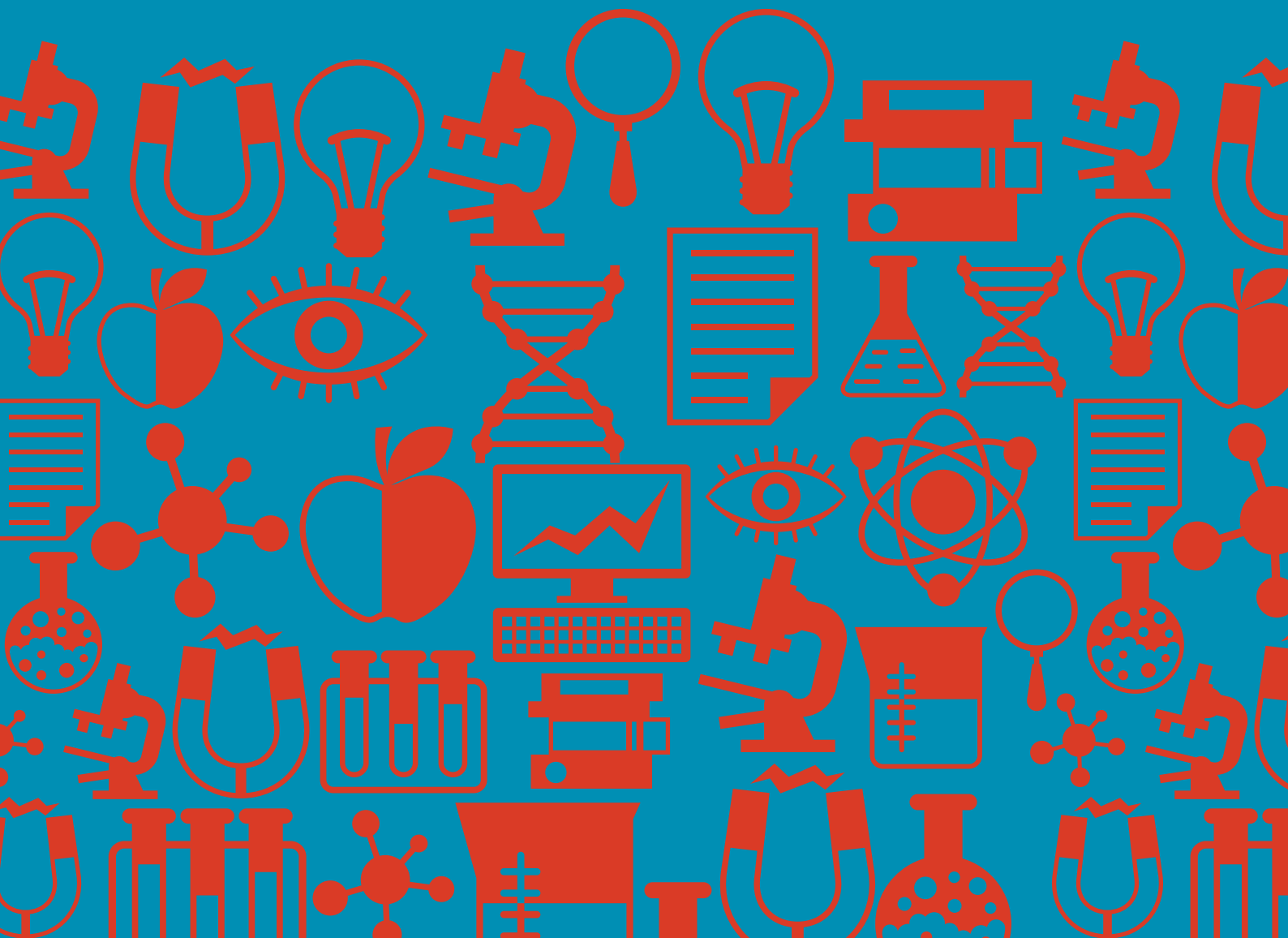


# Future- Proofing and Improving Research Infrastructures in Ireland

ROYAL IRISH ACADEMY RECOMMENDATIONS REPORT



Acadamh Ríoga na hÉireann  
Royal Irish Academy





The Royal Irish Academy, Ireland's leading body of experts in the sciences, humanities and social sciences, established a high-level steering group in May 2018 to consider the current adequacy and requirements of research infrastructures (RIs) in Ireland in the context of Innovation 2020 and Ireland's overall national ambitions for research and higher education.

