **EU funding**, primarily through the EU Framework Programmes (e.g. Horizon Europe, Horizon 2020), is a major source of support. 17 ERICs consider Horizon Europe either their most or second most significant funding source for access. This refers especially to funding for ERIC users through TNA and VA support and vital funding for the development of new or improved tools, products and services. If user costs are not supported through EU grants to the ERICs, the source of user funding is often not actually known to the ERICs, but they may include national or institutional sources for example, as well as again EU funding through direct research support such as ERC or MSC-A support.
- **The ERICs own member country contributions** are considered an important source of access funding for ERICs, with 13 ERICs ranking them as the top contributors for their overall access provision. This funding is especially critical for both the establishment and the ongoing operations of ERICs related to access provision.
- **Funding from national mechanisms** plays a crucial role as well, though it tends to be ranked lower than EU and member country funding. This funding supports both access and other service-related activities, though its contribution for overall access funding is more variable across ERICs.
- Six ERICs also indicated to rely on institutional funds. However, institutional funding is typically not as significant as member countries' contributions or EU grants. Other sources, such as private sector

partnerships, charitable foundations, and non-EU international funding, are mentioned but are typically less significant for most ERICs.

- **TNA** is overwhelmingly funded by EU grants (specifically Horizon Europe), with 14 ERICs relying on this source for TNA funding. Member countries also contribute to TNA, but EU grants are clearly the primary funding mechanism in this area.
- Almost all fully operational ERICs surveyed (21 out of 24) **have already received EU support for TNA and/or VA** (Figure 3).
- **VA** is mainly funded by member countries for 9 ERICs, with some also receiving support from EU grants and national funding. In-kind contributions from member countries are also important for supporting virtual access in some cases.
- **Complexity of funding models**: Several ERICs noted that funding is not always straightforward and understanding the exact funding sources for different services can be challenging due to the complexity of their ERIC operations.
- **User fees and cost recovery**: Some ERICs rely on user fees to cover certain access costs. These fees are typically used in cost-recovery models, where users are asked to contribute to the operational costs of the services they use, especially for more specialized services that go beyond EU-funded TNA.
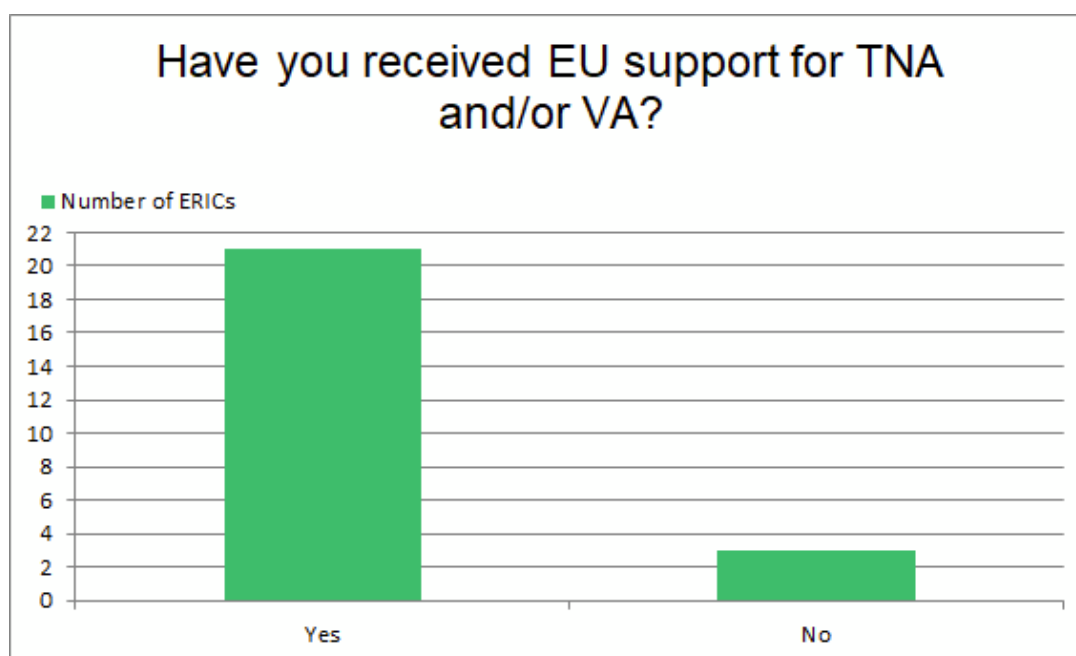
Figure 3: Number of ERICs that have already received EU support for TNA and/or VA.