In its work, the Steering Group considered the following questions:

- Do researchers have access to adequate RIs to support their work?
- What do researchers see as priority areas for investment?
- How can Ireland best future-proof its RIs?

The overall objective of the group was to identify, through consultation and dialogue with the research community and associated stakeholders, evidence-based policy recommendations to inform policymakers and relevant decisionmakers. This report suggests a number of priority action areas for stakeholders, policymakers and decisionmakers to consider with the objective of ensuring that RIs in Ireland are improved and future-proofed to support researchers and Ireland's research excellence.

The recommendations in this report are drawn from a Royal Irish Academy-led survey, a discussion workshop and stakeholder consultation meetings including discussions with Vice-Presidents of research from several higher education institutions (HEIs). This report should be read in conjunction with the survey report<sup>1</sup> that precedes it.

<sup>1</sup> Survey report available at [https://www.ria.ie/sites/default/files/ri\\_survey\\_report-final\\_.pdf](https://www.ria.ie/sites/default/files/ri_survey_report-final_.pdf)

## How do we define ‘research infrastructures’?

There are many varying definitions of research infrastructures. This report takes a broad view of what a ‘research infrastructure’ is and includes equipment, facilities (including library resources), buildings, research institutes, research support systems, virtual infrastructure and personnel. It examines research infrastructures related to Arts, Humanities and Social Sciences (AHSS) disciplines as well as Science, Technology, Engineering and Maths (STEM) related infrastructures.

The definition adopted is that of the Directorate-General for Research, European Commission:

‘research infrastructure’ means facilities, resources and related services that are used by the scientific community to conduct top-level research in their respective fields and covers major scientific equipment or sets of instruments; knowledge-based resources such as collections, archives or structures for scientific information; enabling Information and Communications Technology-based infrastructures such as Grid, computing, software and communication, or any other entity of a unique nature essential to achieve excellence in research. Such infrastructures may be ‘single-sited’ or ‘distributed’.\*

Ireland’s excellence in research and innovation brings major public, social, economic, and cultural benefits. This excellence assumes a high-performing research system supported by the very best researchers across a broad research base and by appropriate RIs. Facilitating and supporting a research system that promotes excellence is a complex endeavour. It requires a **coherent national strategic approach** to addressing the needs of researchers, which should preferably include equipment, facilities, and personnel. This will need a **visionary policy and funding plan** that takes a **long-term approach** rather than solely addressing immediate needs and pressure areas.

*Innovation 2020*, Ireland’s five-year strategy on research and development, science and technology, highlights the importance of investment in RIs. It commits to continuing to ensure that researchers from all disciplines have access to the best possible equipment and facilities to pursue their research. The recommendations and issues identified are based on extensive consultation with the academic community and its stakeholders. The results of the related survey, discussion workshop and stakeholder engagement process were unequivocal – researchers based in Ireland do not have access to adequate RIs; there has been

\* This definition corresponds to the one used for the Seventh Framework Programme of the European Community for research, technological development and demonstration activities (2007–13).

a substantial dearth of funding in the past decade for new RIs while insufficient support for the maintenance of existing RIs has become a critical issue.

In this report the Academy focuses on recommendations that could become part of a wider national strategy over time. There are **urgent, immediate pressures on Ireland's RIs that must be rectified quickly** but there is also an **urgent need to devise and implement an RI strategy** for all research-performing institutions. The key overarching recommendation derived from consulting with the academic community is that an ambitious, co-ordinated, and forward-looking national strategy for RIs must be devised and a permanent committee (as recommended in the Technopolis *Ireland's Future Research Infrastructure Needs* report) should be established to oversee its implementation.

Many of the issues are a direct result of the dearth of funding in the sector in recent years and the amount of time that has passed since the last programme of substantial investment. These recommendations are applicable for all HEIs and attempt to address the system as a whole. However, it became clear through our consultative discussions that Irish Institutes of Technology (ITs) face specific issues as they attempt to scale up their research activities, particularly as they transition towards Technological University status. ITs are heavily dependent on Enterprise Ireland for RI funding and are often ineligible for Science Foundation Ireland (SFI) RI funds. The core grants of ITs also lack a dedicated allocation for RI investment, and many reported difficulty in identifying suitable public research funding options through which to compete for funding for RI projects. Any new national RI policy will need to consider how best to assist the research visions of ITs and the Technological Universities as they progress.

In all of this consultative research, whether by survey, workshop or interview, one key point continuously emerged – the research system, and RIs in particular, are at a critical juncture in their development and a national strategy must be implemented, funded, and resourced immediately.

## Recommendations Summary

The key overarching recommendation derived from consulting with the academic community is that an ambitious, co-ordinated, and forward-looking national strategy for research infrastructures must be devised and a permanent committee (as recommended in the *Technopolis Ireland's Future Research Infrastructure Needs* report) should be established to oversee its implementation. The policy should be evaluated and updated every three to five years to ensure it stays relevant and focused.

- Immediately establish a new round of the Programme for Research in Third-Level Institutions (PRTLII) with a focus on the renewal, replacement, and addition of essential RIs, as well as funding for PhD programmes, across the whole research base and not merely in research prioritisation areas.
- A strand of the recommended National Strategy should be to develop and implement a national plan for data management and open science across all institutions to ensure that, as open access to research data becomes a default requirement for Horizon funding, Irish researchers will have access to the infrastructure they need.
- Form a working group involving relevant government departments, all research-performing institutions, funders and stakeholders and representatives of the National Open Research Forum (NORF) to fast-track the implementation of this plan. It should address all issues related to data management, the requisite infrastructures and the key issues facing each institution. A funding allocation must be committed to ensure speedy implementation of this.
- The new national strategy (as above) should include a review and update of the 2007 national roadmap for RIs as published by the HEA and Forfás.<sup>2</sup>
- Create a National Database of Research Infrastructures to avoid duplication and improve accessibility. This would be an extension of the Large Items of Research Equipment (LIRE) database as overseen by the HEA.
- Research infrastructures should be viewed as 'national assets' and not solely institutional ones. A culture of collaboration, sharing, and accessibility must be fostered to ensure they are utilised effectively.
- As the Irish Research eLibrary (IReL) is particularly important to AHSS researchers, the future development and funding of the IReL must be supported.
- Make basic supports such as staff, IT, library opening hours and online database access a feature of the National Research Infrastructures Strategy and associated funding pot recommended above.

<sup>2</sup> Research Infrastructure in Ireland. HEA and Forfás, 2007. [https://ec.europa.eu/research/infrastructures/pdf/roadmaps/ireland\\_national\\_roadmap.pdf#view=fit&pagemode=none](https://ec.europa.eu/research/infrastructures/pdf/roadmaps/ireland_national_roadmap.pdf#view=fit&pagemode=none)

- Reduce the teaching and administration burden on researchers through providing extra support and protecting their research time as a priority.
- Recognise that disciplines have differing RI needs which must be addressed and funded at an appropriate level.
- Introduce dedicated funding for international travel for researchers wishing to attend conferences and events to build links that may lead to future collaborations and to view collections and databases not available to them in their home institution. This is often of particular relevance to AHSS researchers.
- Establish a cross-departmental protocol on assessing Irish applications seeking to join a European Research Infrastructure Consortium (ERIC), including assessment of feasibility. Ensure this process is conducted in a timely manner and open to all research areas for ERICs.
- Establish a national contact point for projects wishing to join an ERIC so that they can be guided through the approval process.
- Specifically address ERIC opportunities in a regularly reviewed National Research Roadmap, as per the recommendations in the 2015 Technopolis Report on RI Needs by the Department of Business, Enterprise and Innovation and as per the European National Research Roadmap 2016.

# Programme for Research for Third-Level Institutions (PRTLII)

## Background

The roll-out of the PRTLII funding in 2000 marked a new era for Irish research and Irish RIs. PRTLII awarded approximately €1.2 billion in exchequer and private matching funding for buildings, research centres, research equipment, research programmes and training (in particular structured PhD programmes) between 2000 and 2015. The last round of PRTLII funding was committed through a call administered in 2009 and a sixth cycle has not yet been established.