Conclusion

The landscape of access to ERICs' resources is diverse, with a trend toward increasing flexibility through remote, virtual, and hybrid access models. Member country funding and EU grants are the most significant sources for supporting these access modalities, which are critical for both transnational and virtual access, although with

distinct differences in main funding source for the two modalities. As virtual and hybrid access become more common, funding models must continue to evolve to support them.

3.1.2 Challenges of access modalities and funding identified

The challenges and limitations associated with access modalities (physical, remote, and virtual) and their funding are multi-faceted and interlinked.

Challenges with access modalities
- **Physical access**:
  - **Lack of funding for users**: A primary challenge across ERICs is lack of funding for users (indicated by 11 out of 15 ERICs offering physical access), with some facilities requiring large sums for user projects, which often must be covered by the research infrastructure through the provision of grants or the users themselves, which poses a major limiting factor for the users and for increasing user numbers.
  - **Complex application and selection processes**: At the same time the often complex application (5 ERICs) and user selection processes (5 ERICs; experienced especially by ERICs from the Health & Food cluster) within funded access projects and their inconsistent funding cycles and schemes (5 ERICs) represent common challenges for the efficient and good management of access, also creating barriers and limitations in terms of capacity (8 out of 15 ERICs).
  - **Limited awareness and visibility**: Lack of awareness and visibility (9 out of 15 ERICs but none of the ERICs from the Social and Cultural Innovation cluster) is another significant challenge, indicating a need for better promotion and improved outreach efforts.
  - **Additional challenges**: Four and two ERICs, respectively, also indicated monitoring of complex service provision and geographical accessibility as limiting factors for physical access provision.
- **Remote access**:
  - **Common challenges of remote and physical access**: The primary challenges of remote access are similar to physical access, with lack of user funding (10 out of 14 ERICs offering remote access), complex and challenging management within funded access projects (complexity of funding schemes: 6 ERICs, limited capacity: 6 ERICs, complex user selection processes: 4 ERICs, complex application processes: 3 ERICs) and lack of visibility and awareness (10 ERICs) being common issues.
  - **Unique challenges of remote access**: Remote access also faces unique challenges such as user uptake (lack of engagement), difficulties in sample shipments for international users, and cybersecurity concerns. Additionally, offering remote access sometimes demands more resources at the RI than physical access, as managing remote experiments requires more input from facility personnel, adding complexity to the service. One ERIC also mentioned that remote services are currently only offered at a limited number of facilities and expansion of the services to more facilities requires additional funding.
- **Virtual access**:

- Lack of funding for virtual access operations: For virtual access, lack of funding (7 out of 17 ERICs offering virtual access) is the most prominent challenge. As virtual access is generally offered freely, this lack of funding refers to the general operations, e.g. development, maintenance and sustainability of virtual access resources, data and services rather than user funding. As one ERIC pointed out, the preparation of virtual resources, such as data, and making them accessible require considerable effort and resources that are not always available through EU grants or other funding sources that often support the development of new tools and platforms or user access rather than sustainability and maturation of existing virtual resources and services.
- Uncertainties in funding models: In this context, there are also still uncertainties and discussions within the ERIC community about the intended and 'allowed' use of funding for virtual user access in EU-funded INFRA-SERV projects as generally no direct user funding is required for virtual access but rather funding for maintenance, general operations, compute resources and development. The lack of a clear model to specifically support and optimize software development is also mentioned.
- Lack of awareness and visibility: Awareness and advertising are ongoing struggles also for virtual access (5 ERICs).
- Additional challenges: Additional challenges mentioned are monitoring of complex service provision (4 ERICs) and issues with technical expertise and capacity (3 and 2 ERICs respectively). Furthermore, several ERICs reported a lack of knowledge and training related to virtual access services and resources among researchers and facilities. In addition, users may not be used to good practices and the FAIR (Findable, Accessible, Interoperable, Reusable) principles[8] related to metadata collection and making their data available. Also, the acknowledgement, attribution and citation of virtual access services and resources such as data are still falling short. Two ERICs reported not to face any major challenges or limitations related to virtual access.