In addition to PRTLII, the HEA awarded €88m of direct exchequer funding via the Research Equipment Renewal Grant (2007) and Research Facilities Enhancement Schemes (2008). Other substantial investments in research infrastructures were made by Science Foundation Ireland (SFI), government departments and agencies (in health, agriculture, energy, etc.), and research-performing organisations themselves. In total, the Irish government invested between €60m and €80m per year in research infrastructures from 2000 to 2015.<sup>3</sup>

Despite this significant investment of funds in research infrastructure since 1998 and the remarkable transformation of the Irish research landscape since that time, *the National Review of Research Infrastructures 2007* found that weaknesses still existed and gaps remained in the higher-education and national research infrastructure. At that point, only two years before funding for HE was drastically diminished, it stated that we were still in ‘catch-up’ mode while at the same time trying to compete with our international competitors.

In July 2015, the Department of Business, Enterprise and Innovation commissioned Technopolis to take stock of and explore future research infrastructure needs. Its subsequent report, *Ireland’s Future Research Infrastructure Needs*, recommended:

- The development of a long-term financial commitment to underpin the research infrastructure strategy, recognising the need for research infrastructure investments to be supported by a dedicated and long-term strategy to steer dedicated and sustainable funding.
- An annual budget of between €50 million and €80 million to support the recommended RI strategy.
- The development of an RI roadmap subject to regular (every three to five years) review and the establishment of a Permanent Committee on Ireland’s Research Infrastructures, or the allocation of these responsibilities to an existing committee or research council.

In December 2016, the then Minister for Jobs, Enterprise and Innovation, Mary Mitchell O’

<sup>3</sup> <https://dbe.i.gov.ie/en/Publications/Publication-files/Irelands-Future-Research-Infrastructure-Needs-Study.pdf>



Connor TD, stated that her department would seek funding for Cycle 6 of the PRTLl in the mid-term review of the Capital Plan in 2017 and consult with the research community in due course.<sup>4</sup> The subsequently published mid-term review of the capital plan in September 2017 contained no mention of PRTLl, despite the fact that Action 3.16 of *Innovation 2020*, Ireland's five-year strategy on research and development, science and technology, lauds the previous success of PRTLl. *Innovation 2020* commits to 'scope out and develop a successor to PRTLl to support new investment in research infrastructure in the wider research base and to allow for maintenance and upgrading of existing facilities and equipment' and set 2016 as the timeline for this. This timeline has not been met.

The *National Development Plan 2018–2027* (published February 2018), states that PRTLl will be expanded; with increased research capacity with additional PhD and MSc enrolments in third-level institutions in all regions; aligned with a refresh of research prioritisation. This marks a public policy departure from *Innovation 2020*, which envisions PRTLl applying to the wider research base. No timelines for this cycle of PRTLl are outlined either in the *National Development Plan 2018–2027* or in the accompanying *National Planning Framework*.

## Project Findings

The RIA Research Infrastructures Survey found that 90% of researchers in the Sciences and 85% of AHSS researchers believe that there are gaps/deficits in the availability of RIs relevant to their discipline. Additionally, 35% of Science respondents and 39% of AHSS respondents indicated that they are not generally able to access the research infrastructural resources they require. This points to an urgent need to address RI needs in the sector.

The RIA discussion workshop held in June 2018 with approximately 80 high-level representatives from academia, stakeholders and funders heard that issues with the maintenance and repair of existing RIs are a dominant obstacle for researchers. The last round of PRTLl funding was almost a decade ago and much of the RIs purchased over the course of the PRTLl programmes are now coming to the end of their life cycle. The lack of maintenance and service plans for many pieces of equipment has also proved to be problematic – the day-to-day funding required to effectively run RIs was simply not made available and institutions find it difficult to meet these requirements from their existing budget.

At present, RIs investment is largely administered through ad-hoc funding calls from SFI. Such funding, while significant, is typically confined within the research prioritisation areas in which proposals must comply with the legal remit of SFI, which is to 'promote, develop and assist the carrying out of oriented basic and applied research in strategic areas of scientific endeavour that concern the future development and competitiveness of industry and enterprise in the State'. For example, in 2016, SFI's RI programme funded 38 research equipment and facilities awards valued at €47 million to support 36 key RI projects. These awards were in strategically important sectors, including animal and human health, internet of things, networks and manufacturing. Thus, while supporting valuable research, this call is not as comprehensive and

<sup>4</sup> <https://www.kildarestreet.com/wrans/?id=2016-12-07a.720>

wide-ranging as previous cycles of PRTLl and fails to address the infrastructural needs of the majority of disciplines. Restructuring the next cycle of PRTLl to accommodate support for new proposals and for existing investments across the wider research base on an open competitive basis was widely agreed as a crucial feature in future rounds of infrastructure development.

The development of a whole-of-system, national RI policy that speaks to the wider research base offers a positive means of knitting together the current variety of schemes and through this process also better equipping the research community to plan for long-term excellence and sustainability. Given the speed of technological advances and requirements, such a policy should be revisited regularly to ensure its continued relevance and to provide a continued opportunity for the wider research base, policymakers, and funders to engage collectively around the shared ambition of research excellence. A permanent committee (as recommended in the *Technopolis Ireland's Future Research Infrastructure Needs* report) should be established for this purpose and would oversee the implementation of the policy.

### Recommendations:

- An ambitious, co-ordinated, and forward-looking national strategy for RIs must be devised and a permanent committee (as recommended in the *Technopolis Ireland's Future Research Infrastructure Needs* report) should be established to oversee its implementation.
- Commit to evaluating and updating this national policy every three to five years to ensure it stays relevant and focused.
- Immediately establish a new round of PRTLl funding with a focus on the renewal, replacement, and addition of essential RIs as well as funding for PhD programmes, across the whole research base and not merely research prioritisation areas.

## The Data Issue

Data intensive science and open research presents many exciting opportunities but also comes with its own set of challenges. Open Science practices are central to the current European Commission (EC) research and funding landscape and for Irish researchers to access European funding<sup>5</sup> infrastructures must be in place to support data management including the provision of FAIR data<sup>6</sup> and the long-term stewardship/preservation of that data. By 2020, open access to research data will be the default requirement for Horizon Europe funding—thus, we must address this issue immediately. These infrastructures include certified digital repositories and registries, alongside the data stewards<sup>7</sup> and other professionals required to advise, prepare and help manage the lifecycle of research data. Data must be stored securely, in compliance with all data protection regulations, and must be accompanied by metadata and contextual information that renders that data accessible and fit for re-use.

High performance computing capacity, data preservation and processing infrastructure, and the need for platform enabling technologies emerged as a significant and near universal priority for future RI investment. There is a clear concern that Ireland has not fully grasped what is needed for future progression in this space either in terms of capacity, operational costs, ongoing maintenance and investment to future proof investment in such resources.

Much work in this area is being conducted by the *National Open Research Forum* who are examining issues such as FAIR research data, Open Access to publications, enhancing and integrating existing national systems and developing a fully-funded national CERIF (the Common European Research Information Format) compliant system.

Non-commercial research data centres, such as the one held in Waterford Institute of Technology (WIT), need sustained funding to allow them to consider the needs of long-term open data. They particularly need high-speed data encryption and storage coupled with a robust data governance system to restrict and ensure data is only processed appropriately and a security system that is able to identify security breaches and the unauthorised movement of data. This will require an adequate and sustainable funding model that allows for long-term planning and process implementation.

An example of an initiative which can support research data preservation and access in the humanities and social sciences which Ireland has available is the Digital Repository of Ireland (DRI). The DRI is certified by CoreTrustSeal, supports FAIR data through its policy,

<sup>5</sup> By 2020, open access to research data is the default requirement for Horizon 2020 funding: [http://ec.europa.eu/research/participants/data/ref/h2020/grants\\_manual/hi/oa\\_pilot/h2020-hi-oa-data-mgt\\_en.pdf](http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-data-mgt_en.pdf)

<sup>6</sup> The report of the European Commission's expert group on FAIR data, "Turning FAIR into Reality," includes an action plan for FAIR implementation intended to guide member states. It was published on 23 Nov 2018 at the launch of the EOSC. <https://doi.org/10.2777/1524>

<sup>7</sup> Barend Mons, the founding leader of the EOSC HLEG, has stated on a number of occasions that Europe needs 500,000 data stewards to successfully implement the European Open Science Cloud. See: <http://e-irg.eu/news-blog/-/blogs/we-need-500-000-respected-data-stewards-to-operate-the-european-open-science-cloud>

architecture and metadata guidelines, and operates training programmes in data management. DRI also provides a link to European networks for best practice in research data management, including the Research Data Alliance, the Commission's FAIR data expert group, and ALLEA's e-Humanities working group. DRI currently stewards research data sets from a number of institutions across Ireland by providing long term digital preservation and open access to that data; it is capable of scaling to meet the upcoming needs of Ireland's HSS domains, but requires significant investment to achieve this scale.