In general terms, proper acknowledgement of the use of RI services is considered a challenge, and this should be further improved to ensure appropriate visibility of the value and impact ERICs deliver to science, development and innovation.

Funding challenges
- Insufficient funding: As already indicated above, across all access modalities, a consistent theme is the insufficient amount of funding available (including both user funding for physical and remote access and funding for general operations, development and maintenance of virtual access; 13 out of 19 ERICs), with many facilities relying heavily on EU grants and national contributions. ERICs also face the issue of inconsistent and short-term funding cycles (11 out of 19 ERICs), which make it difficult to plan for long-term sustainability. Additionally, ERICs often struggle with the complexity (9 ERICs) and restrictive eligibility criteria of funding schemes (5 ERICs) and report the lack of flexibility in funding use (9 ERICs) as a significant barrier.
- Complexity of EU funding: When specifically asked about EU support for access, it is acknowledged that EU support for TNA and VA provides critical funding but also comes with limitations. The short-term nature of the funding and high administrative burden (including complex application and selection

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[8] https://www.nature.com/articles/sdata201618

processes and reporting requirements) make it difficult for ERICs to plan effectively and provide sustainability. Delays in funding disbursement may also pose a challenge for some ERICs. Furthermore, there is a widespread demand for greater flexibility in funding schemes, in terms of the types of services funded, research topics funded, and the eligibility criteria. The different administrative models of access funding management in Horizon Europe grants (e.g. service providers as beneficiaries or affiliated entities vs. service purchase model, actual vs. unit costs) additionally add to the complexity in all phases of the funding cycle. Competition between ERICs for EU funds further complicates the landscape and inefficient resource use. Additionally, while acknowledging the impact and value of cross-RI access and collaboration, there are observations and concerns that EU funding for TNA is often tied to large project consortia, often topic-driven, making the management more complicated and less efficient. Development of funding mechanisms that are not restricted by topic and rather allowing bottom-up requests for access to relevant RI services, governed by focused consortia or single ERICs when relevant, would add flexibility, thus broadly serving the scientists' and developers' needs in academia and the private sector alike.

- **Sustainability of funding**: Many ERICs express concern that project-based, often inconsistent, funding for access, especially through EU grants, is not a sustainable model for ensuring long-term service provision. There is a clear call for more permanent funding solutions that would secure access to services beyond the duration of specific projects. The lack of sustainable, long-term funding models hampers the ability of ERICs to innovate and maintain their services over time. Some ERICs also highlight that multinational clinical trials or services for the private sector face barriers due to the specific requirements of EU funding models.

Conclusion

The overarching challenge in ERICs' access modalities is the combination of insufficient and inconsistent user funding, the complexity of user and access management in the frame of EU grants, and the lack of long-term sustainability. Although there are many benefits to EU funding for TNA and VA, the short-term, project-based nature of these funds creates hurdles for maintaining and expanding access modalities. The technical challenges of remote and virtual access, such as cybersecurity, data sharing, and service integration between different platforms, are also noted as significant barriers to broader adoption and effective service delivery. A more flexible, sustainable, and predictable funding model is needed to address these challenges and allow ERICs to better serve their research communities.

3.1.3 Opportunities identified

The responses from ERICs regarding the improvements, opportunities, and potential solutions to enhance the effectiveness of access modalities and resolve funding barriers suggest several key themes. These recommendations reflect a strong desire for greater flexibility, long-term stability, and more efficient processes across physical, remote, and virtual access modalities.