In order to meet the data management and open science requirements placed upon them, it is likely that each research performing institution will devise its own plan. However, if we are to create a future-proofed research system it would make considerably more sense, and represent a better use of overall resources, to develop and implement a national plan for data management with dedicated funding and open science across all institutions and disciplines. Better coordination and shared use of resources will provide the most robust infrastructures at the best value to public funds.

These measures will ensure that Irish researchers are supported by an accessible, fully funded, transparent and sustainable system that fits the needs of the research base as a whole. European experts recommend that 5% of a member state's research expenditure should be spent on properly managing and stewarding data.<sup>8</sup> A frequent point made in the discussion workshop referred to the growing complexity of legal and governance structures for large scale international research infrastructures and the need for suitable expertise to guide HEIs as identify, choose, or develop such structures.

## Recommendations:

- Develop and implement a national plan for data management and open science across all institutions to ensure that, as FAIR data and open access to research data becomes a default requirement for Horizon funding, Irish researchers will have access to the infrastructure they need.
- Form a working group involving relevant government departments, all research-performing institutions, funders and stakeholders and representatives of NORE, to fast-track forming a national policy and strategic national plan on all issues related to data management, the requisite infrastructures and the key issues facing each institution. A funding allocation must be committed to ensure a speedy implementation of the national plan that is developed.

<sup>8</sup> [https://ec.europa.eu/research/openscience/pdf/realising\\_the\\_european\\_open\\_science\\_cloud\\_2016.pdf#view=fit&page-mode=none](https://ec.europa.eu/research/openscience/pdf/realising_the_european_open_science_cloud_2016.pdf#view=fit&page-mode=none)

## Mapping the System – Making It Accessible

In July 2015, Technopolis issued a report entitled *Ireland's Future Research Infrastructure Needs*.<sup>9</sup> Many of the recommendations have yet to be addressed and should be considered in the development of a future strategy in this area. One such recommendation related to the creation of a research infrastructure road map:

*Ireland needs a Research Infrastructure roadmap to establish the prioritisation of national and pan-European Research Infrastructures; align Research Infrastructure priorities with STI priorities; facilitate political support at all policy levels; help to define national and regional budgets; and allow for long-term financial commitment by public and private stakeholders. The process of developing the roadmap should engage relevant ministries, agencies, industry, etc. The roadmap should be updated every 3 or 4 years.*

This recommendation has not yet been implemented but is an essential part of any future RI strategy. The development path of Ireland's RIs must be mapped out, agreed, and resourced. Ireland's first RI roadmap was published in 2007 but has not been the subject of the regular updates required.

It is also necessary to get a clearer picture of the RIs currently in existence, how they are used and what further capacity they might have to ensure that future duplication is avoided. The HEA has gone some way towards establishing this type of database through its Large Items of Research Equipment (LIRE) project. This is a national inventory of all significant publicly funded research infrastructure and equipment with a value of at least €100,000.<sup>10</sup> It is currently being updated. However, this database contains obvious exclusions, i.e. equipment valued at less than €100,000.

The establishment of more complete database of research equipment and infrastructures would assist in moving towards an improved model for accessibility. Facilitating the widest possible access to research infrastructure is essential in order to achieve the greatest return on investment and value for money for the state and the research community. At present, in accordance with the *National Guidelines for Access by Researchers to Research Infrastructures Hosted by Higher Education Institutions or Other Research Bodies in Ireland*, as published by the HEA,<sup>11</sup> institutions are encouraged to implement open and transparent access policies. However, these policies are self-regulated by the institutions and access policies may differ between host institutions and even within a host institution depending on the research infrastructure involved.

<sup>9</sup> Full report available at: <https://dbei.gov.ie/en/Publications/Publication-files/Irelands-Future-Research-Infrastructure-Needs-Study.pdf>.

<sup>10</sup> Details on the LIRE database: <http://hea.ie/funding-governance-performance/governance/research-infrastructure-guide-lines-for-access/>.

<sup>11</sup> Full guidelines available here: <http://hea.ie/assets/uploads/2017/09/NATIONAL-PRINCIPLES-FOR-ACCESS-TO-RESEARCH-INFRASTRUCTURE.pdf>.

In order to take a national approach to research infrastructure provision, it is necessary to establish a better system of 'sharing' and accessibility to the RIs that are publicly funded. The Irish research system is relatively small compared to that of other countries, so it is essential that we utilise all infrastructures in the most efficient way. They should be viewed as national assets rather than solely institutional ones.