Opportunities identified to improve access modalities

The suggestions for improving the effectiveness and efficiency of physical, remote, and virtual access modalities reveal several **common themes**, as well as some modality-specific needs. The following suggestions are common to all access modalities:

- **More resources for user support**: Across all modalities, there is a consensus that more resources should be allocated to user support. Whether it's technical assistance, administrative support, or guidance for researchers, increased support can alleviate the burden on users and make the access experience smoother and the whole access process more efficient, leading to improved resource use.
- **Engaging more experts and personnel in service development and provisioning**: The need to engage more experts and personnel in the development and provisioning of services is mentioned for all three modalities. This includes experts in infrastructure, data management, and user engagement, ensuring that access services evolve with new technologies and user needs.
- **A cross-modality 'hybrid' approach** is suggested, where physical, remote and virtual access are seen as complementary, rather than separate. Developing a strategy that incorporates all three could lead to more effective service provision, broader access and better user services.
- **Permanent, stable service pipelines**: This can help create sustainable access programs that do not rely solely on periodic funding calls.
- **Stable funding models** allowing the provision of sustainable access services (see section "Opportunities identified to improve access funding schemes").
- **More funds for users**: Irrespective of whether access is physical, remote, or virtual, more resources for users are suggested to ensure that more users can participate without financial constraints, especially for more complex or specialized access.

In addition to the common themes, there are several **specific suggestions** that reflect the unique challenges and requirements of each access modality:

- **Physical access** can benefit from better coordination and synergies between different facilities of the RI.
- As there still seems to be a high need to expand and increase **remote access** services, targeted support for their continuous development and to increase user uptake is crucial. This is also connected to personnel availability. Increased staff resources are needed to support and maintain remote infrastructures and to assist remote users effectively e.g. by running experiments for them.
- While automation is beneficial for **remote access**, it is critical that it is implemented carefully to avoid safety risks related to equipment or facility networks. Remote access solutions should be flexible, ensuring that automation enhances service delivery without compromising security or safety.
- **Virtual access** requires substantial investment in the development and improvement of user access platforms. This involves improving the technological infrastructure to ensure better performance, capacity, and scalability. As virtual access platforms are often still limited or not user-friendly, substantial resources must be allocated for their enhancement.
- **Virtual access** is often associated with data-heavy research that requires effective data preparation and storage. Therefore, suggestions include providing funding specifically for data curation, storage costs, and the development of data services.
- Additional resources for **VA** could help develop new data products and services beyond just providing raw data, which could significantly enhance the value of VA to research communities

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Opportunities identified to improve access funding schemes

- **Simplified, long-term and sustainable funding**: A key improvement suggested for funding schemes is the move from short-term, project-based funding to long-term, sustainable funding for both TNA and VA. This may help reduce administrative overheads and provide the stability needed to plan and implement effective access programs.
- **More flexible and curiosity-driven funding**: Current access funding schemes are often challenge-driven, limiting opportunities for curiosity-driven research. A more flexible approach, where researchers are encouraged to pursue innovative, less-defined research questions, could open up new areas of exploration.
- **Wider and more inclusive funding**: There is also a call for greater inclusivity in funding schemes, with recommendations to enlarge the visibility and access opportunities to include more types of users, including small and medium sized enterprises (SMEs), public authorities, and private sector users. Some ERICs also recommend including national access alongside transnational access to support a wider range of research activities.

Opportunities identified for EU support

- To strengthen TNA and VA, it was suggested to allocate **more EU funding to individual RIs rather than large consortia**. This would ensure that smaller and more specialized RIs can also provide access to their facilities without being constrained by project-specific rules and requirements and make the management and administration of access less complex and more efficient.
- **Supporting infrastructure**: Respondents call for stronger EU support for core infrastructure, such as cloud platforms and metadata standards, to facilitate virtual access. This would also ensure that data sharing across platforms is more seamless and standardized, enhancing the usability and impact of virtual access.
- **Longer and more flexible TNA/VA projects**: Several ERICs suggest that TNA funding projects should last longer to reduce the impact of short-term project cycles. They also recommend making the management and reporting less bureaucratic and complex (e.g. through elimination of the complex cost calculation tables currently required) and providing more freedom to the ERICs to tailor their services to the needs of their users.
- **Continuous and streamlined reimbursement**: Several respondents suggest that funding for access should be reimbursed on a continuous basis, rather than requiring long delays due to lengthy reporting periods. This would improve cash flow for facilities and make the process more efficient.
- **Integration of access and access funding to ERICs across all pillars of the EU Framework Programmes**: The EU Framework Programmes, such as Horizon Europe, are essential in funding scientific research across Europe, but access to ERICs and related funding opportunities has not always been efficiently integrated across all pillars of the programmes. To enhance access to ERICs, the inclusion of all types of access modalities and access funding opportunities should be facilitated across all pillars of the Framework Programmes and not just those focused on research infrastructures. This would ensure that researchers from all disciplines and sectors can easily access ERICs, reducing administrative burdens and enabling greater integration of ERIC resources into a wider range of collaborative projects. For instance, Horizon Europe's Pillar 2 addresses global challenges and enhances European industrial competitiveness through six thematic clusters, including health, climate, and digital industries. Integrating ERIC access