One area where improved accessibility is being implemented is in relation to the IReL (the Irish Research eLibrary). This is a nationally funded electronic research library, initially conceived to support researchers in Biotechnology and Information Technology in 2004 and, following the success of this, expanded in 2006 to support research in the Humanities and Social Sciences. IReL delivers quality peer-reviewed online research publications, journals, databases, and index and abstracting services, as well as ebooks direct to the desktop of researchers wherever they are located. It addresses the inability of individual institutions to bear the cost of comprehensive information provision and facilitates the collaborative cross-institutional and cross-disciplinary nature of the various research initiatives. It is a cost-effective initiative as it takes advantage of economies of scale from consortium purchasing.

The IReL is currently under review by the HEA to clarify the opportunities and challenges facing IReL and to set out best practice in the provision of national research e-library services. It also intends to propose strategic options for the future. As the IReL is particularly important to AHSS researchers, the future development and funding of the IReL must be ensured.

## Recommendations:

- The new national strategy (as above) should include a review and update of the 2007 national roadmap for research infrastructures as published by the HEA and Forfás.<sup>12</sup>
- Create a National Database of Research Infrastructures to avoid duplication and improve accessibility. This would be an extension of the Large Items of Research Equipment (LIRE) database as overseen by the HEA.
- Research infrastructures should be viewed as 'national assets' and not solely institutional ones. A culture of collaboration, sharing and accessibility must be fostered to ensure they are utilised effectively.
- As the Irish Research eLibrary (IReL) is particularly important to AHSS researchers, the future development and funding of the IReL must be supported.

<sup>12</sup> *Research Infrastructure in Ireland*. HEA and Forfás, 2007. [https://ec.europa.eu/research/infrastructures/pdf/roadmaps/ireland\\_national\\_roadmap.pdf#view=fit&pagemode=none](https://ec.europa.eu/research/infrastructures/pdf/roadmaps/ireland_national_roadmap.pdf#view=fit&pagemode=none)

## Resourcing RI Supports

The RIA survey and subsequent discussion workshop on this topic uncovered several issues in relation to the resourcing of research infrastructures. The first and perhaps most obvious issue is that of maintenance, repair, and renewal of equipment, facilities, and memberships as discussed earlier. However, several other issues were discussed which must be addressed in order to ensure a research system that performs effectively and efficiently. Many of these issues appear to be shared by sciences and arts, humanities, and social sciences researchers.

A key item of discussion was the lack of support staff available, particularly laboratory support staff and technicians. This is an important issue as it can delay and restrict access to equipment that might otherwise be assisting in the performance of vital research. The AHSS disciplines suffer from a similar issue in relation to the provision of staff for library opening hours.

A further item of discussion by researchers is the lack of basic supports available in their institutions which they judge essential to furthering their work and facilitating their research; for example, insufficient IT support and software packages. AHSS researchers pointed to another issue with this area, namely access to online databases. Many cited difficulties with accessing the online journals and databases they require for research, as not all institutions avail of the same subscriptions. Researchers in the Humanities and Social Sciences increasingly rely on commercially produced online databases of sources and archival material which are only available by subscription. These are often too expensive for individual institutions to fund. A cost-effective proposal would be for the HEA to negotiate group licences for these resources to be made available to universities and colleges at a much reduced cost.

Researchers also stressed that increasing demands on their time mean that they cannot devote the necessary time to their research. The administrative burden and teaching load are ever-increasing and so research time becomes difficult to carve out in a busy schedule.

Researchers often need to travel internationally to attend conferences and events and to access library resources and online databases not available to them in their home institution. They require travel funding to ensure they can avail of opportunities to research such materials and to participate in international events with potential to lead to collaborative partnerships in the future. The Royal Irish Academy Charlemont Grants scheme attempts to address this gap on a small scale through funding mobility grants for early career researchers, but a national approach to resolving this issue for researchers at all career stages is needed.

### Recommendations:

- Make basic supports such as staff, IT, library opening hours, and online database access a feature of the National Research Infrastructures Strategy and associated funding pot that is recommended.