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and funding across these clusters would enable researchers and innovators to leverage state-of-the-art research infrastructures, fostering interdisciplinary collaboration, and accelerating mission-driven scientific and technological advancements. Importantly, Horizon Europe's Pillar 3, which focuses on Innovation and Industry, should also promote easier access to ERICs to foster innovation-driven research and cross-sectoral collaborations.

Conclusion

The key improvements suggested by ERICs to resolve challenges in access modalities and funding reflect a broad consensus on the need for more stable, flexible, and long-term funding, simplified processes, and better integration between physical, remote, and virtual access. Increasing the availability of resources for user support, enhancing infrastructure investments, and providing sustained funding are seen as essential for improving the efficiency and effectiveness of access services. Additionally, reducing the complexity of EU funding schemes, offering more inclusive and curiosity-driven funding, and providing continuous reimbursement is crucial to fostering greater engagement and better serving the research community across Europe.

3.2 Survey results in the context of the updates to the European Charter for Access to RIs in 2024

The updated version of the European Charter for Access to RIs was published in November 2024. The revision introduced updated and additional definitions along with reflections on policies and operational aspects highlighting the key role of research infrastructures.

The results indicate that ERICs' status matches well with the updates of the European Charter for Access to Research Infrastructures. For instance, many ERICs provide physical, remote, and virtual access, oftentimes in combination, and thus the novel definition "hybrid access" is well fitting. Also, the importance of facilitating access from industry and SMEs is recognized and supported by many ERICs, as encouraged in the updated Charter for maximizing the impact of the RIs. Engagement with industry and SMEs is being actively enhanced by the ERICs, supported by targeted outreach and development of designated processes, including activities within the ERIC Forum project 2. Raising awareness and boosting capacity will allow boosting industry access to RIs, and collaboration. In addition, free and virtual access to data and tools are widely offered by ERICs, supporting the Open science and FAIR data principles as highlighted in the updated Charter.

Therefore, ERICs are well-positioned to advance the Charter's vision, although further efforts towards sustainable models are needed to address gaps in funding and other identified thresholds of access to ERIC services to maximise their impact as drivers of excellent science, innovation, competitiveness and resilience.

4. Recommendations

- Develop sustainable funding models for TNA/VA allowing long-term programs avoiding funding gaps and too frequent and highly competitive funding cycles that are burdensome in terms of resources for all stakeholders.
- Streamline administrative processes for access funding, reporting, and application, reducing the burden on ERICs and end-users to ensure smart and effective use of the funding.
- Facilitate integration of access funding and access to ERICs throughout all pillars of the EU Framework Programmes.
- Invest in training and capacity-building initiatives for access management.
- Invest in initiatives to increase the visibility of ERIC services.
- Enhance virtual access capabilities, including data interoperability and support systems, and their accessibility and integration with the EOSC and other European Data Spaces.
- Ensure that EU and member state funding policies fully support the ambition of the European Charter for Access to Research Infrastructures, ensuring effective and resilient access to RI services for fostering excellent science, research development and innovation, creating value chains, enhancing competitiveness, and building resilience within the European Research Area.

5. Conclusion

The findings and recommendations presented in this deliverable provide an overview of the status and recommendations for improving transnational and virtual access frameworks. By addressing funding and capacity challenges, these enhancements will foster excellent science and innovation through open access to cutting-edge research services across the ERICs as the strategic assets of Europe (as highlighted by the European Strategy Forum for Research Infrastructures[9]).

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[9] https://zenodo.org/records/14359070

WP5. Sustainability of ERIC services & transnational and virtual access

This survey is intended only for established ERICs.

The survey includes the following parts:

- **Definitions and General Information**
- Survey Part 1: **Operational Sustainability**
- Survey Part 2: **Commercial Services**
- Survey Part 3: **Transnational and Virtual Access**

Please provide as much information as you can, but feel free to skip any questions, as not all need to be answered.

You will be able to receive a copy of your responses via email after submission of the survey.

In case of any questions, technical problems or should you require any additional information, please don't hesitate to contact us:

 - Related to survey part 1 and 2: Luc van Dyck and Yasemin Ucal
 - Related to survey part 3: Luc van Dyck and Ilari Pulli

0. Definitions for the purpose of the survey

- **ERIC** refers to single-site, multiple-site or distributed infrastructures established as European Research Infrastructure Consortium.
- The **Node** covers all entities contributing to the research-support services provided via a distributed infrastructure. Nodes can have different names such as partner site or centre and can be further distributed.
- The **Headquarter** (HQ) is the central administration, sometimes entitled the Central Hub, of an ERIC.
- **Commercial services**, in the context of this survey, are understood as paid services to industry and/or public bodies (e.g. national, regional or local administration and agencies, Copernicus services and other EU agencies/services, etc.).

- **Access** According to the [European Charter for Access to Research Infrastructures](#), access refers to "the legitimate and authorised physical, remote and virtual admission to, interactions with and use of Research Infrastructures (RIs) and to services offered by RIs to Users. Such Access can be granted, amongst others, to machine time, computing resources, software, data, data-communication services, trust and authentication services, sample preparation, archives, collections, the set-up, execution and dismantling of experiments, education and training, expert support and analytical services."
- **Physical access**: According to [ESFRI's 2020 White Paper](#) physical access is "hands-on" access when Users physically visit an infrastructure, /facility/ or equipment. The available services or resources are not unlimited and a competitive process is required following a defined procedure and criteria for selection of Users.
- **Remote access**: According to [ESFRI's 2020 White Paper](#) is access to resources and services offered by the RI without Users physically visiting the infrastructure/facility. Similar to Physical access, the services or resources are not unlimited and a competitive selection is required.
- **Virtual access**: According to [ESFRI's 2020 White Paper](#) virtual access refers to free access to Users provided through communication networks; the available services or resources can be simultaneously used by an unlimited number of Users and the Users are not selected. Virtual access typically concerns access to data and digital tools. [*NB*. *For the purpose of this survey we consider also modalities of **alternative virtual access**, beyond the definition above, as/if applicable, e.g. virtual access for a fee.*]
- **Transnational access**: Transnational access refers to "physical access" and "remote access". Users can either work in a country other than the country(ies) where the installation/facility/service is located or -in the case of access provision through an ERIC - work in the same country as the country(ies) where the ERIC installation/facility/service is located.

* 1. Name of your ERIC

* 2. ERIC Forum [Landscape by Cluster](#)
   □   Energy
   □   Environment
   □   Health & Food
   □   Physical sciences & Engineering
   □   Social and Cultural Innovation

*3. Year of establishment as an ERIC

* 4. Is your ERIC fully operational? Please comment on how to interpret your responses to the survey if not fully operational (e.g. operational status in terms of capacity for offering services and access)

* 5. Name of responding person (for possible further contacts)

* 6. Email address of responding person (for possible further contacts)

* 7. Phone number of responding person (for possible further contacts)

* 8. Position of the responding person

Part 1. Operational sustainability

For information regarding Part 1. 'Operational sustainability' please refer to the ERIC Forum 2 deliverable 5.1.

Part 2. Commercial Services

For information regarding Part 2. 'Commercial Services' please refer to the ERIC Forum 2 deliverable 5.1.

Part 3. Transnational and Virtual Access

ERICs play a crucial role in advancing scientific achievements and discoveries, fostering innovation, creating value chains, enhancing competitiveness, and building resilience within the European Research Area (ERA). Ensuring that researchers and developers from both academia and the private sector have open and fair access to these RIs is thus essential, as highlighted in the ERA policy agenda (1) and the ESFRI Report on RI Access (2). Access funding programmes, such as the funding schemes provided by the European Commission, are therefore essential and invaluable as facilitators of excellent science through the usage of ERIC services.

1) https://commission.europa.eu/system/files/2021-11/ec_rtd_era-policy-agenda-2021.pdf
2) https://zenodo.org/records/10555986

Task 5.2 aims to review and provide recommendations to improve the schemes for deployment of transnational and virtual access (TNA/VA) in terms of funding and access models to identify the RI needs for TNA/VA and, where relevant, to identify access barriers and limitations and potential improvements.