- Reduce the teaching and administration burden on researchers through providing extra support and protecting their research time as a priority.
- Recognise that disciplines have differing RI needs which must be addressed.
- Introduce dedicated funding for international travel for researchers wishing to attend conferences and events to build links that may lead to future collaborations and to view library and archival collections not available to them in their home institution. This is often of particular relevance to AHSS researchers.
- Investigate opportunities to negotiate shared group licenses for institutions wishing to access online resources which might otherwise be too expensive.



# European Research Infrastructure Consortia (ERICs)

## Background

An ERIC is a consortium of member states, with a legal underpinning, involved in the establishment and operation of a European research infrastructure, which may also lead to global potential. The primary objective of an ERIC is to establish and operate, through its members, a research infrastructure of European importance on a non-economic basis. The members of an ERIC may be Member States, associated countries, third countries other than associated countries, and intergovernmental organisations. Further member or associated states, third countries, or intergovernmental organisations may become members or observers without voting rights.

Ireland has a very low membership rate of ERICs. According to the European Strategic Framework for Research Infrastructures (ESFRI) Roadmap 2016, of the 29 operational ERICs in existence, Ireland participates in only a third. Of the 21 proposed and emerging ERICs at that time, Ireland was a participant, or proposed participant, in only seven. Ireland has not taken on a host, or co-ordinating country, role in any ERIC. It is a full member of only two environmental ERICs and a participant in the rest.

ERICs are a relatively new legal entity, developed in the past fifteen years. They can take approximately ten years to develop and become operational. Apart from the ESFRI National Contact Points (NCPs), based in the SFI and HEA, there are no co-ordinating supports for ERICs in Ireland and no approved process for development.

## Project Findings

Participants in the workshop identified Irish research projects that are on a clear track to benefit from participation in a specified ERIC. In each instance, the project has already secured the funding and resources required in developing the research infrastructure for ERIC designation by the European Commission. Once designated, they need similar approval at a national level for participation. This is because it is technically the country and not the project that signs up to an ERIC – thus they require national sign-off and membership funding in order to be instigated. Approval at a national level for ERIC participation at present lacks a standardised process or mechanism, leaving national projects stuck at the gates and unable to participate in international collaborations despite the availability of the necessary national expertise and resources.

Participants noted that joining an ERIC can unlock many benefits for the project and its associated researchers. It allows them access to cutting-edge technologies, equipment, expertise, and datasets in other countries, but also allows other countries access to Irish expertise and resources. It enables knowledge transfer and acts as an incubator for ideas.

ERICs allow Irish researchers to partake in frontier research and establish partnerships between academia and industry. Participation in an ERIC is a very cost-effective membership in relation to the benefits it unlocks. Getting Ireland on track to be a more active member of ERIC groupings is not a funding issue – it is simply a matter of establishing an efficient process to allow for a speedy sign-up.

### **Recommendations:**

- Establish a cross-departmental protocol on assessing Irish applications seeking to join an ERIC, including assessment of feasibility. Ensure this process is conducted in a timely manner and open to all research areas for ERICs.
- Establish a national contact point for projects wishing to join an ERIC so that they can be guided through the approval process.
- Specifically address ERIC opportunities in a regularly reviewed National Research Roadmap, as per the recommendations in the 2015 Technopolis Report on RI Needs by the Department of Business, Enterprise and Innovation and as per the European National Research Roadmap 2016.

## Further information

The Royal Irish Academy/Acadamh Ríoga na hÉireann is Ireland's leading body of experts in the sciences, humanities and social sciences. The Academy champions research and identifies and recognises Ireland's world-class researchers. It supports scholarship and promotes awareness of how science and the humanities enrich our lives and benefit society. Membership of the Academy is by election and is considered the highest academic honour in Ireland. The Academy is the only pan-island HEI in Ireland with a specific north–south remit and offers a trusted, safe forum for cross-border discussions among leaders in higher education and research.

The Royal Irish Academy Research Infrastructures Steering Group would like to express gratitude to everyone who contributed to this project, including those who responded to the survey and attended the discussion workshop. Work in this area will continue into the future and the group will remain active in engaging with stakeholders, policymakers and decisionmakers to encourage them to act upon these recommendations.

The members of the Royal Irish Academy Research Infrastructures Steering Group are:

- Professor Pat Guiry, MRIA, UCD, Co-Chair.
- Professor Mary O' Dowd, MRIA, QUB, Co-Chair.
- Professor Anne Fuchs, MRIA, FBA, UCD.
- Dr John Donovan, DIT.
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