Please note: To answer the questions, please refer to the definitions of the different access modalities at the beginning of the survey.

ACCESS MODALITIES (General Access to your ERIC)

1. Which access modalities does your ERIC currently offer? (Multiple selection)
   - ☐ Physical (on site) access

□ Remote access
□ Virtual access
□ Other (Please specify) (Small comment box is available, 500chr)

2. Regarding the previous question, please comment if appropriate. (2000 char. max.)

3. If providing virtual access, is access free and open, and if not, are there other modalities of alternative virtual access (e.g. service fee, request for access)?
□ Free and open
□ Other (Please specify) (Small comment box is available, 500chr)

4. Regarding the previous question, please comment if appropriate. (2000 char. max.)

5. What are the main challenges or limitations associated with the access modalities you currently offer for **physical access**? (Select all that apply)
□ Lack of funding
□ Complexity of funding schemes
□ Management of complex application processes within funded access projects
□ Management of complex user selection processes within funded access projects
□ Monitoring of complex service provision
□ Awareness, visibility and advertisement
□ Limited capacity
□ Geographical accessibility
□ Other (Please specify) (Small comment box is available, 500chr)

6. Regarding the previous question, please comment if appropriate. (2000 char. max.)

7. What are the main challenges or limitations associated with the access modalities you currently offer for **remote access**? (Multiple selection)
□ Lack of funding
□ Complexity of funding schemes
□ Management of complex application processes within funded access projects
□ Management of complex user selection processes within funded access projects
□ Monitoring of complex service provision
□ Awareness, visibility and advertisement
□ Limited capacity
□ Other (please specify)

8. Regarding the previous question, please comment if appropriate. (2000 char. max.)

9. What are the main challenges or limitations associated with the access modalities you currently offer for **virtual access**? (Select all that apply)
- □ Lack of funding
- □ Complexity of funding schemes
- □ Management of complex application processes within funded access projects
- □ Monitoring of complex service provision
- □ Awareness, visibility and advertisement
- □ Limited capacity
- □ Lack of technical expertise
- □ Inadequate training and support
- □ Other (Please specify) (Small comment box is available, 500chr)

10. Regarding the previous question, please comment if appropriate. (2000 char. max.)

11. What would improve the effectiveness and efficiency of your current access modalities and reduce limitations (please provide examples)?
- Physical:

- Remote:

- Virtual:

12. Regarding the previous question, please elaborate your answers further if required. (2000 char. max.)

ACCESS FUNDING

13. Please select your ERIC's current sources of funding for access and rank them according to their significance to your ERIC (1 = most important).

Member countries	1 - … - 12
National funding	1 - … - 12
Regional funding	1 - … - 12
Local funding	1 - … - 12
Institutional funds	1 - … - 12
Horizon Europe funding	1 - … - 12
Non-EU or international funding	1 - … - 12
Structural Funds	1 - … - 12
Private/charitable foundations	1 - … - 12
Private sector/industry partnerships	1 - … - 12
Non-profit organizations (NGOs)	1 - … - 12
Other (Please specify in the comment box below)	1 - … - 12

Please comment further, if required (1000 char. max.)

14. What is your ERIC's main funding source for **TNA**?

15. What is your ERIC's main funding source for **VA** (if applicable)?

16. What are the main limitations and challenges associated with your current access funding sources? (Select all that apply)
   □   Insufficient funding amounts
   □   Inconsistent funding cycles
   □   Complex application processes
   □   Restrictive eligibility criteria
   □   Lack of flexibility in funding use
   □   Delays in funding disbursement
   □   Other (Please specify) (Small comment box is available, 500chr)

17. Regarding the previous question, please comment if appropriate. (2000 char. max.)

18. How could current access funding schemes be improved to better support and enhance transnational and virtual access?

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19. Have you received EU support for TNA and/or VA?
   □   Yes
   □   No

20. If **YES**, what are the shortcomings and benefits of it?

21. Do you have any specific recommendations related to EU support for TNA and VA for the future?

ADDITIONAL COMMENTS

22. Do you have any additional comments or insights about access funding and access modalities you would like to share with us?

Reminder:
Not all questions need to be answered.